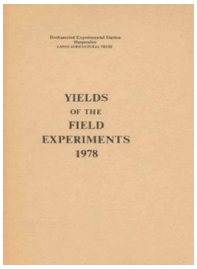
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ROTHAMSTED RESEARCH

Yields of the Field Experiments 1978

Full Table of Content

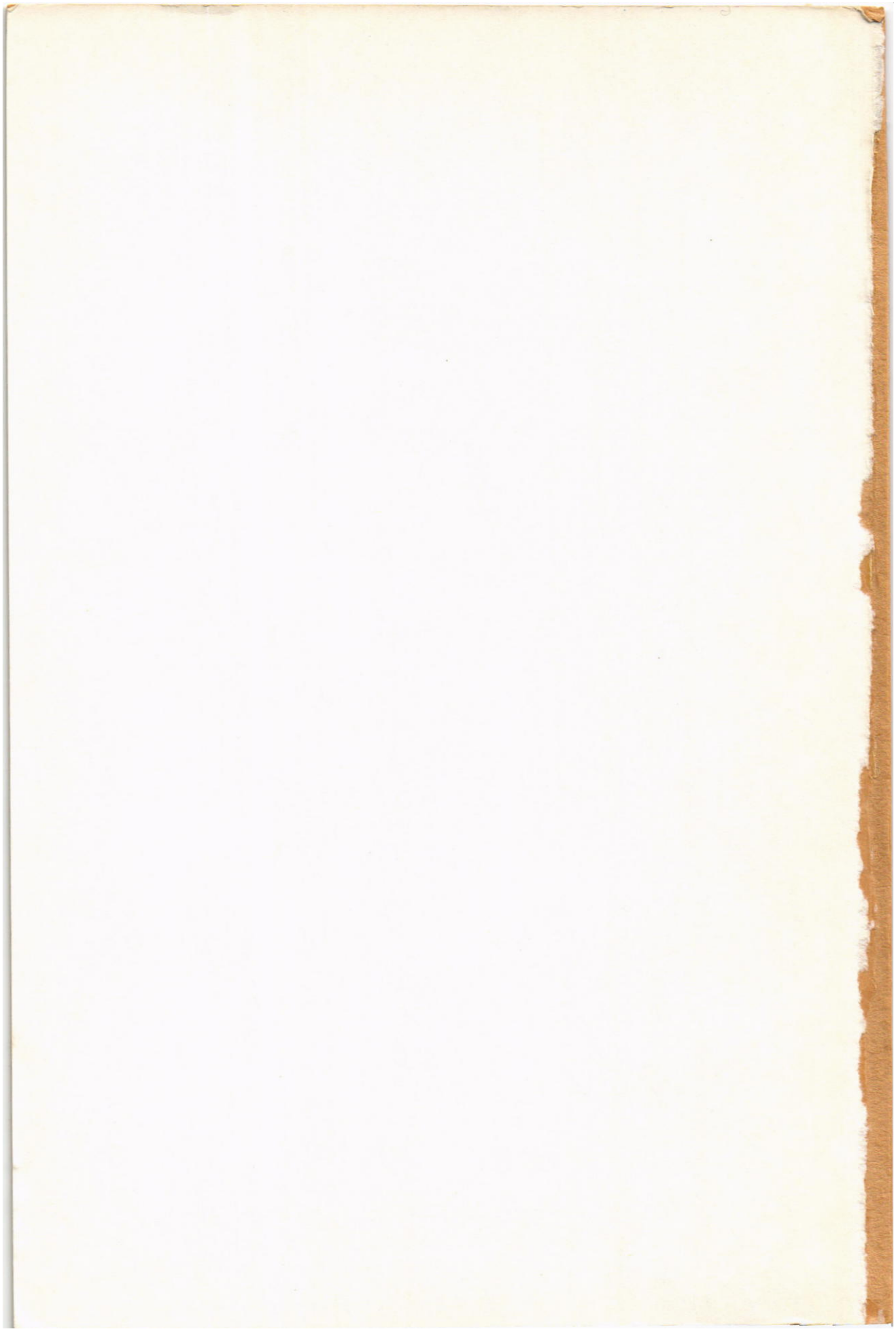


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Rothamsted Research

Rothamsted Research (1979) *Default Title ;* Yields Of The Field Experiments 1978, pp 0 - 459 **- DOI: https://doi.org/10.23637/ERADOC-1-30**

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Rothamsted Experimental Station

Harpenden

Lawes Agricultural Trust

YIELDS

of the

FIELD

EXPERIMENTS

1978

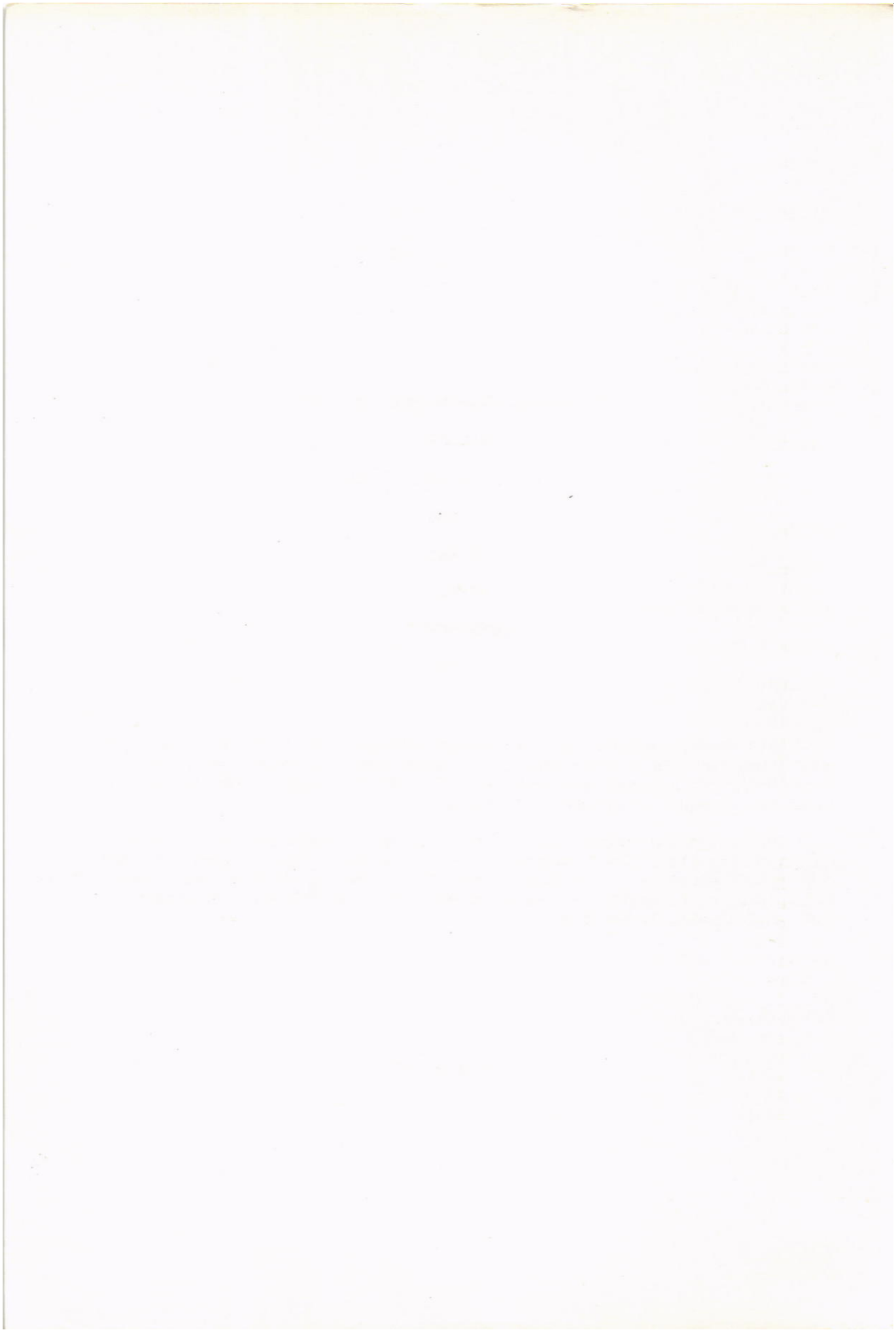
This report includes only experiments conducted at Rothamsted, Woburn and Saxmundham. Only those experiments which have the determination of crop yields as an object are included. For many of these, other determinations are of equal or greater importance.

The design and supervision of the field experiments are the responsibility of the Field Plots Committee (members in 1978: F.G.W. Jones (Chairman), G.V. Dyke (Secretary), J. McEwen (Deputy Secretary), L. Fowden, I.J. Graham-Bryce, A.E. Johnston, E. Lester, T. Lewis, R. Moffitt, J.A. Nelder, P.B. Tinker, C.P. Whittingham, T. Woodhead).

Price: 5.00

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CONVENTIONS 1978

For each experiment current treatments are shown, together with the factor and level names which are used in the tables. The program used for the analyses of these experiments limits level names to eight characters, and factor names similarly, though a suffix of up to 3 digits in brackets may be appended if required.

For each experiment, other than annuals, references are given to previous years. These refer to the '(Numerical)(Results) Yields of the Field Experiments' - (t) indicates a year when treatments were described. Since 1973 treatments have been described annually for all experiments and (t) is not used for these years.

For the classical and some long-term experiments reference is made to 'Details' - separate publications, giving full descriptions of treatments until 1967 & 1973, with full titles 'Details of the Classical and Long Term Experiments up to 1967' and 'Details of the Classical and Long Term Experiments up to 1973'.

The following conventions are observed unless otherwise stated.

All areas are in hectares. All plot dimensions are in metres.

All seed rates, rates of application of fertilisers, sprays etc. are per hectare.

All yields and plant numbers are per hectare.

The following abbreviations are used in variate headings:

Wheat, barley, oats, rye, beans etc.

Grain:	Grain (at 85% dry matter)
Straw:	Straw (at 85% dry matter)

Sugar beet

Roots:	Roots (washed)
Sugar %:	Sugar percentage

All crops

Mean D.M. %:	Mean dry matter % as harvested

For any other crop, details of abbreviations are given as necessary.

Compound fertilisers indicated thus - (20:10:10) = compound fertiliser (20% N, 10% P205, 10% K20), granular unless otherwise stated.

The compound fertiliser (13:13:20) used in our experiments is the grade containing sulphate of potash.

Treatment of cereal seed with organomercury and/or gamma HCH should be assumed in this report, exceptions are noted.

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Harvest areas for cereals

On most of those cereal experiments at Rothamsted and Woburn (but not Saxmundham) which are harvested by combine the 'blank-row' technique is used to distinguish the areas taken for yield from the discard areas. When seed is drilled in rows 7 in. (18 cm.) apart (the most common arrangement), appropriate coulters are prevented from sowing and 8 or 16 rows are left for yield according to the cutter-bar width of the combine to be used. If the row-spacing is other than 7 in. a similar arrangement is used but with a different number of rows.

The ends of plots are separated from each other or from headlands by 3 ft (91 cm.) fallow paths made after the crop has established.

The 'Area harvested' in the 'Yields', when the blank-row technique is used, is the product:-

number of rows harvested x distance between rows x length of rows.

A series of experiments by Widdowson at Rothamsted (68/Da/9, 68/Db/1, 69/R/W/13, 69/R/B/5, 70/R/WW/3) showed that on average the yield of 16 rows (50 ft (15 m) long) was 7.8% greater with blank rows than without. (Experimental Husbandry 23 pp 16-20 (1972)).

If no rows are left blank and the plot is wider than the combine harvester so that discards are left uncut, the 'Area harvested' is the product:-

width of cutter bar x length of rows.

If the plot is narrower than the combine so that the whole area between paths is cut, the 'Area harvested' is the product:-

number of rows x distance between rows x length of rows.

We do not apply the adjustment used by some workers who take the harvested areas as width x length where each is measured to the centre of 'paths' up to a maximum of 18 in (46 cm).

Tables of means

Tables of means are presented directly from computer output. Both factor and level names are present in upper case characters. Vertical and horizontal lines are omitted e.g.:-

FACTOR C	LEVEL C1		LEVEL C2		LEVEL C3	
FACTOR B	LEVEL B1	LEVEL B2	LEVEL B1	LEVEL B2	LEVEL B1	LEVEL B2
FACTOR A						
LEVEL A1	*	*	*	*	*	*
LEVEL A2	*	*	*	*	*	*

Standard errors

NOTES: (1) This report gives standard errors of differences, not of means.

(2) Annotations (e.g. * min rep, max-min, max rep) to S.E.Ds are only explained the first time they occur in any experiment.

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78/R/BK/1

BROADBALK

Object: To study the effects of organic and inorganic manures on continuous winter wheat. Since 1968 two three-year rotations have been included: potatoes, beans, wheat and fallow, wheat, wheat.

The 135th year, wheat, potatoes, beans. The 11th year of the revised scheme.

For previous years see 'Details' 1967 & 1973, Station Report for 1966, pp. 229-231, Station Report for 1968, Part 2, and 74-77/R/BK/1.

Areas harvested:

	Section	
Wheat:	0	0.00434
	1	0.00798
	2, 3 and 6	0.00659
	8 and 9	0.00694
Potatoes:	4	0.00659
Beans:	7	0.00741

Treatments:

Whole plots

PLOT	Plot	Fertilisers and organic manures:- Treatments until 1967	Treatments from 1968
01DN2PK	01	-	D N2 P K
21DN2	21	D	D N2
22D	22	D	D
030	03	None	None
05MIN	05	P K Na Mg	P K (Na) Mg
06N1MIN	06	N1 P K Na Mg	N1 P K (Na) Mg
07N2MIN	07	N2 P K Na Mg	N2 P K (Na) Mg
08N3MIN	08	N3 P K Na Mg	N3 P K (Na) Mg
09N4MIN	09	N*1 P K Na Mg	N4 P K (Na) Mg
10N2	10	N2	N2
11N2P	11	N2 P	N2 P
12N2PNA	12	N2 P Na	N2 P Na
13N2PK	13	N2 P K	N2 P K
14N2PKMG	14	N2 P Mg	N2 P K Mg
15N3MIN	15	N2 P K Na Mg	N3 P K (Na) Mg
16N2MIN	16	N*2 P K Na Mg	N2 P K (Na) Mg
17N2MINH	17	+N2	N2 1/2(P K (Na) Mg)
18N2MINH	18	+ P K Na Mg	N2 1/2(P K (Na) Mg)
19C	19	C	C
20NKMG	20	N2 K Na Mg	N2 K (Na) Mg

+ Alternating

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78/R/BK/1

N1,N2,N3,N4: 48, 96, 144, 192 kg N (as sulphate of ammonia until 1967, except N* which was nitrate of soda. All as 'Nitro-Chalk' from 1968).
P: 35 kg P as single superphosphate (triple superphosphate in 1974)
K: 90 kg K as sulphate of potash
Na: 55 kg Na as sulphate of soda
(Na): 16 kg Na as sulphate of soda until 1973
Mg: 30 kg Mg annually to Plot 14, 35 kg Mg every third year to other plots since 1974. All as kieserite since 1974, previously as sulphate of magnesia annually
D: Farmyard manure at 35 tonnes
C: Castor meal to supply 96 kg N
MIN: P K (Na) Mg

Strips of sub-plots: Until 1967 wheat alone was grown on the experiment, with some bare fallowing on strips of sub-plots. From 1968, ten sub-plots were started with the following cropping:-

SECTION		1968	69	70	71	72	73	74	75	76	77	78
SC0/W27	Section 0	W (last fallowed 1951)	W	W	W	W	W	W	W	W	W	W
SC1/W12	Section 1	W (last fallowed 1966)	W	W	W	W	W	W	W	W	W	W
SC2/W1BE	Section 2	BE	W	P	BE	W	P	BE	W	P	BE	W
SC3/W2F	Section 3	W (fallowed 1967)	W	F	W	W	F	W	W	F	W	W
POTATOES	Section 4	W (fallowed 1965)	P	BE	W	P	BE	W	P	BE	W	P
-	Section 5	W (fallowed 1965)	F	W	W	F	W	W	F	W	W	F
SC6/W1F	Section 6	F	W	W	F	W	W	F	W	W	F	W
BEANS	Section 7	P	BE	W	P	BE	W	P	BE	W	P	BE
SC8/W6	Section 8*	W (fallowed 1963)	W	W	W	F	W	W	W	W	W	W
SC9/W20	Section 9	W (last fallowed 1958)	W	W	W	W	W	W	W	W	W	W

W = wheat, P = potatoes, BE = beans, F = fallow

* No weedkillers

NOTE: For a fuller record of treatments see 'Details' etc.

Standard applications:
Winter wheat: Manures: Section 0: Chalk at 2.9 t. Weedkillers (not applied to Section 8): Terbutryne at 2.8 kg in 220 l. Dicamba with mecoprop and MCPA ('Banlene Plus' at 4.9 l in 220 l). Insecticide (Section 6 only): Omethoate at 0.65 kg in 220 l.
Potatoes: Manures: Chalk at 2.9 t. Weedkillers: Paraquat at 0.84 kg ion in 220 l. Linuron at 1.1 kg in 220 l. Fungicide: Mancozeb at 1.3 kg in 220 l. Fentin acetate and maneb ('Fennite A' at 1.7 kg in 220 l). Insecticide: Pirimicarb at 0.14 kg in 220 l.
Beans: Insecticide: Pirimicarb at 0.14 kg in 220 l. Desiccant: Diquat at 0.59 kg ion with 'Agral' (a wetting agent) at 0.28 kg in 220 l.
Fallow: Manures: Chalk at 2.9 t. Weedkiller: Paraquat at 0.84 kg ion in 220 l.

Seed: Wheat: Cappelle, dressed with chlorfenvinphos, sown at 200 kg.
Potatoes: Pentland Crown.
Beans: Minden, sown at 200 kg.

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78/R/BK/1

Cultivations, etc.:-

ALL SECTIONS: Superphosphate, sulphate of soda, kieserite, and castor meal applied: 22 Sept, 1977. Sulphate of potash applied: 23 Sept. Subsoiled, tines 160 cm apart and 38 cm deep: 28 Sept. FYM applied: 4 Oct. Ploughed: 6 Oct.

CROPPED SECTIONS:

Winter Wheat: Chalk applied: 19 Sept, 1977. Rotary harrowed: 17 Oct. Seed sown: 19 Oct. Terbutryne applied: 24 Oct. Section 6: Insecticide applied: 30 Mar, 1978. N and 'Banlene Plus' applied: 8 May. Sections 0, 1, 2, 3, 8 and 9, combine harvested: 29 Aug. Section 6 combine harvested: 30 Aug.

Potatoes: Chalk applied: 20 Sept, 1977. Heavy spring-tine cultivated: 31 Mar, 1978. N applied: 25 Apr. Paraquat applied: 8 May. Spike rotary cultivated, planted: 9 May. Linuron applied: 15 May. Grubbed and rotary ridged: 26 June. Mancozeb applied: 5 July. Mancozeb and pirimicarb applied twice: 18 July and 4 Aug. 'Fennite A' applied: 17 Aug. Haulm pulverized: 7 Sept. Lifted: 27 Sept.

Spring Beans: Spring-tine cultivated: 9 Mar, 1978. N applied, rotary harrowed, seed sown: 10 Mar. Tractor hoed twice: 19 May and 8 June. Pirimicarb applied: 7 July. Haulm desiccant applied: 19 Sept. Combine harvested: 22 Sept.

FALLOW SECTION: Chalk applied: 20 Sept, 1977. Heavy spring-tine cultivated: 31 Mar, 1978. Paraquat applied: 8 May. Ploughed twice: 24 May and 6 July. Heavy spring-tine cultivated: 15 June. Spring-tine cultivated: 12 July.

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78/R/BK/1

WHEAT

GRAIN TONNES/HECTARE

***** TABLES OF MEANS *****

SECTION PLOT	SC2/W1BE	SC6/W1F	SC3/W2F	SC1/W12	SC9/W20	SC0/W27	SC8/W6	MEAN
01DN2PK	7.84	6.64	6.87	*	*	*	*	7.12
21DN2	8.05	6.55	7.19	7.06	5.97	6.81	5.03	6.67
22D	7.86	7.55	5.97	6.83	6.62	6.23	4.84	6.56
030	3.21	2.66	1.25	1.60	1.65	1.74	1.94	2.01
05MIN	4.17	3.33	1.47	1.66	2.23	1.93	3.12	2.56
06N1MIN	5.55	5.24	3.39	2.92	3.94	3.22	2.62	3.84
07N2MIN	7.30	6.54	5.82	5.13	5.62	5.16	3.54	5.58
08N3MIN	6.78	5.89	6.59	5.65	6.05	5.27	4.80	5.86
09N4MIN	6.43	6.24	6.78	5.89	6.30	4.90	4.89	5.92
10N2	4.36	3.41	4.20	2.64	3.09	2.24	2.85	3.26
11N2P	4.80	4.46	4.98	4.09	3.62	3.80	2.76	4.07
12N2PNA	4.97	4.51	4.99	4.54	3.90	4.73	2.96	4.37
13N2PK	6.80	6.01	5.67	5.39	6.07	4.97	4.04	5.56
14N2PKMG	6.71	5.64	5.85	5.65	5.81	5.13	4.22	5.57
15N3MIN	6.84	6.12	6.73	5.92	5.95	5.14	4.28	5.85
16N2MIN	7.04	5.97	5.97	5.26	5.84	4.76	3.99	5.55
17N2MINH	7.05	6.46	5.61	5.08	5.84	4.76	4.17	5.57
18N2MIN	7.11	5.92	5.47	5.05	5.84	5.13	4.33	5.55
19C	5.36	5.88	3.29	4.01	3.92	4.04	3.10	4.23
20NKMG	*	*	*	2.81	*	3.28	*	3.04

GRAIN MEAN DM% 83.7

STRAW TONNES/HECTARE

***** TABLES OF MEANS *****

SECTION PLOT	SC2/W1BE	SC6/W1F	SC3/W2F	SC1/W12	SC9/W20	SC0/W27	SC8/W6	MEAN
01DN2PK	7.01	6.74	6.31	*	*	*	*	6.68
21DN2	8.33	7.52	6.98	8.00	7.03	6.96	7.87	7.53
22D	7.61	6.47	5.00	6.37	5.81	5.75	6.36	6.20
030	2.08	1.82	0.96	1.54	1.20	1.66	1.97	1.60
05MIN	3.04	2.22	1.17	1.77	1.42	1.73	4.42	2.25
06N1MIN	4.52	3.73	2.16	2.17	2.80	2.42	3.56	3.05
07N2MIN	5.51	4.78	4.00	3.46	4.41	3.51	4.82	4.36
08N3MIN	4.67	4.63	5.70	4.22	5.11	4.14	5.60	4.87
09N4MIN	5.08	3.99	5.24	4.26	4.74	3.53	6.42	4.75
10N2	2.78	2.33	2.48	1.71	2.26	2.24	4.36	2.59
11N2P	3.42	3.32	3.19	2.77	3.45	2.83	4.27	3.32
12N2PNA	3.43	2.66	3.25	3.25	3.55	3.64	4.27	3.44
13N2PK	5.23	4.10	4.18	4.02	5.41	3.69	5.72	4.62
14N2PKMG	5.19	4.01	3.83	3.65	4.59	4.39	5.27	4.42
15N3MIN	4.85	4.19	4.81	4.18	4.79	4.34	6.14	4.76
16N2MIN	5.29	4.31	3.51	3.71	4.74	3.99	5.78	4.48
17N2MINH	5.01	4.81	3.05	3.49	5.02	4.01	5.83	4.46
18N2MIN	5.14	4.45	3.80	3.48	4.77	4.03	5.98	4.52
19C	4.11	4.14	2.36	2.68	3.06	3.34	4.29	3.43
20NKMG	*	*	*	1.97	*	2.79	*	2.38

STRAW MEAN DM% 85.0

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78/R/BK/1

	POTATOES		SPRING BEANS	
PLOT	TOTAL TUBERS TONNES/ HECTARE	% WARE 3.81 CM(1.5 INCH) RIDDLE	GRAIN TONNES/ HECTARE	STRAW TONNES/ HECTARE
01DN2PK	29.1	98.0	2.64	2.33
21DN2	40.1	96.2	3.61	2.27
22D	32.6	97.8	5.00	2.63
030	11.1	95.6	2.26	1.26
05MIN	15.1	96.6	3.33	1.77
06N1MIN	21.5	96.1	3.49	1.99
07N2MIN	32.3	95.0	3.72	1.92
08N3MIN	38.3	96.9	4.52	2.14
09N4MIN	48.4	97.7	3.39	2.00
10N2	11.6	95.3	1.56	0.57
11N2P	12.2	86.3	0.62	2.01
12N2PNA	12.6	83.8	0.62	2.24
13N2PK	20.0	93.4	3.95	2.06
14N2PKMG	30.7	95.6	3.18	2.19
15N3MIN	38.0	96.3	5.03	2.13
16N2MIN	29.7	95.2	2.82	2.13
17N2MINH	27.5	95.1	2.51	1.91
18N2MINH	24.5	96.3	2.42	1.91
19C	19.8	95.6	0.85	2.78
MEAN DM%			81.5	89.2

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78/R/HB/2

HOOSFIELD

Object: To study the effects of organic and inorganic manures on continuous spring barley. Since 1968 a rotation of potatoes, beans and barley has been included.

The 127th year, barley, potatoes and beans. The 11th year of revised scheme.

For previous years see 'Details' 1967 & 1973, Station Report for 1966, and 74-77/R/HB/2.

Treatments to barley: All combinations of:-

1. MANURE Fertilisers, organic manures and frequency of barley cropping:-

	Form of N 1852-1966	Additional treatments 1852-1978	
---CON	None	-	Continuous
-P-CON	None	P	Continuous
--KCON	None	K (Na) Mg	Continuous
-PKCON	None	P K (Na) Mg	Continuous
A--CON	A	-	Continuous
AP-CON	A	P	Continuous
A-KCON	A	K (Na) Mg	Continuous
APKCON	A	P K (Na) Mg	Continuous
N--CON	N	-	Continuous
N--SICON	N	- Si	Continuous
NP-CON	N	P	Continuous
NP-SICON	N	P Si	Continuous
N-KCON	N	K (Na) Mg	Continuous
N-KSICON	N	K (Na) Mg Si	Continuous
NPKCON	N	P K (Na) Mg	Continuous
NPKSICON	N	P K (Na) Mg Si	Continuous
C--CON	C	-	Continuous
C--RTN	C	-	In rotation (P,BE,B)
CP-CON	C	P	Continuous
CP-RTN	C	P	In rotation (P,BE,B)
C-KCON	C	K (Na) Mg	Continuous
C-KRTN	C	K (Na) Mg	In rotation (P,BE,B)
CPKCON	C	P K (Na) Mg	Continuous
CPKRTN	C	P K (Na) Mg	In rotation (P,BE,B)
DCON	None	D	Continuous
(D)CON	(D)	-	Continuous
(A)CON	(Ashes)	-	Continuous
-CON	None	-	Continuous

Form of N: A, sulphate of ammonia: N, nitrate of soda - each to supply 48 kg N. C, castor meal to supply 96 kg N.
P: 35 kg P as single superphosphate (triple superphosphate in 1974).
K: 90 kg K as sulphate of potash.
(Na): 16 kg Na as sulphate of soda until 1973.
Mg: 35 kg Mg, as kieserite every third year, since 1974 (sulphate of magnesia annually until 1973).
Si: Silicate of soda at 450 kg.
D: Farmyard manure at 35 tonnes. (D): until 1871 only.
(Ashes): Weed ash 1852-1916, furnace ash 1917-1932. None since.

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2. N Nitrogen fertiliser (kg N), as 'Nitro-Chalk', since 1968 (cumulative N applications until 1973, on a cyclic system since 1974):

0
48
96
144

There are four extra plots testing all combinations of:-

1. MANURE Fertilisers other than magnesium:

551AN2PK	Plot 551	A	N2	P	K	Continuous
561--PK	Plot 561		-	P	K	Continuous
571NN2--	Plot 571	N	N2			Continuous
581NN2--	Plot 581	N	N2			Continuous

N2: 96 kg N as 'Nitro-Chalk' since 1968. Other symbols as above.

2. MGNESIUM Magnesium fertiliser (kg Mg) as kieserite every third year since 1974:

0
35

Treatments to potatoes and beans:- All combinations of:-

1. MANURE Fertiliser and organic manures:

	To potatoes and beans: 1852-1966	1852-1978
C---	C	-
CP--	C	P
C-KMG	C	K (Na) Mg
CPKMG	C	P K (Na) Mg
	To beans only:	
N----	N	-
N---SI	N	Si
NP---	N	P
NP--SI	N	P Si
N-KMG-	N	K (Na) Mg
N-KMGSI	N	K (Na) Mg Si
NPKMG	N	P K (Na) Mg
NPKMGSI	N	P K (Na) Mg Si

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78/R/HB/2

2. NRES(77) N Nitrogen fertiliser (kg N), as 'Nitro-Chalk':

Beans	Potatoes	Beans (residual effects, applied to previous potatoes)	Potatoes (applied 1978)
0	0		
96	96		
192	192		
288	288		

NOTE: For a fuller record see 'Details' etc.

Standard applications:
Barley: Weedkillers: Glyphosate at 1.7 kg in 220 l. Ioxynil at 0.53 kg and mecoprop at 1.6 kg in 220 l applied with the fungicide. Fungicide: Tridemorph at 0.53 kg.
Potatoes: Manures: Chalk at 2.9 t. Weedkiller: Glyphosate at 1.7 kg in 220 l. Linuron at 1.1 kg in 220 l. Fungicides: Mancozeb at 1.3 kg in 220 l on three occasions, the second and third with insecticide. Fentin acetate and maneb ('Fennite A' at 1.7 kg) in 220 l on two occasions. Insecticide: Pirimicarb at 0.14 kg on two occasions.
Beans: Insecticide: Pirimicarb at 0.14 kg in 220 l.

Seed: Barley: Julia, dressed ethirimol, sown at 160 kg.
Potatoes: Pentland Crown.
Beans: Minden sown at 220 kg.

Cultivations, etc.:-
All plots: Autumn manures applied: 13 Dec, 1977. Ploughed: 14 Dec. Spring-tine cultivated: 10 Mar, 1978.
Barley: Glyphosate applied: 10 Oct, 1977. Seed sown (except 'Form of N 1852-1966 'N and C' plots and 'extra' plots): 22 Mar, 1978. Seed sown on remaining plots: 30 Mar. N applied: 17 May. Ioxynil, mecoprop and tridemorph applied to all plots except 'Form of N 1852-1966' 'N and C' plots and 'extra' plots: 23 May. Remaining plots sprayed: 26 May. Combine harvested: 9 Sept.
Potatoes: Glyphosate applied: 10 Oct, 1977. Chalk applied: 11 Oct. N applied: 11 May, 1978. Spike rotary cultivated, potatoes planted: 12 May. Linuron applied: 15 May. Grubbed and rotary ridged: 19 June. Mancozeb applied: 5 July. Mancozeb and pirimicarb applied: 17 July, 4 Aug. 'Fennite A' applied twice: 17 Aug, 8 Sept. Lifted: 26 Oct.
Beans: Seed sown: 30 Mar, 1978. Tractor hoed twice: 19 May, 8 June. Insecticide applied: 7 July. Combine harvested: 25 Sept.

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78/R/HB/2

BARLEY

GRAIN TONNES/HECTARE

***** TABLES OF MEANS *****

N	0	48	96	144	MEAN
MANURE					
---CON	0.76	1.53	1.68	1.92	1.47
-P-CON	1.78	3.62	4.11	4.04	3.39
--KCON	1.35	2.64	2.87	3.47	2.58
-PKCON	2.05	4.02	5.25	5.17	4.12
A--CON	1.23	1.22	1.97	2.12	1.63
AP-CON	2.35	3.18	3.14	3.04	2.93
A-KCON	1.09	2.35	2.12	2.37	1.98
APKCON	2.20	4.08	4.95	5.37	4.15
N--CON	1.41	1.98	2.32	2.29	2.00
N--SICON	2.31	3.37	3.74	4.58	3.50
NP-CON	2.65	4.18	3.74	3.90	3.62
NP-SICON	1.91	5.07	5.54	5.51	4.51
N-KCON	1.97	2.03	3.40	3.17	2.64
N-KSICON	2.01	4.01	5.39	4.68	4.02
NPKCON	2.45	4.35	4.77	5.59	4.29
NPKSICON	2.61	4.92	5.52	6.09	4.79
C--CON	2.14	4.21	4.87	4.84	4.01
C--RTN	3.32	5.09	5.57	5.12	4.77
CP-CON	2.65	4.83	5.50	5.04	4.50
CP-RTN	3.38	5.29	5.61	5.73	5.00
C-KCON	1.81	3.62	5.09	5.16	3.92
C-KRTN	2.64	5.20	5.29	5.11	4.56
CPKCON	2.79	4.89	5.47	5.50	4.66
CPKRTN	3.73	5.78	5.47	5.71	5.17
DCON	5.12	6.19	5.63	5.53	5.62
(D)CON	2.51	3.59	2.91	3.75	3.19
(A)CON	1.74	2.71	3.60	4.58	3.16
-CON	1.16	2.46	2.10	2.62	2.09
MEAN	2.25	3.80	4.20	4.36	3.65

GRAIN MEAN DM% 78.7

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78/R/HB/2

BARLEY

STRAW TONNES/HECTARE

***** TABLES OF MEANS *****

N	0	48	96	144	MEAN
MANURE					
---CON	0.40	0.81	0.81	0.82	0.71
-P-CON	0.81	1.63	2.43	2.04	1.73
--KCON	0.40	2.00	1.82	2.25	1.62
-PKCON	1.02	2.45	3.69	3.26	2.60
A--CON	0.41	0.60	0.82	0.83	0.66
AP-CON	0.82	1.55	1.85	1.84	1.51
A-KCON	0.60	1.02	1.42	1.43	1.12
APKCON	1.02	2.46	3.07	3.08	2.41
N--CON	0.65	0.67	1.35	1.35	1.01
N--SICON	0.68	1.73	1.72	2.41	1.64
NP-CON	0.99	2.39	2.05	2.71	2.04
NP-SICON	0.68	2.05	2.45	2.78	1.99
N-KCON	0.67	1.34	1.35	2.02	1.34
N-KSICON	1.02	1.72	3.10	2.06	1.98
NPKCON	0.99	2.74	3.09	2.74	2.39
NPKSICON	1.01	2.42	3.46	3.47	2.59
C--CON	0.68	2.10	2.44	2.08	1.83
C--RTN	1.45	2.16	2.55	1.81	1.99
CP-CON	0.68	2.44	2.78	2.45	2.09
CP-RTN	0.72	2.17	2.86	2.88	2.16
C-KCON	1.02	2.05	2.06	2.77	1.97
C-KRTN	1.42	2.51	2.16	2.16	2.06
CPKCON	0.69	2.77	2.45	2.75	2.16
CPKRTN	2.12	2.87	2.51	1.80	2.33
DCON	3.00	3.57	4.41	3.25	3.56
(D)CON	1.36	2.16	2.71	3.23	2.36
(A)CON	0.54	1.36	1.63	2.47	1.50
-CON	0.54	1.36	1.59	1.63	1.28
MEAN	0.94	1.97	2.31	2.30	1.88

STRAW MEAN DM% 86.7

PLOT AREA HARVESTED 0.00007

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78/R/HB/2

BARLEY

GRAIN TONNES/HECTARE

***** TABLES OF MEANS *****

MANURE / MGNESIUM	551AN2PK	561--PK	571NN2--	581NN2--	MEAN
0	4.83	0.75	3.99	2.04	2.90
35	5.21	1.14	3.17	1.94	2.87
MEAN	5.02	0.95	3.58	1.99	2.88

GRAIN MEAN DM% 77.7

STRAW TONNES/HECTARE

***** TABLES OF MEANS *****

MANURE / MGNESIUM	551AN2PK	561--PK	571NN2--	581NN2--	MEAN
0	2.64	0.34	2.09	0.86	1.48
35	2.82	0.52	2.76	0.69	1.69
MEAN	2.73	0.43	2.42	0.77	1.59

STRAW MEAN DM% 89.9

PLOT AREA HARVESTED 0.00306

POTATOES

TOTAL TUBERS TONNES/HECTARE

***** TABLES OF MEANS *****

N / MANURE	0	96	192	288	MEAN
C---	16.5	20.9	25.3	24.0	21.7
CP--	16.3	15.9	16.2	16.7	16.3
C-KMG	18.4	30.2	36.5	38.3	30.8
CPKMG	18.5	41.6	43.7	46.5	37.6
MEAN	17.4	27.1	30.4	31.4	26.6

PERCENTAGE WARE 3.81 CM (1.5 INCH) RIDDLE

***** TABLES OF MEANS *****

N / MANURE	0	96	192	288	MEAN
C---	95.9	96.2	96.9	96.3	96.3
CP--	92.3	88.4	89.6	91.5	90.5
C-KMG	96.6	98.0	98.6	98.5	98.0
CPKMG	97.7	96.3	95.8	98.5	97.1
MEAN	95.6	94.8	95.2	96.2	95.5

PLOT AREA HARVESTED 0.00191

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78/R/HB/2

BEANS

GRAIN TONNES/HECTARE

***** TABLES OF MEANS *****

NRES(77) MANURE	0	96	192	288	MEAN
C---	4.04	2.15	2.00	2.09	2.57
CP--	0.77	1.33	0.70	1.33	1.03
C-KMG	3.65	2.86	3.71	2.23	3.11
CPKMG	3.49	3.67	3.25	4.03	3.61
N----	0.41	0.55	0.74	0.41	0.53
N---SI	1.75	1.84	1.17	1.08	1.46
NP---	0.48	0.41	0.75	0.61	0.56
NP--SI	0.41	0.66	1.00	0.55	0.66
N-KMG-	1.80	1.79	2.41	0.97	1.74
N-KMGSI	3.17	2.05	3.19	1.23	2.41
NPKMG	2.53	2.35	1.17	2.83	2.22
NPKMGSI	2.60	2.54	3.26	3.48	2.97
MEAN	2.09	1.85	1.95	1.74	1.91

GRAIN MEAN DM% 83.6

STRAW TONNES/HECTARE

***** TABLES OF MEANS *****

NRES(77) MANURE	0	96	192	288	MEAN
C---	2.20	0.97	1.03	0.66	1.21
CP--	0.66	1.38	1.25	0.94	1.06
C-KMG	1.36	1.33	1.65	0.63	1.24
CPKMG	1.71	2.51	1.73	1.69	1.91
N----	0.29	0.30	0.57	0.75	0.48
N---SI	1.34	1.12	1.33	0.84	1.16
NP---	1.12	0.81	1.26	0.86	1.01
NP--SI	0.59	0.91	1.05	1.08	0.91
N-KMG-	1.19	0.97	1.49	0.58	1.06
N-KMGSI	1.28	1.33	1.30	1.32	1.30
NPKMG	1.94	1.87	1.19	1.63	1.66
NPKMGSI	1.60	2.29	2.00	2.06	1.98
MEAN	1.27	1.32	1.32	1.09	1.25

STRAW MEAN DM% 75.4

PLOT AREA HARVESTED 0.00143

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78/R/WF/3

WHEAT AND FALLOW

Object: To study the effects of fallowing for one or three years on unmanured winter wheat - Hoosfield.

The 123rd year, winter wheat.

For previous years see 'Details' 1967, 1973 and 74-77/R/WF/3.

Whole plot dimensions: 9.60 x 52.1.

Treatments:

PLOT		Phase of fallowing cycle (up to 1978):-							
1 FALL1	Plot 1	F	F	F	W	F	W	F	W
-	Plot 2	W	F	W	F	W	F	F	F
3 FALL1	Plot 3	F	W	F	F	F	W	F	W
-	Plot 4	F	F	W	F	W	F	W	F
5 FALL3	Plot 5	F	W	F	W	F	F	F	W
-	Plot 6	W	F	F	F	W	F	W	F
-	Plot 7	F	W	F	W	F	W	F	F
-	Plot 8	W	F	W	F	F	F	W	F

W = wheat, F = fallow.

Basal applications: Weedkillers: Dicamba with mecoprop and MCPA ('Banlene Plus' at 4.9 l in 220 l).

Seed: Cappelle, seed dressed chlorfenvinphos, sown at 200 kg.

Cultivations, etc.:-
Wheat plots: Ploughed: 28 Sept, 1977. Rotary harrowed, seed sown: 19 Oct. Weedkillers applied: 18 May, 1978. Combine harvested: 30 Aug.
Fallow plots: Ploughed: 28 Sept, 1977, 25 May, 1978. Rolled and heavy spring-tine cultivated: 15 June. Spring-tine cultivated: 26 June. Ploughed: 5 July. Rolled and spring-tine cultivated: 12 July.

GRAIN TONNES/HECTARE

***** TABLES OF MEANS *****

PLOT	1 FALL1	3 FALL1	5 FALL3	MEAN
	1.08	1.27	1.27	1.20

GRAIN MEAN DM% 77.0

STRAW TONNES/HECTARE

PLOT	1 FALL1	3 FALL1	5 FALL3	MEAN
	0.59	0.59	0.52	0.57

STRAW MEAN DM% 87.7

PLOT AREA HARVESTED 0.01483

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78/R/EX/4

EXHAUSTION LAND

Object: To study the residual effects of manures, applied 1856-1901, on the yield of continuous barley - Hoosfield.

The 123rd year, barley.

For previous years see 'Details' 1967, 1973 and 74-77/R/EX/4.

Treatments: All combinations of:-

Whole plots

1. PLOTFERT(01) Fertiliser and farmyard manure 1876-1901:

1-	Plot 1 None
2-	Plot 2 None
3D	Plot 3 D
4D	Plot 4 D
5N	Plot 5 N
6N*	Plot 6 N*
7NMIN	Plot 7 N P K Na Mg
8N*MIN	Plot 8 N* P K Na Mg
9P	Plot 9 P
10MIN	Plot 10 P K Na Mg

N - 96 kg N as ammonium salts
N* - 96 kg N as nitrate of soda
P - 34 kg P as superphosphate
K - 137 kg K as sulphate of potash
Na - 16 kg Na as sulphate of soda
Mg - 11 kg Mg as sulphate of magnesia
D - Farmyard manure at 35 tonnes
MIN - P K Na Mg

Sub plots

2. N Nitrogen fertiliser (kg N as 'Nitro-Chalk 26') (basal until 1975, on a cyclic system since 1976):

0
48
96
144

For a fuller record of treatments see 'Details' 1967 etc.

Basal applications: Weedkillers: Dicamba with mecoprop and MCPA ('Banlene Plus' at 4.9 l in 220 l). Fungicide: Tridemorph at 0.53 kg in 220 l.

Seed: Julia, seed dressed with ethirimol, sown at 160 kg.

Cultivations, etc.:- Ploughed: 28 Sept, 1977. Heavy spring-tine cultivated, harrowed, seed sown: 31 Mar, 1978. N applied: 17 May. Weedkillers and fungicide applied: 26 May. Combine harvested: 9 Sept.

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78/R/EX/4

GRAIN TONNES/HECTARE

***** TABLES OF MEANS *****

N PLOTFERT(01)	0	48	96	144	MEAN
1-	1.56	2.27	2.50	2.69	2.26
2-	1.30	1.59	2.06	2.01	1.74
3D	2.51	4.09	4.68	4.62	3.98
4D	1.86	3.72	4.88	4.60	3.76
5N	1.73	2.33	2.60	2.97	2.41
6N*	1.43	1.44	2.22	1.93	1.75
7NMIN	1.99	3.76	4.05	4.45	3.56
8N*MIN	1.62	2.50	4.13	3.48	2.93
9P	1.97	3.52	4.01	4.14	3.41
10MIN	1.40	2.58	4.12	3.80	2.98
MEAN	1.74	2.78	3.52	3.47	2.88

GRAIN MEAN DM% 80.3

STRAW TONNES/HECTARE

***** TABLES OF MEANS *****

N PLOTFERT(01)	0	48	96	144	MEAN
1-	0.44	0.88	0.96	1.10	0.85
2-	0.36	0.42	0.65	0.51	0.49
3D	1.10	1.79	2.20	2.29	1.84
4D	0.95	1.60	2.45	2.14	1.78
5N	0.51	0.72	1.11	1.31	0.91
6N*	0.36	0.56	0.96	0.72	0.65
7NMIN	0.66	1.62	1.70	2.11	1.52
8N*MIN	0.58	1.31	1.80	1.60	1.32
9P	0.66	1.41	1.77	1.68	1.38
10MIN	0.37	0.95	1.84	1.70	1.21
MEAN	0.60	1.13	1.54	1.52	1.20

STRAW MEAN DM% 90.6

SUB PLOT AREA HARVESTED 0.00728

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78/R/PG/5

PARK GRASS

Object: To study the effects of organic and inorganic manures and lime on old grass (for hay).

The 123rd year, hay.

For previous years see 'Details' 1967 and 1973 and 74-77/R/PG/5.

Treatments:

Whole plots

MANURE	Fertilisers and organic manures:-	
N1	Plot 1	N1
O(D)	Plot 2	None (D until 1863)
O/PLOT3	Plot 3	None
P	Plot 4-1	P
N2P	Plot 4-2	N2 P
N1MIN	Plot 6	N1 P K Na Mg
MIN	Plot 7	P K Na Mg
PNAMG	Plot 8	P Na Mg
N2MIN	Plot 9	N2 P K Na Mg
N2PNAMG	Plot 10	N2 P Na Mg
N3MIN	Plot 11-1	N3 P K Na Mg
N3MINSI	Plot 11-2	N3 P K Na Mg Si
O/PLOT12	Plot 12	None
D/F	Plot 13	D/F
N2*MIN	Plot 14	N2* P K Na Mg
MIN(N2*)	Plot 15	P K Na Mg (N2* until 1875)
N1*MIN	Plot 16	N1* P K Na Mg
N1*	Plot 17	N1*
N2KNAMG	Plot 18	N2 K Na Mg
D	Plot 19	D
D/N*PK	Plot 20	D/N*P K

N1, N2, N3:	48, 96, 144 kg N as sulphate of ammonia
N1*, N2*:	48, 96 kg N as nitrate of soda (30 kg N to Plot 20, only in years with no farmyard manure)
P:	35 kg P (15 kg P to Plot 20, only in years with no farmyard manure) as single superphosphate (triple superphosphate in 1974)
K:	225 kg K (45 kg K to Plot 20, only in years with no farmyard manure) as sulphate of potash
Na:	15 kg Na as sulphate of soda
Mg:	10 kg Mg as sulphate of magnesia
Si:	Silicate of soda at 450 kg
D:	Farmyard manure at 35 tonnes every fourth year
F:	Fish meal every fourth year to supply 63 kg N
MIN:	P K Na Mg

Sub plots

LIME	Liming:-
A	a Ground chalk applied as necessary to achieve pH7
B	b Ground chalk applied as necessary to achieve pH6
C	c Ground chalk applied as necessary to achieve pH5
D	d None

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78/R/PG/5

NOTE: Lime was applied regularly, and at the same rate, to all a and b sub plots of Plots 1 to 17 (except 12) from 1924. Differential liming started in 1965 on certain b and c sub plots (except on Plot 12) and in 1976 on certain a sub plots (including Plot 12) and 12b.

Additional sub plots (Plots 18, 19 and 20 only) (tonnes $CaCO_3$ applied every fourth year 1920-1964):-

N2KNAMG0	18-1	None
N2KNAMG2	18-2	13.5
N2KNAMG1	18-3	7.9
D0	19-1	None
D2	19-2	6.3
D1	19-3	1.1
D/N*PK0	20-1	None
D/N*PK2	20-2	5.6
D/N*PK1	20-3	1.1

Since 1965 Plot 18-1 has been split into two for treatments 'c' and 'd' above and Plot 18-3 split into two for treatments 'a' and 'b'. The remaining sub-plots of Plots 18, 19 and 20 are treated as 'a'.

NOTE: For a fuller record of treatments see 'Details' etc.

Cultivations, etc.:- Mineral fertilisers applied: 22 Dec, 1977. N applied: 1st dressing: 25 Apr, 1978. 2nd dressing: 19 May. Cut twice: 20 June, 2 Nov.

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78/R/PG/5

1ST CUT (20/6/78) DRY MATTER TONNES/HECTARE

***** TABLES OF MEANS *****

LIME / MANURE	A	B	C	D	MEAN
N1	2.63	2.96	2.81	1.05	2.36
O(D)	2.50	2.75	1.91	1.82	2.24
O/PLOT3	2.66	2.80	1.57	1.70	2.18
P	3.32	3.83	2.70	2.68	3.13
N2P	3.79	4.19	4.43	3.74	4.04
N1MIN	5.28	5.12			5.20
MIN	5.02	5.10	3.99	3.43	4.39
PNAMG	3.03	3.25	2.95	2.86	3.02
N2MIN	5.48	5.60	6.22	4.97	5.57
N2PNAMG	4.17	4.80	4.61	3.82	4.35
N3MIN	5.65	5.39	5.56	3.96	5.14
N3MINSI	5.76	5.93	5.44	5.14	5.57
O/PLOT12	1.94	1.98	1.87	1.77	1.89
D/F	4.95	5.25	4.63	4.15	4.74
N2*MIN	4.69	5.72	5.78	4.86	5.26
MIN(N2*)	5.53	5.00	2.42	3.22	4.04
N1*MIN	5.27	5.26	4.98	4.03	4.89
N1*	3.21	3.52	3.10	2.25	3.02
N2KNAMG0			1.35	0.75	1.05
N2KNAMG2	2.98				2.98
N2KNAMG1	2.74	2.67			2.70
D0	4.47				4.47
D2	5.69				5.69
D1	5.19				5.19
D/N*PK0	5.49				5.49
D/N*PK2	5.19				5.19
D/N*PK1	5.22				5.22

1ST CUT MEAN DM% 24.4

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78/R/PG/5

2ND CUT (2/11/78) DRY MATTER TONNES/HECTARE

***** TABLES OF MEANS *****

LIME / MANURE	A	B	C	D	MEAN
N1	1.66	2.61	1.70	2.03	2.00
O(D)	1.78	1.70	1.85	2.04	1.84
O/PLOT3	1.45	1.62	1.41	2.18	1.67
P	2.02	2.24	2.31	2.59	2.29
N2P	1.73	1.83	2.31	2.47	2.09
N1MIN	2.30	2.39			2.34
MIN	2.97	3.68	2.32	1.92	2.72
PNAMG	2.49	2.13	2.16	2.25	2.26
N2MIN	2.72	3.25	2.29	2.25	2.63
N2PNAMG	1.58	1.90	1.51	2.29	1.82
N3MIN	2.81	3.08	2.07	4.17	3.03
N3MINSI	3.09	2.50	2.32	4.79	3.17
O/PLOT12	3.81	2.60	2.28	2.04	2.68
D/F	5.35	3.42	3.07	2.64	3.62
N2*MIN	1.50	2.11	2.03	1.44	1.77
MIN(N2*)	2.55	2.74	2.14	2.40	2.45
N1*MIN	2.14	2.17	2.28	2.00	2.15
N1*	2.04	1.96	2.12	1.84	1.99
N2KNAMG0			0.94	0.63	0.78
N2KNAMG2	2.50				2.50
N2KNAMG1	2.18	2.43			2.30
D0	2.75				2.75
D2	3.57				3.57
D1	3.17				3.17
D/N*PK0	4.39				4.39
D/N*PK2	3.95				3.95
D/N*PK1	3.72				3.72

2ND CUT MEAN DM% 29.4

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78/R/PG/5

TOTAL OF 2 CUTS DRY MATTER TONNES/HECTARE

***** TABLES OF MEANS *****

LIME / MANURE	A	B	C	D	MEAN
N1	4.29	5.58	4.50	3.08	4.36
O(D)	4.28	4.45	3.76	3.86	4.09
O/PLOT3	4.11	4.42	2.98	3.88	3.85
P	5.34	6.07	5.00	5.27	5.42
N2P	5.52	6.02	6.75	6.21	6.13
N1MIN	7.58	7.51			7.54
MIN	8.00	8.78	6.30	5.35	7.11
PNAMG	5.53	5.38	5.11	5.12	5.28
N2MIN	8.21	8.86	8.50	7.22	8.20
N2PNAMG	5.75	6.70	6.11	6.12	6.17
N3MIN	8.46	8.47	7.63	8.13	8.17
N3MINSI	8.85	8.43	7.75	9.92	8.74
O/PLOT12	5.75	4.57	4.15	3.82	4.57
D/F	10.30	8.67	7.70	6.79	8.37
N2*MIN	6.18	7.82	7.81	6.30	7.03
MIN(N2*)	8.07	7.73	4.55	5.62	6.49
N1*MIN	7.41	7.43	7.26	6.03	7.03
N1*	5.25	5.48	5.22	4.09	5.01
N2KNAMG0			2.29	1.38	1.84
N2KNAMG2	5.48				5.48
N2KNAMG1	4.92	5.10			5.01
D0	7.22				7.22
D2	9.26				9.26
D1	8.36				8.36
D/N*PK0	9.87				9.87
D/N*PK2	9.14				9.14
D/N*PK1	8.93				8.93

TOTAL OF 2 CUTS MEAN DM% 26.9

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AGDELL

Object: To study, by crop yields and soil analyses, the residual values of phosphate and potash applied in the period 1848-1951 and further dressings since 1964.

The ninth year of revised scheme, ryegrass and ryegrass/clover.

For previous years see 'Details' 1967 and 1973, and 74-77/R/AG/6.

Treatments: All combinations of:-

Whole plots

1. OLDRESD — Fertilisers and organic manures applied to roots every fourth year, in the period 1848-1948:

NONE	None
PKNAMG	P K Na Mg
NPKNAMGC	N P K Na Mg C

N: 48 kg N as sulphate of ammonia
P: 41 kg P as superphosphate
K: 224 kg K as sulphate of potash
Na: 16 kg Na as sulphate of soda
Mg: 11 kg Mg as sulphate of magnesia
C: Castor meal at 2240 kg supplying about 112 kg N

NOTE: Yields taken only from OLDRESD NONE.

2. RN CROP (77) — Rotation 1848-1951 and crop since 1977:

(F) G/C	With fallow: Roots (turnips or swedes), barley, fallow, wheat 1848-1951. Grass/clover 1977 & 1978
(L) G	With legume: Roots, barley, legume (clover or beans), wheat 1848-1951. Grass 1977 & 1978

Half plots

3. 1964RESD — Residues of 1964 treatments:

P
K

Quarter plots

4. PREVCROP — Previous cropping 1958-69 on P-test half plots, 1958-70 on K-test half plots:

ARABLE	Arable or fallow
GRASS	Grass

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78/R/AG/6

Sixteenth plots

5. P205 64 K20 64 Rates of 1964 treatments (kg):

P205 to P-test half plots	K20 to K-test half plots
0	0
500	315
1000	630
2000	1260

Sixty fourth plots

6. On P-test half plots:

P205 70(2) Residues of P205 applied 1970-72 (total, kg):

0
375

On K-test half plots:

K20 73(6) Residues of K20 applied 1973-76 (total, kg):

0
870

NOTE: Strips of sixty fourth plots on P-test half plots tested 63 and 94 kg N in 1976. Yields in 1978 were taken only from strips given 94 kg N. Strips of sixty fourth plots on K-test half plots were cropped with potatoes and barley in 1976. Yields in 1978 were taken only from strips cropped with potatoes.

Sub plot dimensions: Plots 1, 2, 3 and 4 - 6.04 x 3.02. Plots 5, 6 - 5.43 x 3.02.

Standard applications: Grass only plots: Manures: N at 100 kg as 'Nitro-Chalk 25' in spring, as 'Nitra-Shell 34' after each cut except the last. Grass and clover plots: Manures: N at 50 kg as 'Nitra-Shell 34'.

Seed: Grass plots: S.23, sown at 22 kg. Grass/clover plots: S.23 at 22 kg, Blanca at 2 kg, mixture sown at 24 kg.

Cultivations, etc.:- First N applied to grass: 6 Mar, 1978. N applied to grass-clover: 18 May. Cut three times: 6 June, 26 July, 1 Nov. N applied to grass: 9 June, 3 Aug.

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78/R/AG/6 P TEST PLOTS

RN CROP(77) (F) G/C

1ST CUT (6/6/78) DRY MATTER TONNES/HECTARE

***** TABLES OF MEANS *****

P205 70(2) / P205 64	0	375	MEAN
0	0.82	1.35	1.09
500	1.12	1.31	1.22
1000	1.01	1.28	1.14
2000	1.09	0.95	1.02
MEAN	1.01	1.22	1.12

PREVCROP / P205 64	ARABLE	GRASS	MEAN
0	0.90	1.27	1.09
500	0.72	1.71	1.22
1000	0.74	1.54	1.14
2000	0.72	1.32	1.02
MEAN	0.77	1.46	1.12

PREVCROP / P205 70(2)	ARABLE	GRASS	MEAN
0	0.65	1.37	1.01
375	0.89	1.56	1.22
MEAN	0.77	1.46	1.12

P205 64	PREVCROP / P205 70(2)	ARABLE	GRASS
0	0	0.66	0.98
	375	1.14	1.56
500	0	0.61	1.63
	375	0.83	1.79
1000	0	0.60	1.41
	375	0.89	1.67
2000	0	0.73	1.46
	375	0.72	1.19

1ST CUT MEAN DM% 23.3

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78/R/AG/6 P TEST PLOTS

RN CROP(77) (F) G/C

2ND CUT (26/7/78) DRY MATTER TONNES/HECTARE

***** TABLES OF MEANS *****

P205 70(2)	0	375	MEAN
P205 64			
0	1.85	2.13	1.99
500	2.46	2.04	2.25
1000	1.85	1.59	1.72
2000	2.40	1.85	2.13
MEAN	2.14	1.90	2.02

PREVCROP	ARABLE	GRASS	MEAN
P205 64			
0	2.28	1.70	1.99
500	2.60	1.89	2.25
1000	1.65	1.79	1.72
2000	2.53	1.73	2.13
MEAN	2.27	1.78	2.02

PREVCROP	ARABLE	GRASS	MEAN
P205 70(2)			
0	2.43	1.86	2.14
375	2.11	1.70	1.90
MEAN	2.27	1.78	2.02

	PREVCROP	ARABLE	GRASS
P205 64	P205 70(2)		
0	0	2.12	1.59
	375	2.45	1.81
500	0	2.87	2.04
	375	2.33	1.75
1000	0	1.86	1.85
	375	1.44	1.74
2000	0	2.86	1.94
	375	2.20	1.51

2ND CUT MEAN DM% 35.0

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78/R/AG/6 P TEST PLOTS

RN CROP(77) (F) G/C

TOTAL OF 2 CUTS DRY MATTER TONNES/HECTARE

***** TABLES OF MEANS *****

P205 70(2) / P205 64	0	375	MEAN
0	2.67	3.48	3.08
500	3.58	3.35	3.46
1000	2.86	2.87	2.86
2000	3.49	2.81	3.15
MEAN	3.15	3.13	3.14

PREVCROP / P205 64	ARABLE	GRASS	MEAN
0	3.19	2.97	3.08
500	3.32	3.61	3.46
1000	2.39	3.34	2.86
2000	3.25	3.05	3.15
MEAN	3.04	3.24	3.14

PREVCROP / P205 70(2)	ARABLE	GRASS	MEAN
0	3.08	3.22	3.15
375	3.00	3.26	3.13
MEAN	3.04	3.24	3.14

P205 64	PREVCROP / P205 70(2)	ARABLE	GRASS
0	0	2.78	2.56
	375	3.59	3.37
500	0	3.48	3.68
	375	3.16	3.54
1000	0	2.46	3.26
	375	2.33	3.41
2000	0	3.58	3.40
	375	2.92	2.70

TOTAL OF 2 CUTS MEAN DM% 29.1

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78/R/AG/6 P TEST PLOTS

RN CROP(77) (L) G

1ST CUT (6/6/78) DRY MATTER TONNES/HECTARE

***** TABLES OF MEANS *****

P205 70(2) / P205 64	0	375	MEAN
0	4.12	5.65	4.89
500	5.32	5.11	5.22
1000	6.08	6.12	6.10
2000	6.00	6.90	6.45
MEAN	5.38	5.95	5.67

PREVCROP / P205 64	ARABLE	GRASS	MEAN
0	6.06	3.71	4.89
500	5.29	5.15	5.22
1000	5.56	6.64	6.10
2000	6.69	6.22	6.45
MEAN	5.90	5.43	5.67

PREVCROP / P205 70(2)	ARABLE	GRASS	MEAN
0	5.52	5.24	5.38
375	6.28	5.62	5.95
MEAN	5.90	5.43	5.67

P205 64	PREVCROP P205 70(2)	ARABLE	GRASS
0	0	5.74	2.51
	375	6.38	4.92
500	0	4.97	5.68
	375	5.61	4.61
1000	0	5.44	6.73
	375	5.69	6.56
2000	0	5.95	6.05
	375	7.42	6.39

1ST CUT MEAN DM% 23.9

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78/R/AG/6 P TEST PLOTS

RN CROP(77) (L) G

2ND CUT (26/7/78) DRY MATTER TONNES/HECTARE

***** TABLES OF MEANS *****

P205 70(2) / P205 64	0	375	MEAN
0	4.40	4.53	4.46
500	4.48	4.82	4.65
1000	4.45	4.44	4.44
2000	5.11	5.25	5.18
MEAN	4.61	4.76	4.68

PREVCROP / P205 64	ARABLE	GRASS	MEAN
0	4.78	4.15	4.46
500	4.41	4.90	4.65
1000	4.61	4.28	4.44
2000	5.42	4.94	5.18
MEAN	4.80	4.56	4.68

PREVCROP / P205 70(2)	ARABLE	GRASS	MEAN
0	4.83	4.39	4.61
375	4.78	4.74	4.76
MEAN	4.80	4.56	4.68

P205 64	PREVCROP / P205 70(2)	ARABLE	GRASS
0	0	4.88	3.91
	375	4.68	4.38
500	0	4.26	4.71
	375	4.55	5.09
1000	0	4.79	4.11
	375	4.44	4.45
2000	0	5.37	4.84
	375	5.46	5.03

2ND CUT MEAN DM% 24.1

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78/R/AG/6 P TEST PLOTS

RN CROP(77) (L) G

3RD CUT (1/11/78) DRY MATTER TONNES/HECTARE

***** TABLES OF MEANS *****

P205 70(2) / P205 64	0	375	MEAN
0	3.34	4.15	3.75
500	3.69	4.15	3.92
1000	4.77	4.45	4.61
2000	3.42	3.99	3.71
MEAN	3.81	4.19	4.00

PREVCROP / P205 64	ARABLE	GRASS	MEAN
0	3.16	4.34	3.75
500	3.69	4.15	3.92
1000	4.22	4.99	4.61
2000	3.18	4.23	3.71
MEAN	3.57	4.43	4.00

PREVCROP / P205 70(2)	ARABLE	GRASS	MEAN
0	3.41	4.21	3.81
375	3.72	4.65	4.19
MEAN	3.57	4.43	4.00

P205 64	PREVCROP / P205 70(2)	ARABLE	GRASS
0	0	2.95	3.73
	375	3.36	4.94
500	0	3.43	3.96
	375	3.96	4.34
1000	0	4.28	5.25
	375	4.17	4.74
2000	0	2.96	3.89
	375	3.41	4.57

3RD CUT MEAN DM% 33.5

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78/R/AG/6 P TEST PLOTS

RN CROP(77) (L) G

TOTAL OF 3 CUTS DRY MATTER TONNES/HECTARE

***** TABLES OF MEANS *****

P205 70(2)	0	375	MEAN
P205 64			
0	11.86	14.33	13.10
500	13.50	14.08	13.79
1000	15.30	15.02	15.16
2000	14.53	16.14	15.34
MEAN	13.80	14.89	14.35

PREVCROP	ARABLE	GRASS	MEAN
P205 64			
0	14.00	12.19	13.10
500	13.39	14.19	13.79
1000	14.40	15.91	15.16
2000	15.29	15.39	15.34
MEAN	14.27	14.42	14.35

PREVCROP	ARABLE	GRASS	MEAN
P205 70(2)			
0	13.76	13.84	13.80
375	14.78	15.00	14.89
MEAN	14.27	14.42	14.35

	PREVCROP	ARABLE	GRASS
P205 64	P205 70(2)		
0	0	13.58	10.15
	375	14.42	14.24
500	0	12.66	14.34
	375	14.12	14.04
1000	0	14.51	16.08
	375	14.29	15.74
2000	0	14.28	14.78
	375	16.29	15.99

TOTAL OF 3 CUTS MEAN DM% 27.2

PLOT AREA HARVESTED 0.00042

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78/R/AG/6 K TEST PLOTS

RN CROP(77) (F) G/C

1ST CUT (6/6/78) DRY MATTER TONNES/HECTARE

***** TABLES OF MEANS *****

K20 73(6) K202K20 64	0	870	MEAN
0	1.70	1.93	1.82
315	2.31	1.92	2.11
630	1.14	1.39	1.27
1260	1.67	1.28	1.47
MEAN	1.71	1.63	1.67

PREVCROP K20 64	ARABLE	GRASS	MEAN
0	1.69	1.94	1.82
315	1.83	2.40	2.11
630	1.17	1.36	1.27
1260	0.71	2.23	1.47
MEAN	1.35	1.98	1.67

PREVCROP K20 73(6)	ARABLE	GRASS	MEAN
0	1.33	2.09	1.71
870	1.38	1.88	1.63
MEAN	1.35	1.98	1.67

K20 64	PREVCROP K20 73(6)	ARABLE	GRASS
0	0	1.57	1.83
	870	1.82	2.04
315	0	2.24	2.38
	870	1.43	2.41
630	0	0.87	1.42
	870	1.48	1.31
1260	0	0.63	2.71
	870	0.80	1.75

1ST CUT MEAN DM% 23.8

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78/R/AG/6 K TEST PLOTS

RN CROP(77) (F) G/C

2ND CUT (26/7/78) DRY MATTER TONNES/HECTARE

***** TABLES OF MEANS *****

K20 73(6) / K20 64	0	870	MEAN
0	2.13	1.77	1.95
315	1.84	2.59	2.21
630	2.28	2.30	2.29
1260	1.94	1.93	1.93
MEAN	2.05	2.15	2.10

PREVCROP / K20 64	ARABLE	GRASS	MEAN
0	1.86	2.04	1.95
315	2.10	2.33	2.21
630	2.19	2.39	2.29
1260	1.92	1.95	1.93
MEAN	2.01	2.18	2.10

PREVCROP / K20 73(6)	ARABLE	GRASS	MEAN
0	1.93	2.17	2.05
870	2.10	2.19	2.15
MEAN	2.01	2.18	2.10

K20 64	PREVCROP / K20 73(6)	ARABLE	GRASS
0	0	2.19	2.07
	870	1.52	2.02
315	0	1.59	2.09
	870	2.61	2.57
630	0	2.10	2.47
	870	2.27	2.32
1260	0	1.83	2.06
	870	2.01	1.85

2ND CUT MEAN DM% 35.7

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78/R/AG/6 K TEST PLOTS

RN CROP(77) (F) G/C

TOTAL OF 2 CUTS DRY MATTER TONNES/HECTARE

***** TABLES OF MEANS *****

K20 73(6) / K20 64	0	870	MEAN
0	3.83	3.70	3.76
315	4.14	4.51	4.33
630	3.43	3.69	3.56
1260	3.61	3.20	3.41
MEAN	3.75	3.78	3.76

PREVCROP / K20 64	ARABLE	GRASS	MEAN
0	3.55	3.98	3.76
315	3.93	4.72	4.33
630	3.36	3.76	3.56
1260	2.63	4.18	3.41
MEAN	3.37	4.16	3.76

PREVCROP / K20 73(6)	ARABLE	GRASS	MEAN
0	3.25	4.25	3.75
870	3.48	4.07	3.78
MEAN	3.37	4.16	3.76

K20 64	PREVCROP / K20 73(6)	ARABLE	GRASS
0	0	3.76	3.90
	870	3.34	4.06
315	0	3.82	4.47
	870	4.04	4.98
630	0	2.97	3.88
	870	3.75	3.63
1260	0	2.46	4.77
	870	2.81	3.60

TOTAL OF 2 CUTS MEAN DM% 29.7

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78/R/AG/6 K TEST PLOTS

RN CROP(77) (L) G

1ST CUT (6/6/78) DRY MATTER TONNES/HECTARE

***** TABLES OF MEANS *****

K20 73(6) / K20 64	0	870	MEAN
0	5.91	7.21	6.56
315	7.39	7.06	7.23
630	6.50	7.07	6.79
1260	7.23	7.36	7.29
MEAN	6.76	7.18	6.97

PREVCROP / K20 64	ARABLE	GRASS	MEAN
0	7.35	5.77	6.56
315	6.89	7.56	7.23
630	6.78	6.80	6.79
1260	6.72	7.87	7.29
MEAN	6.94	7.00	6.97

PREVCROP / K20 73(6)	ARABLE	GRASS	MEAN
0	6.65	6.87	6.76
870	7.23	7.13	7.18
MEAN	6.94	7.00	6.97

K20 64	PREVCROP / K20 73(6)	ARABLE	GRASS
0	0	6.59	5.22
	870	8.10	6.33
315	0	6.95	7.84
	870	6.84	7.28
630	0	6.70	6.31
	870	6.86	7.29
1260	0	6.35	8.11
	870	7.10	7.63

1ST CUT MEAN DM% 21.0

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78/R/AG/6 K TEST PLOTS

RN CROP(77) (L) G

2ND CUT (26/7/78) DRY MATTER TONNES/HECTARE

***** TABLES OF MEANS *****

K20 73(6) / K20 64	0	870	MEAN
0	3.97	4.43	4.20
315	4.68	4.86	4.77
630	4.31	4.57	4.44
1260	4.38	4.48	4.43
MEAN	4.34	4.58	4.46

PREVCROP / K20 64	ARABLE	GRASS	MEAN
0	4.58	3.82	4.20
315	4.92	4.61	4.77
630	4.48	4.41	4.44
1260	4.54	4.32	4.43
MEAN	4.63	4.29	4.46

PREVCROP / K20 73(6)	ARABLE	GRASS	MEAN
0	4.63	4.05	4.34
870	4.64	4.53	4.58
MEAN	4.63	4.29	4.46

K20 64	PREVCROP K20 73(6)	ARABLE	GRASS
0	0	4.43	3.51
	870	4.74	4.13
315	0	4.98	4.37
	870	4.86	4.86
630	0	4.37	4.26
	870	4.58	4.56
1260	0	4.72	4.05
	870	4.37	4.59

2ND CUT MEAN DM% 21.8

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78/R/AG/6 K TEST PLOTS

RN CROP(77) (L) G

3RD CUT (1/11/78) DRY MATTER TONNES/HECTARE

***** TABLES OF MEANS *****

K20 73(6) / K20 64	0	870	MEAN
0	4.11	4.36	4.23
315	3.93	4.15	4.04
630	4.06	4.31	4.19
1260	3.94	3.57	3.75
MEAN	4.01	4.10	4.05

PREVCROP / K20 64	ARABLE	GRASS	MEAN
0	4.54	3.92	4.23
315	4.03	4.05	4.04
630	4.21	4.16	4.19
1260	3.14	4.36	3.75
MEAN	3.98	4.13	4.05

PREVCROP / K20 73(6)	ARABLE	GRASS	MEAN
0	4.02	3.99	4.01
870	3.94	4.26	4.10
MEAN	3.98	4.13	4.05

K20 64	PREVCROP / K20 73(6)	ARABLE	GRASS
0	0	4.53	3.69
	870	4.56	4.16
315	0	4.11	3.75
	870	3.95	4.36
630	0	4.32	3.80
	870	4.09	4.53
1260	0	3.14	4.74
	870	3.14	3.99

3RD CUT MEAN DM% 32.6

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78/R/AG/6 K TEST PLOTS

RN CROP(77) (L) G

TOTAL OF 3 CUTS DRY MATTER TONNES/HECTARE

***** TABLES OF MEANS *****

K20 73(6)	0	870	MEAN
K20 64			
0	13.99	16.01	15.00
315	16.00	16.07	16.03
630	14.88	15.95	15.42
1260	15.55	15.41	15.48
MEAN	15.10	15.86	15.48

PREVCROP	ARABLE	GRASS	MEAN
K20 64			
0	16.47	13.52	15.00
315	15.84	16.23	16.03
630	15.46	15.37	15.42
1260	14.41	16.55	15.48
MEAN	15.55	15.42	15.48

PREVCROP	ARABLE	GRASS	MEAN
K20 73(6)			
0	15.30	14.91	15.10
870	15.80	15.92	15.86
MEAN	15.55	15.42	15.48

	PREVCROP	ARABLE	GRASS
K20 64	K20 73(6)		
0	0	15.55	12.42
	870	17.39	14.62
315	0	16.04	15.96
	870	15.65	16.49
630	0	15.39	14.36
	870	15.53	16.37
1260	0	14.20	16.90
	870	14.62	16.20

TOTAL OF 3 CUTS MEAN DM% 25.1

PLOT AREA HARVESTED 0.00042

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78/R/BN/7

BARNFIELD

Object: The experiment was designed to study the effects of organic and inorganic manures on continuous root crops. It has been progressively modified to study effects on other crops.

Sections 1 and 2 fallow. The fourth year of Italian ryegrass on the rest of the experiment.

For previous years see 'Details' 1967 & 1973 and 74-77/R/BN/7.

Plot dimensions: Ryegrass: 10.7 x 55.9.

Treatments to ryegrass: All combinations of:-

Whole plots

1. MANURE Fertilisers and organic manures:

DN	D	N				
DNPK	D	N	P	K		
NPKMG		N	P	K	(Na)	Mg
NP		N	P			
NPK		N	P	K		
NPMG		N	P		(Na)	Mg
N		N				

N: 100 kg N before first cut as 'Nitro-Chalk 25', 75 kg N after first and second cuts as 'Nitra-Shell 34'.
P: 35 kg P as single superphosphate (triple superphosphate in 1974).
K: 225 kg K as sulphate of potash.
(Na): 90 kg Na as sodium chloride until 1973
Mg: 90 kg Mg as kieserite every fourth year since 1974 (sulphate of magnesia until 1973).
D: Farmyard manure at 35 tonnes (until 1975).

Quarter plots

2. NFORMRES Residues of forms of N (each supplying 96 kg N):

NS	Nitrate of soda
SA	Sulphate of ammonia
SA/CM	Sulphate of ammonia + castor meal
CM	Castor meal

Castor meal last applied 1961, others until 1959.

Plus one plot MANURE NKMG

NOTES: (1) Yields were taken only from half plots cropped with sugar beet in 1973.
(2) P K Mg and D treatments were applied to Sections 1 and 2, fallow in 1978.

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78/R/BN/7

Cultivations, etc.:- Ryegrass and fallow: K applied: 15 Dec, 1977. P applied: 16 Dec.
Ryegrass: N applied: 6 Mar, 1978, 7 June and 3 Aug. Cut: 31 May, 27 July, 1 Nov.
Fallow: FYM applied: 13 Jan, 1978. Ploughed: 18 Jan. Rotary harrowed: 17 May. Rotary cultivated: 12 June. Spring-tine cultivated: 26 June. Cultivated with thistle bar: 20 July. Deep-tine cultivated: 16 Aug. Heavy spring-tine cultivated: 7 Sept. Disc harrowed: 30 Oct.

1ST CUT (31/5/78) DRY MATTER TONNES/HECTARE

***** TABLES OF MEANS *****

NFORMRES MANURE	NS	SA	SA/CM	CM	MEAN
DN	7.50	7.53	7.80	6.12	7.24
DNPK	7.76	7.43	6.84	6.15	7.05
NPKMG	7.53	7.23	6.97	7.22	7.24
NP	7.03	5.89	6.28	6.73	6.48
NPK	7.25	6.83	7.26	7.29	7.16
NPMG	6.98	6.37	6.42	7.19	6.74
N	5.68	5.24	6.15	5.93	5.75
MEAN	7.10	6.65	6.82	6.66	6.81

MANURE NKMG 7.14

GRAND MEAN 6.82

1ST CUT MEAN DM% 25.4

2ND CUT (27/7/78) DRY MATTER TONNES/HECTARE

***** TABLES OF MEANS *****

NFORMRES MANURE	NS	SA	SA/CM	CM	MEAN
DN	4.71	4.99	4.93	5.14	4.94
DNPK	4.49	4.40	4.22	4.59	4.42
NPKMG	3.96	4.04	4.27	3.97	4.06
NP	3.14	2.73	3.04	3.19	3.02
NPK	3.66	3.86	3.93	3.62	3.77
NPMG	2.58	2.84	2.78	2.72	2.73
N	2.72	2.62	2.57	2.67	2.64
MEAN	3.61	3.64	3.67	3.70	3.66

MANURE NKMG 2.75

GRAND MEAN 3.62

2ND CUT MEAN DM% 28.3

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78/R/BN/7

3RD CUT (1/11/78) DRY MATTER TONNES/HECTARE

***** TABLES OF MEANS *****

NFORMRES MANURE	NS	SA	SA/CM	CM	MEAN
DN	3.12	3.04	3.17	2.91	3.06
DNPK	3.47	3.70	3.49	3.32	3.50
NPKMG	2.80	2.93	3.05	2.85	2.90
NP	2.34	2.08	2.26	2.14	2.20
NPK	2.66	2.95	2.83	2.67	2.78
NPMG	2.02	2.10	2.31	1.93	2.09
N	2.31	1.89	1.88	2.08	2.04
MEAN	2.67	2.67	2.71	2.56	2.65

MANURE NKMG 2.90

GRAND MEAN 2.66

3RD CUT MEAN DM% 37.0

TOTAL OF 3 CUTS DRY MATTER TONNES/HECTARE

***** TABLES OF MEANS *****

NFORMRES MANURE	NS	SA	SA/CM	CM	MEAN
DN	15.33	15.55	15.90	14.17	15.24
DNPK	15.71	15.54	14.55	14.07	14.97
NPKMG	14.29	14.20	14.28	14.03	14.20
NP	12.52	10.69	11.58	12.06	11.71
NPK	13.57	13.64	14.02	13.59	13.70
NPMG	11.58	11.32	11.50	11.84	11.56
N	10.72	9.75	10.60	10.68	10.44
MEAN	13.39	12.96	13.20	12.92	13.12

MANURE NKMG 12.80

GRAND MEAN 13.11

TOTAL OF 3 CUTS MEAN DM% 30.2

SUB PLOT AREA HARVESTED 0.00568

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78/R/GC/8

GARDEN CLOVER

Object: To study yields and pathogens of red clover grown continuously - Manor Garden.

The 125th year, red clover.

For previous years see 'Details' 1967 & 1973, and 74-77/R/GC/8.

Whole plot dimensions: 2.13 x 3.05.

Treatments: All combinations of:-

1. VARIETY — Varieties:

   HUNGAROP — Hungaropoly (resistant to Sclerotinia trifoliorum)
   S.123 — S.123 (susceptible to S. trifoliorum)

2. ALDICARB — Aldicarb to seedbed (kg):

   0
   10

NOTE: Many plants failed to survive the winter. Gaps were re-sown in spring.

Basal applications: Manures: (0:14:28) at 540 kg. K20 at 75 kg, as muriate of potash, after each cut except the last. Mg at 110 kg, as Epsom salts, half in spring, half in summer. N at 130 kg, as 'Nitro-Chalk 25', in spring and after each cut except the last.

Seed: Sown at 34 kg.

Cultivations, etc.:- Basal PK and Mg applied: 6 Apr, 1978. Seed sown in gaps, aldicarb applied: 10 Apr. N applied: 5 May. Cut, basal N and K applied: 21 June. Cut, basal N, K and Mg applied: 28 July. Cut, basal N and K applied: 21 Aug. Cut: 9 Oct.

NOTE: Samples of herbage were taken for determination of N, P, K, Ca and Mg.

78/R/GC/8

1ST CUT(21/6/78)DRY MATTER TONNES/HECTARE

***** TABLES OF MEANS *****

ALDICARB / VARIETY	0	10	MEAN
HUNGAROP	0.37	2.03	1.20
S.123	0.50	1.01	0.76
MEAN	0.43	1.52	0.98

1ST CUT MEAN DM% 17.0

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78/R/GC/8

2ND CUT (28/7/78) DRY MATTER TONNES/HECTARE

***** TABLES OF MEANS *****

ALDICARB	0	10	MEAN
VARIETY			
HUNGAROP	0.76	2.01	1.38
S.123	1.03	2.27	1.65
MEAN	0.89	2.14	1.52

2ND CUT MEAN DM% 16.3

3RD CUT (21/8/78) DRY MATTER TONNES/HECTARE

***** TABLES OF MEANS *****

ALDICARB	0	10	MEAN
VARIETY			
HUNGAROP	0.72	1.82	1.27
S.123	0.60	1.43	1.02
MEAN	0.66	1.62	1.14

3RD CUT MEAN DM% 16.7

4TH CUT (9/10/78) DRY MATTER TONNES/HECTARE

***** TABLES OF MEANS *****

ALDICARB	0	10	MEAN
VARIETY			
HUNGAROP	1.10	2.08	1.59
S.123	0.94	1.41	1.18
MEAN	1.02	1.75	1.38

4TH CUT MEAN DM% 14.7

TOTAL OF 4 CUTS DRY MATTER TONNES/HECTARE

***** TABLES OF MEANS *****

ALDICARB	0	10	MEAN
VARIETY			
HUNGAROP	2.94	7.94	5.44
S.123	3.08	6.12	4.60
MEAN	3.01	7.03	5.02

TOTAL OF 4 CUTS MEAN DM% 16.2

PLOT AREA HARVESTED 0.00010

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78/S/RN/1

ROTATION I

Object: To compare nutrient cycles, uptakes of nutrients and responses to fresh P and K. To obtain an estimate of the rate of release of nutrients, particularly K, from Saxmundham soil - Saxmundham.

Sponsor: A.E. Johnston.

The 80th year, grass, lucerne, potatoes, beans and wheat.

For previous years see 'Details' 1967 & 1973, and 74-77/S/RN/1.

Whole plot dimensions (new treatments): 5.49 x 17.1.

Treatments: From 1899 to 1969 the experiment followed a four-course rotation of wheat, roots, barley, legumes. Each phase of the rotation was present each year on a separate block. From 1966 each plot was divided, a small area at the south end being continued under the original treatment (OLDTREAT), modified treatments (NEWTREAT) being applied on the larger sub-plots (see below).

In 1970 the rotation was stopped and each pair of blocks was divided for lucerne and grass
(the OLDTREAT sub-plots form a part of the Grass area).

TREATMENT 1899-1965	OLDTREAT Grass	NEWTREAT Lucerne	NEWTREAT Grass
	MANURE	MANURE	MANURE
D	(D)	(D)	(D)N
B	B	B	BN
N	N	(N)P2	(N)P2N
P	P	(P)P1	(P)P1N
K	K	(K)P2K	(K)P2KN
-	-	(-)P2	(-)P2N
PK	PK	(PK)P1K	(PK)P1KN
NK	NK	(NK)P2K	(NK)P2KN
NP	NP	(NP)P1	(NP)P1N
NPK	NPK	(NPK)P1K	(NPK)P1KN

D: Farmyard manure at 15 tonnes
(D): Farmyard manure at 30 tonnes (1966-1969 15 tonnes on OLDTREAT), 60 tonnes in autumn 1969, none since
B: Bone meal at 0.5 tonnes
N: 1899-1965 - 38 kg N as nitrate of soda. Since 1970 - 100 kg N (38 kg N on OLDTREAT) per cut as 'Nitro-Chalk'
P: 1899-1965 40 kg P205 as single superphosphate. Since 1966 50 kg P205 as triple superphosphate
P1,P2: 50, 100 kg P205 as triple superphosphate (single superphosphate until 1965)
K: 1899-1965 63 kg K20 as muriate of potash. Since 1966 - 126 kg K20 (75 kg K20 on OLDTREAT)

NOTES: (1) For a fuller record of treatments see 'Details' etc.
(2) On OLDTREAT grass, clover appeared naturally on some plots in 1975. To unify the plots white clover was sown on all at 33 kg.
(3) Lucerne was resown in 1976.

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78/S/RN/1

In 1977 lucerne was ploughed on one pair of blocks and the area divided into three for three phases of the arable four-course rotation barley, potatoes, winter beans, wheat. Whole plot treatments are continued on the ploughed area as for NEWTREAT lucerne except all crops, except beans, are given N and plots previously given farmyard manure now receive phosphate fertiliser. Plots on this area are randomly subdivided for each crop for a test of potash fertiliser. All combinations of the following are present:

1. MANURE

Beans	Potatoes and wheat
(D)P2	(D)P2N
B	BN
(N)P2	(N)P2N
(P)P1	(P)P1N
(K)P2K	(K)P2KN
(-)P2	(-)P2N
(PK)P1K	(PK)P1KN
(NK)P2K	(NK)P2KN
(NP)P1	(NP)P1N
(NPK)P1K	(NPK)P1KN

Symbols as above except N = 250 kg (potatoes); 144 kg (wheat) - 50 kg in autumn, 94 kg in spring.

2. POTASH Additional potash fertiliser, as muriate of potash (kg K20):

Beans and wheat	Potatoes
0	0
63	224

NOTE: Remaining lucerne was ploughed in June 1978 after the first cut. The area was then sown to a grass/clover mixture, all plots given (15:15:15) at 167 kg.

Standard applications:
Wheat: Weedkillers: Isoproturon at 3.1 kg in 220 l. Ioxynil at 0.42 kg and mecoprop at 1.3 kg in 280 l applied with the tridemorph. Fungicide: Tridemorph at 0.53 kg. Benodanil at 1.1 kg in 280 l. Insecticide: Pirimicarb at 0.14 kg in 280 l. Growth Regulator: Chlormequat at 1.7 kg in 280 l.
Potatoes: Weedkillers: Linuron at 0.93 kg in 280 l. Fungicide: Mancozeb at 1.3 kg in 280 l on three occasions with insecticide. Insecticide: Pirimicarb at 0.14 kg.
Beans: Weedkillers: Simazine at 1.1 kg in 340 l. Fungicide: Benomyl at 0.28 kg in 280 l.

Seed: Wheat: Maris Huntsman, sown at 200 kg.
Potatoes: Pentland Crown.
Beans: Throws MS, sown at 260 kg.
Grass/Clover: (To remaining 'NEWTREAT' lucerne area): Clover, Blanca and perennial ryegrass S.23, mixture sown at 39 kg.

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78/S/RN/1

Cultivations, etc.:-
OLDTREAT Grass: P, K and bone meal applied: 2 Mar, 1978. N applied: 14 Mar, 21 June. Cut: 8 June, 27 Sept.
NEWTREAT Grass: P, K and bone meal applied: 2 Mar. N applied: 14 Mar, 21 June, 3 Aug. Cut: 8 June, 25 July, 27 Sept.
Lucerne: P, K and bone meal applied: 2 Mar. Cut: 8 June. Ploughed: 23 June. Clover/grass seed sown, NPK applied: 15 Aug.
All tillage crops: Ploughed: 21 Oct, 1977.
Potatoes: Basal N and test K applied: 19 Apr, 1978. Potatoes planted: 25 Apr. Weedkiller applied: 18 May. Fungicide and insecticide applied: 6 June, 3 Aug and 15 Aug. Lifted: 12 Oct.
Wheat: Spring-tine cultivated twice, P and K applied: 2 Sept, 1977. Spring-tine cultivated: 18 Oct. Autumn N applied, seed sown: 19 Oct. Isoproturon applied: 20 Oct. Spring N applied: 7 Apr, 1978. Ioxynil and mecoprop applied with tridemorph. Chlormequat applied: 18 May. Pirimicarb applied: 3 Aug. Combine harvested: 23 Aug.
Beans: Spring-tine cultivated twice. P and K applied, seed sown: 19 Oct, 1977. Simazine applied: 20 Oct. Benomyl applied: 18 May, 6 June and 6 July. Combine harvested: 6 Sept.

78/S/RN/1 GRASS OLDTREAT

DRY MATTER TONNES/HECTARE

***** TABLES OF MEANS *****

	1ST CUT (8/6/78)	2ND CUT (27/9/78)	TOTAL OF 2 CUTS
MANURE			
(D)	2.22	2.23	4.44
B	2.41	2.08	4.49
N	1.71	1.35	3.06
P	2.32	2.02	4.34
K	0.93	0.56	1.49
-	0.99	0.72	1.71
PK	2.37	2.15	4.53
NK	2.07	1.40	3.47
NP	2.11	1.46	3.57
NPK	2.54	1.64	4.18
MEAN	1.97	1.56	3.53
MEAN DM%	31.4	38.7	35.1

PLOT AREA HARVESTED 0.00050

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78/S/RN/1 GRASS NEWTREAT

DRY MATTER TONNES/HECTARE

***** TABLES OF MEANS *****

	1ST CUT (8/6/78)	2ND CUT (25/7/78)	3RD CUT (27/9/78)	TOTAL OF 3 CUTS
MANURE				
(D)N	7.12	3.76	2.38	13.26
BN	6.26	2.59	2.21	11.07
(N)P2N	6.34	2.97	2.15	11.46
(P)P1N	6.62	2.71	2.15	11.49
(K)P2KN	7.28	3.37	2.76	13.41
(-)P2N	6.86	2.70	2.02	11.58
(PK)P1KN	7.44	3.10	2.34	12.88
(NK)P2KN	7.97	3.35	2.69	14.02
(NP)P1N	6.61	2.64	2.03	11.29
(NPK)P1KN	7.60	3.13	2.55	13.28
MEAN	7.01	3.03	2.33	12.37
MEAN DM%	24.5	21.5	32.4	26.1
PLOT AREA HARVESTED	0.00109	0.00139	0.00128	

78/S/RN/1 LUCERNE NEWTREAT

***** TABLES OF MEANS *****

	1ST CUT (8/6/78)
MANURE	
(D)	3.13
B	2.52
(N)P2	2.10
(P)P1	1.83
(K)P2K	2.17
(-)P2	2.42
(PK)P1K	2.30
(NK)P2K	2.58
(NP)P1	2.09
(NPK)P1K	2.84
MEAN	2.40

1ST CUT MEAN DM% 25.5

PLOT AREA HARVESTED 0.00153

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78/S/RN/1

POTATOES

TUBERS TONNES/HECTARE

***** TABLES OF MEANS *****

POTASH MANURE	0	224	MEAN
(D)P2N	45.9	54.0	49.9
BN	34.3	47.3	40.8
(N)P2N	31.9	48.6	40.2
(P)P1N	35.6	48.2	41.9
(K)P2KN	53.4	52.9	53.1
(-)P2N	37.4	52.6	45.0
(PK)P1KN	51.2	54.5	52.8
(NK)P2KN	50.3	55.2	52.7
(NP)P1N	30.4	43.8	37.1
(NPK)P1KN	49.0	47.3	48.2
MEAN	41.9	50.4	46.2

***** STANDARD ERRORS OF DIFFERENCES OF MEANS *****

TABLE	POTASH	MANURE* POTASH
SED	0.75	2.36

* WITHIN SAME LEVEL OF MANURE ONLY

***** STRATUM STANDARD ERRORS AND COEFFICIENTS OF VARIATION *****

STRATUM	DF	SE	CV%
BLOCK.WP	9	2.08	4.5
BLOCK.WP.SP	10	2.36	5.1

SUB PLOT AREA HARVESTED 0.00107

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78/S/RN/1

BEANS

GRAIN TONNES/HECTARE

***** TABLES OF MEANS *****

POTASH MANURE	0	63	MEAN
(D)P2	3.27	4.23	3.75
B	1.67	3.52	2.59
(N)P2	0.75	3.92	2.33
(P)P1	1.70	3.79	2.74
(K)P2K	5.57	5.51	5.54
(-)P2	2.28	4.68	3.48
(PK)P1K	5.09	5.11	5.10
(NK)P2K	5.46	5.95	5.70
(NP)P1	1.25	4.13	2.69
(NPK)P1K	5.02	4.68	4.85
MEAN	3.21	4.55	3.88

***** STANDARD ERRORS OF DIFFERENCES OF MEANS *****

TABLE	POTASH	MANURE* POTASH
SED	0.134	0.423

***** STRATUM STANDARD ERRORS AND COEFFICIENTS OF VARIATION *****

STRATUM	DF	SE	CV%
BLOCK.WP	9	0.340	8.8
BLOCK.WP.SP	10	0.423	10.9

GRAIN MEAN DM% 77.8

SUB PLOT AREA HARVESTED 0.00077

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78/S/RN/1

WHEAT

GRAIN TONNES/HECTARE

***** TABLES OF MEANS *****

POTASH MANURE	0	63	MEAN
(D)P2N	7.85	8.21	8.03
BN	7.32	7.42	7.37
(N)P2N	7.60	8.08	7.84
(P)P1N	8.03	7.50	7.76
(K)P2KN	8.05	7.94	8.00
(-)P2N	7.41	7.98	7.69
(PK)P1KN	7.41	8.07	7.74
(NK)P2KN	7.96	7.59	7.78
(NP)P1N	7.12	7.57	7.35
(NPK)P1KN	6.97	7.09	7.03
MEAN	7.57	7.75	7.66

***** STANDARD ERRORS OF DIFFERENCES OF MEANS *****

TABLE	POTASH	MANURE* POTASH
SED	0.107	0.339

***** STRATUM STANDARD ERRORS AND COEFFICIENTS OF VARIATION *****

STRATUM	DF	SE	CV%
BLOCK.WP	9	0.366	4.8
BLOCK.WP.SP	10	0.339	4.4

GRAIN MEAN DM% 79.0

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78/S/RN/1

WHEAT

STRAW TONNES/HECTARE

***** TABLES OF MEANS *****

POTASH MANURE	0	63	MEAN
(D)P2N	6.35	6.19	6.27
BN	5.60	5.76	5.68
(N)P2N	4.95	5.57	5.26
(P)P1N	4.72	6.44	5.58
(K)P2KN	6.63	6.40	6.51
(-)P2N	6.00	6.16	6.08
(PK)P1KN	6.31	6.39	6.35
(NK)P2KN	7.10	6.67	6.89
(NP)P1N	5.28	5.65	5.46
(NPK)P1KN	5.37	5.58	5.47
MEAN	5.83	6.08	5.96

STRAW MEAN DM% 66.0

SUB PLOT AREA HARVESTED 0.00075

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78/S/RN/2

ROTATION II

Object: To measure, by crop yields and soil analysis, the residual value of P applied as FYM or superphosphate in the periods 1899-1964 and 1965-1967 and of fresh dressings since - Saxmundham.

Sponsors: G.E.G. Mattingly, A.E. Johnston.

The ninth year of revised scheme, wheat, barley.

For previous years see 'Details' 1967 & 1973, and 74-77/S/RN/2.

Whole plot dimensions: 5.49 x 39.8.

Treatments: From 1899-1964 the experiment tested farmyard manure and nitrogen and phosphate fertilisers applied to a rotation of crops. Since 1965 the treatments have been changed to evaluate old residues of P (from FYM and superphosphate) and new residues from treatments applied 1965-1967. All crops of the rotation - potatoes, barley, sugar beet, barley - were grown until 1974. The whole experiment was sown to barley in 1975 and 1976, wheat and barley since 1977, and tests combinations of:

Whole plots

1. RESIDUE — Residues of previous treatments:-

		Approximate total dressing 1899-1964	Total dressing 1965-1967
(0)0	Plot 1	None	None
(D)0	Plot 2	400 tonnes FYM	None
(DP)0	Plot 3	400 tonnes FYM, 2.7 tonnes P205	None
(DP)D2	Plot 4	400 tonnes FYM, 2.7 tonnes P205	100 tonnes FYM
(DP)D2P1	Plot 5	400 tonnes FYM, 2.7 tonnes P205	100 tonnes FYM, 0.56 tonnes P205
(DP)P1	Plot 6	400 tonnes FYM, 2.7 tonnes P205	0.56 tonnes P205
(DP)P2	Plot 7	400 tonnes FYM, 2.7 tonnes P205	1.13 tonnes P205
(DP52)0	Plot 8	326 tonnes FYM, 4.3 tonnes P205 (until 1952 only)	None

Barley in 1978 (after wheat 1977) tests in addition to 1:-

Sub plots

2. P — Phosphate (total P205 applied in each period (kg)):

	1969-71	1973-75	1978 (to preceding wheat stubble)
(0)(0)0	0	0	0
(0)(3)0	0	378	0
(1)(3)1	126	378	120
(2)(3)1	252	378	120
(3)(3)0	378	378	0

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and some of the combinations of 2 with:-

3. N Nitrogen fertiliser (kg N as 'Nitro-Chalk 25'):

30
60
90
120

Wheat in 1978 (after barley 1977) tests in addition to 1:

Sub plots

2. P Phosphate (total P205 applied in each period (kg)):

	1969-71	1973-75
(0)(0)	0	0
(0)(3)	0	378
(1)(3)	126	378
(2)(3)	252	378
(3)(3)	378	378

and some of the combinations of 2 with:-

3. N Nitrogen fertiliser (kg N as 'Nitro-Chalk 25') (in addition to autumn basal N):

40
80
120
160

Standard applications:
Both crops: Manures: K_2O at 150 kg as muriate of potash. Weedkillers: Ioxynil at 0.42 kg and mecoprop at 1.3 kg in 280 l with the fungicide. Fungicide: Tridemorph at 0.53 kg in 280 l.
Winter Wheat: Manures: N at 50 kg at drilling as 'Nitro-Chalk 25'. Weedkillers: Isoproturon at 3.1 kg in 220 l. Growth Regulator: Chlormequat at 1.7 kg in 280 l.

Seed: Winter Wheat: Maris Huntsman, sown at 200 kg.
Barley: Julia, sown at 180 kg.

Cultivations, etc.:-
Both crops: K applied: 21 Sept, 1977. Ploughed: 23 Sept. Weedkillers and fungicide applied: 18 May, 1978.
Winter Wheat: Spring-tine cultivated: 12 Oct, 1977. Seed sown and basal N applied: 19 Oct. Weedkiller applied: 20 Oct. Test N applied: 20 Apr, 1978. Growth Regulator applied: 18 May. Combine harvested: 23 Aug.
Barley: Test P applied: 21 Sept, 1977. Test N applied and spring-tine cultivated: 6 Apr, 1978. Seed sown: 7 Apr. Combine harvested: 24 Aug.

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78/S/RN/2

BARLEY AFTER WHEAT (1977)

GRAIN TONNES/HECTARE

***** TABLES OF MEANS *****

VARIATE: GRAIN (AT 85% DM) TONNES/HECTARE

RESIDUE	N P	30	60	90	120
(O)O	(0)(0)0			2.47	2.64
(O)O	(0)(3)0	3.23	3.21		
(O)O	(1)(3)1	3.09		4.49	
(O)O	(2)(3)1		4.22		5.01
(O)O	(3)(3)0		3.55		4.52
(D)O	(0)(0)0	2.88	4.41		
(D)O	(0)(3)0			4.50	4.97
(D)O	(1)(3)1		4.56		5.21
(D)O	(2)(3)1	3.25		4.66	
(D)O	(3)(3)0	3.44		4.48	
(DP)O	(0)(0)0			4.59	4.88
(DP)O	(0)(3)0	4.21	4.57		
(DP)O	(1)(3)1	3.69		5.13	
(DP)O	(2)(3)1		5.07		5.90
(DP)O	(3)(3)0		4.69		5.06
(DP)D2	(0)(0)0	4.21	5.18		
(DP)D2	(0)(3)0			5.10	5.08
(DP)D2	(1)(3)1	4.27		4.90	
(DP)D2	(2)(3)1		4.67		5.58
(DP)D2	(3)(3)0		5.01		5.07
(DP)D2P1	(0)(0)0			5.35	5.42
(DP)D2P1	(0)(3)0	4.67	5.13		
(DP)D2P1	(1)(3)1	3.96		5.85	
(DP)D2P1	(2)(3)1		5.16		5.88
(DP)D2P1	(3)(3)0		5.09		6.21
(DP)P1	(0)(0)0			5.26	4.59
(DP)P1	(0)(3)0	4.23	5.23		
(DP)P1	(1)(3)1		5.11		5.77
(DP)P1	(2)(3)1	4.62		5.40	
(DP)P1	(3)(3)0	4.34		6.23	
(DP)P2	(0)(0)0	4.36	5.13		
(DP)P2	(0)(3)0			5.60	6.67
(DP)P2	(1)(3)1		5.31		5.64
(DP)P2	(2)(3)1	4.68		5.45	
(DP)P2	(3)(3)0	4.20		6.15	
(DP52)O	(0)(0)0	4.30	4.75		
(DP52)O	(0)(3)0			5.34	5.21
(DP52)O	(1)(3)1		5.55		5.13
(DP52)O	(2)(3)1	4.43		5.27	
(DP52)O	(3)(3)0	4.78		5.31	

GRAIN MEAN DM% 80.7

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78/S/RN/2

BARLEY AFTER WHEAT (1977)

STRAW TONNES/HECTARE

***** TABLES OF MEANS *****

VARIATE: STRAW (AT 85% DM) TONNES/HECTARE

RESIDUE	N P	30	60	90	120
(0)0	(0)(0)0			2.04	1.84
(0)0	(0)(3)0	2.01	1.57		
(0)0	(1)(3)1	1.77		3.06	
(0)0	(2)(3)1		1.98		3.92
(0)0	(3)(3)0		1.58		3.09
(D)0	(0)(0)0	1.75	3.84		
(D)0	(0)(3)0			3.51	3.22
(D)0	(1)(3)1		3.04		4.72
(D)0	(2)(3)1	3.86		3.36	
(D)0	(3)(3)0	2.32		3.82	
(DP)0	(0)(0)0			3.22	4.54
(DP)0	(0)(3)0	2.72	2.25		
(DP)0	(1)(3)1	1.45		4.11	
(DP)0	(2)(3)1		4.09		4.47
(DP)0	(3)(3)0		4.27		4.59
(DP)D2	(0)(0)0	2.42	3.73		
(DP)D2	(0)(3)0			5.70	4.13
(DP)D2	(1)(3)1	2.34		3.56	
(DP)D2	(2)(3)1		2.96		3.67
(DP)D2	(3)(3)0		4.37		4.30
(DP)D2P1	(0)(0)0			3.87	4.58
(DP)D2P1	(0)(3)0	3.86	4.17		
(DP)D2P1	(1)(3)1	2.26		4.46	
(DP)D2P1	(2)(3)1		3.61		4.66
(DP)D2P1	(3)(3)0		3.76		5.30
(DP)P1	(0)(0)0			4.42	4.40
(DP)P1	(0)(3)0	2.26	3.89		
(DP)P1	(1)(3)1		4.19		4.17
(DP)P1	(2)(3)1	2.31		4.57	
(DP)P1	(3)(3)0	2.58		4.52	
(DP)P2	(0)(0)0	2.76	4.00		
(DP)P2	(0)(3)0			4.59	5.56
(DP)P2	(1)(3)1		3.90		4.75
(DP)P2	(2)(3)1	3.16		4.10	
(DP)P2	(3)(3)0	3.33		4.41	
(DP52)0	(0)(0)0	2.33	5.17		
(DP52)0	(0)(3)0			4.12	3.33
(DP52)0	(1)(3)1		3.38		4.44
(DP52)0	(2)(3)1	1.92		4.00	
(DP52)0	(3)(3)0	3.42		3.97	

STRAW MEAN DM% 85.8

SUB PLOT AREA HARVESTED 0.00075

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78/S/RN/2

WHEAT AFTER BARLEY (1977)

GRAIN TONNES/HECTARE

***** TABLES OF MEANS *****

VARIATE: GRAIN (AT 85% DM) TONNES/HECTARE

RESIDUE	N P	40	80	120	160
(O)O	(0)(0)	3.45	3.74		
(O)O	(0)(3)			4.06	5.94
(O)O	(1)(3)		4.94		7.50
(O)O	(2)(3)	5.44		6.80	
(O)O	(3)(3)	5.47		7.86	
(D)O	(0)(0)			6.34	6.53
(D)O	(0)(3)	6.61	6.62		
(D)O	(1)(3)	5.10		7.14	
(D)O	(2)(3)		7.51		8.05
(D)O	(3)(3)		7.00		8.44
(DP)O	(0)(0)	5.80	8.07		
(DP)O	(0)(3)			8.29	8.14
(DP)O	(1)(3)		6.83		8.49
(DP)O	(2)(3)	5.97		8.57	
(DP)O	(3)(3)	6.41		8.19	
(DP)D2	(0)(0)			8.32	8.01
(DP)D2	(0)(3)	7.43	7.71		
(DP)D2	(1)(3)		8.09		6.84
(DP)D2	(2)(3)	6.62		6.94	
(DP)D2	(3)(3)	6.80		8.15	
(DP)D2P1	(0)(0)	6.27	8.09		
(DP)D2P1	(0)(3)			8.12	8.22
(DP)D2P1	(1)(3)		8.70		8.60
(DP)D2P1	(2)(3)	7.11		8.69	
(DP)D2P1	(3)(3)	6.86		8.67	
(DP)P1	(0)(0)	5.88	8.53		
(DP)P1	(0)(3)			7.86	7.48
(DP)P1	(1)(3)	6.52		8.20	
(DP)P1	(2)(3)		7.87		9.44
(DP)P1	(3)(3)		8.01		8.92
(DP)P2	(0)(0)			8.43	9.07
(DP)P2	(0)(3)	7.16	7.87		
(DP)P2	(1)(3)	6.21		8.11	
(DP)P2	(2)(3)		8.26		8.84
(DP)P2	(3)(3)		7.60		8.37
(DP52)O	(0)(0)			7.92	8.18
(DP52)O	(0)(3)	6.32	7.88		
(DP52)O	(1)(3)	6.35		7.12	
(DP52)O	(2)(3)		7.85		7.70
(DP52)O	(3)(3)		8.61		7.45

GRAIN MEAN DM% 78.9

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78/S/RN/2

WHEAT AFTER BARLEY (1977)

STRAW TONNES/HECTARE

***** TABLES OF MEANS *****

VARIATE: STRAW (AT 85% DM) TONNES/HECTARE

RESIDUE	N P	40	80	120	160
(O)O	(0)(0)	1.93	1.14		
(O)O	(0)(3)			1.71	4.28
(O)O	(1)(3)		2.00		4.09
(O)O	(2)(3)	1.93		4.40	
(O)O	(3)(3)	3.07		5.03	
(D)O	(0)(0)			4.16	4.68
(D)O	(0)(3)	5.30	6.54		
(D)O	(1)(3)	3.68		5.83	
(D)O	(2)(3)		4.91		6.89
(D)O	(3)(3)		6.24		6.87
(DP)O	(0)(0)	4.78	6.22		
(DP)O	(0)(3)			5.77	5.99
(DP)O	(1)(3)		5.60		5.72
(DP)O	(2)(3)	3.39		6.89	
(DP)O	(3)(3)	4.98		6.63	
(DP)D2	(0)(0)			7.38	6.30
(DP)D2	(0)(3)	5.10	5.71		
(DP)D2	(1)(3)		6.88		7.06
(DP)D2	(2)(3)	5.80		6.23	
(DP)D2	(3)(3)	6.15		6.38	
(DP)D2P1	(0)(0)	5.25	6.47		
(DP)D2P1	(0)(3)			6.85	7.51
(DP)D2P1	(1)(3)		6.35		6.44
(DP)D2P1	(2)(3)	5.63		7.20	
(DP)D2P1	(3)(3)	5.37		6.78	
(DP)P1	(0)(0)	4.78	6.52		
(DP)P1	(0)(3)			6.24	7.31
(DP)P1	(1)(3)	5.35		7.71	
(DP)P1	(2)(3)		5.69		8.24
(DP)P1	(3)(3)		8.06		7.16
(DP)P2	(0)(0)			8.37	7.89
(DP)P2	(0)(3)	5.68	7.00		
(DP)P2	(1)(3)	5.02		6.53	
(DP)P2	(2)(3)		6.35		7.60
(DP)P2	(3)(3)		6.26		7.58
(DP52)O	(0)(0)			5.35	5.63
(DP52)O	(0)(3)	3.21	5.76		
(DP52)O	(1)(3)	4.17		5.12	
(DP52)O	(2)(3)		5.47		6.10
(DP52)O	(3)(3)		4.77		6.16

STRAW MEAN DM% 64.2

SUB PLOT AREA HARVESTED 0.00075

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78/R/RN/1 and 78/R/RN/2

LEY/ARABLE

Object: To study the effects of three-year leys on the fertility of the soil as measured by a sequence of three arable test crops. From 1968, continuous wheat was grown on some blocks after the three test crops to study the build-up and decline of take-all (Gaeumannomyces graminis) after the different cropping sequences. From 1977 new crop sequences were introduced on these blocks - Highfield and Fosters.

Sponsors: A.E. Johnston, D.B. Slope.

The 30th year, old grass, leys, potatoes, wheat, oats, barley.

For previous years see 'Details' 1967 & 1973 and 74-77/R/RN/1&2.

The experiment is duplicated on:-

HIGHFIELD — A site with much organic matter initially (ploughed out from permanent grass) (78/R/RN/1)

FOSTERS — A site with little organic matter initially (78/R/RN/2)

ROTATION — Treatments: The experiment originally tested four six-course rotations, with all phases present each year. In recent years these rotations were:-

	Treatment crops	Test crops
LUCERNE	LU, LU, LU,	W, P, B
CLOGRA	LC, LC, LC,	W, P, B
GRASS	LN, LN, LN,	W, P, B
ARABLE	H, SB, O,	W, P, B

LU = lucerne, LC = clover/grass ley, no nitrogen fertiliser, LN = all-grass ley with much nitrogen fertiliser, H = 1-year seeds hay, SB = sugar beet, O = oats, W = wheat, P = potatoes, B = barley.

From 1968 the order of test crops was changed to P, W, B except for those phases that had already started the sequence W, P, B.

From 1975 the barley test crop was changed to wheat.

RESEEDED — On both fields in the first three years other plots were sown with long-term reseeded grass

OLDGRASS — On Highfield plots of the old turf were left initially un-ploughed, for comparison with the three-year leys

In 1962 and 1963 some of the old and reseeded grass plots were divided for management identical to:-

C — Clover-grass ley
N — All-grass ley

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78/R/RN/1 and 78/R/RN/2

From 1963 (reseeded) and 1968 (old grass) some grass plots were ploughed and cropped with the same test crops as above, thereafter these plots followed the ARABLE rotation. In 1973 some of these plots were returned to reseeded grass.

From 1968 only two phases on each field continued in the original six-course rotation (the museum blocks). The four other phases (the new sequence blocks) were sown to wheat every year at the end of the test-crop cycle. In both 1977 and 1978 one phase, fallowed in the previous year started a new sequence of treatment cropping. In 1978 one of the remaining phases was fallowed and the other remained in wheat (no yields). The new sequences will be introduced progressively on these remaining phases. The new sequences are:

SEQUENCE		Treatment crops	Test crops
LUCERNE	(previously LUCERNE)	LU, LU, LU	W, W, W, W
CLOGRA	(previously CLOGRA)	LC, LC, LC	W, W, W, W
GRASS/G	(previously GRASS)	R, R, R	W, W, W, W
ARABLE/A	(previously ARABLE)	O, P, BE	W, W, W, W
ARABLE/R	(previously RESEEDED)	B, B, W	W, W, W, W
GRASS/OG	(previously OLDGRASS)	R, R, R	W, W, W, W

R = ryegrass, BE = beans. Other symbols as above. All ploughed at the end of the treatment crop cycle except GRASS/OG - direct drilled to wheat. Treatment crop cycles start after nine previous cereals followed by one fallow. In treatment years yields are taken only from barley and wheat.

Additional treatments to 3rd test crop wheat in the original rotation:-

Sub plots

FYMRES70 Farmyard manure residues, last applied 1970:

NONE None
FYM 30 tonnes on each occasion

Sub plots

N 78 Nitrogen fertiliser (kg N as 'Nitro-Chalk 26'):

0
50
100
150

Standard applications:
Museum blocks:
3rd Treatment Crops:
All-grass ley: Manures: (0:14:28) at 540 kg. (25:0:16) at 300 kg in spring, and after each cut except the last.
Clover-grass ley: Manures: (0:14:28) at 540 kg.
Lucerne: Manures: (0:14:28) at 810 kg.
Oats: Manures: (20:14:14) at 350 kg, combine drilled. Weedkillers: Dicamba with mecoprop and MCPA (as 'Banlene Plus' at 4.9 l in 220 l).

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78/R/RN/1 and 78/R/RN/2

3rd Test Crop: Wheat: Manures: (0:20:20) at 380 kg, combine drilled. Weedkillers: Methabenzthiazuron at 3.1 kg in 220 l. Dicamba with mecoprop and MCPA (as 'Banlene Plus' at 4.9 l in 220 l).
Reseeded Grass and Old grass: (0:14:28) at 540 kg.
All-grass half plots: (25:0:16) at 300 kg in spring, and after each cut except the last.

New sequence blocks:
1st Treatment Crops:
All crops: Manures: Chalk at 8.7 t, Highfield only.
Lucerne: Manures: (0:14:28) at 720 kg in seedbed.
Clover-grass ley: Manures: (0:14:28) at 720 kg in seedbed. (25:0:16) at 300 kg after clover established.
Ryegrass: (0:14:28) at 720 kg to seedbed. (25:0:16) at 300 kg to seedbed and after each cut except the last. On Highfield both ryegrass plots in one block received (13:13:20) at 1500 kg in error before the planned seedbed application of (0:14:28) and (25:0:16). Accordingly on these plots only the planned seedbed dressings were omitted.
Oats and Barley: Manures: (20:14:14) at 350 kg, combine drilled. Weedkillers: Dicamba with mecoprop and MCPA (as 'Banlene Plus' at 4.9 l in 220 l) except Barley on Fosters which received ioxynil at 0.53 l and mecoprop at 1.6 l in 220 l. Fungicide (to Barley only): Tridemorph at 0.53 kg in 220 l.
2nd Treatment Crops:
Lucerne: Manures: (0:14:28) at 720 kg.
Clover-grass leys and Ryegrass: Manures: (0:14:28) at 720 kg. (25:0:16) at 300 kg in spring, repeated (Ryegrass only) after each cut except the last.
Potatoes: Manures: (13:13:20) at 1500 kg. Weedkillers: Linuron at 1.1 kg in 220 l. Paraquat at 0.42 kg ion in 220 l. Fungicides: Mancozeb at 1.3 kg in 220 l. Fentin acetate and maneb (as 'Fentin A' at 1.7 kg in 220 l). Insecticide: Pirimicarb at 0.14 kg in 220 l.
Barley: Manures: (20:14:14) at 350 kg. Weedkillers: Dicamba with mecoprop and MCPA (as 'Banlene Plus' at 4.9 l in 220 l). Fungicide: Tridemorph at 0.53 kg in 220 l.

Preparatory Crop:
Wheat: Manures: (0:20:20) at 380 kg. 'Nitra-Shell 34' at 360 kg. Weedkillers: Methabenzthiazuron at 3.1 kg in 220 l. Dicamba with mecoprop and MCPA (as 'Banlene Plus' at 4.9 l in 220 l).

Seed:
Museum blocks:
All-grass ley: Pecora Timothy at 15 kg, Meadow Fescue S.215 at 19 kg. Mixture sown at 34 kg.
Clover-grass ley: Pecora Timothy at 15 kg, Meadow Fescue S.215 at 19 kg, White Clover S.100 at 3 kg. Mixture sown at 37 kg.
Oats: Manod, sown at 130 kg.
Wheat: Cappelle, sown at 200 kg.

New Sequence blocks:
Lucerne: Vertus, sown at 28 kg.
Clover-grass leys: Timothy RvP Erecta (Pecora on 2nd treatment crops) at 15 kg, Meadow Fescue S.215 at 19 kg, Clover New Zealand Huia at 3 kg. Mixture sown at 37 kg.
Ryegrass: S.24 sown at 22 kg.
Oats: Manod, sown at 130 kg.
Barley: Porthos, sown at 160 kg.
Potatoes: Pentland Crown.
Wheat: Cappelle, sown at 200 kg.

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Cultivations, etc.:-

Museum blocks:

All-grass ley and clover-grass ley: PK applied: 9 Dec, 1977 (Highfield), 12 Dec, 1977 (Fosters). NK applied three times (all-grass ley only): 17 Mar, 1978, 8 June, 28 July. Cut three times: 2 June, 25 July, 31 Oct.

Lucerne: PK applied: 9 Dec, 1977 (Highfield), 12 Dec (Fosters). Cut three times: 27 June, 1978, 17 Aug and 7 Nov.

Oats: Ploughed: 2 Dec, 1977 (Fosters), 5 Dec (Highfield). Rotary harrowed, seed sown: 8 Apr. Weedkiller applied: 26 May. Combine harvested: 18 Sept.

Wheat: Ploughed: 11 Oct, 1977. Power harrowed: 18 Oct. Seed sown: 20 Oct. Methabenzthiazuron applied: 25 Oct. N applied: 8 May, 1978. 'Banlene Plus' applied: 10 May. Combine harvested: 4 Sept.

Reseeded Grass and Old Grass: PK applied: 12 Dec, 1977. NK applied (to N sub plots only): 17 Mar, 1978, 8 June and 28 July. Cut three times: 1 June, 25 July, 31 Oct.

New sequence blocks:

1st Treatment Crops:

All crops: Ploughed: 11 Oct, 1977. Chalk applied (Highfield only): 30 Nov. Chisel ploughed (Highfield only): 2 Dec.

Lucerne: Heavy spring-tine cultivated, PK applied, rotary harrowed: 18 May, 1978. Seed sown: 23 May. Topped: 27 July. Cut: 1 Nov.

Clover-grass ley: Heavy spring-tine cultivated, PK applied and rotary harrowed: 18 May, 1978. Seed sown: 22 May. Topped: 27 July. NK applied: 28 July. Cut: 1 Nov.

Ryegrass: Heavy spring-tine cultivated, PK and NK applied, rotary harrowed: 18 May, 1978. Seed sown: 22 May. Topped: 1 Aug. Cut: 1 Nov.

Oats and Barley: Rotary harrowed, seed sown: 8 Apr, 1978. Weedkillers and fungicide applied: 26 May. Combine harvested: 18 Sept.

2nd Treatment Crops:

Lucerne: PK applied: 9 Dec, 1977. Cut three times: 27 June, 1978, 17 Aug, 1 Nov.

Clover-grass leys: PK applied: 9 Dec, 1977. NK applied: 17 Mar, 1978. Cut three times: 1 June, 26 July, 1 Nov.

Ryegrass: PK applied: 12 Dec, 1977. NK applied three times: 17 Mar, 1978, 8 June, 28 July. Cut three times: 1 June, 26 July, 1 Nov.

Potatoes: Ploughed: 2 Dec, 1977. NPK applied: 25 Apr, 1978. Spike rotary cultivated, seed sown: 9 May. Weedkillers applied: 15 May. Grubbed and rotary ridged: 19 June. Mancozeb applied: 5 July. Mancozeb and pirimicarb applied twice: 17 July, 4 Aug. 'Fennite A' applied twice: 17 Aug, 8 Sept. Haulm pulverized: 22 Sept. Lifted: 18 Oct.

Barley: Rotary harrowed, seed sown: 2 Apr, 1978. Weedkillers and fungicide applied: 26 May. Combine harvested: 10 Sept.

Preparatory Crop:

Wheat: Ploughed: 11 Oct, 1977. Power harrowed: 18 Oct. Seed sown: 20 Oct. Methabenzthiazuron applied: 25 Oct. N applied: 5 May, 1978. 'Banlene Plus' applied: 10 May. Combine harvested: 5 Sept.

Fallow: Ploughed: 1 Dec, 1977. Rotary cultivated three times: 17 May, 1978, 13 June, 7 Aug. Spring-tine cultivated: 26 June. Chisel ploughed: 16 Aug. Disced: 1 Nov.

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NOTES: (1) In July 1978 all spring barley on the New Sequence plots was sampled for take-all (Gaeumannomyces graminis) and Phialophora.
(2) In April and July all wheat plots on the museum blocks were sampled for take-all, Phialophora and eyespot (Pseudocercosporella herpotrichoides).
(3) In September 1978 soil samples were taken from Wheat after LUCERNE, CLOGRA and ARABLE A rotations for assays of take-all and Phialophora.

MUSEUM BLOCKS

DRY MATTER: TONNES/HECTARE

***** TABLES OF MEANS *****

	HIGHFIELD	FOSTERS
CLOVER-GRASS LEY		
TOTAL OF 3 CUTS	8.02	8.43
MEAN DM%	21.8	21.3
ALL GRASS LEY		
TOTAL OF 3 CUTS	12.99	11.82
MEAN DM%	26.4	26.6
LUCERNE		
TOTAL OF 3 CUTS	12.05	13.68
MEAN DM%	21.2	20.2

OLD GRASS

TOTAL OF 3 CUTS

	HIGHFIELD	
	C	N
30TH EXPTL YEAR		
BLOCKS 1 & 4	6.16	10.60
BLOCK 2	6.48	11.09
MEAN DM%	23.6	22.7

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78/R/RN/1 AND 78/R/RN/2

RESEEDED GRASS

TOTAL OF 3 CUTS

		HIGHFIELD			FOSTERS	
	BLOCKS	C	N	BLOCKS	C	N
30TH EXPTL YEAR	1 & 4	6.12	10.97	1 & 3	5.98	10.62
30TH EXPTL YEAR (SEEDED 1949 RESEEDED 1973)	2 & 3	8.09	11.73	2 & 4	8.03	10.91
MEAN DM%		23.1	25.1		22.7	24.8

NEW SEQUENCE BLOCKS

DRY MATTER: TONNES/HECTARE

***** TABLES OF MEANS *****

BARLEY

	HIGHFIELD	FOSTERS
	5.04	5.80
MEAN DM%	77.6	81.0

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MUSEUM BLOCKS

78/R/RN/1 HIGHFIELD

WHEAT

GRAIN TONNES/HECTARE

***** TABLES OF MEANS *****

ROTATION / FYMRES70	LUCERNE	CLOGRA	GRASS	ARABLE	MEAN
NONE	4.80	6.30	6.09	5.51	5.68
FYM	5.38	6.43	6.23	5.44	5.87
MEAN	5.09	6.37	6.16	5.48	5.77

N 78 / FYMRES70	0	50	100	150	MEAN
NONE	4.29	5.84	6.22	6.35	5.68
FYM	4.24	6.13	6.35	6.76	5.87
MEAN	4.27	5.99	6.29	6.56	5.77

N 78 / ROTATION	0	50	100	150	MEAN
LUCERNE	3.37	5.59	5.30	6.09	5.09
CLOGRA	5.03	6.72	6.75	6.97	6.37
GRASS	5.06	6.12	6.71	6.76	6.16
ARABLE	3.60	5.51	6.39	6.41	5.48
MEAN	4.27	5.99	6.29	6.56	5.77

FYMRES70 / ROTATION \ N 78	0	50	100	150
NONE LUCERNE	3.65	5.09	5.37	5.07
CLOGRA	5.06	6.79	6.59	6.76
GRASS	5.01	6.31	6.36	6.69
ARABLE	3.45	5.16	6.57	6.87
FYM LUCERNE	3.09	6.09	5.23	7.10
CLOGRA	5.00	6.65	6.91	7.17
GRASS	5.10	5.93	7.06	6.84
ARABLE	3.75	5.86	6.21	5.95

GRAIN MEAN DM% 82.3

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78/R/RN/1 HIGHFIELD

WHEAT

STRAW TONNES/HECTARE

***** TABLES OF MEANS *****

ROTATION	LUCERNE	CLOGRA	GRASS	ARABLE	MEAN
FYMRES70					
NONE	4.51	5.18	4.81	4.45	4.74
FYM	4.79	4.95	4.89	4.42	4.76
MEAN	4.65	5.07	4.85	4.43	4.75

N 78	0	50	100	150	MEAN
FYMRES70					
NONE	3.55	4.94	5.37	5.08	4.74
FYM	3.25	4.79	5.36	5.65	4.76
MEAN	3.40	4.87	5.36	5.37	4.75

N 78	0	50	100	150	MEAN
ROTATION					
LUCERNE	3.12	4.92	5.49	5.07	4.65
CLOGRA	3.94	5.33	5.64	5.36	5.07
GRASS	3.83	4.61	5.26	5.70	4.85
ARABLE	2.71	4.61	5.06	5.34	4.43
MEAN	3.40	4.87	5.36	5.37	4.75

N 78		0	50	100	150
FYMRES70	ROTATION				
NONE	LUCERNE	3.82	4.78	5.30	4.14
	CLOGRA	4.01	5.56	6.09	5.06
	GRASS	3.76	5.00	4.98	5.51
	ARABLE	2.63	4.43	5.09	5.63
FYM	LUCERNE	2.41	5.06	5.67	6.00
	CLOGRA	3.88	5.09	5.19	5.66
	GRASS	3.91	4.23	5.54	5.89
	ARABLE	2.80	4.79	5.03	5.06

STRAW MEAN DM% 83.8

SUB PLOT AREA HARVESTED 0.00655

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78/R/RN/2 FOSTERS

WHEAT

GRAIN TONNES/HECTARE

***** TABLES OF MEANS *****

ROTATION	LUCERNE	CLOGRA	GRASS	ARABLE	MEAN
FYMRES70					
NONE	5.85	6.21	5.48	5.64	5.79
FYM	6.33	6.42	5.33	5.51	5.89
MEAN	6.09	6.31	5.40	5.57	5.84

N 78	0	50	100	150	MEAN
FYMRES70					
NONE	4.16	5.68	6.73	6.60	5.79
FYM	4.62	5.54	6.67	6.75	5.89
MEAN	4.39	5.61	6.70	6.67	5.84

N 78	0	50	100	150	MEAN
ROTATION					
LUCERNE	4.91	6.03	6.82	6.59	6.09
CLOGRA	4.95	6.11	7.19	7.01	6.31
GRASS	3.85	5.09	6.21	6.46	5.40
ARABLE	3.85	5.23	6.56	6.63	5.57
MEAN	4.39	5.61	6.70	6.67	5.84

N 78		0	50	100	150
FYMRES70	ROTATION				
NONE	LUCERNE	4.68	5.71	6.56	6.44
	CLOGRA	4.29	6.50	7.18	6.87
	GRASS	3.71	5.42	6.19	6.59
	ARABLE	3.96	5.10	6.98	6.50
FYM	LUCERNE	5.15	6.34	7.08	6.74
	CLOGRA	5.61	5.71	7.19	7.15
	GRASS	3.99	4.75	6.24	6.33
	ARABLE	3.75	5.36	6.15	6.77

GRAIN MEAN DM% 80.9

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78/R/RN/2 FOSTERS

WHEAT

STRAW TONNES/HECTARE

***** TABLES OF MEANS *****

ROTATION	LUCERNE	CLOGRA	GRASS	ARABLE	MEAN
FYMRES70					
NONE	4.69	4.13	4.27	3.89	4.24
FYM	4.84	4.57	4.04	4.00	4.36
MEAN	4.76	4.35	4.15	3.95	4.30

N 78	0	50	100	150	MEAN
FYMRES70					
NONE	2.70	3.88	4.91	5.49	4.24
FYM	3.13	3.91	4.97	5.44	4.36
MEAN	2.92	3.89	4.94	5.47	4.30

N 78	0	50	100	150	MEAN
ROTATION					
LUCERNE	3.60	4.32	5.34	5.80	4.76
CLOGRA	3.00	4.28	4.89	5.23	4.35
GRASS	2.85	3.46	4.78	5.53	4.15
ARABLE	2.22	3.52	4.74	5.31	3.95
MEAN	2.92	3.89	4.94	5.47	4.30

N 78		0	50	100	150
FYMRES70	ROTATION				
NONE	LUCERNE	3.58	4.11	4.95	6.12
	CLOGRA	2.25	4.75	4.32	5.21
	GRASS	2.70	3.61	5.14	5.62
	ARABLE	2.26	3.07	5.22	5.01
FYM	LUCERNE	3.62	4.53	5.73	5.47
	CLOGRA	3.74	3.81	5.46	5.25
	GRASS	3.00	3.31	4.43	5.44
	ARABLE	2.18	3.97	4.26	5.60

STRAW MEAN DM% 86.7

SUB PLOT AREA HARVESTED 0.00655

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78/W/RN/3

LEY/ARABLE

Object: To compare the effects on soil fertility of rotations with or without leys - Woburn Stackyard D.

Sponsors: A.E. Johnston, F.G.W. Jones, G.A. Salt.

The 41st year, leys, barley, oats, wheat.

For previous years see 'Details' 1967 & 1973 and 74-77/W/RN/3.

Design: 5 series of 8 plots, split for treatments other than rotations.

Whole plot dimensions: 8.53 x 40.7.

Treatments: All phases of four five-course rotations were originally present:

ROTATION

LEY	Clover/grass ley:	L, L, L, P, W
CLO	All legume ley:	SA, SA, SA, P, W until 1971 then CL, CL, CL P, W
A	Arable with roots:	P, R, C, P, W until 1971 then P, B, B, P, W
A H	Arable with hay:	P, R, H, P, W until 1971 then P, B, H, P, W

P = potatoes, R = rye, C = carrots, W = wheat, B = barley, H = hay,
L = clover/grass ley, SA = sainfoin ley, CL = red clover ley

Rotations themselves followed different cycles:

On four plots in each block the rotations were repeated (PER)
On four plots in each block arable rotations alternated each five years with ley rotations (ALT)

From 1976 all the rotations were changed on all phases except for the first and second test crops in 1976:

LN	(Previous LEY) LN, LN, LN, W, B
LC	(Previous CLO) LC, LC, LC, W, B
AF	(Previous A) F, F, O, W, B
AB	(Previous A H) B, B, O, W, B

LN = grass ley with N, LC = clover/grass ley no N, O = oats, F = fallow

Plots hitherto in alternating rotations were changed to test eight-year leys:

ALT LN	LN, LN, LN, LN, LN, LN, LN, LN, W, B
ALT LC	LC, LC, LC, LC, LC, LC, LC, LC, W, B

The new scheme started by sowing these new leys in spring 1976 on four phases and in spring 1977 on the fifth phase (2nd test crop in 1976). Initially some of the long term leys are ploughed up in less than eight years, depending on the starting point in relation to the test crop, to ensure that ultimately eight-year leys will be available for each test crop period.

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78/W/RN/3

Treatments to first test crop wheat and second test crop barley (yields are taken only from the test crops):

ROT CYCL — Combinations of rotations and cycles defined above

LN
LC
AF
AB
ALT LN
ALT LC

Additional treatments to first test crop, wheat:-

1/2 plots

1. FYMRES65 — Farmyard manure residues, last applied 1965:

NONE	None
FYM	38 tonnes on each occasion

1/8 plots

2. N — Nitrogen fertiliser (kg N):

0
63
126
189

Additional treatments to second test crop, barley:-

1/2 plots

1. FYMRES67 — Farmyard manure residues, last applied 1967:

NONE	None
FYM	38 tonnes on each occasion

1/8 plots

2. N — Nitrogen fertiliser (kg N):

0
50
100
150

NOTE: The first and second treatment crop barley was resown because of bird damage to the first sowing.

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78/W/RN/3

Corrective K dressings (kg K_2O) as muriate of potash, applied to first test crop wheat and long-term leys in the wheat block:

Continuous rotations	No FYM half plots	FYM half plots
Ley	326	176
Clover	63	126
Arable with hay	126	138
Arable	126	163
Alternating rotations (last two rotations in order)		
Ley/Arable with hay	151	213
Sainfoin/Arable	75	0
Arable with hay/Ley	264	264
Arable/Clover	100	38

Standard applications:-

Grass ley and Clover/grass ley, 1st year: Manures: (0:14:28) at 540 kg. N at 75 kg as 'Nitro-Chalk 25' to grass ley only. Weedkillers: Paraquat at 0.84 kg ion in 280 l. Dinoseb amine at 2.0 kg in 450 l.

Grass ley, 2nd, 3rd, 4th, 5th and 6th years: Manures: Magnesian limestone at 5 t to 5th year only. (0:14:28) at 540 kg. (25:0:16) at 300 kg in spring and after the first cut.

Clover/grass ley, 2nd, 3rd, 4th, 5th and 6th years: Manures: Magnesian limestone at 5 t to 5th year only. (0:14:28) at 540 kg. K_2O at 48 kg in spring and after the first cut.

Barley: Manures: 1st and 2nd treatment crops: (20:14:14) at 400 kg combine drilled. 2nd test crop: Magnesian limestone at 5 t. (0:20:20) at 300 kg combine drilled. Weedkillers: Mecoprop, bromoxynil and ioxynil ('Brittox' at 2.5 kg in 280 l). Fungicide: Tridemorph at 0.53 kg in 280 l, with weedkillers. 2nd test crop only: Nematicide: Aldicarb at 10 kg.

Oats: Manures: (20:14:14) at 400 kg combine drilled. Weedkillers: Mecoprop, bromoxynil and ioxynil ('Brittox' at 2.5 kg in 280 l).

Winter wheat: Manures: (0:20:20) at 310 kg combine drilled. Weedkillers: Paraquat at 0.84 kg ion in 220 l. Mecoprop, bromoxynil and ioxynil ('Brittox' at 3.5 kg in 280 l). Nematicide: Aldicarb at 10 kg.

Fallow, 1st year: Paraquat at 0.84 kg ion in 280 l.

Varieties: Grass ley: Erecta timothy 17 kg, Meadow fescue S.215 17 kg, sown at 34 kg.
Clover/grass ley: Erecta timothy 20 kg, Meadow fescue S.215 16 kg, Huia white clover 4 kg, sown at 40 kg.
Barley: Porthos, dressed with ethirimol, sown at 160 kg.
Oats: Manod, sown at 200 kg.

Cultivations, etc.:- Treatment crops.

Grass ley and Clover/grass ley, 1st year: Ploughed: 27 Sept, 1977. Spring-tine cultivated with crumbler attached: 13 Mar, 1978. PK applied, N applied to grass ley only: 17 Apr. Paraquat applied: 8 May. Spring-tine cultivated, seeds sown: 10 May. Dinoseb amine applied: 9 June. Cut once: 13 Sept.

Grass ley and Clover/grass ley, 2nd, 3rd, 4th, 5th and 6th years: Magnesian limestone applied to 5th year only: 21 Oct, 1977. PK applied: 6 Jan, 1978. NK applied to grass ley, K applied to Clover/grass ley: 8 Mar, 20 June. Cut twice: 12 June, 13 Sept.

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78/W/RN/3

Barley: 1st and 2nd treatment crops: Ploughed: 27 Sept, 1977. Spring-tine cultivated with crumbler attached, seed sown: 15 Mar, 1978. Spring-tine cultivated, seed resown: 7 Apr. Weedkiller applied: 15 May. Combine harvested: 4 Sept.

Oats: 3rd treatment crop: Ploughed: 27 Sept, 1977. Spring-tine cultivated with crumbler attached, seed sown: 13 Mar, 1978. Weedkiller applied: 15 May. Combine harvested: 4 Sept.

Fallow: 1st treatment year: Ploughed: 27 Sept, 1977. Spring-tine cultivated with crumbler attached: 13 Mar, 1978. Weedkiller applied: 8 May. Spring-tine cultivated twice: 10 May, 24 July. Rotary cultivated twice: 16 June, 8 Sept.

Fallow: 2nd treatment year: Ploughed: 27 Sept, 1977. Spring-tine cultivated with crumbler attached: 13 Mar. Spring-tine cultivated: 24 July. Rotary cultivated: 8 Sept.

Test Crops:

Winter wheat, 1st test crop: Paraquat applied: 26 Sept, 1977. Ploughed: 7 Oct. Corrective K applied: 10 Oct. Aldicarb applied, rotary cultivated: 24 Oct. Spring-tine cultivated, seed sown: 25 Oct. N applied: 7 Apr, 1978. Mecoprop, bromoxynil and ioxynil applied: 10 May. Combine harvested: 25 Aug.

Barley, 2nd test crop: Magnesian limestone applied: 21 Oct, 1977. Ploughed: 8 Nov. Spring-tine cultivated with crumbler attached: 13 Mar, 1978. Aldicarb applied, rotary cultivated, spring-tine cultivated with crumbler attached, seed sown: 3 Apr. N applied: 7 Apr. Weedkiller applied: 15 May. Combine harvested: 23 Aug.

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78/W/RN/3

WHEAT 1ST TEST CROP

GRAIN TONNES/HECTARE

***** TABLES OF MEANS *****

ROT CYCL FYMRES65	LN	LC	AF	AB	ALT LN	ALT LC	MEAN
NONE	5.08	4.76	4.50	4.62	4.99	4.63	4.76
FYM	4.74	5.08	4.58	4.78	4.49	4.73	4.73
N							
0	3.58	3.45	2.14	2.80	3.61	2.95	3.09
63	5.52	5.37	4.59	5.00	5.31	4.82	5.10
126	5.33	5.42	5.77	5.62	5.01	5.70	5.47
189	5.22	5.44	5.66	5.39	5.02	5.26	5.33
MEAN	4.91	4.92	4.54	4.70	4.74	4.68	4.75

FYMRES65	ROT CYCL N	LN	LC	AF	AB	ALT LN	ALT LC
NONE	0	3.69	3.39	2.26	2.95	3.74	2.80
	63	5.51	5.15	4.57	4.73	5.39	4.74
	126	5.47	5.35	5.81	5.22	5.46	5.48
	189	5.66	5.17	5.33	5.56	5.36	5.50
FYM	0	3.47	3.51	2.02	2.64	3.48	3.09
	63	5.53	5.60	4.61	5.27	5.23	4.90
	126	5.19	5.48	5.72	6.01	4.56	5.91
	189	4.77	5.72	5.99	5.21	4.69	5.03

GRAIN MEAN DM% 79.8

STRAW TONNES/HECTARE

***** TABLES OF MEANS *****

ROT CYCL FYMRES65	LN	LC	AF	AB	ALT LN	ALT LC	MEAN
NONE	5.34	5.28	4.12	4.98	5.33	4.67	4.95
FYM	5.03	5.60	4.53	4.92	5.52	4.60	5.03
N							
0	3.31	2.80	1.48	2.26	3.35	2.68	2.65
63	5.62	5.31	4.88	5.09	6.09	4.99	5.33
126	5.66	6.55	5.81	5.85	5.81	5.29	5.83
189	6.13	7.08	5.12	6.59	6.44	5.57	6.15
MEAN	5.18	5.44	4.32	4.95	5.42	4.63	4.99

FYMRES65	ROT CYCL N	LN	LC	AF	AB	ALT LN	ALT LC
NONE	0	3.79	2.69	1.48	2.29	3.30	2.44
	63	5.64	4.17	5.28	5.16	6.09	4.97
	126	6.29	6.11	5.21	5.63	5.97	5.96
	189	5.63	8.13	4.52	6.83	5.94	5.29
FYM	0	2.84	2.91	1.49	2.23	3.39	2.92
	63	5.60	6.45	4.48	5.03	6.09	5.00
	126	5.04	7.00	6.42	6.06	5.65	4.61
	189	6.63	6.03	5.72	6.35	6.93	5.85

STRAW MEAN DM% 80.6 PLOT AREA HARVESTED 0.00260

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78/W/RN/3

BARLEY 2ND TEST CROP

GRAIN TONNES/HECTARE

***** TABLES OF MEANS *****

ROT CYCL / FYMRES67	LN	LC	AF	AB	ALT LN	ALT LC	MEAN
NONE	4.84	4.84	4.65	5.46	4.78	4.68	4.87
FYM	5.81	4.54	4.02	5.07	5.23	4.59	4.88
N							
0	3.49	2.72	1.88	3.01	2.75	2.51	2.73
50	5.44	4.21	3.52	4.79	4.82	4.65	4.57
100	6.10	6.06	5.63	6.17	6.23	5.62	5.97
200	6.27	5.75	6.29	7.09	6.21	5.77	6.23
MEAN	5.33	4.69	4.33	5.27	5.00	4.64	4.88

FYMRES67	ROT CYCL N	LN	LC	AF	AB	ALT LN	ALT LC
NONE	0	3.00	2.90	1.91	2.86	2.07	2.58
	50	4.69	4.71	3.84	4.71	5.18	4.52
	100	5.55	6.28	5.76	6.12	5.93	5.46
	200	6.11	5.46	7.07	8.16	5.93	6.17
FYM	0	3.99	2.55	1.85	3.16	3.42	2.44
	50	6.18	3.72	3.21	4.87	4.46	4.78
	100	6.64	5.85	5.50	6.23	6.54	5.78
	200	6.43	6.05	5.51	6.01	6.50	5.36

GRAIN MEAN DM% 79.9

STRAW TONNES/HECTARE

***** TABLES OF MEANS *****

ROT CYCL / FYMRES67	LN	LC	AF	AB	ALT LN	ALT LC	MEAN
NONE	3.55	3.58	3.02	3.41	3.01	3.48	3.34
FYM	4.41	3.49	2.27	3.23	3.47	3.39	3.38
N							
0	1.79	1.52	1.07	1.40	1.33	1.35	1.41
50	3.94	2.65	1.84	3.01	2.95	3.09	2.91
100	4.79	4.78	3.34	4.30	4.12	3.84	4.19
200	5.40	5.20	4.33	4.57	4.58	5.46	4.92
MEAN	3.98	3.54	2.65	3.32	3.24	3.44	3.36

FYMRES67	ROT CYCL N	LN	LC	AF	AB	ALT LN	ALT LC
NONE	0	1.48	1.45	1.12	1.34	1.00	1.53
	50	3.67	3.26	2.03	2.93	3.17	2.96
	100	3.65	4.80	3.31	4.27	3.54	3.78
	200	5.40	4.84	5.62	5.09	4.35	5.66
FYM	0	2.10	1.59	1.02	1.46	1.66	1.17
	50	4.21	2.04	1.66	3.09	2.74	3.23
	100	5.93	4.76	3.37	4.33	4.69	3.91
	200	5.40	5.56	3.04	4.06	4.81	5.26

STRAW MEAN DM% 74.2 PLOT AREA HARVESTED 0.00260

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78/W/RN/4

MARKET GARDEN

Object: To study the residual effects of fertilisers and organic manures applied in the period 1942-67 - Woburn Lansome I.

Sponsor: A.E. Johnston.

The 37th year, ryegrass.

For previous years see 'Details' 1967 & 1973 and 74-77/W/RN/4.

Design: 2 series each of 40 plots divided into 4 blocks of 10 plots. Series B has the plots split into 2.

Whole plot dimensions: 8.53 x 5.18.

NOTE: Yields were not taken and no new treatments were applied.

Basal applications: Manures: 80 kg N, as 'Nitro-Chalk 25' in spring and as 'Nitra-Shell 34' after the first cut.

Seed: RvP Italian ryegrass at 40 kg, sown 16 Sept, 1974.

Cultivations, etc.:- Both series.
N applied: 8 Mar, 1978, 23 June. Cut three times: 6 Jan, 12 June, 17 Aug.

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78/R/RN/5

ARABLE REFERENCE PLOTS

Object: To study the long term effects of FYM and N, P and K fertilisers on the yield and mineral content of crops - Great Field IV.

Sponsor: F.V. Widdowson.

The 23rd year of the rotation, barley, ley, potatoes, winter wheat, kale.
The 19th year of the same rotation on the additional plots.
The 22nd year of permanent grass.

For previous years see 58/Bc/1(t), 59/Bc/1(t), 60/B/3(t), 61-64/B/2, 65/B/2(t), 66/B/2(t), 67/B/2, 68/B/3(t) and 69-77/R/RN/5.

Design: 1 block of 12 plots for each crop on original plots. 1 block of 7 plots for each crop on additional plots.

Whole plot dimensions: 2.13 x 2.44.

Treatments: Fertilisers and farmyard manure:

MANURE

Original plots

0
N1
P
N1P
K
N1K
PK
N1PK
N2PK
D
N1PKD
N2PKD

N1, 2 (kg N): 19, 38 (ley): 56, 112 (barley): 75, 150 (wheat): 125, 250 (potatoes - 75, 150 until 1975): 125, 250 (kale and permanent grass) as 'Nitro-Chalk'

P: 63 kg P205 as superphosphate

K: 250 kg K20 as muriate of potash

D: 38 tonnes FYM (permanent grass): 50 tonnes (kale and potatoes): none to other crops.

NOTE: Since 1977 all wheat on these plots receives a standard dressing of 82 kg MgO as Epsom salts. Before 1976 potatoes tested 0 v 82 kg MgO on sub plots, dressing balanced-up after harvest before wheat.

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Additional plots

MANURE

O	None
F	N PK
FMGCA	N PK Mg Ca
FMGS	N PK Mg S
FCAS	N PK Ca S
FMGCAS	N PK Mg Ca S
FMGCASTE	N PK Mg Ca S TE

F: N PK
N: N applied as urea. N1 to wheat, N2 to other crops. Rates as above.
P: 126 kg P205 as potassium dihydrogen phosphate
K: 251 kg K20 total. As potassium dihydrogen phosphate (83 kg K20) on all NPK plots. In addition plots without S receive 168 kg K20 as potassium chloride, plots with S receive 92 kg K20 as potassium sulphate plus 76 kg K20 as potassium chloride. Since 1978 all F plots received in addition 126 kg K20 for potatoes - applied in autumn as potassium chloride.
Mg: 126 kg MgO as magnesium chloride
Ca: 126 kg CaO as calcium carbonate
S: 30 kg S supplied by potassium sulphate
TE: Trace element mixture including Mn, Cu, Zn, B, Mo, Ca, Fe. Test varies with crop.

Standard applications:
Barley: Weedkillers: Ioxynil at 0.53 kg and mecoprop at 1.6 kg in 280 l applied with the fungicide. Fungicide: Tridemorph at 0.53 kg in 280 l.
Potatoes: Weedkillers: Linuron at 0.93 kg with paraquat at 0.28 kg ion in 280 l. Fungicide: Mancozeb at 1.3 kg in 280 l on two occasions, the second with insecticide. Insecticide: Pirimicarb at 0.14 kg.
Winter Wheat: Ioxynil at 0.63 kg and mecoprop at 1.9 kg in 280 l. Fungicides: Tridemorph at 0.53 kg in 280 l. Carbendazim at 0.25 kg and maneb at 1.6 kg in 280 l.
Kale: Insecticides: Pirimicarb at 0.14 kg, menazon at 0.28 kg, HCH, derris, and thiram ('Hexil Plus' at 0.28 kg) all in 280 l.

Seed: Barley: Maris Mink, sown at 200 kg.
Grass-clover ley: RvP Italian ryegrass and Hungaropoly red clover.
Potatoes: Pentland Crown.
Winter Wheat: Maris Hobbit, sown at 220 kg.
Kale: Thousand Headed.

Cultivations, etc.:-
Barley: Additional plots dug by hand: 11 July, 1977. Original plots dug by hand: 11 Nov. P, K, Ca, Mg, and S applied: 16 Feb, 1978. N applied, rotary cultivated, seed sown: 13 Mar. Weedkillers applied: 19 May. Trace elements applied: 7 June. Harvested by hand: 22 Aug.
Grass-clover ley: Additional plots rotary cultivated, seed sown: 16 Aug, 1977. Original plots rotary cultivated, seed sown: 23 Aug. P, K, Ca, Mg and S applied: 15 Dec. N applied: 13 Mar, 1978. Trace elements applied to additional plots: 17 May. Cut: 25 May, 27 Aug, and 20 Sept.

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Potatoes: FYM applied to original plots. All plots dug: 25 Oct, 1977. P, K, Ca, Mg, and S applied: 16 Feb, 1978. First half N applied, rotary cultivated twice, potatoes planted: 11 May. Weedkillers applied: 25 May. Second half N applied to additional plots: 13 June. Trace elements applied to additional plots: 20 June. Fungicide applied: 7 July. Insecticide applied with fungicide: 4 Aug. All plots not given K or FYM lifted by hand: 9 Aug. Remaining plots lifted: 21 Sept.

Winter Wheat: Mg applied to original plots, all plots dug by hand: 7 Oct, 1977. P, K, Ca, Mg, and S applied, seed sown: 17 Oct. Weedkiller applied: 30 Mar, 1978. N applied: 14 Apr. Trace elements applied: 17 May. Tridemorph applied: 22 May. Carbendazim and maneb applied: 12 June. Harvested by hand: 21 Aug.

Kale: FYM applied to original plots, all plots dug by hand: 25 Oct, 1977. P, K, Mg, Ca and S applied: 16 Feb, 1978. All N applied to original plots and first half N to additional plots, seed sown: 17 May. Second half N applied to additional plots: 27 June. Trace elements applied to additional plots: 7 July. Pirimicarb applied: 19 Sept. Menazon applied: 26 Sept. 'Hexil Plus' applied: 3 Oct. Harvested by hand: 17 Oct.

Permanent Grass: P and K applied: 15 Dec, 1977. FYM applied: 17 Feb, 1978. N applied three times: 13 Mar, 22 May, 28 July. Cut three times: 22 May, 27 July, 6 Oct.

NOTES: (1) Potato leaves were assessed for K and Mg.
(2) Despite the use of insecticides the kale became severely infested with caterpillars and was harvested early to prevent further loss.

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78/R/RN/5

GREAT FIELD IV (R):ORIGINAL PLOTS

TONNES/HECTARE

***** TABLES OF MEANS *****

	WINTER WHEAT:		KALE: FRESH	BARLEY:		LEY : DRY MATTER 1ST	2ND	3RD	TOTAL OF
	GRAIN	STRAW	WEIGHT	GRAIN	STRAW	CUT	CUT	CUT	3 CUTS
MANURE									
0	5.28	4.64	13.1	2.79	2.66	1.75	3.06	1.95	6.76
N1	5.64	5.55	11.3	1.74	2.39	3.53	3.45	2.25	9.23
P	2.60	3.04	18.3	2.03	2.43	2.78	4.93	2.89	10.60
N1P	2.46	3.34	33.1	1.07	1.89	3.47	2.97	1.50	7.93
K	4.44	4.07	13.9	3.88	2.95	2.65	4.75	2.63	10.03
N1K	6.91	6.36	14.8	4.80	3.46	3.11	4.04	2.14	9.29
PK	5.87	4.97	19.2	4.38	3.34	3.60	6.82	3.57	13.99
N1PK	7.66	6.92	40.1	4.78	4.40	3.65	6.08	3.24	12.97
N2PK	8.11	7.92	54.1	5.84	5.16	4.37	5.44	3.31	13.12
D	6.66	6.29	27.0	4.81	3.95	3.94	5.91	3.91	13.77
N1PKD	8.55	8.22	49.7	6.00	5.14	3.60	6.39	3.46	13.45
N2PKD	8.42	8.12	61.9	6.58	6.16	5.66	6.42	4.10	16.19
MEAN DM%	83.6	61.8		70.1	52.4	20.0	24.4	22.0	22.1

	POTATOES: TOTAL TUBERS	PERMANENT GRASS : DRY MATTER 1ST CUT	2ND CUT	3RD CUT	TOTAL OF 3 CUTS
MANURE					
0	11.3	0.94	1.36	0.63	2.93
N1	10.2	1.89	1.90	1.72	5.52
P	8.6	1.16	1.14	0.61	2.91
N1P	7.3	2.43	1.99	2.01	6.44
K	30.8	1.24	1.79	0.88	3.91
N1K	38.9	2.96	2.71	1.96	7.63
PK	41.1	1.06	1.56	0.91	3.53
N1PK	60.3	2.92	2.54	1.73	7.19
N2PK	71.3	4.43	3.28	2.80	10.50
D	52.3	4.84	2.28	1.65	8.76
N1PKD	69.5	5.81	3.10	2.60	11.50
N2PKD	73.3	4.80	5.59	3.65	14.04
MEAN DM%		24.4	31.9	28.5	28.3

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78/R/RN/5

GREAT FIELD IV (R): ADDITIONAL PLOTS

TONNES/HECTARE

***** TABLES OF MEANS *****

	WINTER WHEAT: GRAIN	WINTER WHEAT: STRAW	KALE: FRESH WEIGHT	BARLEY: GRAIN	BARLEY: STRAW	POTATOES: TOTAL TUBERS
MANURE						
0	4.27	3.64	17.4	1.97	2.24	16.6
F	7.74	7.05	56.7	5.20	4.46	69.6
FMGCA	7.66	6.66	57.5	6.58	5.37	78.5
FMGS	7.04	6.42	55.8	5.82	4.66	67.3
FCAS	7.68	7.14	53.2	6.50	5.49	71.5
FMGCAS	7.48	6.87	61.9	6.41	5.52	68.8
FMGCASTE	7.32	7.32	55.8	6.09	5.05	70.3
MEAN DM%	83.9	59.6		74.8	56.1	

	LEY : DRY MATTER 1ST CUT	2ND CUT	3RD CUT	TOTAL OF 3 CUTS
MANURE				
0	1.95	2.95	1.83	6.74
F	5.26	4.76	3.42	13.44
FMGCA	5.32	4.46	3.42	13.20
FMGS	4.74	4.84	3.26	12.84
FCAS	5.18	5.40	3.66	14.23
FMGCAS	5.12	4.87	3.43	13.41
FMGCASTE	5.16	4.97	3.42	13.55
MEAN DM%	21.8	23.4	20.8	22.0

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78/W/RN/6

ARABLE REFERENCE PLOTS

Object: To study the long term effects of FYM and N, P and K fertilisers on the yield and mineral content of crops - Woburn Stackyard C.

Sponsor: F.V. Widdowson.

The 19th year, oats, sugar beet, barley, ley, potatoes, permanent grass.

For previous years see 60/B/3(t), 61-65/B/2, 66/B/2(t), 67/B/2(t), 68/B/3(t), 69/W/RN/6, 70/W/RN/6(t) and 71-77/W/RN/6.

Design: 1 block of 12 plots for each crop.

Whole plot dimensions: 2.74 x 2.13.

Treatments: All combinations of:-

Blocks

1. CROP		Crops:-
		After old grass (1960-73):
	S BEET/G	Sugar beet
		In arable rotation since 1960:
	BARLEY	Barley
	LEY	Ley
	POTATOES	Potatoes
	S BEET/A	Sugar beet
	OATS	Oats
	Also:	
	PERMGRAS	Permanent grass, sown autumn 1973

Plots

2. MANURE — Fertilisers and farmyard manure:-

0
N1
P
N1P
K
N1K
PK
N1PK
N2PK
D
N1PKD
N2PKD

N1,2 (kg N): 31.5, 63 (ley): 63, 126 (barley and oats): 126, 252 (sugar beet and potatoes): 188, 376 (permanent grass) as ammonium nitrate.
P: P_2O_5 at 63 kg as triple superphosphate.
K: K_2O at 252 kg as potassium bicarbonate.
D: Farmyard manure at 25 tonnes (permanent grass): 50 tonnes (sugar beet and potatoes): none to other crops.

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NOTES: (1) The old grass block was dug in autumn 1973 and follows the arable rotation, the crop in 1978 being sugar beet. A new block was sown to permanent grass in 1974.
(2) Potatoes and sugar beet test on sub plots: - v MG (82 kg MgO as Epsom salts). Yields are recorded from potatoes only. Untreated sub plots receive 82 kg MgO after potato and sugar beet harvest.

Standard applications:
Winter oats: Insecticide: Phorate granules at 2 kg. Weedkillers: Ioxynil at 0.63 kg plus mecoprop at 1.9 kg in 280 l.
Sugar beet: Manures: Boron at 0.92 kg B_2O_3 as borax in 1120 l. Insecticide: Pirimicarb at 0.14 kg in 280 l.
Barley: Weedkillers: Ioxynil at 0.52 kg plus mecoprop at 1.6 kg in 280 l with the fungicide. Fungicide: Tridemorph at 0.53 kg.
Potatoes: Weedkillers: Linuron at 1.0 kg plus paraquat at 0.28 kg ion in in 280 l. Insecticide: Pirimicarb at 0.14 kg in 280 l. Fungicide: Mancozeb at 1.3 kg in 280 l.

Seed: Winter oats: Peniarth, sown at 210 kg.
Sugar beet: Klein E, sown at 5.6 kg.
Barley: Wing, sown at 180 kg.
Potatoes: Pentland Crown.
Grass-clover ley: RvP Italian ryegrass and Hungaropoly red clover.
Permanent Grass: S215 Meadow fescue at 20 kg; S24 perennial ryegrass at 20 kg; crested dogstail at 7 kg; chewings fescue at 7 kg; smooth stalked meadow grass at 7 kg; alsike clover at 4 kg; wild white clover at 2 kg. Mixture sown at 67 kg.

Cultivations, etc.:-
Winter Oats: Balancing Mg applied after potatoes: 3 Oct, 1977. P and K applied, raked, phorate applied, raked, seed sown, raked: 20 Oct. First half N applied: 21 Mar, 1978. Weedkiller applied: 31 Mar. Second half N applied: 12 May. Harvested: 10 Aug.
Sugar beet: FYM applied to block after old arable and plots in this block only dug by hand: 6 Dec, 1977. FYM applied to block after old grass and plots in this block only dug by hand: 9 Dec. P and K applied: 20 Feb, 1978. First N applied, raked, Mg applied to half plots, seed sown, raked in: 21 Mar. Second N applied, boron applied, singled: 14 June. Insecticide applied: 13 July. Lifted: 25 Oct.
Barley: Plots dug by hand: 9 Dec, 1977. P and K applied: 20 Feb, 1978. First N applied, raked, seed sown, raked: 6 Mar. Second N applied: 12 May. Weedkiller and fungicide applied: 19 May. Harvested: 11 Aug.
Potatoes: FYM applied, plots dug by hand: 5 Dec, 1977. P and K applied: 20 Feb, 1978. First N applied, rotary cultivated, Mg applied to half plots, potatoes planted and earthed up: 12 May. Weedkiller applied: 25 May. Second N applied: 14 June. Insecticide and fungicide applied: 13 July. Lifted plots without K: 10 Aug. Remaining plots lifted: 2 Oct.
Grass-clover ley: Barley stubble raked, seeds sown, raked in: 11 Aug, 1977. P and K applied: 12 Dec. N applied: 7 Mar, 1978. Cut three times: 5 June, 1 Aug, 16 Oct.
Permanent Grass: P and K applied: 10 Nov, 1977. FYM applied: 20 Feb, 1978. N applied in three equal amounts: 7 Mar, 5 June, 1 Aug. Cut three times: 5 June, 1 Aug, 16 Oct.

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NOTES: (1) Samples were taken for determination of dry matter for each crop and the percentage N, P and K.
(2) The percentages of Mg in sugar beet tops, potato tubers and leaves were determined.
(3) The percentage of K in potato leaves in July was determined.

TONNES/HECTARE

***** TABLES OF MEANS *****

	S BEET/G							
	ROOTS WASHED	SUGAR %	TOTAL SUGAR	TOPS	BARLEY GRAIN	BARLEY STRAW	OATS GRAIN	OATS STRAW
MANURE								
0	17.8	17.4	3.10	10.9	1.71	1.50	1.49	1.62
N1	27.3	17.6	4.82	22.2	3.38	3.03	3.25	3.46
P	20.3	18.2	3.71	11.8	1.68	1.75	1.45	1.53
N1P	13.5	16.9	2.27	16.1	2.50	2.67	2.85	3.14
K	22.9	18.2	4.17	12.1	1.57	1.54	1.48	1.61
N1K	37.6	18.6	6.99	22.7	3.57	3.09	3.47	5.30
PK	19.8	17.5	3.48	9.4	1.58	1.60	2.05	2.72
N1PK	32.8	18.4	6.05	19.5	5.29	4.47	4.26	6.71
N2PK	36.2	18.9	6.86	23.8	5.61	5.17	4.71	6.52
D	38.3	19.4	7.44	21.9	2.84	2.66	2.35	3.07
N1PKD	46.0	19.9	9.13	23.8	5.59	5.48	4.13	6.73
N2PKD	46.1	19.1	8.79	31.3	5.75	6.12	5.46	9.26
MEAN DM%					78.6	74.1	78.8	46.1

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78/W/RN/6

TONNES/HECTARE

***** TABLES OF MEANS *****

	LEY : DRY MATTER 1ST CUT	2ND CUT	3RD CUT	TOTAL OF 3 CUTS	POTATOES TOTAL TUBERS -	MG	MEAN
MANURE							
0	2.36	1.05	1.09	4.51	8.9	5.1	7.0
N1	3.62	0.83	0.95	5.40	10.3	10.9	10.6
P	2.89	0.88	1.04	4.81	8.2	7.5	7.9
N1P	3.97	0.74	0.72	5.44	9.9	13.0	11.4
K	3.58	2.42	2.24	8.24	7.2	8.5	7.9
N1K	5.36	2.37	2.21	9.93	5.8	8.2	7.0
PK	4.99	2.67	2.27	9.92	17.4	16.7	17.1
N1PK	6.09	2.55	2.55	11.19	15.7	20.8	18.3
N2PK	5.73	1.84	2.16	9.73	46.1	49.2	47.7
D	4.64	2.55	2.37	9.56	27.0	30.1	28.5
N1PKD	6.50	2.70	2.45	11.65	42.0	47.2	44.6
N2PKD	7.12	2.11	2.11	11.34	50.6	47.2	48.9
MEAN DM%	26.1	24.1	28.3	26.1			

	S BEET/A ROOTS WASHED	SUGAR %	TOTAL SUGAR	TOPS	PERMGRAS : DRY MATTER 1ST CUT	2ND CUT	3RD CUT	TOTAL OF 3 CUTS
MANURE								
0	14.2	16.9	2.40	6.8	2.48	0.63	0.74	3.85
N1	21.2	17.5	3.71	15.0	3.81	1.24	1.65	6.71
P	12.5	16.8	2.10	6.8	2.18	0.69	0.78	3.65
N1P	16.1	16.8	2.71	14.2	4.55	1.03	1.80	7.38
K	15.5	17.9	2.78	6.8	3.33	1.07	1.01	5.41
N1K	33.5	18.5	6.21	18.6	5.49	1.29	1.90	8.68
PK	11.8	16.8	1.98	6.8	3.48	1.30	1.05	5.83
N1PK	35.9	19.5	6.99	17.9	5.09	1.28	2.10	8.47
N2PK	41.0	17.9	7.33	29.6	6.34	1.55	2.55	10.44
D	30.8	18.1	5.57	21.0	4.66	0.67	0.92	6.24
N1PKD	44.4	18.8	8.34	28.7	5.73	1.16	2.12	9.01
N2PKD	57.1	17.8	10.15	42.0	6.42	1.78	2.80	11.00
MEAN DM%					24.6	23.3	31.4	26.4

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78/R/RN/7

RESIDUAL PHOSPHATE

Object: Originally to study the fresh and residual effects of phosphate fertiliser on the yields of three arable crops grown in rotation. Since 1974 the effects on ley and on yield and pathogens of continuous wheat are also studied - Great Field IV and Sawyers I.

Sponsors: G.E.G. Mattingly, D.B. Slope.

The 19th year, ley (Great Field IV): wheat and ley (Sawyers I).

For previous years see 'Details' 1967 and 1973 and 74-77/R/RN/7.

Design: Great Field IV: 3 series each of 1 randomised block of 12 plots.
Sawyers I: 3 series each of 2 randomised blocks of 12 plots.

Whole plot dimensions:
Great Field IV: 4.27 x 18.3
Sawyers I: 4.27 x 20.1

Treatments:

P205	Rates and frequency of applying phosphate:-
NONE	0
	Annual dressings, kg P205:
29 ANN	29
57 ANN	57
115 ANN	115
172 ANN	172
	Triennial dressings, kg P205 (last applied 1978):
86 TRI	86
172 TRI	172
	Six-yearly dressings, kg P205 (last applied 1973):
344 SIX	344
688 SIX	688
1032 SIX	1032
	Single dressing, kg P205 (applied autumn 1959):
376 G(1)	376 as Gafsa rock phosphate
376 S(1)	376 as granular superphosphate

NOTES: (1) Since 1974 the original rotation of potatoes, barley, swedes on both fields has been changed. Blocks after barley were sown to continuous wheat on Sawyers I, to ley on Great Field IV. In 1978 one block was sown to ley on Sawyers I.
(2) Since 1960 all phosphate has been applied as superphosphate.
(3) The six-yearly dressings were applied half in autumn before ploughing, half in spring.

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78/R/RN/7

Standard applications:
Leys: (Great Field IV only): Manures: K_2O at 150 kg as muriate of potash. (Sawyers I only): Manures: Chalk at 2.9 t, N at 60 kg 'Nitro-Chalk 25' and K_2O at 250 kg as muriate of potash. Weedkillers: Paraquat at 0.42 kg ion in 220 l.
Wheat: (Sawyers I only): Manures: K_2O at 90 kg as muriate of potash. N at 125 kg as 'Nitro-Chalk 25'. Weedkillers: Methabenzthiazuron at 3.1 kg in 220 l. Mecoprop with bromoxynil and ioxynil ('Brittox' at 3.5 kg) in 220 l.

Seed: Ley (Sawyers I only): Mixture of: Timothy (RvP Erecta), Meadow Fescue (S.215) and White Clover (N.2 Huia), sown at 24 kg.
Wheat: Cappelle sown at 200 kg.

Cultivations, etc.:-
Leys: (Great Field IV): Standard K applied: 22 Dec, 1977. Test P applied: 15 Feb, 1978. Cut three times: 5 June, 25 July, 6 Nov.
(Sawyers I): Chalk applied: 20 Sept, 1977. Ploughed: 20 Oct. Disc harrowed: 24 Oct. Standard N, K and test P applied: 19 May, 1978. Paraquat applied: 22 May. Heavy spring-tine cultivated twice, rotary harrowed twice, seed sown: 23 May. Topped: 27 July. Cut: 1 Sept, 30 Oct.
Wheat: (Sawyers I): Ploughed: 20 Oct, 1977. Disc harrowed: 24 Oct. Standard K applied: 25 Oct. Heavy spring-tine cultivated: 26 Oct. Test P applied, power harrowed, seed sown: 17 Nov. Methabenzthiazuron applied: 18 Nov. Standard N applied: 25 Apr, 1978. 'Brittox' applied: 11 May. Combine harvested: 30 Aug.

NOTE: All wheat plots were sampled for take-all in May and take-all and eyespot in July.

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78/R/RN/7 GREAT FIELD IV

SERIES I LEY

DRY MATTER TONNES/HECTARE

	CUT 1 (5/6/78)	CUT 2 (25/7/78)	CUT 3 (6/11/78)	TOTAL OF 3 CUTS
P205				
NONE	4.39	2.00	2.29	8.68
29 ANN	5.31	2.32	2.71	10.34
57 ANN	4.43	2.24	2.71	9.37
115 ANN	5.02	2.36	2.53	9.92
172 ANN	4.73	2.62	2.54	9.89
86 TRI	4.22	2.22	2.81	9.24
172 TRI	4.00	2.87	2.18	9.05
344 SIX	4.76	2.42	2.31	9.48
688 SIX	4.59	2.55	2.31	9.44
1032 SIX	4.41	2.50	2.13	9.04
376 G(1)	4.59	2.41	2.39	9.39
376 S(1)	3.81	2.43	2.11	8.36
MEAN	4.52	2.41	2.42	9.35
MEAN DM%	15.3	17.0	20.6	17.7

PLOT AREA HARVESTED 0.00186

SERIES II LEY

DRY MATTER TONNES/HECTARE

	CUT 1 (5/6/78)	CUT 2 (25/7/78)	CUT 3 (6/11/78)	TOTAL OF 3 CUTS
P205				
NONE	3.67	2.09	1.99	7.75
29 ANN	3.96	2.53	2.34	8.83
57 ANN	3.95	2.85	2.96	9.76
115 ANN	4.79	2.98	2.54	10.31
172 ANN	4.52	2.87	2.74	10.14
86 TRI	4.35	2.54	2.47	9.36
172 TRI	4.00	3.00	2.39	9.39
344 SIX	4.64	3.01	2.60	10.26
688 SIX	3.73	2.74	2.46	8.93
1032 SIX	3.46	2.57	2.42	8.45
376 G(1)	3.93	2.79	2.34	9.06
376 S(1)	4.10	2.46	2.03	8.59
MEAN	4.09	2.70	2.44	9.24
MEAN DM%	13.9	18.2	22.8	18.3

PLOT AREA HARVESTED 0.00186

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78/R/RN/7 GREAT FIELD IV

SERIES III LEY

DRY MATTER TONNES/HECTARE

	CUT 1 (5/6/78)	CUT 2 (25/7/78)	CUT 3 (6/11/78)	TOTAL OF 3 CUTS
P205				
NONE	3.78	2.04	1.41	7.24
29 ANN	4.25	2.53	1.87	8.65
57 ANN	4.20	2.83	2.46	9.48
115 ANN	4.72	2.87	2.76	10.35
172 ANN	3.73	2.77	2.16	8.66
86 TRI	4.04	2.71	2.17	8.93
172 TRI	3.79	2.78	2.30	8.87
344 SIX	3.91	3.03	2.36	9.30
688 SIX	4.21	2.98	2.68	9.87
1032 SIX	3.69	2.42	1.90	8.02
376 G(1)	3.64	2.17	2.02	7.83
376 S(1)	3.74	2.26	1.48	7.47
MEAN	3.98	2.62	2.13	8.72
MEAN DM%	14.0	18.2	23.6	18.6

PLOT AREA HARVESTED 0.00186

78/R/RN/7 SAWYERS I

SERIES III LEY

DRY MATTER TONNES/HECTARE

***** TABLES OF MEANS *****

	CUT 1 (1/9/78)	CUT 2 (30/10/78)	TOTAL OF 2 CUTS
P205			
NONE	0.68	0.45	1.14
29 ANN	2.03	0.54	2.57
57 ANN	2.25	0.52	2.76
115 ANN	2.43	0.47	2.91
172 ANN	2.91	0.58	3.49
86 TRI	2.22	0.37	2.59
172 TRI	2.54	0.52	3.06
344 SIX	1.83	0.49	2.32
688 SIX	2.43	0.41	2.84
1032 SIX	2.52	0.51	3.03
376 G(1)	0.81	0.49	1.31
376 S(1)	1.16	0.43	1.59
MEAN	1.98	0.48	2.47
MEAN DM%	17.9	29.1	23.5

PLOT AREA HARVESTED 0.00204

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78/R/RN/7 SAWYERS I

WHEAT SERIES I 4TH CEREAL

GRAIN TONNES/HECTARE

***** TABLES OF MEANS *****

P205	
NONE	2.90
29 ANN	4.02
57 ANN	4.07
115 ANN	4.08
172 ANN	4.28
86 TRI	3.98
172 TRI	4.43
344 SIX	4.39
688 SIX	5.03
1032 SIX	4.42
376 G(1)	3.28
376 S(1)	3.55
MEAN	4.04

***** STANDARD ERRORS OF DIFFERENCES OF MEANS *****

TABLE	P205
SED	0.492

***** STRATUM STANDARD ERRORS AND COEFFICIENTS OF VARIATION *****

STRATUM	DF	SE	CV%
BLOCK.WP	11	0.492	12.2

GRAIN MEAN DM% 84.0

STRAW TONNES/HECTARE

***** TABLES OF MEANS *****

P205	
NONE	1.65
29 ANN	2.32
57 ANN	2.26
115 ANN	2.45
172 ANN	2.14
86 TRI	2.03
172 TRI	2.87
344 SIX	2.50
688 SIX	2.79
1032 SIX	2.55
376 G(1)	2.04
376 S(1)	1.97
MEAN	2.30

STRAW MEAN DM% 90.1

PLOT AREA HARVESTED 0.00562

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78/R/RN/7 SAWYERS I

WHEAT SERIES II 5TH CEREAL

GRAIN TONNES/HECTARE

***** TABLES OF MEANS *****

P205	
NONE	2.27
29 ANN	2.94
57 ANN	3.60
115 ANN	3.52
172 ANN	4.08
86 TRI	3.44
172 TRI	3.55
344 SIX	2.67
688 SIX	3.21
1032 SIX	3.38
376 G(1)	2.60
376 S(1)	2.46
MEAN	3.14

***** STANDARD ERRORS OF DIFFERENCES OF MEANS *****

TABLE	P205
SED	0.492

***** STRATUM STANDARD ERRORS AND COEFFICIENTS OF VARIATION *****

STRATUM	DF	SE	CV%
BLOCK.WP	11	0.492	12.2

GRAIN MEAN DM% 84.5

STRAW TONNES/HECTARE

***** TABLES OF MEANS *****

P205	
NONE	1.46
29 ANN	1.66
57 ANN	1.98
115 ANN	2.13
172 ANN	2.40
86 TRI	1.89
172 TRI	2.13
344 SIX	1.80
688 SIX	1.93
1032 SIX	2.36
376 G(1)	1.60
376 S(1)	1.66
MEAN	1.92

STRAW MEAN DM% 90.2

PLOT AREA HARVESTED 0.00562

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78/R/RN/8

CULTIVATION/WEEDKILLER

Object: To study the long-term effects of weedkillers and different methods of primary cultivation on a sequence of crops - Great Harpenden I.

Sponsors: R. Moffitt, G.V. Dyke, J.A. Currie.

The 18th year, barley.

For previous years see 'Details' 1967 and 1973 and 74-77/R/RN/8.

Design: 2 randomised blocks of 12 plots split into 2.

Whole plot dimensions: 12.8 x 15.2.

Treatments: All combinations of:-

Whole plots

1. CULTIVTN — Primary cultivations annually:

PLOUGH	Ploughed: 6 Dec, 1977
ROTAVATE	Rotary cultivated: 9 Dec
DEEPTINE	Deep-tine cultivated twice: 5 Dec

2. WEEDCNTL(76) — Weed control to beans and potatoes in the rotation beans, wheat, potatoes, barley practised until 1976. Last applied to beans 1976:

MECHANCL	Mechanical
RESIDUAL	Residual weedkiller (duplicated)

Sub plots

3. WEEDKLLR(75) — Hormone weedkiller to cereals in the previous rotation, last applied to barley 1975 (basal hormone weedkiller to spring wheat 1977 and barley 1978):

NONE	None
HORMONE	Hormone weedkiller

4. WEEDKLLR(78) — Paraquat weedkiller to cereal stubbles: 2 Dec:

NONE
PARAQUAT

NOTE: The combinations of 3 and 4 are tested on half plots: WEEDKLLR(75) NONE, WEEDKLLR(78) NONE and WEEDKLLR(75) HORMONE, WEEDKLLR(78) PARAQUAT on one block, remaining combinations on the other.

EXTRA — plus three extra whole plot treatments:

SPNGTINE	Heavy spring-tine cultivated twice: 5 Dec, 1977. Given simazine to beans 1976, with sub plot tests 3 and 4 above.
(SH)PLGH	Shallow ploughed: 9 Dec, 1977. Given simazine to beans 1976 and paraquat to cereal stubbles with sub plot test 3 above.

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78/R/RN/8

STANDARD — Standard cultivations as considered best for each crop. Ploughed 6 Dec, 1977. Given simazine to beans 1976, with sub plot tests 3 and 4 above.

Basal applications: Manures: (20:14:14) at 440 kg, combine drilled. Weedkiller: Ioxynil plus mecoprop ('Actril C' at 7.0 l in 220 l). Fungicide: Tridemorph at 0.53 kg in 220 l.

Seed: Porthos, sown at 160 kg.

Cultivations, etc.:- Power harrowed: 5 Apr, 1978. Seed sown: 6 Apr. Rolled: 7 Apr. Weedkiller and fungicide applied: 26 May. Combine harvested: 8 Sept.

EXTRA PLOTS ONLY

GRAIN TONNES/HECTARE

***** TABLES OF MEANS *****

	EXTRA	SPNGTINE	(SH)PLGH	STANDARD
WEEDKLLR(75)				
	NONE	5.64	5.55	5.74
	HORMONE	5.72	5.64	5.39
WEEDKLLR(78)				
	NONE	5.78		5.50
	PARAQUAT	5.58	5.59	5.63
	MEAN	5.68	5.59	5.56

GRAIN MEAN DM% 79.7

SUB PLOT AREA HARVESTED 0.00408

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78/R/RN/8

OMITTING EXTRA PLOTS

GRAIN TONNES/HECTARE

***** TABLES OF MEANS *****

CULTIVTN	PLOUGH	ROTAVATE	DEEPTINE	MEAN
WEEDCNTL(76)				
MECHANCL	5.56	5.69	5.78	5.68
RESIDUAL	5.71	5.68	5.65	5.68
WEEDKLLR(75)				
NONE	5.67	5.69	5.77	5.71
HORMONE	5.65	5.68	5.62	5.65
WEEDKLLR(78)				
NONE	5.55	5.61	5.51	5.56
PARAQUAT	5.76	5.76	5.88	5.80
MEAN	5.66	5.68	5.69	5.68

***** STANDARD ERRORS OF DIFFERENCES OF MEANS *****

TABLE	CULTIVTN	WEEDCNTL(76)	WEEDKLLR(75)	WEEDKLLR(78)
SED	0.119	0.103	0.063	0.063

TABLE	CULTIVTN WEEDCNTL(76)	CULTIVTN WEEDKLLR(75)	CULTIVTN WEEDKLLR(78)	
SED	0.206			MIN REP
	0.179	0.142	0.142	MAX-MIN
	0.146			MAX REP
EXCEPT WHEN COMPARING MEANS WITH SAME LEVEL(S) OF:				
CULTIVTN		0.110	0.110	

	WEEDCNTL(76)
MIN REP	MECHANCL
MAX-MIN	MECHANCL V RESIDUAL
MAX REP	RESIDUAL

***** STRATUM STANDARD ERRORS AND COEFFICIENTS OF VARIATION *****

STRATUM	DF	SE	CV%
BLOCK.WP	11	0.206	3.6
BLOCK.WP.SP	10	0.190	3.3

GRAIN MEAN DM% 79.9

SUB PLOT AREA HARVESTED 0.00408

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78/W/RN/12

ORGANIC MANURING

Object: To study, from crop yields and soil analyses, the residual effects of a range of types of organic matter - Woburn, Stackyard B.

Sponsor: G.E.G. Mattingly.

The 14th year, winter wheat, potatoes.

For previous years see 'Details' 1973 and 74-77/W/RN/12.

Design for each crop: 2 blocks of 8 plots split into 8.

Whole plot dimensions: 8.53 x 30.5.

Treatments: From 1966 to 1971 the experiment had a preliminary period designed to build up organic matter, derived from different sources. An arable rotation was started on two blocks in 1972 and the remaining two blocks in 1973. Organic manures were last applied in 1971, the leys were ploughed in autumn 1971 and 1972 before starting the rotation. The experiment now tests all combinations of:-

Whole plots

1. MANURE — Organic manures and fertilisers in the preliminary period:

FYM	Farmyard manure
STRAW	Straw
PEAT	Peat
GREENMNR	Green manures
FERT-FYM	Fertilisers equivant to FYM
FERT-STR	Fertilisers equivalent to straw
CLOVRLEY	Grass/clover ley, no N
GRASSLEY	Grass ley with N for each cut

Sub plots

2. N — Fertiliser nitrogen (kg N) as 'Nitro-Chalk 25':

WHEAT	POTATOES
0	0
30	75
60	150
90	225
120	300
150	375
180	450
210	525

Standard applications:
Winter wheat: Manures: 110 kg P_2O_5 as superphosphate, 60 kg K_2O as muriate of potash. Weedkillers: Mecoprop, bromoxynil, and ioxynil ('Brittox' at 3.5 kg in 280 l).

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78/W/RN/12

Potatoes: Manures: (0:20:20) at 1210 kg in winter, (0:20:20) at 1210 kg in spring. 60 kg Mg as kieserite. Weedkillers: Linuron at 1.3 kg plus paraquat at 0.42 kg ion in 280 l. Fungicides: Mancozeb at 1.3 kg on three occasions, in 280 l on the first, in 420 l on the second, in 420 l with insecticide on the third. Fentin acetate with maneb ('Fennite A' at 1.7 kg in 280 l). Insecticide: Pirimicarb at 0.14 kg, on one occasion with fungicide, in 420 l. Haulm desiccant: Undiluted BOV at 170 l.

Seed: Winter wheat: Maris Huntsman at 210 kg.
Potatoes: Pentland Crown.

Cultivations, etc.:-
Winter wheat: PK applied: 10 Nov, 1977. Ploughed: 11 Nov. Spring-tine cultivated with crumbler attached, seed sown: 14 Nov. N applied: 11 Apr, 1978. Weedkiller applied: 10 May. Combine harvested: 25 Aug.
Potatoes: Heavy spring-tine cultivated three times: 15 July, 1977, 18 July, 9 Aug. Ploughed: 30 Sept. Winter PK applied: 6 Jan, 1978. Reploughed: 9 Feb. Spring PK applied: 30 Mar. Deep-tine cultivated: 31 Mar. N applied: 14 Apr. Kieserite applied: 20 Apr. Rotary cultivated, potatoes planted: 24 Apr. Weedkillers applied: 15 May. Grubbed: 6 June. Earthed up: 9 June. Mancozeb applied: 5 July, 20 July. Mancozeb applied with insecticide: 11 Aug. Fentin acetate with maneb applied: 23 Aug. Haulm desiccant applied: 23 Sept. Lifted: 11 Oct.

NOTE: Because of an error in weighing, yield of one plot of potatoes, treatment combination MANURE FERT FYM, N 0, was lost. An estimated value was used in the analysis.

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78/W/RN/12

WHEAT

GRAIN TONNES/HECTARE

***** TABLES OF MEANS *****

N / MANURE	0	30	60	90	120	150	180	210	MEAN
FYM	1.68	2.91	4.26	4.86	5.40	5.39	5.41	5.98	4.49
STRAW	1.44	3.83	3.88	4.78	5.15	5.11	3.84	4.67	4.09
PEAT	1.45	2.72	3.96	4.43	4.69	5.31	5.07	5.19	4.10
GREENMNR	1.36	2.53	3.98	4.70	4.76	4.89	5.09	5.34	4.08
FERT-FYM	1.35	2.50	3.65	4.36	4.81	4.91	5.09	5.43	4.01
FERT-STR	1.32	2.80	3.63	4.23	5.34	4.47	4.43	4.58	3.85
CLOVRLEY	1.85	3.16	4.48	5.23	5.22	5.33	5.09	5.33	4.46
GRASSLEY	1.50	3.34	4.47	4.98	5.20	4.88	5.05	5.03	4.31
MEAN	1.49	2.97	4.04	4.70	5.07	5.03	4.88	5.19	4.17

***** STANDARD ERRORS OF DIFFERENCES OF MEANS *****

TABLE	MANURE	N	MANURE N
SED	0.452	0.194	0.683
EXCEPT WHEN COMPARING MEANS WITH SAME LEVEL(S) OF:			
MANURE			0.548

***** STRATUM STANDARD ERRORS AND COEFFICIENTS OF VARIATION *****

STRATUM	DF	SE	CV%
BLOCK.WP	7	0.452	10.8
BLOCK.WP.SP	56	0.548	13.1

GRAIN MEAN DM% 82.6

STRAW TONNES/HECTARE

***** TABLES OF MEANS *****

N / MANURE	0	30	60	90	120	150	180	210	MEAN
FYM	1.04	2.34	3.05	3.17	4.18	3.19	3.39	3.94	3.04
STRAW	0.87	2.12	2.34	3.18	3.29	3.48	3.09	3.66	2.75
PEAT	0.76	2.10	3.07	3.16	2.94	3.41	3.33	3.87	2.83
GREENMNR	0.89	1.62	2.48	3.21	3.10	3.26	2.98	3.81	2.67
FERT-FYM	0.84	1.53	2.37	3.18	3.11	2.85	2.82	3.49	2.53
FERT-STR	0.83	1.85	2.37	3.20	3.49	3.12	3.12	3.40	2.67
CLOVRLEY	1.04	1.58	2.95	3.17	3.57	3.78	2.34	3.44	2.73
GRASSLEY	0.74	2.42	3.00	3.29	3.04	3.07	2.97	3.50	2.75
MEAN	0.88	1.95	2.70	3.20	3.34	3.27	3.00	3.64	2.75

STRAW MEAN DM% 89.6

SUB PLOT AREA HARVESTED 0.00173

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78/W/RN/12

POTATOES

TOTAL TUBERS TONNES/HECTARE

***** TABLES OF MEANS *****

N / MANURE	0	75	150	225	300	375	450	525	MEAN
FYM	21.8	30.7	37.8	49.0	49.0	44.7	49.3	50.8	41.6
STRAW	29.4	35.8	47.9	50.3	43.3	55.8	58.5	56.6	47.2
PEAT	9.2	20.5	21.8	35.3	39.9	45.1	42.2	45.8	32.5
GREENMNR	14.4	18.4	39.4	41.2	33.2	35.6	45.8	47.1	34.4
FERT-FYM	30.2	25.0	29.9	36.9	38.7	43.4	37.8	44.2	35.8
FERT-STR	24.5	25.4	29.9	38.8	43.6	46.4	49.1	44.4	37.8
CLOVRLEY	31.6	44.6	49.5	52.2	51.0	54.6	54.5	52.4	48.8
GRASSLEY	35.1	47.7	58.0	61.7	63.5	65.1	64.1	63.8	57.4
MEAN	24.5	31.0	39.3	45.7	45.3	48.8	50.2	50.6	41.9

***** STANDARD ERRORS OF DIFFERENCES OF MEANS *****

TABLE	MANURE	N	MANURE N
SED	5.74	1.68	7.26
EXCEPT WHEN COMPARING MEANS WITH SAME LEVEL(S) OF:			
MANURE			4.75

***** STRATUM STANDARD ERRORS AND COEFFICIENTS OF VARIATION *****

STRATUM	DF	SE	CV%
BLOCK.WP	7	5.74	13.7
BLOCK.WP.SP	56	4.75	11.3

PERCENTAGE WARE 3.81 CM (1.5INCH) RIDDLE

***** TABLES OF MEANS *****

N / MANURE	0	75	150	225	300	375	450	525	MEAN
FYM	94.8	95.3	96.5	96.6	97.1	95.7	96.9	96.6	96.2
STRAW	96.9	97.6	97.6	97.3	96.6	97.4	96.1	96.3	97.0
PEAT	86.9	91.1	95.3	95.0	95.9	94.7	95.8	97.3	94.0
GREENMNR	95.0	93.2	95.3	96.4	94.8	96.0	97.1	96.5	95.5
FERT-FYM	96.7	93.7	95.3	95.3	95.9	96.0	94.9	95.2	95.4
FERT-STR	95.8	95.1	92.8	96.4	96.0	95.7	95.6	96.9	95.5
CLOVRLEY	97.5	97.8	96.3	97.2	97.5	97.0	97.2	97.1	97.2
GRASSLEY	98.5	97.2	96.7	97.8	96.6	96.7	97.6	96.6	97.2
MEAN	95.3	95.1	95.7	96.5	96.3	96.1	96.4	96.6	96.0

SUB PLOT AREA HARVESTED 0.00087

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78/W/RN/13

INTENSIVE CEREALS

Object: To study the effects of intensive cereal cropping on yield, incidence of soil-borne pathogens and organic matter in the soil - Woburn Stackyard I.

Sponsors: A.E. Johnston, J. McEwen.

The 13th year, winter wheat, barley.

For previous years see 'Details' 1973 and 74-77/W/RN/13.

Design: For each experiment: 2 randomised blocks of 6 plots, split into 4. ALDICARB tested on blocks.

Whole plot dimensions: 8.53 x 20.4.

Treatments:-
One experiment on winter wheat on part of the site of the classical wheat experiment 1877-1954
One experiment on barley on part of the site of the classical barley experiment 1877-1954
Factors tested on both experiments are the same but crop and nitrogen rates differ. All combinations of:-

Blocks

1. ALDICARB — Aldicarb, cumulative to 1977 dressing, worked into the seedbed (kg):

0
10

Whole plots

2. PREVCROP — Previous crops:

	1972	1973	1974	1975	1976	1977
C/L/P/C	C	C	C	L	P	C
L/P/C/C	C	C	L	P	C	C
P/C/C/C	C	L	P	C	C	C
C/C/C/C	L	P	C	C	C	C
C/C/L/C	P	C	C	C	L	C
C/C/C/C	C	C	C	C	C	C

Ley = 1 year ley P = Potatoes C = Cereal: wheat or barley. All plots in cereal from 1977.

Sub plots

3. N — Nitrogen fertiliser (kg N as 'Nitro-Chalk 25'):

Wheat	Barley
63	50
126	100
189	150
252	200

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78/W/RN/13

Standard applications:
Wheat: Manures: (0:20:20) at 310 kg, combine drilled. Weedkillers: Methabenzthiazuron at 1.5 kg in 280 l. Mecoprop, bromoxynil and ioxynil ('Brittox' at 3.5 l in 280 l).
Barley: Manures: (0:20:20) at 300 kg, combine drilled. Weedkillers: Mecoprop, bromoxynil and ioxynil ('Brittox' at 2.5 l in 280 l). Fungicide: Tridemorph at 0.53 kg applied with the weedkillers.

Seed: Wheat: Cappelle, sown at 210 kg.
Barley: Porthos, dressed with ethirimol, sown at 160 kg.

Cultivations, etc.:- All plots ploughed: 27 Sept, 1977.
Wheat: Aldicarb applied, rotary cultivated: 24 Oct, 1977. Spring-tine cultivated, seed sown: 25 Oct. Methabenzthiazuron applied: 29 Oct. N applied: 7 Apr, 1978. Mecoprop, bromoxynil and ioxynil applied: 10 May. Combine harvested: 25 Aug.
Barley: Spring-tine cultivated: 9 Mar, 1978. Aldicarb applied, rotary cultivated, spring-tine cultivated with crumbler attached, seed sown: 3 Apr. N applied, weedkillers and fungicide applied: 15 May. Combine harvested: 23 Aug.

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78/W/RN/13

WHEAT

GRAIN TONNES/HECTARE

***** TABLES OF MEANS *****

PREVCROP ALDICARB	C/L/P/C	L/P/C/C	P/C/C/C	C/C/C/C	C/C/L/C	C/C/C/C	MEAN
0	4.26	4.26	3.88	3.81	4.36	3.94	4.08
10	4.06	3.92	3.74	3.44	3.62	3.18	3.66
MEAN	4.16	4.09	3.81	3.62	3.99	3.56	3.87

N ALDICARB	63	126	189	252	MEAN
0	3.42	4.32	4.36	4.23	4.08
10	3.15	3.95	3.66	3.87	3.66
MEAN	3.29	4.14	4.01	4.05	3.87

N PREVCROP	63	126	189	252	MEAN
C/L/P/C	3.52	4.71	4.39	4.01	4.16
L/P/C/C	3.76	4.22	4.01	4.38	4.09
P/C/C/C	3.21	3.98	4.06	3.99	3.81
C/C/C/C	2.98	3.65	3.95	3.91	3.62
C/C/L/C	3.35	4.33	3.84	4.43	3.99
C/C/C/C	2.90	3.94	3.83	3.58	3.56
MEAN	3.29	4.14	4.01	4.05	3.87

N		63	126	189	252
ALDICARB	PREVCROP				
0	C/L/P/C	3.45	4.56	4.51	4.51
	L/P/C/C	3.92	4.79	4.49	3.83
	P/C/C/C	2.83	3.98	3.98	4.73
	C/C/C/C	3.47	3.70	4.29	3.77
	C/C/L/C	3.29	4.73	4.73	4.70
	C/C/C/C	3.57	4.18	4.18	3.83
10	C/L/P/C	3.59	4.87	4.26	3.51
	L/P/C/C	3.59	3.65	3.52	4.92
	P/C/C/C	3.60	3.97	4.14	3.25
	C/C/C/C	2.50	3.59	3.60	4.05
	C/C/L/C	3.41	3.93	2.96	4.17
	C/C/C/C	2.23	3.69	3.49	3.33

GRAIN MEAN DM% 82.4

SUB PLOT AREA HARVESTED 0.00277

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78/W/RN/13

BARLEY

GRAIN TONNES/HECTARE

***** TABLES OF MEANS *****

PREVCROP / ALDICARB	C/L/P/C	L/P/C/C	P/C/C/C	C/C/C/C	C/C/L/C	C/C/C/C	MEAN
0	5.00	5.00	4.63	4.35	4.07	3.81	4.48
10	4.75	4.94	4.65	3.95	4.80	4.20	4.55
MEAN	4.88	4.97	4.64	4.15	4.43	4.01	4.51

N / ALDICARB	50	100	150	200	MEAN
0	3.02	4.61	5.22	5.05	4.48
10	2.87	4.74	5.17	5.42	4.55
MEAN	2.94	4.67	5.20	5.24	4.51

N / PREVCROP	50	100	150	200	MEAN
C/L/P/C	3.56	5.04	5.73	5.17	4.88
L/P/C/C	3.82	5.06	5.28	5.72	4.97
P/C/C/C	3.05	4.75	5.37	5.39	4.64
C/C/C/C	1.97	4.59	5.18	4.87	4.15
C/C/L/C	2.94	4.47	5.01	5.32	4.43
C/C/C/C	2.34	4.13	4.62	4.94	4.01
MEAN	2.94	4.67	5.20	5.24	4.51

N / ALDICARB / PREVCROP	50	100	150	200
0 C/L/P/C	4.06	4.89	6.06	5.00
L/P/C/C	3.85	5.28	5.46	5.39
P/C/C/C	3.30	4.46	5.21	5.54
C/C/C/C	2.39	4.76	5.23	5.03
C/C/L/C	2.49	4.21	4.85	4.72
C/C/C/C	2.05	4.08	4.51	4.62
10 C/L/P/C	3.06	5.20	5.40	5.35
L/P/C/C	3.78	4.84	5.09	6.05
P/C/C/C	2.79	5.04	5.53	5.24
C/C/C/C	1.55	4.42	5.12	4.71
C/C/L/C	3.38	4.74	5.17	5.91
C/C/C/C	2.63	4.18	4.73	5.27

GRAIN MEAN DM% 77.6

SUB PLOT AREA HARVESTED 0.00277

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78/W/RN/14

LONG TERM PHOSPHATE

Object: To study the residual effects of superphosphate on a clover/grass ley - Woburn Stackyard III.

Sponsor: G.E.G. Mattingly.

The 11th year, clover/grass ley.

For previous years see 68/B/8(t), 69/W/RN/14, 70/W/RN/14(t), 71/W/RN/14(t), 72/W/RN/14(t) and 73-77/W/RN/14.

Design: 6 blocks of 6 plots, split into 2.

Whole plot dimensions: 8.53 x 15.8.

Treatments: All combinations of:-

Whole plots

1. P205RES(73) Residues of superphosphate applied autumn 1967 and spring 1973 (kg P205):

	1967	1973	Total
0	None	None	None (Duplicate plots)
360	188	172	360
720	376	344	720
1440	753	687	1440
2160	1130	1030	2160

Sub plots

2. P205RES(72) Residues of superphosphate applied in three equal dressings 1970-72 (kg P205, total):

0
376

Basal applications: Manures: K20 at 110 kg as muriate of potash. MgO at 30 kg as Epsom Salts.

Cultivations, etc.:- K applied: 10 Jan, 1978. Mg applied: 30 Mar. Cut twice: 13 June, 12 Sept.

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78/W/RN/14

1ST CUT (13/6/78) DRY MATTER TONNES/HECTARE

***** TABLES OF MEANS *****

P205RES(73) / P205RES(72)	0	360	720	1440	2160	MEAN
0	3.64	3.52	3.62	3.54	2.98	3.49
376	4.09	3.90	3.47	3.46	2.66	3.61
MEAN	3.86	3.71	3.54	3.50	2.82	3.55

***** STANDARD ERRORS OF DIFFERENCES OF MEANS *****

TABLE	P205RES(73)	P205RES(72)	P205RES(73) P205RES(72)	
REP	UNEQUAL	36	UNEQUAL	
SED	0.372		0.397	MIN REP
	0.322	0.081	0.344	MAX-MIN
EXCEPT WHEN COMPARING MEANS WITH SAME LEVEL(S) OF:				
P205RES(73)			0.198	MIN REP
			0.140	MAX REP

	P205RES(73)
MAX REP	0
MAX-MIN	0 V ANY OF REMAINDER
MIN REP	ANY OF REMAINDER

***** STRATUM STANDARD ERRORS AND COEFFICIENTS OF VARIATION *****

STRATUM	DF	SE	CV%
BLOCK.WP	26	0.643	18.1
BLOCK.WP.SP	31	0.343	9.7

1ST CUT MEAN DM% 20.1

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78/W/RN/14

2ND CUT (12/9/78) DRY MATTER TONNES/HECTARE

***** TABLES OF MEANS *****

P205RES(73) / P205RES(72)	0	360	720	1440	2160	MEAN
0	1.92	1.93	2.12	1.98	1.91	1.96
376	2.27	2.06	2.04	1.83	1.66	2.02
MEAN	2.10	1.99	2.08	1.91	1.78	1.99

***** STANDARD ERRORS OF DIFFERENCES OF MEANS *****

TABLE	P205RES(73)	P205RES(72)	P205RES(73) P205RES(72)	
REP	UNEQUAL	36	UNEQUAL	
SED	0.203		0.228	MIN REP
	0.176	0.060	0.198	MAX-MIN
EXCEPT WHEN COMPARING MEANS WITH SAME LEVEL(S) OF:				
P205RES(73)			0.148	MIN REP
			0.105	MAX REP

***** STRATUM STANDARD ERRORS AND COEFFICIENTS OF VARIATION *****

STRATUM	DF	SE	CV%
BLOCK.WP	26	0.351	17.6
BLOCK.WP.SP	31	0.256	12.9

2ND CUT MEAN DM% 21.7

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78/W/RN/14

TOTAL OF 2 CUTS DRY MATTER TONNES/HECTARE

***** TABLES OF MEANS *****

P205RES(73) / P205RES(72)	0	360	720	1440	2160	MEAN
0	5.56	5.45	5.74	5.52	4.88	5.45
376	6.37	5.97	5.51	5.29	4.32	5.64
MEAN	5.96	5.71	5.62	5.40	4.60	5.54

***** STANDARD ERRORS OF DIFFERENCES OF MEANS *****

TABLE	P205RES(73)	P205RES(72)	P205RES(73) P205RES(72)	
REP	UNEQUAL	36	UNEQUAL	
SED	0.545		0.583	MIN REP
	0.472	0.120	0.505	MAX-MIN
EXCEPT WHEN COMPARING MEANS WITH SAME LEVEL(S) OF:				
P205RES(73)			0.293	MIN REP
			0.207	MAX REP

***** STRATUM STANDARD ERRORS AND COEFFICIENTS OF VARIATION *****

STRATUM	DF	SE	CV%
BLOCK.WP	26	0.944	17.0
BLOCK.WP.SP	31	0.508	9.2

TOTAL OF 2 CUTS MEAN DM% 2.8

PLOT AREA HARVESTED 0.00145

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78/W/RN/16

EFFECTS OF DEEP PK

Object: To study the residual effects of subsoiling and of incorporating a large dressing of PK in either the subsoil or topsoil, on yields and nutrient uptakes of barley - Woburn Butt Furlong.

Sponsor: J. McEwen.

The fifth year, spring barley.

For previous years see 74-77/W/RN/16.

Design: 4 series of 3 randomised blocks of 4 plots with PREVCROP on series.

Whole plot dimensions: 4.27 x 2.59.

Treatments: All combinations of:-

Series

1. PREVCROP — Previous cropping (1974-1977):

POTATOES	Wheat, sugar beet, barley, potatoes
WHEAT	Sugar beet, barley, potatoes, wheat
S BEET	Barley, potatoes, wheat, sugar beet
BARLEY	Potatoes, wheat, sugar beet, barley

Plots

2. PK SUB — Extra PK and subsoil treatment (applied autumn 1973):

	Extra PK	Subsoil (25-50 cm) treatment
- -	None	None
- SUB	None	Subsoiled
PKTOP -	To topsoil (0-25 cm)	None
- PKSUB	To subsoil	Subsoiled

NOTES: (1) The rates of P and K were 1930 kg P205, as superphosphate and 460 kg K20 as muriate of potash. These quantities, applied to subsoil, were chosen to equalize available P and K in top and subsoil.
(2) Subsoiling was done by spade, after removing the topsoil which was then replaced. PK to subsoil was worked in by forking.
(3) PK to topsoil was applied half before ploughing in autumn half soon after on the plough furrow.

Standard applications:
Manures: PREVCROP WHEAT series only: Magnesian limestone at 5 tonnes. All series: (20:14:14) at 450 kg combine drilled. Weedkillers: Mecoprop, bromoxynil and ioxynil ('Brittox' at 2.5 kg in 340 l).

Seed: Porthos, dressed with ethirimol, sown at 160 kg.

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78/W/RN/16

Cultivations, etc.:- Magnesian limestone applied: 24 Oct, 1977. Ploughed: 21 Nov. Spring-tine cultivated with crumbler attached, seed sown: 9 Mar, 1978. Weedkiller applied: 15 May. Hand harvested: 16 Aug.

NOTE: Samples of grain were analysed for contents of N, P, K, Na, Ca and Mg.

GRAIN TONNES/HECTARE

***** TABLES OF MEANS *****

PK SUB PREVCROP.	- -	- SUB	PKTOP -	- PKSUB	MEAN
POTATOES	5.75	7.06	6.82	7.43	6.77
WHEAT	4.68	4.78	4.97	5.82	5.06
S BEET	6.62	7.11	6.56	7.38	6.92
BARLEY	4.07	3.65	4.12	4.42	4.07
MEAN	5.28	5.65	5.62	6.26	5.70

***** STANDARD ERRORS OF DIFFERENCES OF MEANS *****

TABLE	PK SUB	PREVCROP* PK SUB
SED	0.239	0.478

* ONLY WHEN COMPARING MEANS WITH SAME LEVELS OF PREVCROP

***** STRATUM STANDARD ERRORS AND COEFFICIENTS OF VARIATION *****

STRATUM	DF	SE	CV%
BLOCK.WP	6	0.348	6.1
BLOCK.WP.SP	24	0.585	10.3

GRAIN MEAN DM% 82.9

STRAW TONNES/HECTARE

***** TABLES OF MEANS *****

PK SUB PREVCROP	- -	- SUB	PKTOP -	- PKSUB	MEAN
POTATOES	4.34	5.31	4.72	5.49	4.96
WHEAT	3.94	3.98	3.56	4.59	4.02
S BEET	4.71	5.80	4.47	5.51	5.12
BARLEY	3.23	3.11	3.26	3.79	3.35
MEAN	4.06	4.55	4.00	4.85	4.36

STRAW MEAN DM% 63.7

SUB PLOT AREA HARVESTED 0.00065

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78/R/CS/10 and 78/W/CS/10

LONG TERM LIMING

Object: To study the effects of different amounts of lime on the yields of a sequence of crops. The effects of P, K and Mg are also studied - Rothamsted (R) Sawyers I and Woburn (W) Stackyard C.

Sponsor: J. Bolton.

The 17th year, spring barley.

For previous years see 'Details' 1967, 1973 and 74-77/R&W/CS/10.

Design: 2 randomised blocks of 16 plots, split into 2.

Whole plot dimensions: 6.40 x 18.3.

Treatments: All combinations of:-

Whole plots

1. LIME Ground chalk (tonnes CaCO3) (total applied 1962-63):

R	W
0	0
5	5
10	12
20	19

2. P205 Phosphate, applied cumulatively to previous dressings, as superphosphate (kg P205):

0
63

3. K20 Potassium, applied cumulatively to previous dressings, as muriate of potash (kg K20):

0
126

Sub plots

4. MG Magnesium, applied cumulatively in 1974, 1976 and 1977 as Epsom salts and in 1978 as kieserite (kg Mg):

0
112

Basal applications:
Sawyers I (R): Manures: N at 80 kg, combine drilled. Weedkillers: Dicamba with mecoprop and MCPA ('Banlene Plus' at 4.9 l in 220 l).
Stackyard C (W): Manures: N at 130 kg, combine drilled. Weedkillers: Paraquat at 0.56 kg ion in 220 l. Mecoprop, bromoxynil and ioxynil ('Brittox' at 2.5 kg in 280 l). Fungicide: Tridemorph at 0.53 kg in 280 l.

NOTE: Paraquat was applied on Stackyard C (W) as a spot treatment to control areas of couch grass (Agropyron repens).

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78/R/CS/10 and 78/W/CS/10

Seed: Sawyers I (R) and Stackyard C (W): Porthos, dressed with ethirimol, sown at 160 kg.

Cultivations, etc.:-
Sawyers I (R): Ploughed: 29 Nov, 1977. Spring-tine cultivated: 7 Apr, 1978. Treatment P, K and Mg applied, power harrowed, seed sown: 19 Apr. Weedkiller applied: 8 June. Combine harvested: 8 Sept.
Stackyard C (W): Paraquat applied: 23 Sept, 1977. Ploughed: 30 Sept. Spring-tine cultivated: 9 Mar. P, K and Mg applied, spring-tine cultivated with crumbler attached: 13 Mar. Seed sown: 15 Mar. Spring-tine cultivated with crumbler attached, seed resown because of bird damage: 3 Apr. Weedkiller and fungicide applied: 15 May. Combine harvested: 23 Aug.

NOTES: (1) At both Rothamsted and Woburn measurable yields were obtained from treatment LIME 0 only in combinations with P205 63 and K20 126 (one replicate at Rothamsted, two replicates at Woburn). Grain yields, tonnes/hectare from these combinations were:

	Rothamsted	Woburn
LIME 0 P205 63 K20 126 MG 0	1.51	1.05
LIME 0 P205 63 K20 126 MG 112	1.59	2.13

These figures have been excluded from the main analysis.

(2) At Rothamsted only, no measurable yields were obtained from one of the replicates of certain combinations of LIME 5 with the other treatments. Combinations affected were all those of P205 0 with K20 0 and 126 and MG 0 and 112 and also the single combination P205 63, K20 0, MG 0. Yields from the remainder are presented in the four-way tables but have been excluded from the analysis.

78/R/CS/10 SAWYERS I(R)

GRAIN TONNES/HECTARE

***** TABLES OF MEANS *****

P205	0	63	MEAN
LIME			
10	3.50	4.52	4.01
20	3.55	4.84	4.20
MEAN	3.52	4.68	4.10

K20	0	126	MEAN
LIME			
10	3.60	4.42	4.01
20	3.90	4.49	4.20
MEAN	3.75	4.45	4.10

K20	0	126	MEAN
P205			
0	3.10	3.94	3.52
63	4.40	4.96	4.68
MEAN	3.75	4.45	4.10

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78/R/CS/10 SAWYERS I(R)

GRAIN TONNES/HECTARE

***** TABLES OF MEANS *****

MG	0	112	MEAN
LIME			
10	3.89	4.13	4.01
20	4.18	4.21	4.20
MEAN	4.03	4.17	4.10

MG	0	112	MEAN
P205			
0	3.39	3.65	3.52
63	4.67	4.69	4.68
MEAN	4.03	4.17	4.10

MG	0	112	MEAN
K20			
0	3.62	3.88	3.75
126	4.44	4.46	4.45
MEAN	4.03	4.17	4.10

P205	0		63	
K20	0	126	0	126
LIME				
10	3.11	3.88	4.08	4.95
20	3.09	4.01	4.72	4.97

P205	0		63	
MG	0	112	0	112
LIME				
10	3.27	3.73	4.51	4.52
20	3.52	3.58	4.84	4.85

K20	0		126	
MG	0	112	0	112
LIME				
10	3.32	3.87	4.45	4.38
20	3.92	3.89	4.44	4.54

K20	0		126	
MG	0	112	0	112
P205				
0	2.87	3.33	3.91	3.98
63	4.37	4.43	4.98	4.94

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78/R/CS/10 SAWYERS I(R)

GRAIN TONNES/HECTARE

***** TABLES OF MEANS *****

	K20	0		126	
	MG	0	112	0	112
LIME	P205				
5	0	1.34	1.73	0.78	1.60
5	63	1.70	2.42	4.51	4.57
10	0	2.73	3.50	3.80	3.96
10	63	3.92	4.24	5.10	4.81
20	0	3.02	3.16	4.02	4.00
20	63	4.82	4.62	4.86	5.08

***** STANDARD ERRORS OF DIFFERENCES OF MEANS *****

TABLE	LIME	P205	K20	MG
SED	0.303	0.303	0.303	0.121

TABLE	LIME P205	LIME K20	P205 K20	LIME MG
SED	0.428	0.428	0.428	0.326
EXCEPT WHEN COMPARING MEANS WITH SAME LEVEL(S) OF:				
LIME				0.171

TABLE	P205 MG	K20 MG	LIME P205 K20	LIME P205 MG
SED	0.326	0.326	0.605	0.461
EXCEPT WHEN COMPARING MEANS WITH SAME LEVEL(S) OF:				
P205	0.171			
K20		0.171		
LIME.P205				0.243

TABLE	LIME K20 MG	P205 K20 MG	LIME* P205 K20 MG
SED	0.461	0.461	0.652
EXCEPT WHEN COMPARING MEANS WITH SAME LEVEL(S) OF:			
LIME.K20	0.243		
P205.K20		0.243	
LIME.P205.K20			0.343

* DO NOT USE FOR COMPARISONS INVOLVING LIME 5

***** STRATUM STANDARD ERRORS AND COEFFICIENTS OF VARIATION *****

STRATUM	DF	SE	CV%
BLOCK.WP	7	0.605	14.8
BLOCK.WP.SP	8	0.343	8.4

GRAIN MEAN DM% 75.0

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78/R/CS/10 SAWYERS I(R)

STRAW TONNES/HECTARE

***** TABLES OF MEANS *****

P205	0	63	MEAN
LIME			
10	1.92	2.33	2.12
20	2.08	2.57	2.32
MEAN	2.00	2.45	2.22

K20	0	126	MEAN
LIME			
10	1.78	2.47	2.12
20	2.13	2.51	2.32
MEAN	1.96	2.49	2.22

K20	0	126	MEAN
P205			
0	1.64	2.35	2.00
63	2.27	2.63	2.45
MEAN	1.96	2.49	2.22

MG	0	112	MEAN
LIME			
10	2.08	2.16	2.12
20	2.32	2.32	2.32
MEAN	2.20	2.24	2.22

MG	0	112	MEAN
P205			
0	1.97	2.03	2.00
63	2.44	2.46	2.45
MEAN	2.20	2.24	2.22

MG	0	112	MEAN
K20			
0	1.87	2.05	1.96
126	2.54	2.44	2.49
MEAN	2.20	2.24	2.22

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78/R/CS/10 SAWYERS I(R)

STRAW TONNES/HECTARE

***** TABLES OF MEANS *****

P205	0		63	
K20	0	126	0	126
LIME				
10	1.56	2.27	2.00	2.66
20	1.73	2.42	2.54	2.61

P205	0		63	
MG	0	112	0	112
LIME				
10	1.84	2.00	2.33	2.33
20	2.10	2.05	2.55	2.59

K20	0		126	
MG	0	112	0	112
LIME				
10	1.56	2.00	2.60	2.33
20	2.17	2.10	2.48	2.55

K20	0		126	
MG	0	112	0	112
P205				
0	1.56	1.73	2.37	2.32
63	2.17	2.37	2.71	2.55

	K20	0		126	
	MG	0	112	0	112
LIME	P205				
5	0	0.65	0.97	0.42	0.74
5	63	0.76	1.18	2.50	2.40
10	0	1.28	1.83	2.39	2.16
10	63	1.85	2.16	2.82	2.49
20	0	1.84	1.62	2.36	2.49
20	63	2.50	2.57	2.61	2.61

STRAW MEAN DM% 90.7

PLOT AREA HARVESTED 0.00247

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78/W/CS/10 STACKYARD C(W)

GRAIN TONNES/HECTARE

***** TABLES OF MEANS *****

P205	0	63	MEAN
LIME			
5	4.05	4.40	4.22
12	4.79	4.85	4.82
19	4.99	5.07	5.03
MEAN	4.61	4.77	4.69

K20	0	126	MEAN
LIME			
5	4.14	4.30	4.22
12	4.55	5.10	4.82
19	4.61	5.45	5.03
MEAN	4.43	4.95	4.69

K20	0	126	MEAN
P205			
0	4.40	4.83	4.61
63	4.47	5.07	4.77
MEAN	4.44	4.95	4.69

MG	0	112	MEAN
LIME			
5	3.87	4.57	4.22
12	4.73	4.92	4.82
19	4.93	5.13	5.03
MEAN	4.51	4.87	4.69

MG	0	112	MEAN
P205			
0	4.40	4.82	4.61
63	4.62	4.93	4.77
MEAN	4.51	4.87	4.69

MG	0	112	MEAN
K20			
0	4.21	4.66	4.44
126	4.82	5.08	4.95
MEAN	4.51	4.87	4.69

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78/W/CS/10 STACKYARD C(W)

GRAIN TONNES/HECTARE

***** TABLES OF MEANS *****

P205	0		63	
K20	0	126	0	126
LIME				
5	4.12	3.97	4.16	4.63
12	4.51	5.07	4.59	5.12
19	4.55	5.43	4.68	5.47

P205	0		63	
MG	0	112	0	112
LIME				
5	3.58	4.52	4.16	4.63
12	4.68	4.90	4.77	4.93
19	4.94	5.04	4.93	5.22

K20	0		126	
MG	0	112	0	112
LIME				
5	3.80	4.48	3.94	4.67
12	4.42	4.68	5.04	5.15
19	4.40	4.83	5.47	5.43

K20	0		126	
MG	0	112	0	112
P205				
0	4.17	4.62	4.64	5.02
63	4.25	4.70	4.99	5.15

	K20	0		126	
	MG	0	112	0	112
LIME	P205				
5	0	3.74	4.50	3.42	4.53
5	63	3.86	4.46	4.46	4.81
12	0	4.39	4.63	4.97	5.17
12	63	4.44	4.73	5.11	5.13
19	0	4.36	4.74	5.52	5.35
19	63	4.43	4.92	5.42	5.52

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78/W/CS/10 STACKYARD C(W)

GRAIN TONNES/HECTARE

***** STANDARD ERRORS OF DIFFERENCES OF MEANS *****

TABLE	LIME	P205	K20	MG
SED	0.190	0.155	0.155	0.113

TABLE	LIME P205	LIME K20	P205 K20	LIME MG
SED	0.269	0.269	0.220	0.235
EXCEPT WHEN COMPARING MEANS WITH SAME LEVEL(S) OF:				
LIME				0.196

TABLE	P205 MG	K20 MG	LIME P205 K20	LIME P205 MG
SED	0.192	0.192	0.381	0.333
EXCEPT WHEN COMPARING MEANS WITH SAME LEVEL(S) OF:				
P205	0.160			
K20		0.160		
LIME.P205				0.277

TABLE	LIME K20 MG	P205 K20 MG	LIME P205 K20 MG
SED	0.333	0.272	0.471
EXCEPT WHEN COMPARING MEANS WITH SAME LEVEL(S) OF:			
LIME.K20	0.277		
P205.K20		0.226	
LIME.P205.K20			0.392

***** STRATUM STANDARD ERRORS AND COEFFICIENTS OF VARIATION *****

STRATUM	DF	SE	CV%
BLOCK.WP	11	0.381	8.1
BLOCK.WP.SP	12	0.392	8.3

GRAIN MEAN DM% 77.4

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78/W/CS/10 STACKYARD C(W)

STRAW TONNES/HECTARE

***** TABLES OF MEANS *****

P205	0	63	MEAN
LIME			
5	2.20	2.29	2.25
12	2.63	2.67	2.65
19	2.88	2.77	2.82
MEAN	2.57	2.58	2.57

K20	0	126	MEAN
LIME			
5	2.03	2.46	2.25
12	2.45	2.85	2.65
19	2.34	3.31	2.82
MEAN	2.27	2.88	2.57

K20	0	126	MEAN
P205			
0	2.19	2.94	2.57
63	2.35	2.81	2.58
MEAN	2.27	2.88	2.57

MG	0	112	MEAN
LIME			
5	2.02	2.47	2.25
12	2.64	2.66	2.65
19	2.76	2.89	2.82
MEAN	2.47	2.67	2.57

MG	0	112	MEAN
P205			
0	2.41	2.73	2.57
63	2.54	2.62	2.58
MEAN	2.47	2.67	2.57

MG	0	112	MEAN
K20			
0	2.08	2.46	2.27
126	2.87	2.88	2.88
MEAN	2.47	2.67	2.57

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78/W/CS/10 STACKYARD C(W)

STRAW TONNES/HECTARE

***** TABLES OF MEANS *****

P205	0		63	
K20	0	126	0	126
LIME				
5	1.98	2.42	2.08	2.51
12	2.37	2.88	2.52	2.82
19	2.23	3.53	2.44	3.09

P205	0		63	
MG	0	112	0	112
LIME				
5	1.88	2.51	2.17	2.42
12	2.58	2.67	2.69	2.65
19	2.77	3.00	2.76	2.78

K20	0		126	
MG	0	112	0	112
LIME				
5	1.77	2.28	2.27	2.66
12	2.37	2.53	2.90	2.80
19	2.10	2.58	3.43	3.20

K20	0		126	
MG	0	112	0	112
P205				
0	1.89	2.50	2.93	2.96
63	2.27	2.43	2.81	2.81

	K20	0		126	
	MG	0	112	0	112
LIME	P205				
5	0	1.56	2.40	2.21	2.63
5	63	1.99	2.17	2.34	2.68
12	0	2.25	2.49	2.91	2.86
12	63	2.49	2.56	2.90	2.75
19	0	1.86	2.60	3.67	3.39
19	63	2.33	2.56	3.19	3.00

STRAW MEAN DM% 78.2

SUB PLOT AREA HARVESTED 0.00247

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78/W/CS/11

SOIL STRUCTURE

Object: To study the residual effects of peat, at a range of nitrogen levels, on the yield of ryegrass - Woburn Stackyard II.

Sponsor: A.E. Johnston.

The 15th year, barley.

For previous years see 64/C/20(t), 65/C/19(t), 66/C/11(t), 67/C/8(t), 68/C/31(t), 69/W/CS/11(t), 70/W/CS/11(t), 71/W/CS/11, 72/W/CS/11(t) and 73-77/W/CS/11.

Design: Single replicate of 5 x 4.

Whole plot dimensions: 2.13 x 3.05.

Treatments: All combinations of:-

1. PEAT — Peat (tonnes dry matter - total applied 1963-72):

   0
   8
   55
   110
   165

2. N — Nitrogen fertiliser as ammonium nitrate (kg N) cumulative to previous treatments:

   0
   50
   100
   150

Basal applications: Manures: Ground chalk at 2.5 tonnes. P at 85 kg, as triple superphosphate, K at 300 kg, as potassium bicarbonate, Mg at 55 kg, as magnesium sulphate. Weedkillers: Ioxynil at 0.52 kg with mecoprop at 1.6 kg in 280 l applied with the fungicide. Fungicide: Tridemorph at 0.53 kg.

Seed: Porthos, dressed with ethirimol, sown at 160 kg.

Cultivations, etc.:- Hand dug: 14 Dec, 1977. Ground chalk, P, K, Mg applied, raked in, seed sown: 7 Mar. Weedkiller with fungicide applied: 19 May. Hand harvested: 16 Aug.

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78/W/CS/11

GRAIN TONNES/HECTARE

***** TABLES OF MEANS *****

N / PEAT	0	50	100	150	MEAN
0	2.32	4.74	6.88	6.56	5.12
8	2.05	5.25	6.58	7.53	5.36
55	2.74	4.86	7.07	7.91	5.64
110	2.46	5.30	7.19	7.53	5.62
165	2.69	4.94	6.50	8.08	5.55
MEAN	2.45	5.02	6.84	7.52	5.46

GRAIN MEAN DM% 83.6

STRAW TONNES/HECTARE

***** TABLES OF MEANS *****

N / PEAT	0	50	100	150	MEAN
0	1.80	3.82	6.20	6.49	4.58
8	1.78	4.55	6.08	6.13	4.64
55	2.26	4.06	6.56	7.33	5.05
110	1.99	3.93	6.49	6.13	4.64
165	2.27	4.66	5.87	7.53	5.08
MEAN	2.02	4.20	6.24	6.72	4.80

STRAW MEAN DM% 61.5

PLOT AREA HARVESTED 0.00056

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78/R/CS/13

N LEVELS TO OLD GRASS

Object: To study the effects of a range of nitrogen rates on yield and botanical composition of very old permanent pasture. N fixed by legumes is estimated and the effect of treatments on nutrients available in the soil is also studied - Park Grass Old Plot 6.

Sponsor: A.E. Johnston.

The 14th year, old grass.

For previous years see 'Details' 1973 and 74-77/R/CS/13.

Design: 4 randomised blocks of 10 plots.

Whole plot dimensions: 1.83 x 10.1.

Treatments

TOTAL N	Fertiliser nitrogen (kg N-total per annum applied in four equal dressings as 25:0:16):
0(S)	0 (sprayed with ioxynil plus mecoprop to control legumes, duplicated)
0	0 (duplicated)
75	
150	
225	
300	
375	
450	

NOTE: Ioxynil at 0.84 kg with mecoprop at 2.5 kg in 280 l applied on 13 July, 1978.

Basal applications: Manures: 34 kg P as superphosphate. 11 kg Mg as magnesium sulphate.

Cultivations, etc.:- Basal P and Mg applied: 15 Dec, 1977. NK applied: 28 Feb, 1978, 15 May, 26 June, 7 Aug. Cut: 15 May, 26 June, 7 Aug, 30 Oct.

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78/R/CS/13

1ST CUT (15/5/78) DRY MATTER TONNES/HECTARE

***** TABLES OF MEANS *****

TOTAL N	0(S)	0	75	150	225	300	375	450	MEAN
	0.56	1.06	1.46	2.10	2.98	3.71	4.01	4.01	2.15

***** STANDARD ERRORS OF DIFFERENCES OF MEANS *****

TABLE	TOTAL N	
SED	0.273	MIN REP
	0.237	MAX-MIN
	0.193	MAX REP

	TOTAL N
MAX REP	0(S) V 0
MAX-MIN	0(S) OR 0 V ANY OF REMAINDER
MIN REP	ANY OF REMAINDER

***** STRATUM STANDARD ERRORS AND COEFFICIENTS OF VARIATION *****

STRATUM	DF	SE	CV%
BLOCK.WP	29	0.386	18.0

1ST CUT MEAN DM% 17.3

2ND CUT (26/6/78) DRY MATTER TONNES/HECTARE

***** TABLES OF MEANS *****

TOTAL N	0(S)	0	75	150	225	300	375	450	MEAN
	1.45	2.36	2.45	3.02	3.18	3.43	3.54	3.32	2.66

***** STANDARD ERRORS OF DIFFERENCES OF MEANS *****

TABLE	TOTAL N	
SED	0.276	MIN REP
	0.239	MAX-MIN
	0.195	MAX REP

***** STRATUM STANDARD ERRORS AND COEFFICIENTS OF VARIATION *****

STRATUM	DF	SE	CV%
BLOCK.WP	29	0.390	14.7

2ND CUT MEAN DM% 18.4

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78/R/CS/13

3RD CUT (7/8/78) DRY MATTER TONNES/HECTARE

***** TABLES OF MEANS *****

TOTAL N	0(S)	0	75	150	225	300	375	450	MEAN
	0.56	1.66	1.20	1.61	1.93	2.17	2.19	2.22	1.58

***** STANDARD ERRORS OF DIFFERENCES OF MEANS *****

TABLE	TOTAL N	
SED	0.185	MIN REP
	0.160	MAX-MIN
	0.131	MAX REP

***** STRATUM STANDARD ERRORS AND COEFFICIENTS OF VARIATION *****

STRATUM	DF	SE	CV%
BLOCK.WP	29	0.261	16.6

3RD CUT MEAN DM% 18.2

4TH CUT (30/10/78) DRY MATTER TONNES/HECTARE

***** TABLES OF MEANS *****

TOTAL N	0(S)	0	75	150	225	300	375	450	MEAN
	0.39	1.42	0.96	1.26	1.28	1.93	1.64	1.40	1.21

***** STANDARD ERRORS OF DIFFERENCES OF MEANS *****

TABLE	TOTAL N	
SED	0.219	MIN REP
	0.190	MAX-MIN
	0.155	MAX REP

***** STRATUM STANDARD ERRORS AND COEFFICIENTS OF VARIATION *****

STRATUM	DF	SE	CV%
BLOCK.WP	29	0.310	25.7

4TH CUT MEAN DM% 28.5

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78/R/CS/13

TOTAL OF 4 CUTS DRY MATTER TONNES/HECTARE

***** TABLES OF MEANS *****

TOTAL N	0(S)	0	75	150	225	300	375	450	MEAN
	2.95	6.50	6.07	7.99	9.37	11.24	11.38	10.95	7.59

***** STANDARD ERRORS OF DIFFERENCES OF MEANS *****

TABLE	TOTAL N	
SED	0.440	MIN REP
	0.381	MAX-MIN
	0.311	MAX REP

***** STRATUM STANDARD ERRORS AND COEFFICIENTS OF VARIATION *****

STRATUM	DF	SE	CV%
BLOCK.WP	29	0.622	8.2

TOTAL OF 4 CUTS MEAN DM% 20.6

PLOT AREA HARVESTED 0.00086

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78/R/CS/14

NPK TO OLD GRASS

Object: To study the effects of a range of P and K levels on yields of permanent pasture on sites with much or little P and K in the soil - Park Grass Old Plots 5/1 and 5/2.

Sponsor: A.E. Johnston.

The 14th year, old grass.

For previous years see 'Details' 1973 and 74-77/R/CS/14.

Design: On each site: A single replicate of 2 x 4 x 4 in 2 blocks of 16 plots each, with 2 x 2 x 2 additional plots.

Whole plot dimensions: 1.83 x 10.1.

Treatments:

The experiment is duplicated on sites differing in previous history:-

PLOT	
5/1NORES	Park Grass Plot 5/1: No P or K
5/2PKRES	Park Grass Plot 5/2: Superphosphate to supply 34 kg P, sulphate of potash to supply 224 kg K, annually 1898-1964

On each site, all combinations of:-

1. NPERCUT — Nitrogen fertiliser (kg N for each cut):

   33.6
   67.2

2. P — Phosphate (kg P) as superphosphate annually:

   0.0
   16.8
   33.6
   67.2

3. K — Potassium (kg K) as potassium chloride annually:

   0
   112
   224
   448

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together with extra treatments, all combinations of:

1. NPERCUT Nitrogen fertiliser (kg N for each cut):

   33.6
   67.2

2. P Phosphate (kg P) as superphosphate:

   (34)34 33.6 kg P in 1965, none 1966-1976, 33.6 kg P annually since 1977
   (34)67 33.6 kg P in 1965, none 1966-1976, 67.2 kg P annually since 1977

3. K Potassium (kg K) as potassium chloride:

   (56) 56 56 kg K in 1965, none 1966-1976, 56 kg K annually since 1977
   (336)336 336 kg K in 1965, none 1966-1976, 336 kg K annually since 1977

Cultivations, etc.:- Test P and K applied: 15 Dec, 1977. N applied: 28 Feb, 1978, 9 June, 31 June. Cut: 9 June, 31 June, 30 Oct.

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78/R/CS/14 PLOT 5/1 NORES

EXCLUDING EXTRA TREATMENTS

1ST CUT (9/6/78) DRY MATTER TONNES/HETA¢NNES/HECTARE

***** TABLES OF MEANS *****

P NPERCUT	0.0	16.8	33.6	67.2	MEAN
33.6	2.85	4.23	4.09	3.98	3.79
67.2	2.97	5.54	5.49	5.07	4.77
MEAN	2.91	4.89	4.79	4.52	4.28

K NPERCUT	0	112	224	448	MEAN
33.6	3.17	3.93	4.17	3.88	3.79
67.2	3.02	5.11	5.48	5.45	4.77
MEAN	3.09	4.52	4.83	4.67	4.28

K P	0	112	224	448	MEAN
0.0	2.39	3.42	2.93	2.90	2.91
16.8	3.62	5.07	5.71	5.14	4.89
33.6	3.22	5.10	5.71	5.12	4.79
67.2	3.14	4.48	4.96	5.51	4.52
MEAN	3.09	4.52	4.83	4.67	4.28

NPERCUT	K P	0	112	224	448
33.6	0.0	2.86	3.35	2.52	2.67
	16.8	3.33	4.53	4.74	4.34
	33.6	3.02	4.30	4.79	4.24
	67.2	3.46	3.55	4.63	4.27
67.2	0.0	1.92	3.50	3.34	3.12
	16.8	3.92	5.61	6.68	5.94
	33.6	3.42	5.91	6.64	6.00
	67.2	2.81	5.41	5.29	6.75

1ST CUT MEAN DM% 23.5

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78/R/CS/14 PLOT 5/1 NORES

EXCLUDING EXTRA TREATMENTS

2ND CUT (25/7/78) DRY MATTER TONNES/HECTARE

***** TABLES OF MEANS *****

P	0.0	16.8	33.6	67.2	MEAN
NPERCUT					
33.6	1.59	1.47	1.32	1.36	1.43
67.2	1.60	2.11	2.10	2.16	1.99
MEAN	1.60	1.79	1.71	1.76	1.71

K	0	112	224	448	MEAN
NPERCUT					
33.6	1.26	1.41	1.48	1.59	1.43
67.2	1.36	2.19	2.28	2.15	1.99
MEAN	1.31	1.80	1.88	1.87	1.71

K	0	112	224	448	MEAN
P					
0.0	1.36	1.79	1.69	1.55	1.60
16.8	1.20	2.08	1.97	1.92	1.79
33.6	1.27	1.47	2.12	1.97	1.71
67.2	1.41	1.85	1.74	2.04	1.76
MEAN	1.31	1.80	1.88	1.87	1.71

	K	0	112	224	448
NPERCUT	P				
33.6	0.0	1.42	1.64	1.52	1.79
	16.8	1.12	1.61	1.52	1.63
	33.6	1.09	1.09	1.53	1.57
	67.2	1.41	1.29	1.35	1.38
67.2	0.0	1.29	1.95	1.87	1.31
	16.8	1.27	2.55	2.41	2.22
	33.6	1.46	1.85	2.71	2.37
	67.2	1.42	2.41	2.12	2.69

2ND CUT MEAN DM% 17.5

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78/R/CS/14 PLOT 5/1 NORES

EXCLUDING EXTRA TREATMENTS

3RD CUT (30/10/78) DRY MATTER TONNES/HECTARE

***** TABLES OF MEANS *****

P / NPERCUT	0.0	16.8	33.6	67.2	MEAN
33.6	1.57	1.36	1.37	1.47	1.44
67.2	1.81	2.02	1.80	2.07	1.93
MEAN	1.69	1.69	1.59	1.77	1.68

K / NPERCUT	0	112	224	448	MEAN
33.6	1.13	1.42	1.75	1.47	1.44
67.2	1.27	2.03	2.59	1.81	1.93
MEAN	1.20	1.72	2.17	1.64	1.68

K / P	0	112	224	448	MEAN
0.0	0.81	1.99	2.24	1.72	1.69
16.8	1.38	1.46	2.22	1.70	1.69
33.6	1.04	1.83	1.80	1.68	1.59
67.2	1.57	1.62	2.43	1.47	1.77
MEAN	1.20	1.72	2.17	1.64	1.68

NPERCUT	K / P	0	112	224	448
33.6	0.0	0.99	1.38	2.19	1.73
	16.8	1.43	1.44	1.11	1.44
	33.6	1.05	1.45	1.72	1.26
	67.2	1.04	1.41	1.98	1.45
67.2	0.0	0.63	2.60	2.29	1.71
	16.8	1.32	1.48	3.33	1.95
	33.6	1.03	2.20	1.87	2.11
	67.2	2.10	1.82	2.89	1.49

3RD CUT MEAN DM% 33.3

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78/R/CS/14 PLOT 5/1 NORES

EXCLUDING EXTRA TREATMENTS

TOTAL OF 3 CUTS DRY MATTER TONNES/HECTARE

***** TABLES OF MEANS *****

P NPERCUT	0.0	16.8	33.6	67.2	MEAN
33.6	6.02	7.06	6.78	6.81	6.66
67.2	6.38	9.67	9.39	9.30	8.69
MEAN	6.20	8.37	8.08	8.05	7.68

K NPERCUT	0	112	224	448	MEAN
33.6	5.56	6.76	7.40	6.95	6.66
67.2	5.65	9.33	10.36	9.42	8.69
MEAN	5.60	8.04	8.88	8.18	7.68

K P	0	112	224	448	MEAN
0.0	4.56	7.21	6.86	6.17	6.20
16.8	6.20	8.61	9.89	8.76	8.37
33.6	5.53	8.40	9.63	8.78	8.08
67.2	6.12	7.95	9.13	9.02	8.05
MEAN	5.60	8.04	8.88	8.18	7.68

K NPERCUT P	0	112	224	448
33.6 0.0	5.27	6.37	6.23	6.20
16.8	5.89	7.57	7.37	7.41
33.6	5.15	6.84	8.04	7.07
67.2	5.91	6.25	7.95	7.11
67.2 0.0	3.85	8.05	7.49	6.14
16.8	6.51	9.65	12.41	10.11
33.6	5.91	9.96	11.22	10.48
67.2	6.33	9.64	10.30	10.93

TOTAL OF 3 CUTS MEAN DM% 24.4

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78/R/CS/14 PLOT 5/1 NORES

EXTRA TREATMENTS

1ST CUT (9/6/78) DRY MATTER TONNES/HECTARE

***** TABLES OF MEANS *****

P / NPERCUT	(34)34	(34)67	MEAN
33.6	4.99	4.45	4.72
67.2	5.27	5.74	5.51
MEAN	5.13	5.09	5.11

K / NPERCUT	(56)56	(336)336	MEAN
33.6	4.47	4.97	4.72
67.2	5.17	5.84	5.51
MEAN	4.82	5.41	5.11

K / P	(56)56	(336)336	MEAN
(34)34	4.78	5.48	5.13
(34)67	4.85	5.34	5.09
MEAN	4.82	5.41	5.11

1ST CUT MEAN DM% 22.9

2ND CUT (25/7/78) DRY MATTER TONNES/HECTARE

***** TABLES OF MEANS *****

P / NPERCUT	(34)34	(34)67	MEAN
33.6	1.51	1.41	1.46
67.2	1.80	1.65	1.73
MEAN	1.66	1.53	1.59

K / NPERCUT	(56)56	(336)336	MEAN
33.6	1.43	1.49	1.46
67.2	1.64	1.81	1.73
MEAN	1.53	1.65	1.59

K / P	(56)56	(336)336	MEAN
(34)34	1.62	1.69	1.66
(34)67	1.45	1.61	1.53
MEAN	1.53	1.65	1.59

2ND CUT MEAN DM% 17.9

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78/R/CS/14 PLOT 5/1 NORES

EXTRA TREATMENTS

3RD CUT (30/10/78) DRY MATTER TONNES/HECTARE

***** TABLES OF MEANS *****

P / NPERCUT	(34)34	(34)67	MEAN
33.6	1.95	1.33	1.64
67.2	2.11	2.46	2.28
MEAN	2.03	1.90	1.96

K / NPERCUT	(56)56	(336)336	MEAN
33.6	1.32	1.97	1.64
67.2	1.69	2.88	2.28
MEAN	1.50	2.42	1.96

K / P	(56)56	(336)336	MEAN
(34)34	1.49	2.57	2.03
(34)67	1.52	2.27	1.90
MEAN	1.50	2.42	1.96

3RD CUT MEAN DM% 33.4

TOTAL OF 3 CUTS DRY MATTER TONNES/HECTARE

***** TABLES OF MEANS *****

P / NPERCUT	(34)34	(34)67	MEAN
33.6	8.45	7.18	7.82
67.2	9.18	9.86	9.52
MEAN	8.82	8.52	8.67

K / NPERCUT	(56)56	(336)336	MEAN
33.6	7.21	8.43	7.82
67.2	8.50	10.53	9.52
MEAN	7.86	9.48	8.67

K / P	(56)56	(336)336	MEAN
(34)34	7.89	9.74	8.82
(34)67	7.82	9.21	8.52
MEAN	7.86	9.48	8.67

TOTAL OF 3 CUTS MEAN DM% 24.4

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78/R/CS/14 PLOT 5/2 PKRES

EXCLUDING EXTRA TREATMENTS

1ST CUT (9/6/78) DRY MATTER TONNES/HECTARE

***** TABLES OF MEANS *****

P NPERCUT	0.0	16.8	33.6	67.2	MEAN
33.6	4.76	4.70	4.67	4.27	4.60
67.2	6.88	6.59	6.75	6.22	6.61
MEAN	5.82	5.65	5.71	5.24	5.61

K NPERCUT	0	112	224	448	MEAN
33.6	4.55	4.59	4.78	4.49	4.60
67.2	6.66	6.35	6.88	6.56	6.61
MEAN	5.60	5.47	5.83	5.52	5.61

K P	0	112	224	448	MEAN
0.0	5.79	5.57	6.04	5.88	5.82
16.8	5.55	5.61	6.08	5.35	5.65
33.6	5.78	5.81	5.75	5.51	5.71
67.2	5.28	4.90	5.44	5.35	5.24
MEAN	5.60	5.47	5.83	5.52	5.61

NPERCUT	K P	0	112	224	448
33.6	0.0	4.77	4.66	4.94	4.67
	16.8	4.42	5.07	4.86	4.46
	33.6	4.63	4.62	4.89	4.55
	67.2	4.38	4.02	4.43	4.26
67.2	0.0	6.82	6.49	7.14	7.09
	16.8	6.69	6.15	7.30	6.23
	33.6	6.93	7.00	6.62	6.47
	67.2	6.18	5.79	6.45	6.44

1ST CUT MEAN DM% 24.1

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78/R/CS/14 PLOT 5/2 PKRES

EXCLUDING EXTRA TREATMENTS

2ND CUT (25/7/78) DRY MATTER TONNES/HECTARE

***** TABLES OF MEANS *****

P	0.0	16.8	33.6	67.2	MEAN
NPERCUT					
33.6	1.90	1.79	1.86	1.76	1.83
67.2	2.71	2.73	2.77	2.61	2.70
MEAN	2.30	2.26	2.32	2.19	2.27

K	0	112	224	448	MEAN
NPERCUT					
33.6	1.85	1.90	1.71	1.84	1.83
67.2	2.81	2.61	2.96	2.43	2.70
MEAN	2.33	2.26	2.34	2.14	2.27

K	0	112	224	448	MEAN
P					
0.0	2.07	2.20	2.49	2.46	2.30
16.8	2.17	2.18	2.38	2.29	2.26
33.6	2.75	2.37	2.35	1.80	2.32
67.2	2.33	2.28	2.14	1.99	2.19
MEAN	2.33	2.26	2.34	2.14	2.27

	K	0	112	224	448
NPERCUT	P				
33.6	0.0	1.93	1.94	1.74	1.99
	16.8	1.70	1.65	1.73	2.06
	33.6	1.87	2.18	1.66	1.72
	67.2	1.88	1.85	1.73	1.59
67.2	0.0	2.21	2.46	3.23	2.93
	16.8	2.64	2.70	3.04	2.52
	33.6	3.62	2.56	3.03	1.88
	67.2	2.78	2.72	2.55	2.39

2ND CUT MEAN DM% 16.1

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78/R/CS/14 PLOT 5/2 PKRES

EXCLUDING EXTRA TREATMENTS

3RD CUT (30/10/78) DRY MATTER TONNES/HECTARE

***** TABLES OF MEANS *****

P / NPERCUT	0.0	16.8	33.6	67.2	MEAN
33.6	1.39	1.17	1.28	1.00	1.21
67.2	1.93	1.99	1.83	1.89	1.91
MEAN	1.66	1.58	1.56	1.44	1.56

K / NPERCUT	0	112	224	448	MEAN
33.6	1.24	1.19	1.27	1.14	1.21
67.2	1.68	1.98	1.97	2.00	1.91
MEAN	1.46	1.58	1.62	1.57	1.56

K / P	0	112	224	448	MEAN
0.0	1.71	1.56	1.80	1.57	1.66
16.8	1.35	1.40	1.71	1.84	1.58
33.6	1.50	1.70	1.46	1.55	1.56
67.2	1.27	1.67	1.52	1.31	1.44
MEAN	1.46	1.58	1.62	1.57	1.56

NPERCUT	K / P	0	112	224	448
33.6	0.0	1.49	1.43	1.53	1.11
	16.8	1.31	0.74	1.38	1.25
	33.6	1.32	1.43	1.27	1.11
	67.2	0.84	1.15	0.92	1.09
67.2	0.0	1.93	1.68	2.07	2.04
	16.8	1.40	2.06	2.05	2.44
	33.6	1.69	1.97	1.65	2.00
	67.2	1.71	2.20	2.12	1.53

3RD CUT MEAN DM% 32.3

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78/R/CS/14 PLOT 5/2 PKRES

EXCLUDING EXTRA TREATMENTS

TOTAL OF 3 CUTS DRY MATTER TONNES/HECTARE

***** TABLES OF MEANS *****

P / NPERCUT	0.0	16.8	33.6	67.2	MEAN
33.6	8.05	7.65	7.82	7.03	7.64
67.2	11.52	11.31	11.35	10.71	11.22
MEAN	9.78	9.48	9.58	8.87	9.43

K / NPERCUT	0	112	224	448	MEAN
33.6	7.64	7.68	7.77	7.46	7.64
67.2	11.15	10.94	11.81	10.99	11.22
MEAN	9.39	9.31	9.79	9.23	9.43

K / P	0	112	224	448	MEAN
0.0	9.57	9.33	10.33	9.91	9.78
16.8	9.08	9.18	10.17	9.48	9.48
33.6	10.03	9.88	9.56	8.87	9.58
67.2	8.89	8.86	9.10	8.65	8.87
MEAN	9.39	9.31	9.79	9.23	9.43

NPERCUT / K / P	0	112	224	448
33.6 / 0.0	8.18	8.03	8.21	7.76
16.8	7.43	7.46	7.96	7.77
33.6	7.82	8.23	7.83	7.38
67.2	7.10	7.02	7.08	6.94
67.2 / 0.0	10.95	10.63	12.45	12.06
16.8	10.73	10.91	12.39	11.20
33.6	12.24	11.53	11.30	10.35
67.2	10.67	10.70	11.13	10.36

TOTAL OF 3 CUTS MEAN DM% 24.4

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78/R/CS/14 PLOT 5/2 PKRES

EXTRA TREATMENTS

1ST CUT (9/6/78) DRY MATTER TONNES/HECTARE

***** TABLES OF MEANS *****

P / NPERCUT	(34)34	(34)67	MEAN
33.6	4.96	5.17	5.06
67.2	7.26	7.29	7.27
MEAN	6.11	6.23	6.17

K / NPERCUT	(56)56	(336)336	MEAN
33.6	4.82	5.30	5.06
67.2	7.19	7.36	7.27
MEAN	6.00	6.33	6.17

K / P	(56)56	(336)336	MEAN
(34)34	6.13	6.09	6.11
(34)67	5.88	6.58	6.23
MEAN	6.00	6.33	6.17

1ST CUT MEAN DM% 22.8

2ND CUT (25/7/78) DRY MATTER TONNES/HECTARE

***** TABLES OF MEANS *****

P / NPERCUT	(34)34	(34)67	MEAN
33.6	2.06	1.67	1.87
67.2	2.94	2.92	2.93
MEAN	2.50	2.30	2.40

K / NPERCUT	(56)56	(336)336	MEAN
33.6	1.78	1.96	1.87
67.2	3.03	2.83	2.93
MEAN	2.40	2.39	2.40

K / P	(56)56	(336)336	MEAN
(34)34	2.73	2.27	2.50
(34)67	2.08	2.51	2.30
MEAN	2.40	2.39	2.40

2ND CUT MEAN DM% 15.4

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78/R/CS/14 PLOT 5/2 PKRES

EXTRA TREATMENTS

3RD CUT (30/10/78) DRY MATTER TONNES/HECTARE

***** TABLES OF MEANS *****

P / NPERCUT	(34)34	(34)67	MEAN
33.6	1.42	1.31	1.37
67.2	2.01	1.78	1.89
MEAN	1.71	1.54	1.63

K / NPERCUT	(56)56	(336)336	MEAN
33.6	1.30	1.43	1.37
67.2	1.79	1.99	1.89
MEAN	1.55	1.71	1.63

K / P	(56)56	(336)336	MEAN
(34)34	1.79	1.64	1.71
(34)67	1.31	1.78	1.54
MEAN	1.55	1.71	1.63

3RD CUT MEAN DM% 31.5

TOTAL OF 3 CUTS DRY MATTER TONNES/HECTARE

***** TABLES OF MEANS *****

P / NPERCUT	(34)34	(34)67	MEAN
33.6	8.44	8.15	8.30
67.2	12.21	11.99	12.10
MEAN	10.32	10.07	10.20

K / NPERCUT	(56)56	(336)336	MEAN
33.6	7.90	8.70	8.30
67.2	12.01	12.18	12.10
MEAN	9.95	10.44	10.20

K / P	(56)56	(336)336	MEAN
(34)34	10.64	10.00	10.32
(34)67	9.26	10.87	10.07
MEAN	9.95	10.44	10.20

TOTAL OF 3 CUTS MEAN DM% 24.4

PLOT AREA HARVESTED 0.00086

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78/R/CS/24

PK AND TAKE-ALL

Object: To study the effects of different amounts of phosphate and potassium fertiliser on the yields and incidence of take-all (Gaeumannomyces graminis) in continuous wheat - West Barnfield II.

Sponsors: G.E.G. Mattingly, D.B. Slope.

The 11th year, continuous winter wheat (after continuous barley 1968-1973).

For previous years see 'Details' 1973 and 74-77/R/CS/24.

Design: 4 randomised blocks of 10 plots, split into 2.

Whole plot dimensions: 5.33 x 20.1.

Treatments: All combinations of:-

Whole plots

1. P — Phosphate (kg P) as superphosphate:

0	None
15 A	15 annually
60 A	60 annually
90 S	90 six-yearly, last applied autumn 1973
360 S	360 six-yearly, last applied autumn 1973

2. K — Potassium (kg K) annually as muriate of potash:

30
120

Sub plots

3. N — Nitrogen fertiliser, applied cumulatively to test applications 1970-1973 (basal application only in 1974-1977) (kg N):

50
100
150
200

Basal applications: Autumn weedkiller: Glyphosate at 1.7 kg in 220 l. Spring weedkillers: Mecoprop, bromoxynil and ioxynil ('Brittox' at 2.8 l in 220 l).

Seed: Cappelle sown at 200 kg.

Cultivations, etc.:- Autumn weedkiller applied: 10 Oct, 1977. Ploughed: 25 Oct. Spring-tine cultivated: 26 Oct. P and K applied, power harrowed, seed sown: 18 Nov. Rolled: 19 Apr, 1978. N applied: 24 Apr. Spring weedkiller applied: 11 May. Combine harvested: 30 Aug.

NOTE: The crop was sampled in July for take-all and eyespot assessments.

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78/R/CS/24

GRAIN TONNES/HECTARE

***** TABLES OF MEANS *****

K / P	30	120	MEAN
0	3.49	3.57	3.53
15 A	4.20	4.65	4.43
60 A	4.74	5.18	4.96
90 S	4.31	4.55	4.43
360 S	4.64	4.83	4.74
MEAN	4.28	4.56	4.42

N / P	50	100	150	200	MEAN
0	3.40	2.98	3.85	3.89	3.53
15 A	3.79	4.73	4.68	4.51	4.43
60 A	4.48	4.86	5.20	5.29	4.96
90 S	3.98	4.57	4.78	4.39	4.43
360 S	4.07	4.92	5.25	4.71	4.74
MEAN	3.94	4.41	4.75	4.56	4.42

N / K	50	100	150	200	MEAN
30	3.86	4.37	4.43	4.44	4.28
120	4.03	4.46	5.07	4.67	4.56
MEAN	3.94	4.41	4.75	4.56	4.42

P	N / K	50	100	150	200
0	30	3.38	3.14	3.48	3.96
	120	3.41	2.83	4.22	3.82
15 A	30	3.98	4.48	4.17	4.18
	120	3.60	4.97	5.19	4.84
60 A	30	4.27	4.49	4.91	5.28
	120	4.68	5.23	5.48	5.30
90 S	30	3.75	4.79	4.43	4.27
	120	4.21	4.35	5.14	4.51
360 S	30	3.91	4.94	5.19	4.54
	120	4.24	4.91	5.31	4.88

***** STANDARD ERRORS OF DIFFERENCES OF MEANS *****

TABLE	P	K	N	P K
SED	0.133	0.084	0.119	0.188

TABLE	P N	K N	P K N
SED	0.266	0.170	0.395

***** STRATUM STANDARD ERRORS AND COEFFICIENTS OF VARIATION *****

STRATUM	DF	SE	CV%
BLOCK.WP+BLOCK.WP.SP	37	0.377	8.5

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78/R/CS/24

STRAW TONNES/HECTARE

***** TABLES OF MEANS *****

K / P	30	120	MEAN
0	2.39	2.65	2.52
15 A	2.71	3.46	3.08
60 A	3.24	4.08	3.66
90 S	2.70	3.23	2.97
360 S	3.22	3.72	3.47
MEAN	2.85	3.43	3.14

N / P	50	100	150	200	MEAN
0	2.58	1.95	2.92	2.64	2.52
15 A	2.89	3.42	3.14	2.88	3.08
60 A	3.11	3.62	4.02	3.89	3.66
90 S	2.51	3.03	3.28	3.04	2.97
360 S	2.69	3.57	4.01	3.61	3.47
MEAN	2.76	3.12	3.48	3.21	3.14

N / K	50	100	150	200	MEAN
30	2.60	2.85	3.00	2.96	2.85
120	2.91	3.39	3.95	3.47	3.43
MEAN	2.76	3.12	3.48	3.21	3.14

P	N / K	50	100	150	200
0	30	2.37	2.00	2.69	2.51
	120	2.79	1.89	3.15	2.77
15 A	30	3.01	2.96	2.41	2.45
	120	2.76	3.88	3.88	3.30
60 A	30	2.66	3.04	3.69	3.57
	120	3.57	4.20	4.36	4.20
90 S	30	2.46	3.08	2.39	2.89
	120	2.56	2.98	4.18	3.20
360 S	30	2.50	3.17	3.84	3.37
	120	2.89	3.97	4.17	3.86

GRAIN MEAN DM% 84.1

STRAW MEAN DM% 91.0

PLOT AREA HARVESTED 0.00270

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78/W/CS/34

NEMATICIDES IN CROP SEQUENCE

Object: To study the effects of a range of nematicides on incidence of Globodera rostochiensis and yield of potatoes. Residual effects of previous treatments are studied in wheat and barley - Woburn Great Hill II and III.

Sponsor: A.G. Whitehead.

The ninth year, potatoes, wheat, barley.

For previous years see 71/W/CS/34(t), 72/W/CS/34(t) and 73-77/W/CS/34.

Design: 4 series of 3 blocks of 10 plots.

Whole plot dimensions: 4.27 x 9.14.

Treatments: The experiment has four series with the following cropping:-

	1969	1970	1971	1972	1973	1974	1975	1976	1977	1978
Series I	P	P	P*	SB	B	P	P*	W	B	P
Series II	P	P	P	P*	SB	B	P	P*	W	B
Series III	P	B	P	P	P*	SB	B	P	P*	W
Series IV	P	B	P	P	P	P*	SB	B	P	P*

P = potatoes, SB = sugar beet, B = barley, W = wheat

* Treatments applied to potatoes, later crops test residual effects.

Treatments to potatoes (Series I): All combinations of:-

1. NEMACIDE(75) Residues of nematicides applied 1975:

DURSBAN	'Dursban'
PHOXIM	Phoxim
DACAMOX	'Dacamox'

2. RATE Rates of nematicide (kg a.i.):

SINGLE	Single (2.8 kg for 'Dursban' and 'Dacamox': 5.6 kg for phoxim)
DOUBLE	Double (5.6 kg for 'Dursban' and 'Dacamox': 11.2 kg for phoxim)
QUAD	Quadruple (11.2 kg for 'Dursban' and 'Dacamox': 22.4 kg for phoxim)
NONE	plus one untreated plot per block

Treatments to barley (Series II): All combinations of:-

1. NEMACIDE(76) Residues of nematicides applied 1976:

AC 64475	'AC 64475'
CARBOFUR	Carbofuran
PHOXIM	Phoxim

2. RATE Rates of nematicide (kg a.i.):

		'AC 64475'	Carbofuran	Phoxim
SINGLE	Single	2.2	2.8	5.6
DOUBLE	Double	4.4	5.6	11.2
QUAD	Quadruple	8.8	11.2	22.4

NONE plus one untreated plot per block

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78/W/CS/34

Treatments to wheat (Series III): All combinations of:-

1. NEMACIDE(77) Residues of nematicides applied 1977:

AC 64475	'AC 64475'
CARBOFUR	Carbofuran
PHOXIM	Phoxim

2. RATE Rates of nematicide (kg a.i.):

		'AC 64475'	Carbofuran	Phoxim
SINGLE	Single	2.2	2.8	5.6
DOUBLE	Double	4.4	5.6	11.2
QUAD	Quadruple	8.8	11.2	22.4

NONE plus one untreated plot per block

Treatments to potatoes (Series IV): All combinations of:-

1. NEMACIDE(78) Nematicides applied 1978:

BENDIOCA	Bendiocarb
THIOPHAN	Thiophanate methyl
TERBUFOS	Terbufos

2. RATE Rates of nematicide (kg a.i.):

5
10
20

0.0 plus one untreated plot per block

Standard applications:
Potatoes (Series I & IV): Manures: (13:13:20) at 1850 kg. Weedkillers: Linuron at 1.3 kg plus paraquat at 0.42 kg ion in 280 l. Fungicide: Mancozeb at 1.3 kg on three occasions, in 280 l on the first, in 420 l on the second, in 420 l with insecticide on the third. Fentin acetate with maneb ('Fennite A' at 1.7 kg in 280 l). Insecticide: Pirimicarb at 0.14 kg, on one occasion with fungicide, in 420 l.
Wheat (Series III): Manures: Magnesian limestone at 5 t. (10:24:24) at 250 kg, combine drilled. N at 130 kg as 'Nitra-Shell 34'. Weedkillers: Mecoprop, bromoxynil and ioxynil ('Brittox' at 3.5 l in 280 l).
Barley (Series II): Manures: (20:14:14) at 450 kg, combine drilled. Weedkillers: Mecoprop, bromoxynil and ioxynil ('Brittox' at 2.5 l in 280 l).

Seed: Potatoes: Pentland Crown
Wheat: Cappelle, sown at 210 kg
Barley: Porthos, dressed with ethirimol, sown at 160 kg.

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78/W/CS/34

Cultivations, etc.:-

Potatoes (Series I & IV): Ploughed: 28 September, 1977 (Series I), 1 Dec. (Series IV). NPK applied: 5 Apr, 1978. Deep-tine cultivated: 10 Apr. Rotary cultivated, potatoes planted: 17 Apr (Series I). Spring-tine cultivated with crumbler attached: 18 Apr (Series IV). Treatments applied, all plots rotary cultivated, potatoes planted: 19 Apr (Series IV). Fine-tooth harrowed: 11 May. Grubbed and earthed up: 12 May. Weedkillers applied: 15 May. Mancozeb applied: 5 July, 20 July. Mancozeb applied with insecticide: 10 Aug. Fentin acetate with maneb applied: 23 Aug. Haulm mechanically destroyed: 14 Sept. Lifted: 4 Oct.

Wheat (Series III): Magnesian limestone applied: 24 Oct, 1977. Ploughed: 25 Oct. Spring-tine cultivated with crumbler attached, seed sown: 26 Oct. N applied 8 Apr, 1978. Weedkillers applied: 10 May. Combine harvested: 25 Aug.

Barley (Series II): Ploughed: 28 Sept, 1977. Spring-tine cultivated: 8 Mar, 1978. Seed sown: 9 Mar. Weedkillers applied: 17 May. Combine harvested: 18 Aug.

NOTES: (1) Soil samples were taken before applying treatments and after harvest for counts of cysts, eggs and larvae of Globodera rostochiensis.

(2) The yields of barley and wheat (especially those of straw) showed that the performance of the combine harvester was different when working in different directions. An appropriate adjustment has been made by covariance.

(3) Because of bird damage, the yields of two plots of Barley were lost, those with treatment combinations

NEMACIDE(76)	RATE
PHOXIM	SINGLE
CARBOFUR	DOUBLE

Estimated values were used in the analysis.

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78/W/CS/34

POTATOES SERIES I

TOTAL TUBERS TONNES/HECTARE

***** TABLES OF MEANS *****

RATE NEMACIDE(75)	SINGLE	DOUBLE	QUAD	MEAN
DURSBAN	22.5	24.2	29.2	25.3
PHOXIM	27.0	24.5	26.1	25.9
THIOFAN	24.3	25.2	29.3	26.3
MEAN	24.6	24.6	28.2	25.8

RATE NONE 26.9

GRAND MEAN 25.9

***** STANDARD ERRORS OF DIFFERENCES OF MEANS *****

TABLE	NEMACIDE(75)	RATE NEMACIDE(75)	RATE & RATE NONE
SED	1.46	1.46	2.52

***** STRATUM STANDARD ERRORS AND COEFFICIENTS OF VARIATION *****

STRATUM	DF	SE	CV%
BLOCK.WP	18	3.09	11.9

PERCENTAGE WARE 3.81CM (1.5 INCH) RIDDLE

***** TABLES OF MEANS *****

RATE NEMACIDE(75)	SINGLE	DOUBLE	QUAD	MEAN
DURSBAN	88.0	89.5	94.2	90.6
PHOXIM	90.9	88.3	91.9	90.4
THIOFAN	91.7	90.1	93.3	91.7
MEAN	90.2	89.3	93.1	90.9

RATE NONE 92.9

GRAND MEAN 91.1

PLOT AREA HARVESTED 0.00130

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78/W/CS/34

POTATOES SERIES IV

TOTAL TUBERS TONNES/HECTARE

***** TABLES OF MEANS *****

RATE NEMACIDE(78)	5	10	20	MEAN
BENDIOCA	26.2	28.4	25.5	26.7
THIOPHAN	17.8	18.9	21.4	19.4
TERBUFOS	24.0	23.4	26.7	24.7
MEAN	22.7	23.6	24.5	23.6

RATE 0.0 13.5

GRAND MEAN 22.6

***** STANDARD ERRORS OF DIFFERENCES OF MEANS *****

TABLE	NEMACIDE(78)	RATE NEMACIDE(78) RATE & RATE 0.0
SED	1.71	1.71 2.96

***** STRATUM STANDARD ERRORS AND COEFFICIENTS OF VARIATION *****

STRATUM	DF	SE	CV%
BLOCK.WP	18	3.62	16.0

PERCENTAGE WARE 3.81 CM (1.5 INCH) RIDDLE

***** TABLES OF MEANS *****

RATE NEMACIDE(78)	5	10	20	MEAN
BENDIOCA	86.5	86.1	84.5	85.7
THIOPHAN	83.0	88.8	85.7	85.8
TERBUFOS	86.2	84.9	85.2	85.4
MEAN	85.3	86.6	85.1	85.7

RATE 0.0 82.8

GRAND MEAN 85.4

PLOT AREA HARVESTED 0.00130

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78/W/CS/34

BARLEY SERIES II

GRAIN TONNES/HECTARE

***** TABLES OF MEANS *****

RATE NEMACIDE(76)	SINGLE	DOUBLE	QUAD	MEAN
AC 64475	2.59	3.17	2.88	2.88
CARBOFUR	1.93	2.52	2.86	2.43
PHOXIM	2.66	1.66	2.60	2.30
MEAN	2.39	2.45	2.78	2.54

RATE NONE 2.87

GRAND MEAN 2.57

***** STANDARD ERRORS OF DIFFERENCES OF MEANS *****

TABLE	NEMACIDE(76)	RATE NEMACIDE(76)	RATE & RATE NONE
SED	0.397	0.405	0.703

***** STRATUM STANDARD ERRORS AND COEFFICIENTS OF VARIATION *****

STRATUM	DF	SE	CV%
BLOCK.WP	15	0.841	32.7

GRAIN MEAN DM% 84.8

STRAW TONNES/HECTARE

***** TABLES OF MEANS *****

RATE NEMACIDE(76)	SINGLE	DOUBLE	QUAD	MEAN
AC 64475	1.22	1.27	1.22	1.24
CARBOFUR	0.97	0.94	1.13	1.01
PHOXIM	1.15	0.89	1.23	1.09
MEAN	1.12	1.03	1.19	1.11

RATE NONE 1.02

GRAND MEAN 1.11

STRAW MEAN DM% 90.0

PLOT AREA HARVESTED 0.00260

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78/W/CS/34

WINTER WHEAT SERIES III

GRAIN TONNES/HECTARE

***** TABLES OF MEANS *****

RATE NEMACIDE(77)	SINGLE	DOUBLE	QUAD	MEAN
AC 64475	5.60	4.99	5.19	5.26
CARBOFUR	4.98	5.06	5.44	5.16
PHOXIM	5.17	4.08	4.75	4.67
MEAN	5.25	4.71	5.13	5.03

RATE NONE 5.01

GRAND MEAN 5.03

***** STANDARD ERRORS OF DIFFERENCES OF MEANS *****

TABLE	NEMACIDE(77)	RATE NEMACIDE(77)	RATE & RATE NONE
SED	0.246	0.247	0.427

***** STRATUM STANDARD ERRORS AND COEFFICIENTS OF VARIATION *****

STRATUM	DF	SE	CV%
BLOCK.WP	17	0.520	10.3

GRAIN MEAN DM% 82.4

STRAW TONNES/HECTARE

***** TABLES OF MEANS *****

RATE NEMACIDE(77)	SINGLE	DOUBLE	QUAD	MEAN
AC 64475	4.42	3.86	4.25	4.18
CARBOFUR	4.05	4.38	4.35	4.26
PHOXIM	4.06	3.52	3.94	3.84
MEAN	4.18	3.92	4.18	4.09

RATE NONE 3.79

GRAND MEAN 4.06

STRAW MEAN DM% 83.7

PLOT AREA HARVESTED 0.00260

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78/W/CS/35

NEMATICIDES DOSAGE

Object: To study the effects of rates and methods of applying nematicides on Globodera rostochiensis and yield of potatoes, residual effects are also studied - Woburn Stackyard AII.

Sponsor: A.G. Whitehead.

The seventh year, potatoes.

For previous years see 72/W/CS/35(t) and 73-77/W/CS/35.

Design: 3 series of 4 replicates of 18 plots.

Whole plot dimensions: 4.27 x 6.10.

Treatments:-
The experiment has three series with the following cropping:-

	1968-71	1972	1973	1974	1975	1976	1977	1978
Series I	P	P*	SB	B	P*	P	P	P*
Series II	P	P	P*	SB	B	P*	P	P
Series III	P	P	P	P*	SB	B	P*	P

P = Potatoes, SB = Sugar beet, B = Barley

*Treatments applied to potatoes, following two crops test residual effects.

Treatments:
On Series I new sets of treatments were applied which ignore those applied in earlier years. All combinations of:-

1. A NEM — Autumn nematicide:

   NONE — None
   TELONE — 'Telone' at 224 kg

2. S NEM — Spring nematicides:

   ALDICARB
   OXAMYL

3. SNEMRATE — Rates of spring nematicides (kg):

   2.5
   5.0
   7.5
   10.0

   NONE plus two untreated plots per replicate

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78/W/CS/35

Series II & III test all combinations of:-

Treatments: All combinations of:-

1. Varieties and residual effects of varieties:

VARIETY	Series II	
	1973	1976-78
(PC)PC3	Pentland Crown	Pentland Crown
(MP)PC3	Maris Piper	Pentland Crown

VARIETY	Series III	
	1974	1977-78
(PC)PC2	Pentland Crown	Pentland Crown
(MP)PC2	Maris Piper	Pentland Crown

2. Residues of nematicides (kg) (applied to Series II 1976, Series III 1977):

NEM RES(76)	Series II
NEM RES(77)	Series III
NONE	None
	Dazomet (half before, half after autumn ploughing)
DAZ2	220
DAZ3	330
DAZ4	440
DAZ6	660
DAZ2+TE2	Dazomet, 220, 'Telone', 220, all after autumn ploughing
TE4	'Telone' 450 all after autumn ploughing
OX	Oxamyl 5.6 in spring
TE2+OX	'Telone' 220, after autumn ploughing, oxamyl 5.6 in spring

NOTES: (1) Because of the wet autumn all nematicides were applied in the spring for Series III 1977.
(2) On Series I many of the plots were affected by flooding soon after planting. Yields were not taken.

Standard applications: Manures: Magnesian limestone at 5.6 t to Series III only. All Series: (13:13:20) at 1850 kg. Weedkillers: Linuron at 1.3 kg plus paraquat at 0.42 kg ion in 280 l to Series II and III. All series: Fungicide: Mancozeb at 1.3 kg on three occasions in 280 l on the first, in 420 l on the second, in 420 l with insecticide on the third. Fentin acetate with maneb ('Fennite A' at 1.7 kg in 280 l). Insecticide: Pirimicarb at 0.14 kg on one occasion with fungicide, in 420 l. Haulm desiccant: Undiluted BOV at 170 l.

Seed: Pentland Crown.

Cultivations, etc.:-
All Series: Deep-tine cultivated three times: 7 Mar, 1978, 15 Mar, 10 Apr. Insecticide applied: 10 Aug. Fentin acetate with maneb applied: 23 Aug. Haulm mechanically destroyed: 15 Sept. Haulm desiccant applied: 23 Sept.

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78/W/CS/35

Series I: Spring-tine cultivated, 'Telone' injected, spring-tine cultivated with crumbler attached two strokes: 19 Oct, 1977. NPK applied: 10 Apr, 1978. Spring-tine cultivated with crumbler attached: 20 Apr. Aldicarb and oxamyl applied, spring-tine cultivated: 24 Apr. Rotary cultivated, potatoes planted: 25 Apr. Grubbed three times: 17 May, 1 June, 9 July. Earthed up three times: 19 May, 9 June, 9 July. Mancozeb applied: 6 July, 20 July, 10 Aug. Lifted: 27 Sept.

Series II: Spring-tine cultivated: 19 Oct, 1977. NPK applied: 5 Apr, 1978. Rotary cultivated, potatoes planted: 19 Apr. Weedkiller applied: 15 May. Grubbed and earthed up twice: 9 June, 9 July. Mancozeb applied: 5 July, 20 July, 10 Aug. Lifted: 27 Sept.

Series III: Magnesian limestone applied: 8 Nov, 1977. NPK applied: 5 Apr, 1978. Rotary cultivated, potatoes planted: 18 Apr. Weedkiller applied: 15 May. Grubbed and earthed up: 9 June. Mancozeb applied: 5 July, 20 July, 10 Aug. Lifted: 3 Oct.

NOTE: Soil samples were taken before treatments were applied and after harvest for cyst and egg counts of Globodera rostochiensis.

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78/W/CS/35

POTATOES SERIES II

TOTAL TUBERS TONNES/HECTARE

***** TABLES OF MEANS *****

VARIETY NEM RES(76)	(PC)PC3	(MP)PC3	MEAN
NONE	18.9	16.8	17.9
DAZ2	10.3	17.8	14.1
DAZ3	14.5	20.8	17.7
DAZ4	14.6	24.8	19.7
DAZ6	17.7	26.4	22.1
DAZ2+TE2	14.9	20.3	17.6
TE4	11.4	13.8	12.6
OX	12.8	19.8	16.3
TE2+OX	24.4	29.7	27.0
MEAN	15.5	21.1	18.3

***** STANDARD ERRORS OF DIFFERENCES OF MEANS *****

TABLE	VARIETY NEM RES(76)	VARIETY NEM RES(76)
SED	1.33	2.97	4.19

***** STRATUM STANDARD ERRORS AND COEFFICIENTS OF VARIATION *****

STRATUM	DF	SE	CV%
BLOCK.WP	47	5.65	30.9

PERCENTAGE WARE 3.81 CM (1.5 INCH) RIDDLE

***** TABLES OF MEANS *****

VARIETY NEM RES(76)	(PC)PC3	(MP)PC3	MEAN
NONE	91.3	90.7	91.0
DAZ2	79.5	86.3	82.9
DAZ3	86.5	92.6	89.5
DAZ4	85.7	92.6	89.2
DAZ6	88.7	90.7	89.7
DAZ2+TE2	88.5	91.8	90.2
TE4	85.3	89.6	87.5
OX	84.5	89.2	86.9
TE2+OX	92.5	92.6	92.5
MEAN	86.9	90.7	88.8

PLOT AREA HARVESTED 0.00087

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78/W/CS/35

POTATOES SERIES III

TOTAL TUBERS TONNES/HECTARE

***** TABLES OF MEANS *****

VARIETY NEM RES(77)	(PC)PC2	(MP)PC2	MEAN
NONE	16.0	14.7	15.3
DAZ2	19.0	32.6	25.8
DAZ3	20.6	35.3	28.0
DAZ4	22.8	33.5	28.1
DAZ6	30.1	28.7	29.4
DAZ2+TE2	20.0	35.8	27.9
TE4	13.8	26.5	20.2
OX	34.6	33.9	34.3
TE2+OX	36.7	32.2	34.5
MEAN	23.7	30.4	27.0

***** STANDARD ERRORS OF DIFFERENCES OF MEANS *****

TABLE	VARIETY NEM RES(77)		VARIETY NEM RES(77)
SED	1.17	2.63	3.71

***** STRATUM STANDARD ERRORS AND COEFFICIENTS OF VARIATION *****

STRATUM	DF	SE	CV%
BLOCK.WP	47	4.98	18.4

PERCENTAGE WARE 3.81CM (1.5 INCH) RIDDLE

***** TABLES OF MEANS *****

VARIETY NEM RES(77)	(PC)PC2	(MP)PC2	MEAN
NONE	85.8	89.6	87.7
DAZ2	89.5	92.5	91.0
DAZ3	90.3	92.8	91.5
DAZ4	92.9	93.2	93.1
DAZ6	92.7	91.8	92.3
DAZ2+TE2	91.4	92.3	91.8
TE4	88.0	90.9	89.4
OX	91.1	93.0	92.1
TE2+OX	92.0	91.8	91.9
MEAN	90.4	92.0	91.2

PLOT AREA HARVESTED 0.00087

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78/R/CS/41

CULTIVATIONS AND SOIL INVERTEBRATES

Object: To study the effects of cultivations on yield of grass and on populations of soil animals - Road Piece.

Sponsor: C.A. Edwards.

The tenth year, old grass, new grass.

For previous years see 69/R/CS/41(t), 70/R/CS/41(t) and 71-77/R/CS/41.

Design: 4 blocks of 8 plots, randomisation restricted.

Whole plot dimensions: 6.40 x 7.32.

Treatments: Cultivations and reseeding:

CULTIVTN

O	No treatments to old grass (two plots per block)
	Grass ploughed up:-
SF	In spring 1969, reseeded after fewest cultivations needed to produce a seedbed
SM	In spring 1969, reseeded after many seedbed cultivations
AM	In autumn 1969, reseeded spring 1970 after many seedbed cultivations
SFR	Every spring since 1969, reseeded each year after fewest cultivations needed to produce a seedbed
SMR	Every spring since 1969, reseeded each year after many seedbed cultivations
AMR	Every autumn since 1969, reseeded every following spring after many seedbed cultivations

Seeds mixture for 1978: RvP Erecta timothy at 6.7 kg. S.215 meadow fescue at 13.5 kg. Huia white clover at 2.2 kg. Sown at 22.4 kg.

Basal applications: Manures: (0:14:28) at 500 kg in winter. (25:0:16) at 440 kg in spring and at 220 kg after each of the first two cuts.

Cultivations, etc.:- Basal PK applied: 8 Dec, 1977. AMR plots ploughed: 6 Jan, 1978. SFR and SMR plots ploughed: 2 Mar. NK applied: 7 Mar. Rotary harrowed AMR, SMR, SFR plots twice: 18 May, 22 May. Disc harrowed AMR, SMR plots three times, SFR plots once, spike harrowed, rolled and sown AMR, SMR, SFR plots: 22 May. Cut (excluding AMR, SMR, SFR plots): 5 June. NK applied to all cut plots: 7 June. All plots cut: 26 July, 6 Nov. NK to all plots: 4 Aug.

NOTE: Soil cores were taken to assess total soil fauna and quadrats were sampled on each plot for earthworms in autumn and spring.

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78/R/CS/41

1ST CUT (5/6/78) DRY MATTER TONNES/HECTARE

***** TABLES OF MEANS *****

CULTIVTN	0	SF	SM	AM	MEAN
	5.70	5.74	4.82	6.06	5.60

***** STANDARD ERRORS OF DIFFERENCES OF MEANS *****

TABLE	CULTIVTN	
SED	0.398	MIN REP
	0.345	MAX-MIN

	CULTIVTN
MAX-MIN	O V ANY OF REMAINDER
MIN REP	ANY OF REMAINDER

***** STRATUM STANDARD ERRORS AND COEFFICIENTS OF VARIATION *****

STRATUM	DF	SE	CV%
BLOCK.WP	13	0.563	10.1

1ST CUT MEAN DM% 16.4

2ND CUT (26/7/78) DRY MATTER TONNES/HECTARE

***** TABLES OF MEANS *****

CULTIVTN	0	SF	SM	AM	SFR	SMR	AMR	MEAN
	2.49	2.82	2.75	2.84	1.10	1.31	1.26	2.13

***** STANDARD ERRORS OF DIFFERENCES OF MEANS *****

TABLE	CULTIVTN	
SED	0.240	MIN REP
	0.208	MAX-MIN

***** STRATUM STANDARD ERRORS AND COEFFICIENTS OF VARIATION *****

STRATUM	DF	SE	CV%
BLOCK.WP	22	0.340	15.9

2ND CUT MEAN DM% 17.0

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78/R/CS/41

3RD CUT (6/11/78) DRY MATTER TONNES/HECTARE

***** TABLES OF MEANS *****

CULTIVTN	0	SF	SM	AM	SFR	SMR	AMR	MEAN
	3.54	3.73	3.38	3.42	3.83	3.95	4.19	3.70

***** STANDARD ERRORS OF DIFFERENCES OF MEANS *****

TABLE	CULTIVTN	
SED	0.472	MIN REP
	0.409	MAX-MIN

***** STRATUM STANDARD ERRORS AND COEFFICIENTS OF VARIATION *****

STRATUM	DF	SE	CV%
BLOCK.WP	22	0.668	18.1

3RD CUT MEAN DM% 32.5

TOTAL OF 3 CUTS DRY MATTER TONNES/HECTARE

***** TABLES OF MEANS *****

CULTIVTN	0	SF	SM	AM	SFR	SMR	AMR	MEAN
	11.74	12.29	10.95	12.33	4.93	5.26	5.46	9.34

***** STANDARD ERRORS OF DIFFERENCES OF MEANS *****

TABLE	CULTIVTN	
SED	0.623	MIN REP
	0.540	MAX-MIN

***** STRATUM STANDARD ERRORS AND COEFFICIENTS OF VARIATION *****

STRATUM	DF	SE	CV%
BLOCK.WP	22	0.882	9.4

TOTAL OF 3 CUTS MEAN DM% 22.8

PLOT AREA HARVESTED 0.00074

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78/W/CS/66

DAZOMET AND NITROGEN

Object: To study the cumulative effects of dazomet and nitrogen on pathogens and yield of maize grown continuously - Woburn Butt Furlong.

Sponsors: A.J. Barnard, D. Hornby.

The eighth year, maize.

For previous years see 71/W/CS/66(t), 72/W/CS/66(t) and 73-77/W/CS/66.

Design: 4 blocks of 2 plots split into 4.

Whole plot dimensions: 2.13 x 16.5.

Treatments: All combinations of:-

Whole plots

1. DAZOMET	Dazomet (kg per annum) cumulative 1971-78:
0	
450	

Sub plots

2. N	Nitrogen fertiliser (kg N as 'Nitro-Chalk 34') cumulative 1971-78:
50	50 to seedbed
100	100 to seedbed
150	150 to seedbed
100+50	100 to seedbed, 50 five weeks before sowing (before 1978 this treatment received 100 to seedbed, 50 five weeks after emergence)

Basal applications: Manures: Magnesian limestone at 7.5 tonnes, (0:14:28) at 860 kg. Weedkiller: Atrazine at 1.1 kg in 340 l.

Seed: Fronica, sown at 103,300 seeds per ha.

Cultivations, etc.:- Magnesian limestone applied: 18 Nov, 1977. Ploughed: 21 Nov. Spring-tine cultivated with crumbler attached, early N applied, dazomet applied, rotary cultivated twice: 3 Apr, 1978. PK applied, spring-tine cultivated with crumbler attached, seed sown: 12 May. Seedbed N applied: 19 May. Weedkiller applied: 23 May. Hand harvested: 11 Oct.

NOTES: (1) Soil samples were taken before sowing and after harvest for counts of ectoparasitic nematodes.
(2) Counts were made of common smut (Ustilago maydis) and stalk rots (Fusarium spp.).

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78/W/CS/66

FORAGE DRY MATTER TONNES/HECTARE

***** TABLES OF MEANS *****

N DAZOMET	50	100	150	100+50	MEAN
0	8.56	9.89	11.26	11.49	10.30
450	10.61	11.99	13.51	13.70	12.45
MEAN	9.59	10.94	12.38	12.60	11.38

***** STANDARD ERRORS OF DIFFERENCES OF MEANS *****

TABLE	N	DAZOMET* N
SED	0.683	0.966

* WITHIN THE SAME LEVEL OF DAZOMET ONLY

***** STRATUM STANDARD ERRORS AND COEFFICIENTS OF VARIATION *****

STRATUM	DF	SE	CV%
BLOCK.WP.SP	18	1.366	12.0

FORAGE MEAN DM% 25.0

SUB PLOT AREA HARVESTED 0.00039

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78/R/CS/90

CULTIVATIONS FOR CEREALS

Object: To study the effects of different tillage systems for continuous wheat - Meadow.

Sponsors: R. Moffitt, R.D. Prew, C.A. Edwards.

The seventh year, winter wheat.

For previous years see 72-77/R/CS/90.

Design: 3 randomised blocks of 4 plots.

Whole plot dimensions: 13.7 x 33.8.

Treatments

TILLAGE	Tillage systems:-
1	Three passages of the tractor (three-pass system): Ploughed 20 cm deep (8 inches): disc harrowed: drilled.
2	Three-pass system: Chisel-ploughed once 15 cm deep (6 inches): disc harrowed: drilled.
8	Two-pass system: Sprayed with paraquat (0.56 kg ion in 220 l on 3 Oct, 1977): direct drilled.
9	Three-pass system: Rotary digger (N.I.A.E.) cultivated: disc harrowed: drilled.

NOTES: (1) Rotary digger (N.I.A.E.) - depth of working: rotor 10 cm, tines 20 cm.
(2) Treatments 3-7 and 10 were not included in the experiment in 1978.

TILLAGE 1 plots ploughed: 31 Oct, 1977. TILLAGE 2 plots chisel ploughed: 10 Oct. TILLAGE 9 plots rotary dug: 3 Oct. TILLAGE 1, 2 and 9 disc harrowed, sown, harrowed: 7 Nov. TILLAGE 8 direct drilled and disc harrowed in: 7 Nov.

Basal applications: Manures: (10:24:24) at 250 kg, combine drilled. 'Nitra-Shell 34' at 360 kg. Weedkillers: Paraquat at 0.84 kg ion in 220 l, methabenzthiazuron at 3.1 kg in 220 l, and difenzoquat at 0.99 kg with 1 l 'Agral' (a wetting agent) in 220 l.

Seed: Maris Huntsman, sown at 190 kg.

Cultivations, etc.:- Chopped stubble: 19 Sept, 1977. Paraquat applied: 30 Oct. Methabenzthiazuron applied: 11 Nov. N applied: 7 Apr, 1978. Difenzoquat applied: 10 May. Combine harvested: 29 Aug.

NOTES: (1) Disease and pest assessments were made during the season.
(2) Measurements were made on TILLAGE 1 and TILLAGE 8 of the following:- In the soil: total organic matter, organic carbon, organic nitrogen, microbial bio-mass, total soil adenosine triphosphate. In the plants: total nitrogen at flowering.

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78/R/CS/90

GRAIN TONNES/HECTARE

***** TABLES OF MEANS *****

TILLAGE	1	2	8	9	MEAN
	6.40	6.02	4.71	6.44	5.89

***** STANDARD ERRORS OF DIFFERENCES OF MEANS *****

TABLE	TILLAGE
SED	0.410

***** STRATUM STANDARD ERRORS AND COEFFICIENTS OF VARIATION *****

STRATUM	DF	SE	CV%
BLOCK.WP	6	0.502	8.5

GRAIN MEAN DM% 82.9

PLOT AREA HARVESTED 0.01031

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78/W/CS/99

EFFECTS OF BREAKS ON TAKE-ALL

Object: To study the phenomenon of take-all (Gaeumannomyces graminis) decline in barley - Woburn Butt Furlong.

Sponsor: D. Hornby.

The sixth year, barley, spring beans.

For previous years see 72/W/CS/99(t) and 73-77/W/CS/99.

Design: 2 blocks of 9 plots.

Whole plot dimensions: 5.33 x 15.2.

Treatments: Previous crops:-

PREVCROP	1968-71	1972	1973	1974	1975	1976	1977
BBBBBB	B	B	B	B	B	B	B
FBBBBB	B	F	B	B	B	B	B
FBEBBBB	B	F	BE	B	B	B	B
BFBEBBB	B	B	F	BE	B	B	B
BBFBEBB	B	B	B	F	BE	B	B
BBBFBEB	B	B	B	B	F	BE	B
BBBBFBE	B	B	B	B	B	F	BE

B = Barley, BE = Beans, F = Fallow

Standard applications:
All plots: Manures: Magnesian limestone at 7.5 tonnes.
Barley: Manures: (20:14:14) at 450 kg, combine drilled. Weedkillers: Mecoprop, bromoxynil and ioxynil ('Brittox' at 2.5 l in 280 l) applied with Fungicide: Tridemorph at 0.53 kg.
Spring beans: Manures: (0:14:28) at 400 kg. Insecticide: Pirimicarb at 0.14 kg in 280 l.

Seed: Barley: Porthos, dressed with ethirimol, sown at 160 kg.
Spring beans: Minden, sown at 220 kg.

Cultivations, etc.:-
All plots: Magnesian limestone applied: 17 Oct, 1977. Ploughed: 8 Nov. Spring-tine cultivated: 8 Mar, 1978.
Barley: Seed sown: 9 Mar, 1978. Weedkillers and fungicide applied: 15 May. Combine harvested: 18 Aug.
Spring beans: PK applied, seed sown: 15 Mar, 1978. Hand hoed twice: 24 May, 28 June. Insecticide applied: 14 June. Hand harvested: 11 Sept.
Fallow: Rotary cultivated: 16 May, 1978. Hand hoed twice: 24 May, 30 July.

NOTES: (1) Soil samples were taken before sowing and after harvest and plant samples in July for incidence of take-all (Gaeumannomyces graminis).
(2) An examination of the results showed a fertility trend coinciding with the contours of the field. The yields presented have been adjusted for this trend.

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78/W/CS/99

GRAIN TONNES/HECTARE

***** TABLES OF MEANS *****

PREVCROP	BBBBBB	FBBBBB	FBEBBBB	BFBEBBB	BBFBEBB	BBBFBEB	BBBBFBE	MEAN
	3.14	3.68	4.05	4.19	4.06	3.56	4.46	3.88

***** STANDARD ERRORS OF DIFFERENCES OF MEANS *****

TABLE	PREVCROP
SED	0.245

***** STRATUM STANDARD ERRORS AND COEFFICIENTS OF VARIATION *****

STRATUM	DF	SE	CV%
BLOCK.WP	5	0.229	5.9

GRAIN MEAN DM% 83.5

PLOT AREA HARVESTED 0.00434

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78/R/CS/130

EFFECTS OF EARTHWORM INOCULATION

Object: To study the effects of different species of earthworms on yield and other characteristics of grass - Fosters O & E.

Sponsor: J.R. Lofty.

The fifth year,ley.

For previous years see 74-77/R/CS/130.

Design: 3 blocks of 4 plots.

Whole plot dimensions: 8.53 x 9.14.

Treatments: Inoculation with earthworm species in 1974 and 1975:

WORMSPEC

NONE	None
ALLOLOBO	Allolobophora longa at 15,000 per hectare in 1974; 5,000 in 1975
LUMBRICU	Lumbricus terrestris at 5,000 per hectare in 1974 and 1975
SIX SPEC	Six species - A. caliginosa, A. chlorotica, A. longa, A. rosea, L. rubellus, L. terrestris at a total of 35,000 per hectare in 1974, 12,000 in 1975

NOTE: The experiment was ploughed in error in July 1976 and resown in autumn 1976.

Basal applications: Manures: (0:14:28) at 500 kg, (25:0:16) at 440 kg in spring, (25:0:16) at 220 kg after the first two cuts.

Seeds mixture: Combi perennial ryegrass at 8.4 kg, S24 perennial ryegrass at 8.4 kg, S23 perennial ryegrass at 5.6 kg, S26 cocksfoot at 5.6 kg, S37 cocksfoot at 5.6 kg, S48 Timothy at 2.8 kg, Pecora Timothy at 2.8 kg, Huia white clover at 2.8 kg, wild white clover at 2.8 kg. Sown at 45 kg.

Cultivations, etc.:- PK applied: 12 Dec, 1977. NK applied: 2 Mar, 1978. Cut three times: 2 June, 24 July, 30 Oct. NK applied: 6 June, 28 July.

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78/R/CS/130

1ST CUT (2/6/78) DRY MATTER TONNES/HECTARE

***** TABLES OF MEANS *****

WORMSPEC	NONE	ALLOLOBO	LUMBRICU	SIX SPEC	MEAN
	4.04	4.22	4.36	4.16	4.20

***** STANDARD ERRORS OF DIFFERENCES OF MEANS *****

TABLE	WORMSPEC
SED	0.359

***** STRATUM STANDARD ERRORS AND COEFFICIENTS OF VARIATION *****

STRATUM	DF	SE	CV%
BLOCK.WP	6	0.440	10.5

1ST CUT MEAN DM% 18.9

2ND CUT (24/7/78) DRY MATTER TONNES/HECTARE

***** TABLES OF MEANS *****

WORMSPEC	NONE	ALLOLOBO	LUMBRICU	SIX SPEC	MEAN
	2.92	2.66	3.08	2.94	2.90

***** STANDARD ERRORS OF DIFFERENCES OF MEANS *****

TABLE	WORMSPEC
SED	0.277

***** STRATUM STANDARD ERRORS AND COEFFICIENTS OF VARIATION *****

STRATUM	DF	SE	CV%
BLOCK.WP	6	0.340	11.7

2ND CUT MEAN DM% 23.2

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78/R/CS/130

3RD CUT (30/10/78) DRY MATTER TONNES/HECTARE

***** TABLES OF MEANS *****

WORMSPEC	NONE	ALLOLOBO	LUMBRICU	SIX SPEC	MEAN
	2.34	2.37	2.60	2.21	2.38

***** STANDARD ERRORS OF DIFFERENCES OF MEANS *****

TABLE	WORMSPEC
SED	0.195

***** STRATUM STANDARD ERRORS AND COEFFICIENTS OF VARIATION *****

STRATUM	DF	SE	CV%
BLOCK.WP	6	0.239	10.0

3RD CUT MEAN DM% 37.0

TOTAL OF 3 CUTS DRY MATTER TONNES/HECTARE

***** TABLES OF MEANS *****

WORMSPEC	NONE	ALLOLOBO	LUMBRICU	SIX SPEC	MEAN
	9.30	9.26	10.04	9.32	9.48

***** STANDARD ERRORS OF DIFFERENCES OF MEANS *****

TABLE	WORMSPEC
SED	0.412

***** STRATUM STANDARD ERRORS AND COEFFICIENTS OF VARIATION *****

STRATUM	DF	SE	CV%
BLOCK.WP	6	0.505	5.3

TOTAL OF 3 CUTS MEAN DM% 26.3

PLOT AREA HARVESTED 0.00046

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78/R/CS/131

EFFECTS OF EARTHWORM DESTRUCTION

Object: To study the effects of eliminating earthworms on yield and soil structure of old grass - Appletree.

Sponsor: J.R. Lofty.

The fifth year, old grass.

For previous years see 74-77/R/CS/131.

Design: 4 blocks of 4 plots.

Whole plot dimensions: 7.62 x 7.62.

Treatments: Chemicals:-

CHEMICAL	
NONE	None (duplicated)
BENOMYL	Benomyl at 5 kg in 1974 and at 2.5 kg in 1976
CHLORDAN	Chlordane at 10 kg in 1974 only

Basal applications: Manures: Chalk at 7.5 t. (0:14:28) at 500 kg in winter. (25:0:16) at 440 kg in spring and at 220 kg after each of the first two cuts.

Cultivations, etc.:- Chalk applied: 6 Dec, 1977. PK applied: 8 Dec. NK applied: 7 Mar, 1978. Cut three times: 5 June, 24 July, 3 Nov. NK applied: 8 June, 28 July.

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78/R/CS/131

1ST CUT (5/6/78) DRY MATTER TONNES/HECTARE

***** TABLES OF MEANS *****

CHEMICAL	NONE	BENOMYL	CHLORDAN	MEAN
	4.79	5.36	5.09	5.01

***** STANDARD ERRORS OF DIFFERENCES OF MEANS *****

TABLE	CHEMICAL	
SED	0.390	MIN REP
	0.338	MAX-MIN

CHEMICAL
MAX-MIN NONE V ANY OF REMAINDER
MIN REP ANY OF REMAINDER

***** STRATUM STANDARD ERRORS AND COEFFICIENTS OF VARIATION *****

STRATUM	DF	SE	CV%
BLOCK.WP	10	0.552	11.0

1ST CUT MEAN DM% 14.1

2ND CUT (24/7/78) DRY MATTER TONNES/HECTARE

***** TABLES OF MEANS *****

CHEMICAL	NONE	BENOMYL	CHLORDAN	MEAN
	2.76	2.94	2.92	2.85

***** STANDARD ERRORS OF DIFFERENCES OF MEANS *****

TABLE	CHEMICAL	
SED	0.169	MIN REP
	0.146	MAX-MIN

***** STRATUM STANDARD ERRORS AND COEFFICIENTS OF VARIATION *****

STRATUM	DF	SE	CV%
BLOCK.WP	10	0.239	8.4

2ND CUT MEAN DM% 19.1

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78/R/CS/131

3RD CUT (3/11/78) DRY MATTER TONNES/HECTARE

***** TABLES OF MEANS *****

CHEMICAL	NONE	BENOMYL	CHLORDAN	MEAN
	3.90	4.35	3.72	3.97

***** STANDARD ERRORS OF DIFFERENCES OF MEANS *****

TABLE	CHEMICAL	
SED	0.452	MIN REP
	0.392	MAX-MIN

***** STRATUM STANDARD ERRORS AND COEFFICIENTS OF VARIATION *****

STRATUM	DF	SE	CV%
BLOCK.WP	10	0.639	16.1

3RD CUT MEAN DM% 29.8

TOTAL OF 3 CUTS DRY MATTER TONNES/HECTARE

***** TABLES OF MEANS *****

CHEMICAL	NONE	BENOMYL	CHLORDAN	MEAN
	11.45	12.65	11.73	11.82

***** STANDARD ERRORS OF DIFFERENCES OF MEANS *****

TABLE	CHEMICAL	
SED	0.334	MIN REP
	0.289	MAX-MIN

***** STRATUM STANDARD ERRORS AND COEFFICIENTS OF VARIATION *****

STRATUM	DF	SE	CV%
BLOCK.WP	10	0.472	4.0

TOTAL OF 3 CUTS MEAN DM% 21.0

PLOT AREA HARVESTED 0.00046

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78/R/CS/133

CONTROL OF PATHOGENS

Object: To study the effects of a range of chemicals on incidence of pathogens and yield of continuous maize - Long Hoos VI/VII 6.

Sponsors: A.J. Barnard, K.E. Fletcher, D.J. Hooper, D. Hornby, R.T. Plumb, T.D. Williams, J.C. Wilson.

The fifth year, forage maize.

For previous years see 74-77/R/CS/133.

Design: 3 randomised blocks of 9 plots split into 3.

Whole plot dimensions: 2.13 x 18.3.

Treatments: All combinations of:-

Whole plots

1. CHEMICAL		Chemicals applied annually except where stated:
	NONE	None (4 plots per block)
	ALDICARB	Aldicarb, 4.5 kg as granules to seedbed
	BENOMYL	Benomyl, 11.2 kg as dust to seedbed
	DAZOMET	Dazomet, 450 kg as granules in early spring (not applied 1975)
	PHORATE	Phorate, 1.68 kg as granules to seedbed
	BE/DA/PH	Benomyl + dazomet (not applied 1975) + phorate, at above rates and times

Sub plots

2. N — Nitrogen fertiliser (kg N as 'Nitra-Shell 34'):

50
100
150

Basal applications: Manures: Chalk at 2.9 t. (0:14:28) at 630 kg. Weedkillers: Atrazine at 1.7 kg in 220 l.

Seed: Fronica, sown at 100,000 seeds per hectare.

Cultivations, etc.:- PK applied: 23 Nov, 1977. Chalk applied: 25 Nov. Ploughed: 7 Dec. Dazomet applied and these plots only rotary cultivated: 7 Apr, 1978. All other treatments applied, power harrowed: 18 May. Seed sown: 19 May. Weedkiller applied: 22 May. N applied: 14 June. Harvested by hand: 2 Oct.

NOTES: (1) Germination was assessed in June.
(2) Frit fly (Oscinella frit) damage was assessed.
(3) Nitrogen percentages in harvest produce were determined.

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78/R/CS/133

FORAGE MAIZE TONNES/HECTARE

***** TABLES OF MEANS *****

N	50	100	150	MEAN
CHEMICAL				
NONE	9.81	11.84	12.49	11.38
ALDICARB	10.39	12.54	14.04	12.32
BENOMYL	9.78	12.71	12.49	11.66
DAZOMET	11.29	12.72	12.71	12.24
PHORATE	9.56	12.18	12.16	11.30
BE/DA/PH	11.87	12.92	13.56	12.78
MEAN	10.24	12.27	12.77	11.76

***** STANDARD ERRORS OF DIFFERENCES OF MEANS *****

TABLE	CHEMICAL	N	CHEMICAL N	
SED	0.418		0.744	MIN REP
	0.330	0.252	0.589	MAX-MIN
EXCEPT WHEN COMPARING MEANS WITH SAME LEVEL(S) OF:				
CHEMICAL			0.755	MIN REP
			0.377	MAX REP

	CHEMICAL
MAX REP	WITHIN NONE
MAX-MIN	NONE V REMAINDER
MIN REP	REMAINDER

***** STRATUM STANDARD ERRORS AND COEFFICIENTS OF VARIATION *****

STRATUM	DF	SE	CV%
BLOCK.WP	19	0.512	4.4
BLOCK.WP.SP	42	0.924	7.9

GRAIN MEAN DM% 26.0

SUB PLOT AREA HARVESTED 0.00059

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78/R/CS/140

CHEMICAL REFERENCE PLOTS

Object: To study the persistence in soil of four agricultural chemicals applied annually, singly and in combination and their effects on soil microflora and on yield of continuous barley - Long Hoos V 3.

Sponsors: G.G. Briggs, N. Walker, R. MacDonald.

The fifth year, barley.

For previous years see 74-77/R/CS/140.

Design: Two replicates of 2 x 2 x 2 x 2 fully randomised.

Whole plot dimensions: 4.06 x 4.57.

Treatments, applied cumulatively 1974-78 except WEEDKLLR - 1974 and 76 only: All combinations of:-

1. FUNGCIDE Fungicide:

   NONE None
   BENOMYL Benomyl at 4 kg

2. INSCTCDE Insecticide:

   NONE None
   CHLORFEN Chlorfenvinphos at 2 kg

3. NEMACIDE Nematicide:

   NONE None
   ALDICARB Aldicarb at 6 kg

4. WEEDKLLR Weedkiller:

   NONE None
   CHLORTOL Chlortoluron at 2 kg applied 1974 and 1976 only

NOTE: Chemicals were applied to the seedbed on 8 Mar, 1978.

Basal applications: Manures: (0:14:28) at 720 kg, 'Nitro-Chalk 25' at 450 kg. Weedkillers: Dicamba with mecoprop and MCPA ('Tetralex Plus' at 5.6 l in 340 l).

Seed: Porthos (undressed), sown at 160 kg.

Cultivations, etc.:- PK applied: 3 Oct, 1977. Ploughed: 29 Nov. N applied: 6 Mar, 1978. Spring-tine cultivated: 7 Mar. Power harrowed, seed sown: 8 Mar. Weedkillers applied: 10 May. Combine harvested: 18 Aug.

NOTE: Mildew was assessed during the season.

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78/R/CS/140

GRAIN TONNES/HECTARE

***** TABLES OF MEANS *****

INSCTCDE	NONE	CHLORFEN	MEAN
FUNGCIDE			
NONE	4.91	5.17	5.04
BENOMYL	5.07	4.62	4.85
MEAN	4.99	4.90	4.94

NEMACIDE	NONE	ALDICARB	MEAN
FUNGCIDE			
NONE	4.47	5.61	5.04
BENOMYL	4.85	4.84	4.85
MEAN	4.66	5.23	4.94

NEMACIDE	NONE	ALDICARB	MEAN
INSCTCDE			
NONE	4.50	5.48	4.99
CHLORFEN	4.82	4.98	4.90
MEAN	4.66	5.23	4.94

WEEDKLLR	NONE	CHLORTOL	MEAN
FUNGCIDE			
NONE	5.55	4.53	5.04
BENOMYL	4.70	4.99	4.85
MEAN	5.13	4.76	4.94

WEEDKLLR	NONE	CHLORTOL	MEAN
INSCTCDE			
NONE	5.16	4.82	4.99
CHLORFEN	5.10	4.70	4.90
MEAN	5.13	4.76	4.94

WEEDKLLR	NONE	CHLORTOL	MEAN
NEMACIDE			
NONE	5.10	4.22	4.66
ALDICARB	5.16	5.30	5.23
MEAN	5.13	4.76	4.94

INSCTCDE	NONE		CHLORFEN	
NEMACIDE	NONE	ALDICARB	NONE	ALDICARB
FUNGCIDE				
NONE	4.11	5.71	4.82	5.52
BENOMYL	4.89	5.25	4.81	4.44

INSCTCDE	NONE		CHLORFEN	
WEEDKLLR	NONE	CHLORTOL	NONE	CHLORTOL
FUNGCIDE				
NONE	5.60	4.22	5.51	4.84
BENOMYL	4.72	5.42	4.68	4.57

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78/R/CS/140

GRAIN TONNES/HECTARE

***** TABLES OF MEANS *****

NEMACIDE	NONE		ALDICARB	
WEEDKLLR	NONE	CHLORTOL	NONE	CHLORTOL
FUNGCIDE				
NONE	5.44	3.49	5.67	5.56
BENOMYL	4.75	4.95	4.65	5.03

NEMACIDE	NONE		ALDICARB	
WEEDKLLR	NONE	CHLORTOL	NONE	CHLORTOL
INSCTCDE				
NONE	5.00	4.00	5.32	5.63
CHLORFEN	5.19	4.44	5.00	4.96

	NEMACIDE	NONE		ALDICARB	
	WEEDKLLR	NONE	CHLORTOL	NONE	CHLORTOL
FUNGCIDE	INSCTCDE				
NONE	NONE	5.26	2.96	5.93	5.48
	CHLORFEN	5.62	4.03	5.40	5.64
BENOMYL	NONE	4.74	5.05	4.71	5.79
	CHLORFEN	4.77	4.86	4.60	4.27

***** STANDARD ERRORS OF DIFFERENCES OF MEANS *****

TABLE	FUNGCIDE	INSCTCDE	NEMACIDE	WEEDKLLR
SED	0.394	0.394	0.394	0.394

TABLE	FUNGCIDE INSCTCDE	FUNGCIDE NEMACIDE	INSCTCDE NEMACIDE	FUNGCIDE WEEDKLLR
SED	0.557	0.557	0.557	0.557

TABLE	INSCTCDE WEEDKLLR	NEMACIDE WEEDKLLR	FUNGCIDE INSCTCDE NEMACIDE	FUNGCIDE INSCTCDE WEEDKLLR
SED	0.557	0.557	0.787	0.787

TABLE	FUNGCIDE NEMACIDE WEEDKLLR	INSCTCDE NEMACIDE WEEDKLLR	FUNGCIDE INSCTCDE NEMACIDE WEEDKLLR
SED	0.787	0.787	1.113

***** STRATUM STANDARD ERRORS AND COEFFICIENTS OF VARIATION *****

STRATUM	DF	SE	CV%
WP	16	1.113	22.5

GRAIN MEAN DM% 84.6

PLOT AREA HARVESTED 0.00075

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78/R/CS/156

LEATHERJACKET STUDY

Object: To study the effects of protection from bird predation on leatherjacket populations and yield of old grass - Road Piece.

Sponsors: J. Bowden, J.R. Lofty.

The fourth year on this site, first year of new treatments, old grass.

For previous years see 75-76/R/CS/156.

Design: 3 blocks of 6 plots.

Whole plot dimensions: 2.74 x 3.66.

Treatments (ignoring those applied in 1975-1976). The experiment was treated uniformly in 1977, no yields taken:

TREATMNT	
NONE	No protection
GRS SEPT	Long grass allowed to grow on this treatment in September 1977 by omitting the penultimate cut in that year
NET E	Covered by bird-proof netting 13 December 1977 - 8 March 1978
NET M	" " " " " 8 March - 5 May
NET L	" " " " " 5 May - 26 June
NET EML	" " " " " 13 December - 26 June

Basal applications: Manures: (0:14:28) at 500 kg. (25:0:16) at 440 kg in spring and 220 kg after the second cut.

Cultivations, etc.:- PK applied: 8 Dec, 1977. NK applied: 7 Mar, 1978, 4 Aug. Cut: 5 June, 27 July, 6 Nov.

NOTES: (1) An intended application of (25:0:16) in June was not applied.
(2) The plots were sampled for leatherjackets several times during the season.

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78/R/CS/156

1ST CUT (5/6/78) DRY MATTER TONNES/HECTARE

***** TABLES OF MEANS *****

TREATMNT	NONE	GRS	SEPT	NET E	NET M	NET L	NET EML	MEAN
	5.26		5.04	5.47	5.28	5.29	5.42	5.29

***** STANDARD ERRORS OF DIFFERENCES OF MEANS *****

TABLE	TREATMNT
SED	0.405

***** STRATUM STANDARD ERRORS AND COEFFICIENTS OF VARIATION *****

STRATUM	DF	SE	CV%
BLOCK.WP	10	0.496	9.4

1ST CUT MEAN DM% 18.7

2ND CUT (27/7/78) DRY MATTER TONNES/HECTARE

***** TABLES OF MEANS *****

TREATMNT	NONE	GRS	SEPT	NET E	NET M	NET L	NET EML	MEAN
	1.48		1.22	1.47	1.48	1.35	1.65	1.44

***** STANDARD ERRORS OF DIFFERENCES OF MEANS *****

TABLE	TREATMNT
SED	0.176

***** STRATUM STANDARD ERRORS AND COEFFICIENTS OF VARIATION *****

STRATUM	DF	SE	CV%
BLOCK.WP	10	0.216	15.0

2ND CUT MEAN DM% 26.6

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78/R/CS/156

3RD CUT (6/11/78) DRY MATTER TONNES/HECTARE

***** TABLES OF MEANS *****

TREATMNT	NONE	GRS	SEPT	NET E	NET M	NET L	NET EML	MEAN
	3.90		3.50	3.84	3.75	3.74	3.25	3.66

***** STANDARD ERRORS OF DIFFERENCES OF MEANS *****

TABLE	TREATMNT
SED	0.311

***** STRATUM STANDARD ERRORS AND COEFFICIENTS OF VARIATION *****

STRATUM	DF	SE	CV%
BLOCK.WP	10	0.380	10.4

3RD CUT MEAN DM% 34.0

TOTAL OF 3 CUTS DRY MATTER TONNES/HECTARE

***** TABLES OF MEANS *****

TREATMNT	NONE	GRS	SEPT	NET E	NET M	NET L	NET EML	MEAN
	10.64		9.76	10.78	10.51	10.38	10.32	10.40

***** STANDARD ERRORS OF DIFFERENCES OF MEANS *****

TABLE	TREATMNT
SED	0.519

***** STRATUM STANDARD ERRORS AND COEFFICIENTS OF VARIATION *****

STRATUM	DF	SE	CV%
BLOCK.WP	10	0.636	6.1

TOTAL OF 3 CUTS MEAN DM% 26.4

PLOT AREA HARVESTED 0.00037

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78/R/CS/161

INJECTED N

Object: To study the cumulative and residual effects of injecting aqueous urea, with or without a nitrification inhibitor, at three rates and two spacings on the yield and nitrogen uptake of old grass cut for silage - Highfield IX.

Sponsors: F.V. Widdowson, A. Penny, J. Ashworth.

The fourth year, old grass.

For previous years see 76-77/R/CS/161.

Design: 2 randomised blocks of 18 plots split into 2.

Whole plot dimensions: 4.27 x 15.2.

Treatments: All combinations of:-

Whole plots

1. LIQUID N	Liquid nitrogen fertiliser:
UREA	Aqueous solution of urea, no nitrification inhibitor
UREA+INH	Aqueous solution of urea plus a nitrification inhibitor (ammonium trithiocarbonate in 1976, sodium trithiocarbonate in 1977 and 1978)
2. SPACING	Spacing between tines injecting liquid fertiliser:
30 CM	
60 CM	
3. N RATE	Rate of liquid fertiliser, applied as a single annual dressing (kg N):
250	
375	
500	

Sub plots

4. YEARS	Years of application, cumulative when applied:
75+6+8	1975, 1976 and 1978
75+6+7+8	1975, 1976, 1977 and 1978
SOLID N	plus six whole plots given 'Nitro-Chalk 25', dressing divided between cuts (kg N, total/annum):
0	
100	
200	
300	
400	
500	

with sub plots YEARS as above.

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78/R/CS/161

NOTES: (1) The whole area was grazed in 1975, yields were not taken.
(2) Sodium trithiocarbonate was applied at 18 kg to SPACING, 30 CM and at 9 kg to SPACING, 60 CM.

Basal applications: (0:14:28) at 1010 kg. Chalk at 2.9 t.

Cultivations, etc.:- PK applied: 9 Dec, 1977. Chalk applied: 3 Feb, 1978. Aqueous urea and inhibitors injected: 9 Mar. 'Nitro-Chalk' applied six times: 10 Mar, 9 May, 17 June, 11 July, 10 Aug and 8 Sept. Cut: 8 May, 2 June, 10 July, 9 Aug, 8 Sept and 31 Oct.

NOTE: Rates of nitrification of injected N were assessed and grass samples were taken for N determinations.

1ST CUT (5/5/78) DRY MATTER TONNES/HECTARE

***** TABLES OF MEANS *****

SPACING	30 CM	60 CM	MEAN
LIQUID N			
UREA	2.55	2.20	2.37
UREA+INH	2.51	1.96	2.24
MEAN	2.53	2.08	2.31

N RATE	250	375	500	MEAN
LIQUID N				
UREA	2.27	2.41	2.45	2.37
UREA+INH	2.15	2.20	2.36	2.24
MEAN	2.21	2.30	2.40	2.31

N RATE	250	375	500	MEAN
SPACING				
30 CM	2.51	2.49	2.58	2.53
60 CM	1.90	2.12	2.23	2.08
MEAN	2.21	2.30	2.40	2.31

YEARS	75+6+8	75+6+7+8	MEAN
LIQUID N			
UREA	2.50	2.25	2.37
UREA+INH	2.28	2.20	2.24
MEAN	2.39	2.22	2.31

YEARS	75+6+8	75+6+7+8	MEAN
SPACING			
30 CM	2.64	2.41	2.53
60 CM	2.13	2.03	2.08
MEAN	2.39	2.22	2.31

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78/R/CS/161

1ST CUT (5/5/78) DRY MATTER TONNES/HECTARE

***** TABLES OF MEANS *****

YEARS N RATE	75+6+8	75+6+7+8	MEAN
250	2.13	2.28	2.21
375	2.35	2.26	2.30
500	2.69	2.12	2.40
MEAN	2.39	2.22	2.31

SPACING	30 CM			60 CM		
N RATE	250	375	500	250	375	500
LIQUID N						
UREA	2.48	2.51	2.66	2.06	2.31	2.24
UREA+INH	2.55	2.47	2.50	1.75	1.92	2.22

SPACING	30 CM		60 CM	
YEARS	75+6+8	75+6+7+8	75+6+8	75+6+7+8
LIQUID N				
UREA	2.70	2.39	2.31	2.10
UREA+INH	2.59	2.43	1.96	1.97

N RATE	250		375		500	
YEARS	75+6+8	75+6+7+8	75+6+8	75+6+7+8	75+6+8	75+6+7+8
LIQUID N						
UREA	2.21	2.33	2.50	2.32	2.80	2.09
UREA+INH	2.06	2.24	2.19	2.20	2.58	2.14

N RATE	250		375		500	
YEARS	75+6+8	75+6+7+8	75+6+8	75+6+7+8	75+6+8	75+6+7+8
SPACING						
30 CM	2.48	2.55	2.54	2.44	2.92	2.24
60 CM	1.79	2.02	2.15	2.08	2.46	2.00

	N RATE	250		375		500	
	YEARS	75+6+8	75+6+7+8	75+6+8	75+6+7+8	75+6+8	75+6+7+8
LIQUID N	SPACING						
UREA	30 CM	2.47	2.48	2.58	2.43	3.05	2.26
	60 CM	1.95	2.17	2.42	2.21	2.55	1.92
UREA+INH	30 CM	2.49	2.61	2.49	2.45	2.79	2.21
	60 CM	1.63	1.88	1.89	1.95	2.38	2.07

SOLID N	0	100	200	300	400	500	MEAN
YEARS							
75+6+8		1.10	1.44	1.71	2.24	2.42	1.78
75+6+7+8		1.05	1.39	1.94	1.62	1.85	1.57
MEAN	0.58	1.07	1.41	1.83	1.93	2.14	1.49

GRAND MEAN 2.12

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78/R/CS/161

1ST CUT (5/5/78) DRY MATTER TONNES/HECTARE

***** STANDARD ERRORS OF DIFFERENCES OF MEANS *****

TABLE	SOLID N	LIQUID N	SPACING	N RATE
SED	0.148	0.060	0.060	0.074

TABLE	YEARS	LIQUID N SPACING	LIQUID N N RATE	SPACING N RATE
SED	0.054 0.084*	0.085	0.105	0.105

TABLE	SOLID N YEARS	LIQUID N YEARS	SPACING YEARS	N RATE YEARS
SED	0.198	0.081	0.081	0.099
EXCEPT WHEN COMPARING MEANS WITH SAME LEVEL(S) OF:				
SOLID N	0.187			
LIQUID N		0.076		
SPACING			0.076	
N RATE				0.094

TABLE	LIQUID N SPACING N RATE	LIQUID N SPACING YEARS	LIQUID N N RATE YEARS	SPACING N RATE YEARS
SED	0.148	0.115	0.140	0.140
EXCEPT WHEN COMPARING MEANS WITH SAME LEVEL(S) OF:				
LIQUID N.SPACING		0.108		
LIQUID N.N RATE			0.132	
SPACING N RATE				0.132

TABLE	LIQUID N SPACING N RATE YEARS
SED	0.198
EXCEPT WHEN COMPARING MEANS WITH SAME LEVEL(S) OF:	
LIQUID N.SPACING.N RATE	0.187

* USE ONLY IN TABLES INVOLVING SOLID N

***** STRATUM STANDARD ERRORS AND COEFFICIENTS OF VARIATION *****

STRATUM	DF	SE	CV%
BLOCK.WP	16	0.148	7.0
BLOCK.WP.SP	17	0.187	8.8

1ST CUT MEAN DM% 14.2

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2ND CUT (1/6/78) DRY MATTER TONNES/HECTARE

***** TABLES OF MEANS *****

SPACING LIQUID N	30 CM	60 CM	MEAN
UREA	3.64	3.39	3.51
UREA+INH	3.63	3.41	3.52
MEAN	3.63	3.40	3.52

N RATE LIQUID N	250	375	500	MEAN
UREA	3.43	3.55	3.56	3.51
UREA+INH	3.53	3.56	3.49	3.52
MEAN	3.48	3.55	3.53	3.52

N RATE SPACING	250	375	500	MEAN
30 CM	3.55	3.74	3.62	3.63
60 CM	3.41	3.37	3.44	3.40
MEAN	3.48	3.55	3.53	3.52

YEARS LIQUID N	75+6+8	75+6+7+8	MEAN
UREA	3.54	3.49	3.51
UREA+INH	3.56	3.49	3.52
MEAN	3.55	3.49	3.52

YEARS SPACING	75+6+8	75+6+7+8	MEAN
30 CM	3.65	3.61	3.63
60 CM	3.44	3.37	3.40
MEAN	3.55	3.49	3.52

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2ND CUT (1/6/78) DRY MATTER TONNES/HECTARE

***** TABLES OF MEANS *****

YEARS N RATE	75+6+8	75+6+7+8	MEAN
250	3.58	3.38	3.48
375	3.58	3.53	3.55
500	3.48	3.57	3.53
MEAN	3.55	3.49	3.52

SPACING	30 CM			60 CM		
N RATE	250	375	500	250	375	500
LIQUID N						
UREA	3.51	3.77	3.62	3.35	3.33	3.50
UREA+INH	3.58	3.71	3.61	3.47	3.41	3.37

SPACING	30 CM		60 CM	
YEARS	75+6+8	75+6+7+8	75+6+8	75+6+7+8
LIQUID N				
UREA	3.66	3.62	3.42	3.37
UREA+INH	3.65	3.61	3.46	3.37

N RATE	250		375		500	
YEARS	75+6+8	75+6+7+8	75+6+8	75+6+7+8	75+6+8	75+6+7+8
LIQUID N						
UREA	3.56	3.30	3.49	3.61	3.55	3.57
UREA+INH	3.59	3.46	3.67	3.44	3.42	3.56

N RATE	250		375		500	
YEARS	75+6+8	75+6+7+8	75+6+8	75+6+7+8	75+6+8	75+6+7+8
SPACING						
30 CM	3.72	3.38	3.73	3.76	3.52	3.71
60 CM	3.44	3.38	3.44	3.30	3.44	3.43

	N RATE	250		375		500	
	YEARS	75+6+8	75+6+7+8	75+6+8	75+6+7+8	75+6+8	75+6+7+8
LIQUID N	SPACING						
UREA	30 CM	3.77	3.25	3.65	3.89	3.54	3.71
	60 CM	3.36	3.34	3.33	3.33	3.56	3.44
UREA+INH	30 CM	3.66	3.50	3.80	3.63	3.51	3.71
	60 CM	3.52	3.42	3.55	3.26	3.32	3.42

SOLID N YEARS	0	100	200	300	400	500	MEAN
75+6+8		2.45	2.99	3.14	3.04	3.14	2.95
75+6+7+8		2.42	2.89	3.14	3.76	3.69	3.18
MEAN	1.99	2.43	2.94	3.14	3.40	3.42	2.89

GRAND MEAN 3.39

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2ND CUT (1/6/78) DRY MATTER TONNES/HECTARE

***** STANDARD ERRORS OF DIFFERENCES OF MEANS *****

TABLE	SOLID N	LIQUID N	SPACING	N RATE
SED	0.098	0.040	0.040	0.049

TABLE	YEARS	LIQUID N SPACING	LIQUID N N RATE	SPACING N RATE
SED	0.072 0.112*	0.056	0.069	0.069

TABLE	SOLID N YEARS	LIQUID N YEARS	SPACING YEARS	N RATE YEARS
SED	0.202	0.082	0.082	0.101
EXCEPT WHEN COMPARING MEANS WITH SAME LEVEL(S) OF:				
SOLID N	0.250			
LIQUID N		0.102		
SPACING			0.102	
N RATE				0.125

TABLE	LIQUID N SPACING N RATE	LIQUID N SPACING YEARS	LIQUID N N RATE YEARS	SPACING N RATE YEARS
SED	0.098	0.117	0.143	0.143
EXCEPT WHEN COMPARING MEANS WITH SAME LEVEL(S) OF:				
LIQUID N.SPACING		0.144		
LIQUID N.N RATE			0.177	
SPACING N RATE				0.177

TABLE	LIQUID N SPACING N RATE YEARS
SED	0.202
EXCEPT WHEN COMPARING MEANS WITH SAME LEVEL(S) OF:	
LIQUID N.SPACING.N RATE	0.250

***** STRATUM STANDARD ERRORS AND COEFFICIENTS OF VARIATION *****

STRATUM	DF	SE	CV%
BLOCK.WP	16	0.098	2.9
BLOCK.WP.SP	17	0.250	7.4

2ND CUT MEAN DM% 15.4

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78/R/CS/161

3RD CUT (11/7/78) DRY MATTER TONNES/HECTARE

***** TABLES OF MEANS *****

SPACING	30 CM	60 CM	MEAN
LIQUID N			
UREA	1.96	1.97	1.97
UREA+INH	2.02	1.96	1.99
MEAN	1.99	1.97	1.98

N RATE	250	375	500	MEAN
LIQUID N				
UREA	1.53	2.22	2.15	1.97
UREA+INH	1.68	2.13	2.16	1.99
MEAN	1.60	2.18	2.15	1.98

N RATE	250	375	500	MEAN
SPACING				
30 CM	1.40	2.25	2.31	1.99
60 CM	1.81	2.10	1.99	1.97
MEAN	1.60	2.18	2.15	1.98

YEARS	75+6+8	75+6+7+8	MEAN
LIQUID N			
UREA	2.08	1.86	1.97
UREA+INH	2.15	1.83	1.99
MEAN	2.11	1.84	1.98

YEARS	75+6+8	75+6+7+8	MEAN
SPACING			
30 CM	2.13	1.84	1.99
60 CM	2.09	1.84	1.97
MEAN	2.11	1.84	1.98

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3RD CUT (11/7/78) DRY MATTER TONNES/HECTARE

***** TABLES OF MEANS *****

YEARS N RATE	75+6+8	75+6+7+8	MEAN
250	1.61	1.60	1.60
375	2.29	2.06	2.18
500	2.44	1.87	2.15
MEAN	2.11	1.84	1.98

SPACING	30 CM			60 CM		
N RATE	250	375	500	250	375	500
LIQUID N						
UREA	1.28	2.35	2.25	1.78	2.09	2.04
UREA+INH	1.52	2.15	2.37	1.84	2.10	1.94

SPACING	30 CM		60 CM	
YEARS	75+6+8	75+6+7+8	75+6+8	75+6+7+8
LIQUID N				
UREA	2.08	1.84	2.07	1.87
UREA+INH	2.18	1.85	2.11	1.81

N RATE	250		375		500	
YEARS	75+6+8	75+6+7+8	75+6+8	75+6+7+8	75+6+8	75+6+7+8
LIQUID N						
UREA	1.52	1.54	2.31	2.13	2.40	1.89
UREA+INH	1.70	1.65	2.26	2.00	2.47	1.84

N RATE	250		375		500	
YEARS	75+6+8	75+6+7+8	75+6+8	75+6+7+8	75+6+8	75+6+7+8
SPACING						
30 CM	1.39	1.41	2.37	2.13	2.64	1.99
60 CM	1.83	1.79	2.20	2.00	2.24	1.75

	N RATE	250		375		500	
	YEARS	75+6+8	75+6+7+8	75+6+8	75+6+7+8	75+6+8	75+6+7+8
LIQUID N	SPACING						
UREA	30 CM	1.29	1.27	2.42	2.29	2.54	1.97
	60 CM	1.75	1.82	2.21	1.97	2.26	1.82
UREA+INH	30 CM	1.49	1.55	2.33	1.97	2.73	2.01
	60 CM	1.92	1.75	2.19	2.02	2.21	1.67

SOLID N	0	100	200	300	400	500	MEAN
YEARS							
75+6+8		1.02	1.37	1.63	2.12	2.38	1.71
75+6+7+8		0.89	1.22	1.61	1.82	2.24	1.56
MEAN	1.03	0.96	1.30	1.62	1.97	2.31	1.53

GRAND MEAN 1.88

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3RD CUT (11/7/78) DRY MATTER TONNES/HECTARE

***** STANDARD ERRORS OF DIFFERENCES OF MEANS *****

TABLE	SOLID N	LIQUID N	SPACING	N RATE
SED	0.176	0.072	0.072	0.088

TABLE	YEARS	LIQUID N SPACING	LIQUID N N RATE	SPACING N RATE
SED	0.067 0.104*	0.101	0.124	0.124

TABLE	SOLID N YEARS	LIQUID N YEARS	SPACING YEARS	N RATE YEARS
SED	0.241	0.098	0.098	0.120
EXCEPT WHEN COMPARING MEANS WITH SAME LEVEL(S) OF:				
SOLID N	0.233			
LIQUID N		0.095		
SPACING			0.095	
N RATE				0.116

TABLE	LIQUID N SPACING N RATE	LIQUID N SPACING YEARS	LIQUID N N RATE YEARS	SPACING N RATE YEARS
SED	0.176	0.139	0.170	0.170
EXCEPT WHEN COMPARING MEANS WITH SAME LEVEL(S) OF:				
LIQUID N.SPACING		0.134		
LIQUID N.N RATE			0.164	
SPACING N RATE				0.164

TABLE	LIQUID N SPACING N RATE YEARS
SED	0.241
EXCEPT WHEN COMPARING MEANS WITH SAME LEVEL(S) OF:	
LIQUID N.SPACING.N RATE	0.233

***** STRATUM STANDARD ERRORS AND COEFFICIENTS OF VARIATION *****

STRATUM	DF	SE	CV%
BLOCK.WP	16	0.176	9.4
BLOCK.WP.SP	17	0.233	12.4

3RD CUT MEAN DM% 20.4

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4TH CUT (8/8/78) DRY MATTER TONNES/HECTARE

***** TABLES OF MEANS *****

SPACING LIQUID N	30 CM	60 CM	MEAN
UREA	1.18	1.23	1.21
UREA+INH	1.11	1.26	1.19
MEAN	1.15	1.25	1.20

N RATE LIQUID N	250	375	500	MEAN
UREA	0.78	1.29	1.55	1.21
UREA+INH	0.82	1.27	1.47	1.19
MEAN	0.80	1.28	1.51	1.20

N RATE SPACING	250	375	500	MEAN
30 CM	0.71	1.16	1.57	1.15
60 CM	0.89	1.40	1.45	1.25
MEAN	0.80	1.28	1.51	1.20

YEARS LIQUID N	75+6+8	75+6+7+8	MEAN
UREA	1.19	1.23	1.21
UREA+INH	1.17	1.20	1.19
MEAN	1.18	1.21	1.20

YEARS SPACING	75+6+8	75+6+7+8	MEAN
30 CM	1.15	1.14	1.15
60 CM	1.21	1.29	1.25
MEAN	1.18	1.21	1.20

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4TH CUT (8/8/78) DRY MATTER TONNES/HECTARE

***** TABLES OF MEANS *****

YEARS	75+6+8	75+6+7+8	MEAN
N RATE			
250	0.81	0.79	0.80
375	1.25	1.31	1.28
500	1.48	1.54	1.51
MEAN	1.18	1.21	1.20

SPACING	30 CM			60 CM		
N RATE	250	375	500	250	375	500
LIQUID N						
UREA	0.70	1.22	1.63	0.86	1.36	1.48
UREA+INH	0.71	1.10	1.51	0.92	1.44	1.42

SPACING	30 CM		60 CM	
YEARS	75+6+8	75+6+7+8	75+6+8	75+6+7+8
LIQUID N				
UREA	1.21	1.16	1.17	1.29
UREA+INH	1.09	1.12	1.25	1.28

N RATE	250		375		500	
YEARS	75+6+8	75+6+7+8	75+6+8	75+6+7+8	75+6+8	75+6+7+8
LIQUID N						
UREA	0.76	0.80	1.26	1.33	1.55	1.55
UREA+INH	0.85	0.78	1.25	1.30	1.41	1.52

N RATE	250		375		500	
YEARS	75+6+8	75+6+7+8	75+6+8	75+6+7+8	75+6+8	75+6+7+8
SPACING						
30 CM	0.78	0.63	1.15	1.17	1.52	1.62
60 CM	0.84	0.95	1.35	1.45	1.45	1.46

	N RATE	250		375		500	
	YEARS	75+6+8	75+6+7+8	75+6+8	75+6+7+8	75+6+8	75+6+7+8
LIQUID N	SPACING						
UREA	30 CM	0.73	0.68	1.26	1.19	1.64	1.62
	60 CM	0.80	0.92	1.26	1.47	1.46	1.49
UREA+INH	30 CM	0.83	0.59	1.05	1.16	1.40	1.62
	60 CM	0.87	0.98	1.44	1.44	1.43	1.42

SOLID N	0	100	200	300	400	500	MEAN
YEARS							
75+6+8		0.94	1.34	1.28	1.43	1.42	1.28
75+6+7+8		0.67	0.97	1.19	1.23	1.29	1.07
MEAN	0.76	0.81	1.16	1.23	1.33	1.36	1.11

GRAND MEAN 1.19

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4TH CUT (8/8/78) DRY MATTER TONNES/HECTARE

***** STANDARD ERRORS OF DIFFERENCES OF MEANS *****

TABLE	SOLID N	LIQUID N	SPACING	N RATE
SED	0.069	0.028	0.028	0.034

TABLE	YEARS	LIQUID N SPACING	LIQUID N N RATE	SPACING N RATE
SED	0.035 0.055*	0.040	0.049	0.049

TABLE	SOLID N YEARS	LIQUID N YEARS	SPACING YEARS	N RATE YEARS
SED	0.110	0.045	0.045	0.055
EXCEPT WHEN COMPARING MEANS WITH SAME LEVEL(S) OF:				
SOLID N	0.122			
LIQUID N		0.050		
SPACING			0.050	
N RATE				0.061

TABLE	LIQUID N SPACING N RATE	LIQUID N SPACING YEARS	LIQUID N N RATE YEARS	SPACING N RATE YEARS
SED	0.069	0.064	0.078	0.078
EXCEPT WHEN COMPARING MEANS WITH SAME LEVEL(S) OF:				
LIQUID N.SPACING		0.070		
LIQUID N.N RATE			0.086	
SPACING N RATE				0.086

TABLE	LIQUID N SPACING N RATE YEARS
SED	0.110
EXCEPT WHEN COMPARING MEANS WITH SAME LEVEL(S) OF:	
LIQUID N.SPACING.N RATE	0.122

***** STRATUM STANDARD ERRORS AND COEFFICIENTS OF VARIATION *****

STRATUM	DF	SE	CV%
BLOCK.WP	16	0.069	5.8
BLOCK.WP.SP	17	0.122	10.2

4TH CUT MEAN DM% 17.3

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5TH CUT (8/9/78) DRY MATTER TONNES/HECTARE

***** TABLES OF MEANS *****

SPACING	30 CM	60 CM	MEAN
LIQUID N			
UREA	0.69	0.79	0.74
UREA+INH	0.62	0.77	0.70
MEAN	0.65	0.78	0.72

N RATE	250	375	500	MEAN
LIQUID N				
UREA	0.46	0.73	1.03	0.74
UREA+INH	0.43	0.66	0.99	0.70
MEAN	0.45	0.70	1.01	0.72

N RATE	250	375	500	MEAN
SPACING				
30 CM	0.42	0.53	1.01	0.65
60 CM	0.47	0.86	1.01	0.78
MEAN	0.45	0.70	1.01	0.72

YEARS	75+6+8	75+6+7+8	MEAN
LIQUID N			
UREA	0.79	0.69	0.74
UREA+INH	0.74	0.65	0.70
MEAN	0.77	0.67	0.72

YEARS	75+6+8	75+6+7+8	MEAN
SPACING			
30 CM	0.71	0.60	0.65
60 CM	0.83	0.73	0.78
MEAN	0.77	0.67	0.72

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5TH CUT (8/9/78) DRY MATTER TONNES/HECTARE

***** TABLES OF MEANS *****

YEARS N RATE	75+6+8	75+6+7+8	MEAN
250	0.49	0.40	0.45
375	0.73	0.66	0.70
500	1.08	0.94	1.01
MEAN	0.77	0.67	0.72

SPACING	30 CM			60 CM		
N RATE	250	375	500	250	375	500
LIQUID N						
UREA	0.43	0.58	1.05	0.48	0.88	1.02
UREA+INH	0.41	0.48	0.97	0.46	0.84	1.01

SPACING	30 CM		60 CM	
YEARS	75+6+8	75+6+7+8	75+6+8	75+6+7+8
LIQUID N				
UREA	0.73	0.65	0.86	0.72
UREA+INH	0.69	0.55	0.80	0.74

N RATE	250		375		500	
YEARS	75+6+8	75+6+7+8	75+6+8	75+6+7+8	75+6+8	75+6+7+8
LIQUID N						
UREA	0.51	0.40	0.78	0.68	1.09	0.98
UREA+INH	0.48	0.39	0.67	0.65	1.08	0.91

N RATE	250		375		500	
YEARS	75+6+8	75+6+7+8	75+6+8	75+6+7+8	75+6+8	75+6+7+8
SPACING						
30 CM	0.48	0.37	0.56	0.50	1.08	0.94
60 CM	0.51	0.43	0.89	0.83	1.08	0.95

	N RATE	250		375		500	
	YEARS	75+6+8	75+6+7+8	75+6+8	75+6+7+8	75+6+8	75+6+7+8
LIQUID N	SPACING						
UREA	30 CM	0.49	0.37	0.65	0.51	1.04	1.06
	60 CM	0.54	0.43	0.92	0.84	1.13	0.90
UREA+INH	30 CM	0.47	0.36	0.47	0.49	1.12	0.82
	60 CM	0.49	0.42	0.87	0.81	1.03	1.00

SOLID N	0	100	200	300	400	500	MEAN
YEARS							
75+6+8		0.74	0.99	1.07	1.21	1.29	1.00
75+6+7+8		0.56	0.94	1.23	1.13	1.05	0.98
MEAN	0.63	0.65	0.96	1.15	1.17	1.17	0.95

GRAND MEAN 0.81

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5TH CUT (8/9/78) DRY MATTER TONNES/HECTARE

***** STANDARD ERRORS OF DIFFERENCES OF MEANS *****

TABLE	SOLID N	LIQUID N	SPACING	N RATE
SED	0.086	0.035	0.035	0.043

TABLE	YEARS	LIQUID N SPACING	LIQUID N N RATE	SPACING N RATE
SED	0.033 0.052*	0.050	0.061	0.061

TABLE	SOLID N YEARS	LIQUID N YEARS	SPACING YEARS	N RATE YEARS
SED	0.119	0.048	0.048	0.059
EXCEPT WHEN COMPARING MEANS WITH SAME LEVEL(S) OF:				
SOLID N	0.116			
LIQUID N		0.047		
SPACING			0.047	
N RATE				0.058

TABLE	LIQUID N SPACING N RATE	LIQUID N SPACING YEARS	LIQUID N N RATE YEARS	SPACING N RATE YEARS
SED	0.086	0.068	0.084	0.084
EXCEPT WHEN COMPARING MEANS WITH SAME LEVEL(S) OF:				
LIQUID N.SPACING		0.067		
LIQUID N.N RATE			0.082	
SPACING N RATE				0.082

TABLE	LIQUID N SPACING N RATE YEARS
SED	0.119
EXCEPT WHEN COMPARING MEANS WITH SAME LEVEL(S) OF:	
LIQUID N.SPACING.N RATE	0.116

***** STRATUM STANDARD ERRORS AND COEFFICIENTS OF VARIATION *****

STRATUM	DF	SE	CV%
BLOCK.WP	16	0.086	10.6
BLOCK.WP.SP	17	0.116	14.3

5TH CUT MEAN DM% 18.1

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6TH CUT (31/10/78) DRY MATTER TONNES/HECTARE

***** TABLES OF MEANS *****

SPACING	30 CM	60 CM	MEAN
LIQUID N			
UREA	0.18	0.32	0.25
UREA+INH	0.15	0.30	0.22
MEAN	0.17	0.31	0.24

N RATE	250	375	500	MEAN
LIQUID N				
UREA	0.08	0.22	0.45	0.25
UREA+INH	0.08	0.20	0.39	0.22
MEAN	0.08	0.21	0.42	0.24

N RATE	250	375	500	MEAN
SPACING				
30 CM	0.07	0.10	0.32	0.17
60 CM	0.09	0.32	0.52	0.31
MEAN	0.08	0.21	0.42	0.24

YEARS	75+6+8	75+6+7+8	MEAN
LIQUID N			
UREA	0.23	0.28	0.25
UREA+INH	0.23	0.21	0.22
MEAN	0.23	0.24	0.24

YEARS	75+6+8	75+6+7+8	MEAN
SPACING			
30 CM	0.14	0.19	0.17
60 CM	0.33	0.29	0.31
MEAN	0.23	0.24	0.24

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6TH CUT (31/10/78) DRY MATTER TONNES/HECTARE

***** TABLES OF MEANS *****

YEARS N RATE	75+6+8	75+6+7+8	MEAN
250	0.09	0.08	0.08
375	0.20	0.22	0.21
500	0.41	0.43	0.42
MEAN	0.23	0.24	0.24

SPACING	30 CM			60 CM		
N RATE	250	375	500	250	375	500
LIQUID N						
UREA	0.08	0.12	0.35	0.08	0.33	0.55
UREA+INH	0.07	0.09	0.29	0.10	0.31	0.48

SPACING	30 CM		60 CM	
YEARS	75+6+8	75+6+7+8	75+6+8	75+6+7+8
LIQUID N				
UREA	0.14	0.23	0.32	0.32
UREA+INH	0.14	0.16	0.33	0.26

N RATE	250		375		500	
YEARS	75+6+8	75+6+7+8	75+6+8	75+6+7+8	75+6+8	75+6+7+8
LIQUID N						
UREA	0.07	0.09	0.21	0.24	0.40	0.50
UREA+INH	0.10	0.07	0.19	0.20	0.41	0.36

N RATE	250		375		500	
YEARS	75+6+8	75+6+7+8	75+6+8	75+6+7+8	75+6+8	75+6+7+8
SPACING						
30 CM	0.08	0.07	0.08	0.12	0.25	0.40
60 CM	0.09	0.09	0.32	0.32	0.57	0.47

N RATE		250		375		500	
YEARS		75+6+8	75+6+7+8	75+6+8	75+6+7+8	75+6+8	75+6+7+8
LIQUID N	SPACING						
UREA	30 CM	0.07	0.09	0.12	0.11	0.22	0.49
	60 CM	0.07	0.09	0.30	0.36	0.58	0.52
UREA+INH	30 CM	0.09	0.04	0.05	0.13	0.27	0.31
	60 CM	0.11	0.09	0.33	0.28	0.56	0.41

SOLID N	0	100	200	300	400	500	MEAN
YEARS							
75+6+8		0.30	0.28	0.43	0.68	0.69	0.48
75+6+7+8		0.13	0.39	0.73	0.54	0.65	0.49
MEAN	0.15	0.21	0.33	0.58	0.61	0.67	0.43

GRAND MEAN 0.31

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6TH CUT (31/10/78) DRY MATTER TONNES/HECTARE

***** STANDARD ERRORS OF DIFFERENCES OF MEANS *****

TABLE	SOLID N	LIQUID N	SPACING	N RATE
SED	0.077	0.032	0.032	0.039

TABLE	YEARS	LIQUID N SPACING	LIQUID N N RATE	SPACING N RATE
SED	0.022 0.034*	0.045	0.055	0.055

TABLE	SOLID N YEARS	LIQUID N YEARS	SPACING YEARS	N RATE YEARS
SED	0.094	0.038	0.038	0.047
EXCEPT WHEN COMPARING MEANS WITH SAME LEVEL(S) OF:				
SOLID N	0.076			
LIQUID N		0.031		
SPACING			0.031	
N RATE				0.038

TABLE	LIQUID N SPACING N RATE	LIQUID N SPACING YEARS	LIQUID N N RATE YEARS	SPACING N RATE YEARS
SED	0.077	0.054	0.066	0.066
EXCEPT WHEN COMPARING MEANS WITH SAME LEVEL(S) OF:				
LIQUID N.SPACING		0.044		
LIQUID N.N RATE			0.054	
SPACING N RATE				0.054

TABLE	LIQUID N SPACING N RATE YEARS
SED	0.094
EXCEPT WHOCOMPARING MEANS WITH SAME LEVEL(S) OF:	
LIQUID N.SPACING.N RATE	0.076

***** STRATUM STANDARD ERRORS AND COEFFICIENTS OF VARIATION *****

STRATUM	DF	SE	CV%
BLOCK.WP	16	0.077	24.9
BLOCK.WP.SP	17	0.076	24.5

6TH CUT MEAN DM% 29.4

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TOTAL OF 6 CUTS DRY MATTER TONNES/HECTARE

***** TABLES OF MEANS *****

SPACING	30 CM	60 CM	MEAN
LIQUID N			
UREA	10.20	9.92	10.06
UREA+INH	10.03	9.67	9.85
MEAN	10.12	9.79	9.96

N RATE	250	375	500	MEAN
LIQUID N				
UREA	8.55	10.43	11.19	10.06
UREA+INH	8.69	10.01	10.86	9.85
MEAN	8.62	10.22	11.02	9.96

N RATE	250	375	500	MEAN
SPACING				
30 CM	8.66	10.28	11.41	10.12
60 CM	8.58	10.17	10.64	9.79
MEAN	8.62	10.22	11.02	9.96

YEARS	75+6+8	75+6+7+8	MEAN
LIQUID N			
UREA	10.33	9.79	10.06
UREA+INH	10.13	9.58	9.85
MEAN	10.23	9.68	9.96

YEARS	75+6+8	75+6+7+8	MEAN
SPACING			
30 CM	10.43	9.80	10.12
60 CM	10.03	9.56	9.79
MEAN	10.23	9.68	9.96

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78/R/CS/161

TOTAL OF 6 CUTS DRY MATTER TONNES/HECTARE

***** TABLES OF MEANS *****

YEARS N RATE	75+6+8	75+6+7+8	MEAN
250	8.71	8.53	8.62
375	10.40	10.05	10.22
500	11.58	10.47	11.02
MEAN	10.23	9.68	9.96

SPACING	30 CM			60 CM		
N RATE	250	375	500	250	375	500
LIQUID N						
UREA	8.48	10.55	11.57	8.62	10.31	10.82
UREA+INH	8.84	10.01	11.25	8.54	10.02	10.46

SPACING	30 CM		60 CM	
YEARS	75+6+8	75+6+7+8	75+6+8	75+6+7+8
LIQUID N				
UREA	10.51	9.89	10.15	9.68
UREA+INH	10.35	9.72	9.91	9.43

N RATE	250		375		500	
YEARS	75+6+8	75+6+7+8	75+6+8	75+6+7+8	75+6+8	75+6+7+8
LIQUID N						
UREA	8.64	8.46	10.56	10.30	11.79	10.60
UREA+INH	8.78	8.60	10.23	9.79	11.37	10.34

N RATE	250		375		500	
YEARS	75+6+8	75+6+7+8	75+6+8	75+6+7+8	75+6+8	75+6+7+8
SPACING						
30 CM	8.92	8.40	10.44	10.12	11.92	10.89
60 CM	8.50	8.66	10.35	9.98	11.24	10.04

	N RATE	250		375		500	
	YEARS	75+6+8	75+6+7+8	75+6+8	75+6+7+8	75+6+8	75+6+7+8
LIQUID N	SPACING						
UREA	30 CM	8.81	8.15	10.69	10.41	12.03	11.10
	60 CM	8.46	8.77	10.43	10.19	11.55	10.09
UREA+INH	30 CM	9.03	8.65	10.19	9.82	11.82	10.68
	60 CM	8.53	8.54	10.27	9.76	10.93	10.00

SOLID N	0	100	200	300	400	500	MEAN
YEARS							
75+6+8		6.55	8.41	9.27	10.72	11.35	9.26
75+6+7+8		5.73	7.80	9.84	10.09	10.77	8.84
MEAN	5.14	6.14	8.11	9.55	10.41	11.06	8.40

GRAND MEAN 9.69

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78/R/CS/161

TOTAL OF 6 CUTS DRY MATTER TONNES/HECTARE

***** STANDARD ERRORS OF DIFFERENCES OF MEANS *****

TABLE	SOLID N	LIQUID N	SPACING	N RATE
SED	0.258	0.105	0.105	0.129

TABLE	YEARS	LIQUID N SPACING	LIQUID N N RATE	SPACING N RATE
SED	0.095 0.147*	0.149	0.182	0.182

TABLE	SOLID N YEARS	LIQUID N YEARS	SPACING YEARS	N RATE YEARS
SED	0.347	0.142	0.142	0.174
EXCEPT WHEN COMPARING MEANS WITH SAME LEVEL(S) OF:				
SOLID N	0.328			
LIQUID N		0.134		
SPACING			0.134	
N RATE				0.164

TABLE	LIQUID N SPACING N RATE	LIQUID N SPACING YEARS	LIQUID N N RATE YEARS	SPACING N RATE YEARS
SED	0.258	0.200	0.245	0.245
EXCEPT WHEN COMPARING MEANS WITH SAME LEVEL(S) OF:				
LIQUID N.SPACING		0.190		
LIQUID N.N RATE			0.232	
SPACING N RATE				0.232

TABLE	LIQUID N SPACING N RATE YEARS
SED	0.347
EXCEPT WHEN COMPARING MEANS WITH SAME LEVEL(S) OF:	
LIQUID N.SPACING.N RATE	
	0.328

* USE ONLY IN TABLES INVOLVING SOLID N

***** STRATUM STANDARD ERRORS AND COEFFICIENTS OF VARIATION *****

STRATUM	DF	SE	CV%
BLOCK.WP	16	0.258	2.7
BLOCK.WP.SP	17	0.328	3.4

TOTAL OF 6 CUTS MEAN DM% 19.1

SUBPLOT AREA HARVESTED 0.00141

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78/R/CS/162

TIMES OF APPLYING ACARICIDE

Object: To study the effects of applying the acaricide endosulfan, on the incidence of ryegrass mosaic virus and its mite vectors and on the yield of Italian and perennial ryegrass sown separately and in mixtures - Claycroft.

Sponsors: R.W. Gibson, R.T. Plumb.

The fourth year, ryegrass. First year of new scheme.

For previous years see 75-77/R/CS/162.

Design: Originally 4 randomised blocks of 18 plots - 9 plots Italian ryegrass and 9 plots perennial ryegrass. In 1978 plots previously in Italian ryegrass were sown in summer, plots previously in perennial ryegrass were fallowed, after failure of autumn 1977 sowings, to be resown in autumn 1978. Design for each sowing: 6 blocks of 6 plots with ACARICID on blocks.

Whole plot dimensions: 4.27 x 6.10.

Treatments (to summer sowing only): All combinations of:-

Blocks

1. ACARICID	Acaricide:
NONE	None
ENDOSULF	Endosulfan

Plots

2. VARIETY	Varieties and mixtures (proportions by weight)
I5 -	Italian ryegrass (RvP)
- P5	Perennial ryegrass (S24)
I1 P4	20% RvP : 80% S24
I2 P3	40% RvP : 60% S24
I3 P2	60% RvP : 40% S24
I4 P1	80% RvP : 20% S24

NOTES: (1) All plots were sown at 30 kg.
(2) Endosulfan was applied at 0.28 kg in 340 l on 18 Aug, 1978.

Standard applications:
To all plots: Manures: (0:14:28) at 500 kg. (25:0:16) at 810 kg. Weedkiller: Paraquat at 0.84 kg ion in 220 l. Irrigation: TOTAL 25 mm (12.5 mm on 14 and 19 June).
To plots sown in summer 1978: Manures: (25:0:16) at 600 kg after the first cut.
To plots fallow in summer 1978: Weedkiller: Paraquat at 0.56 kg ion in 220 l.

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78/R/CS/162

Cultivations, etc.:-
To all plots: Autumn PK applied: 6 Jan, 1978. Spring NK applied: 7 Mar. Weedkiller applied: 4 May. Heavy spring-tine cultivated twice: 18 May. Rotary harrowed three times: 22 May. Rolled: 23 May.
To plots sown in summer 1978: Seed sown by hand, harrowed, and rolled in: 6 June. Grass cut: 15 Aug and 31 Oct. NK applied: 16 Aug.
To plots fallow in summer 1978: Weedkiller applied: 26 Sept, 1977. Heavy spring-tine cultivated twice, and rotary harrowed: 3 Oct. Seed sown by hand, and spring-tine cultivated in: 14 Oct. The crop failed to establish adequately and was destroyed in May 1978 (see above). Cultivated with thistle bar: 20 July.

NOTE: Mite numbers, virus incidence and sward composition were assessed during the season.

78/R/CS/162

1ST CUT (15/8/78) DRY MATTER TONNES/HECTARE

***** TABLES OF MEANS *****

VARIETY	I5 -	- P5	I1 P4	I2 P3	I3 P2	I4 P1	MEAN
	1.79	1.74	1.62	1.44	1.72	1.82	1.69

***** STANDARD ERRORS OF DIFFERENCES OF MEANS *****

TABLE	VARIETY
SED	0.276

***** STRATUM STANDARD ERRORS AND COEFFICIENTS OF VARIATION *****

STRATUM	DF	SE	CV%
BLOCK.WP	25	0.478	28.3

1ST CUT MEAN DM% 12.5

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78/R/CS/162

2ND CUT (31/10/78) DRY MATTER TONNES/HECTARE

***** TABLES OF MEANS *****

VARIETY ACARICID	I5 -	- P5	I1 P4	I2 P3	I3 P2	I4 P1	MEAN
NONE	3.34	3.20	3.43	3.32	3.25	3.42	3.33
ENDOSULF	3.10	3.06	3.22	3.48	3.38	3.08	3.22
MEAN	3.22	3.13	3.32	3.40	3.31	3.25	3.27

***** STANDARD ERRORS OF DIFFERENCES OF MEANS *****

TABLE	ACARICID	VARIETY	ACARICID VARIETY
SED	0.064	0.165	0.223
EXCEPT WHEN COMPARING MEANS WITH SAME LEVEL(S) OF:			
ACARICID			0.234

***** STRATUM STANDARD ERRORS AND COEFFICIENTS OF VARIATION *****

STRATUM	DF	SE	CV%
BLOCK.WP	20	0.286	8.7

TOTAL OF 2 CUTS DRY MATTER TONNES/HECTARE

***** TABLES OF MEANS *****

VARIETY	I5 -	- P5	I1 P4	I2 P3	I3 P2	I4 P1	MEAN
	5.01	4.87	4.95	4.84	5.04	5.07	4.96

***** STANDARD ERRORS OF DIFFERENCES OF MEANS *****

TABLE	VARIETY
SED	0.299

***** STRATUM STANDARD ERRORS AND COEFFICIENTS OF VARIATION *****

STRATUM	DF	SE	CV%
BLOCK.WP	25	0.519	10.4

TOTAL OF 2 CUTS MEAN DM% 17.3

PLOT AREA HARVESTED 0.00062

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78/R/CS/165

SCLEROTINIA CONTROL

Object: To study the effects of two fungicides and paraquat on the incidence of Sclerotinia and on yield of red and white clover - Little Knott I.

Sponsor: J.F. Jenkyn.

The first year of treatments, red and white clover.

Design: 2 randomised blocks of 30 plots.

Whole plot dimensions: 2.13 x 3.05.

Treatments: All combinations of:-

1. VARIETY — Varieties and their resistance to Sclerotinia trifoliorum:

BLANC WR	Blanca, white clover, resistant
SABED WS	Sabeda, white clover, susceptible
HUNGA RR	Hungaropoly, red clover, resistant
SABTO RS	Sabtoron, red clover, susceptible

2. TREATMNT — Chemical sprays and timing:

NONE	None
IPROD E	Iprodione early period, 26 Sept, 1977 and 18 Oct
IPROD M	Iprodione mid period, 18 Oct, and 29 Nov
IPROD L	Iprodione late period, 29 Nov, and 16 Dec
IPROD A	Iprodione all periods, 26 Sept, 18 Oct, 29 Nov, 16 Dec, 1977 and 15 Feb, 1978
BENOMY A	Benomyl all periods, 26 Sept, 18 Oct, 29 Nov, 16 Dec, 1977 and 15 Feb, 1978
PARAQ W	Paraquat in winter, 29 Nov, 1977

plus two extra treatments:

EXTRA

SABED PS	Sabeda, sprayed paraquat in spring, 20 Mar, 1978
SABTO PS	Sabtoron, sprayed paraquat in spring, 20 Mar, 1978

NOTE: Chemical treatments applied as follows:- Iprodione at 0.50 kg in 340 l. Benomyl at 0.50 kg in 340 l (both applied with 'Spreadite', a wetting agent, at 0.25 kg). Paraquat at 0.56 kg ion in 340 l.

Basal applications: None.

Cultivations, etc.:- Cut three times: 13 June, 1978, 4 Aug, 27 Sept. Previous crops: 1976 Fallow, 1977 Clover.

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78/R/CS/165

1ST CUT (13/6/78) DRY MATTER TONNES/HECTARE

***** TABLES OF MEANS *****

VARIETY TREATMNT	BLANC WR	SABED WS	HUNGA RR	SABTO RS	MEAN
NONE	3.41	3.16	5.26	5.39	4.31
IPROD E	3.85	3.05	6.59	5.23	4.68
IPROD M	3.58	3.13	6.62	5.53	4.71
IPROD L	3.56	3.84	6.00	5.44	4.71
IPROD A	3.86	3.82	6.96	5.75	5.10
BENOMY A	4.86	4.17	7.44	5.86	5.58
PARAQ W	3.30	3.09	6.23	4.83	4.36
MEAN	3.78	3.47	6.44	5.43	4.78

EXTRA	SABED PS	SABTO PS
	2.36	4.60

GRAND MEAN 4.69

***** STANDARD ERRORS OF DIFFERENCES OF MEANS *****

TABLE	EXTRA	TREATMNT	VARIETY	TREATMNT VARIETY & EXTRA
SED	0.739	0.370	0.279	0.739

***** STRATUM STANDARD ERRORS AND COEFFICIENTS OF VARIATION *****

STRATUM	DF	SE	CV%
BLOCK.WP	29	0.739	15.8

1ST CUT MEAN DM% 16.2

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78/R/CS/165

2ND CUT (4/8/78) DRY MATTER TONNES/HECTARE

***** TABLES OF MEANS *****

VARIETY / TREATMNT	BLANC WR	SABED WS	HUNGA RR	SABTO RS	MEAN
NONE	2.26	1.93	3.79	4.26	3.06
IPROD E	1.89	1.46	4.07	3.76	2.80
IPROD M	1.88	1.62	4.34	4.15	3.00
IPROD L	1.82	1.96	4.09	4.25	3.03
IPROD A	1.76	1.83	4.36	4.15	3.03
BENOMY A	1.76	1.87	4.02	4.88	3.13
PARAQ W	2.31	1.94	4.83	4.24	3.33
MEAN	1.95	1.80	4.22	4.24	3.05

EXTRA	SABED PS	SABTO PS
	1.86	4.07

GRAND MEAN 3.05

***** STANDARD ERRORS OF DIFFERENCES OF MEANS *****

TABLE	EXTRA	TREATMNT	VARIETY	TREATMNT VARIETY & EXTRA
SED	0.373	0.187	0.141	0.373

***** STRATUM STANDARD ERRORS AND COEFFICIENTS OF VARIATION *****

STRATUM	DF	SE	CV%
BLOCK.WP	29	0.373	12.3

2ND CUT MEAN DM% 16.1

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78/R/CS/165

3RD CUT (27/9/78) DRY MATTER TONNES/HECTARE

***** TABLES OF MEANS *****

VARIETY TREATMNT	BLANC WR	SABED WS	HUNGA RR	SABTO RS	MEAN
NONE	1.57	1.61	1.60	1.77	1.64
IPROD E	1.13	1.68	1.56	1.94	1.58
IPROD M	1.39	1.46	1.95	1.90	1.68
IPROD L	1.59	1.45	1.85	1.61	1.63
IPROD A	2.11	1.81	1.78	1.65	1.83
BENOMY A	1.92	1.48	1.05	2.18	1.66
PARAQ W	1.16	1.49	1.82	1.92	1.60
MEAN	1.55	1.57	1.66	1.85	1.66

EXTRA	SABED PS	SABTO PS
	1.29	1.84

GRAND MEAN 1.65

***** STANDARD ERRORS OF DIFFERENCES OF MEANS *****

TABLE	EXTRA	TREATMNT	VARIETY	TREATMNT VARIETY & EXTRA
SED	0.228	0.114	0.086	0.228

***** STRATUM STANDARD ERRORS AND COEFFICIENTS OF VARIATION *****

STRATUM	DF	SE	CV%
BLOCK.WP	29	0.228	13.8

3RD CUT MEAN DM% 20.8

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78/R/CS/165

TOTAL OF 3 CUTS DRY MATER TONNES/HECTARE

***** TABLES OF MEANS *****

VARIETY TREATMNT	BLANC WR	SABED WS	HUNGA RR	SABTO RS	MEAN
NONE	7.25	6.70	10.66	11.42	9.01
IPROD E	6.87	6.19	12.23	10.92	9.05
IPROD M	6.85	6.21	12.91	11.58	9.39
IPROD L	6.97	7.26	11.94	11.29	9.37
IPROD A	7.73	7.46	13.10	11.54	9.96
BENOMY A	8.54	7.53	12.52	12.91	10.38
PARAQ W	6.77	6.52	12.89	10.99	9.29
MEAN	7.28	6.84	12.32	11.52	9.49

EXTRA	SABED PS	SABTO PS
	5.51	10.52

GRAND MEAN 9.39

***** STANDARD ERRORS OF DIFFERENCES OF MEANS *****

TABLE	EXTRA	TREATMNT	VARIETY	TREATMNT VARIETY & EXTRA
SED	0.980	0.490	0.371	0.980

***** STRATUM STANDARD ERRORS AND COEFFICIENTS OF VARIATION *****

STRATUM	DF	SE	CV%
BLOCK.WP	29	0.980	10.4

TOTAL OF 3 CUTS MEAN DM% 17.7

PLOT AREA HARVESTED 0.00028

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78/W/CS/174

SOWING DATES AND CCN

Object: To study the residual effects of sowing date and the effect of a nematicide and a soil sterilant on the incidence of cereal cyst-nematode (Heterodera avenae) (CCN) and the yield of three cereals in a soil known to contain a fungal parasite of the nematode - Woburn, Butt Close.

Sponsor: B.R. Kerry.

The fourth year, spring wheat, barley and oats.

For previous years see 75/W/M/1 and 76-77/W/CS/174.

Design: Single replicate of 36 plots split into 2.

Whole plot dimensions: 2.13 x 6.70.

Treatments: All combinations of:-

Whole plots

1. CROP(76) Crop (cumulative 1975-76):

   WHEAT
   BARLEY
   OATS

2. SOW DATE(76) Sowing date (cumulative 1975-76):

   AUTUMN
   SPRING

3. NEMACIDE(78) Nematicide (cumulative 1975-78):

   NONE None
   OXAMYL Oxamyl at 8.8 kg

4. CROP(78) Crop in 1977 & 1978, (all spring sown):

   WHEAT
   BARLEY
   OATS

Sub plots

5. STERILNT Sterilant

   NONE None
   FORMALIN Formalin at 3000 l in 109000 l. To SOW DATE SPRING in 1976 & 1978 only. To SOW DATE AUTUMN in 1977 only.

Basal applications: Manures: (20:14:14) at 400 kg, combine drilled. Weedkillers: Mecoprop, bromoxynil and ioxynil ('Brittox' at 2.5 kg in 340 l).

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78/W/CS/174

Irrigation (mm water):

25 May	25.0
1 June	25.0
15 June	25.0
22 June	21.0
29 June	8.0
13 July	20.0
20 July	25.0
27 July	17.0
Total	166.0

Seed: Wheat: Sicco, sown at 200 kg.
Barley: Julia, seed dressed ethirimol, sown at 160 kg.
Oats: Manod, sown at 200 kg.

Cultivations, etc.:- All cereals: Ploughed: 28 Sept, 1977. Spring-tine cultivated: 9 Mar, 1978. Formalin applied: 13 Mar. Oxamyl applied, rotary cultivated, spring-tine cultivated with crumbler attached, seed sown: 31 Mar. Weedkiller applied: 15 May. Combine harvested: 5 Sept.

NOTES: (1) Yields were not taken of the oats because of severe damage to plots by grazing bullocks.
(2) Soil samples were taken in March for estimates of Heterodera avenae cysts and eggs.
(3) Soil and plant samples were taken from plots not treated with oxamyl at weekly intervals from 6 June to 21 August and on 12 September after harvest for estimates of numbers of females and eggs of H. avenae and the amount of fungal parasitism of these stages.
(4) Soil samples were taken in June from plots treated with oxamyl for counts of unhatched H. avenae.

GRAIN TONNES/HECTARE

***** TABLES OF MEANS *****

SOW DATE(76)	AUTUMN	SPRING	MEAN
CROP(76)			
WHEAT	2.19	3.30	2.74
BARLEY	2.81	3.07	2.94
OATS	2.92	3.22	3.07
MEAN	2.64	3.20	2.92

NEMACIDE(78)	NONE	OXAMYL	MEAN
CROP(76)			
WHEAT	1.95	3.54	2.74
BARLEY	1.64	4.24	2.94
OATS	2.36	3.79	3.07
MEAN	1.98	3.86	2.92

NEMACIDE(78)	NONE	OXAMYL	MEAN
SOW DATE(76)			
AUTUMN	1.53	3.75	2.64
SPRING	2.43	3.96	3.20
MEAN	1.98	3.86	2.92

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78/W/CS/174

GRAIN TONNES/HECTARE

***** TABLES OF MEANS *****

CROP(78) / CROP(76)	WHEAT	BARLEY	MEAN
WHEAT	1.93	3.56	2.74
BARLEY	2.20	3.68	2.94
OATS	2.55	3.60	3.07
MEAN	2.23	3.61	2.92

CROP(78) / SOW DATE(76)	WHEAT	BARLEY	MEAN
AUTUMN	2.08	3.20	2.64
SPRING	2.37	4.02	3.20
MEAN	2.23	3.61	2.92

CROP(78) / NEMACIDE(78)	WHEAT	BARLEY	MEAN
NONE	1.48	2.49	1.98
OXAMYL	2.97	4.74	3.86
MEAN	2.23	3.61	2.92

STERILNT / CROP(76)	NONE	FORMALIN	MEAN
WHEAT	2.37	3.12	2.74
BARLEY	2.49	3.39	2.94
OATS	2.79	3.35	3.07
MEAN	2.55	3.29	2.92

STERILNT / SOW DATE(76)	NONE	FORMALIN	MEAN
AUTUMN	2.48	2.80	2.64
SPRING	2.62	3.77	3.20
MEAN	2.55	3.29	2.92

STERILNT / NEMACIDE(78)	NONE	FORMALIN	MEAN
NONE	1.69	2.28	1.98
OXAMYL	3.42	4.29	3.86
MEAN	2.55	3.29	2.92

STERILNT / CROP(78)	NONE	FORMALIN	MEAN
WHEAT	1.96	2.49	2.23
BARLEY	3.15	4.08	3.61
MEAN	2.55	3.29	2.92

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78/W/CS/174

GRAIN TONNES/HECTARE

***** TABLES OF MEANS *****

SOW DATE(76)	AUTUMN		SPRING	
NEMACIDE(78)	NONE	OXAMYL	NONE	OXAMYL
CROP(76)				
WHEAT	1.73	2.65	2.16	4.43
BARLEY	1.23	4.39	2.06	4.09
OATS	1.63	4.21	3.08	3.36

SOW DATE(76)	AUTUMN		SPRING	
CROP(78)	WHEAT	BARLEY	WHEAT	BARLEY
CROP(76)				
WHEAT	1.25	3.13	2.61	3.98
BARLEY	2.40	3.22	2.00	4.14
OATS	2.59	3.25	2.50	3.95

NEMACIDE(78)	NONE		OXAMYL	
CROP(78)	WHEAT	BARLEY	WHEAT	BARLEY
CROP(76)				
WHEAT	1.42	2.48	2.45	4.63
BARLEY	1.20	2.09	3.20	5.28
OATS	1.81	2.90	3.28	4.29

NEMACIDE(78)	NONE		OXAMYL	
CROP(78)	WHEAT	BARLEY	WHEAT	BARLEY
SOW DATE(76)				
AUTUMN	1.23	1.83	2.93	4.57
SPRING	1.72	3.15	3.02	4.90

SOW DATE(76)	AUTUMN		SPRING	
STERILNT	NONE	FORMALIN	NONE	FORMALIN
CROP(76)				
WHEAT	2.07	2.31	2.67	3.92
BARLEY	2.45	3.17	2.54	3.61
OATS	2.93	2.91	2.65	3.79

NEMACIDE(78)	NONE		OXAMYL	
STERILNT	NONE	FORMALIN	NONE	FORMALIN
CROP(76)				
WHEAT	1.53	2.37	3.21	3.87
BARLEY	1.38	1.91	3.60	4.87
OATS	2.16	2.56	3.43	4.14

NEMACIDE(78)	NONE		OXAMYL	
STERILNT	NONE	FORMALIN	NONE	FORMALIN
SOW DATE(76)				
AUTUMN	1.49	1.57	3.48	4.02
SPRING	1.89	2.98	3.35	4.57

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GRAIN TONNES/HECTARE

***** TABLES OF MEANS *****

CROP(78)	WHEAT		BARLEY	
STERILNT	NONE	FORMALIN	NONE	FORMALIN
CROP(76)				
WHEAT	1.68	2.18	3.06	4.05
BARLEY	1.97	2.43	3.01	4.35
OATS	2.22	2.87	3.36	3.83

CROP(78)	WHEAT		BARLEY	
STERILNT	NONE	FORMALIN	NONE	FORMALIN
SOW DATE(76)				
AUTUMN	1.94	2.22	3.02	3.38
SPRING	1.97	2.77	3.27	4.78

CROP(78)	WHEAT		BARLEY	
STERILNT	NONE	FORMALIN	NONE	FORMALIN
NEMACIDE(78)				
NONE	1.29	1.66	2.08	2.89
OXAMYL	2.62	3.33	4.21	5.26

***** STANDARD ERRORS OF DIFFERENCES OF MEANS *****

TABLE	STERILNT	CROP(76) STERILNT	SOW DATE(76) STERILNT	NEMACIDE(78) STERILNT
SED	0.208	0.360*	0.294*	0.294*

TABLE	CROP(78) STERILNT	CROP(76) SOW DATE(76) STERILNT	CROP(76) NEMACIDE(78) STERILNT	SOW DATE(76) NEMACIDE(78) STERILNT
SED	0.294*	0.509*	0.509*	0.415*

TABLE	CROP(76) CROP(78) STERILNT	SOW DATE(76) CROP(78) STERILNT	NEMACIDE(78) CROP(78) STERILNT
SED	0.509*	0.415*	0.415*

* USE ONLY TO COMPARE THE TWO LEVELS OF STERILNT FOR THE SAME LEVEL(S) OF THE OTHER FACTOR(S)

***** STRATUM STANDARD ERRORS AND COEFFICIENTS OF VARIATION *****

STRATUM	DF	SE	CV%
WP.SP	9	0.719	24.6

GRAIN MEAN DM% 77.5

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STRAW TONNES/HECTARE

***** TABLES OF MEANS *****

SOW DATE(76)	AUTUMN	SPRING	MEAN
CROP(76)			
WHEAT	2.52	3.16	2.84
BARLEY	2.99	3.01	3.00
OATS	2.83	3.53	3.18
MEAN	2.78	3.23	3.00

NEMACIDE(78)	NONE	OXAMYL	MEAN
CROP(76)			
WHEAT	2.08	3.60	2.84
BARLEY	2.08	3.92	3.00
OATS	2.41	3.94	3.18
MEAN	2.19	3.82	3.00

NEMACIDE(78)	NONE	OXAMYL	MEAN
SOW DATE(76)			
AUTUMN	1.94	3.62	2.78
SPRING	2.44	4.02	3.23
MEAN	2.19	3.82	3.00

CROP(78)	WHEAT	BARLEY	MEAN
CROP(76)			
WHEAT	3.11	2.57	2.84
BARLEY	3.38	2.62	3.00
OATS	3.64	2.71	3.18
MEAN	3.38	2.63	3.00

CROP(78)	WHEAT	BARLEY	MEAN
SOW DATE(76)			
AUTUMN	3.26	2.30	2.78
SPRING	3.49	2.97	3.23
MEAN	3.38	2.63	3.00

CROP(78)	WHEAT	BARLEY	MEAN
NEMACIDE(78)			
NONE	2.39	1.99	2.19
OXAMYL	4.36	3.28	3.82
MEAN	3.38	2.63	3.00

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STRAW TONNES/HECTARE

***** TABLES OF MEANS *****

STERILNT / CROP(76)	NONE	FORMALIN	MEAN
WHEAT	2.57	3.11	2.84
BARLEY	2.36	3.64	3.00
OATS	2.78	3.57	3.18
MEAN	2.57	3.44	3.00

STERILNT / SOW DATE(76)	NONE	FORMALIN	MEAN
AUTUMN	2.70	2.86	2.78
SPRING	2.44	4.02	3.23
MEAN	2.57	3.44	3.00

STERILNT / NEMACIDE(78)	NONE	FORMALIN	MEAN
NONE	1.80	2.58	2.19
OXAMYL	3.34	4.30	3.82
MEAN	2.57	3.44	3.00

STERILNT / CROP(78)	NONE	FORMALIN	MEAN
WHEAT	2.80	3.95	3.38
BARLEY	2.33	2.93	2.63
MEAN	2.57	3.44	3.00

SOW DATE(76)	AUTUMN		SPRING	
NEMACIDE(78)	NONE	OXAMYL	NONE	OXAMYL
CROP(76)				
WHEAT	2.01	3.03	2.15	4.17
BARLEY	1.97	4.00	2.19	3.83
OATS	1.83	3.82	2.99	4.06

SOW DATE(76)	AUTUMN		SPRING	
CROP(78)	WHEAT	BARLEY	WHEAT	BARLEY
CROP(76)				
WHEAT	2.84	2.20	3.37	2.94
BARLEY	3.70	2.28	3.05	2.96
OATS	3.23	2.42	4.06	2.99

NEMACIDE(78)	NONE		OXAMYL	
CROP(78)	WHEAT	BARLEY	WHEAT	BARLEY
CROP(76)				
WHEAT	2.24	1.91	3.98	3.22
BARLEY	2.52	1.63	4.23	3.61
OATS	2.41	2.41	4.88	3.00

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STRAW TONNES/HECTARE

***** TABLES OF MEANS *****

NEMACIDE(78)	NONE		OXAMYL	
CROP(78)	WHEAT	BARLEY	WHEAT	BARLEY
SOW DATE(76)				
AUTUMN	2.37	1.51	4.15	3.09
SPRING	2.42	2.47	4.57	3.46

SOW DATE(76)	AUTUMN		SPRING	
STERILNT	NONE	FORMALIN	NONE	FORMALIN
CROP(76)				
WHEAT	2.57	2.47	2.57	3.75
BARLEY	2.66	3.31	2.06	3.96
OATS	2.87	2.78	2.68	4.37

NEMACIDE(78)	NONE		OXAMYL	
STERILNT	NONE	FORMALIN	NONE	FORMALIN
CROP(76)				
WHEAT	1.90	2.25	3.23	3.97
BARLEY	1.53	2.63	3.19	4.64
OATS	1.97	2.85	3.59	4.29

NEMACIDE(78)	NONE		OXAMYL	
STERILNT	NONE	FORMALIN	NONE	FORMALIN
SOW DATE(76)				
AUTUMN	1.84	2.04	3.56	3.67
SPRING	1.76	3.12	3.11	4.93

CROP(78)	WHEAT		BARLEY	
STERILNT	NONE	FORMALIN	NONE	FORMALIN
CROP(76)				
WHEAT	2.79	3.43	2.34	2.79
BARLEY	2.50	4.25	2.22	3.03
OATS	3.11	4.18	2.44	2.97

CROP(78)	WHEAT		BARLEY	
STERILNT	NONE	FORMALIN	NONE	FORMALIN
SOW DATE(76)				
AUTUMN	3.15	3.36	2.25	2.35
SPRING	2.45	4.54	2.42	3.51

CROP(78)	WHEAT		BARLEY	
STERILNT	NONE	FORMALIN	NONE	FORMALIN
NEMACIDE(78)				
NONE	1.88	2.90	1.72	2.25
OXAMYL	3.73	5.00	2.95	3.61

STRAW MEAN DM% 51.7

PLOT AREA HARVESTED 0.00041

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78/R/CS/180

FACTORS AFFECTING YIELD

Object: To study the residual effects on wheat of a range of treatments applied to field beans in 1976 - Little Hoos.

Sponsors: R. Bardner, G.G. Briggs, A.J. Cockbain, J.M. Day, K.E. Fletcher, B.J. Legg, J. McEwen, G.A. Salt, H.R. Simpson, R.M. Webb, J.F. Witty.

The third year, winter wheat.

For previous years see 76-77/R/CS/180.

Design: Single replicate of 2 x 2 x 2 x 2 x 2 x 2 x 2 in eight blocks of 2 plots split into 8.

Whole plot dimensions: 9.14 x 40.2.

Treatments applied in 1976: All combinations of:-

Whole plots

1. IRRIGATN(76) Irrigation:

NONE	None
FULL	Full (291 mm)

Sub plots

2. N(76) Nitrogen fertiliser:

0	0
150+150	150 kg N to seedbed and 150 kg N at flowering

3. ALDICARB(76) Aldicarb to seedbed (kg):

0
10

4. DIELDRIN(76) Dieldrin to seedbed (kg):

0.0
2.5

5. BENOMYL(76) Benomyl to seedbed (kg):

0
15

6. FENITROT(76) Fenitrothion foliar spray (kg):

0.0
1.5

7. PIRIMICA(76) Pirimicarb foliar spray (kg):

0.00
0.14

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Basal applications: Manures: (0:20:20) at 310 kg, combine drilled. 'Nitra-Shell 34' at 360 kg. Weedkillers: Dicamba with mecoprop and MCPA ('Banlene Plus' at 4.9 l in 220 l).

Seed: Atou, sown at 210 kg.

Cultivations, etc.:- Ploughed: 23 Sept, 1977. Power harrowed: 17 Oct. Seed sown: 20 Oct. N applied: 25 Apr, 1978. Weedkiller applied: 8 May. Combine harvested: 13 Sept.

GRAIN TONNES/HECTARE

***** TABLES OF MEANS *****

N(76)	0	150+150	MEAN
IRRIGATN(76)			
NONE	6.58	6.25	6.41
FULL	6.62	6.65	6.64
MEAN	6.60	6.45	6.52

ALDICARB(76)	0	10	MEAN
IRRIGATN(76)			
NONE	6.46	6.36	6.41
FULL	6.67	6.60	6.64
MEAN	6.57	6.48	6.52

ALDICARB(76)	0	10	MEAN
N(76)			
0	6.63	6.57	6.60
150+150	6.51	6.39	6.45
MEAN	6.57	6.48	6.52

DIELDRIN(76)	0.0	2.5	MEAN
IRRIGATN(76)			
NONE	6.37	6.46	6.41
FULL	6.58	6.69	6.64
MEAN	6.47	6.57	6.52

DIELDRIN(76)	0.0	2.5	MEAN
N(76)			
0	6.58	6.62	6.60
150+150	6.37	6.53	6.45
MEAN	6.47	6.57	6.52

DIELDRIN(76)	0.0	2.5	MEAN
ALDICARB(76)			
0	6.59	6.55	6.57
10	6.36	6.60	6.48
MEAN	6.47	6.57	6.52

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GRAIN TONNES/HECTARE

***** TABLES OF MEANS *****

BENOMYL(76)	0	15	MEAN
IRRIGATN(76)			
NONE	6.43	6.39	6.41
FULL	6.66	6.61	6.64
MEAN	6.55	6.50	6.52

BENOMYL(76)	0	15	MEAN
N(76)			
0	6.55	6.64	6.60
150+150	6.54	6.36	6.45
MEAN	6.55	6.50	6.52

BENOMYL(76)	0	15	MEAN
ALDICARB(76)			
0	6.57	6.57	6.57
10	6.52	6.44	6.48
MEAN	6.55	6.50	6.52

BENOMYL(76)	0	15	MEAN
DIELDRIN(76)			
0.0	6.49	6.46	6.47
2.5	6.60	6.55	6.57
MEAN	6.55	6.50	6.52

FENITROT(76)	0.0	1.5	MEAN
IRRIGATN(76)			
NONE	6.49	6.33	6.41
FULL	6.66	6.61	6.64
MEAN	6.58	6.47	6.52

FENITROT(76)	0.0	1.5	MEAN
N(76)			
0	6.61	6.59	6.60
150+150	6.54	6.36	6.45
MEAN	6.58	6.47	6.52

FENITROT(76)	0.0	1.5	MEAN
ALDICARB(76)			
0	6.61	6.53	6.57
10	6.55	6.41	6.48
MEAN	6.58	6.47	6.52

FENITROT(76)	0.0	1.5	MEAN
DIELDRIN(76)			
0.0	6.52	6.43	6.47
2.5	6.63	6.52	6.57
MEAN	6.58	6.47	6.52

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GRAIN TONNES/HECTARE

***** TABLES OF MEANS *****

FENITROT(76)	0.0	1.5	MEAN
BENOMYL(76)			
0	6.60	6.49	6.55
15	6.55	6.45	6.50
MEAN	6.58	6.47	6.52

PIRIMICA(76)	0.00	0.14	MEAN
IRRIGATN(76)			
NONE	6.45	6.37	6.41
FULL	6.59	6.68	6.64
MEAN	6.52	6.53	6.52

PIRIMICA(76)	0.00	0.14	MEAN
N(76)			
0	6.61	6.59	6.60
150+150	6.43	6.47	6.45
MEAN	6.52	6.53	6.52

PIRIMICA(76)	0.00	0.14	MEAN
ALDICARB(76)			
0	6.51	6.62	6.57
10	6.53	6.43	6.48
MEAN	6.52	6.53	6.52

PIRIMICA(76)	0.00	0.14	MEAN
DIELDRIN(76)			
0.0	6.47	6.48	6.47
2.5	6.57	6.58	6.57
MEAN	6.52	6.53	6.52

PIRIMICA(76)	0.00	0.14	MEAN
BENOMYL(76)			
0	6.51	6.58	6.55
15	6.53	6.48	6.50
MEAN	6.52	6.53	6.52

PIRIMICA(76)	0.00	0.14	MEAN
FENITROT(76)			
0.0	6.57	6.59	6.58
1.5	6.48	6.46	6.47
MEAN	6.52	6.53	6.52

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GRAIN TONNES/HECTARE

***** TABLES OF MEANS (INDIVIDUAL VALUES) *****

IRRIGATN(76)	N(76)	ALDICARB(76)	DIELDRIN(76)	BENOMYL(76)	FENITROT(76)	PIRIMICA(76)	GRAIN
NONE	0	0	0.0	0	0.0	0.00	6.84
NONE	0	0	0.0	0	0.0	0.14	6.63
NONE	0	0	0.0	0	1.5	0.00	6.78
NONE	0	0	0.0	0	1.5	0.14	6.56
NONE	0	0	0.0	15	0.0	0.00	6.59
NONE	0	0	0.0	15	0.0	0.14	6.54
NONE	0	0	0.0	15	1.5	0.00	6.34
NONE	0	0	0.0	15	1.5	0.14	6.76
NONE	0	0	2.5	0	0.0	0.00	6.44
NONE	0	0	2.5	0	0.0	0.14	6.50
NONE	0	0	2.5	0	1.5	0.00	6.36
NONE	0	0	2.5	0	1.5	0.14	6.40
NONE	0	0	2.5	15	0.0	0.00	6.78
NONE	0	0	2.5	15	0.0	0.14	6.49
NONE	0	0	2.5	15	1.5	0.00	6.70
NONE	0	0	2.5	15	1.5	0.14	7.08
NONE	0	10	0.0	0	0.0	0.00	6.55
NONE	0	10	0.0	0	0.0	0.14	6.87
NONE	0	10	0.0	0	1.5	0.00	6.44
NONE	0	10	0.0	0	1.5	0.14	6.33
NONE	0	10	0.0	15	0.0	0.00	6.65
NONE	0	10	0.0	15	0.0	0.14	6.39
NONE	0	10	0.0	15	1.5	0.00	6.83
NONE	0	10	0.0	15	1.5	0.14	6.62
NONE	0	10	2.5	0	0.0	0.00	6.58
NONE	0	10	2.5	0	0.0	0.14	6.47
NONE	0	10	2.5	0	1.5	0.00	6.57
NONE	0	10	2.5	0	1.5	0.14	6.50
NONE	0	10	2.5	15	0.0	0.00	6.55
NONE	0	10	2.5	15	0.0	0.14	6.39
NONE	0	10	2.5	15	1.5	0.00	6.90
NONE	0	10	2.5	15	1.5	0.14	6.03

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GRAIN TONNES/HECTARE

***** TABLES OF MEANS (INDIVIDUAL VALUES) *****

IRRIGATN(76)	N(76)	ALDICARB(76)	DIELDRIN(76)	BENOMYL(76)	FENITROT(76)	PIRIMICA(76)	GRAIN
NONE	150+150	0	0.0	0	0.0	0.00	5.66
NONE	150+150	0	0.0	0	0.0	0.14	6.78
NONE	150+150	0	0.0	0	1.5	0.00	6.82
NONE	150+150	0	0.0	0	1.5	0.14	6.27
NONE	150+150	0	0.0	15	0.0	0.00	6.27
NONE	150+150	0	0.0	15	0.0	0.14	5.63
NONE	150+150	0	0.0	15	1.5	0.00	6.46
NONE	150+150	0	0.0	15	1.5	0.14	7.03
NONE	150+150	0	2.5	0	0.0	0.00	6.99
NONE	150+150	0	2.5	0	0.0	0.14	6.64
NONE	150+150	0	2.5	0	1.5	0.00	5.54
NONE	150+150	0	2.5	0	1.5	0.14	6.36
NONE	150+150	0	2.5	15	0.0	0.00	5.72
NONE	150+150	0	2.5	15	0.0	0.14	6.56
NONE	150+150	0	2.5	15	1.5	0.00	5.92
NONE	150+150	0	2.5	15	1.5	0.14	6.42
NONE	150+150	10	0.0	0	0.0	0.00	6.30
NONE	150+150	10	0.0	0	0.0	0.14	6.89
NONE	150+150	10	0.0	0	1.5	0.00	5.07
NONE	150+150	10	0.0	0	1.5	0.14	4.92
NONE	150+150	10	0.0	15	0.0	0.00	6.17
NONE	150+150	10	0.0	15	0.0	0.14	6.55
NONE	150+150	10	0.0	15	1.5	0.00	6.07
NONE	150+150	10	0.0	15	1.5	0.14	5.09
NONE	150+150	10	2.5	0	0.0	0.00	6.75
NONE	150+150	10	2.5	0	0.0	0.14	6.59
NONE	150+150	10	2.5	0	1.5	0.00	7.12
NONE	150+150	10	2.5	0	1.5	0.14	6.17
NONE	150+150	10	2.5	15	0.0	0.00	6.99
NONE	150+150	10	2.5	15	0.0	0.14	6.03
NONE	150+150	10	2.5	15	1.5	0.00	6.61
NONE	150+150	10	2.5	15	1.5	0.14	5.50

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GRAIN TONNES/HECTARE

***** TABLES OF MEANS (INDIVIDUAL VALUES) *****

IRRIGATN(76)	N(76)	ALDICARB(76)	DIELDRIN(76)	BENOMYL(76)	FENITROT(76)	PIRIMICA(76)	GRAIN
FULL	0	0	0.0	0	0.0	0.00	6.99
FULL	0	0	0.0	0	0.0	0.14	6.40
FULL	0	0	0.0	0	1.5	0.00	6.49
FULL	0	0	0.0	0	1.5	0.14	6.60
FULL	0	0	0.0	15	0.0	0.00	7.41
FULL	0	0	0.0	15	0.0	0.14	6.26
FULL	0	0	0.0	15	1.5	0.00	6.40
FULL	0	0	0.0	15	1.5	0.14	6.55
FULL	0	0	2.5	0	0.0	0.00	6.54
FULL	0	0	2.5	0	0.0	0.14	7.17
FULL	0	0	2.5	0	1.5	0.00	5.97
FULL	0	0	2.5	0	1.5	0.14	6.46
FULL	0	0	2.5	15	0.0	0.00	6.69
FULL	0	0	2.5	15	0.0	0.14	7.05
FULL	0	0	2.5	15	1.5	0.00	6.56
FULL	0	0	2.5	15	1.5	0.14	6.78
FULL	0	10	0.0	0	0.0	0.00	6.32
FULL	0	10	0.0	0	0.0	0.14	6.28
FULL	0	10	0.0	0	1.5	0.00	6.61
FULL	0	10	0.0	0	1.5	0.14	6.33
FULL	0	10	0.0	15	0.0	0.00	6.54
FULL	0	10	0.0	15	0.0	0.14	6.25
FULL	0	10	0.0	15	1.5	0.00	6.66
FULL	0	10	0.0	15	1.5	0.14	6.78
FULL	0	10	2.5	0	0.0	0.00	5.89
FULL	0	10	2.5	0	0.0	0.14	6.99
FULL	0	10	2.5	0	1.5	0.00	6.94
FULL	0	10	2.5	0	1.5	0.14	6.86
FULL	0	10	2.5	15	0.0	0.00	6.66
FULL	0	10	2.5	15	0.0	0.14	6.85
FULL	0	10	2.5	15	1.5	0.00	6.93
FULL	0	10	2.5	15	1.5	0.14	6.63

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78/R/CS/180

GRAIN TONNES/HECTARE

***** TABLES OF MEANS (INDIVIDUAL VALUES) *****

IRRIGATN(76)	N(76)	ALDICARB(76)	DIELDRIN(76)	BENOMYL(76)	FENITROT(76)	PIRIMICA(76)	GRAIN
FULL	150+150	0	0.0	0	0.0	0.00	6.65
FULL	150+150	0	0.0	0	0.0	0.14	6.48
FULL	150+150	0	0.0	0	1.5	0.00	6.86
FULL	150+150	0	0.0	0	1.5	0.14	7.12
FULL	150+150	0	0.0	15	0.0	0.00	6.59
FULL	150+150	0	0.0	15	0.0	0.14	6.78
FULL	150+150	0	0.0	15	1.5	0.00	6.55
FULL	150+150	0	0.0	15	1.5	0.14	6.68
FULL	150+150	0	2.5	0	0.0	0.00	6.85
FULL	150+150	0	2.5	0	0.0	0.14	6.52
FULL	150+150	0	2.5	0	1.5	0.00	6.50
FULL	150+150	0	2.5	0	1.5	0.14	7.12
FULL	150+150	0	2.5	15	0.0	0.00	6.97
FULL	150+150	0	2.5	15	0.0	0.14	6.97
FULL	150+150	0	2.5	15	1.5	0.00	6.22
FULL	150+150	0	2.5	15	1.5	0.14	6.36
FULL	150+150	10	0.0	0	0.0	0.00	6.23
FULL	150+150	10	0.0	0	0.0	0.14	6.88
FULL	150+150	10	0.0	0	1.5	0.00	6.94
FULL	150+150	10	0.0	0	1.5	0.14	6.85
FULL	150+150	10	0.0	15	0.0	0.00	6.46
FULL	150+150	10	0.0	15	0.0	0.14	6.91
FULL	150+150	10	0.0	15	1.5	0.00	5.60
FULL	150+150	10	0.0	15	1.5	0.14	6.22
FULL	150+150	10	2.5	0	0.0	0.00	7.01
FULL	150+150	10	2.5	0	0.0	0.14	6.59
FULL	150+150	10	2.5	0	1.5	0.00	6.87
FULL	150+150	10	2.5	0	1.5	0.14	6.87
FULL	150+150	10	2.5	15	0.0	0.00	6.46
FULL	150+150	10	2.5	15	0.0	0.14	6.57
FULL	150+150	10	2.5	15	1.5	0.00	6.65
FULL	150+150	10	2.5	15	1.5	0.14	6.61

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78/R/CS/180

GRAIN TONNES/HECTARE

***** STANDARD ERRORS OF DIFFERENCES OF MEANS *****

SED 0.060*
0.085**
0.121***

* USE ONLY ON MARGINS OF A TWO WAY TABLE,EXCEPT FOR IRRIGATN(76) .
** USE FOR THE BODY OF A TWO WAY TABLE,ONLY WITHIN THE SAME LEVEL OF IRRIGATN(76) (IF APPLICABLE).
*** USE FOR THREE WAY TABLES (IF CONSTRUCTED FROM INDIVIDUAL VALUES), ONLY WITHIN THE SAME LEVEL OF IRRIGATN(76) (IF APPLICABLE) .
DO NOT USE SED FOR THE FOLLOWING TABLES
N(76).DIELDRIN(76).BENOMYL(76)
N(76).ALDICARB(76).FENITROT(76)
ALDICARB(76).DIELDRIN(76).PIRIMICA(76)
BENOMYL(76).FENITROT(76).PIRIMICA(76)
AS NO SED'S ARE AVAILABLE FOR THESE TABLES .

***** STRATUM STANDARD ERRORS AND COEFFICIENTS OF VARIATION *****

STRATUM	DF	SE	CV%
BLOCK	7	0.090	1.4
BLOCK.WP.SP	54	0.342	5.2

GRAIN MEAN DM% 83.9

SUB PLOT AREA HARVESTED 0.00259

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78/W/CS/181

GREEN MANURE

Object: To study the effects of a green manure sown at different dates and interactions with fertiliser nitrogen on the following crop - Woburn Great Hill III, Lansome III.

Sponsors: G.V. Dyke, G.E.G. Mattingly.

The third year, barley.

For previous years see 76-77/W/CS/181.

Design: 3 series, each a single replicate of 24 plots.

Whole plot dimensions: 4.26 x 6.10.

Treatments:

Series I (after barley 1977), Series II (after potatoes 1978): All combinations of:-

1. TREFOIL(768) — Trefoil to barley in 1976 and 1978:

NONE	None
US	Undersown in spring
US+SS	Undersown in spring, sown into stubble after harvest
OS/SS	Oversown in July before harvest and/or sown into stubble after harvest

2. N(77) — Amounts of nitrogen fertiliser in 1977 (kg N) (given basal N at 63 kg in 1978):

Series I To Barley	Series II To Potatoes	Series I To Barley	Series II Potatoes
0	0	0	0
50	100	50 to seedbed	100 to seedbed
100	200	100 to seedbed	200 to seedbed
150	300	150 to seedbed	300 to seedbed
50+50	100+100	50 to seedbed + 50 in May	100 to seedbed + 100 in June
100+50	200+100	100 to seedbed + 50 in May	200 to seedbed + 100 in June

Series IV (barley): All combinations of:-

1. TREFOIL(768) — Trefoil to barley in 1976, 1977 and 1978:

NONE	None
US	Undersown in spring
US+SS	Undersown in spring and sown into stubble after harvest
OS/SS	Oversown in July and/or sown into stubble after harvest

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2. N 78 — Amounts of nitrogen fertiliser (kg N as 'Nitro-Chalk 25'):

	1977 and 1978	1976
0	0	(0)
50	50 to seedbed	(30)
100	100 to seedbed	(60)
150	150 to seedbed	(90)
50+50	50 to seedbed + 50 in May	(120)
100+50	100 to seedbed + 50 in May	(150)

NOTES: (1) N to Series IV in 1976 was all applied to the seedbed.
(2) Series III was sown to barley in 1978 but yields were not recorded.
(3) English common trefoil, inoculated with Rhizobium, at 26 kg, undersown in spring: 16 May, 1978, oversown: 12 July and sown into stubble: 13 Sept.

Standard applications:
Barley, Great Hill III, Series I & II: Manures: (20:14:14) at 310 kg, combine drilled. Weedkillers: Dinoseb at 8.4 kg in 450 l.
Barley, Lansome III, Series IV: Manures: (0:20:20) at 220 kg, combine drilled. Weedkiller: Dinoseb at 8.4 kg in 450 l.

Seed: Porthos, dressed with ethirimol, sown at 160 kg.

Cultivations, etc.:-
Barley, Great Hill III, Series I & II: Ploughed: 9 Feb, 1978. Spring-tine cultivated with crumbler attached, seed sown: 10 Mar. Weedkiller applied: 19 May. Combine harvested: 23 Aug.
Barley, Lansome III, Series IV: Ploughed: 9 Feb, 1978. Spring-tine cultivated: 9 Mar. Spring-tine cultivated with crumbler attached, seed sown, spring N applied: 10 Mar. Late N applied: 11 May. Weedkiller applied: 19 May. Combine harvested: 22 Aug.

NOTE: Samples of trefoil and weeds were dug just before ploughing on Series I and IV for the determination of dry matter and N.

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78/W/CS/181 SERIES I

GRAIN TONNES/HECTARE

***** TABLES OF MEANS *****

N(77) / TREFOIL(768)	0	50	100	150	50+50	100+50	MEAN
NONE	3.53	2.52	3.21	3.00	2.97	3.50	3.12
US	2.62	3.72	3.04	4.01	3.08	3.26	3.29
US+SS	2.74	3.06	3.74	3.36	3.63	3.16	3.28
OS/SS	2.84	2.54	3.55	3.81	3.14	2.79	3.11
MEAN	2.93	2.96	3.38	3.54	3.21	3.18	3.20

GRAIN MEAN DM% 80.8

STRAW TONNES/HECTARE

***** TABLES OF MEANS *****

N(77) / TREFOIL(768)	0	50	100	150	50+50	100+50	MEAN
NONE	1.89	1.36	1.36	1.68	2.03	2.36	1.78
US	1.58	2.58	2.07	1.85	1.32	2.12	1.92
US+SS	1.81	2.66	2.39	2.26	2.71	2.56	2.40
OS/SS	1.68	1.43	1.76	1.70	2.09	1.32	1.66
MEAN	1.74	2.01	1.89	1.87	2.04	2.09	1.94

STRAW MEAN DM% 82.4 PLOT AREA HARVESTED 0.00173

78/W/CS/181 SERIES II

GRAIN TONNES/HECTARE

***** TABLES OF MEANS *****

N(77) / TREFOIL(768)	0	100	200	300	100+100	200+100	MEAN
NONE	4.21	4.08	4.30	4.93	4.06	3.37	4.16
US	4.79	4.80	4.25	4.75	4.75	4.21	4.59
US+SS	3.90	4.07	4.34	3.62	4.13	4.07	4.02
OS/SS	4.46	4.69	4.80	3.78	4.11	4.76	4.43
MEAN	4.34	4.41	4.42	4.27	4.26	4.10	4.30

GRAIN MEAN DM% 77.9

STRAW TONNES/HECTARE

***** TABLES OF MEANS *****

N(77) / TREFOIL(768)	0	100	200	300	100+100	200+100	MEAN
NONE	2.70	2.08	2.80	3.20	2.52	1.55	2.48
US	3.21	3.59	2.39	3.16	2.85	1.60	2.80
US+SS	2.13	2.76	1.89	2.40	1.87	1.75	2.13
OS/SS	2.95	3.33	2.38	2.66	2.05	3.11	2.75
MEAN	2.75	2.94	2.37	2.86	2.32	2.00	2.54

STRAW MEAN DM% 80.5 PLOT AREA HARVESTED 0.00173

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78/W/CS/181 SERIES IV

GRAIN TONNES/HECTARE

***** TABLES OF MEANS *****

N 78 TREFOIL(768)	0	50	100	150	50+50	100+50	MEAN
NONE	0.70	3.03	4.55	5.99	1.02	5.59	3.48
US	0.77	2.66	5.81	6.26	4.82	6.82	4.52
US+SS	0.89	3.18	4.81	5.64	5.00	5.34	4.14
OS/SS	0.95	2.65	5.00	5.95	4.78	6.19	4.25
MEAN	0.83	2.88	5.04	5.96	3.90	5.99	4.10

GRAIN MEAN DM% 82.3

STRAW TONNES/HECTARE

***** TABLES OF MEANS *****

N 78 TREFOIL(768)	0	50	100	150	50+50	100+50	MEAN
NONE	0.44	1.54	2.11	3.81	2.19	3.44	2.26
US	0.29	1.37	3.14	3.01	2.55	3.32	2.28
US+SS	0.46	1.33	1.99	3.24	2.79	3.66	2.25
OS/SS	0.41	1.42	2.35	3.05	2.73	3.08	2.17
MEAN	0.40	1.41	2.40	3.28	2.57	3.38	2.24

STRAW MEAN DM% 72.5

PLOT AREA HARVESTED 0.00173

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78/W/CS/184

CEREAL CYST NEMATODE STUDY

Object: To study the residual effects of varieties, aldicarb and formalin on cereal cyst nematode (Heterodera avenae), nematode-parasitic fungi and on the yield of oats - Woburn Butt Close.

Sponsor: T.D. Williams.

The third year, oats.

For previous years see 76-77/W/CS/184.

Design: 4 randomised blocks of 4 plots split into 4.

Whole plot dimensions: 2.13 x 21.0.

Treatments: All combinations of:-

Whole plots

1. VARIETY(77) Varieties and resistance to cereal cyst nematode (all Manod (susceptible) in 1978):

   NELSON/R Nelson (resistant)
   TABARD/S Maris Tabard (susceptible)

2. ALDICARB(77) Aldicarb to seedbed (kg):

   0
   10

Sub plots

3. FORMALIN(76) Formalin applied in1976 (l):

   0
   3000

4. FORMALIN(77) Formalin applied in 1977 (l):

   0
   3000

Basal applications: Manures: (20:14:14) at 400 kg, combine drilled. Weedkillers: Mecoprop, bromoxynil and ioxynil ('Brittox' at 2.5 l in 340 l).

Seed: Manod, sown at 200 kg.

Cultivations, etc.:- Ploughed: 28 Sept, 1977. Spring-tine cultivated with crumbler attached, seed sown: 31 Mar, 1978. Harrowed: 6 Apr. Weedkiller applied: 15 May. Combine harvested: 4 Sept.

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NOTES: (1) Plant samples were taken in May for measurements of fresh tops and root weights and counts were made of Heterodera avenae invasion.
(2) Soil samples were taken in June to estimate populations of Heterodera avenae remaining from the unhatched residues of the 1977 populations.
(3) Plant samples were taken in June for measurements of fresh top and root weights, and counts were made of total numbers of white females of Heterodera avenae females and proportion infected with fungi.
(4) Soil samples were taken in September for egg counts of Heterodera avenae.

GRAIN TONNES/HECTARE

***** TABLES OF MEANS *****

ALDICARB(77) VARIETY(77)	0	10	MEAN
NELSON/R	2.71	2.66	2.68
TABARD/S	1.08	2.45	1.77
MEAN	1.90	2.55	2.23

FORMALIN(76) VARIETY(77)	0	3000	MEAN
NELSON/R	2.68	2.69	2.68
TABARD/S	1.65	1.88	1.77
MEAN	2.16	2.29	2.23

FORMALIN(76) ALDICARB(77)	0	3000	MEAN
0	1.83	1.96	1.90
10	2.49	2.61	2.55
MEAN	2.16	2.29	2.23

FORMALIN(77) VARIETY(77)	0	3000	MEAN
NELSON/R	2.68	2.69	2.68
TABARD/S	1.72	1.81	1.77
MEAN	2.20	2.25	2.23

FORMALIN(77) ALDICARB(77)	0	3000	MEAN
0	1.80	1.99	1.90
10	2.60	2.51	2.55
MEAN	2.20	2.25	2.23

FORMALIN(77) FORMALIN(76)	0	3000	MEAN
0	2.20	2.13	2.16
3000	2.20	2.38	2.29
MEAN	2.20	2.25	2.23

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78/W/CS/184

GRAIN TONNES/HECTARE

***** TABLES OF MEANS *****

ALDICARB(77)	0		10	
FORMALIN(76)	0	3000	0	3000
VARIETY(77)				
NELSON/R	2.67	2.75	2.68	2.63
TABARD/S	1.00	1.17	2.31	2.59

ALDICARB(77)	0		10	
FORMALIN(77)	0	3000	0	3000
VARIETY(77)				
NELSON/R	2.58	2.84	2.77	2.54
TABARD/S	1.02	1.14	2.42	2.47

FORMALIN(76)	0		3000	
FORMALIN(77)	0	3000	0	3000
VARIETY(77)				
NELSON/R	2.64	2.72	2.71	2.67
TABARD/S	1.77	1.54	1.68	2.08

FORMALIN(76)	0		3000	
FORMALIN(77)	0	3000	0	3000
ALDICARB(77)				
0	1.79	1.88	1.81	2.11
10	2.62	2.37	2.58	2.64

	FORMALIN(76)	0		3000	
	FORMALIN(77)	0	3000	0	3000
VARIETY(77)	ALDICARB(77)				
NELSON/R	0	2.47	2.87	2.68	2.82
	10	2.80	2.56	2.74	2.52
TABARD/S	0	1.10	0.89	0.94	1.40
	10	2.43	2.18	2.42	2.77

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78/W/CS/184

GRAIN TONNES/HECTARE

***** STANDARD ERRORS OF DIFFERENCES OF MEANS *****

TABLE	VARIETY(77)	ALDICARB(77)	FORMALIN(76)	FORMALIN(77)
SED	0.173	0.173	0.123	0.123

TABLE	VARIETY(77) ALDICARB(77)	VARIETY(77) FORMALIN(76)	ALDICARB(77) FORMALIN(76)	VARIETY(77) FORMALIN(77)
SED	0.245	0.212	0.212	0.212
EXCEPT WHEN COMPARING MEANS WITH SAME LEVEL(S) OF:				
VARIETY(77)		0.174		0.174
ALDICARB(77)			0.174	

TABLE	ALDICARB(77) FORMALIN(77)	FORMALIN(76) FORMALIN(77)	VARIETY(77) ALDICARB(77) FORMALIN(76)	VARIETY(77) ALDICARB(77) FORMALIN(77)
SED	0.212	0.174	0.300	0.300
EXCEPT WHEN COMPARING MEANS WITH SAME LEVEL(S) OF:				
ALDICARB(77)	0.174			
VARIETY(77).ALDICARB(77)			0.246	0.246

TABLE	VARIETY(77) FORMALIN(76)	ALDICARB(77) FORMALIN(76)	VARIETY(77) ALDICARB(77) FORMALIN(76)	VARIETY(77) ALDICARB(77) FORMALIN(77)
SED	0.275	0.275	0.388	
EXCEPT WHEN COMPARING MEANS WITH SAME LEVEL(S) OF:				
VARIETY(77)	0.246			
ALDICARB(77)		0.246		
VARIETY(77).ALDICARB(77)			0.348	

***** STRATUM STANDARD ERRORS AND COEFFICIENTS OF VARIATION *****

STRATUM	DF	SE	CV%
BLOCK.WP	9	0.347	15.6
BLOCK.WP.SP	36	0.492	22.1

GRAIN MEAN DM% 79.5

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78/W/CS/184

STRAW TONNES/HECTARE

***** TABLES OF MEANS *****

ALDICARB(77)	0	10	MEAN
VARIETY(77)			
NELSON/R	1.90	1.89	1.90
TABARD/S	1.07	1.91	1.49
MEAN	1.48	1.90	1.69

FORMALIN(76)	0	3000	MEAN
VARIETY(77)			
NELSON/R	1.94	1.85	1.90
TABARD/S	1.46	1.51	1.49
MEAN	1.70	1.68	1.69

FORMALIN(76)	0	3000	MEAN
ALDICARB(77)			
0	1.54	1.43	1.48
10	1.87	1.93	1.90
MEAN	1.70	1.68	1.69

FORMALIN(77)	0	3000	MEAN
VARIETY(77)			
NELSON/R	1.91	1.88	1.90
TABARD/S	1.40	1.57	1.49
MEAN	1.66	1.73	1.69

FORMALIN(77)	0	3000	MEAN
ALDICARB(77)			
0	1.41	1.56	1.48
10	1.90	1.90	1.90
MEAN	1.66	1.73	1.69

FORMALIN(77)	0	3000	MEAN
FORMALIN(76)			
0	1.70	1.70	1.70
3000	1.61	1.75	1.68
MEAN	1.66	1.73	1.69

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78/W/CS/184

STRAW TONNES/HECTARE

***** TABLES OF MEANS *****

ALDICARB(77)	0		10	
FORMALIN(76)	0	3000	0	3000
VARIETY(77)				
NELSON/R	1.99	1.82	1.90	1.89
TABARD/S	1.08	1.05	1.84	1.98

ALDICARB(77)	0		10	
FORMALIN(77)	0	3000	0	3000
VARIETY(77)				
NELSON/R	1.86	1.95	1.96	1.82
TABARD/S	0.96	1.17	1.83	1.98

FORMALIN(76)	0		3000	
FORMALIN(77)	0	3000	0	3000
VARIETY(77)				
NELSON/R	1.89	1.99	1.93	1.77
TABARD/S	1.51	1.41	1.29	1.73

FORMALIN(76)	0		3000	
FORMALIN(77)	0	3000	0	3000
ALDICARB(77)				
0	1.51	1.57	1.31	1.55
10	1.89	1.84	1.90	1.96

	FORMALIN(76)	0		3000	
	FORMALIN(77)	0	3000	0	3000
VARIETY(77)	ALDICARB(77)				
NELSON/R	0	1.93	2.05	1.79	1.84
	10	1.86	1.94	2.07	1.70
TABARD/S	0	1.09	1.08	0.84	1.26
	10	1.93	1.74	1.74	2.21

STRAW MEAN DM% 56.2

PLOT AREA HARVESTED 0.00098

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78/R/CS/193

EFFECTS OF PATHOGENS

Object: To study the effects of several factors on yield and pathogens of winter oilseed rape - Summerdells I.

Sponsor: C.J. Rawlinson.

The third year, winter oilseed rape.

For previous years see 76/R/RA/1 and 77/R/CS/193.

Design: Single replicate of 2 x 2 x 3 x 2 x 2.

Whole plot dimensions: 4.27 x 9.14.

Treatments: All combinations of:-

1. VARIETY(78)	Varieties (cumulative 1976-1978):	
EURORA	Eurora (low erucic acid)	
VICTOR	Victor (high erucic acid)	
2. BEN SD(78)	Benomyl seed dressing (1978 only) g/kg seed:	
0		
5		
3. BEN FOL(78)	Benomyl foliar spray (1978 only) kg:	
0	None	
1.1	Single application of 1.1 on 10 Feb 1978	
2.2	Two applications of 1.1 on 10 Feb and 28 Apr	
4. BEN(77)	Benomyl (cumulative 1976 and 1977):	
0	None	
SD+FOL	Seed dressing + foliar sprays	
5. NEMACIDE(77)	Nematicide (cumulative 1976 and 1977):	
NONE	None	
ALDICARB	Aldicarb at 10 kg to seedbed	

NOTE: Benomyl foliar sprays were applied in 340 l.

Basal applications: Manures: (10:24:24) at 310 kg, 'Nitro-chalk 25' at 800 kg. Weedkillers: Dalapon at 0.95 kg with propyzamide at 0.56 kg in 220 l. Haulm desiccant: Diquat at 0.69 kg ion plus 'Agral' (a wetting agent) at 0.3 l in 220 l.

Seed: Sown at 13 kg.

Cultivations, etc.:- Ploughed: 18 Aug, 1977. NPK applied: 30 Aug. Heavy spring-tine cultivated: 31 Aug. Power harrowed and harrowed: 5 Sept. Seed sown and harrowed in: 6 Sept. Weedkillers applied: 18 Oct. N applied: 6 Mar, 1978. Haulm desiccant applied: 4 Aug. Combine harvested: 13 Aug.

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78/W/CS/193

NOTES: (1) Emergence counts were made in September, 1977.
(2) The experiment was severely grazed by pigeons but damage by March, 1978 was considered to be uniform on all plots.
(3) Disease assessments were made in November, 1977 and June, 1978.

GRAIN TONNES/HECTARE

***** TABLES OF MEANS *****

BEN SD(78)	0	5	MEAN
VARIETY(78)			
EURORA	2.04	2.12	2.08
VICTOR	2.67	2.58	2.63
MEAN	2.36	2.35	2.35

BEN FOL(78)	0	1.1	2.2	MEAN
VARIETY(78)				
EURORA	1.82	2.15	2.28	2.08
VICTOR	2.48	2.63	2.77	2.63
MEAN	2.15	2.39	2.52	2.35

BEN FOL(78)	0	1.1	2.2	MEAN
BEN SD(78)				
0	2.16	2.32	2.59	2.36
5	2.14	2.46	2.45	2.35
MEAN	2.15	2.39	2.52	2.35

NEMACIDE(77)	NONE	ALDICARB	MEAN
VARIETY(78)			
EURORA	2.08	2.08	2.08
VICTOR	2.63	2.62	2.63
MEAN	2.36	2.35	2.35

NEMACIDE(77)	NONE	ALDICARB	MEAN
BEN SD(78)			
0	2.37	2.35	2.36
5	2.35	2.35	2.35
MEAN	2.36	2.35	2.35

NEMACIDE(77)	NONE	ALDICARB	MEAN
BEN FOL(78)			
0	2.16	2.14	2.15
1.1	2.38	2.40	2.39
2.2	2.53	2.51	2.52
MEAN	2.36	2.35	2.35

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78/R/CS/193

GRAIN TONNES/HECTARE

***** TABLES OF MEANS *****

BEN(77)	0	SD+FOL	MEAN
VARIETY(78)			
EURORA	2.00	2.16	2.08
VICTOR	2.57	2.68	2.63
MEAN	2.29	2.42	2.35

BEN(77)	0	SD+FOL	MEAN
BEN SD(78)			
0	2.27	2.45	2.36
5	2.31	2.39	2.35
MEAN	2.29	2.42	2.35

BEN(77)	0	SD+FOL	MEAN
BEN FOL(78)			
0	2.03	2.27	2.15
1.1	2.38	2.40	2.39
2.2	2.45	2.59	2.52
MEAN	2.29	2.42	2.35

BEN(77)	0	SD+FOL	MEAN
NEMACIDE(77)			
NONE	2.30	2.41	2.36
ALDICARB	2.27	2.43	2.35
MEAN	2.29	2.42	2.35

BEN SD(78)	0			5		
BEN FOL(78)	0	1.1	2.2	0	1.1	2.2
VARIETY(78)						
EURORA	1.74	2.06	2.32	1.89	2.24	2.23
VICTOR	2.58	2.58	2.86	2.39	2.69	2.68

BEN SD(78)	0		5	
BEN(77)	0	SD+FOL	0	SD+FOL
VARIETY(78)				
EURORA	1.95	2.13	2.05	2.18
VICTOR	2.58	2.76	2.56	2.61

BEN FOL(78)	0		1.1		2.2	
BEN(77)	0	SD+FOL	0	SD+FOL	0	SD+FOL
VARIETY(78)						
EURORA	1.66	1.97	2.15	2.15	2.19	2.36
VICTOR	2.40	2.57	2.61	2.66	2.71	2.83

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GRAIN TONNES/HECTARE

***** TABLES OF MEANS *****

BEN FOL(78)	0		1.1		2.2	
BEN(77)	0	SD+FOL	0	SD+FOL	0	SD+FOL
BEN SD(78)						
0	2.11	2.21	2.13	2.52	2.57	2.62
5	1.95	2.33	2.64	2.28	2.33	2.57

BEN SD(78)	0		5	
NEMACIDE(77)	NONE	ALDICARB	NONE	ALDICARB
VARIETY(78)				
EURORA	2.07	2.02	2.09	2.14
VICTOR	2.67	2.68	2.60	2.57

BEN FOL(78)	0		1.1		2.2	
NEMACIDE(77)	NONE	ALDICARB	NONE	ALDICARB	NONE	ALDICARB
VARIETY(78)						
EURORA	1.80	1.83	2.11	2.19	2.33	2.22
VICTOR	2.52	2.44	2.65	2.62	2.73	2.81

BEN FOL(78)	0		1.1		2.2	
NEMACIDE(77)	NONE	ALDICARB	NONE	ALDICARB	NONE	ALDICARB
BEN SD(78)						
0	2.08	2.24	2.32	2.32	2.70	2.48
5	2.25	2.03	2.44	2.49	2.36	2.54

BEN(77)	0		SD+FOL	
NEMACIDE(77)	NONE	ALDICARB	NONE	ALDICARB
VARIETY(78)				
EURORA	2.04	1.97	2.13	2.19
VICTOR	2.57	2.58	2.70	2.67

BEN(77)	0		SD+FOL	
NEMACIDE(77)	NONE	ALDICARB	NONE	ALDICARB
BEN SD(78)				
0	2.30	2.24	2.44	2.46
5	2.31	2.31	2.39	2.40

BEN(77)	0		SD+FOL	
NEMACIDE(77)	NONE	ALDICARB	NONE	ALDICARB
BEN FOL(78)				
0	2.00	2.06	2.33	2.21
1.1	2.44	2.32	2.32	2.49
2.2	2.47	2.43	2.60	2.59

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GRAIN TONNES/HECTARE

***** STANDARD ERRORS OF DIFFERENCES OF MEANS *****

TABLE	VARIETY(78)	BEN SD(78)	BEN FOL(78)	BEN(77)
SED	0.065	0.065	0.080	0.065

TABLE	NEMACIDE(77)	VARIETY(78) BEN SD(78)	VARIETY(78) BEN FOL(78)	BEN SD(78) BEN FOL(78)
SED	0.065	0.092	0.113	0.113

TABLE	VARIETY(78) BEN(77)	BEN SD(78) BEN(77)	BEN FOL(78) BEN(77)	VARIETY(78) NEMACIDE(77)
SED	0.092	0.092	0.113	0.092

TABLE	BEN SD(78) NEMACIDE(77)	BEN FOL(78) NEMACIDE(77)	BEN(77) NEMACIDE(77)	VARIETY(78) BEN SD(78) BEN FOL(78)
SED	0.092	0.113	0.092	0.160

TABLE	VARIETY(78) BEN SD(78) BEN(77)	VARIETY(78) BEN FOL(78) BEN(77)	BEN SD(78) BEN FOL(78) BEN(77)	VARIETY(78) BEN SD(78) NEMACIDE(77)
SED	0.130	0.160	0.160	0.130

TABLE	VARIETY(78) BEN FOL(78) NEMACIDE(77)	BEN SD(78) BEN FOL(78) NEMACIDE(77)	VARIETY(78) BEN(77) NEMACIDE(77)	BEN SD(78) BEN(77) NEMACIDE(77)
SED	0.160	0.160	0.130	0.130

TABLE	BEN FOL(78) BEN(77) NEMACIDE(77)
SED	0.160

***** STRATUM STANDARD ERRORS AND COEFFICIENTS OF VARIATION *****

STRATUM	DF	SE	CV%
WP	11	0.226	9.6

GRAIN MEAN DM% 83.3

PLOT AREA HARVESTED 0.00279

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78/R/CS/198

NITRIFICATION INHIBITORS

Object: To study the residual effects on barley of nitrogen fertiliser treatments applied to forage maize in 1977 - Long Hoos VI/VII 5.

Sponsors: J. Ashworth, A.J. Barnard.

The second year, barley.

For previous year see 77/R/CS/198

Design: 3 randomised blocks of 10 plots split into 2.

Whole plot dimensions: 4.27 x 9.14.

Treatments: All combinations of:-

Whole plots

1. N TREAT(77) Nitrogen forms and rates, and nitrification inhibitors applied in 1977:

Aqueous urea/ammonium nitrate injected to seedbed (May) at 120 kg N:-

AQ3 -	Alone
AQ3 STC1	With sodium trithiocarbonate at 10 kg
AQ3 STC2	With sodium trithiocarbonate at 25 kg
AQ3 NIT1	With nitrapyrin ('N-Serve') at 0.5 kg
AQ3 NIT2	With nitrapyrin at 1.0 kg

'Nitro-Chalk' applied to seedbed (May) (kg N):-

NC1	40
NC2	80
NC3	120
NC4	160

'Nitro-Chalk' dressing divided (kg N):-

NC1+1+1	40 to seedbed (May), 40 in July, 40 at tasselling in August

Sub plots

2. N 78 Nitrogen fertiliser, as 'Nitro-Chalk 25', applied to seedbed in 1978 (kg N):

0
50

Basal applications: Manures: (0:14:28) at 750 kg. Chalk at 2.9 t. Weedkillers: Dicamba with mecoprop and MCPA ('Banlene Plus' at 4.9 l in 220 l). Fungicide: Tridemorph at 0.53 kg in 220 l.

Seed: Porthos, sown at 160 kg.

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78/R/CS/198

Cultivations, etc.:- Cleared maize, PK applied: 10 Jan, 1978. Chalk applied: 8 Feb. Ploughed: 27 Feb. Power harrowed, rotary harrowed, seed sown: 6 Apr. N applied: 8 May. Weedkiller applied: 26 May. Combine harvested: 31 Aug-4 Sept.

NOTE: N percentages of grain were determined.

GRAIN TONNES/HECTARE

***** TABLES OF MEANS *****

N 78 / N TREAT(77)	0	50	MEAN
AQ3 -	2.81	5.01	3.91
AQ3 STC1	2.98	5.45	4.22
AQ3 STC2	3.46	5.17	4.31
AQ3 NIT1	2.93	5.03	3.98
AQ3 NIT2	3.01	5.02	4.02
NC1	2.58	4.91	3.74
NC2	3.12	5.04	4.08
NC3	3.43	5.58	4.51
NC4	4.40	6.18	5.29
NC1+1+1	3.70	5.68	4.69
MEAN	3.24	5.31	4.27

***** STANDARD ERRORS OF DIFFERENCES OF MEANS *****

TABLE	N TREAT(77)	N 78	N TREAT(77) N 78
SED	0.273	0.092	0.342
EXCEPT WHEN COMPARING MEANS WITH SAME LEVEL(S) OF:			
N TREAT(77)			0.292

***** STRATUM STANDARD ERRORS AND COEFFICIENTS OF VARIATION *****

STRATUM	DF	SE	CV%
BLOCK.WP	18	0.334	7.8
BLOCK.WP.SP	20	0.357	8.4

GRAIN MEAN DM% 77.6

SUB PLOT AREA HARVESTED 0.00059

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78/R/CS/200 and 78/W/CS/200

FACTORS AFFECTING YIELD

Object: To study some of the factors limiting yield of grass, clover and lucerne - Rothamsted (R), Pastures and Woburn (W), Butt Furlong.

Sponsors: J.M. Day, I.F. Henderson, J.F. Jenkyn, A.E. Johnston, B.J. Legg, J. McEwen, R.T. Plumb, R.J. Roughley, A. Spaull, J.F. Witty.

The second year, ryegrass, white clover, lucerne.

For previous year see 77/R&W/CS/200.

Design: Single replicate of 2 plots split into 50.

Whole plot dimensions: Pastures (R): 23.8 x 24.5.
Butt Furlong (W): 22.3 x 24.5.

Treatments: Combinations of:-

Whole plots

1. IRRIGTN — Irrigation:

NONE	None
FULL	Irrigated to reduce a soil moisture deficit of 25 mm to zero

Sub plots

2. TREATMNT — Treatments, combinations of:

Species:

- Ryegrass, S.23, (RG)
- Ryegrass, S.23 + Clover, Blanca (GB)
- Ryegrass, S.23 + Clover, S.100 (GS)
- Clover, Blanca (CL)
- Lucerne, Vertus (LU)

Cutting frequencies:

- Three times (3)
- Six times (6)

Amounts of nitrogen fertiliser (kg N total per annum, applied as (25:0:16)):

- 0, 100, 200, 300, 400, 500, 600 (N0, N1, N2, N3, N4, N5, N6)

Times of applying nitrogen fertiliser:

- Not applied (--), N0 only
- Divided equally between cuts (DE)
- In spring only (SP)
- Half in spring, half in summer (SS)

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78/R/CS/200 and 78/W/CS/200

Control of pathogens:

None (-)
Controlled (C)

The following combinations are tested:

RG6NO---	GB3NO--- (duplicated)	CL3NO--- (duplicated)
RG6N1DE-	GB3N1DE-	CL3N2DE- "
RG6N2DE-	GB3N2DE-	CL3NO--C "
RG6N3DE-	GB3N3DE-	CL3N2DEC "
RG6N4DE-	GB3N4DE-	
RG6N5DE-		LU3NO--- "
RG6N6DE-	GB3NO--C	LU3NO--C "
	GB3N1DEC	
GB6NO---	GB3N2DEC	
GB6N1DE-	GB3N3DEC	
GB6N2DE-	GB3N4DEC	
GB6N3DE-		
GB6N4DE-	GB3N1SP- (duplicated)	
	GB3N1SS- "	
GS6NO---	GB3N2SS- "	
GS6N1DE-		
GS6N2DE-	RG3N2DE- "	
GS6N3DE-	RG3N2DEC "	
GS6N4DE-		

NOTES: (1) Pathogen control consisted of:- (1) Aldicarb at 10 kg applied in the spring, (2) benomyl foliar spray at 0.56 kg + phorate at 5.0 kg, applied as granules, after each cut.

(2) Irrigation was applied as follows (mm water):

Pastures (R)

26 May	25
1 June	25
14 June	25
12 July	25
26 July	25
25 Aug	25
19 Sept	25
Total	175

Butt Furlong (W)

25 May	25
1 June	25
15 June	25
23 June	25
14 July	25
21 July	25
27 July	12.5
24 Aug	25
31 Aug	25
20 Sept	25
Total	237.5

(3) NO plots receive 64 kg K2O, as muriate of potash, after the fourth cutting occasion.

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78/R/CS/200 and 78/W/CS/200

Standard applications:
Pastures (R) All plots: Manures: (0:14:28) at 1070 kg. Weedkillers, to RG plots only: Dicamba with mecoprop and MCPA ('Tetralex plus' at 5.6 kg in 170 l).
Butt Furlong (W) All plots: Manures: Magnesian limestone at 2.5 tonnes. (0:14:28) at 1080 kg. Weedkillers, to RG plots only: Dicamba with mecoprop and MCPA ('Tetralex Plus' at 5.6 kg in 170 l).

Seed: S.23 Perennial ryegrass alone sown at 20 kg
S.23 Perennial ryegrass sown at 10 kg either with Blanca white clover sown at 4 kg or with S.100 white clover at 4 kg
Blanca white clover alone, sown at 4 kg
Lucerne, Vertus, sown at 10 kg, inoculated with Rhizobium
Pastures (R) sown 20 May, 1977
Butt Furlong (W) sown 23 May, 1977.

Cultivations, etc.:-
Pastures (R): PK applied: 7 Feb, 1978. NK applied six times: 10 Mar, 9 May, 8 June, 4 July, 1 Aug, 29 Aug. Aldicarb applied: 14 Mar. Benomyl and phorate applied: 25 October, 1977, 9 May, 1978, 8 June, 4 July, 1 Aug, 29 Aug. Weedkiller applied to RG plots only: 26 May. '6-cut' plots cut: 9 May, 6 June, 4 July, 1 Aug, 29 Aug, 20 Sept. '3-cut' plots cut: 6 June, 1 Aug, 20 Sept.
Butt Furlong (W): Benomyl and phorate applied: 18 Oct, 1977, 14 Mar, 1978, 10 May, 7 June, 5 July, 4 Aug, 30 Aug. Magnesian limestone, PK applied: 8 Nov, 1977. Aldicarb applied: 14 Mar, 1978. Weedkiller applied to RG plots only: 26 May. '6-cut' plots cut: 10 May, 7 June, 5 July, 4 Aug, 30 Aug, 27 Sept. '3-cut' plots cut: 7 June, 4 Aug, 27 Sept.

NOTES: (1) At Butt Furlong (W) before the fourth cutting occasion, plots were damaged by bullocks. Forty-five plots (all '3-cut') were affected. These plots were cut on the fourth cutting occasion but yields were not recorded. Later cuts were not affected.
(2) Assessments of pests and diseases were made during the season. Nitrogen percentages of crop produce were measured.

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78/R/CS/200 PASTURES (R)

1ST CUTTING OCCASION (9/5/78) DRY MATTER TONNES/HECTARE

***** TABLES OF MEANS *****

IRRIGATN TREATMNT	NONE	FULL	MEAN
RG6N0---	0.55	0.89	0.72
RG6N1DE-	1.35	1.49	1.42
RG6N2DE-	1.60	1.43	1.51
RG6N3DE-	2.04	1.38	1.71
RG6N4DE-	2.21	2.20	2.21
RG6N5DE-	2.40	1.80	2.10
RG6N6DE-	2.58	2.14	2.36
GB6N0---	1.13	1.08	1.11
GB6N1DE-	1.21	1.23	1.22
GB6N2DE-	1.57	1.46	1.51
GB6N3DE-	1.94	1.66	1.80
GB6N4DE-	2.34	1.97	2.16
GS6N0---	0.90	0.63	0.77
GS6N1DE-	1.10	1.20	1.15
GS6N2DE-	1.42	1.30	1.36
GS6N3DE-	1.65	1.65	1.65
GS6N4DE-	1.85	2.18	2.02
MEAN	1.64	1.51	1.57

1ST CUTTING OCCASION MEAN DM% 15.8

* USE STANDARD ERRORS ONLY TO COMPARE TREATMNT LEVELS
GB3N0---,GB3N1SP-,GB3N1SS-,GB3N2SS-,RG3N2DE-,RG3N2DEC,
CL3N0---,CL3N2DE-,CL3N0--C,CL3N2DEC,LU3N0---,LU3N0--C
AND WITHIN THE SAME LEVEL OF IRRIGATN.

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78/R/CS/200 PASTURES (R)

2ND CUTTING OCCASION (6/6/78) DRY MATTER TONNES/HECTARE

***** TABLES OF MEANS *****

IRRIGATN TREATMNT	NONE	FULL	MEAN
RG6N0---	0.99	1.00	0.99
RG6N1DE-	2.03	1.82	1.92
RG6N2DE-	2.88	3.05	2.97
RG6N3DE-	3.05	3.10	3.08
RG6N4DE-	3.56	3.63	3.59
RG6N5DE-	2.96	3.81	3.38
RG6N6DE-	2.93	3.57	3.25
GB6N0---	2.86	3.02	2.94
GB6N1DE-	2.76	3.15	2.96
GB6N2DE-	3.51	3.34	3.43
GB6N3DE-	3.52	3.50	3.51
GB6N4DE-	3.83	3.37	3.60
GS6N0---	2.59	2.56	2.58
GS6N1DE-	2.92	3.29	3.10
GS6N2DE-	3.67	3.79	3.73
GS6N3DE-	3.99	3.83	3.91
GS6N4DE-	3.70	3.86	3.78
GB3N0---	4.41	3.27	3.84
GB3N1DE-	4.55	4.84	4.70
GB3N2DE-	5.87	6.30	6.09
GB3N3DE-	6.10	6.39	6.24
GB3N4DE-	6.99	6.80	6.89
GB3N0--C	3.87	4.23	4.05
GB3N1DEC	5.28	6.24	5.76
GB3N2DEC	5.42	5.39	5.40
GB3N3DEC	6.82	6.38	6.60
GB3N4DEC	6.26	6.24	6.25
GB3N1SP-	5.82	6.61	6.22
GB3N1SS-	5.37	6.08	5.72
GB3N2SS-	6.40	5.75	6.08
RG3N2DE-	5.66	5.73	5.69
RG3N2DEC	5.88	5.24	5.56
CL3N0---	3.36	3.89	3.62
CL3N2DE-	4.00	4.13	4.07
CL3N0--C	3.43	2.83	3.13
CL3N2DEC	3.66	4.04	3.85
LU3N0---	3.88	3.75	3.82
LU3N0--C	3.67	3.55	3.61
MEAN	4.28	4.32	4.30

***** STANDARD ERRORS OF DIFFERENCES OF MEANS *****

TABLE	TREATMNT*	TREATMNT* IRRIGATN
SED	0.366	0.518

***** STRATUM STANDARD ERRORS AND COEFFICIENTS OF VARIATION *****

STRATUM	DF	SE	CV%
WP	24	0.518	12.0

2ND CUTTING OCCASION MEAN DM% 14.4

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78/R/CS/200 PASTURES (R)

3RD CUTTING OCCASION (4/7/78) DRY MATTER TONNES/HECTARE

***** TABLES OF MEANS *****

IRRIGATN TREATMNT	NONE	FULL	MEAN
RG6N0---	0.38	0.23	0.31
RG6N1DE-	0.54	0.62	0.58
RG6N2DE-	1.01	1.29	1.15
RG6N3DE-	0.89	1.00	0.94
RG6N4DE-	1.59	0.58	1.08
RG6N5DE-	1.31	1.50	1.41
RG6N6DE-	0.65	0.61	0.63
GB6N0---	1.37	1.36	1.36
GB6N1DE-	1.41	1.34	1.37
GB6N2DE-	1.28	1.23	1.26
GB6N3DE-	0.98	1.04	1.01
GB6N4DE-	1.28	0.56	0.92
GS6N0---	1.06	1.47	1.27
GS6N1DE-	1.21	1.26	1.24
GS6N2DE-	1.03	1.02	1.03
GS6N3DE-	1.24	1.33	1.29
GS6N4DE-	0.55	0.50	0.52
MEAN	1.04	1.00	1.02

3RD CUTTING OCCASION MEAN DM% 14.5

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78/R/CS/200 PASTURES (R)

4TH CUTTING OCCASION (1/8/78) DRY MATTER TONNES/HECTARE

***** TABLES OF MEANS *****

IRRIGATN TREATMNT	NONE	FULL	MEAN
RG6N0---	0.34	0.35	0.34
RG6N1DE-	0.54	0.56	0.55
RG6N2DE-	1.64	1.44	1.54
RG6N3DE-	1.35	1.88	1.62
RG6N4DE-	1.79	3.03	2.41
RG6N5DE-	2.12	2.67	2.40
RG6N6DE-	1.16	2.67	1.91
GB6N0---	2.15	1.90	2.03
GB6N1DE-	2.23	2.63	2.43
GB6N2DE-	2.16	1.93	2.04
GB6N3DE-	2.46	2.96	2.71
GB6N4DE-	2.52	3.23	2.88
GS6N0---	1.93	1.74	1.83
GS6N1DE-	1.59	2.08	1.83
GS6N2DE-	2.03	2.27	2.15
GS6N3DE-	2.30	2.49	2.40
GS6N4DE-	2.18	2.86	2.52
GB3N0---	3.12	3.24	3.18
GB3N1DE-	4.15	3.24	3.70
GB3N2DE-	3.17	3.93	3.55
GB3N3DE-	4.06	4.84	4.45
GB3N4DE-	4.78	4.99	4.89
GB3N0--C	2.94	3.06	3.00
GB3N1DEC	3.17	3.65	3.41
GB3N2DEC	4.16	4.36	4.26
GB3N3DEC	5.09	5.97	5.53
GB3N4DEC	3.42	3.19	3.30
GB3N1SP-	2.83	3.11	2.97
GB3N1SS-	2.99	3.94	3.47
GB3N2SS-	2.32	3.62	2.97
RG3N2DE-	3.02	3.45	3.24
RG3N2DEC	3.06	3.74	3.40
CL3N0---	2.62	3.06	2.84
CL3N2DE-	2.81	2.75	2.78
CL3N0--C	2.65	2.53	2.59
CL3N2DEC	4.03	3.52	3.77
LU3N0---	3.88	3.58	3.73
LU3N0--C	3.79	4.22	4.01
MEAN	2.79	3.11	2.95

***** STANDARD ERRORS OF DIFFERENCES OF MEANS *****

TABLE	TREATMNT*	TREATMNT* IRRIGATN
SED	0.350	0.495

***** STRATUM STANDARD ERRORS AND COEFFICIENTS OF VARIATION *****

STRATUM	DF	SE	CV%
WP	24	0.495	16.8

4TH CUTTING OCCASION MEAN DM% 12.9

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78/R/CS/200 PASTURES (R)

5TH CUTTING OCCASION (29/8/78) DRY MATTER TONNES/HECTARE

***** TABLES OF MEANS *****

IRRIGATN TREATMNT	NONE	FULL	MEAN
RG6N0---	0.16	0.13	0.15
RG6N1DE-	0.59	0.50	0.55
RG6N2DE-	1.61	1.63	1.62
RG6N3DE-	2.14	2.25	2.20
RG6N4DE-	3.14	2.21	2.68
RG6N5DE-	2.57	2.76	2.66
RG6N6DE-	2.69	2.70	2.70
GB6N0---	2.16	1.88	2.02
GB6N1DE-	2.29	1.98	2.13
GB6N2DE-	2.28	1.97	2.13
GB6N3DE-	2.23	2.37	2.30
GB6N4DE-	2.47	2.39	2.43
GS6N0---	2.24	2.18	2.21
GS6N1DE-	2.27	2.27	2.27
GS6N2DE-	2.31	2.35	2.33
GS6N3DE-	2.42	2.52	2.47
GS6N4DE-	2.69	2.42	2.55
MEAN	2.13	2.03	2.08

5TH CUTTING OCCASION MEAN DM% 16.1

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78/R/CS/200 PASTURES (R)

6TH CUTTING OCCASION (26/9/78) DRY MATTER TONNES/HECTARE

***** TABLES OF MEANS *****

IRRIGATN TREATMNT	NONE	FULL	MEAN
RG6N0---	0.08	0.08	0.08
RG6N1DE-	0.17	0.17	0.17
RG6N2DE-	0.51	0.55	0.53
RG6N3DE-	0.71	0.89	0.80
RG6N4DE-	1.01	1.40	1.20
RG6N5DE-	0.35	1.57	0.96
RG6N6DE-	0.59	1.69	1.14
GB6N0---	0.53	1.45	0.99
GB6N1DE-	0.73	0.85	0.79
GB6N2DE-	0.57	1.65	1.11
GB6N3DE-	0.73	0.93	0.83
GB6N4DE-	0.58	0.99	0.79
GS6N0---	0.66	0.86	0.76
GS6N1DE-	0.73	1.29	1.01
GS6N2DE-	0.74	1.43	1.08
GS6N3DE-	0.84	1.56	1.20
GS6N4DE-	0.71	1.60	1.15
GB3N0---	2.25	2.35	2.30
GB3N1DE-	2.59	2.96	2.78
GB3N2DE-	2.52	2.14	2.33
GB3N3DE-	2.99	2.89	2.94
GB3N4DE-	2.94	2.52	2.73
GB3N0--C	2.53	3.16	2.85
GB3N1DEC	2.45	2.30	2.37
GB3N2DEC	2.79	3.20	3.00
GB3N3DEC	2.84	2.66	2.75
GB3N4DEC	3.41	3.12	3.27
GB3N1SP-	2.39	2.63	2.51
GB3N1SS-	2.49	2.49	2.49
GB3N2SS-	2.19	2.52	2.36
RG3N2DE-	3.07	3.54	3.30
RG3N2DEC	3.17	3.24	3.21
CL3N0---	1.90	2.23	2.07
CL3N2DE-	1.89	2.36	2.12
CL3N0--C	1.94	2.54	2.24
CL3N2DEC	2.56	2.59	2.58
LU3N0---	2.46	2.58	2.52
LU3N0--C	2.57	3.29	2.93
MEAN	1.86	2.17	2.02

***** STANDARD ERRORS OF DIFFERENCES OF MEANS *****

TABLE	TREATMNT*	TREATMNT* IRRIGATN
SED	0.258	0.365

***** STRATUM STANDARD ERRORS AND COEFFICIENTS OF VARIATION *****

STRATUM	DF	SE	CV%
WP	24	0.365	18.1

6TH CUTTING OCCASION MEAN DM% 18.8

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78/R/CS/200 PASTURES (R)

TOTAL OF 6 CUTTING OCCASIONS DRY MATTER TONNES/HECTARE
***** TABLES OF MEANS *****

IRRIGATN TREATMNT	NONE	FULL	MEAN
RG6N0---	2.50	2.68	2.59
RG6N1DE-	5.21	5.16	5.18
RG6N2DE-	9.24	9.38	9.31
RG6N3DE-	10.17	10.51	10.34
RG6N4DE-	13.30	13.05	13.18
RG6N5DE-	11.71	14.12	12.91
RG6N6DE-	10.59	13.37	11.98
GB6N0---	10.21	10.69	10.45
GB6N1DE-	10.62	11.18	10.90
GB6N2DE-	11.37	11.58	11.48
GB6N3DE-	11.87	12.45	12.16
GB6N4DE-	13.02	12.50	12.76
GS6N0---	9.38	9.44	9.41
GS6N1DE-	9.82	11.39	10.61
GS6N2DE-	11.20	12.17	11.68
GS6N3DE-	12.45	13.38	12.91
GS6N4DE-	11.68	13.42	12.55
GB3N0---	9.78	8.86	9.32
GB3N1DE-	11.30	11.05	11.17
GB3N2DE-	11.56	12.38	11.97
GB3N3DE-	13.16	14.12	13.64
GB3N4DE-	14.71	14.31	14.51
GB3N0--C	9.34	10.45	9.90
GB3N1DEC	10.90	12.19	11.54
GB3N2DEC	12.37	12.95	12.66
GB3N3DEC	14.75	15.01	14.88
GB3N4DEC	13.09	12.54	12.82
GB3N1SP-	11.05	12.34	11.70
GB3N1SS-	10.85	12.52	11.69
GB3N2SS-	10.91	11.89	11.40
RG3N2DE-	11.75	12.72	12.24
RG3N2DEC	12.11	12.22	12.16
CL3N0---	7.88	9.17	8.53
CL3N2DE-	8.70	9.24	8.97
CL3N0--C	8.02	7.90	7.96
CL3N2DEC	10.25	10.15	10.20
LU3N0---	10.22	9.92	10.07
LU3N0--C	10.04	11.06	10.55
MEAN	10.57	11.15	10.86

***** STANDARD ERRORS OF DIFFERENCES OF MEANS *****

TABLE	TREATMNT*	TREATMNT* IRRIGATN
SED	0.603	0.852

***** STRATUM STANDARD ERRORS AND COEFFICIENTS OF VARIATION *****

STRATUM	DF	SE	CV%
WP	24	0.852	7.8

TOTAL OF 6 CUTTING OCCASIONS MEAN DM% 15.2
SUBPLOT AREA HARVESTED 0.00038

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78/W/CS/200 BUTT FURLONG (W)

1ST CUTTING OCCASION (10/5/78) DRY MATTER TONNES/HECTARE

***** TABLES OF MEANS *****

IRRIGATN TREATMNT	NONE	FULL	MEAN
RG6N0---	0.18	0.36	0.27
RG6N1DE-	0.28	0.82	0.55
RG6N2DE-	1.11	0.93	1.02
RG6N3DE-	1.00	1.18	1.09
RG6N4DE-	1.57	1.47	1.52
RG6N5DE-	1.82	2.27	2.04
RG6N6DE-	2.27	2.17	2.22
GB6N0---	2.15	1.98	2.06
GB6N1DE-	2.25	2.31	2.28
GB6N2DE-	2.30	2.27	2.28
GB6N3DE-	2.65	2.84	2.75
GB6N4DE-	2.81	2.46	2.64
GS6N0---	1.26	1.40	1.33
GS6N1DE-	2.14	1.79	1.96
GS6N2DE-	2.19	2.35	2.27
GS6N3DE-	2.22	2.24	2.23
GS6N4DE-	2.83	2.71	2.77
MEAN	1.83	1.85	1.84

1ST CUTTING OCCASION MEAN DM% 15.9

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78/W/CS/200 BUTT FURLONG (W)

2ND CUTTING OCCASION (7/6/78) DRY MATTER TONNES/HECTARE

***** TABLES OF MEANS *****

IRRIGATN TREATMNT	NONE	FULL	MEAN
RG6N0---	0.67	0.91	0.79
RG6N1DE-	1.09	2.26	1.67
RG6N2DE-	2.35	2.97	2.66
RG6N3DE-	2.72	4.11	3.41
RG6N4DE-	3.15	4.69	3.92
RG6N5DE-	3.86	4.90	4.38
RG6N6DE-	3.77	4.99	4.38
GB6N0---	1.75	2.97	2.36
GB6N1DE-	2.14	3.25	2.70
GB6N2DE-	2.17	3.22	2.70
GB6N3DE-	2.09	3.67	2.88
GB6N4DE-	2.89	3.97	3.43
GS6N0---	1.65	2.60	2.12
GS6N1DE-	1.99	3.22	2.61
GS6N2DE-	2.03	3.55	2.79
GS6N3DE-	2.27	3.56	2.91
GS6N4DE-	2.48	4.12	3.30
GB3N0---	4.40	5.32	4.86
GB3N1DE-	5.59	7.22	6.41
GB3N2DE-	5.53	7.50	6.51
GB3N3DE-	6.58	7.43	7.01
GB3N4DE-	6.52	7.44	6.98
GB3N0--C	3.83	5.30	4.57
GB3N1DEC	5.92	6.95	6.43
GB3N2DEC	6.52	6.56	6.54
GB3N3DEC	7.10	8.48	7.79
GB3N4DEC	7.73	7.86	7.79
GB3N1SP-	6.17	7.29	6.73
GB3N1SS-	6.41	6.96	6.69
GB3N2SS-	6.43	7.51	6.97
RG3N2DE-	6.53	6.54	6.53
RG3N2DEC	6.34	8.57	7.46
CL3N0---	3.52	4.56	4.04
CL3N2DE-	4.00	5.35	4.68
CL3N0--C	3.89	4.49	4.19
CL3N2DEC	4.16	5.56	4.86
LU3N0---	4.37	5.33	4.85
LU3N0--C	4.34	4.65	4.50
MEAN	4.31	5.36	4.83

***** STANDARD ERRORS OF DIFFERENCES OF MEANS *****

TABLE	TREATMNT*	TREATMNT* IRRIGATN
SED	0.492	0.696

***** STRATUM STANDARD ERRORS AND COEFFICIENTS OF VARIATION *****

STRATUM	DF	SE	CV%
WP	24	0.696	14.4

2ND CUTTING OCCASION MEAN DM% 17.5

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78/W/CS/200 BUTT FURLONG (W)

3RD CUTTING OCCASION (5/7/78) DRY MATTER TONNES/HECTARE

***** TABLES OF MEANS *****

IRRIGATN TREATMNT	NONE	FULL	MEAN
RG6N0---	0.11	0.19	0.15
RG6N1DE-	0.30	0.57	0.44
RG6N2DE-	0.82	0.99	0.90
RG6N3DE-	1.03	1.19	1.11
RG6N4DE-	1.18	1.45	1.32
RG6N5DE-	0.97	1.32	1.15
RG6N6DE-	1.44	1.80	1.62
GB6N0---	0.91	1.74	1.33
GB6N1DE-	1.51	1.76	1.63
GB6N2DE-	1.59	1.85	1.72
GB6N3DE-	1.67	1.67	1.67
GB6N4DE-	1.61	1.92	1.76
GS6N0---	0.52	0.89	0.70
GS6N1DE-	1.16	1.40	1.28
GS6N2DE-	1.20	1.42	1.31
GS6N3DE-	1.17	1.25	1.21
GS6N4DE-	2.12	1.53	1.82
MEAN	1.14	1.35	1.24

3RD CUTTING OCCASION MEAN DM% 13.8

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78/W/CS/200 BUTT FURLONG (W)

4TH CUTTING OCCASION (4/8/78) DRY MATTER TONNES/HECTARE

***** TABLES OF MEANS *****

IRRIGATN TREATMNT	NONE	FULL	MEAN
RG6N0---	0.18	0.14	0.16
RG6N1DE-	0.34	1.05	0.69
RG6N2DE-	0.71	1.38	1.05
RG6N3DE-	0.87	2.43	1.65
RG6N4DE-	1.03	3.25	2.14
RG6N5DE-	0.91	2.37	1.64
RG6N6DE-	1.39	3.36	2.38
GB6N0---	0.35	2.45	1.40
GB6N1DE-	1.14	2.65	1.90
GB6N2DE-	1.10	2.45	1.77
GB6N3DE-	1.18	3.20	2.19
GB6N4DE-	1.38	3.02	2.20
GS6N0---	0.27	2.13	1.20
GS6N1DE-	0.79	2.60	1.70
GS6N2DE-	0.88	2.37	1.62
GS6N3DE-	0.63	2.42	1.52
GS6N4DE-	1.35	3.60	2.48
GB3N0---	2.09	*	2.09
GB3N1DE-	1.78	*	1.78
GB3N1SP-	2.44	*	2.44
GB3N1SS-	2.73	3.20	2.97
CL3N0---	2.09	2.81	2.33
CL3N2DE-	2.60	2.94	2.77
CL3N0--C	2.74	3.11	2.93
CL3N2DEC	3.14	*	3.14
LU3N0---	3.65	4.60	4.13
LU3N0--C	3.48	4.59	4.03
MEAN	1.68	2.85	2.21

4TH CUTTING OCCASION MEAN DM% 15.1

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78/W/CS/200 BUTT FURLONG (W)

5TH CUTTING OCCASION (30/8/78) DRY MATTER TONNES/HECTARE

***** TABLES OF MEANS *****

IRRIGATN TREATMNT	NONE	FULL	MEAN
RG6N0---	0.00	0.10	0.05
RG6N1DE-	0.27	0.54	0.41
RG6N2DE-	1.31	1.18	1.24
RG6N3DE-	1.80	1.72	1.76
RG6N4DE-	1.91	2.05	1.98
RG6N5DE-	2.14	2.25	2.19
RG6N6DE-	2.21	1.68	1.94
GB6N0---	1.53	1.88	1.70
GB6N1DE-	1.99	1.74	1.87
GB6N2DE-	2.28	1.84	2.06
GB6N3DE-	1.95	1.68	1.82
GB6N4DE-	2.34	1.50	1.92
GS6N0---	0.84	1.78	1.31
GS6N1DE-	1.84	1.59	1.71
GS6N2DE-	1.70	1.82	1.76
GS6N3DE-	1.92	1.77	1.84
GS6N4DE-	2.21	1.61	1.91
MEAN	1.66	1.57	1.62

5TH CUTTING OCCASION MEAN DM% 16.2

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78/W/CS/200 BUTT FURLONG (W)

6TH CUTTING OCCASION (27/9/78) DRY MATTER TONNES/HECTARE

**** TABLES OF MEANS *****

IRRIGATN TREATMNT	NONE	FULL	MEAN
RG6N0---	0.00	0.14	0.07
RG6N1DE-	0.16	0.37	0.27
RG6N2DE-	0.57	0.73	0.65
RG6N3DE-	0.71	1.23	0.97
RG6N4DE-	0.62	1.71	1.16
RG6N5DE-	0.68	2.28	1.48
RG6N6DE-	0.64	1.81	1.23
GB6N0---	0.36	1.41	0.89
GB6N1DE-	0.77	1.41	1.09
GB6N2DE-	0.61	1.33	0.97
GB6N3DE-	0.75	1.58	1.17
GB6N4DE-	0.88	1.49	1.19
GS6N0---	0.30	1.29	0.80
GS6N1DE-	0.58	1.17	0.88
GS6N2DE-	0.47	1.61	1.04
GS6N3DE-	0.32	1.43	0.87
GS6N4DE-	1.02	2.02	1.52
GB3N0---	1.91	2.41	2.16
GB3N1DE-	2.18	2.32	2.25
GB3N2DE-	2.65	3.46	3.06
GB3N3DE-	3.67	3.21	3.44
GB3N4DE-	3.85	2.87	3.36
GB3N0--C	2.27	3.26	2.77
GB3N1DEC	3.26	2.98	3.12
GB3N2DEC	3.67	2.86	3.27
GB3N3DEC	3.93	3.78	3.86
GB3N4DEC	4.78	4.11	4.44
GB3N1SP-	1.72	1.97	1.84
GB3N1SS-	2.25	1.87	2.06
GB3N2SS-	3.17	2.52	2.85
RG3N2DE-	2.56	2.80	2.68
RG3N2DEC	3.16	3.55	3.36
CL3N0---	1.66	2.59	2.13
CL3N2DE-	1.20	2.63	1.91
CL3N0--C	2.38	2.62	2.50
CL3N2DEC	2.12	3.01	2.57
LU3N0---	3.16	3.20	3.18
LU3N0--C	2.64	3.77	3.20
MEAN	1.91	2.36	2.13

***** STANDARD ERRORS OF DIFFERENCES OF MEANS *****

TABLE	TREATMNT*	TREATMNT* IRRIGATN
SED	0.242	0.342

***** STRATUM STANDARD ERRORS AND COEFFICIENTS OF VARIATION *****

STRATUM	DF	SE	CV%
WP	24	0.342	16.0

6TH CUTTING OCCASION MEAN DM% 17.9

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78/W/CS/200 BUTT FURLONG (W)

TOTAL OF 6 CUTTING OCCASIONS DRY MATTER TONNES/HECTARE

***** TABLES OF MEANS *****

IRRIGATN TREATMNT	NONE	FULL	MEAN
RG6N0---	1.14	1.85	1.49
RG6N1DE-	2.44	5.60	4.02
RG6N2DE-	6.87	8.18	7.52
RG6N3DE-	8.14	11.85	10.00
RG6N4DE-	9.45	14.62	12.04
RG6N5DE-	10.38	15.38	12.88
RG6N6DE-	11.72	15.81	13.77
GB6N0---	7.05	12.42	9.73
GB6N1DE-	9.81	13.13	11.47
GB6N2DE-	10.05	12.95	11.50
GB6N3DE-	10.29	14.64	12.47
GB6N4DE-	11.92	14.35	13.14
GS6N0---	4.84	10.09	7.47
GS6N1DE-	8.50	11.77	10.13
GS6N2DE-	8.47	13.12	10.80
GS6N3DE-	8.53	12.66	10.59
GS6N4DE-	12.00	15.59	13.79
GB3N0---	7.85	*	7.85
GB3N1DE-	9.55	*	9.55
GB3N1SP-	10.40	*	10.40
GB3N1SS-	11.29	12.01	11.68
CL3N0---	7.27	10.57	8.37
CL3N2DE-	7.97	10.55	9.26
CL3N0--C	9.23	10.61	9.92
CL3N2DEC	9.75	*	9.75
LU3N0---	11.18	13.13	12.16
LU3N0--C	10.46	13.00	11.73
MEAN	8.85	12.00	10.28

TOTAL OF 6 CUTTING OCCASIONS MEAN DM% 16.9

SUB PLOT AREA HARVESTED 0.00038

https://doi.org/10.23637/ERADOC-1-30 *pp 264*

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78/R/CS/201

FACTORS AFFECTING YIELD

Object: To study the residual effects on wheat of a range of treatments applied to field beans in 1977 - Pastures.

Sponsors: R. Bardner, G.G. Briggs, A.J. Cockbain, J.M. Day, K.E. Fletcher, B.J. Legg, J. McEwen, R.J. Roughley, G.A. Salt, H.R. Simpson, R.M. Webb, J.F. Witty.

The second year, winter wheat.

For previous year see 77/R/CS/201.

Design: Half replicate of 2^8 in 8 blocks of 2 plots split into 8.

Whole plot dimensions: 10.4 x 57.6.

Treatments applied in 1977: Combinations of:-

Whole plots

1. IRRIGATN(77) Irrigation:

   NONE None
   FULL Full (119 mm)

Sub plots

2. N(77) Nitrogen fertiliser at flowering (kg N):

   0
   150

3. ALDICARB(77) Aldicarb to seedbed (kg):

   0
   10

4. FONOFOS(77) Fonofos to seedbed (kg):

   0
   5

5. BEN 1(77) Benomyl to seedbed (kg):

   0
   32

6. PERMETH(77) Permethrin foliar spray (kg):

   0.00
   0.15

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7. PIRIMICA(77) Pirimicarb foliar spray (kg):

0.00
0.14

8. BEN 2(77) Benomyl foliar spray (kg):

0.0
0.6

Basal applications: Manures: (0:20:20) at 310 kg, combine drilled. 'Nitra-Shell 34' at 290 kg. Weedkillers: Dicamba with mecoprop and MCPA ('Banlene plus' at 4.9 l in 220 l).

Seed: Atou, sown at 200 kg.

Cultivations, etc.:- Ploughed: 26 Oct, 1977. Rotary harrowed, seed sown: 15 Nov. N applied: 25 Apr. Weedkiller applied: 10 May. Combine harvested: 13 Sept.

GRAIN TONNES/HECTARE

***** TABLES OF MEANS *****

N(77)	0	150	MEAN
IRRIGATN(77)			
NONE	7.28	7.10	7.19
FULL	7.20	7.22	7.21
MEAN	7.24	7.16	7.20

ALDICARB(77)	0	10	MEAN
IRRIGATN(77)			
NONE	7.19	7.19	7.19
FULL	7.20	7.22	7.21
MEAN	7.20	7.21	7.20

ALDICARB(77)	0	10	MEAN
N(77)			
0	7.25	7.24	7.24
150	7.15	7.17	7.16
MEAN	7.20	7.21	7.20

FONOFOS(77)	0	5	MEAN
IRRIGATN(77)			
NONE	7.18	7.20	7.19
FULL	7.21	7.21	7.21
MEAN	7.20	7.20	7.20

FONOFOS(77)	0	5	MEAN
N(77)			
0	7.22	7.27	7.24
150	7.18	7.14	7.16
MEAN	7.20	7.20	7.20

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GRAIN TONNES/HECTARE

***** TABLES OF MEANS *****

FONOFOS(77)	0	5	MEAN
ALDICARB(77)			
0	7.19	7.20	7.20
10	7.20	7.21	7.21
MEAN	7.20	7.20	7.20

BEN 1(77)	0	32	MEAN
IRRIGATN(77)			
NONE	7.17	7.21	7.19
FULL	7.26	7.16	7.21
MEAN	7.22	7.19	7.20

BEN 1(77)	0	32	MEAN
N(77)			
0	7.25	7.24	7.24
150	7.18	7.14	7.16
MEAN	7.22	7.19	7.20

BEN 1(77)	0	32	MEAN
ALDICARB(77)			
0	7.23	7.16	7.20
10	7.20	7.21	7.21
MEAN	7.22	7.19	7.20

BEN 1(77)	0	32	MEAN
FONOFOS(77)			
0	7.21	7.18	7.20
5	7.22	7.19	7.20
MEAN	7.22	7.19	7.20

PERMETH(77)	0.00	0.15	MEAN
IRRIGATN(77)			
NONE	7.22	7.16	7.19
FULL	7.26	7.16	7.21
MEAN	7.24	7.16	7.20

PERMETH(77)	0.00	0.15	MEAN
N(77)			
0	7.29	7.20	7.24
150	7.19	7.13	7.16
MEAN	7.24	7.16	7.20

PERMETH(77)	0.00	0.15	MEAN
ALDICARB(77)			
0	7.26	7.13	7.20
10	7.22	7.19	7.21
MEAN	7.24	7.16	7.20

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GRAIN TONNES/HECTARE

***** TABLES OF MEANS *****

PERMETH(77)	0.00	0.15	MEAN
FONOFOS(77)			
0	7.22	7.17	7.20
5	7.26	7.15	7.20
MEAN	7.24	7.16	7.20

PERMETH(77)	0.00	0.15	MEAN
BEN 1(77)			
0	7.26	7.17	7.22
32	7.22	7.15	7.19
MEAN	7.24	7.16	7.20

PIRIMICA(77)	0.00	0.14	MEAN
IRRIGATN(77)			
NONE	7.16	7.22	7.19
FULL	7.21	7.21	7.21
MEAN	7.18	7.22	7.20

PIRIMICA(77)	0.00	0.14	MEAN
N(77)			
0	7.23	7.26	7.24
150	7.14	7.18	7.16
MEAN	7.18	7.22	7.20

PIRIMICA(77)	0.00	0.14	MEAN
ALDICARB(77)			
0	7.18	7.22	7.20
10	7.19	7.22	7.21
MEAN	7.18	7.22	7.20

PIRIMICA(77)	0.00	0.14	MEAN
FONOFOS(77)			
0	7.18	7.21	7.20
5	7.19	7.22	7.20
MEAN	7.18	7.22	7.20

PIRIMICA(77)	0.00	0.14	MEAN
BEN 1(77)			
0	7.19	7.24	7.22
32	7.18	7.19	7.19
MEAN	7.18	7.22	7.20

PIRIMICA(77)	0.00	0.14	MEAN
PERMETH(77)			
0.00	7.22	7.27	7.24
0.15	7.15	7.17	7.16
MEAN	7.18	7.22	7.20

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GRAIN TONNES/HECTARE

***** TABLES OF MEANS *****

BEN 2(77)	0.0	0.6	MEAN
IRRIGATN(77)			
NONE	7.19	7.19	7.19
FULL	7.22	7.21	7.21
MEAN	7.20	7.20	7.20

BEN 2(77)	0.0	0.6	MEAN
N(77)			
0	7.27	7.22	7.24
150	7.14	7.18	7.16
MEAN	7.20	7.20	7.20

BEN 2(77)	0.0	0.6	MEAN
ALDICARB(77)			
0	7.18	7.21	7.20
10	7.23	7.18	7.21
MEAN	7.20	7.20	7.20

BEN 2(77)	0.0	0.6	MEAN
FONOFOS(77)			
0	7.19	7.20	7.20
5	7.21	7.20	7.20
MEAN	7.20	7.20	7.20

BEN 2(77)	0.0	0.6	MEAN
BEN 1(77)			
0	7.24	7.19	7.22
32	7.17	7.21	7.19
MEAN	7.20	7.20	7.20

BEN 2(77)	0.0	0.6	MEAN
PERMETH(77)			
0.00	7.24	7.24	7.24
0.15	7.17	7.16	7.16
MEAN	7.20	7.20	7.20

BEN 2(77)	0.0	0.6	MEAN
PIRIMICA(77)			
0.00	7.18	7.19	7.18
0.14	7.22	7.21	7.22
MEAN	7.20	7.20	7.20

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GRAIN TONNES/HECTARE

***** TABLES OF MEANS (INDIVIDUAL VALUES) *****

IRRIGATN(77)	N(77)	ALDICARB(77)	FONOFOS(77)	BEN 1(77)	PERMETH(77)	PIRIMICA(77)	BEN 2(77)	GRAIN
NONE	0	0	0	0	0.00	0.00	0.0	7.28
NONE	0	0	0	0	0.00	0.14	0.6	7.02
NONE	0	0	0	0	0.15	0.00	0.6	6.97
NONE	0	0	0	0	0.15	0.14	0.0	7.45
NONE	0	0	0	32	0.00	0.00	0.6	7.46
NONE	0	0	0	32	0.00	0.14	0.0	7.15
NONE	0	0	0	32	0.15	0.00	0.0	7.02
NONE	0	0	0	32	0.15	0.14	0.6	7.62
NONE	0	0	5	0	0.00	0.00	0.6	7.45
NONE	0	0	5	0	0.00	0.14	0.0	7.43
NONE	0	0	5	0	0.15	0.00	0.0	7.31
NONE	0	0	5	0	0.15	0.14	0.6	7.26
NONE	0	0	5	32	0.00	0.00	0.0	7.53
NONE	0	0	5	32	0.00	0.14	0.6	7.10
NONE	0	0	5	32	0.15	0.00	0.6	7.29
NONE	0	0	5	32	0.15	0.14	0.0	7.09
NONE	0	10	0	0	0.00	0.00	0.6	7.05
NONE	0	10	0	0	0.00	0.14	0.0	7.41
NONE	0	10	0	0	0.15	0.00	0.0	7.37
NONE	0	10	0	0	0.15	0.14	0.6	7.10
NONE	0	10	0	32	0.00	0.00	0.0	7.05
NONE	0	10	0	32	0.00	0.14	0.6	7.71
NONE	0	10	0	32	0.15	0.00	0.6	7.19
NONE	0	10	0	32	0.15	0.14	0.0	7.08
NONE	0	10	5	0	0.00	0.00	0.0	7.18
NONE	0	10	5	0	0.00	0.14	0.6	7.13
NONE	0	10	5	0	0.15	0.00	0.6	7.39
NONE	0	10	5	0	0.15	0.14	0.0	7.35
NONE	0	10	5	32	0.00	0.00	0.6	7.09
NONE	0	10	5	32	0.00	0.14	0.0	8.17
NONE	0	10	5	32	0.15	0.00	0.0	7.12
NONE	0	10	5	32	0.15	0.14	0.6	7.26

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GRAIN TONNES/HECTARE

***** TABLES OF MEANS (INDIVIDUAL VALUES) *****

IRRIGATN(77)	N(77)	ALDICARB(77)	FONOFOS(77)	BEN 1(77)	PERMETH(77)	PIRIMICA(77)	BEN 2(77)	GRAIN
NONE	150	0	0	0	0.00	0.00	0.6	7.37
NONE	150	0	0	0	0.00	0.14	0.0	7.07
NONE	150	0	0	0	0.15	0.00	0.0	6.84
NONE	150	0	0	0	0.15	0.14	0.6	7.17
NONE	150	0	0	32	0.00	0.00	0.0	7.39
NONE	150	0	0	32	0.00	0.14	0.6	7.34
NONE	150	0	0	32	0.15	0.00	0.6	7.03
NONE	150	0	0	32	0.15	0.14	0.0	6.91
NONE	150	0	5	0	0.00	0.00	0.0	7.10
NONE	150	0	5	0	0.00	0.14	0.6	7.29
NONE	150	0	5	0	0.15	0.00	0.6	6.98
NONE	150	0	5	0	0.15	0.14	0.0	7.04
NONE	150	0	5	32	0.00	0.00	0.6	7.07
NONE	150	0	5	32	0.00	0.14	0.0	6.70
NONE	150	0	5	32	0.15	0.00	0.0	6.92
NONE	150	0	5	32	0.15	0.14	0.6	7.39
NONE	150	10	0	0	0.00	0.00	0.0	6.82
NONE	150	10	0	0	0.00	0.14	0.6	7.11
NONE	150	10	0	0	0.15	0.00	0.6	7.13
NONE	150	10	0	0	0.15	0.14	0.0	7.20
NONE	150	10	0	32	0.00	0.00	0.6	6.88
NONE	150	10	0	32	0.00	0.14	0.0	7.11
NONE	150	10	0	32	0.15	0.00	0.0	7.58
NONE	150	10	0	32	0.15	0.14	0.6	6.89
NONE	150	10	5	0	0.00	0.00	0.6	6.91
NONE	150	10	5	0	0.00	0.14	0.0	7.47
NONE	150	10	5	0	0.15	0.00	0.0	6.92
NONE	150	10	5	0	0.15	0.14	0.6	6.83
NONE	150	10	5	32	0.00	0.00	0.0	6.96
NONE	150	10	5	32	0.00	0.14	0.6	7.17
NONE	150	10	5	32	0.15	0.00	0.6	7.45
NONE	150	10	5	32	0.15	0.14	0.0	7.03

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GRAIN TONNES/HECTARE

***** TABLES OF MEANS (INDIVIDUAL VALUES) *****

IRRIGATN(77)	N(77)	ALDICARB(77)	FONOFOS(77)	BEN 1(77)	PERMETH(77)	PIRIMICA(77)	BEN 2(77)	GRAIN
FULL	0	0	0	0	0.00	0.00	0.6	7.20
FULL	0	0	0	0	0.00	0.14	0.0	7.03
FULL	0	0	0	0	0.15	0.00	0.0	7.58
FULL	0	0	0	0	0.15	0.14	0.6	7.38
FULL	0	0	0	32	0.00	0.00	0.0	7.13
FULL	0	0	0	32	0.00	0.14	0.6	7.58
FULL	0	0	0	32	0.15	0.00	0.6	7.02
FULL	0	0	0	32	0.15	0.14	0.0	6.63
FULL	0	0	5	0	0.00	0.00	0.0	7.13
FULL	0	0	5	0	0.00	0.14	0.6	7.66
FULL	0	0	5	0	0.15	0.00	0.6	7.02
FULL	0	0	5	0	0.15	0.14	0.0	7.41
FULL	0	0	5	32	0.00	0.00	0.6	7.32
FULL	0	0	5	32	0.00	0.14	0.0	7.23
FULL	0	0	5	32	0.15	0.00	0.0	6.82
FULL	0	0	5	32	0.15	0.14	0.6	7.28
FULL	0	10	0	0	0.00	0.00	0.0	7.50
FULL	0	10	0	0	0.00	0.14	0.6	7.07
FULL	0	10	0	0	0.15	0.00	0.6	6.96
FULL	0	10	0	0	0.15	0.14	0.0	7.39
FULL	0	10	0	32	0.00	0.00	0.6	7.49
FULL	0	10	0	32	0.00	0.14	0.0	7.26
FULL	0	10	0	32	0.15	0.00	0.0	7.05
FULL	0	10	0	32	0.15	0.14	0.6	6.76
FULL	0	10	5	0	0.00	0.00	0.6	7.24
FULL	0	10	5	0	0.00	0.14	0.0	7.02
FULL	0	10	5	0	0.15	0.00	0.0	7.36
FULL	0	10	5	0	0.15	0.14	0.6	6.94
FULL	0	10	5	32	0.00	0.00	0.0	7.53
FULL	0	10	5	32	0.00	0.14	0.6	6.76
FULL	0	10	5	32	0.15	0.00	0.6	7.20
FULL	0	10	5	32	0.15	0.14	0.0	7.58

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GRAIN TONNES/HECTARE

***** TABLES OF MEANS (INDIVIDUAL VALUES) *****

IRRIGATN(77)	N(77)	ALDICARB(77)	FONOFOS(77)	BEN 1(77)	PERMETH(77)	PIRIMICA(77)	BEN 2(77)	GRAIN
FULL	150	0	0	0	0.00	0.00	0.0	7.25
FULL	150	0	0	0	0.00	0.14	0.6	7.21
FULL	150	0	0	0	0.15	0.00	0.6	6.93
FULL	150	0	0	0	0.15	0.14	0.0	7.25
FULL	150	0	0	32	0.00	0.00	0.6	6.96
FULL	150	0	0	32	0.00	0.14	0.0	7.38
FULL	150	0	0	32	0.15	0.00	0.0	7.39
FULL	150	0	0	32	0.15	0.14	0.6	7.09
FULL	150	0	5	0	0.00	0.00	0.6	7.43
FULL	150	0	5	0	0.00	0.14	0.0	7.85
FULL	150	0	5	0	0.15	0.00	0.0	7.20
FULL	150	0	5	0	0.15	0.14	0.6	6.95
FULL	150	0	5	32	0.00	0.00	0.0	7.22
FULL	150	0	5	32	0.00	0.14	0.6	7.03
FULL	150	0	5	32	0.15	0.00	0.6	7.01
FULL	150	0	5	32	0.15	0.14	0.0	7.00
FULL	150	10	0	0	0.00	0.00	0.6	7.58
FULL	150	10	0	0	0.00	0.14	0.0	7.24
FULL	150	10	0	0	0.15	0.00	0.0	7.15
FULL	150	10	0	0	0.15	0.14	0.6	7.66
FULL	150	10	0	32	0.00	0.00	0.0	6.74
FULL	150	10	0	32	0.00	0.14	0.6	7.22
FULL	150	10	0	32	0.15	0.00	0.6	7.36
FULL	150	10	0	32	0.15	0.14	0.0	7.39
FULL	150	10	5	0	0.00	0.00	0.0	7.28
FULL	150	10	5	0	0.00	0.14	0.6	7.58
FULL	150	10	5	0	0.15	0.00	0.6	7.19
FULL	150	10	5	0	0.15	0.14	0.0	6.74
FULL	150	10	5	32	0.00	0.00	0.6	7.30
FULL	150	10	5	32	0.00	0.14	0.0	7.03
FULL	150	10	5	32	0.15	0.00	0.0	7.15
FULL	150	10	5	32	0.15	0.14	0.6	7.28

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GRAIN TONNES/HECTARE

***** STANDARD ERRORS OF DIFFERENCES OF MEANS *****

SED 0.035*
0.050**
0.071***

* USE ONLY ON MARGINS OF A TWO WAY TABLE,EXCEPT FOR IRRIGATN(77) .
** USE FOR THE BODY OF A TWO WAY TABLE,ONLY WITHIN THE SAME LEVEL OF IRRIGATN(77) (IF APPLICABLE).
*** USE FOR THREE WAY TABLES (IF CONSTRUCTED FROM INDIVIDUAL VALUES), ONLY WITHIN THE SAME LEVEL OF IRRIGATN(77) (IF APPLICABLE) .
DO NOT USE SED FOR THE FOLLOWING TABLES
ALDICARB(77).FONOFOS(77).BEN 1(77)
N(77).BEN 1(77).PERMETH(77)
N(77).FONOFOS(77).PIRIMICA(77)
ALDICARB(77).PERMETH(77).PIRIMICA(77)
N(77).ALDICARB(77).BEN 2(77)
FONOFOS(77).PERMETH(77).BEN 2(77)
BEN 1(77).PIRIMICA(77).BEN 2(77)
AS NO SED'S ARE AVAILABLE FOR THESE TABLES .

***** STRATUM STANDARD ERRORS AND COEFFICIENTS OF VARIATION *****

STRATUM	DF	SE	CV%
BLOCK.WP.SP	28	0.200	2.8

GRAIN MEAN DM% 83.5

SUB PLOT AREA HARVESTED 0.00260

https://doi.org/10.23637/ERADOC-1-30 *pp 274*

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78/R/CS/202

EFFECTS OF PHIALOPHORA

Object: To study the effects of ryegrass, oats and wheat, and of soil inoculation on populations of Phialophora radicicola graminicola (Prg) and on take-all (Gauemannomyces graminis) and yield of following wheat crops - Whittlocks.

Sponsors: E. Lester, D.B. Slope, R.J. Gutteridge.

The second year, wheat.

For previous year see 77/R/CS/202.

Design: 3 randomised blocks of 8 plots.

Whole plot dimensions: 2.67 x 6.10.

Treatments:

CRP INOC(778) Crop in 1977 and inoculation in 1977 and 1978:

GRASS	Ryegrass
GRASS(I)	Ryegrass + Prg inoculum 1977
OATS	Spring oats
OATS(I)	Spring oats + Prg inoculum 1977
OATS I	Spring oats + Prg inoculum to 1978 wheat
OATS DI	Spring oats + dummy inoculum (sand) to 1978 wheat
WHEAT	Spring wheat
WHEAT(I)	Spring wheat + Prg inoculum 1977

NOTE: Phialophora inoculum was applied on 20 Oct, 1977. The inoculum was a Phialophora culture macerated in coarse sand. Coarse sand alone was applied as dummy inoculum on the same date.

Basal applications: Manures: (10:24:24) at 200 kg, combine drilled. 'Nitro-chalk 26' at 300 kg. K_2O at 100 kg as muriate of potash. Weedkillers: Paraquat at 0.56 kg ion in 220 l. Terbutryne at 2.8 kg in 220 l.

Seed: Cappelle, sown at 190 kg.

Cultivations, etc.: Paraquat applied: 26 Sept, 1977. K applied, ploughed: 11 Oct. Rolled, rotary harrowed: 20 Oct. Power harrowed, seed sown and terbutryne applied: 24 Oct. N applied: 4 May, 1978. Combine harvested: 4 Sept, 1978.

NOTE: Take-all and Phialophora were estimated in plants in April and July and in soil in September.

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78/R/CS/202

GRAIN TONNES/HECTARE

***** TABLES OF MEANS *****

CRP INOC(778)	
GRASS	8.23
GRASS(I)	7.76
OATS	7.22
OATS(I)	7.82
OATS I	8.44
OATS DI	7.26
WHEAT	6.40
WHEAT(I)	5.75
MEAN	7.36

***** STANDARD ERRORS OF DIFFERENCES OF MEANS *****

TABLE	CRP INOC(778)
SED	0.457

***** STRATUM STANDARD ERRORS AND COEFFICIENTS OF VARIATION *****

STRATUM	DF	SE	CV%
BLOCK.WP	14	0.560	7.6

GRAIN MEAN DM% 80.6

PLOT AREA HARVESTED 0.00116

https://doi.org/10.23637/ERADOC-1-30 *pp 276*

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78/R/CS/204

CLOVER VARIETIES IN GRASS/CLOVER MIXTURES

Object: To study the effects of controlling pests and diseases on the persistence of different varieties of white clover in mixed grass/clover swards - Long Hoos IV 2.

Sponsors: I.F. Henderson, R.T. Plumb, J.F. Jenkyn.

The second year, white clover, ryegrass.

For previous year see 77/R/CS/204

Design: 2 randomised blocks of 40 plots.

Whole plot dimensions: 1.83 x 6.10.

Treatments: All combinations of:-

1. VARIETY	Varieties and species:	
	S23	S.23 ryegrass
	S23/BLAN	S.23 ryegrass + Blanca white clover
	S23/KWW	S.23 ryegrass + Kent wild white clover
	S23/LAD	S.23 ryegrass + Ladino white clover
	S23/MIL	S.23 ryegrass + Milkanova white clover
2. CHEMICAL	Chemicals for pest and disease control:	
	NONE	None
	ALDICARB	Aldicarb at 5 kg
	BENOMYL	Benomyl at 0.5 kg
	PHOR+MET	Phorate at 5 kg + metaldehyde at 1.8 kg
3. NITROGEN	Nitrogen fertiliser (kg N as 'Nitro-Chalk 25'):	
	N 1	100 in spring
	N 2	100 in spring + 50 after each cut except the last

NOTES: (1) Aldicarb was applied on 20 Mar, 1978, and 7 July.
(2) Benomyl was applied on 23 Sept, 1977, 25 Oct, 22 Nov, 20 Dec, 24 Jan, 1978, 23 Feb.
(3) Phorate and metaldehyde were applied on 17 Mar, 1978, 24 Apr, 12 May, 23 June, 7 Aug, 19 Sept.
(4) This was the first year of the test of nitrogen.

Basal applications: Manures: (0:14:28) at 720 kg.

Cultivations, etc.:- PK applied: 24 Nov, 1977. Spring N applied: 10 Mar, 1978. Cut 5 times: 9 May, 19 June, 31 July, 11 Sept, 11 Oct. N applied: 10 May, 20 June, 1 Aug, 12 Sept.

NOTE: The proportions of grass, clover, monocotyledonous and dicotyledonous weeds were determined. Plots were vacuum sampled for insect pests at fortnightly intervals between late April and mid October.

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78/R/CS/204

1ST CUT (9/5/78) DRY MATTER TONNES/HECTARE

***** TABLES OF MEANS *****

NITROGEN	N 1	N 2	MEAN
CHEMICAL			
NONE	4.02	3.91	3.97
ALDICARB	3.90	4.02	3.96
BENOMYL	4.03	4.35	4.19
PHOR+MET	4.25	3.98	4.12
MEAN	4.05	4.06	4.06

VARIETY	S23	S23/BLAN	S23/KWW	S23/LAD	S23/MIL	MEAN
CHEMICAL						
NONE	4.58	3.69	3.69	4.16	3.70	3.97
ALDICARB	4.34	3.62	4.16	3.76	3.92	3.96
BENOMYL	4.40	4.14	3.92	4.07	4.41	4.19
PHOR+MET	4.44	3.72	4.23	4.43	3.77	4.12
MEAN	4.44	3.79	4.00	4.11	3.95	4.06

VARIETY	S23	S23/BLAN	S23/KWW	S23/LAD	S23/MIL	MEAN
NITROGEN						
N 1	4.51	3.78	4.00	4.19	3.78	4.05
N 2	4.38	3.81	4.00	4.02	4.12	4.06
MEAN	4.44	3.79	4.00	4.11	3.95	4.06

VARIETY	NITROGEN	N 1	N 2
	CHEMICAL		
S23	NONE	4.81	4.36
	ALDICARB	4.11	4.57
	BENOMYL	4.37	4.44
	PHOR+MET	4.74	4.14
S23/BLAN	NONE	3.68	3.70
	ALDICARB	3.68	3.57
	BENOMYL	3.94	4.35
	PHOR+MET	3.81	3.62
S23/KWW	NONE	3.80	3.58
	ALDICARB	4.23	4.09
	BENOMYL	3.59	4.24
	PHOR+MET	4.39	4.07
S23/LAD	NONE	4.31	4.01
	ALDICARB	3.77	3.76
	BENOMYL	4.02	4.13
	PHOR+MET	4.68	4.18
S23/MIL	NONE	3.51	3.90
	ALDICARB	3.72	4.12
	BENOMYL	4.24	4.59
	PHOR+MET	3.65	3.88

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78/R/CS/204

1ST CUT (9/5/78) DRY MATTER TONNES/HECTARE

***** STANDARD ERRORS OF DIFFERENCES OF MEANS *****

TABLE	VARIETY	CHEMICAL	NITROGEN	VARIETY CHEMICAL
SED	0.164	0.147	0.104	0.328

TABLE	VARIETY NITROGEN	CHEMICAL NITROGEN	VARIETY CHEMICAL NITROGEN
SED	0.232	0.208	0.464

***** STRATUM STANDARD ERRORS AND COEFFICIENTS OF VARIATION *****

STRATUM	DF	SE	CV%
BLOCK.WP	39	0.464	11.4

1ST CUT MEAN DM% 15.9

2ND CUT (19/6/78) DRY MATTER TONNES/HECTARE

***** TABLES OF MEANS *****

NITROGEN / CHEMICAL	N 1	N 2	MEAN
NONE	2.75	3.55	3.15
ALDICARB	2.73	3.56	3.14
BENOMYL	2.91	3.66	3.29
PHOR+MET	2.46	3.38	2.92
MEAN	2.71	3.54	3.12

VARIETY / CHEMICAL	S23	S23/BLAN	S23/KWW	S23/LAD	S23/MIL	MEAN
NONE	1.87	3.73	3.56	2.79	3.80	3.15
ALDICARB	2.05	3.63	3.40	2.84	3.80	3.14
BENOMYL	1.87	3.64	3.91	3.19	3.84	3.29
PHOR+MET	1.95	3.54	3.09	2.72	3.28	2.92
MEAN	1.94	3.64	3.49	2.88	3.68	3.12

VARIETY / NITROGEN	S23	S23/BLAN	S23/KWW	S23/LAD	S23/MIL	MEAN
N 1	1.23	3.26	3.07	2.54	3.47	2.71
N 2	2.64	4.01	3.91	3.23	3.89	3.54
MEAN	1.94	3.64	3.49	2.88	3.68	3.12

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2ND CUT (19/6/78) DRY MATTER TONNES/HECTARE

***** TABLES OF MEANS *****

VARIETY	NITROGEN / CHEMICAL	N 1	N 2
S23	NONE	1.21	2.52
	ALDICARB	1.34	2.76
	BENOMYL	1.09	2.66
	PHOR+MET	1.28	2.62
S23/BLAN	NONE	3.47	3.99
	ALDICARB	3.17	4.09
	BENOMYL	3.24	4.04
	PHOR+MET	3.18	3.90
S23/KWW	NONE	3.00	4.12
	ALDICARB	3.00	3.80
	BENOMYL	3.57	4.24
	PHOR+MET	2.69	3.50
S23/LAD	NONE	2.52	3.05
	ALDICARB	2.42	3.25
	BENOMYL	2.95	3.42
	PHOR+MET	2.27	3.18
S23/MIL	NONE	3.52	4.07
	ALDICARB	3.74	3.87
	BENOMYL	3.72	3.96
	PHOR+MET	2.89	3.68

***** STANDARD ERRORS OF DIFFERENCES OF MEANS *****

TABLE	VARIETY	CHEMICAL	NITROGEN	VARIETY CHEMICAL
SED	0.095	0.085	0.060	0.190

TABLE	VARIETY NITROGEN	CHEMICAL NITROGEN	VARIETY CHEMICAL NITROGEN
SED	0.135	0.120	0.269

***** STRATUM STANDARD ERRORS AND COEFFICIENTS OF VARIATION *****

STRATUM	DF	SE	CV%
BLOCK.WP	39	0.269	8.6

2ND CUT MEAN DM% 24.3

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3RD CUT (31/7/78) DRY MATTER TONNES/HECTARE

***** TABLES OF MEANS *****

NITROGEN	N 1	N 2	MEAN
CHEMICAL			
NONE	1.72	1.92	1.82
ALDICARB	1.77	1.96	1.86
BENOMYL	1.68	2.05	1.86
PHOR+MET	1.90	2.05	1.97
MEAN	1.77	2.00	1.88

VARIETY	S23	S23/BLAN	S23/KWW	S23/LAD	S23/MIL	MEAN
CHEMICAL						
NONE	0.40	2.37	1.88	2.23	2.24	1.82
ALDICARB	0.48	2.32	2.04	2.20	2.29	1.86
BENOMYL	0.41	2.39	2.12	1.90	2.50	1.86
PHOR+MET	0.26	2.54	2.28	2.56	2.23	1.97
MEAN	0.39	2.40	2.08	2.22	2.31	1.88

VARIETY	S23	S23/BLAN	S23/KWW	S23/LAD	S23/MIL	MEAN
NITROGEN						
N 1	0.08	2.35	2.00	2.15	2.25	1.77
N 2	0.70	2.45	2.16	2.29	2.37	2.00
MEAN	0.39	2.40	2.08	2.22	2.31	1.88

	NITROGEN	N 1	N 2
VARIETY	CHEMICAL		
S23	NONE	0.03	0.77
	ALDICARB	0.11	0.84
	BENOMYL	0.12	0.71
	PHOR+MET	0.04	0.48
S23/BLAN	NONE	2.14	2.59
	ALDICARB	2.28	2.37
	BENOMYL	2.37	2.40
	PHOR+MET	2.63	2.45
S23/KWW	NONE	1.82	1.93
	ALDICARB	1.95	2.13
	BENOMYL	1.96	2.28
	PHOR+MET	2.27	2.30
S23/LAD	NONE	2.35	2.11
	ALDICARB	2.21	2.19
	BENOMYL	1.46	2.34
	PHOR+MET	2.60	2.52
S23/MIL	NONE	2.28	2.20
	ALDICARB	2.31	2.26
	BENOMYL	2.47	2.53
	PHOR+MET	1.96	2.50

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3RD CUT (31/7/78) DRY MATTER TONNES/HECTARE

***** STANDARD ERRORS OF DIFFERENCES OF MEANS *****

TABLE	VARIETY	CHEMICAL	NITROGEN	VARIETY CHEMICAL
SED	0.092	0.083	0.058	0.185

TABLE	VARIETY NITROGEN	CHEMICAL NITROGEN	VARIETY CHEMICAL NITROGEN
SED	0.131	0.117	0.261

***** STRATUM STANDARD ERRORS AND COEFFICIENTS OF VARIATION *****

STRATUM	DF	SE	CV%
BLOCK.WP	39	0.261	13.9

3RD CUT MEAN DM% 18.2

4TH CUT (11/9/78) DRY MATTER TONNES/HECTARE

***** TABLES OF MEANS *****

NITROGEN / CHEMICAL	N 1	N 2	MEAN
NONE	1.36	1.65	1.51
ALDICARB	1.36	1.86	1.61
BENOMYL	1.38	1.62	1.50
PHOR+MET	1.34	1.77	1.55
MEAN	1.36	1.72	1.54

VARIETY / CHEMICAL	S23	S23/BLAN	S23/KWW	S23/LAD	S23/MIL	MEAN
NONE	0.45	1.77	1.61	1.98	1.71	1.51
ALDICARB	0.45	2.12	1.57	2.07	1.85	1.61
BENOMYL	0.40	1.65	1.61	1.93	1.91	1.50
PHOR+MET	0.43	1.81	1.58	2.09	1.87	1.55
MEAN	0.43	1.84	1.59	2.02	1.83	1.54

VARIETY / NITROGEN	S23	S23/BLAN	S23/KWW	S23/LAD	S23/MIL	MEAN
N 1	0.05	1.66	1.41	1.95	1.74	1.36
N 2	0.82	2.01	1.78	2.09	1.93	1.72
MEAN	0.43	1.84	1.59	2.02	1.83	1.54

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4TH CUT (11/9/78) DRY MATTER TONNES/HECTARE

***** TABLES OF MEANS *****

VARIETY	NITROGEN CHEMICAL	N 1	N 2
S23	NONE	0.05	0.86
	ALDICARB	0.05	0.85
	BENOMYL	0.06	0.74
	PHOR+MET	0.04	0.82
S23/BLAN	NONE	1.66	1.89
	ALDICARB	1.78	2.46
	BENOMYL	1.38	1.92
	PHOR+MET	1.84	1.78
S23/KWW	NONE	1.31	1.90
	ALDICARB	1.29	1.84
	BENOMYL	1.71	1.52
	PHOR+MET	1.32	1.84
S23/LAD	NONE	2.01	1.95
	ALDICARB	1.97	2.18
	BENOMYL	1.97	1.90
	PHOR+MET	1.83	2.34
S23/MIL	NONE	1.78	1.65
	ALDICARB	1.73	1.98
	BENOMYL	1.78	2.03
	PHOR+MET	1.68	2.05

***** STANDARD ERRORS OF DIFFERENCES OF MEANS *****

TABLE	VARIETY	CHEMICAL	NITROGEN	VARIETY CHEMICAL
SED	0.055	0.049	0.035	0.109

TABLE	VARIETY NITROGEN	CHEMICAL NITROGEN	VARIETY CHEMICAL NITROGEN
SED	0.077	0.069	0.155

***** STRATUM STANDARD ERRORS AND COEFFICIENTS OF VARIATION *****

STRATUM	DF	SE	CV%
BLOCK.WP	39	0.155	10.0

4TH CUT MEAN DM% 21.2

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5TH CUT (23/10/78) DRY MATTER TONNES/HECTARE

***** TABLES OF MEANS *****

NITROGEN	N 1	N 2	MEAN
CHEMICAL			
NONE	0.22	0.46	0.34
ALDICARB	0.26	0.46	0.36
BENOMYL	0.22	0.44	0.33
PHOR+MET	0.23	0.52	0.37
MEAN	0.23	0.47	0.35

VARIETY	S23	S23/BLAN	S23/KWW	S23/LAD	S23/MIL	MEAN
CHEMICAL						
NONE	0.22	0.34	0.24	0.59	0.32	0.34
ALDICARB	0.22	0.41	0.29	0.57	0.32	0.36
BENOMYL	0.30	0.33	0.19	0.61	0.25	0.33
PHOR+MET	0.24	0.37	0.30	0.61	0.34	0.37
MEAN	0.24	0.36	0.26	0.59	0.31	0.35

VARIETY	S23	S23/BLAN	S23/KWW	S23/LAD	S23/MIL	MEAN
NITROGEN						
N 1	0.02	0.25	0.13	0.54	0.23	0.23
N 2	0.47	0.47	0.38	0.64	0.38	0.47
MEAN	0.24	0.36	0.26	0.59	0.31	0.35

VARIETY	NITROGEN	N 1	N 2
	CHEMICAL		
S23	NONE	0.02	0.43
	ALDICARB	0.01	0.42
	BENOMYL	0.01	0.58
	PHOR+MET	0.02	0.47
S23/BLAN	NONE	0.28	0.39
	ALDICARB	0.26	0.55
	BENOMYL	0.25	0.40
	PHOR+MET	0.21	0.54
S23/KWW	NONE	0.08	0.40
	ALDICARB	0.21	0.38
	BENOMYL	0.06	0.32
	PHOR+MET	0.16	0.44
S23/LAD	NONE	0.48	0.69
	ALDICARB	0.62	0.51
	BENOMYL	0.55	0.67
	PHOR+MET	0.52	0.71
S23/MIL	NONE	0.23	0.41
	ALDICARB	0.20	0.43
	BENOMYL	0.25	0.26
	PHOR+MET	0.23	0.44

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78/R/CS/204

5TH CUT (23/10/78) DRY MATTER TONNES/HECTARE

***** STANDARD ERRORS OF DIFFERENCES OF MEANS *****

TABLE	VARIETY	CHEMICAL	NITROGEN	VARIETY CHEMICAL
SED	0.039	0.035	0.025	0.079

TABLE	VARIETY NITROGEN	CHEMICAL NITROGEN	VARIETY CHEMICAL NITROGEN
SED	0.056	0.050	0.112

***** STRATUM STANDARD ERRORS AND COEFFICIENTS OF VARIATION *****

STRATUM	DF	SE	CV%
BLOCK.WP	39	0.112	31.7

5TH CUT MEAN DM% 22.4

TOTAL OF 5 CUTS DRY MATTER TONNES/HECTARE

***** TABLES OF MEANS *****

NITROGEN CHEMICAL	N 1	N 2	MEAN
NONE	10.07	11.49	10.78
ALDICARB	10.03	11.85	10.94
BENOMYL	10.22	12.13	11.18
PHOR+MET	10.19	11.69	10.94
MEAN	10.13	11.79	10.96

VARIETY CHEMICAL	S23	S23/BLAN	S23/KWW	S23/LAD	S23/MIL	MEAN
NONE	7.53	11.90	10.98	11.74	11.77	10.78
ALDICARB	7.53	12.10	11.45	11.44	12.18	10.94
BENOMYL	7.38	12.14	11.75	11.70	12.91	11.18
PHOR+MET	7.33	11.98	11.48	12.41	11.48	10.94
MEAN	7.44	12.03	11.42	11.82	12.08	10.96

VARIETY NITROGEN	S23	S23/BLAN	S23/KWW	S23/LAD	S23/MIL	MEAN
N 1	5.88	11.31	10.60	11.37	11.47	10.13
N 2	9.01	12.75	12.23	12.27	12.70	11.79
MEAN	7.44	12.03	11.42	11.82	12.08	10.96

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78/R/CS/204

TOTAL OF 5 CUTS DRY MATTER TONNES/HECTARE

***** TABLES OF MEANS *****

VARIETY	NITROGEN / CHEMICAL	N 1	N 2
S23	NONE	6.12	8.94
	ALDICARB	5.62	9.44
	BENOMYL	5.65	9.12
	PHOR+MET	6.12	8.53
S23/BLAN	NONE	11.23	12.57
	ALDICARB	11.16	13.04
	BENOMYL	11.17	13.10
	PHOR+MET	11.67	12.29
S23/KWW	NONE	10.02	11.93
	ALDICARB	10.68	12.23
	BENOMYL	10.89	12.61
	PHOR+MET	10.82	12.15
S23/LAD	NONE	11.67	11.81
	ALDICARB	10.98	11.90
	BENOMYL	10.94	12.46
	PHOR+MET	11.90	12.92
S23/MIL	NONE	11.32	12.22
	ALDICARB	11.70	12.65
	BENOMYL	12.46	13.36
	PHOR+MET	10.41	12.55

***** STANDARD ERRORS OF DIFFERENCES OF MEANS *****

TABLE	VARIETY	CHEMICAL	NITROGEN	VARIETY CHEMICAL
SED	0.228	0.204	0.144	0.456

TABLE	VARIETY NITROGEN	CHEMICAL NITROGEN	VARIETY CHEMICAL NITROGEN
SED	0.323	0.289	0.646

***** STRATUM STANDARD ERRORS AND COEFFICIENTS OF VARIATION *****

STRATUM	DF	SE	CV%
BLOCK.WP	39	0.646	5.9

TOTAL OF 5 CUTS MEAN DM% 20.4

PLOT AREA HARVESTED 0.00059

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78/R/CS/205

NITRIFICATION INHIBITORS

Object: To study the residual effects on barley of nitrogen fertiliser treatments applied to kale in 1977 - West Barnfield II.

Sponsors: F.V. Widdowson, A. Penny, J. Ashworth.

The second year, barley.

For previous year see 77/R/CS/205.

Design: 3 randomised blocks of 24 plots.

Whole plot dimensions: 4.27 x 8.53.

Treatments: All combinations of:-

1. L N FORM(77) Forms of liquid nitrogen fertiliser applied in 1977:

AN+UR	Ammonium nitrate + urea (26% N)
UR	Urea (19% N)

2. L N RATE(77) Rates of nitrogen fertiliser applied in 1977 (kg N):

100
200

3. NI INHIB(77) Nitrification inhibitors added to liquid nitrogen fertiliser in 1977:

NONE	None
NITRAPYR	Nitrapyrin ('N-Serve') at 1 kg
SOD TRI	Sodium trithiocarbonate at 22 kg

plus twelve extra treatments given solid nitrogen fertiliser (kg N) in 1977:

SOLID N(77)

BSL 100S	BSL (a urea condensation product) at 100 to seedbed
BSL 200S	BSL at 200 to seedbed
NC 50S	'Nitro-Chalk' at 50 to seedbed
NC 100S	'Nitro-Chalk' at 100 to seedbed
NC 100DE	'Nitro-Chalk' at 100 divided equally between seedbed and top dressing
NC 100DU	'Nitro-Chalk' at 100 divided unequally, one-quarter to seedbed, three-quarters top dressed
NC 150S	'Nitro-Chalk' at 150 to seedbed
NC 200S	'Nitro-Chalk' at 200 to seedbed
NC 200DE	'Nitro-Chalk' at 200 divided equally between seedbed and top dressing
NC 200DU	'Nitro-Chalk' at 200 divided unequally, one-quarter to seedbed, three-quarters top dressed
NC 250S	'Nitro-Chalk' at 250 to seedbed
NC 300S	'Nitro-Chalk' at 300 to seedbed

Basal applications: Manures: (20:14:14) at 380 kg, combine drilled. Weedkillers: Ioxynil at 0.53 kg and mecoprop at 1.6 kg in 220 l. Fungicide: Tridemorph at 0.53 kg applied with the weedkillers.

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78/R/CS/205

Seed: Porthos, dressed with ethirimol, sown at 160 kg.

Cultivations, etc.:- Ploughed: 13 Jan, 1978. Rotary harrowed: 31 Mar. Seed sown: 5 Apr. Weedkillers and fungicide applied: 23 May. Combine harvested: 10 Sept.

NOTES: Crop samples were taken for N determinations.

GRAIN TONNES/HECTARE

***** TABLES OF MEANS *****

L N RATE(77)	100	200	MEAN
L N FORM(77)			
AN+UR	5.82	6.14	5.98
UR	6.01	6.09	6.05
MEAN	5.92	6.11	6.02

NI INHIB(77)	NONE	NITRAPYR	SOD TRI	MEAN
L N FORM(77)				
AN+UR	5.81	6.03	6.10	5.98
UR	6.10	6.04	6.02	6.05
MEAN	5.95	6.03	6.06	6.02

NI INHIB(77)	NONE	NITRAPYR	SOD TRI	MEAN
L N RATE(77)				
100	5.88	5.86	6.00	5.92
200	6.02	6.20	6.12	6.11
MEAN	5.95	6.03	6.06	6.02

L N RATE(77)	100			200		
NI INHIB(77)	NONE	NITRAPYR	SOD TRI	NONE	NITRAPYR	SOD TRI
L N FORM(77)						
AN+UR	5.69	5.82	5.95	5.93	6.23	6.25
UR	6.08	5.91	6.05	6.12	6.17	5.98

SOLID N(77)	
BSL 100S	5.89
BSL 200S	6.25
NC 50S	5.88
NC 100S	6.26
NC 100DE	5.92
NC 100DU	5.99
NC 150S	6.13
NC 200S	6.10
NC 200DE	6.11
NC 200DU	6.03
NC 250S	6.30
NC 300S	6.02
MEAN	6.07

GRAND MEAN 6.04

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78/R/CS/205

GRAIN TONNES/HECTARE

***** TABLES OF MEANS *****

***** STANDARD ERRORS OF DIFFERENCES OF MEANS *****

TABLE	SOLID N(77) L N FORM(77) L N RATE(77) NI INHIB(77)
SED	0.197

TABLE	L N FORM(77) L N FORM(77) L N RATE(77) L N FORM(77) L N RATE(77) NI INHIB(77) NI INHIB(77) L N RATE(77) NI INHIB(77) & SOLID N(77)
SED	0.114

***** STRATUM STANDARD ERRORS AND COEFFICIENTS OF VARIATION *****

STRATUM	DF	SE	CV%
BLOCK.WP	46	0.241	4.0

GRAIN MEAN DM% 83.4

PLOT AREA HARVESTED 0.00243

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78/R/CS/206

LATE N

Object: To study the residual effects on wheat of a range of fertilisers applied to potatoes in 1977 - Great Knott II.

Sponsors: T.M. Addiscott, J. Ashworth, A. Penny, F.V. Widdowson.

The second year, wheat.

For first year see 77/R/CS/206.

Design: 3 randomised blocks of 18 plots.

Whole plot dimensions: 4.27 x 13.1.

Treatments: All combinations of:-

1. N FORM(77) Forms of nitrogen fertiliser in 1977:

AA	Aqueous ammonia, injected before planting
AA+NITRA	Aqueous ammonia + nitrapyrin ('N-Serve') at 1 kg, injected before planting
AA+STC	Aqueous ammonia + sodium trithiocarbonate at 42 kg injected before planting
IB SMALL	IBDU (isobutylidene diurea), small granules to seedbed
IB LARGE	IBDU, large granules to seedbed
AN E+L	Ammonium nitrate, half in seedbed, half top-dressed
AN E	Ammonium nitrate, all in seedbed

2. N RATE(1) Rates of nitrogen fertiliser in 1977 (kg N):

200
300

plus four extra treatments given ammonium nitrate, all in the seedbed in 1977 (kg N):

N RATE(2)

AN E 150
AN E 250
AN E 350
AN E 400

NOTES: (1) The intended rate of sodium trithiocarbonate was 24 kg. Only one plot, treatment N RATE(1)200, received this rate, all other plots received 42 kg.
(2) Aqueous ammonia and inhibitors were injected, 10 cm deep with tines 30 cm apart.

Basal applications: Manures: (0:20:20) at 310 kg, combine drilled. 'Nitra-Shell 34' at 240 kg. Weedkillers: Dicamba with mecoprop and MCPA ('Banlene Plus' at 4.9 l in 220 l). Growth regulator: Chlormequat at 1.4 kg in 220 l.

Seed: Atou, sown at 210 kg.

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Cultivations, etc.:- Heavy spring-tine cultivated twice: 7 and 8 Nov, 1977. Seed sown: 15 Nov. N applied: 19 Apr, 1978. Weedkiller and growth regulator applied: 10 May. Combine harvested: 12 Sept.

NOTE: Crop samples were taken for N determinations.

GRAIN TONNES/HECTARE

***** TABLES OF MEANS *****

N RATE(1) / N FORM(77)	200	300	MEAN
AA	5.01	5.69	5.35
AA+NITRA	5.26	5.89	5.57
AA+STC	5.41	5.96	5.69
IB SMALL	5.51	5.78	5.65
IB LARGE	5.63	5.90	5.76
AN E+L	5.91	5.99	5.95
AN E	5.33	5.79	5.56
MEAN	5.44	5.86	5.65

N RATE(2)	AN E 150	AN E 250	AN E 350	AN E 400	MEAN
	5.00	5.61	5.49	6.01	5.53

GRAND MEAN 5.62

***** STANDARD ERRORS OF DIFFERENCES OF MEANS *****

TABLE	N RATE(2)	N FORM(77)	N RATE(1)	N FORM(77) N RATE(1) & RATE(2)
SED	0.263	0.186	0.099	0.263

***** STRATUM STANDARD ERRORS AND COEFFICIENTS OF VARIATION *****

STRATUM	DF	SE	CV%
BLOCK.WP	34	0.322	5.7

PLOT AREA HARVESTED 0.00279

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78/R/CS/211

FACTORS AFFECTING EYESPOT

Object: To study the effects of a range of treatments on the incidence of eyespot (Pseudocercosporella herpotrichoides previously Cercosporella herpotrichoides) and on the yield of wheat - Meadow.

Sponsors: R.D. Prew, A. Bainbridge.

The first year, wheat.

Design: 2 randomised blocks of 2 whole plots split into 6.

Whole plot dimensions: 94.0 x 9.14.

Treatments: All combinations of:-

Whole plots

1. STRAW	Treatment of straw in autumn 1977:	
BURNT	Burnt on site after spreading	
CARTED	Baled and carted off	

Sub plots

2. DRILLING	Cultivations and drilling:	
CNVNTIAL	Cultivated and conventionally drilled	) Treatments
DIRECT	Uncultivated, direct drilled	) triplicated

NOTES: (1) An intended test of three sowing dates on sub plots and three seed rates on sub sub plots was not made this year. Sub sub plots were all sown at 150 kg seed but were separately harvested.
(2) DRILLING CNVNTIAL plots: Ploughed: 31 Oct, 1977. Spring-tine cultivated, seed sown and harrowed in: 7 Nov.
(3) DRILLING DIRECT plots: Seed sown 7 Nov. Chain harrowed in: 8 Nov.
(4) Because of very poor establishment, yields were not taken from one sub plot of treatment combination STRAW CARTED, DRILLING DIRECT. An estimated value was used in the analysis.

Basal applications: Manures: (10:24:24) at 250 kg. 'Nitra-Shell 34' at 360 kg. Weedkillers: Paraquat at 0.56 kg ion in 220 l. Methabenzthiazuron at 1.3 kg in 220 l.

Seed: Kador, sown at 150 kg.

Cultivations, etc.:- Straw treatments applied: 27 Sept, 1977. Paraquat applied: 11 Oct. Seed sown: 7 Nov. Methabenzthiazuron applied: 11 Nov. N applied: 7 Apr, 1978. Combine harvested: 30 Aug.

NOTE: Emergence counts were made and eyespot was assessed at intervals during the season.

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GRAIN TONNES/HECTARE

***** TABLES OF MEANS *****

DRILLING / STRAW	CNVNTIAL	DIRECT	MEAN
BURNT	5.05	5.03	5.04
CARTED	5.35	5.58	5.46
MEAN	5.20	5.30	5.25

***** STANDARD ERRORS OF DIFFERENCES OF MEANS *****

TABLE	DRILLING	STRAW* DRILLING
SED	0.218	0.309

* WITHIN SAME LEVEL OF STRAW ONLY

***** STRATUM STANDARD ERRORS AND COEFFICIENTS OF VARIATION *****

STRATUM	DF	SE	CV%
BLOCK.WP.SP	17	0.535	10.2

GRAIN MEAN DM% 84.8

SUB PLOT AREA HARVESTED 0.00257

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78/R/CS/212

SEASONAL EFFECTS OF TAKE-ALL

Object: To study the incidence of take-all (Gaeumannomyces graminis) in continuous wheat and in first and second wheats after a break - Great Harpenden I.

Sponsor: D. Hornby.

The first year, beans, wheat.

Design: 3 randomised blocks of 4 plots.

Whole plot dimensions: 5.33 x 31.39.

Treatments:

CRP SEQ Crop sequences:

	1978	1979	1980	1981	1982	1983
1	W	W	W	W	W	W
2	W	BE	W	W	BE	W
3	W	W	BE	W	W	BE
4	BE	W	W	BE	W	W

BE = spring beans, W = wheat

NOTE: (1) Yields are recorded from wheat only.
(2) In this, the first year, yields were recorded from the separate sequences although they do not yet differ in treatment.

Standard applications:-
Wheat: Manures: (0:20:20) at 310 kg. 'Nitra-shell 34' at 260 kg. Weedkillers: Mecoprop, bromoxynil and ioxynil ('Brittox' at 3.5 kg) in 220 l.
Beans: Insecticide: Pirimicarb at 0.14 kg in 220 l.

Seed: Wheat: Flanders, sown at 190 kg.
Beans: Minden, sown at 200 kg.

Cultivations, etc.:-
All plots: Chisel ploughed: 23 Aug, 1977. Heavy spring-tine cultivated: 21 Oct. Spring-tine cultivated: 24 Oct.
Wheat: Seed sown: 24 Oct. N applied: 8 May, 1978. Weedkillers applied: 11 May. Combine harvested: 13 Sept.
Beans: Rotary harrowed, seed sown: 8 Apr, 1978. Tractor hoed twice: 19 May, 8 June. Insecticide applied: 7 July. Combine harvested: 25 Sept.
Previous crops: W. Oats, 1976, Potatoes 1977.

NOTE: Soil and plant samples were taken throughout the season. An additional soil sample was taken after harvest. Samples were assessed for take-all.

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78/R/CS/212

WINTER WHEAT

GRAIN TONNES/HECTARE

***** TABLES OF MEANS *****

CRP SEQ	1	2	3	MEAN
	7.05	6.56	6.58	6.73

***** STANDARD ERRORS OF DIFFERENCES OF MEANS *****

TABLE	CRP SEQ
SED	0.184

***** STRATUM STANDARD ERRORS AND COEFFICIENTS OF VARIATION *****

STRATUM	DF	SE	CV%
BLOCK.WP	4	0.226	3.4

GRAIN MEAN DM% 84.5

PLOT AREA HARVESTED 0.00434

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78/R/CS/213

PESTICIDES AND ESTABLISHMENT

Object: To study the effects of pest and disease control and interactions with seedbed condition and seed rates, on establishment and subsequent yield of Italian ryegrass - Long Hoos IV 1.

Sponsor: I.F. Henderson.

The first year, Italian ryegrass.

Design: 3 randomised blocks of 2 plots split into 8.

Whole plot dimensions: 2.44 x 6.10.

Treatments: All combinations of:-

Whole plots

1.	SEEDBED	Seedbed conditions:
	FINE	
	ROUGH	

Sub plots

2.	SEEDRATE	Seed rate, kg:
	2	
	20	
3.	FUNGCIDE	Fungicides, kg:
	NONE	None
	DRAZ+BEN	Drazoxolon at 0.02 kg + benomyl at 10 kg on 19 Apr, 1978
4.	INSCTCDE	Insecticide, kg:
	NONE	None
	PHORATE	Phorate at 10 kg on 17 April

NOTES: (1) Phorate was applied as 10% granules.
(2) Drazoxolon was applied as a seed dressing, benomyl was watered on to the seedbed in 672 l.

Basal applications: Manures: (0:14:28) at 720 kg. N at 75 kg, as 'Nitro-Chalk 25' to the seed bed and after the first three cuts. Weedkiller: Paraquat at 0.56 kg ion in 340 l.

Seed: RvP.

Cultivations, etc.:- NPK applied: 29 Sept, 1977. Ploughed: 11 Oct. 'SEEDBED ROUGH' plots rigid-tined, 'SEEDBED FINE' plots power harrowed and rolled: 10 Apr, 1978. Weedkiller applied: 12 Apr. N applied and rotary cultivated after phorate and benomyl applied: 17 Apr. Seed sown: 19 Apr. Cut: 12 July, 11 Aug, 12 Sept, 12 Oct. N applied: 14 July, 15 Aug, 13 Sept. Previous crops: Clover 1976, fallow 1977.

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NOTE: Emergence counts were made on 12 June. The proportions of grass, clover, monocotyledonous and dicotyledonous weeds were determined. The incidence of frit fly Oscinella frit larvae were assessed in August and October.

1ST CUT (12/7/78) DRY MATTER TONNES/HECTARE

***** TABLES OF MEANS *****

SEEDRATE	2	20	MEAN
SEEDBED			
FINE	4.25	4.59	4.42
ROUGH	3.50	3.99	3.75
MEAN	3.87	4.29	4.08

FUNGCIDE	NONE	DRAZ+BEN	MEAN
SEEDBED			
FINE	4.39	4.45	4.42
ROUGH	3.82	3.67	3.75
MEAN	4.10	4.06	4.08

FUNGCIDE	NONE	DRAZ+BEN	MEAN
SEEDRATE			
2	3.91	3.84	3.87
20	4.30	4.28	4.29
MEAN	4.10	4.06	4.08

INSCTCDE	NONE	PHORATE	MEAN
SEEDBED			
FINE	4.40	4.44	4.42
ROUGH	3.47	4.02	3.75
MEAN	3.94	4.23	4.08

INSCTCDE	NONE	PHORATE	MEAN
SEEDRATE			
2	3.81	3.94	3.87
20	4.06	4.52	4.29
MEAN	3.94	4.23	4.08

INSCTCDE	NONE	PHORATE	MEAN
FUNGCIDE			
NONE	3.84	4.37	4.10
DRAZ+BEN	4.03	4.09	4.06
MEAN	3.94	4.23	4.08

SEEDRATE	2		20	
FUNGCIDE	NONE	DRAZ+BEN	NONE	DRAZ+BEN
SEEDBED				
FINE	4.21	4.28	4.56	4.62
ROUGH	3.61	3.39	4.04	3.95

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1ST CUT (12/7/78) DRY MATTER TONNES/HECTARE

***** TABLES OF MEANS *****

SEEDRATE	2		20	
INSCTCDE	NONE	PHORATE	NONE	PHORATE
SEEDBED				
FINE	4.44	4.06	4.37	4.81
ROUGH	3.19	3.81	3.76	4.23

FUNGCIDE	NONE		DRAZ+BEN	
INSCTCDE	NONE	PHORATE	NONE	PHORATE
SEEDBED				
FINE	4.25	4.52	4.55	4.35
ROUGH	3.43	4.22	3.52	3.82

FUNGCIDE	NONE		DRAZ+BEN	
INSCTCDE	NONE	PHORATE	NONE	PHORATE
SEEDRATE				
2	3.73	4.09	3.89	3.78
20	3.95	4.64	4.17	4.39

	FUNGCIDE	NONE		DRAZ+BEN	
	INSCTCDE	NONE	PHORATE	NONE	PHORATE
SEEDBED	SEEDRATE				
FINE	2	4.31	4.11	4.56	4.01
	20	4.19	4.92	4.54	4.70
ROUGH	2	3.15	4.07	3.22	3.55
	20	3.71	4.37	3.81	4.08

***** STANDARD ERRORS OF DIFFERENCES OF MEANS *****

TABLE	SEEDRATE	FUNGCIDE	INSCTCDE
SED	0.130	0.130	0.130

TABLE	SEEDBED* SEEDRATE	SEEDBED* FUNGCIDE	SEEDRATE FUNGCIDE	SEEDBED* INSCTCDE
SED	0.184	0.184	0.184	0.184

TABLE	SEEDRATE INSCTCDE	FUNGCIDE INSCTCDE	SEEDBED* SEEDRATE FUNGCIDE	SEEDBED* SEEDRATE INSCTCDE
SED	0.184	0.184	0.261	0.261

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1ST CUT (12/7/78) DRY MATTER TONNES/HECTARE

***** STANDARD ERRORS OF DIFFERENCES OF MEANS *****

TABLE	SEEDBED* FUNGCIDE INSCTCDE	SEEDRATE FUNGCIDE INSCTCDE	SEEDBED* SEEDRATE FUNGCIDE INSCTCDE
SED	0.261	0.261	0.369
EXCEPT WHEN COMPARING MEANS WITH SAME LEVEL(S) OF:			
SEEDBED	0.261		0.369

* WITHIN SAME LEVEL OF SEEDBED ONLY

***** STRATUM STANDARD ERRORS AND COEFFICIENTS OF VARIATION *****

STRATUM	DF	SE	CV%
BLOCK.WP.SP	28	0.451	11.1

1ST CUT MEAN DM% 20.1

2ND CUT (11/8/78) DRY MATTER TONNES/HECTARE

***** TABLES OF MEANS *****

SEEDRATE	2	20	MEAN
SEEDBED			
FINE	1.26	2.28	1.77
ROUGH	1.12	1.88	1.50
MEAN	1.19	2.08	1.63

FUNGCIDE	NONE	DRAZ+BEN	MEAN
SEEDBED			
FINE	1.79	1.75	1.77
ROUGH	1.52	1.47	1.50
MEAN	1.66	1.61	1.63

FUNGCIDE	NONE	DRAZ+BEN	MEAN
SEEDRATE			
2	1.24	1.14	1.19
20	2.08	2.08	2.08
MEAN	1.66	1.61	1.63

INSCTCDE	NONE	PHORATE	MEAN
SEEDBED			
FINE	1.53	2.02	1.77
ROUGH	1.32	1.67	1.50
MEAN	1.42	1.85	1.63

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2ND CUT (11/8/78) DRY MATTER TONNES/HECTARE

***** TABLES OF MEANS *****

INSCTCDE	NONE	PHORATE	MEAN
SEEDRATE			
2	0.92	1.46	1.19
20	1.93	2.23	2.08
MEAN	1.42	1.85	1.63

INSCTCDE	NONE	PHORATE	MEAN
FUNGCIDE			
NONE	1.41	1.90	1.66
DRAZ+BEN	1.43	1.79	1.61
MEAN	1.42	1.85	1.63

SEEDRATE	2		20	
FUNGCIDE	NONE	DRAZ+BEN	NONE	DRAZ+BEN
SEEDBED				
FINE	1.31	1.21	2.27	2.30
ROUGH	1.16	1.07	1.88	1.87

SEEDRATE	2		20	
INSCTCDE	NONE	PHORATE	NONE	PHORATE
SEEDBED				
FINE	0.94	1.58	2.12	2.45
ROUGH	0.90	1.33	1.74	2.02

FUNGCIDE	NONE		DRAZ+BEN	
INSCTCDE	NONE	PHORATE	NONE	PHORATE
SEEDBED				
FINE	1.55	2.04	1.51	1.99
ROUGH	1.28	1.76	1.35	1.58

FUNGCIDE	NONE		DRAZ+BEN	
INSCTCDE	NONE	PHORATE	NONE	PHORATE
SEEDRATE				
2	0.96	1.52	0.88	1.40
20	1.87	2.29	1.99	2.18

FUNGCIDE		NONE		DRAZ+BEN	
INSCTCDE		NONE	PHORATE	NONE	PHORATE
SEEDBED	SEEDRATE				
FINE	2	0.99	1.64	0.88	1.53
	20	2.10	2.44	2.13	2.46
ROUGH	2	0.93	1.39	0.87	1.27
	20	1.63	2.14	1.84	1.90

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2ND CUT (11/8/78) DRY MATTER TONNES/HECTARE

***** STANDARD ERRORS OF DIFFERENCES OF MEANS *****

TABLE	SEEDRATE	FUNGCIDE	INSCTCDE
SED	0.062	0.062	0.062

TABLE	SEEDBED* SEEDRATE	SEEDBED* FUNGCIDE	SEEDRATE FUNGCIDE	SEEDBED* INSCTCDE
SED	0.088	0.088	0.088	0.088

TABLE	SEEDRATE INSCTCDE	FUNGCIDE INSCTCDE	SEEDBED* SEEDRATE FUNGCIDE	SEEDBED* SEEDRATE INSCTCDE
SED	0.088	0.088	0.124	0.124

TABLE	SEEDBED* FUNGCIDE INSCTCDE	SEEDRATE FUNGCIDE INSCTCDE	SEEDBED* SEEDRATE FUNGCIDE INSCTCDE
SED	0.124	0.124	0.176

***** STRATUM STANDARD ERRORS AND COEFFICIENTS OF VARIATION *****

STRATUM	DF	SE	CV%
BLOCK.WP.SP	28	0.215	13.2

2ND CUT MEAN DM% 14.2

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3RD CUT (12/9/78) DRY MATTER TONNES/HECTARE

***** TABLES OF MEANS *****

SEEDRATE SEEDBED	2	20	MEAN
FINE	2.01	2.35	2.18
ROUGH	1.90	2.13	2.02
MEAN	1.96	2.24	2.10

FUNGCIDE SEEDBED	NONE	DRAZ+BEN	MEAN
FINE	2.14	2.22	2.18
ROUGH	2.08	1.96	2.02
MEAN	2.11	2.09	2.10

FUNGCIDE SEEDRATE	NONE	DRAZ+BEN	MEAN
2	2.01	1.91	1.96
20	2.22	2.26	2.24
MEAN	2.11	2.09	2.10

INSCTCDE SEEDBED	NONE	PHORATE	MEAN
FINE	2.03	2.34	2.18
ROUGH	1.84	2.19	2.02
MEAN	1.94	2.26	2.10

INSCTCDE SEEDRATE	NONE	PHORATE	MEAN
2	1.76	2.16	1.96
20	2.11	2.37	2.24
MEAN	1.94	2.26	2.10

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3RD CUT (12/9/78) DRY MATTER TONNES/HECTARE

***** TABLES OF MEANS *****

INSCTCDE	NONE	PHORATE	MEAN
FUNGCIDE			
NONE	1.90	2.32	2.11
DRAZ+BEN	1.97	2.21	2.09
MEAN	1.94	2.26	2.10

SEEDRATE	2		20	
FUNGCIDE	NONE	DRAZ+BEN	NONE	DRAZ+BEN
SEEDBED				
FINE	2.05	1.98	2.24	2.46
ROUGH	1.96	1.84	2.19	2.07

SEEDRATE	2		20	
INSCTCDE	NONE	PHORATE	NONE	PHORATE
SEEDBED				
FINE	1.87	2.16	2.19	2.52
ROUGH	1.66	2.15	2.03	2.23

FUNGCIDE	NONE		DRAZ+BEN	
INSCTCDE	NONE	PHORATE	NONE	PHORATE
SEEDBED				
FINE	1.97	2.32	2.09	2.36
ROUGH	1.84	2.32	1.85	2.06

FUNGCIDE	NONE		DRAZ+BEN	
INSCTCDE	NONE	PHORATE	NONE	PHORATE
SEEDRATE				
2	1.76	2.25	1.77	2.06
20	2.05	2.39	2.17	2.36

FUNGCIDE		NONE		DRAZ+BEN	
INSCTCDE		NONE	PHORATE	NONE	PHORATE
SEEDBED	SEEDRATE				
FINE	2	1.83	2.26	1.91	2.06
	20	2.10	2.38	2.27	2.66
ROUGH	2	1.69	2.24	1.63	2.06
	20	1.99	2.39	2.07	2.06

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78/R/CS/213

3RD CUT (12/9/78) DRY MATTER TONNES/HECTARE

***** STANDARD ERRORS OF DIFFERENCES OF MEANS *****

TABLE	SEEDRATE	FUNGCIDE	INSCTCDE
SED	0.059	0.059	0.059

TABLE	SEEDBED* SEEDRATE	SEEDBED* FUNGCIDE	SEEDRATE FUNGCIDE	SEEDBED* INSCTCDE
SED	0.083	0.083	0.083	0.083

TABLE	SEEDRATE INSCTCDE	FUNGCIDE INSCTCDE	SEEDBED* SEEDRATE FUNGCIDE	SEEDBED* SEEDRATE INSCTCDE
SED	0.083	0.083	0.118	0.118

EXCEPT WHEN COMPARING MEANS WITH SAME LEVEL(S) OF:

TABLE	SEEDBED* FUNGCIDE INSCTCDE	SEEDRATE FUNGCIDE INSCTCDE	SEEDBED* SEEDRATE FUNGCIDE INSCTCDE
SED	0.118	0.118	0.167

***** STRATUM STANDARD ERRORS AND COEFFICIENTS OF VARIATION *****

STRATUM	DF	SE	CV%
BLOCK.WP.SP	28	0.204	9.7

3RD CUT MEAN DM% 20.3

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78/R/CS/213

4TH CUT (12/10/78) DRY MATTER TONNES/HECTARE

***** TABLES OF MEANS *****

SEEDRATE	2	20	MEAN
SEEDBED			
FINE	0.87	1.08	0.98
ROUGH	0.82	1.05	0.93
MEAN	0.85	1.07	0.96

FUNGCIDE	NONE	DRAZ+BEN	MEAN
SEEDBED			
FINE	0.97	0.99	0.98
ROUGH	0.94	0.93	0.93
MEAN	0.96	0.96	0.96

FUNGCIDE	NONE	DRAZ+BEN	MEAN
SEEDRATE			
2	0.85	0.85	0.85
20	1.06	1.07	1.07
MEAN	0.96	0.96	0.96

INSCTCDE	NONE	PHORATE	MEAN
SEEDBED			
FINE	0.93	1.03	0.98
ROUGH	0.89	0.98	0.93
MEAN	0.91	1.01	0.96

INSCTCDE	NONE	PHORATE	MEAN
SEEDRATE			
2	0.78	0.92	0.85
20	1.03	1.10	1.07
MEAN	0.91	1.01	0.96

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78/R/CS/213

4TH CUT (12/10/78) DRY MATTER TONNES/HECTARE

***** TABLES OF MEANS *****

INSCTCDE	NONE	PHORATE	MEAN
FUNGCIDE			
NONE	0.88	1.03	0.96
DRAZ+BEN	0.93	0.98	0.96
MEAN	0.91	1.01	0.96

SEEDRATE	2		20	
FUNGCIDE	NONE	DRAZ+BEN	NONE	DRAZ+BEN
SEEDBED				
FINE	0.86	0.88	1.07	1.10
ROUGH	0.83	0.81	1.05	1.04

SEEDRATE	2		20	
INSCTCDE	NONE	PHORATE	NONE	PHORATE
SEEDBED				
FINE	0.81	0.93	1.04	1.13
ROUGH	0.74	0.90	1.03	1.06

FUNGCIDE	NONE		DRAZ+BEN	
INSCTCDE	NONE	PHORATE	NONE	PHORATE
SEEDBED				
FINE	0.91	1.03	0.94	1.03
ROUGH	0.86	1.03	0.91	0.94

FUNGCIDE	NONE		DRAZ+BEN	
INSCTCDE	NONE	PHORATE	NONE	PHORATE
SEEDRATE				
2	0.75	0.95	0.81	0.88
20	1.01	1.11	1.05	1.08

	FUNGCIDE	NONE		DRAZ+BEN	
	INSCTCDE	NONE	PHORATE	NONE	PHORATE
SEEDBED	SEEDRATE				
FINE	2	0.77	0.96	0.85	0.90
	20	1.04	1.11	1.04	1.15
ROUGH	2	0.72	0.94	0.76	0.86
	20	0.99	1.12	1.07	1.01

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78/R/CS/213

4TH CUT (12/10/78) DRY MATTER TONNES/HECTARE

***** STANDARD ERRORS OF DIFFERENCES OF MEANS *****

TABLE	SEEDRATE	FUNGCIDE	INSCTCDE
SED	0.031	0.031	0.031

TABLE	SEEDBED* SEEDRATE	SEEDBED* FUNGCIDE	SEEDRATE FUNGCIDE	SEEDBED* INSCTCDE
SED	0.043	0.043	0.043	0.043

TABLE	SEEDRATE INSCTCDE	FUNGCIDE INSCTCDE	SEEDBED* SEEDRATE FUNGCIDE	SEEDBED* SEEDRATE INSCTCDE
SED	0.043	0.043	0.061	0.061

TABLE	SEEDBED* FUNGCIDE INSCTCDE	SEEDRATE FUNGCIDE INSCTCDE	SEEDBED* SEEDRATE FUNGCIDE INSCTCDE
SED	0.061	0.061	0.087

***** STRATUM STANDARD ERRORS AND COEFFICIENTS OF VARIATION *****

STRATUM	DF	SE	CV%
BLOCK.WP.SP	28	0.106	11.1

4TH CUT MEAN DM% 18.2

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TOTAL OF 4 CUTS DRY MATTER TONNES/HECTARE

***** TABLES OF MEANS *****

SEEDRATE SEEDBED	2	20	MEAN
FINE	8.40	10.31	9.35
ROUGH	7.34	9.04	8.19
MEAN	7.87	9.68	8.77

FUNGCIDE SEEDBED	NONE	DRAZ+BEN	MEAN
FINE	9.29	9.41	9.35
ROUGH	8.37	8.02	8.19
MEAN	8.83	8.71	8.77

FUNGCIDE SEEDRATE	NONE	DRAZ+BEN	MEAN
2	8.00	7.73	7.87
20	9.66	9.70	9.68
MEAN	8.83	8.71	8.77

INSCTCDE SEEDBED	NONE	PHORATE	MEAN
FINE	8.88	9.82	9.35
ROUGH	7.52	8.86	8.19
MEAN	8.20	9.34	8.77

INSCTCDE SEEDRATE	NONE	PHORATE	MEAN
2	7.27	8.46	7.87
20	9.13	10.22	9.68
MEAN	8.20	9.34	8.77

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TOTAL OF 4 CUTS DRY MATTER TONNES/HECTARE

***** TABLES OF MEANS *****

INSCTCDE	NONE	PHORATE	MEAN
FUNGCIDE			
NONE	8.04	9.62	8.83
DRAZ+BEN	8.36	9.07	8.71
MEAN	8.20	9.34	8.77

SEEDRATE	2		20	
FUNGCIDE	NONE	DRAZ+BEN	NONE	DRAZ+BEN
SEEDBED				
FINE	8.44	8.35	10.14	10.47
ROUGH	7.57	7.11	9.17	8.92

SEEDRATE	2		20	
INSCTCDE	NONE	PHORATE	NONE	PHORATE
SEEDBED				
FINE	8.06	8.73	9.71	10.91
ROUGH	6.49	8.19	8.56	9.53

FUNGCIDE	NONE		DRAZ+BEN	
INSCTCDE	NONE	PHORATE	NONE	PHORATE
SEEDBED				
FINE	8.67	9.91	9.09	9.74
ROUGH	7.41	9.33	7.63	8.40

FUNGCIDE	NONE		DRAZ+BEN	
INSCTCDE	NONE	PHORATE	NONE	PHORATE
SEEDRATE				
2	7.20	8.80	7.34	8.13
20	8.88	10.43	9.38	10.01

	FUNGCIDE	NONE		DRAZ+BEN	
	INSCTCDE	NONE	PHORATE	NONE	PHORATE
SEEDBED	SEEDRATE				
FINE	2	7.91	8.97	8.20	8.50
	20	9.44	10.84	9.97	10.97
ROUGH	2	6.49	8.64	6.48	7.75
	20	8.33	10.01	8.78	9.05

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TOTAL OF 4 CUTS DRY MATTER TONNES/HECTARE

***** STANDARD ERRORS OF DIFFERENCES OF MEANS *****

TABLE	SEEDRATE	FUNGCIDE	INSCTCDE
SED	0.146	0.146	0.146

TABLE	SEEDBED* SEEDRATE	SEEDBED* FUNGCIDE	SEEDRATE FUNGCIDE	SEEDBED* INSCTCDE
SED	0.206	0.206	0.206	0.206

TABLE	SEEDRATE INSCTCDE	FUNGCIDE INSCTCDE	SEEDBED* SEEDRATE FUNGCIDE	SEEDBED* SEEDRATE INSCTCDE
SED	0.206	0.206	0.292	0.292

TABLE	SEEDBED* FUNGCIDE INSCTCDE	SEEDRATE FUNGCIDE INSCTCDE	SEEDBED* SEEDRATE FUNGCIDE INSCTCDE
SED	0.292	0.292	0.412

***** STRATUM STANDARD ERRORS AND COEFFICIENTS OF VARIATION *****

STRATUM	DF	SE	CV%
BLOCK.WP.SP	28	0.505	5.8

TOTAL OF 4 CUTS MEAN DM% 18.2

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78/R/CS/216 and 78/W/CS/216

EFFECTS OF SUBSOILING & DEEP PK

Object: To study the effects of subsoiling and of incorporating a large dressing of PK in the subsoil on yields and nutrient uptakes of barley - Rothamsted (R) Delharding and Woburn (W) Road Piece.

Sponsors: J.McEwen, A.E. Johnston (R), M.K.V. Carr, R.J. Godwin (National College of Agricultural Engineering), P.T. Gooderham, I.B. Warboys, J.M. Wilkes (Wye College).

The first year, barley.

Design: 3 randomised blocks of 6 plots.

Whole plot dimensions: 4.27 x 13.7.

Treatments:

TREATMNT	Machines and incorporation of P and K into the subsoil:
NONE	Not subsoiled, no P or K
FARM 0	Farm standard, unwinged, subsoiler, no P or K
NCAE 0	N.C.A.E. winged subsoiler, no P or K
NCAE PK	N.C.A.E. winged subsoiler, P and K applied
WYE 0	Wye double digger, no P or K
WYE PK	Wye double digger, P and K applied

NOTES: (1) The rates of P and K were 1930 kg P_2O_5, as triple superphosphate and 460 kg K_2O as muriate of potash.
(2) The Farm standard, unwinged, subsoiler was set to work at a depth of 38 cm at intervals of 50 cm Delharding (R) and at a depth of 50 cm at intervals of 70 cm Road Piece (W).
(3) The N.C.A.E. winged subsoiler was set to work at a depth of 40 cm at intervals of 60 cm on plots not given P and K and at alternate depths of 30 cm and 40 cm spaced 30 cm apart on plots given P and K. Fertiliser was applied behind the subsoiling points.
(4) The Wye double digger turns a furrow with a conventional plough share, to a depth of 23 cm, and at the same time rotary cultivates the bottom of the furrow to a further depth of 15 cm. When applying P and K this was distributed ahead of the rotary cultivator.

Basal applications:
Delharding (R): Manures: (20:14:14) at 440 kg combine drilled. Weedkillers: Dicamba with mecoprop and MCPA ('Banlene Plus' at 4.9 l in 220 l). Fungicide: Tridemorph at 0.53 kg in 220 l.
Road Piece (W): Manures: (20:14:14) at 440 kg. Weedkillers: Mecoprop, bromoxynil and ioxynil ('Brittox' at 2.5 kg in 340 l). Fungicide: Tridemorph at 0.53 kg in 280 l.

Seed: Delharding (R) and Road Piece (W): Porthos, dressed with ethirimol, sown at 160 kg.

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78/R/CS/216 and 78/W/CS/216

Cultivations, etc.:-
Delharding (R): Farm subsoil treatments applied: 28 Sept, 1977. N.C.A.E. subsoil treatments and PK applied: 29 Sept. Wye double digger treatments and PK applied: 13 Oct. All treatments except Wye double digger, ploughed: 28 Nov. All plots rotary harrowed, seed sown: 11 Mar, 1978. Weedkiller and fungicide applied: 17 May. Combine harvested: 21 Aug. Previous crops: Barley 1976 and 1977.
Road Piece (W): N.C.A.E. subsoil treatments and PK applied: 28 Sept, 1977. Farm subsoil treatments applied: 30 Sept. Wye double digger treatments and PK applied: 13 Oct. All treatments except Wye double digger, ploughed: 31 Oct. All plots spring-tine cultivated: 8 Mar, 1978. Spring-tine cultivated with crumbler attached, seed sown: 9 Mar. Weedkiller and fungicide applied: 12 May. Combine harvested: 18 Aug. Previous crops: Barley 1976 and 1977.

NOTES: (1) On Road Piece (W) water use was measured during the season using neutron probes.
(2) Penetrometer measurements were made on both sites and samples of grain and straw were analysed for contents of N, P, K, Na, Ca and Mg.
(3) On Delharding (R) yields have been adjusted for a diagonal trend across the site. For this purpose, the block has been ignored in the analysis.

78/R/CS/216 DELHARDING (R)

GRAIN TONNES/HECTARE

***** TABLES OF MEANS *****

TREATMNT	NONE	FARM 0	NCAE 0	NCAE PK	WYE 0	WYE PK	MEAN
	4.39	4.61	4.62	5.08	5.25	5.97	4.99

***** STANDARD ERRORS OF DIFFERENCES OF MEANS *****

TABLE	TREATMNT
SED	0.426

***** STRATUM STANDARD ERRORS AND COEFFICIENTS OF VARIATION *****

STRATUM	DF	SE	CV%
BLOCK.WP	10	0.483	9.7

GRAIN MEAN DM% 84.2

STRAW TONNES/HECTARE

***** TABLES OF MEANS *****

TREATMNT	NONE	FARM 0	NCAE 0	NCAE PK	WYE 0	WYE PK	MEAN
	2.52	2.69	2.92	2.64	3.27	3.70	2.96

STRAW MEAN DM% 67.2

PLOT AREA HARVESTED 0.00260

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78/W/CS/216 ROAD PIECE (W)

GRAIN TONNES/HECTARE

***** TABLES OF MEANS *****

TREATMNT	NONE	FARM 0	NCAE 0	NCAE PK	WYE 0	WYE PK	MEAN
	4.35	4.95	3.58	2.89	5.27	5.46	4.42

***** STANDARD ERRORS OF DIFFERENCES OF MEANS *****

TABLE	TREATMNT
SED	0.441

***** STRATUM STANDARD ERRORS AND COEFFICIENTS OF VARIATION *****

STRATUM	DF	SE	CV%
BLOCK.WP	10	0.541	12.2

GRAIN MEAN DM% 83.9

STRAW TONNES/HECTARE

***** TABLES OF MEANS *****

TREATMNT	NONE	FARM 0	NCAE 0	NCAE PK	WYE 0	WYE PK	MEAN
	2.03	2.33	1.36	1.59	2.47	2.61	2.07

STRAW MEAN DM% 69.6

PLOT AREA HARVESTED 0.00260

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78/R/CS/222

FACTORS AFFECTING YIELD

Object: To study the effects of a range of factors on pests, diseases, nitrogen fixation and yield of field beans - Great Knott I.

Sponsors: R. Bardner, R.H. Bromilow, A.J. Cockbain, J.M. Day, K.E. Fletcher, B.J. Legg, J. McEwen, R.J. Roughley, G.A. Salt, H.R. Simpson, R.M. Webb, J.F. Witty.

The first year, field beans.

Design: Half replicate of 2^8 in 8 blocks of 2 plots split into 8.

Whole plot dimensions: 57.6 x 10.4.

Treatments: Combinations of:-

Whole plots

1.	IRRIGATN	Irrigation
	NONE	None
	FULL	Full (75 mm)

Sub plots

2.	N	Nitrogen fertiliser at flowering (kg N, as 'Nitro-Chalk 26'):
	0	
	150	
3.	ALDICARB	Aldicarb to seedbed (kg): 10 Mar, 1978
	0	
	10	
4.	FONOFOS	Fonofos to seedbed (kg): 9 Mar
	0	
	5	
5.	BENOMYL(1)	Benomyl to seedbed (kg): 9 Mar
	0.0	
	13.5	
6.	PERMETH	Permethrin foliar spray (kg):
	0.00	0.00
	0.15	0.15 on 17 May and 9 June

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7. PIRIMICA	Pirimicarb foliar spray (kg):
0.00	0.00
0.14	0.14 on 31 May
8. BENOMYL(2)	Benomyl foliar spray (kg):
0.0	0.0
0.6	0.6 on 20 July and 25 Aug

NOTES: (1) All sprays were applied in 340 l except BENOMYL(2) on 25 Aug which was applied in 220 l.

(2) Irrigation treatments were applied to reduce a deficit of 50 mm to 25 mm before pod set and from 80 mm to 55 mm after pod set (mm water):

1 June	25
19 July	25
28 July	25
TOTAL	75

Basal applications: Manures: FYM at 35 t. Weedkillers: Paraquat at 0.6 kg ion in 220 l. Simazine at 1.1 kg in 220 l. Insecticide: Pirimicarb at 0.14 kg in 220 l.

Seed: Minden, sown at 200 kg.

Cultivations, etc.: Paraquat applied: 8 Nov, 1977. FYM applied, ploughed: 24 Nov. Spring-tine cultivated: 8 Mar, 1978. Spike rotary cultivated: 10 Mar. Seed sown: 11 Mar. Simazine applied: 30 Mar. Basal insecticide applied: 11 July. Combine harvested: 5 Oct. Previous crops: Wheat 1976 and 1977.

NOTE: Plant counts were made after establishment and again before harvest. Total above-ground dry matter and nitrogen percentages were measured on three occasions. Components of yield were measured before harvest. Amounts of nodular material and nitrogenase activity were measured on two occasions. Ectoparasitic nematodes, root and foliar fungi, aphids, weevils and viruses were counted at intervals during the season. Nitrogen percentages of grain were measured.

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78/R/CS/222

GRAIN TONNES/HECTARE

***** TABLES OF MEANS *****

N	0	150	MEAN
IRRIGATN			
NONE	5.69	5.92	5.80
FULL	6.00	5.97	5.99
MEAN	5.85	5.94	5.89

ALDICARB	0	10	MEAN
IRRIGATN			
NONE	5.60	6.01	5.80
FULL	5.89	6.08	5.99
MEAN	5.74	6.04	5.89

ALDICARB	0	10	MEAN
N			
0	5.67	6.02	5.85
150	5.82	6.07	5.94
MEAN	5.74	6.04	5.89

FONOFOS	0	5	MEAN
IRRIGATN			
NONE	5.81	5.80	5.80
FULL	5.93	6.04	5.99
MEAN	5.87	5.92	5.89

FONOFOS	0	5	MEAN
N			
0	5.82	5.87	5.85
150	5.92	5.97	5.94
MEAN	5.87	5.92	5.89

FONOFOS	0	5	MEAN
ALDICARB			
0	5.69	5.80	5.74
10	6.05	6.04	6.04
MEAN	5.87	5.92	5.89

BENOMYL(1)	0.0	13.5	MEAN
IRRIGATN			
NONE	5.91	5.70	5.80
FULL	6.28	5.69	5.99
MEAN	6.09	5.70	5.89

BENOMYL(1)	0.0	13.5	MEAN
N			
0	6.06	5.63	5.85
150	6.13	5.76	5.94
MEAN	6.09	5.70	5.89

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GRAIN TONNES/HECTARE

***** TABLES OF MEANS *****

BENOMYL(1)	0.0	13.5	MEAN
ALDICARB			
0	5.98	5.51	5.74
10	6.21	5.88	6.04
MEAN	6.09	5.70	5.89

BENOMYL(1)	0.0	13.5	MEAN
FONOFOS			
0	6.08	5.66	5.87
5	6.11	5.73	5.92
MEAN	6.09	5.70	5.89

PERMETH	0.00	0.15	MEAN
IRRIGATN			
NONE	5.68	5.93	5.80
FULL	5.85	6.12	5.99
MEAN	5.77	6.02	5.89

PERMETH	0.00	0.15	MEAN
N			
0	5.71	5.98	5.85
150	5.82	6.07	5.94
MEAN	5.77	6.02	5.89

PERMETH	0.00	0.15	MEAN
ALDICARB			
0	5.58	5.90	5.74
10	5.95	6.14	6.04
MEAN	5.77	6.02	5.89

PERMETH	0.00	0.15	MEAN
FONOFOS			
0	5.72	6.03	5.87
5	5.82	6.02	5.92
MEAN	5.77	6.02	5.89

PERMETH	0.00	0.15	MEAN
BENOMYL(1)			
0.0	5.96	6.23	6.09
13.5	5.57	5.82	5.70
MEAN	5.77	6.02	5.89

PIRIMICA	0.00	0.14	MEAN
IRRIGATN			
NONE	5.95	5.66	5.80
FULL	5.92	6.05	5.99
MEAN	5.94	5.85	5.89

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GRAIN TONNES/HECTARE

***** TABLES OF MEANS *****

PIRIMICA N	0.00	0.14	MEAN
0	5.88	5.81	5.85
150	5.99	5.89	5.94
MEAN	5.94	5.85	5.89

PIRIMICA ALDICARB	0.00	0.14	MEAN
0	5.82	5.66	5.74
10	6.05	6.04	6.04
MEAN	5.94	5.85	5.89

PIRIMICA FONOFOS	0.00	0.14	MEAN
0	5.83	5.91	5.87
5	6.04	5.80	5.92
MEAN	5.94	5.85	5.89

PIRIMICA BENOMYL(1)	0.00	0.14	MEAN
0.0	6.13	6.06	6.09
13.5	5.74	5.65	5.70
MEAN	5.94	5.85	5.89

PIRIMICA PERMETH	0.00	0.14	MEAN
0.00	5.83	5.70	5.77
0.15	6.04	6.01	6.02
MEAN	5.94	5.85	5.89

BENOMYL(2) IRRIGATN	0.0	0.6	MEAN
NONE	5.61	6.00	5.80
FULL	5.73	6.24	5.99
MEAN	5.67	6.12	5.89

BENOMYL(2) N	0.0	0.6	MEAN
0	5.62	6.07	5.85
150	5.72	6.16	5.94
MEAN	5.67	6.12	5.89

BENOMYL(2) ALDICARB	0.0	0.6	MEAN
0	5.52	5.96	5.74
10	5.82	6.27	6.04
MEAN	5.67	6.12	5.89

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GRAIN TONNES/HECTARE

***** TABLES OF MEANS *****

BENOMYL(2) FONOFOS	0.0	0.6	MEAN
0	5.68	6.06	5.87
5	5.66	6.18	5.92
MEAN	5.67	6.12	5.89

BENOMYL(2) BENOMYL(1)	0.0	0.6	MEAN
0.0	5.92	6.26	6.09
13.5	5.42	5.97	5.70
MEAN	5.67	6.12	5.89

BENOMYL(2) PERMETH	0.0	0.6	MEAN
0.00	5.53	6.00	5.77
0.15	5.81	6.23	6.02
MEAN	5.67	6.12	5.89

BENOMYL(2) PIRIMICA	0.0	0.6	MEAN
0.00	5.67	6.20	5.94
0.14	5.67	6.04	5.85
MEAN	5.67	6.12	5.89

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GRAIN TONNES/HECTARE

***** TABLES OF MEANS (INDIVIDUAL VALUES) *****

IRRIGATN	N	ALDICARB	FONOFOS	BENOMYL(1)	PERMETH	PIRIMICA	BENOMYL(2)	GRAIN
NONE	0	0	0	0.0	0.00	0.00	0.0	5.29
NONE	0	0	0	0.0	0.00	0.14	0.6	5.42
NONE	0	0	0	0.0	0.15	0.00	0.6	5.95
NONE	0	0	0	0.0	0.15	0.14	0.0	5.89
NONE	0	0	0	13.5	0.00	0.00	0.6	6.10
NONE	0	0	0	13.5	0.00	0.14	0.0	3.88
NONE	0	0	0	13.5	0.15	0.00	0.0	4.59
NONE	0	0	0	13.5	0.15	0.14	0.6	5.31
NONE	0	0	5	0.0	0.00	0.00	0.6	6.00
NONE	0	0	5	0.0	0.00	0.14	0.0	5.62
NONE	0	0	5	0.0	0.15	0.00	0.0	5.56
NONE	0	0	5	0.0	0.15	0.14	0.6	6.30
NONE	0	0	5	13.5	0.00	0.00	0.0	5.67
NONE	0	0	5	13.5	0.00	0.14	0.6	4.75
NONE	0	0	5	13.5	0.15	0.00	0.6	6.77
NONE	0	0	5	13.5	0.15	0.14	0.0	4.44
NONE	0	10	0	0.0	0.00	0.00	0.6	6.24
NONE	0	10	0	0.0	0.00	0.14	0.0	6.01
NONE	0	10	0	0.0	0.15	0.00	0.0	5.96
NONE	0	10	0	0.0	0.15	0.14	0.6	5.87
NONE	0	10	0	13.5	0.00	0.00	0.0	5.49
NONE	0	10	0	13.5	0.00	0.14	0.6	6.00
NONE	0	10	0	13.5	0.15	0.00	0.6	6.15
NONE	0	10	0	13.5	0.15	0.14	0.0	5.88
NONE	0	10	5	0.0	0.00	0.00	0.0	5.88
NONE	0	10	5	0.0	0.00	0.14	0.6	5.75
NONE	0	10	5	0.0	0.15	0.00	0.6	6.24
NONE	0	10	5	0.0	0.15	0.14	0.0	6.08
NONE	0	10	5	13.5	0.00	0.00	0.6	5.66
NONE	0	10	5	13.5	0.00	0.14	0.0	5.62
NONE	0	10	5	13.5	0.15	0.00	0.0	5.75
NONE	0	10	5	13.5	0.15	0.14	0.6	5.99

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GRAIN TONNES/HECTARE

***** TABLES OF MEANS (INDIVIDUAL VALUES) *****

IRRIGATN	N	ALDICARB	FONOFOS	BENOMYL(1)	PERMETH	PIRIMICA	BENOMYL(2)	GRAIN
NONE	150	0	0	0.0	0.00	0.00	0.6	5.02
NONE	150	0	0	0.0	0.00	0.14	0.0	5.52
NONE	150	0	0	0.0	0.15	0.00	0.0	6.54
NONE	150	0	0	0.0	0.15	0.14	0.6	6.18
NONE	150	0	0	13.5	0.00	0.00	0.0	5.31
NONE	150	0	0	13.5	0.00	0.14	0.6	6.13
NONE	150	0	0	13.5	0.15	0.00	0.6	6.65
NONE	150	0	0	13.5	0.15	0.14	0.0	5.48
NONE	150	0	5	0.0	0.00	0.00	0.0	6.16
NONE	150	0	5	0.0	0.00	0.14	0.6	5.60
NONE	150	0	5	0.0	0.15	0.00	0.6	6.32
NONE	150	0	5	0.0	0.15	0.14	0.0	5.46
NONE	150	0	5	13.5	0.00	0.00	0.6	5.97
NONE	150	0	5	13.5	0.00	0.14	0.0	4.48
NONE	150	0	5	13.5	0.15	0.00	0.0	5.24
NONE	150	0	5	13.5	0.15	0.14	0.6	5.54
NONE	150	10	0	0.0	0.00	0.00	0.0	5.52
NONE	150	10	0	0.0	0.00	0.14	0.6	5.89
NONE	150	10	0	0.0	0.15	0.00	0.6	6.35
NONE	150	10	0	0.0	0.15	0.14	0.0	6.15
NONE	150	10	0	13.5	0.00	0.00	0.6	6.60
NONE	150	10	0	13.5	0.00	0.14	0.0	6.23
NONE	150	10	0	13.5	0.15	0.00	0.0	6.65
NONE	150	10	0	13.5	0.15	0.14	0.6	5.68
NONE	150	10	5	0.0	0.00	0.00	0.6	7.05
NONE	150	10	5	0.0	0.00	0.14	0.0	5.84
NONE	150	10	5	0.0	0.15	0.00	0.0	5.79
NONE	150	10	5	0.0	0.15	0.14	0.6	5.62
NONE	150	10	5	13.5	0.00	0.00	0.0	5.06
NONE	150	10	5	13.5	0.00	0.14	0.6	6.03
NONE	150	10	5	13.5	0.15	0.00	0.6	6.85
NONE	150	10	5	13.5	0.15	0.14	0.0	6.40

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GRAIN TONNES/HECTARE

***** TABLES OF MEANS (INDIVIDUAL VALUES) *****

IRRIGATN	N	ALDICARB	FONOFOS	BENOMYL(1)	PERMETH	PIRIMICA	BENOMYL(2)	GRAIN
FULL	0	0	0	0.0	0.00	0.00	0.6	6.60
FULL	0	0	0	0.0	0.00	0.14	0.0	5.26
FULL	0	0	0	0.0	0.15	0.00	0.0	6.04
FULL	0	0	0	0.0	0.15	0.14	0.6	6.36
FULL	0	0	0	13.5	0.00	0.00	0.0	4.85
FULL	0	0	0	13.5	0.00	0.14	0.6	5.53
FULL	0	0	0	13.5	0.15	0.00	0.6	5.23
FULL	0	0	0	13.5	0.15	0.14	0.0	5.91
FULL	0	0	5	0.0	0.00	0.00	0.0	5.98
FULL	0	0	5	0.0	0.00	0.14	0.6	6.03
FULL	0	0	5	0.0	0.15	0.00	0.6	6.25
FULL	0	0	5	0.0	0.15	0.14	0.0	5.82
FULL	0	0	5	13.5	0.00	0.00	0.6	5.99
FULL	0	0	5	13.5	0.00	0.14	0.0	5.48
FULL	0	0	5	13.5	0.15	0.00	0.0	6.03
FULL	0	0	5	13.5	0.15	0.14	0.6	6.59
FULL	0	10	0	0.0	0.00	0.00	0.0	5.83
FULL	0	10	0	0.0	0.00	0.14	0.6	6.70
FULL	0	10	0	0.0	0.15	0.00	0.6	6.75
FULL	0	10	0	0.0	0.15	0.14	0.0	6.89
FULL	0	10	0	13.5	0.00	0.00	0.6	6.18
FULL	0	10	0	13.5	0.00	0.14	0.0	5.67
FULL	0	10	0	13.5	0.15	0.00	0.0	5.49
FULL	0	10	0	13.5	0.15	0.14	0.6	7.01
FULL	0	10	5	0.0	0.00	0.00	0.6	6.23
FULL	0	10	5	0.0	0.00	0.14	0.0	6.05
FULL	0	10	5	0.0	0.15	0.00	0.0	6.14
FULL	0	10	5	0.0	0.15	0.14	0.6	6.88
FULL	0	10	5	13.5	0.00	0.00	0.0	5.33
FULL	0	10	5	13.5	0.00	0.14	0.6	5.66
FULL	0	10	5	13.5	0.15	0.00	0.6	5.77
FULL	0	10	5	13.5	0.15	0.14	0.0	5.38

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GRAIN TONNES/HECTARE

***** TABLES OF MEANS (INDIVIDUAL VALUES) *****

IRRIGATN	N	ALDICARB	FONOFOS	BENOMYL(1)	PERMETH	PIRIMICA	BENOMYL(2)	GRAIN
FULL	150	0	0	0.0	0.00	0.00	0.0	5.82
FULL	150	0	0	0.0	0.00	0.14	0.6	6.40
FULL	150	0	0	0.0	0.15	0.00	0.6	6.81
FULL	150	0	0	0.0	0.15	0.14	0.0	6.20
FULL	150	0	0	13.5	0.00	0.00	0.6	4.45
FULL	150	0	0	13.5	0.00	0.14	0.0	5.96
FULL	150	0	0	13.5	0.15	0.00	0.0	5.37
FULL	150	0	0	13.5	0.15	0.14	0.6	6.11
FULL	150	0	5	0.0	0.00	0.00	0.6	6.26
FULL	150	0	5	0.0	0.00	0.14	0.0	6.03
FULL	150	0	5	0.0	0.15	0.00	0.0	6.28
FULL	150	0	5	0.0	0.15	0.14	0.6	6.33
FULL	150	0	5	13.5	0.00	0.00	0.0	5.26
FULL	150	0	5	13.5	0.00	0.14	0.6	5.90
FULL	150	0	5	13.5	0.15	0.00	0.6	6.02
FULL	150	0	5	13.5	0.15	0.14	0.0	5.35
FULL	150	10	0	0.0	0.00	0.00	0.6	6.47
FULL	150	10	0	0.0	0.00	0.14	0.0	5.72
FULL	150	10	0	0.0	0.15	0.00	0.0	5.92
FULL	150	10	0	0.0	0.15	0.14	0.6	6.95
FULL	150	10	0	13.5	0.00	0.00	0.0	5.18
FULL	150	10	0	13.5	0.00	0.14	0.6	5.61
FULL	150	10	0	13.5	0.15	0.00	0.6	5.18
FULL	150	10	0	13.5	0.15	0.14	0.0	5.31
FULL	150	10	5	0.0	0.00	0.00	0.0	5.91
FULL	150	10	5	0.0	0.00	0.14	0.6	6.61
FULL	150	10	5	0.0	0.15	0.00	0.6	6.92
FULL	150	10	5	0.0	0.15	0.14	0.0	6.40
FULL	150	10	5	13.5	0.00	0.00	0.6	7.28
FULL	150	10	5	13.5	0.00	0.14	0.0	5.05
FULL	150	10	5	13.5	0.15	0.00	0.0	5.59
FULL	150	10	5	13.5	0.15	0.14	0.6	6.46

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GRAIN TONNES/HECTARE

***** STANDARD ERRORS OF DIFFERENCES OF MEANS *****

SED 0.079*
0.112**
0.158***

* USE ONLY ON MARGINS OF A TWO WAY TABLE,EXCEPT FOR IRRIGATN .
** USE FOR THE BODY OF A TWO WAY TABLE,ONLY WITHIN THE SAME LEVEL OF IRRIGATN (IF APPLICABLE) .
*** USE FOR THREE WAY TABLES (IF CONSTRUCTED FROM INDIVIDUAL VALUES), ONLY WITHIN THE SAME LEVEL OF IRRIGATN (IF APPLICABLE) .
DO NOT USE SED FOR FOLLOWING TABLES
ALDICARB.FONOFOS.PERMETH
N.BENOMYL(1).PERMETH
N.FONOFOS.PIRIMICA
ALDICARB.BENOMYL(1).PIRIMICA
N.ALDICARB.BENOMYL(2)
FONOFOS.BENOMYL(1).BENOMYL(2)
PERMETH.PIRIMICA.BENOMYL(2)
AS NO SED'S ARE AVAILABLE FOR THESE TABLES .

***** STRATUM STANDARD ERRORS AND COEFFICIENTS OF VARIATION *****

STRATUM	DF	SE	CV%
BLOCK.WP.SP	28	0.447	7.6

GRAIN MEAN DM% 80.2

SUB PLOT AREA HARVESTED 0.00293

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78/R/CS/223

LATE N

Object: To study the effects of a range of fertilisers that release nitrogen later in the growing season than traditional forms on the growth and yield of potatoes - Long Hoos III.

Sponsors: T.M. Addiscott, J. Ashworth, A. Penny, F.V. Widdowson.

The first year, potatoes.

Design: 3 randomised blocks of 18 plots.

Whole plot dimensions: 9.14 x 4.27.

Treatments: All combinations of:-

1. N FORM — Forms of nitrogen fertiliser:

AA	Aqueous ammonia, injected before planting
AA+NITRA	Aqueous ammonia + nitrapyrin at 1.1 kg, injected before planting
AA+STC	Aqueous ammonia + sodium trithiocarbonate at 22 kg injected before planting
AU	Aqueous urea, injected before planting
AN E	Ammonium nitrate, all to the seedbed
AN E+L	Ammonium nitrate, half to the seedbed, half top-dressed
IBDU	Isobutylidene diurea, medium granules all to the seedbed

2. N RATE(1) — Rates of nitrogen fertiliser (kg N):

200
300

plus four extra treatments given ammonium nitrate, all to the seedbed (kg N):

AN E 150
AN E 250
AN E 350
AN E 400

NOTE: Aqueous fertilisers were injected on 9 May, 1978, IBDU and seedbed ammonium nitrate was applied on 10 May. Late ammonium nitrate was applied on 22 June.

Basal applications: Manures: (0:14:28) at 1.9 t. Weedkillers: Linuron at 1.1 kg with paraquat at 0.42 kg ion in 220 l. Fungicides: Mancozeb at 1.3 kg in 220 l on three occasions, with insecticide on the second and third occasions. Fentin acetate and maneb ('Fennite A' at 1.7 kg) in 220 l on two occasions. Insecticide: Pirimicarb at 0.14 kg in 220 l. Haulm desiccant: Undiluted BOV at 170 l. Irrigation: Total 50 mm.

Seed: Pentland Crown.

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Cultivations, etc.:- Ploughed: 21 Nov, 1977. Heavy spring-tine cultivated: 6 Apr, 1978. PK applied: 25 Apr. Spike rotary cultivated, potatoes planted: 11 May. Grubbed: 18 May. Weedkillers applied: 26 May. Grubbed and rotary ridged: 20 June. Mancozeb applied: 5 July. Mancozeb and pirimicarb applied twice: 18 July, 1 Aug. 'Fennite A' applied twice: 17 Aug, 8 Sept. Irrigation applied twice: 25 mm on 25 Aug and 25 mm on 13 Sept. BOV applied: 2 Oct. Pulverized: 18 Oct. Lifted: 19 Oct. Previous crops: Wheat 1976, W. oats 1977.

NOTE: Plots were asssed for dry matter of tubers and haulm, and for numbers of tubers on several occasions during the season. Samples of tubers were analysed for nitrogen percentages.

TOTAL TUBERS TONNES/HECTARE

***** TABLES OF MEANS *****

N RATE(1) / N FORM	200	300	MEAN
AA	44.0	53.0	48.5
AA+NITRA	46.3	53.2	49.7
AA+STC	46.4	52.9	49.6
AU	47.0	52.4	49.7
AN E	51.8	55.6	53.7
AN E+L	53.6	57.7	55.6
IBDU	41.8	45.6	43.7
MEAN	47.3	52.9	50.1

EXTRA	
AN E 150	41.7
AN E 250	56.7
AN E 350	59.7
AN E 400	57.4
MEAN	53.9

GRAND MEAN 50.9

***** STANDARD ERRORS OF DIFFERENCES OF MEANS *****

TABLE	EXTRA	N FORM	N RATE(1)	N FORM N RATE(1) & EXTRA
SED	2.65	1.88	1.00	2.65

***** STRATUM STANDARD ERRORS AND COEFFICIENTS OF VARIATION *****

STRATUM	DF	SE	CV%
BLOCK.WP	34	3.25	6.4

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PERCENTAGE WARE 4.44CM (1.75 INCH) RIDDLE

***** TABLES OF MEANS *****

N RATE(1)	200	300	MEAN
N FORM			
AA	87.2	89.9	88.5
AA+NITRA	87.4	92.4	89.9
AA+STC	88.2	91.8	90.0
AU	89.3	91.6	90.5
AN E	90.5	92.7	91.6
AN E+L	90.9	91.3	91.1
IBDU	88.9	89.3	89.1
MEAN	88.9	91.3	90.1
EXTRA			
AN E 150	85.5		
AN E 250	92.3		
AN E 350	91.5		
AN E 400	91.6		
MEAN	90.2		

GRAND MEAN 90.1

PLOT AREA HARVESTED 0.00260

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78/S/CS/1

VARIETIES, N AND CCC

Object: To study the effects of varieties, fungicides, and rates and times of applying nitrogen fertiliser on the incidence of foliar diseases and on yield of barley - Saxmundham, Oldershaw's and Garner's plots.

Sponsors: F.V. Widdowson, J.F. Jenkyn, A. Penny.

The 13th year, barley.

For previous years see 66/C/30(t), 67/C/23(t), 68/C/39, 69-70/S/CS/1, 71/S/CS/1(t), 72/S/CS/1(t) and 73-77/S/CS/1.

Design: A single replicate of 2^6 in 4 blocks of 4 plots each split into half and quarter plots, plus one additional plot per block similarly split. Treatments to wheat 1966-1976 have been ignored.

Whole plot dimensions: 5.49 x 40.2.

Treatments (cumulative to 1977): All combinations of:-

Whole plots

1. VARIETY	Varieties:-	
	JULIA	
	WING	
2. MILDFUNG	Fungicides to control mildew:	
	NONE	None
	ETH+TRI	Ethirimol seed dressing + tridemorph foliar spray (0.53 kg applied with the weedkillers on 18 May, 1978)

Half plots

3. S N RATE	Rates of solid nitrogen fertiliser (kg N):	
	50	
	100	
4. S N TIME	Times of applying solid nitrogen fertiliser:	
	SEEDBED	Seedbed on 6 Apr
	TOPDRESS	Top dressed on 18 May

Quarter plots

5. L N RATE	Rates of liquid nitrogen fertiliser (kg N):	
	0	None
	50	25 on 7 June + 25 on 21 June
6. RUSTFUNG	Fungicide to control rust:	
	NONE	None
	BENODANI	Benodanil foliar spray (1.12 kg in 280 l on 21 June and 6 July)

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XTRA WMR — Plus one additional whole plot per block sown to variety Wing, seed dressed ethirimol, given foliar sprays of tridemorph and benodanil and testing all combinations of:

Half plots

1. S N — Rates of solid nitrogen fertiliser (kg N):

25+25	25 to seedbed + 25 top dressed
50+50	50 to seedbed + 50 top dressed

2. GRTH REG — Growth regulator:

NONE	None
MEP+ETH	Mepiquat chloride + ethephon ('BAS 09800W' at 2.0 l in 250 l on 8 June)

Quarter plots

3. L N — Rates of liquid nitrogen fertiliser (kg N):

0	None
25+25	25 on 7 June + 25 on 21 June

Basal applications: Manures: (7.5:17.5:17.5) at 250 kg. Weedkillers: Ioxynil at 0.42 kg with mecoprop at 1.3 kg in 220 l.

Seed: sown at 190 kg.

Cultivations, etc.:- Ploughed: 14 Sept, 1977. NPK applied, seed sown: 7 Apr, 1978. Weedkillers applied: 18 May. Combine harvested: 5 Sept.

GRAIN TONNES/HECTARE

***** TABLES OF MEANS *****

MILDFUNG / VARIETY	NONE	ETH+TRI	MEAN
JULIA	5.27	5.37	5.32
WING	5.18	5.37	5.28
MEAN	5.23	5.37	5.30

S N RATE / VARIETY	50	100	MEAN
JULIA	5.38	5.26	5.32
WING	5.31	5.24	5.28
MEAN	5.34	5.25	5.30

S N RATE / MILDFUNG	50	100	MEAN
NONE	5.27	5.19	5.23
ETH+TRI	5.42	5.32	5.37
MEAN	5.34	5.25	5.30

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GRAIN TONNES/HECTARE

***** TABLES OF MEANS *****

S N TIME VARIETY	SEEDBED	TOPDRESS	MEAN
JULIA	5.67	4.97	5.32
WING	5.60	4.95	5.28
MEAN	5.63	4.96	5.30

S N TIME MILDFUNG	SEEDBED	TOPDRESS	MEAN
NONE	5.56	4.90	5.23
ETH+TRI	5.71	5.03	5.37
MEAN	5.63	4.96	5.30

S N TIME S N RATE	SEEDBED	TOPDRESS	MEAN
50	5.60	5.09	5.34
100	5.67	4.84	5.25
MEAN	5.63	4.96	5.30

L N RATE VARIETY	0	50	MEAN
JULIA	5.43	5.21	5.32
WING	5.37	5.18	5.28
MEAN	5.40	5.20	5.30

L N RATE MILDFUNG	0	50	MEAN
NONE	5.31	5.14	5.23
ETH+TRI	5.49	5.25	5.37
MEAN	5.40	5.20	5.30

L N RATE S N RATE	0	50	MEAN
50	5.42	5.27	5.34
100	5.38	5.12	5.25
MEAN	5.40	5.20	5.30

L N RATE S N TIME	0	50	MEAN
SEEDBED	5.75	5.51	5.63
TOPDRESS	5.04	4.88	4.96
MEAN	5.40	5.20	5.30

RUSTFUNG VARIETY	NONE	BENODANI	MEAN
JULIA	5.19	5.45	5.32
WING	5.03	5.52	5.28
MEAN	5.11	5.48	5.30

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GRAIN TONNES/HECTARE

***** TABLES OF MEANS *****

RUSTFUNG MILDFUNG	NONE	BENODANI	MEAN
NONE	5.06	5.40	5.23
ETH+TRI	5.17	5.57	5.37
MEAN	5.11	5.48	5.30

RUSTFUNG S N RATE	NONE	BENODANI	MEAN
50	5.18	5.51	5.34
100	5.05	5.46	5.25
MEAN	5.11	5.48	5.30

RUSTFUNG S N TIME	NONE	BENODANI	MEAN
SEEDBED	5.43	5.84	5.63
TOPDRESS	4.79	5.13	4.96
MEAN	5.11	5.48	5.30

RUSTFUNG L N RATE	NONE	BENODANI	MEAN
0	5.21	5.59	5.40
50	5.02	5.38	5.20
MEAN	5.11	5.48	5.30

MILDFUNG	NONE		ETH+TRI	
S N RATE	50	100	50	100
VARIETY				
JULIA	5.32	5.22	5.43	5.30
WING	5.21	5.15	5.41	5.34

MILDFUNG	NONE		ETH+TRI	
S N TIME	SEEDBED	TOPDRESS	SEEDBED	TOPDRESS
VARIETY				
JULIA	5.64	4.91	5.70	5.04
WING	5.47	4.89	5.73	5.02

S N RATE	50		100	
S N TIME	SEEDBED	TOPDRESS	SEEDBED	TOPDRESS
VARIETY				
JULIA	5.65	5.11	5.68	4.84
WING	5.55	5.07	5.65	4.84

S N RATE	50		100	
S N TIME	SEEDBED	TOPDRESS	SEEDBED	TOPDRESS
MILDFUNG				
NONE	5.57	4.96	5.54	4.84
ETH+TRI	5.63	5.21	5.79	4.85

MILDFUNG	NONE		ETH+TRI	
L N RATE	0	50	0	50
VARIETY				
JULIA	5.37	5.18	5.48	5.25
WING	5.25	5.11	5.49	5.25

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GRAIN TONNES/HECTARE

***** TABLES OF MEANS *****

S N RATE	50		100	
L N RATE	0	50	0	50
VARIETY				
JULIA	5.46	5.29	5.39	5.13
WING	5.37	5.25	5.37	5.11

S N RATE	50		100	
L N RATE	0	50	0	50
MILDFUNG				
NONE	5.32	5.22	5.30	5.07
ETH+TRI	5.52	5.33	5.46	5.18

S N TIME	SEEDBED		TOPDRESS	
L N RATE	0	50	0	50
VARIETY				
JULIA	5.82	5.52	5.04	4.91
WING	5.69	5.51	5.05	4.85

S N TIME	SEEDBED		TOPDRESS	
L N RATE	0	50	0	50
MILDFUNG				
NONE	5.66	5.45	4.96	4.84
ETH+TRI	5.85	5.58	5.13	4.93

S N TIME	SEEDBED		TOPDRESS	
L N RATE	0	50	0	50
S N RATE				
50	5.70	5.51	5.14	5.04
100	5.81	5.52	4.95	4.73

MILDFUNG	NONE		ETH+TRI	
RUSTFUNG	NONE	BENODANI	NONE	BENODANI
VARIETY				
JULIA	5.16	5.38	5.22	5.51
WING	4.95	5.42	5.11	5.63

S N RATE	50		100	
RUSTFUNG	NONE	BENODANI	NONE	BENODANI
VARIETY				
JULIA	5.25	5.50	5.13	5.39
WING	5.10	5.52	4.96	5.52

S N RATE	50		100	
RUSTFUNG	NONE	BENODANI	NONE	BENODANI
MILDFUNG				
NONE	5.13	5.40	4.98	5.40
ETH+TRI	5.22	5.62	5.12	5.52

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GRAIN TONNES/HECTARE

***** TABLES OF MEANS *****

S N TIME	SEEDBED		TOPDRESS	
RUSTFUNG	NONE	BENODANI	NONE	BENODANI
VARIETY				
JULIA	5.52	5.81	4.87	5.08
WING	5.35	5.86	4.71	5.19

S N TIME	SEEDBED		TOPDRESS	
RUSTFUNG	NONE	BENODANI	NONE	BENODANI
MILDFUNG				
NONE	5.38	5.73	4.73	5.06
ETH+TRI	5.49	5.94	4.85	5.20

S N TIME	SEEDBED		TOPDRESS	
RUSTFUNG	NONE	BENODANI	NONE	BENODANI
S N RATE				
50	5.41	5.80	4.95	5.23
100	5.46	5.87	4.64	5.04

L N RATE	0		50	
RUSTFUNG	NONE	BENODANI	NONE	BENODANI
VARIETY				
JULIA	5.34	5.51	5.04	5.38
WING	5.07	5.67	4.99	5.37

L N RATE	0		50	
RUSTFUNG	NONE	BENODANI	NONE	BENODANI
MILDFUNG				
NONE	5.09	5.53	5.02	5.27
ETH+TRI	5.32	5.65	5.02	5.49

L N RATE	0		50	
RUSTFUNG	NONE	BENODANI	NONE	BENODANI
S N RATE				
50	5.28	5.56	5.07	5.47
100	5.14	5.63	4.96	5.29

L N RATE	0		50	
RUSTFUNG	NONE	BENODANI	NONE	BENODANI
S N TIME				
SEEDBED	5.55	5.96	5.31	5.71
TOPDRESS	4.86	5.23	4.72	5.04

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GRAIN TONNES/HECTARE

***** STANDARD ERRORS OF DIFFERENCES OF MEANS *****

TABLE	VARIETY	MILDFUNG	S N RATE	S N TIME
SED	0.109	0.109	0.046	0.046

TABLE	L N RATE	RUSTFUNG	VARIETY MILDFUNG	VARIETY S N RATE
SED	0.039	0.039	0.154	0.118
EXCEPT WHEN COMPARING MEANS WITH SAME LEVEL(S) OF:				
VARIETY				0.065

TABLE	MILDFUNG S N RATE	VARIETY S N TIME	MILDFUNG S N TIME	S N RATE S N TIME
SED	0.118	0.118	0.118	0.065
EXCEPT WHEN COMPARING MEANS WITH SAME LEVEL(S) OF:				
VARIETY		0.065		
MILDFUNG	0.065		0.065	
S N RATE				0.118
S N TIME				0.118

TABLE	VARIETY L N RATE	MILDFUNG L N RATE	S N RATE L N RATE	S N TIME L N RATE
SED	0.116	0.116	0.060	0.060
EXCEPT WHEN COMPARING MEANS WITH SAME LEVEL(S) OF:				
VARIETY	0.055			
MILDFUNG		0.055		
S N RATE			0.055	
S N TIME				0.055

TABLE	VARIETY RUSTFUNG	MILDFUNG RUSTFUNG	S N RATE RUSTFUNG	S N TIME RUSTFUNG
SED	0.116	0.116	0.060	0.060
EXCEPT WHEN COMPARING MEANS WITH SAME LEVEL(S) OF:				
VARIETY	0.055			
MILDFUNG		0.055		
S N RATE			0.055	
S N TIME				0.055

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GRAIN TONNES/HECTARE

***** STANDARD ERRORS OF DIFFERENCES OF MEANS *****

TABLE	L N RATE RUSTFUNG	VARIETY MILDFUNG S N RATE	VARIETY MILDFUNG S N TIME	VARIETY S N RATE S N TIME
SED	0.055	0.167	0.167	0.167
EXCEPT WHEN COMPARING MEANS WITH SAME LEVEL(S) OF:				
VARIETY				0.092
L N RATE	0.060			
RUSTFUNG	0.060			
VARIETY.MILDFUNG		0.092	0.092	

TABLE	MILDFUNG S N RATE S N TIME	VARIETY MILDFUNG L N RATE	VARIETY S N RATE L N RATE	MILDFUNG S N RATE L N RATE
SED	0.167	0.164	0.130	0.130
EXCEPT WHEN COMPARING MEANS WITH SAME LEVEL(S) OF:				
VARIETY			0.085	
MILDFUNG	0.092			0.085
VARIETY.MILDFUNG		0.078		
VARIETY.S N RATE			0.078	
MILDFUNG.S N RATE				0.078

TABLE	VARIETY S N TIME L N RATE	MILDFUNG S N TIME L N RATE	S N RATE S N TIME L N RATE	VARIETY MILDFUNG RUSTFUNG
SED	0.130	0.130	0.085	0.164
EXCEPT WHEN COMPARING MEANS WITH SAME LEVEL(S) OF:				
VARIETY	0.085			
MILDFUNG		0.085		
S N RATE			0.130	
S N TIME			0.130	
VARIETY.MILDFUNG				0.078
VARIETY.S N TIME	0.078			
MILDFUNG.S N TIME		0.078		
S N RATE.S N TIME			0.078	

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GRAIN TONNES/HECTARE

***** STANDARD ERRORS OF DIFFERENCES OF MEANS *****

TABLE	VARIETY S N RATE RUSTFUNG	MILDFUNG S N RATE RUSTFUNG	VARIETY S N TIME RUSTFUNG	MILDFUNG S N TIME RUSTFUNG
SED	0.130	0.130	0.130	0.130
EXCEPT WHEN COMPARING MEANS WITH SAME LEVEL(S) OF:				
VARIETY	0.085		0.085	
MILDFUNG		0.085		0.085
VARIETY.S N RATE	0.078			
MILDFUNG.S N RATE		0.078		
VARIETY.S N TIME			0.078	
MILDFUNG.S N TIME				0.078

TABLE	S N RATE S N TIME RUSTFUNG	VARIETY L N RATE RUSTFUNG	MILDFUNG L N RATE RUSTFUNG	S N RATE L N RATE RUSTFUNG
SED	0.085	0.130	0.130	0.130
EXCEPT WHEN COMPARING MEANS WITH SAME LEVEL(S) OF:				
VARIETY		0.078		
MILDFUNG			0.078	
S N RATE	0.130			0.078
S N TIME	0.130			
L N RATE				0.085
RUSTFUNG				0.085
S N RATE.S N TIME	0.078			
VARIETY.L N RATE		0.085		
MILDFUNG.L N RATE			0.085	
VARIETY.RUSTFUNG		0.085		
MILDFUNG.RUSTFUNG			0.085	

TABLE	S N TIME L N RATE RUSTFUNG
SED	0.130
EXCEPT WHEN COMPARING MEANS WITH SAME LEVEL(S) OF:	
S N TIME	0.078
L N RATE	0.085
RUSTFUNG	0.085

***** STRATUM STANDARD ERRORS AND COEFFICIENTS OF VARIATION *****

STRATUM	DF	SE	CV%
BLOCK.WP	4	0.218	4.1
BLOCK.WP.HP	5	0.130	2.5
BLOCK.WP.HP.QP	10	0.155	2.9

GRAIN MEAN DM% 83.9

SUB PLOT AREA HARVESTED 0.00479

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EXTRA

GRAIN TONNES/HECTARE

***** TABLES OF MEANS *****

L N / S N	0	25+25	MEAN
25+25	5.63	5.61	5.62
50+50	5.90	5.49	5.69
MEAN	5.76	5.55	5.66

GRTH REG / S N	NONE	MEP+ETH	MEAN
25+25	5.60	5.64	5.62
50+50	5.74	5.64	5.69
MEAN	5.67	5.64	5.66

GRTH REG / L N	NONE	MEP+ETH	MEAN
0	5.76	5.77	5.76
25+25	5.59	5.51	5.55
MEAN	5.67	5.64	5.66

L N	0		25+25	
GRTH REG	NONE	MEP+ETH	NONE	MEP+ETH
S N				
25+25	5.63	5.63	5.57	5.65
50+50	5.89	5.91	5.60	5.37

***** STANDARD ERRORS OF DIFFERENCES OF MEANS *****

TABLE	S N	L N	GRTH REG	S N / L N
SED	0.175	0.095	0.175	0.199
EXCEPT WHEN COMPARING MEANS WITH SAME LEVEL(S) OF:				
S N				0.134

TABLE	S N / GRTH REG	L N / GRTH REG	S N / L N / GRTH REG
SED	0.247	0.199	0.281
EXCEPT WHEN COMPARING MEANS WITH SAME LEVEL(S) OF:			
S N	0.208		0.247
GRTH REG	0.208	0.134	0.247
S N.GRTH REG			0.189

***** STRATUM STANDARD ERRORS AND COEFFICIENTS OF VARIATION *****

STRATUM	DF	SE	CV%
BLOCK.WP.HP.QP	4	0.189	3.3

GRAIN MEAN DM% 83.1

SUB PLOT AREA HARVESTED 0.00479

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78/R/WW/1

WINTER WHEAT

VARIETIES AND N

Object: To study the yields and flour quality of a selection of the newer varieties of winter wheat and the effects of nitrogen on them on land in rotation (pathogen free) and after cereal (pathogen infected) - Great Harpenden I (pathogen free RH) and Little Hoos (pathogen infected RD).

Sponsors: R. Moffitt, R.J. Gutteridge.

Design: 4 randomised blocks of 9 plots split into 4 (RD) and 1 block of 9 plots split into 4 (RH).

Whole plot dimensions: 4.27 x 33.2 (RH)
4.27 x 27.1 (RD)

Treatments: All combinations of:-

Whole plots

1. VARIETY — Varieties:

ARMADA	Armada
ATOU	Atou
FLANDERS	Flanders
HOBBIT	Hobbit
KADOR	Kador
MARDLER	Mardler
HUNTSMAN	Maris Huntsman
KINSMAN	Maris Kinsman
SPORTSMN	Sportsman

Sub plots

2. N — Nitrogen fertiliser (kg N):

(RH)	(RD)	Gt. Harpenden I (RH)	Little Hoos (RD)
0	63	0	63 in spring
63	126	63 in spring	126 in spring
126	189	126 in spring	189 in spring
63+63	126+63	63 in spring + 63 at flowering	126 in spring + 63 at flowering

NOTES: (1) Three blocks were sown on Gt. Harpenden I (RH). Two were waterlogged during the winter and were abandoned.
(2) An identical experiment was sown at Woburn but was abandoned after severe damage by birds during the winter.
(3) Spring N was applied as 'Nitro-Chalk 25'. N at flowering was applied as a mixture of ammonium nitrate and urea applied in 530 l (the solution contained 6% N). The total dressing was divided equally between two occasions: 13 June and 5 July.

Basal applications: Manures: Gt. Harpenden I (RH) and Little Hoos (RD): (0:20:20) at 320 kg. Weedkillers: Gt. Harpenden I (RH): Mecoprop with bromoxynil and ioxynil ('Brittox' at 3.5 kg) in 220 l. Little Hoos (RD): Dicamba with mecoprop and MCPA ('Banlene Plus' at 4.9 kg) in 220 l.

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Seed: Both sites: Varieties sown at 200 kg except Sportsman which had a smaller germination percentage and was sown at 260 kg.

Cultivations, etc.:-
Gt. Harpenden I (RH): PK applied: 1 Nov, 1977. Heavy spring-tine cultivated: 5 Nov. Spring-tine cultivated twice: 8 Nov, 15 Nov. Seed sown, spring-tine cultivated: 16 Nov. Spring N applied: 25 Apr, 1978. Weedkillers applied: 11 May. Combine harvested: 13 Sept. Previous crops: Oats 1976, potatoes 1977.
Little Hoos (RD): Ploughed: 23 Sept, 1977. PK applied: 1 Nov. Heavy spring-tine cultivated: 5 Nov. Seed sown: 10 Nov. Spring N applied: 28 Apr, 1978. Weedkillers applied: 8 May. Combine harvested: 14 Sept. Previous crops: Beans 1976, wheat 1977.

NOTE: Samples were taken in July, on Little Hoos (RD) only, for estimates of eyespot (Pseudocercosporella herpotrichoides) and 'take-all' (Gaeumannomyces graminis).

78/R/WW/1 GREAT HARPENDEN I (RH) PATHOGEN FREE

GRAIN TONNES/HECTARE

***** TABLES OF MEANS *****

N	0	63	126	63+63	MEAN
VARIETY					
ARMADA	3.87	6.31	7.57	6.85	6.15
ATOU	4.58	5.56	6.38	5.93	5.61
FLANDERS	3.64	5.62	6.81	6.40	5.62
HOBBIT	3.82	5.94	7.91	6.81	6.12
KADOR	4.23	6.13	7.57	5.37	5.82
MARDLER	4.57	6.44	7.05	7.22	6.32
HUNTSMAN	3.88	5.58	6.73	6.32	5.63
KINSMAN	3.23	5.12	6.44	5.95	5.19
SPORTSMN	4.24	6.35	7.11	6.53	6.06
MEAN	4.01	5.89	7.06	6.38	5.84

GRAIN MEAN DM% 83.9

SUB PLOT AREA HARVESTED 0.00217

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78/R/WW/1 LITTLE HOOS (RD) PATHOGEN INFECTED

GRAIN TONNES/HECTARE

***** TABLES OF MEANS *****

N VARIETY	63	126	189	126+63	MEAN
ARMADA	5.28	6.96	7.19	7.05	6.62
ATOU	5.34	6.45	6.69	6.62	6.28
FLANDERS	5.03	6.33	7.06	6.83	6.32
HOBBIT	5.79	6.84	6.44	6.58	6.41
KADOR	5.23	6.32	7.15	6.89	6.40
MARDLER	5.77	6.69	6.73	7.18	6.59
HUNTSMAN	5.52	6.69	7.82	6.93	6.74
KINSMAN	5.28	6.73	6.87	6.89	6.44
SPORTSMN	5.80	6.76	6.50	6.81	6.47
MEAN	5.45	6.64	6.94	6.86	6.47

***** STANDARD ERRORS OF DIFFERENCES OF MEANS *****

TABLE	VARIETY	N	VARIETY N
SED	0.162	0.081	0.265
EXCEPT WHEN COMPARING MEANS WITH SAME LEVEL(S) OF:			
VARIETY			0.242

***** STRATUM STANDARD ERRORS AND COEFFICIENTS OF VARIATION *****

STRATUM	DF	SE	CV%
BLOCK.WP	24	0.229	3.5
BLOCK.WP.SP	81	0.342	5.3

GRAIN MEAN DM% 79.4

SUB PLOT AREA HARVESTED 0.00172

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78/R/WW/2 and 78/W/WW/2

WINTER WHEAT

AQUEOUS N AND NITRIFICATION INHIBITORS

Object: To study the effects of adding nitrification inhibitors to aqueous urea and aqueous ammonia on the yield and nitrogen uptake of winter wheat sown conventionally or direct drilled - Rothamsted (R), White Horse I and Woburn (W), Horsepool Lane Close West.

Sponsors: F.V. Widdowson, A. Penny, J. Ashworth.

Design: Single replicate of 40 plots, split semi-systematically into 2 for DRILLING (White Horse I (R)). 2 randomised blocks of 42 plots (Horsepool Lane Close West (W)).

Whole plot dimensions: White Horse I (R): 4.27 x 29.0.
Horsepool Lane Close West (W): 4.27 x 9.14.

Treatments: All combinations of:-

Whole plots

1. N FORM(1)	Forms of aqueous nitrogen:	
AMMONIA	Aqueous ammonia 28% N	
UREA	Aqueous urea 18% N	
2. N RATE	Rate of nitrogen (kg N):	
80		
120		
3. N TIME	Times of applying aqueous nitrogen:	
AUTUMN		
SPRING		
4. NIT INHB	Nitrification inhibitors added to aqueous nitrogen:	
NONE	None	
NITRAPYR	Nitrapyrin	
SOD TRI	Sodium trithiocarbonate	

plus extra treatments given additional forms of nitrogen fertiliser (kg N):

N FORM(2)	
0	0
NC 70	70 as 'Nitro-Chalk' in spring
NC 80	80 as 'Nitro-Chalk' in spring
NC 90	90 as 'Nitro-Chalk' in spring
NC 100	100 as 'Nitro-Chalk' in spring
NC 110	110 as 'Nitro-Chalk' in spring
NC 120	120 as 'Nitro-Chalk' in spring
NC 130	130 as 'Nitro-Chalk' in spring

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78/R/WW/2 & 78/W/WW/2

A40INC80	Aqueous ammonia (A) at 40 plus nitropyrin (I) applied in autumn, 'Nitro-Chalk 25' (NC) at 80 in spring
A80INC40	A at 80 plus I in autumn, NC at 40 in spring
A40TNC80	A at 40 plus sodium trithiocarbonate (T) in autumn, NC at 80 in spring
A80TNC40	A at 80 plus T in autumn, NC at 40 in spring
U40INC80	Aqueous urea (U) at 40 plus I in autumn, NC at 80 in spring
U80INC40	U at 80 plus I in autumn, NC at 40 in spring
U40TNC80	U at 40 plus T in autumn, NC at 80 in spring
U80TNC40	U at 80 plus T in autumn, NC at 40 in spring

and at Horsepool Lane Close West (W) only, in aqueous form in spring:

AS -- 120	120 as ammonium sulphate
AS IC 120	120 as ammonium sulphate plus I and carbon disulphide

Sub plots (White Horse I (R) only)

5. DRILLING	Cultivations and drilling:
CNVNTIAL	Cultivated and conventionally drilled
DIRECT	Uncultivated, direct drilled

NOTES: (1) Nitrification inhibitor rates:
White Horse I (R): Aqueous N applied with nitrapyrin at 1.5 kg or with sodium trithiocarbonate at 40 kg in autumn and with nitrapyrin at 1.0 kg or with sodium trithiocarbonate at 17 kg in spring.
Horsepool Lane Close West (W): Aqueous N applied with nitrapyrin at 1.5 kg or with sodium trithiocarbonate at 40 kg in autumn and with nitrapyrin at 1.0 kg or with sodium trithiocarbonate at 20 kg. Aqueous ammonium sulphate applied with nitrapyrin at 1.0 kg plus carbon disulphide at 10 kg as an emulsion in spring.
(2) Aqueous nitrogen was applied by injectors with tines spaced 30 cm apart, 10 cm deep.

Basal applications:
White Horse I (R): Manures: (0:20:20) at 310 kg, combine drilled. Weedkillers: Difenzoquat at 0.99 kg with 1 l 'Agral' (a wetting agent) plus 2, 4-D at 0.98 kg in 220 l. Paraquat at 0.84 kg ion and 0.56 kg ion on successive occasions, both in 220 l. Growth regulator: Chlormequat at 1.4 kg in 220 l.
Horsepool Lane Close West (W): Manures: (0:20:20) at 310 kg, combine drilled. Weedkiller: Mecoprop at 2.1 kg in 280 l. Growth regulator: Chlormequat at 1.7 kg in 280 l.

Seed: White Horse I (R) and Horsepool Lane Close West (W): Maris Huntsman, sown at 190 kg.

Cultivations, etc.:-
White Horse I (R): Stubble chopped: 21 Sept, 1977. Conventionally drilled plots only: Heavy spring-tine cultivated three times: 4 Oct. Paraquat applied twice: 11 Oct, 19 Oct. Aqueous N with inhibitors injected: 12 Oct. Conventionally drilled plots only: rotary harrowed 28 Oct, seed sown 29 Oct. Direct drilled plots only: seed sown 4 Nov. Aqueous N with inhibitors injected: 10 Apr, 1978. 'Nitro-Chalk' treatments applied: 27 Apr. Weedkillers applied: 11 May. Growth regulator applied: 17 May. Combine harvested: 29 Aug. Previous crops: Barley 1976, oats 1977.

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78/R/WW/2 & 78/W/WW/2

Horsepool Lane Close West (W): Heavy spring-tine cultivated twice: 22 Sept, 1977. Aqueous N with inhibitors injected: 10 Oct. Heavy spring-tine cultivated, rotary cultivated: 19 Oct. Seed sown: 20 Oct. Weedkiller applied: 8 Apr, 1978. Aqueous N with inhibitors injected: 17 Apr. 'Nitro-Chalk' treatments applied: 27 Apr. Growth regulator applied: 18 May. Combine harvested: 4 Sept. Previous crops: Barley 1976, winter oats 1977.

NOTES: (1) Soil samples were taken at monthly intervals, November to July for measurement of N in the injected bands. N was measured in a cross section of the band at Rothamsted only.
(2) Plant top samples were taken at fortnightly intervals from April until G.S.10 and then ear samples for measurement of nitrate N at Rothamsted only.

78/R/WW/2 WHITE HORSE I(R)

GRAIN TONNES/HECTARE

***** TABLES OF MEANS *****

N FORM(1)	AMMONIA	UREA	MEAN
NIT INHB			
NONE	5.24	5.37	5.30
NITRAPYR	6.03	5.89	5.96
SOD TRI	5.09	5.99	5.54
MEAN	5.45	5.75	5.60

N RATE	80	120	MEAN
NIT INHB			
NONE	5.06	5.54	5.30
NITRAPYR	5.47	6.45	5.96
SOD TRI	5.06	6.03	5.54
MEAN	5.20	6.01	5.60

N RATE	80	120	MEAN
N FORM(1)			
AMMONIA	5.12	5.79	5.45
UREA	5.27	6.23	5.75
MEAN	5.20	6.01	5.60

N TIME	AUTUMN	SPRING	MEAN
NIT INHB			
NONE	4.17	6.43	5.30
NITRAPYR	5.39	6.54	5.96
SOD TRI	4.79	6.30	5.54
MEAN	4.78	6.42	5.60

N TIME	AUTUMN	SPRING	MEAN
N FORM(1)			
AMMONIA	4.61	6.30	5.45
UREA	4.95	6.55	5.75
MEAN	4.78	6.42	5.60

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78/R/WW/2 WHITE HORSE I(R)

GRAIN TONNES/HECTARE

***** TABLES OF MEANS *****

N TIME N RATE	AUTUMN	SPRING	MEAN
80	4.29	6.11	5.20
120	5.27	6.74	6.01
MEAN	4.78	6.42	5.60

DRILLING NIT INHB	CNVNTIAL	DIRECT	MEAN
NONE	5.09	5.52	5.30
NITRAPYR	5.86	6.06	5.96
SOD TRI	5.35	5.74	5.54
MEAN	5.43	5.77	5.60

DRILLING N FORM(1)	CNVNTIAL	DIRECT	MEAN
AMMONIA	5.26	5.65	5.45
UREA	5.60	5.90	5.75
MEAN	5.43	5.77	5.60

DRILLING N RATE	CNVNTIAL	DIRECT	MEAN
80	4.97	5.43	5.20
120	5.90	6.12	6.01
MEAN	5.43	5.77	5.60

DRILLING N TIME	CNVNTIAL	DIRECT	MEAN
AUTUMN	4.65	4.91	4.78
SPRING	6.21	6.64	6.42
MEAN	5.43	5.77	5.60

DRILLING N FORM(2)	CNVNTIAL	DIRECT	MEAN
0	4.23	4.86	4.54
NC 70	5.75	5.15	5.45
NC 80	6.03	6.32	6.18
NC 90	6.26	6.22	6.24
NC 100	6.86	7.00	6.93
NC 110	6.88	6.09	6.49
NC 120	6.90	6.86	6.88
NC 130	6.97	6.86	6.92
A40INC80	4.83	6.26	5.55
A80INC40	6.40	6.91	6.66
A40TNC80	6.26	6.69	6.47
A80TNC40	5.51	5.91	5.71
U40INC80	6.45	6.36	6.41
U80INC40	6.01	6.54	6.27
U40TNC80	5.96	6.72	6.34
U80TNC40	6.21	5.94	6.07
MEAN	6.09	6.29	6.19

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78/R/WW/2 WHITE HORSE I(R)

GRAIN TONNES/HECTARE

***** TABLES OF MEANS *****

N FORM(1)	AMMONIA		UREA	
N RATE	80	120	80	120
NIT INHB				
NONE	5.16	5.31	4.97	5.77
NITRAPYR	5.45	6.62	5.50	6.28
SOD TRI	4.76	5.42	5.35	6.63

N FORM(1)	AMMONIA		UREA	
N TIME	AUTUMN	SPRING	AUTUMN	SPRING
NIT INHB				
NONE	4.28	6.19	4.06	6.68
NITRAPYR	5.32	6.75	5.45	6.33
SOD TRI	4.22	5.97	5.36	6.62

N RATE	80		120	
N TIME	AUTUMN	SPRING	AUTUMN	SPRING
NIT INHB				
NONE	3.95	6.17	4.39	6.70
NITRAPYR	4.59	6.35	6.18	6.73
SOD TRI	4.32	5.80	5.26	6.79

N RATE	80		120	
N TIME	AUTUMN	SPRING	AUTUMN	SPRING
N FORM(1)				
AMMONIA	4.26	5.99	4.96	6.62
UREA	4.32	6.23	5.59	6.86

N FORM(1)	AMMONIA		UREA	
DRILLING	CNVNTIAL	DIRECT	CNVNTIAL	DIRECT
NIT INHB				
NONE	5.17	5.30	5.00	5.73
NITRAPYR	5.72	6.34	6.00	5.78
SOD TRI	4.89	5.30	5.81	6.17

N RATE	80		120	
DRILLING	CNVNTIAL	DIRECT	CNVNTIAL	DIRECT
NIT INHB				
NONE	4.85	5.27	5.32	5.77
NITRAPYR	5.26	5.69	6.46	6.44
SOD TRI	4.78	5.33	5.91	6.14

N RATE	80		120	
DRILLING	CNVNTIAL	DIRECT	CNVNTIAL	DIRECT
N FORM(1)				
AMMONIA	4.79	5.45	5.73	5.85
UREA	5.14	5.41	6.07	6.39

N TIME	AUTUMN		SPRING	
DRILLING	CNVNTIAL	DIRECT	CNVNTIAL	DIRECT
NIT INHB				
NONE	4.04	4.30	6.13	6.73
NITRAPYR	5.35	5.42	6.37	6.71
SOD TRI	4.57	5.01	6.13	6.46

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78/R/WW/2 WHITE HORSE I(R)

GRAIN TONNES/HECTARE

***** TABLES OF MEANS *****

N TIME DRILLING / N FORM(1)	AUTUMN CNVNTIAL	AUTUMN DIRECT	SPRING CNVNTIAL	SPRING DIRECT
AMMONIA	4.35	4.86	6.17	6.43
UREA	4.95	4.96	6.25	6.84

N TIME DRILLING / N RATE	AUTUMN CNVNTIAL	AUTUMN DIRECT	SPRING CNVNTIAL	SPRING DIRECT
80	4.05	4.53	5.88	6.33
120	5.26	5.29	6.54	6.94

***** STANDARD ERRORS OF DIFFERENCES OF MEANS *****

TABLE	N FORM(2) DRILLING	N FORM(1) DRILLING	N RATE DRILLING
SED	0.762*	0.220*	0.220*

TABLE	N TIME DRILLING	NIT INHB DRILLING	N FORM(1) N RATE DRILLING	N FORM(1) N TIME DRILLING
SED	0.220*	0.269*	0.311*	0.311*

TABLE	N RATE N TIME DRILLING	N FORM(1) NIT INHB DRILLING	N RATE NIT INHB DRILLING	N TIME NIT INHB DRILLING
SED	0.311*	0.381*	0.381*	0.381*

* ONLY FOR COMPARING THE DIFFERENCE OF TWO EFFECTS OF DRILLING.
THE SED OF SUCH A DIFFERENCE EQUALS 1.4142 TIMES THE SED SHOWN.

***** STRATUM STANDARD ERRORS AND COEFFICIENTS OF VARIATION *****

STRATUM	DF	SE	CV%
WP.SP	9	0.539	9.2

GRAIN MEAN DM% 83.8

PLOT AREA HARVESTED 0.00279

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78/W/WW/2 HORSEPOOL LANE CLOSE (W)

GRAIN TONNES/HECTARE

***** TABLES OF MEANS *****

N FORM(1)	AMMONIA	UREA	MEAN
NIT INHB			
NONE	6.24	6.25	6.24
NITRAPYR	6.78	6.30	6.54
SOD TRI	6.03	6.84	6.44
MEAN	6.35	6.46	6.41

N RATE	80	120	MEAN
NIT INHB			
NONE	6.09	6.40	6.24
NITRAPYR	5.98	7.10	6.54
SOD TRI	5.51	7.37	6.44
MEAN	5.86	6.96	6.41

N RATE	80	120	MEAN
N FORM(1)			
AMMONIA	5.70	7.01	6.35
UREA	6.02	6.91	6.46
MEAN	5.86	6.96	6.41

N TIME	AUTUMN	SPRING	MEAN
NIT INHB			
NONE	6.06	6.42	6.24
NITRAPYR	6.26	6.83	6.54
SOD TRI	6.16	6.71	6.44
MEAN	6.16	6.66	6.41

N TIME	AUTUMN	SPRING	MEAN
N FORM(1)			
AMMONIA	6.32	6.38	6.35
UREA	6.00	6.93	6.46
MEAN	6.16	6.66	6.41

N TIME	AUTUMN	SPRING	MEAN
N RATE			
80	5.06	6.65	5.86
120	7.26	6.66	6.96
MEAN	6.16	6.66	6.41

N FORM(1)	AMMONIA		UREA	
N RATE	80	120	80	120
NIT INHB				
NONE	5.80	6.68	6.38	6.12
NITRAPYR	6.20	7.37	5.77	6.84
SOD TRI	5.09	6.98	5.92	7.76

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78/W/WW/2 HORSEPOOL LANE CLOSE (W)

GRAIN TONNES/HECTARE

***** TABLES OF MEANS *****

N FORM(1)	AMMONIA		UREA	
N TIME	AUTUMN	SPRING	AUTUMN	SPRING
NIT INHB				
NONE	6.47	6.01	5.66	6.84
NITRAPYR	6.70	6.87	5.82	6.79
SOD TRI	5.79	6.28	6.54	7.15

N RATE	80		120	
N TIME	AUTUMN	SPRING	AUTUMN	SPRING
NIT INHB				
	5.44	6.73	6.68	6.12
NITRAPYR	5.13	6.84	7.39	6.82
SOD TRI	4.62	6.39	7.70	7.04

N RATE	80		120	
N TIME	AUTUMN	SPRING	AUTUMN	SPRING
N FORM(1)				
AMMONIA	4.96	6.43	7.68	6.34
UREA	5.17	6.88	6.84	6.98

N RATE		80		120	
N TIME		AUTUMN	SPRING	AUTUMN	SPRING
NIT INHBN	FORM(1)				
NONE	AMMONIA	5.42	6.18	7.52	5.84
	UREA	5.47	7.28	5.84	6.40
NITRAPYR	AMMONIA	5.54	6.86	7.86	6.88
	UREA	4.71	6.83	6.92	6.76
SOD TRI	AMMONIA	3.92	6.25	7.65	6.30
	UREA	5.32	6.53	7.75	7.77

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78/W/WW/2/HORSEPOOL LANE CLOSE (W)

GRAIN TONNES/HECTARE

***** TABLES OF MEANS *****

N FORM(2)	
0	4.14
NC 70	6.96
NC 80	6.23
NC 90	6.73
NC 100	6.94
NC 110	7.17
NC 120	6.60
NC 130	7.00
A40INC80	7.01
A80INC40	6.68
A40TNC80	7.35
A80TNC40	6.71
U40INC80	7.90
U80INC40	7.31
U40TNC80	6.70
U80TNC40	7.27
AS --120	7.69
AS IC120	7.58
MEAN	6.89
GRAND MEAN	6.41

***** STANDARD ERRORS OF DIFFERENCES OF MEANS *****

TABLE	N FORM(2)	NIT INHB	N FORM(1)	N RATE
SED	0.867	0.307	0.250	0.250

TABLE	N TIME	NIT INHB N FORM(1)	NIT INHB N RATE	N FORM(1) N RATE
SED	0.250	0.434	0.434	0.354

TABLE	NIT INHB N TIME	N FORM(1) N TIME	N RATE N TIME	NIT INHB N FORM(1) N RATE
SED	0.434	0.354	0.354	0.613

TABLE	NIT INHB N FORM(1) N TIME	NIT INHB N RATE N TIME	N FORM(1) N RATE N TIME	NIT INHB N FORM(1) N RATE N TIME
SED	0.613	0.613	0.501	0.867

***** STRATUM STANDARD ERRORS AND COEFFICIENTS OF VARIATION *****

STRATUM	DF	SE	CV%
BLOCK.WP	41	0.867	13.1

GRAIN MEAN DM% 81.1

PLOT AREA HARVESTED 0.00279

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78/R/WW/4

WINTER WHEAT

PRECISION SOWING, IRRIGATION & N

Object: To study the effects of precision sowing, seed rates, irrigation and nitrogen fertiliser on the growth and yield of winter wheat - Gt. Field I & II.

Sponsors: G.N. Thorne, P.J. Welbank, F.V. Widdowson.

Design: Single replicate of 3 x 2 x 2 x 2 x 2 + 20 extra plots.

Whole plot dimensions: (1) ND, BND and HS: 4.27 x 15.2
(2) ST: 4.88 x 15.2

Treatments: All combinations of:-

1. DRL SPAC — Drills and spacing between rows:

ST1	Stanhay precision drill, rows 10.5 cm apart
ND1	Nordsten drill, rows 10.5 cm apart
ND2	Nordsten drill, rows 21 cm apart

2. SEEDRATE — Seed rates:

S1	Half standard (188 seeds per square metre, 115 kg)
S2	Standard (376 seeds per square metre, 230 kg)

3. IRRIGATN — Irrigation:

NONE	None
FULL	Irrigated (total 102.2 mm). Whenever the soil moisture deficit exceeded 25 mm, irrigation was applied to reduce this to 12 mm.

4. EARLY N — Nitrogen fertiliser as 'Nitro-Chalk 25' on 28 April (kg N):

EN3	90
EN5	150

5. LATE N — Nitrogen fertiliser as 'Nitro-Chalk 25' on 24 May (kg N):

LN0	0
LN1	30

plus twenty additional plots:

EXTRA — Sown with the Nordsten drill, rows 10.5 cm apart, standard seed rate, not irrigated, with eight nitrogen rates, applied in April (kg N):

ND1S2EN0	0
ND1S2EN1	30
ND1S2EN2	60
ND1S2EN3	90
ND1S2EN4	120
ND1S2EN5	150
ND1S2EN6	180
ND1S2EN7	210

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Sown with Nordsten drill but with seed tubes disconnected to broadcast the seed, unirrigated, nitrogen applied on 28 April, all treatments duplicated:

BNDS1EN3	Half standard seed rate, 90 kg N
BNDS1EN5	Half standard seed rate, 150 kg N
BNDS2EN3	Standard seed rate, 90 kg N
BNDS2EN5	Standard seed rate, 150 kg N

Sown by hand at half standard seed rate in rows 10.5 cm apart, unirrigated, nitrogen applied on 28 April, all treatments duplicated:

HS1S1EN3	Half standard seed rate, 90 kg N
HS1S1EN5	Half standard seed rate, 150 kg N

NOTE: Irrigation treatments (mm water)

30 May, 1978	25.6
14 June	21.6
21 June	15.5
19 July	18.3
28 July	21.2
Total	102.2

Basal applications: Manures: (0:20:20) at 310 kg. Weedkillers: (1) Methabenzthiazuron 2.0 kg in 280 l, (2) Dicamba with mecoprop and MCPA ('Banlene Plus' at 4.9 l in 220 l). Growth regulator: Chlormequat at 1.4 kg in 220 l. Fungicide: Triadimefon at 0.13 kg in 220 l.

Seed: Maris Huntsman.

Cultivations, etc.:- Ploughed: 20 Oct, 1977. Heavy spring-tine cultivated, PK applied: 24 Oct. Rotary harrowed: 25 Oct. Seed sown: 27 Oct. Weedkiller (1) applied: 4 Nov. Rolled: 6 April, 1978. Weedkiller (2) and growth regulator (mix) applied: 10 May. Fungicide applied: 14 June. Combine harvested: 4 Sept. Previous crops: Barley 1976, beans 1977.

NOTE: Emergence counts were made in December. Measurements were made of shoot numbers, dry weight of tops and ears, leaf area, and nitrogen content four times during the season. Weekly measurements were made of stem nitrate (between late April and mid July), of soil moisture (between mid April and August) and on two occasions measurements were made of light intensity at ground level.

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78/R/WW/4

GRAIN TONNES/HECTARE

***** TABLES OF MEANS *****

SEEDRATE DRL SPAC	S1	S2	MEAN
ST1	7.99	8.11	8.05
ND1	8.00	8.33	8.17
ND2	7.86	8.01	7.94
MEAN	7.95	8.15	8.05

IRRIGATN DRL SPAC	NONE	FULL	MEAN
ST1	8.16	7.94	8.05
ND1	8.27	8.06	8.17
ND2	8.09	7.78	7.94
MEAN	8.18	7.93	8.05

IRRIGATN SEEDRATE	NONE	FULL	MEAN
S1	8.00	7.91	7.95
S2	8.35	7.94	8.15
MEAN	8.18	7.93	8.05

EARLY N DRL SPAC	EN3	EN5	MEAN
ST1	7.81	8.29	8.05
ND1	7.96	8.38	8.17
ND2	7.55	8.32	7.94
MEAN	7.77	8.33	8.05

EARLY N SEEDRATE	EN3	EN5	MEAN
S1	7.70	8.21	7.95
S2	7.85	8.45	8.15
MEAN	7.77	8.33	8.05

EARLY N IRRIGATN	EN3	EN5	MEAN
NONE	7.88	8.47	8.18
FULL	7.67	8.18	7.93
MEAN	7.77	8.33	8.05

LATE N DRL SPAC	LN0	LN1	MEAN
ST1	7.81	8.29	8.05
ND1	8.03	8.30	8.17
ND2	7.80	8.07	7.94
MEAN	7.88	8.22	8.05

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78/R/WW/4

GRAIN TONNES/HECTARE

***** TABLES OF MEANS *****

LATE N SEEDRATE	LN0	LN1	MEAN
S1	7.80	8.10	7.95
S2	7.95	8.34	8.15
MEAN	7.88	8.22	8.05

LATE N IRRIGATN	LN0	LN1	MEAN
NONE	7.99	8.36	8.18
FULL	7.77	8.08	7.93
MEAN	7.88	8.22	8.05

LATE N EARLY N	LN0	LN1	MEAN
EN3	7.52	8.03	7.77
EN5	8.24	8.42	8.33
MEAN	7.88	8.22	8.05

SEEDRATE	S1		S2	
IRRIGATN DRL SPAC	NONE	FULL	NONE	FULL
ST1	8.19	7.80	8.13	8.09
ND1	7.95	8.06	8.60	8.06
ND2	7.85	7.87	8.33	7.68

SEEDRATE	S1		S2	
EARLY N DRL SPAC	EN3	EN5	EN3	EN5
ST1	7.82	8.17	7.80	8.41
ND1	7.83	8.18	8.09	8.57
ND2	7.45	8.27	7.65	8.37

IRRIGATN	NONE		FULL	
EARLY N DRL SPAC	EN3	EN5	EN3	EN5
ST1	7.78	8.54	7.84	8.04
ND1	8.19	8.36	7.72	8.39
ND2	7.66	8.53	7.45	8.11

IRRIGATN	NONE		FULL	
EARLY N SEEDRATE	EN3	EN5	EN3	EN5
S1	7.72	8.27	7.68	8.14
S2	8.03	8.68	7.66	8.22

SEEDRATE	S1		S2	
LATE N DRL SPAC	LN0	LN1	LN0	LN1
ST1	7.71	8.27	7.90	8.31
ND1	7.88	8.13	8.18	8.47
ND2	7.82	7.91	7.78	8.24

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78/R/WW/4

GRAIN TONNES/HECTARE

***** TABLES OF MEANS *****

IRRIGATN	NONE		FULL	
LATE N	LN0	LN1	LN0	LN1
DRL SPAC				
ST1	7.92	8.39	7.69	8.19
ND1	8.11	8.43	7.95	8.17
ND2	7.93	8.25	7.66	7.89

IRRIGATN	NONE		FULL	
LATE N	LN0	LN1	LN0	LN1
SEEDRATE				
S1	7.84	8.16	7.77	8.05
S2	8.14	8.57	7.77	8.12

EARLY N	EN3		EN5	
LATE N	LN0	LN1	LN0	LN1
DRL SPAC				
ST1	7.47	8.16	8.15	8.43
ND1	7.83	8.08	8.23	8.52
ND2	7.26	7.84	8.33	8.30

EARLY N	EN3		EN5	
LATE N	LN0	LN1	LN0	LN1
SEEDRATE				
S1	7.51	7.89	8.09	8.32
S2	7.52	8.17	8.38	8.52

EARLY N	EN3		EN5	
LATE N	LN0	LN1	LN0	LN1
IRRIGATN				
NONE	7.57	8.19	8.41	8.54
FULL	7.47	7.87	8.07	8.30

EXTRA	
ND1S2EN0	5.75
ND1S2EN1	6.20
ND1S2EN2	6.09
ND1S2EN3	7.41
ND1S2EN4	7.85
ND1S2EN5	8.30
ND1S2EN6	8.59
ND1S2EN7	8.71
BNDS1EN3	8.05
BNDS1EN5	8.84
BNDS2EN3	8.05
BNDS2EN5	8.78
HS1S1EN3	7.52
HS1S1EN5	8.62

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78/R/WW/4

GRAIN TONNES/HECTARE

***** STANDARD ERRORS OF DIFFERENCES OF MEANS *****

TABLE	DRL SPAC	SEEDRATE	IRRIGATN	EARLY N
SED	0.155	0.127	0.127	0.127

TABLE	LATE N	DRL SPAC SEEDRATE	DRL SPAC IRRIGATN	SEEDRATE IRRIGATN
SED	0.127	0.220	0.220	0.179

TABLE	DRL SPAC EARLY N	SEEDRATE EARLY N	IRRIGATN EARLY N	DRL SPAC LATE N
SED	0.220	0.179	0.179	0.220

TABLE	SEEDRATE LATE N	IRRIGATN LATE N	EARLY N LATE N	DRL SPAC SEEDRATE IRRIGATN
SED	0.179	0.179	0.179	0.311

TABLE	DRL SPAC SEEDRATE EARLY N	DRL SPAC IRRIGATN EARLY N	SEEDRATE IRRIGATN EARLY N	DRL SPAC SEEDRATE LATE N
SED	0.311	0.311	0.254	0.311

TABLE	DRL SPAC IRRIGATN LATE N	SEEDRATE IRRIGATN LATE N	DRL SPAC EARLY N LATE N	SEEDRATE EARLY N LATE N
SED	0.311	0.254	0.311	0.254

TABLE	IRRIGATN EARLY N LATE N	EXTRA	
SED	0.254	0.621	MIN REP
		0.538	MAX-MIN
		0.439	MAX REP

	EXTRA
MAX REP	BNDS1EN3,BNDS1EN5,BNDS2EN3,BNDS2EN5, HS1S1EN3,HS1S1EN5
MAX-MIN	THOSE IN MAX REP V ANY OF REMAINDER
MIN REP	ANY OF REMAINDER

***** STRATUM STANDARD ERRORS AND COEFFICIENTS OF VARIATION *****

STRATUM	DF	SE	CV%
WP	17	0.439	5.5

MEAN DM% 83.2

PLOT AREA HARVESTED 0.00195

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78/R/WW/5

WINTER WHEAT

SEED RATES AND DIVIDED N DRESSINGS

Object: To study the effects of seed rates, precision sowing, a growth regulator, foliar fungicide and rates and times of nitrogen fertiliser on the growth and yield of winter wheat - Gt. Field I.

Sponsors: J. McEwen, R. Moffitt.

Design: Single replicate of 3 x 2 x 2 x 6.

Whole plot dimensions: 3.25 x 7.62.

Treatments: All combinations of:-

1. DR SD RT — Drills and seed rates:

NRDSTN 1	Nordsten conventional drill, seed rate 120 kg
NRDSTN 2	Nordsten conventional drill, seed rate 240 kg
STNHAY 1	Stanhay precision drill, seed rate 120 kg

2. GRTH REG — Growth regulator:

NONE	None
CHLORMEQ	Chlormequat at 1.7 kg on 25 April

3. FUNGCIDE — Fungicide:

NONE	None
T+C+M+S	Tridemorph at 0.45 kg + carbendazim at 0.21 kg + maneb at 1.33 kg + sulphur at 2.4 kg in 340 l on 12 June, 1978 and on 6 July

4. N — Nitrogen fertiliser, times and rates (kg N as 'Nitro-Chalk 25'):

	7 March	17 April	6 June
1 3 1	25	75	25
1 4 1	25	100	25
0 4 0	0	100	0
0 5 0	0	125	0
0 6 0	0	150	0
0 4 1	0	100	25

Basal applications: Manures: (0:20:20) at 310 kg. Weedkillers: Dicamba with mecoprop and MCPA ('Banlene Plus' at 4.9 l in 220 l).

Seed: Maris Huntsman.

Cultivations, etc.:- Ploughed: 20 Oct, 1977. Heavy spring-tine cultivated, PK applied: 24 Oct. Rotary harrowed: 25 Oct. Seed sown: 27 Oct. Rolled: 6 Apr, 1978. Weedkiller applied: 10 May. Combine harvested: 4 Sept. Previous crops: Barley 1976, beans 1977.

NOTES: (1) Establishment counts were made in February 1978.
(2) Ear counts were made in August. 1000 grain weights were measured and grain was analysed for N percentage.

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78/R/WW/5

GRAIN TONNES/HECTARE

***** TABLES OF MEANS *****

GRTH REG DR SD RT	NONE	CHLORMEQ	MEAN
NRDSTN 1	8.81	9.39	9.10
NRDSTN 2	8.90	9.16	9.03
STNHAY 1	8.96	9.07	9.02
MEAN	8.89	9.21	9.05

FUNGCIDE DR SD RT	NONE	T+C+M+S	MEAN
NRDSTN 1	9.08	9.12	9.10
NRDSTN 2	8.99	9.08	9.03
STNHAY 1	8.87	9.16	9.02
MEAN	8.98	9.12	9.05

FUNGCIDE GRTH REG	NONE	T+C+M+S	MEAN
NONE	8.79	9.00	8.89
CHLORMEQ	9.17	9.25	9.21
MEAN	8.98	9.12	9.05

N DR SD RT	1 3 1	1 4 1	0 4 0	0 5 0	0 6 0	0 4 1	MEAN
NRDSTN 1	9.35	9.65	8.06	9.23	9.35	8.96	9.10
NRDSTN 2	9.06	9.56	8.45	8.98	9.01	9.14	9.03
STNHAY 1	8.81	9.26	8.60	8.97	9.07	9.39	9.02
MEAN	9.07	9.49	8.37	9.06	9.14	9.16	9.05

N GRTH REG	1 3 1	1 4 1	0 4 0	0 5 0	0 6 0	0 4 1	MEAN
NONE	8.97	9.10	8.15	8.84	9.13	9.16	8.89
CHLORMEQ	9.18	9.88	8.59	9.28	9.15	9.16	9.21
MEAN	9.07	9.49	8.37	9.06	9.14	9.16	9.05

N FUNGCIDE	1 3 1	1 4 1	0 4 0	0 5 0	0 6 0	0 4 1	MEAN
NONE	9.05	9.48	8.39	8.95	9.08	8.92	8.98
T+C+M+S	9.10	9.50	8.36	9.17	9.20	9.40	9.12
MEAN	9.07	9.49	8.37	9.06	9.14	9.16	9.05

GRTH REG	NONE		CHLORMEQ	
FUNGCIDE DR SD RT	NONE	T+C+M+S	NONE	T+C+M+S
NRDSTN 1	8.71	8.91	9.46	9.32
NRDSTN 2	8.83	8.98	9.15	9.18
STNHAY 1	8.82	9.09	8.91	9.23

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GRAIN TONNES/HECTARE

***** TABLES OF MEANS *****

DR SD RT	GRTH REG	N	1 3 1	1 4 1	0 4 0	0 5 0	0 6 0	0 4 1
NRDSTN 1	NONE		9.13	9.41	7.51	8.69	9.33	8.79
	CHLORMEQ		9.58	9.88	8.61	9.76	9.36	9.13
NRDSTN 2	NONE		8.91	8.97	8.19	9.00	8.90	9.45
	CHLORMEQ		9.21	10.15	8.72	8.96	9.12	8.82
STNHAY 1	NONE		8.87	8.91	8.75	8.82	9.16	9.24
	CHLORMEQ		8.75	9.61	8.44	9.13	8.97	9.54

DR SD RT	FUNGCIDE	N	1 3 1	1 4 1	0 4 0	0 5 0	0 6 0	0 4 1
NRDSTN 1	NONE		9.20	9.72	8.16	9.20	9.33	8.89
	T+C+M+S		9.50	9.58	7.96	9.26	9.37	9.03
NRDSTN 2	NONE		9.20	9.57	8.41	8.65	9.10	8.98
	T+C+M+S		8.92	9.56	8.49	9.31	8.92	9.30
STNHAY 1	NONE		8.75	9.15	8.59	9.01	8.81	8.90
	T+C+M+S		8.87	9.36	8.61	8.93	9.32	9.89

GRTH REG	FUNGCIDE	N	1 3 1	1 4 1	0 4 0	0 5 0	0 6 0	0 4 1
NONE	NONE		8.93	9.01	8.22	8.54	9.05	8.96
	T+C+M+S		9.00	9.18	8.08	9.14	9.21	9.36
CHLORMEQ	NONE		9.17	9.94	8.56	9.37	9.11	8.88
	T+C+M+S		9.19	9.82	8.63	9.19	9.19	9.45

***** STANDARD ERRORS OF DIFFERENCES OF MEANS *****

TABLE	DR SD RT	GRTH REG	FUNGCIDE	N
SED	0.084	0.069	0.069	0.119

TABLE	DR SD RT GRTH REG	DR SD RT FUNGCIDE	GRTH REG FUNGCIDE	DR SD RT N
SED	0.119	0.119	0.098	0.207

TABLE	GRTH REG N	FUNGCIDE N	DR SD RT GRTH REG FUNGCIDE	DR SD RT GRTH REG N
SED	0.169	0.169	0.169	0.293

TABLE	DR SD RT FUNGCIDE N	GRTH REG FUNGCIDE N
SED	0.293	0.239

***** STRATUM STANDARD ERRORS AND COEFFICIENTS OF VARIATION *****

STRATUM	DF	SE	CV%
WP	10	0.293	3.2

GRAIN MEAN DM% 82.0

PLOT AREA HARVESTED 0.00163

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78/R/WW/6

WINTER WHEAT

FUNGICIDES AND GRAIN MICROFLORA

Object: To study the effects of a range of fungicides applied at a range of times on the yield, quality and grain microflora of winter wheat - Geescroft.

Sponsor: R.A. Hill.

Design: 2 randomised blocks of 3 x 2 x 2 x 2.

Whole plot dimensions: 4.27 x 13.1.

Treatments: All combinations of:

1. FUNGCIDE — Broad spectrum fungicides:

CAPTAFOL	Captafol at 0.57 kg
CARB+MAN	Carbendazim at 0.10 kg + maneb at 0.65 kg
BENOMYL	Benomyl at 0.45 kg

2. APP TIME — Application times of broad spectrum fungicides:

	4 July 1978	12 July	24 July
NONE	None	None	None
E	Sprayed	None	None
M	None	Sprayed	None
L	None	None	Sprayed
E+M	Sprayed	Sprayed	None
E+L	Sprayed	None	Sprayed
M+L	None	Sprayed	Sprayed
E+M+L	Sprayed	Sprayed	Sprayed

NOTE: Treatment sprays were applied in 340 l.

Basal applications: Manures: (0:20:20) at 310 kg, combine drilled. 'Nitra-shell 34' at 300 kg. Weedkillers: Mecoprop, bromoxynil and ioxynil ('Brittox' at 3.5 l in 220 l).

Seed: Maris Freeman, sown at 190 kg.

Cultivations, etc.:- Ploughed: 7 Oct, 1977. Rotary harrowed, seed sown: 14 Oct. N applied: 24 Apr, 1978. Weedkiller applied: 9 May. Combine harvested: 6 Sept. Previous crops: Barley 1976, beans 1977.

NOTES: (1) Grain microflora were assessed at 7-10 day intervals after heading on unsprayed plots, after each application of fungicide on treated plots and on all plots just before harvest.
(2) Thousand grain weights, germination of harvested produce and bread making quality were assessed.

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GRAIN TONNES/HECTARE

***** TABLES OF MEANS *****

APP TIME / FUNGCIDE	E	M	L	E+M	E+L	M+L	E+M+L	MEAN
CAPTAFOL	7.34	7.20	7.67	7.30	7.38	7.51	7.07	7.35
CARB+MAN	7.22	7.69	7.08	7.20	7.39	7.61	7.31	7.36
BENOMYL	7.27	7.11	7.08	7.43	7.28	7.23	7.83	7.32
MEAN	7.28	7.33	7.28	7.31	7.35	7.45	7.40	7.34

APP TIME NONE 7.12

GRAND MEAN 7.32

***** STANDARD ERRORS OF DIFFERENCES OF MEANS *****

TABLE	FUNGCIDE	APP TIME	FUNGCIDE APP TIME
SED	0.151	0.231	0.400

***** STRATUM STANDARD ERRORS AND COEFFICIENTS OF VARIATION *****

STRATUM	DF	SE	CV%
BLOCK.WP	25	0.400	5.5

GRAIN MEAN DM% 81.8

PLOT AREA HARVESTED 0.00260

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78/R/WW/7

WINTER WHEAT

SOWING DATES AND INSECTICIDES

Object: To study the effects of dates of sowing and times of applying insecticides on the incidence of cereal aphids, barley yellow dwarf virus (BYDV) and on the yield of winter wheat - Claycroft.

Sponsor: R.T. Plumb.

Design: 3 randomised blocks of 12 plots.

Whole plot dimensions: 6.40 x 18.3.

Treatments: All combinations of:-

1. SOW DATE	Dates of sowing:	
	6 OCT	6 October, 1977
	4 NOV	4 November
	25 NOV	25 November
2. INSCTCDE(1)	Phorate granules to seedbed:	
	NONE	None
	PHORATE	Phorate at 5 kg
3. INSCTCDE(2)	Menazon spray:	
	NONE	None
	MENAZON	Menazon (0.7 l 'Saphi-Col' in 220 l on 7 July, 1978)

Basal applications: Manures: (0:20:20) at 310 kg, combine drilled, 'Nitra-Shell 34' at 350 kg. Weedkillers: Dicamba plus mecoprop and MCPA ('Banlene Plus' at 4.9 l in 220 l).

Seed: Flanders, sown at 190 kg.

Cultivations, etc.:- Ploughed: 4 Oct, 1977. Rotary harrowed all plots, treatments applied to SOW DATE 6 OCT and these plots only rotary harrowed 5 Oct and sown: 6 Oct. Treatments applied to SOW DATE 4 NOV and these plots only power harrowed and sown: 4 Nov. Treatments applied to SOW DATE 25 NOV and these plots only rotary harrowed and sown: 25 Nov. N applied: 8 May, 1978. Weedkillers applied: 9 May. Combine harvested: 13 Sept. Previous crops: Fallow 1976, beans 1977.

NOTE: Plant emergence, aphid and virus counts were made during the season, tiller counts before harvest and grains per ear at harvest.

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78/R/WW/7

GRAIN TONNES/HECTARE

***** TABLES OF MEANS *****

INSCTCDE(1) SOW DATE	NONE	PHORATE	MEAN
6 OCT	6.94	7.65	7.29
4 NOV	7.66	7.91	7.79
25 NOV	6.53	6.55	6.54
MEAN	7.04	7.37	7.21

INSCTCDE(2) SOW DATE	NONE	MENAZON	MEAN
6 OCT	7.41	7.17	7.29
4 NOV	7.54	8.03	7.79
25 NOV	6.60	6.49	6.54
MEAN	7.19	7.23	7.21

INSCTCDE(2) INSCTCDE(1)	NONE	MENAZON	MEAN
NONE	6.99	7.10	7.04
PHORATE	7.39	7.36	7.37
MEAN	7.19	7.23	7.21

INSCTCDE(1)	NONE		PHORATE	
INSCTCDE(2) SOW DATE	NONE	MENAZON	NONE	MENAZON
6 OCT	7.04	6.83	7.79	7.51
4 NOV	7.29	8.03	7.80	8.03
25 NOV	6.63	6.44	6.57	6.54

***** STANDARD ERRORS OF DIFFERENCES OF MEANS *****

TABLE	SOW DATE	INSCTCDE(1)	INSCTCDE(2)	SOW DATE INSCTCDE(1)
SED	0.221	0.180	0.180	0.312

TABLE	SOW DATE INSCTCDE(1) INSCTCDE(2)	INSCTCDE(1)	SOW DATE INSCTCDE(1) INSCTCDE(2)
SED	0.312	0.255	0.441

***** STRATUM STANDARD ERRORS AND COEFFICIENTS OF VARIATION *****

STRATUM	DF	SE	CV%
BLOCK.WP	22	0.540	7.5

GRAIN MEAN DM% 84.5

PLOT AREA HARVESTED 0.00260

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78/R/WW/8

WINTER WHEAT

RATES & TIMES OF APPLYING N

Object: To study the effects of applying a range of nitrogen rates before and after ear initiation on the growth and yield of winter wheat - Gt. Field I.

Sponsors: G.N. Thorne, P.J. Taylor, P.J. Welbank.

Design: 4 randomised blocks of 8 plots.

Whole plot dimensions: 4.27 x 13.1.

Treatments: All combinations of:-

1. N DATE — Dates of applying nitrogen fertiliser:

6 MARCH	6 March, before ear initiation
17 APRIL	17 April, after ear initiation

2. N RATE — Rates of applying nitrogen fertiliser (kg N as 'Nitro-Chalk 25'):

0
60
120
180

Basal applications: Manures: (0:20:20) at 310 kg. Weedkillers: Dicamba with mecoprop and MCPA ('Banlene Plus' at 4.9 l in 220 l). Fungicide: Triadimefon at 0.13 kg in 220 l.

Seed: Maris Huntsman, sown at 190 kg.

Cultivations, etc.:- Ploughed: 20 Oct, 1977. Heavy spring-tine cultivated and PK applied: 24 Oct. Rotary harrowed: 25 Oct. Seed sown: 26 Oct. Weedkiller applied: 10 May, 1978. Fungicide applied: 15 June. Combine harvested: 4 Sept. Previous crops: Barley 1976, beans 1977.

NOTE: Shoots were counted, apical development observed and lodging scored. Measurements of dry weights of tops and ears, leaf areas, nitrogen contents and shoot lengths were made during the season.

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78/R/WW/8

GRAIN TONNES/HECTARE

***** TABLES OF MEANS *****

N RATE / N DATE	0	60	120	180	MEAN
6 MARCH		6.12	7.34	7.54	7.00
17 APRIL		6.34	7.43	8.13	7.30
MEAN	4.31	6.23	7.38	7.83	6.44

***** STANDARD ERRORS OF DIFFERENCES OF MEANS *****

TABLE	N DATE	N RATE	N DATE N RATE
SED	0.140	0.172	0.243 0.210*

* FOR COMPARING WITH N RATE 0

***** STRATUM STANDARD ERRORS AND COEFFICIENTS OF VARIATION *****

STRATUM	DF	SE	CV%
BLOCK.WP	22	0.343	5.3

GRAIN MEAN DM% 82.3

PLOT AREA HARVESTED 0.00260

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78/R/WW/9

WINTER WHEAT

PARASITES AND PREDATORS OF INSECT PESTS

Object: To study the effects of two insecticides, applied separately and together, on the parasites and predators and on the yield of winter wheat - Stackyard.

Sponsors: R. Bardner, J.R. Lofty, K.E. Fletcher.

Design: 3 randomised blocks of 4 plots.

Whole plot dimensions: 12.8 x 18.3.

Treatments:

INSCTCDE	Insecticides:
NONE	None
FON	Fonofos at 0.5 kg as 10% granules to the seedbed on 28 Oct, 1977
CHL	Chlorpyrifos at 1.17 kg as a foliar spray in 1100 l on 17 Apr, 1978 and 5 June
FON+CHL	Fonofos + chlorpyrifos at above rates and times

Basal applications: Manures: (10:24:24) at 250 kg, combine drilled. 'Nitro-Chalk 26' at 430 kg. Weedkillers: Isoproturon at 2.2 kg plus mecoprop at 2.5 kg in 220 l.

Seed: Flanders, sown at 190 kg.

Cultivations, etc.:- Ploughed: 24 Oct, 1977. Rotary harrowed: 26 Oct. Rotary harrowed after applying fonofos: 28 Oct. Seed sown: 1 Nov. N applied: 8 May, 1978. Weedkillers applied: 11 May. Combine harvested: 12 Sept. Previous crops: Fallow 1976, wheat 1977.

NOTE: Soil samples for pests and predators were taken six times during the season. Plant samples for stem borers were taken twice. Pitfall traps, emergence traps and sticky traps were examined weekly. Aphids and thrips were assessed during the season.

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78/R/WW/9

GRAIN TONNES/HECTARE

***** TABLES OF MEANS *****

INSCTCDE	NONE	FON	CHL	FON+CHL	MEAN
	4.88	5.14	5.45	5.63	5.27

***** STANDARD ERRORS OF DIFFERENCES OF MEANS *****

TABLE	INSCTCDE
SED	0.389

***** STRATUM STANDARD ERRORS AND COEFFICIENTS OF VARIATION *****

STRATUM	DF	SE	CV%
BLOCK.WP	6	0.476	9.0

GRAIN MEAN DM% 85.0

PLOT AREA HARVESTED 0.00520

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78/S/WW/1

WINTER WHEAT

RATES AND TIMES OF N AND FUNGICIDE

Object: To study the effects of fungicides and rates and times of nitrogen fertiliser on the incidence of foliar diseases and on yield of winter wheat - Saxmundham.

Sponsors: F.V. Widdowson, A. Penny.

Design: Half replicate of 4 x 2^4 plus 8 extra plots.

Whole plot dimensions: 6.40 x 2.74.

Treatments: Combinations of:

1. N AUTUMN	Nitrogen fertiliser in autumn (19 Oct, 1977):	
	0	None
	IBDU 1	Isobutylidene diurea at 50 kg N
2. N SPRING	Nitrogen fertiliser in spring (14 Mar, 1978):	
	0	None
	NC 1	'Nitro-Chalk' 25% N at 50 kg N
	NC 2	'Nitro-Chalk' 25% N at 100 kg N
	NC 3	'Nitro-Chalk' 25% N at 150 kg N
3. N SUMMER	Nitrogen fertiliser in summer:	
	0	None
	AG 1	'Agsol 26% N' at 50 kg N. Foliar spray, half on 7 June, half on 21 June
4. FUNGCIDE(1)	Fungicide:	
	0	None
	BN+CA+MA	Benomyl on 18 May, carbendazim + maneb on 7 June and 6 July
5. FUNGCIDE(2)	Fungicide:	
	0	None
	BENODANI	Benodanil on 21 June and on 6 July

plus four extra treatments (duplicated), all given FUNGCIDE(1) and FUNGCIDE(2):

EXTRA	
NCA1NCD2	'Nitro-Chalk' in autumn at 50 kg N, 'Nitro-Chalk' in spring/summer at 100 kg N dressing divided 1/5 at G.S.3, 3/5 at G.S.5, 1/5 at G.S.8.
NCA1NCD3	As previous treatment but spring/summer dressing at 150 kg N
IBA1NCD2	Isobutylidene diurea in autumn at 50 kg N, 'Nitro-Chalk' in spring/summer at 100 kg N dressing divided as above
IBA1NCD3	As previous treatment but spring/summer dressing at 150 kg N

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NOTES: (1) EXTRA nitrogen treatments were applied on the following dates: G.S.3 14 Mar, G.S.5 20 Apr, G.S.8 18 May.
(2) 'FUNGCIDE(1)' Benomyl was applied at 0.28 kg in 280 l and carbendazim at 0.25 kg plus maneb at 1.6 kg in 280 l.
(3) 'FUNGCIDE(2)' Benodanil was applied at 1.1 kg in 280 l.

Basal applications: Manures: Muriate of potash at 250 kg. (0:20:20) at 250 kg. Weedkillers: Isoproturon at 1.8 kg in 450 l. Ioxynil at 0.53 kg with mecoprop at 1.9 kg in 280 l applied with the fungicide and growth regulator (see below). Fungicide: Tridemorph at 0.53 kg. Insecticide: Pirimicarb at 0.14 kg in 280 l. Growth regulator: Chlormequat at 1.7 kg.

Seed: Maris Huntsman, sown at 200 kg.

Cultivations, etc.:- Muriate of potash applied: 21 Sept, 1977. Ploughed: 24 Sept. Harrowed and rolled three times: 12 Oct. PK applied, seed sown, isoproturon applied: 19 Oct. Ioxynil, mecoprop, tridemorph and chlormequat applied: 18 May, 1978. Pirimicarb applied: 3 Aug. Combine harvested: 23 Aug.

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GRAIN TONNES/HECTARE

***** TABLES OF MEANS *****

N SPRING	0	NC 1	NC 2	NC 3	MEAN
N AUTUMN					
0	2.83	5.20	6.37	6.88	5.32
IBDU 1	3.98	5.90	6.67	7.01	5.89
MEAN	3.40	5.55	6.52	6.94	5.60

N SUMMER	0	AG 1	MEAN
N AUTUMN			
0	5.00	5.63	5.32
IBDU 1	5.74	6.04	5.89
MEAN	5.37	5.84	5.60

N SUMMER	0	AG 1	MEAN
N SPRING			
0	3.06	3.75	3.40
NC 1	5.18	5.93	5.55
NC 2	6.45	6.58	6.52
NC 3	6.79	7.09	6.94
MEAN	5.37	5.84	5.60

FUNGCIDE(1)	0	BN+CA+MA	MEAN
N AUTUMN			
0	5.23	5.41	5.32
IBDU 1	5.80	5.98	5.89
MEAN	5.51	5.69	5.60

FUNGCIDE(1)	0	BN+CA+MA	MEAN
N SPRING			
0	3.27	3.54	3.40
NC 1	5.61	5.50	5.55
NC 2	6.40	6.63	6.52
NC 3	6.77	7.11	6.94
MEAN	5.51	5.69	5.60

FUNGCIDE(1)	0	BN+CA+MA	MEAN
N SUMMER			
0	5.25	5.49	5.37
AG 1	5.78	5.90	5.84
MEAN	5.51	5.69	5.60

FUNGCIDE(2)	0	BENODANI	MEAN
N AUTUMN			
0	5.36	5.27	5.32
IBDU 1	5.97	5.81	5.89
MEAN	5.67	5.54	5.60

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GRAIN TONNES/HECTARE

***** TABLES OF MEANS *****

FUNGCIDE(2) N SPRING	0	BENODANI	MEAN
0	3.34	3.47	3.40
NC 1	5.63	5.48	5.55
NC 2	6.56	6.48	6.52
NC 3	7.14	6.75	6.94
MEAN	5.67	5.54	5.60

FUNGCIDE(2) N SUMMER	0	BENODANI	MEAN
0	5.32	5.42	5.37
AG 1	6.01	5.67	5.84
MEAN	5.67	5.54	5.60

FUNGCIDE(2) FUNGCIDE(1)	0	BENODANI	MEAN
0	5.64	5.39	5.51
BN+CA+MA	5.69	5.70	5.69
MEAN	5.67	5.54	5.60

EXTRA	NCA1NCD2	NCA1NCD3	IBA1NCD2	IBA1NCD3	MEAN
	7.27	7.69	6.64	7.52	7.28

***** STANDARD ERRORS OF DIFFERENCES OF MEANS *****

TABLE	N AUTUMN	N SPRING	N SUMMER	FUNGCIDE(1)
SED	0.093	0.132	0.093	0.093

TABLE	FUNGCIDE(2)	EXTRA	N AUTUMN N SUMMER	N SPRING N SUMMER
SED	0.093	0.263	0.132	0.186

TABLE	N AUTUMN FUNGCIDE(1)	N SPRING FUNGCIDE(1)	N SUMMER FUNGCIDE(1)	N AUTUMN FUNGCIDE(2)
SED	0.132	0.186	0.132	0.132

TABLE	N SPRING FUNGCIDE(2)	N SUMMER FUNGCIDE(2)	FUNGCIDE(1) FUNGCIDE(2)	N AUTUMN N SPRING
SED	0.186	0.132	0.132	0.186

***** STRATUM STANDARD ERRORS AND COEFFICIENTS OF VARIATION *****

STRATUM	DF	SE	CV%
WP	10	0.263	4.4

GRAIN MEAN DM% 79.8

PLOT AREA HARVESTED 0.00098

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78/R/WS/1

SPRING WHEAT

BACTERIAL INOCULATION

Object: To study the effects of applying a bacterial inoculant and additives on the growth and yield of spring wheat in the presence and absence of straw applied in winter - Hoosfield.

Sponsors: M.E. Brown, J.F. Witty.

Design: Single replicate of 2 x 3 split into 2 x 4.

Whole plot dimensions: 4.27 x 7.62.

Treatments: All combinations of:-

Whole plots

1. STRAW — Straw (t) applied in winter, chopped on site and ploughed in on 14 Dec, 1977:

   0.0
   7.5

2. SEEDBD N — Nitrogen fertiliser (kg N) (as 'Nitro-chalk 26') applied to seedbed on 17 May, 1978:

   30
   90
   150

Sub plots

3. WINTER N — Nitrogen fertiliser (kg N) (as 'Nitro-chalk 25') applied just before straw on 13 Dec, 1977:

   0
   30

4. INOCULNT — Inoculants sprayed on chopped straw:

0	None
B+W+C	Bacterial inoculant plus fermented whey plus cobalt lactate
W+C	Fermented whey plus cobalt lactate
C	Cobalt lactate

NOTE: Rates of application of INOCULNT were:
(1) Bacteria at 0.019 kg of a culture containing Actinomyces thermophilus, Azotobacter chroococcum, Cellvibrio, Cytophaga and Bacillus subtilis.
(2) Whey 6.67 kg.
(3) Cobalt lactate (0.22 kg 'Symbooster').
Materials were applied in 240 l.

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Basal applications: Manures: (0:20:20) at 310 kg, combine drilled. Weedkillers: Dicamba with mecoprop and MCPA ('Banlene Plus' at 4.9 l) in 220 l.

Seed: Sicco, sown at 190 kg.

Cultivations, etc.:- Ploughed: 16 Dec, 1977. Rotary harrowed, seed sown: 15 Mar, 1978. Weedkillers applied: 26 May. Combine harvested: 16 Sept. Previous crops: Sugar beet 1976, barley 1977.

NOTE: Germination counts were made in May and the total dry weight of plants was measured in May and June.

GRAIN TONNES/HECTARE

***** TABLES OF MEANS *****

SEEDBD N / STRAW	30	90	150	MEAN
0.0	2.30	2.98	3.85	3.04
7.5	1.60	2.22	3.07	2.29
MEAN	1.95	2.60	3.46	2.67

WINTER N / STRAW	0	30	MEAN
0.0	2.80	3.29	3.04
7.5	2.10	2.49	2.29
MEAN	2.45	2.89	2.67

WINTER N / SEEDBD N	0	30	MEAN
30	1.80	2.10	1.95
90	2.34	2.85	2.60
150	3.21	3.71	3.46
MEAN	2.45	2.89	2.67

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GRAIN TONNES/HECTARE

***** TABLES OF MEANS *****

INOCULNT	0	B+W+C	W+C	C	MEAN
STRAW					
0.0	3.09	3.01	2.95	3.12	3.04
7.5	2.39	2.37	2.24	2.17	2.29
MEAN	2.74	2.69	2.59	2.65	2.67

INOCULNT	0	B+W+C	W+C	C	MEAN
SEEDBD N					
30	1.99	1.99	1.99	1.82	1.95
90	2.81	2.48	2.51	2.59	2.60
150	3.43	3.61	3.26	3.53	3.46
MEAN	2.74	2.69	2.59	2.65	2.67

INOCULNT	0	B+W+C	W+C	C	MEAN
WINTER N					
0	2.61	2.51	2.27	2.41	2.45
30	2.87	2.88	2.92	2.89	2.89
MEAN	2.74	2.69	2.59	2.65	2.67

WINTER N	0	30
STRAW SEEDBD N		
0.0 30	2.07	2.53
90	2.76	3.20
150	3.57	4.12
7.5 30	1.52	1.67
90	1.93	2.50
150	2.84	3.30

INOCULNT	0	B+W+C	W+C	C
STRAW SEEDBD N				
0.0 30	2.19	2.45	2.24	2.32
90	3.23	2.77	2.81	3.11
150	3.86	3.82	3.79	3.93
7.5 30	1.79	1.53	1.75	1.31
90	2.39	2.20	2.22	2.06
150	3.00	3.40	2.74	3.13

INOCULNT	0	B+W+C	W+C	C
STRAW WINTER N				
0.0 0	2.82	2.84	2.56	2.99
30	3.36	3.19	3.33	3.26
7.5 0	2.41	2.18	1.97	1.83
30	2.38	2.57	2.50	2.51

INOCULNT	0	B+W+C	W+C	C
SEEDBD N WINTER N				
30 0	2.03	1.94	1.49	1.71
30	1.95	2.04	2.50	1.92
90 0	2.60	2.07	2.33	2.37
30	3.01	2.90	2.70	2.81
150 0	3.20	3.51	2.98	3.13
30	3.66	3.71	3.55	3.93

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GRAIN TONNES/HECTARE

***** STANDARD ERRORS OF DIFFERENCES OF MEANS *****

TABLE	STRAW	SEEDBD N	WINTER N	INOCULNT
SED	**	**	0.089	0.126

TABLE	STRAW SEEDBD N	STRAW* WINTER N	SEEDBD N* WINTER N	STRAW* INOCULNT
SED	**	0.126	0.154	0.178

TABLE	SEEDBD N* INOCULNT	WINTER N INOCULNT	STRAW* SEEDBD N WINTER N	STRAW* SEEDBD N INOCULNT
	0.218	0.178	0.218	0.308

TABLE	STRAW* WINTER N INOCULNT	SEEDBD N* WINTER N INOCULNT
SED	0.251	0.308

* WITHIN SAME LEVEL OF STRAW,SEEDBD N OR STRAW SEEDBD N
** NO STANDARD ERROR AVAILABLE

***** STRATUM STANDARD ERRORS AND COEFFICIENTS OF VARIATION *****

STRATUM	DF	SE	CV%
WP.SP	6	0.308	11.5

GRAIN MEAN DM% 80.8

PLOT AREA HARVESTED 0.00217

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78/R/WS/2

SPRING WHEAT

INTEGRATED PEST CONTROL

Object: To study the effects of chemical and biological pest control treatments on the incidence of pests and on yield of spring wheat - Stackyard.

Sponsors: G. Dean, R. Bardner, C.A. Edwards, A. Dewar, J.W. Stephenson, N. Wilding, K.E. Fletcher, J.R. Lofty.

Design: 3 randomised blocks of 4 plots.

Whole plot dimensions: 19.2 x 19.2.

Treatments:

TREATMNT	Chemical and biological treatments:
NONE	None (duplicated)
BIOLOGIC	Metarrhizium fungus applied as 4 x 10^{13} spores per hectare on rice grains applied at 800 kg on 17 May
MULTCHEM	Multiple chemical treatments: Chlorpyrifos at 2 kg on 17 March. Metaldehyde at 31.4 kg on 30 March. Omethoate at 0.2 kg on 2 June. Pirimicarb at 0.14 kg on 4 July

NOTE: It was intended to add to BIOLOGIC the release of aphids infected with Entomophthora. Natural aphids were few and this treatment was not applied. A planned additional treatment of aphicide only was also not applied for the same reason.

Basal applications: Manures: (20:14:14) at 440 kg, combine drilled. Weedkillers: Dicamba with mecoprop and MCPA ('Banlene Plus' at 4.9 l) in 220 l.

Seed: Sicco, seed not dressed, sown at 190 kg.

Cultivations, etc.:- Ploughed: 22 Nov, 1977. Spring-tine cultivated twice: 13 Mar, 1978. Seed sown: 15 Mar. Weedkiller applied: 18 May. Combine harvested: 15 Sept. Previous crops: Beans 1976, wheat 1977.

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78/R/WS/2

GRAIN TONNES/HECTARE

***** TABLES OF MEANS *****

TREATMNT	NONE	BIOLOGIC	MULTCHEM	MEAN
	5.43	5.44	5.85	5.54

***** STANDARD ERRORS OF DIFFERENCES OF MEANS *****

TABLE	TREATMNT	
REP	UNEQUAL	
SED	0.146	MIN REP
	0.127	MAX-MIN

	TREATMENT
MAX-MIN	NONE V ANY OF REMAINDER
MIN REP	ANY OF REMAINDER

***** STRATUM STANDARD ERRORS AND COEFFICIENTS OF VARIATION *****

STRATUM	DF	SE	CV%
BLOCK.WP	7	0.179	3.2

GRAIN MEAN DM% 80.8

PLOT AREA HARVESTED 0.00410

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78/R/WS/3

SPRING WHEAT

FUNGICIDES AND GRAIN MICROFLORA

Object: To study the effects of a range of fungicides applied at a range of times on the yield, quality and grain microflora of spring wheat - Summerdells I.

Sponsor: R.A. Hill.

Design: 2 randomised blocks of 3 x 2 x 2 x 2.

Whole plot dimensions: 4.27 x 13.1.

Treatments: All combinations of:-

1. FUNGCIDE — Broad spectrum fungicides:

CAPTAFOL	Captafol at 1.4 kg
CARB+MAN	Carbendazim at 0.25 kg + maneb at 1.6 kg
BENOMYL	Benomyl at 1.1 kg

2. APP TIME — Application times of broad spectrum fungicides:

	10 July	20 July	11 Aug
NONE	None	None	None
E	Sprayed	None	None
M	None	Sprayed	None
L	None	None	Sprayed
E+M	Sprayed	Sprayed	None
E+L	Sprayed	None	Sprayed
M+L	None	Sprayed	Sprayed
E+M+L	Sprayed	Sprayed	Sprayed

NOTE: Treatment sprays were applied in 340 l.

Basal applications: Manures: (20:14:14) at 440 kg, combine drilled. Weedkiller: Mecoprop at 2.5 kg in 220 l.

Seed: Timmo, sown at 190 kg.

Cultivations, etc.:- Chisel ploughed twice: 8 and 10 Nov, 1977. Spring-tine cultivated twice and seed sown: 13 Mar, 1978. Weedkiller applied: 22 May. Combine harvested: 15 Sept. Previous crops: Winter oats 1976, potatoes 1977.

NOTE: Grain microflora were assessed weekly after heading. Thousand grain weights were measured, and grain was assessed for germination, vigour and breadmaking quality.

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78/R/WS/3

GRAIN TONNES/HECTARE

***** TABLES OF MEANS *****

APP TIME / FUNGCIDE	E	M	L	E+M	E+L	M+L	E+M+L	MEAN
CAPTAFOL	6.50	6.75	6.18	6.35	6.82	6.55	6.80	6.57
CARB+MAN	6.86	6.50	6.38	6.71	6.55	6.82	6.86	6.67
BENOMYL	6.38	6.50	6.25	6.53	6.48	6.62	6.71	6.50
MEAN	6.58	6.59	6.27	6.53	6.62	6.66	6.79	6.58

APP TIME NONE 6.31

GRAND MEAN 6.54

***** STANDARD ERRORS OF DIFFERENCES OF MEANS *****

TABLE	FUNGCIDE	APP TIME	FUNGCIDE APP TIME
SED	0.098	0.150	0.259

***** STRATUM STANDARD ERRORS AND COEFFICIENTS OF VARIATION *****

STRATUM	DF	SE	CV%
BLOCK.WP	25	0.259	4.0

GRAIN MEAN DM% 80.5

PLOT AREA HARVESTED 0.00195

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78/R/WS/4

SPRING WHEAT

IRRIGATION, LODGING, CCC AND MICROFLORA

Object: To study the effects of irrigation, artificial lodging and a growth regulator on grain microflora and yield - Long Hoos IV 4.

Sponsor: R.A. Hill.

Design: 4 randomised blocks of 2 plots split into 4.

Whole plot dimensions: 8.53 x 9.75.

Treatments: All combinations of:-

Whole plots

1.	IRRIGATN	Irrigation:
	NONE	None
	FULL	Full (108 mm)

Sub plots

2.	LODGING	Lodging:
	NONE	None, supported by netting
	LODGED	Lodged, under netting
3.	GRWTHREG	Growth regulator:
	NONE	None
	CHLORMEQ	Chlormequat (CCC) at 1.1 kg in 340 l on 19 June, 1978.

NOTES: (1) Lodging treatment was applied on 1 Aug, 1978.
(2) Irrigation was applied at 9 mm on each dry day between 11 Aug and harvest (11, 16, 17, 18, 21, 23, 24, 25 and 29 August and 5, 8 and 11 Sept).

Basal applications: Manures (0:14:28) at 720 kg. 'Nitro-chalk 25' at 500 kg combine drilled. Weedkillers: Mecoprop, bromoxynil and ioxynil ('Brittox' at 2.5 l in 340 l).

Seed: Timmo, sown at 180 kg.

Cultivations, etc.:- PK applied: 30 Sept, 1977. Ploughed: 6 Oct. Power harrowed: 31 Mar, 1978. Seed sown: 5 Apr. Weedkillers applied: 11 May. Combine harvested: 19 Sept.

NOTE: Grain microflora were assessed weekly after lodging and at harvest. 1000 grain weights were taken and grain assessed for mycotoxins, germination percentage and seedling vigour.

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78/R/WS/4

GRAIN TONNES/HECTARE

***** TABLES OF MEANS *****

LODGING IRRIGATN	NONE	LODGED	MEAN
NONE	5.15	2.47	3.81
FULL	4.80	1.69	3.24
MEAN	4.97	2.08	3.53

GRWTHREG IRRIGATN	NONE	CHLORMEQ	MEAN
NONE	3.81	3.81	3.81
FULL	3.06	3.43	3.24
MEAN	3.43	3.62	3.53

GRWTHREG LODGING	NONE	CHLORMEQ	MEAN
NONE	4.77	5.17	4.97
LODGED	2.10	2.07	2.08
MEAN	3.43	3.62	3.53

LODGING	NONE		LODGED	
GRWTHREG	NONE	CHLORMEQ	NONE	CHLORMEQ
IRRIGATN				
NONE	5.02	5.29	2.60	2.34
FULL	4.53	5.06	1.59	1.79

***** STANDARD ERRORS OF DIFFERENCES OF MEANS *****

TABLE	LODGING	GRWTHREG	IRRIGATN* LODGING
SED	0.119	0.119	0.168

TABLE	IRRIGATN* GRWTHREG	LODGING GRWTHREG	IRRIGATN* LODGING GRWTHREG
SED	0.168	0.168	0.238

* WITHIN SAME LEVEL OF IRRIGATN ONLY

***** STRATUM STANDARD ERRORS AND COEFFICIENTS OF VARIATION *****

STRATUM	DF	SE	CV%
BLOCK.WP.SP	18	0.336	9.5

GRAIN MEAN DM% 84.4

SUB PLOT AREA HARVESTED 0.00087

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78/R/B/2

WINTER BARLEY

FACTORS AFFECTING YIELD AND DISEASE CONTROL

Object: To study the effects and interactions of sowing date, seed rate, timing of mildew control and spring nitrogen on the incidence of mildew and on yield of winter barley - Scout.

Sponsors: A. Bainbridge, J.F. Jenkyn, M.E. Finney.

Design: 3 x 2 x 2 x 2 x 2 in 2 blocks of 24 plots with confounding.

Whole plot dimensions: 2.13 x 6.10.

Treatments: All combinations of:-

1.	S DATE T	Sowing date and autumn tridemorph:
	6 OCT+T	6 October, tridemorph spray in autumn on 18 Nov, 1977
	6 OCT 0	6 October, no tridemorph spray in autumn
	2 NOV 0	2 November, no tridemorph spray in autumn
2.	SEEDRATE	Seed rates (kg):
	78	
	156	
3.	TRIDEMOR(1)	Tridemorph in early spring:
	NONE	None
	SPRAYED	Sprayed (3 May, 1978)
4.	TRIDEMOR(2)	Tridemorph in late spring:
	NONE	None
	SPRAYED	Sprayed (26 May, 1978)
5.	N TIME	Time of applying nitrogen (at 75 kg):
	6 MAR	6 March
	25 APR	25 April

NOTES: (1) Tridemorph was applied at 0.53 kg in 340 l.
(2) The experiment had a surround of 18.3 m sown to winter barley, variety Athene, on 6 October, 1977 and each plot was separated from its neighbours by sidelands of 2.13 m and internal headlands of 9.14 m sown to Athene on this date.

Basal applications: Manures: (10:24:24) at 250 kg, combine drilled. Weedkiller: Mecoprop at 3.1 kg in 220 l.

Seed: Hoppel.

Cultivations, etc.:- Straw burned: 11 Sept, 1977. Chisel ploughed twice: 16 Sept and 19 Sept. Rotary harrowed: 28 Sept. Weedkiller applied: 4 May, 1978. Combine harvested: 11 Aug. Previous crops: Wheat 1976, Barley 1977.

NOTE: Emergence counts were made for both sowings. Mildew was assessed three times during the season. Numbers of fertile tillers, grains per ear and thousand grain weights were assessed.

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GRAIN TONNES/HECTARE

***** TABLES OF MEANS *****

SEEDRATE S DATE T	78	156	MEAN
6 OCT+T	5.78	5.48	5.63
6 OCT 0	5.49	5.48	5.49
2 NOV 0	3.60	3.60	3.60
MEAN	4.96	4.85	4.91

TRIDEMOR(1) S DATE T	NONE	SPRAYED	MEAN
6 OCT+T	5.45	5.81	5.63
6 OCT 0	5.28	5.70	5.49
2 NOV 0	3.63	3.57	3.60
MEAN	4.79	5.02	4.91

TRIDEMOR(1) SEEDRATE	NONE	SPRAYED	MEAN
78	4.73	5.18	4.96
156	4.84	4.86	4.85
MEAN	4.79	5.02	4.91

TRIDEMOR(2) S DATE T	NONE	SPRAYED	MEAN
6 OCT+T	5.55	5.70	5.63
6 OCT 0	5.24	5.74	5.49
2 NOV 0	3.47	3.72	3.60
MEAN	4.75	5.06	4.91

TRIDEMOR(2) SEEDRATE	NONE	SPRAYED	MEAN
78	5.22	4.70	4.96
156	4.29	5.41	4.85
MEAN	4.75	5.06	4.91

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78/R/B/2

GRAIN TONNES/HECTARE

***** TABLES OF MEANS *****

TRIDEMOR(2) / TRIDEMOR(1)	NONE	SPRAYED	MEAN
NONE	4.44	5.13	4.79
SPRAYED	5.07	4.98	5.02
MEAN	4.75	5.06	4.91

N TIME / S DATE T	6 MAR	25 APR	MEAN
6 OCT+T	5.93	5.32	5.63
6 OCT 0	5.61	5.37	5.49
2 NOV 0	3.11	4.09	3.60
MEAN	4.88	4.93	4.91

N TIME / SEEDRATE	6 MAR	25 APR	MEAN
78	4.81	5.10	4.96
156	4.95	4.75	4.85
MEAN	4.88	4.93	4.91

N TIME / TRIDEMOR(1)	6 MAR	25 APR	MEAN
NONE	4.80	4.78	4.79
SPRAYED	4.97	5.08	5.02
MEAN	4.88	4.93	4.91

N TIME / TRIDEMOR(2)	6 MAR	25 APR	MEAN
NONE	4.82	4.68	4.75
SPRAYED	4.94	5.17	5.06
MEAN	4.88	4.93	4.91

SEEDRATE	78		156	
TRIDEMOR(1) / S DATE T	NONE	SPRAYED	NONE	SPRAYED
6 OCT+T	5.63	5.92	5.27	5.69
6 OCT 0	5.11	5.88	5.45	5.52
2 NOV 0	3.46	3.74	3.81	3.39

SEEDRATE	78		156	
TRIDEMOR(2) / S DATE T	NONE	SPRAYED	NONE	SPRAYED
6 OCT+T	6.29	5.27	4.81	6.14
6 OCT 0	5.57	5.42	4.91	6.06
2 NOV 0	3.79	3.41	3.16	4.04

TRIDEMOR(1)	NONE		SPRAYED	
TRIDEMOR(2) / S DATE T	NONE	SPRAYED	NONE	SPRAYED
6 OCT+T	5.17	5.72	5.93	5.68
6 OCT 0	4.83	5.74	5.65	5.74
2 NOV 0	3.33	3.94	3.62	3.51

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GRAIN TONNES/HECTARE

***** TABLES OF MEANS *****

TRIDEMOR(1)	NONE		SPRAYED	
TRIDEMOR(2)	NONE	SPRAYED	NONE	SPRAYED
SEEDRATE				
78	4.86	4.60	5.57	4.80
156	4.02	5.67	4.57	5.16

SEEDRATE	78		156	
N TIME	6 MAR	25 APR	6 MAR	25 APR
S DATE T				
6 OCT+T	5.95	5.60	5.91	5.05
6 OCT 0	5.49	5.50	5.73	5.24
2 NOV 0	3.00	4.20	3.21	3.98

TRIDEMOR(1)	NONE		SPRAYED	
N TIME	6 MAR	25 APR	6 MAR	25 APR
S DATE T				
6 OCT+T	5.95	4.95	5.91	5.70
6 OCT 0	5.18	5.38	6.04	5.35
2 NOV 0	3.27	4.00	2.94	4.19

TRIDEMOR(1)	NONE		SPRAYED	
N TIME	6 MAR	25 APR	6 MAR	25 APR
SEEDRATE				
78	4.71	4.75	4.92	5.45
156	4.89	4.80	5.02	4.71

TRIDEMOR(2)	NONE		SPRAYED	
N TIME	6 MAR	25 APR	6 MAR	25 APR
S DATE T				
6 OCT+T	6.05	5.05	5.81	5.60
6 OCT 0	5.09	5.39	6.13	5.35
2 NOV 0	3.33	3.61	2.88	4.57

TRIDEMOR(2)	NONE		SPRAYED	
N TIME	6 MAR	25 APR	6 MAR	25 APR
SEEDRATE				
78	5.05	5.38	4.58	4.82
156	4.60	3.99	5.30	5.52

TRIDEMOR(2)	NONE		SPRAYED	
N TIME	6 MAR	25 APR	6 MAR	25 APR
TRIDEMOR(1)				
NONE	4.55	4.34	5.05	5.22
SPRAYED	5.10	5.03	4.83	5.13

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78/R/B/2

GRAIN TONNES/HECTARE

***** STANDARD ERRORS OF DIFFERENCES OF MEANS *****

TABLE	S DATE T	SEEDRATE	TRIDEMOR(1)	TRIDEMOR(2)
SED	0.188	0.154	0.154	0.154

TABLE	N TIME	S DATE T SEEDRATE	S DATE T TRIDEMOR(1)	SEEDRATE TRIDEMOR(1)
SED	0.154	0.267	0.267	0.218

TABLE	S DATE T TRIDEMOR(2)	SEEDRATE TRIDEMOR(2)	TRIDEMOR(1) TRIDEMOR(2)	S DATE T N TIME
SED	0.267	0.218	0.218	0.267

TABLE	SEEDRATE N TIME	TRIDEMOR(1) N TIME	TRIDEMOR(2) N TIME	S DATE T SEEDRATE TRIDEMOR(1)
SED	0.218	0.218	0.218	0.377

TABLE	S DATE T SEEDRATE TRIDEMOR(2)	S DATE T TRIDEMOR(1) TRIDEMOR(2)	SEEDRATE TRIDEMOR(1) TRIDEMOR(2)	S DATE T SEEDRATE N TIME
SED	0.377	0.377	0.308	0.377

TABLE	S DATE T TRIDEMOR(1) N TIME	SEEDRATE TRIDEMOR(1) N TIME	S DATE T TRIDEMOR(2) N TIME	SEEDRATE TRIDEMOR(2) N TIME
SED	0.377	0.308	0.377	0.308

TABLE	TRIDEMOR(1) TRIDEMOR(2) N TIME
SED	0.308

***** STRATUM STANDARD ERRORS AND COEFFICIENTS OF VARIATION *****

STRATUM	DF	SE	CV%
BLOCK.WP	10	0.533	10.9

GRAIN MEAN DM% 84.9

PLOT AREA HARVESTED 0.00130

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78/R/B/3

WINTER BARLEY

SOWING DATES, VERNALIZATION AND MILDEW

Object: To study the effects of sowing date and vernalization on the incidence of mildew and on the yield of winter barley - Garden Plot 1.

Sponsors: J.F. Jenkyn, M.E. Finney, N. White.

Design: 3 randomised blocks of 8 plots.

Whole plot dimensions: 1.83 x 3.05.

Treatments: All combinations of:-

1. S DATE T — Sowing date and autumn tridemorph:

13 OCT+T	13 October, tridemorph spray at 0.53 kg in 340 l on 18 Nov, 1977
13 OCT 0	13 October, no tridemorph
15 NOV 0	15 November, no tridemorph
7 APR 0	7 April, no tridemorph

2. SD TREAT — Seed treatment before sowing

NONE	None
VERN	Seed vernalized for six weeks before sowing

NOTES: (1) For SD TREAT VERN the seed was placed in a cold room kept at 0° to 1°C and seed was maintained at 80% moisture content by the weekly addition of weighed quantities of water.
(2) Yields were not recorded from S DATE T 15 NOV 0 because of severe bird damage prior to harvest.

Basal applications: Manures: (0:14:28) at 720 kg. N at 100 kg (as 'Nitro-Chalk 25').

Seed: Astrix, sown by hand at 150 kg.

Cultivations, etc.:- Ploughed: 23 Aug,1977. N applied: 27 Apr, 1978. Harvested: 14 Aug and 15 Sept.

NOTE: Mildew was observed throughout the season. Observations were also made of the number of leaves on the main shoot and first tiller, the size of the leaves, and the proportion of the leaves which had been killed by mildew.

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78/R/B/3

GRAIN TONNES/HECTARE

***** TABLES OF MEANS *****

SD TREAT S DATE T	NONE	VERN	MEAN
13 OCT+T	4.60	5.47	5.03
13 OCT 0	5.41	4.49	4.95
7 APR 0	4.96	5.21	5.08
MEAN	4.99	5.05	5.02

***** STANDARD ERRORS OF DIFFERENCES OF MEANS *****

TABLE	S DATE T	SD TREAT	S DATE T SD TREAT
SED	0.488	0.399	0.691

***** STRATUM STANDARD ERRORS AND COEFFICIENTS OF VARIATION *****

STRATUM	DF	SE	CV%
BLOCK.WP	10	0.846	16.8

GRAIN MEAN DM% 79.4

PLOT AREA HARVESTED 0.00038

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78/R/B/4 and 78/W/B/4

SPRING BARLEY

VARIETIES AND N

Object: To study the yields of some of the newer varieties of barley; a growth regulator and three rates of nitrogen are also tested - Rothamsted (R) Gt. Knott III and Woburn (W) Lansome III.

Sponsor: R. Moffitt.

Design: 2 randomised blocks of 2 whole plots split into 10 sub plots systematically split ito 3 sub sub plots.

Whole plot dimensions: 42.7 x 20.1.

Treatments: All combinations of:-

Whole plots

1. GRTH REG — Growth regulator:

NONE	None
MEP+ETH	Mepiquat chloride + ethephon ('BAS 09800W' at 2.0 l in 280 l)

Sub plots

2. VARIETY — Varieties:

ARAMIR
ATHOS
GEORGIE
JULIA
JUPITER
LOFAABED
MALAABED
MINAK
PORTHOS
PRINTA

Sub sub plots

3. N — Nitrogen fertiliser (kg N):

38
75
113

Basal applications:
Gt. Knott III (R): Manures: (0:20:20) at 310 kg, combine drilled. Weedkiller: Mecoprop, bromoxynil and ioxynil ('Brittox' at 2.5 kg in 220 l). Fungicide: Tridemorph at 0.53 kg applied with weedkiller.

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78/R/B/4 and 78/W/B/4

Lansome III (W): Manures: (0:20:20) at 300 kg, combine drilled. Weedkiller. Mecoprop, bromoxynil and ioxynil ('Brittox' at 2.5 kg in 280 l). Fungicide: Tridemorph at 0.53 kg with weedkiller.

Seed: Gt. Knott III (R): Varieties sown at 160 kg.
Lansome III (W): Varieties sown at 160 kg.

Cultivations, etc.:-
Gt. Knott III (R): Ploughed: 25 Oct, 1977. Spring-tine cultivated: 11 Mar, 1978. Seed sown: 6 Apr. Test N applied: 17 May. Weedkiller and fungicide applied: 22 May. Growth regulator applied: 6 June. Combine harvested: 9 Sept. Previous crops: Wheat 1976, 1977.
Lansome III (W): Ploughed: 18 Nov, 1977. Spring-tine cultivated: 9 Mar, 1978. Test N applied, spring-tine cultivated with crumbler attached, seed sown: 29 Mar. Weedkiller and fungicide applied: 17 May. Growth regulator applied: 6 June. Combine harvested: 22 Aug. Previous crops: Potatoes 1976, barley 1977.

78/R/B/4 GT.KNOTT III (R)

GRAIN TONNES/HECTARE

***** TABLE OF MEANS *****

GRTH REG	NONE	MEP+ETH	MEAN
VARIETY			
ARAMIR	6.43	6.36	6.39
ATHOS	6.52	6.47	6.49
GEORGIE	6.52	6.40	6.46
JULIA	5.68	5.79	5.73
JUPITER	6.11	6.41	6.26
LOFAABED	5.96	6.37	6.16
MALAABED	5.92	6.41	6.17
MINAK	6.14	5.83	5.99
PORTHOS	6.26	6.43	6.35
PRINTA	5.47	5.76	5.62
MEAN	6.10	6.22	6.16

N	38	75	113	MEAN
VARIETY				
ARAMIR	6.05	6.94	6.19	6.39
ATHOS	5.91	6.70	6.88	6.49
GEORGIE	5.94	6.77	6.67	6.46
JULIA	5.66	5.65	5.88	5.73
JUPITER	5.94	6.44	6.39	6.26
LOFAABED	5.86	6.45	6.18	6.16
MALAABED	5.88	6.38	6.23	6.17
MINAK	6.04	6.08	5.84	5.99
PORTHOS	5.93	6.60	6.51	6.35
PRINTA	5.37	5.65	5.82	5.62
MEAN	5.86	6.37	6.26	6.16

N	38	75	113	MEAN
GRTH REG				
NONE	5.70	6.28	6.32	6.10
MEP+ETH	6.01	6.45	6.20	6.22
MEAN	5.86	6.37	6.26	6.16

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78/R/B/4 GT.KNOTT III (R)

GRAIN TONNES/HECTARE

***** TABLES OF MEANS *****

GRTH REG	VARIETY	N 38	75	113
NONE	ARAMIR	5.97	7.11	6.21
	ATHOS	5.93	6.69	6.95
	GEORGIE	5.74	6.88	6.94
	JULIA	5.63	5.55	5.85
	JUPITER	5.61	6.36	6.35
	LOFAABED	5.67	6.22	6.01
	MALAABED	5.55	5.77	6.45
	MINAK	6.04	6.26	6.13
	PORTHOS	5.69	6.55	6.56
	PRINTA	5.20	5.48	5.73
MEP+ETH	ARAMIR	6.13	6.78	6.18
	ATHOS	5.89	6.71	6.80
	GEORGIE	6.14	6.66	6.41
	JULIA	5.69	5.76	5.92
	JUPITER	6.27	6.52	6.44
	LOFAABED	6.06	6.68	6.36
	MALAABED	6.21	7.00	6.02
	MINAK	6.04	5.91	5.55
	PORTHOS	6.18	6.65	6.46
	PRINTA	5.55	5.82	5.92

***** STANDARD ERRORS OF DIFFERENCES OF MEANS *****

TABLE	VARIETY	N	GRTH REG* VARIETY
SED	0.201	0.130	0.284

TABLE	GRTH REG* N	VARIETY N	GRTH REG* VARIETY N
SED	0.184	0.291	0.411

EXCEPT WHEN COMPARING MEANS WITH SAME LEVEL(S) OF:

VARIETY	0.245	
N	0.269	
GRTH REG.VARIETY		0.347
GRTH REG.N		0.380

* WITHIN SAME LEVEL OF GRTH REG ONLY

***** STRATUM STANDARD ERRORS AND COEFFICIENTS OF VARIATION *****

STRATUM	DF	SE	CV%
BLOCK.WP.COLSP	18	0.284	4.6
BLOCK.WP.ROWSP	4	0.184	3.0
BLOCK.WP.COLSP.ROWSP	36	0.310	5.0

GRAIN MEAN DM% 81.5

SUB PLOT AREA HARVESTED 0.00130

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78/W/B/4 LANSOME III (W)

GRAIN TONNES/HECTARE

***** TABLES OF MEANS *****

GRTH REG VARIETY	NONE	MEP+ETH	MEAN
ARAMIR	4.62	4.66	4.64
ATHOS	4.36	4.83	4.60
GEORGIE	4.08	4.99	4.53
JULIA	3.53	4.29	3.91
JUPITER	4.23	4.96	4.59
LOFAABED	4.03	4.51	4.27
MALAABED	4.05	4.49	4.27
MINAK	4.49	4.95	4.72
PORTHOS	4.54	4.82	4.68
PRINTA	4.44	4.70	4.57
MEAN	4.24	4.72	4.48

N VARIETY	38	75	113	MEAN
ARAMIR	3.47	4.97	5.48	4.64
ATHOS	3.47	4.93	5.39	4.60
GEORGIE	3.22	4.90	5.48	4.53
JULIA	2.91	4.15	4.67	3.91
JUPITER	3.47	4.87	5.43	4.59
LOFAABED	3.39	4.40	5.02	4.27
MALAABED	3.48	4.18	5.15	4.27
MINAK	3.51	4.86	5.79	4.72
PORTHOS	3.58	4.93	5.52	4.68
PRINTA	3.65	4.71	5.35	4.57
MEAN	3.42	4.69	5.33	4.48

N GRTH REG	38	75	113	MEAN
NONE	3.06	4.49	5.15	4.24
MEP+ETH	3.77	4.88	5.51	4.72
MEAN	3.42	4.69	5.33	4.48

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78/W/B/4 LANSOME III (W)

GRAIN TONNES/HECTARE

***** TABLES OF MEANS *****

GRTH REG	VARIETY	N	38	75	113
NONE	ARAMIR		3.46	4.83	5.57
	ATHOS		3.24	4.68	5.17
	GEORGIE		2.71	4.37	5.15
	JULIA		2.40	3.90	4.29
	JUPITER		3.02	4.67	4.99
	LOFAABED		2.98	4.08	5.02
	MALAABED		3.08	4.03	5.04
	MINAK		3.15	4.59	5.74
	PORTHOS		3.28	4.97	5.36
	PRINTA		3.32	4.82	5.18
MEP+ETH	ARAMIR		3.47	5.10	5.40
	ATHOS		3.71	5.19	5.60
	GEORGIE		3.73	5.42	5.80
	JULIA		3.42	4.40	5.05
	JUPITER		3.92	5.08	5.87
	LOFAABED		3.79	4.71	5.01
	MALAABED		3.88	4.32	5.27
	MINAK		3.87	5.12	5.85
	PORTHOS		3.87	4.89	5.69
	PRINTA		3.98	4.59	5.53

***** STANDARD ERRORS OF DIFFERENCES OF MEANS *****

TABLE	VARIETY	N	GRTH REG* VARIETY
SED	0.341	0.162	0.482

TABLE	GRTH REG* N	VARIETY N	GRTH REG* VARIETY N
SED	0.229	0.415	0.587

EXCEPT WHEN COMPARING MEANS WITH SAME LEVEL(S) OF:

VARIETY		0.271	
N		0.389	
GRTH REG.VARIETY			0.383
GRTH REG.N			0.550

* WITHIN SAME LEVEL OF GRTH REG ONLY

***** STRATUM STANDARD ERRORS AND COEFFICIENTS OF VARIATION *****

STRATUM	DF	SE	CV%
BLOCK.WP.COLSP	18	0.482	10.8
BLOCK.WP.ROWSP	4	0.229	5.1
BLOCK.WP.COLSP.ROWSP	36	0.324	7.2

GRAIN MEAN DM% 79.2

SUB PLOT AREA HARVESTED 0.00173

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78/R/B/5

SPRING BARLEY

CONTROLLED DROP APPLICATION OF TRIDEMORPH

Object: To compare controlled drop application with conventional spraying on the deposition of spray material, control of mildew and on the yield of spring barley - Gt. Knott III.

Sponsors: A.J. Arnold, P. Etheridge, F.T. Phillips.

Design: 3 randomised blocks of 10 plots.

Whole plot dimensions: 4.27 x 18.3.

Treatments: All combinations of:-

1. SPRAYER	Sprayer and drop density:	
	CDA 1	Controlled drop application sprayer, standard drop density
	CDA 2	Controlled drop application sprayer, twice standard drop density
	HYDRAUL	Hydraulic sprayer
2. TRI RATE	Rates of applying tridemorph (on 3 June, 1978):	
	1	Standard, 525 g
	1/2	Half standard, 263 g
	1/10	Tenth standard, 52.5 g

NONE plus one extra plot not sprayed

NOTES: (1) CDA sprayer applied tridemorph in 21 l.
(2) Hydraulic sprayer applied tridemorph in 337 l.

Basal applications: Manures: (20:14:14) at 440 kg, combine drilled. Weedkillers: Mecoprop plus bromoxynil and ioxynil ('Brittox' at 2.5 l in 220 l).

Seed: Wing, sown at 160 kg.

Cultivations, etc.:- Ploughed: 29 Nov, 1977. Spring-tine cultivated: 11 Mar, 1978. Spring-tine cultivated, seed sown: 15 Mar. Weedkillers applied: 19 May. Combine harvested: 25 Aug. Previous crops: Potatoes 1976, barley 1977.

NOTE: Observations were made on patterns of spray deposition using very small quantities of permethrin as a chemical marker.

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78/R/B/5

GRAIN TONNES/HECTARE

****** TABLES OF MEANS *****

TRI RATE / SPRAYER	1	1/2	1/10	MEAN
CDA 1	5.98	6.26	5.82	6.02
CDA 2	6.15	6.25	5.98	6.13
HYDRAUL	6.31	5.88	5.97	6.05
MEAN	6.15	6.13	5.92	6.07

NONE 5.62

GRAND MEAN 6.02

***** STANDARD ERRORS OF DIFFERENCES OF MEANS *****

TABLE	SPRAYER	TRI RATE	SPRAYER TRI RATE & NONE
SED	0.128	0.128	0.221

***** STRATUM STANDARD ERRORS AND COEFFICIENTS OF VARIATION *****

STRATUM	DF	SE	CV%
BLOCK.WP	18	0.247	4.1

GRAIN MEAN DM% 84.5

PLOT AREA HARVESTED 0.00390

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78/R/B/7

SPRING BARLEY

MILDEW SENSITIVITY TO ETHIRIMOL

Object: To study the effects of a range of rates of ethirimol seed dressing on mildew sensitivity and yield of barley - Long Hoos V4.

Sponsor: D.W. Hollomon.

Design: 4 randomised blocks of 4 plots.

Whole plot dimensions: 2.41 x 5.18.

Treatments:

ETHIRIMO	Ethirimol seed dressing (g/kg of seed):
0	0.00
1	0.93
4	3.20
16	14.40

NOTE: Surrounds were sown to Proctor not treated against mildew.

Basal applications: Manures: (0:14:28) at 630 kg, 'Nitro-Chalk 25' at 400 kg. Weedkillers: Dicamba with mecoprop and MCPA ('Tetralex Plus' at 5.6 l in 340 l).

Seed: Proctor, sown at 160 kg.

Cultivations, etc.:- PK applied: 23 Nov, 1977. Ploughed: 29 Nov. N applied, spring-tine cultivated: 10 Mar, 1978. Sown: 11 Mar. Weedkillers applied: 10 May. Combine harvested: 26 May. Previous crops: Wheat and barley 1976, potatoes 1977.

NOTES: (1) Plots were inoculated with plants heavily infected with mildew (five strains) on 24 Apr, 1978.
(2) Mildew and its race composition and ethirimol sensitivity were assessed at 3 growth stages during the season.

GRAIN TONNES/HECTARE

***** TABLES OF MEANS *****

ETHIRIMO	0	1	4	16	MEAN
	5.35	5.35	5.51	5.46	5.42

***** STANDARD ERRORS OF DIFFERENCES OF MEANS *****

TABLE	ETHIRIMO
SED	0.112

***** STRATUM STANDARD ERRORS AND COEFFICIENTS OF VARIATION *****

STRATUM	DF	SE	CV%
BLOCK.WP	9	0.159	2.9

GRAIN MEAN DM% 79.6 PLOT AREA HARVESTED 0.00086

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78/R/B/8

SPRING BARLEY

N AND FOLIAR DISEASES

Object: To study the effects of mildew on response to a range of nitrogen rates - Summerdells II.

Sponsors: J.F. Jenkyn, M.E. Finney.

Design: 3 randomised blocks of 6 plots split into 2.

Whole plot dimensions: 4.27 x 16.2.

Treatments: All combinations of:-

Whole plots

1. N — Amounts of nitrogen fertiliser (kg N as 'Nitro-Chalk 26'). Applied: 17 May, 1978:

   25
   50
   70
   90
   110
   135

Sub plots

2. MILDEW F — Mildew fungicide:

   NONE — None
   TRIDEMOR — Tridemorph on 7 June and 6 July

NOTES: (1) Tridemorph was applied at 0.53 kg in 340 l.
(2) Sides of plots were separated by a strip of Mazurka barley 2.13 m wide sprayed tridemorph at above rate on 14 June.

Basal applications: Manures: (0:20:20) at 310 kg, combine drilled. Weedkillers: Dicamba plus mecoprop and MCPA ('Banlene Plus' at 4.9 l in 220 l).

Seed: Zephyr, sown at 160 kg.

Cultivations, etc.:- Ploughed: 23 Nov, 1977. Spring-tine cultivated twice: 15 Mar, 1978. Heavy spring-tine cultivated, power harrowed, seed sown: 17 Apr. Weedkiller applied: 26 May. Combine harvested: 8 Sept. Previous crops: W. oats 1976, barley 1977.

NOTES: (1) Seedling emergence counts were made.
(2) Mildew and brown rust were assessed throughout the season.
(3) Samples were taken for nitrogen analysis.
(4) Ear counts were made before harvest.

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78/R/B/8

GRAIN TONNES/HECTARE

***** TABLES OF MEANS *****

MILDEW F N	NONE	TRIDEMOR	MEAN
25	4.30	4.26	4.28
50	4.32	5.01	4.66
70	4.77	5.30	5.04
90	5.02	5.50	5.26
110	5.07	5.45	5.26
135	5.16	5.88	5.52
MEAN	4.77	5.23	5.00

***** STANDARD ERRORS OF DIFFERENCES OF MEANS *****

TABLE	N	MILDEW F	N MILDEW F
SED	0.245	0.083	0.285
EXCEPT WHEN COMPARING MEANS WITH SAME LEVEL(S) OF:			
N			0.204

***** STRATUM STANDARD ERRORS AND COEFFICIENTS OF VARIATION *****

STRATUM	DF	SE	CV%
BLOCK.WP	10	0.301	6.0
BLOCK.WP.SP	12	0.249	5.0

GRAIN MEAN DM% 79.0

SUB PLOT AREA HARVESTED 0.00163

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78/R/B/9

SPRING BARLEY

NITRIFICATION INHIBITOR AND FOLIAR DISEASES

Object: To study the effects of adding a nitrification inhibitor to a liquid nitrogen fertiliser on the incidence and control of foliar diseases, N uptake and yield - Summerdells II.

Sponsors: J.F. Jenkyn, M.E. Finney, F.V. Widdowson, A. Penny, J. Ashworth.

Design: 2 randomised blocks of 10 plots split into 4.

Whole plot dimensions: 4.27 x 33.2.

Treatments: All combinations of:-

Whole plots

1. N RATE — Amounts of nitrogen fertiliser (kg N):

   70
   110

2. N FORM — Form of nitrogen fertiliser and nitrification inhibitor:

LIQUID 0	Liquid fertiliser (urea/ammonium nitrate, 26% N), injected before sowing, no nitrification inhibitor
LIQUID I	Liquid fertiliser (urea/ammonium nitrate, 26% N), injected before sowing, with nitrapyrin added as a nitrification inhibitor
NC 0 E	Solid fertiliser ('Nitro-Chalk', 25% N) applied to seedbed, no nitrification inhibitor
NC 0 L	Solid fertiliser ('Nitro-Chalk' 25% N), top-dressed, no nitrification inhibitor
NC 0 EL	Solid fertiliser ('Nitro-Chalk' 25% N), half to seedbed, half top-dressed, no nitrification inhibitor

Sub plots

3. MILDEW F — Mildew fungicide:

NONE	None (duplicated)
TRIDEMOR	Tridemorph on 7 June, 1978 and 6 July (duplicated)

NOTES: (1) A proposed test of benodanil fungicide was not made because there was little rust.
(2) Tridemorph was applied at 0.53 kg in 340 l.
(3) Sides of plots were separated by a 2 m strip of Mazurka sprayed tridemorph at above rate on 14 June.
(4) Liquid nitrogen was applied by injectors with tines 30 cm apart 10 cm deep.
(5) Nitrapyrin was applied at 1 kg.
(6) Nitrogen fertiliser was applied to N FORM LIQUID 0 and LIQUID I and NC 0 E on 6 Apr, and to NC 0 L and NC 0 EL on 22 May.

Basal applications: Manures: (0:20:20) at 310 kg, combine drilled. Weedkillers: Dicamba with mecoprop and MCPA ('Banlene Plus' at 4.9 l in 220 l).

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78/R/B/9

Seed: Zephyr, sown at 160 kg.

Cultivations, etc.:- Ploughed: 23 Nov, 1977. Spring-tine cultivated twice: 15 Mar, 1978. Heavy spring-tine cultivated, power harrowed, seed sown: 17 Apr. Weedkiller applied: 26 May. Combine harvested: 8 Sept. Previous crops: Oats 1976, barley 1977.

NOTES: Plant emergence counts were made. Mildew and brown rust were assessed during the season. Counts of ears, numbers of grains per ear and thousand grain weights were made. The crop was sampled for nitrogen and the soil for nitrification of ammonia in the injected bands.

GRAIN TONNES/HECTARE

***** TABLES OF MEANS *****

N FORM / N RATE	LIQUID O	LIQUID I	NC O E	NC O L	NC O EL	MEAN
70	5.19	5.23	4.99	5.24	5.42	5.22
110	5.29	5.30	5.28	5.24	5.49	5.32
MEAN	5.24	5.26	5.14	5.24	5.46	5.27

MILDEW F / N RATE	NONE	TRIDEMOR	MEAN
70	4.93	5.50	5.22
110	4.97	5.67	5.32
MEAN	4.95	5.59	5.27

MILDEW F / N FORM	NONE	TRIDEMOR	MEAN
LIQUID O	4.93	5.55	5.24
LIQUID I	5.06	5.46	5.26
NC O E	4.84	5.44	5.14
NC O L	4.87	5.61	5.24
NC O EL	5.05	5.86	5.46
MEAN	4.95	5.59	5.27

N RATE	MILDEW F / N FORM	NONE	TRIDEMOR
70	LIQUID O	4.86	5.53
	LIQUID I	5.01	5.45
	NC O E	4.71	5.27
	NC O L	5.05	5.43
	NC O EL	5.03	5.82
110	LIQUID O	5.01	5.58
	LIQUID I	5.12	5.48
	NC O E	4.96	5.61
	NC O L	4.69	5.79
	NC O EL	5.07	5.90

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78/R/B/9

***** STANDARD ERRORS OF DIFFERENCES OF MEANS *****

TABLE	N RATE	N FORM	MILDEW F	N RATE N FORM
SED	0.092	0.145	0.063	0.205

TABLE	N RATE MILDEW F	N FORM MILDEW F	N RATE N FORM MILDEW F
SED	0.111	0.176	0.249
EXCEPT WHEN COMPARING MEANS WITH SAME LEVEL(S) OF:			
N RATE	0.089		
N FORM		0.141	
N RATE.N FORM			0.199

***** STRATUM STANDARD ERRORS AND COEFFICIENTS OF VARIATION *****

STRATUM	DF	SE	CV%
BLOCK.WP	9	0.205	3.9
BLOCK.WP.SP	50	0.282	5.3

GRAIN MEAN DM% 79.0

SUB PLOT AREA HARVESTED 0.00163

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78/R/B/10

SPRING BARLEY

SOWING DATES AND PATHOGEN CONTROL

Object: To study the effects of aphid, virus and fungus control on pathogens and yield of barley sown on two dates - Webbs.

Sponsors: R.T. Plumb, J.F. Jenkyn.

Design: 2 replicates of 2 x 2 x 2 x 2 in blocks of 8 plots.

Whole plot dimensions: 6.40 x 18.3.

Treatments: All combinations of:-

1. SOW DATE	Dates of sowing:	
	8 MAR	8 March, 1978
	24 APR	24 April
2. FUNGCIDE	Fungicide:	
	NONE	None
	ETHIRIMO	Ethirimol seed dressing
3. APHICIDE(1)	Aphicide to seedbed:	
	NONE	None
	PHORATE	Phorate at 5 kg as granules
4. APHICIDE(2)	Aphicide on 10 July:	
	NONE	NONE
	DIMETH	Dimethoate at 0.34 kg in 220 l

NOTE: Tridemorph applied to surrounds at 0.53 kg in 340 l on 14 June.

Basal applications: Manures: (20:14:14) at 440 kg, combine drilled. Weedkillers: Dicamba with mecoprop and MCPA (as 'Banlene Plus' at 4.9 l in 220 l).

Seed: Wing, sown at 160 kg.

Cultivations, etc.:- Ploughed: 21 Dec, 1977. Spring-tine cultivated all plots: 7 Mar, 1978. Power harrowed for early sowing: 8 Mar. Power harrowed for late sowing: 24 Apr. Weedkillers applied to early sowing: 18 May. Weedkillers applied to late sowing: 26 May. Early-sown plots combine harvested: 21 Aug. Late-sown plots combine harvested: 25 Aug. Previous crops: Potatoes 1976, barley 1977.

NOTE: Emergence counts were made for both sowings. Aphid counts were made on seven occasions and virus scores six times. Tiller counts were made once, and counts of grains per ear were made at harvest.

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78/R/B/10

GRAIN TONNES/HECTARE

***** TABLES OF MEANS *****

FUNGCIDE SOW DATE	NONE	ETHIRIMO	MEAN
8 MAR	5.50	6.14	5.82
24 APR	5.01	4.82	4.91
MEAN	5.25	5.48	5.37

APHICIDE(1) SOW DATE	NONE	PHORATE	MEAN
8 MAR	5.75	5.89	5.82
24 APR	4.81	5.01	4.91
MEAN	5.28	5.45	5.37

APHICIDE(1) FUNGCIDE	NONE	PHORATE	MEAN
NONE	5.18	5.33	5.25
ETHIRIMO	5.39	5.57	5.48
MEAN	5.28	5.45	5.37

APHICIDE(2) SOW DATE	NONE	DIMETH	MEAN
8 MAR	5.87	5.77	5.82
24 APR	4.84	4.98	4.91
MEAN	5.36	5.37	5.37

APHICIDE(2) FUNGCIDE	NONE	DIMETH	MEAN
NONE	5.28	5.23	5.25
ETHIRIMO	5.44	5.52	5.48
MEAN	5.36	5.37	5.37

APHICIDE(2) APHICIDE(1)	NONE	DIMETH	MEAN
NONE	5.35	5.22	5.28
PHORATE	5.37	5.53	5.45
MEAN	5.36	5.37	5.37

FUNGCIDE	NONE		ETHIRIMO	
APHICIDE(1)	NONE	PHORATE	NONE	PHORATE
SOW DATE				
8 MAR	5.53	5.47	5.98	6.30
24 APR	4.84	5.18	4.79	4.85

FUNGCIDE	NONE		ETHIRIMO	
APHICIDE(2)	NONE	DIMETH	NONE	DIMETH
SOW DATE				
8 MAR	5.51	5.49	6.24	6.04
24 APR	5.06	4.96	4.63	5.01

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78/R/B/10

GRAIN TONNES/HECTARE

***** TABLES OF MEANS *****

APHICIDE(1)	NONE		PHORATE	
APHICIDE(2)	NONE	DIMETH	NONE	DIMETH
SOW DATE				
8 MAR	5.89	5.61	5.86	5.92
24 APR	4.81	4.82	4.88	5.15

APHICIDE(1)	NONE		PHORATE	
APHICIDE(2)	NONE	DIMETH	NONE	DIMETH
FUNGCIDE				
NONE	5.27	5.10	5.30	5.36
ETHIRIMO	5.44	5.33	5.44	5.71

APHICIDE(1)		NONE		PHORATE	
APHICIDE(2)		NONE	DIMETH	NONE	DIMETH
SOW DATE	FUNGCIDE				
8 MAR	NONE	5.65	5.41	5.37	5.58
	ETHIRIMO	6.14	5.82	6.34	6.26
24 APR	NONE	4.89	4.79	5.22	5.13
	ETHIRIMO	4.73	4.85	4.53	5.17

***** STANDARD ERRORS OF DIFFERENCES OF MEANS *****

TABLE	SOW DATE	FUNGCIDE	APHICIDE(1)	APHICIDE(2)
SED	0.104	0.104	0.104	0.104

TABLE	SOW DATE FUNGCIDE	SOW DATE APHICIDE(1)	FUNGCIDE APHICIDE(1)	SOW DATE APHICIDE(2)
SED	0.147	0.147	0.147	0.147

TABLE	FUNGCIDE APHICIDE(2)	APHICIDE(1) APHICIDE(2)	SOW DATE FUNGCIDE APHICIDE(1)	SOW DATE FUNGCIDE APHICIDE(2)
SED	0.147	0.147	0.207	0.207

TABLE	SOW DATE APHICIDE(1) APHICIDE(2)	FUNGCIDE APHICIDE(1) APHICIDE(2)
SED	0.207	0.207

***** STRATUM STANDARD ERRORS AND COEFFICIENTS OF VARIATION *****

STRATUM	DF	SE	CV%
BLOCK.WP	14	0.293	5.5

GRAIN MEAN DM% 84.6

PLOT AREA HARVESTED 0.00260

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78/R/B/17

SPRING BARLEY

MILDEW CONTROL IN A SERIALLY BALANCED DESIGN

Object: To study the effects of two fungicides and the effects of interference between plots on the incidence of mildew and on yield - Webbs.

Sponsors: J.F. Jenkyn, G.V. Dyke.

Design: 8 'blocks' of 3 plots (+ flanking plots).

Whole plot dimensions: 4.27 x 9.14.

Treatments:

FUNGCIDE	Fungicides
NONE	None
TRIADIME	Triadimefon
TRIDEMOR	Tridemorph

NOTES: (1) Treatments were applied to 26 plots in one line in an order such that each of the possible sets of 3 adjacent treatments occurred exactly twice, (omitting sets with the same treatments on 2 successive plots). The effects of treatments to neighbouring plots (left-hand neighbour LHN, right-hand neighbour RHN) are estimated in the analysis. In this experiment 'left' was east and 'right' was west.

(2) Fungicide treatments were applied on 7 June, 1978. Tridemorph was applied at 0.53 kg in 340 l, triadimefon at 0.13 kg in 340 l.

(3) The experiment had an 18 m surround sown to barley variety Wing, seed dressed ethirimol, sprayed tridemorph at 0.53 kg in 340 l on 14 June.

Basal applications: Manures: (20:14:14) at 440 kg combine drilled. Weedkillers: Dicamba with mecoprop and MCPA ('Banlene Plus' at 4.9 kg) in 220 l.

Seed: Julia, sown at 160 kg.

Cultivations, etc.:- Ploughed: 21 Dec, 1977. Spring-tine cultivated twice: 7 Mar, 1978, 25 Mar. Seed sown: 25 Mar. Weedkillers applied: 18 May. Combine harvested: 21 Aug. Previous crops: Potatoes 1976, barley 1977.

NOTE: Seedling emergence counts were made. Mildew was assessed on two occasions.

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78/R/B/17

GRAIN TONNES/HECTARE

***** TABLES OF MEANS *****

VARIATE: GRAIN (AT 85% DM) TONNES/HECTARE

GRAND MEAN 6.76

FUNGCIDE	NONE	TRIADIME	TRIDEMOR
	6.13	7.21	6.95

LHN FUNGCIDE	NONE	TRIADIME	TRIDEMOR
NONE		6.00	6.25
TRIADIME	7.29		7.13
TRIDEMOR	6.99	6.90	

RHN FUNGCIDE	NONE	TRIADIME	TRIDEMOR
NONE		6.08	6.17
TRIADIME	7.26		7.16
TRIDEMOR	7.09	6.80	

***** STANDARD ERRORS OF DIFFERENCES OF MEANS *****

TABLE	FUNGCIDE	FUNGCIDE LHN	FUNGCIDE RHN
REP	8	4	4
SED	0.237	0.335	0.335

***** STRATUM STANDARD ERRORS AND COEFFICIENTS OF VARIATION *****

STRATUM	DF	SE	CV%
WP	11	0.473	7.0

GRAIN MEAN DM% 84.3

PLOT AREA HARVESTED 0.00172

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78/R/B/18

SPRING BARLEY

MIXED VARIETIES AND MILDEW

Object: To study the effects of variety mixtures and different fungicides on mildew development and yield - Summerdells II.

Sponsor: J.F. Jenkyn.

Design: 4 randomised blocks of 9 plots.

Whole plot dimensions: 6.40 x 9.14.

Treatments:

VAR FUNG	Varieties and fungicides:
H 0	Hassan, no fungicide
M 0	Midas, no fungicide
W 0	Wing, no fungicide
H T	Hassan, seed treated triforine
W E	Wing, seed treated ethirimol
HO MO WO	Mixture of the three varieties, no fungicide
HO MO WE	Mixture of the three varieties. Ethirimol seed treatment to Wing only
HT MO WO	Mixture of the three varieties. Triforine seed treatment to Hassan only
HT MO WE	Mixture of the three varieties. Triforine seed treatment to Hassan, none to Mazurka, ethirimol to Wing

NOTE: All plots were separated at their sides by 10.7 m of variety Proctor, seed dressed ethirimol, and at their ends by 12 m of variety Proctor, seed dressed organo-mercury. All the Proctor was sprayed with tridemorph at 0.53 kg in 220 l on 14 June, 1978. Yields were taken from the Proctor adjacent to the sides of plots, and used for covariance analysis.

Basal applications: Manures: (20:14:14) at 440 kg, combine drilled. Weedkillers: Dicamba with mecoprop and MCPA ('Banlene Plus' at 4.9 l in 220 l).

Seed: All seed sown at 160 kg except internal headlands sown at 78 kg.

Cultivations, etc.:- Ploughed: 23 Nov, 1977. Spring-tine cultivated twice: 15 Mar, 1978. Heavy spring-tine cultivated, rotary harrowed, seed sown on plots (and covariate plots): 10 Apr. Seed sown on headlands and surrounds: 17 Apr. Weedkiller applied: 24 May. Combine harvested: 9 Sept. Previous crops: W. oats 1976, s. wheat 1977.

NOTE: Seedling emergence counts were made. Mildew was assessed on three occasions.

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78/R/B/18

GRAIN TONNES/HECTARE

***** TABLES OF MEANS *****

VAR FUNG	
H O	4.44
M O	5.09
W O	4.86
H T	4.60
W E	4.82
HO MO WO	4.83
HO MO WE	5.18
HT MO WO	4.87
HT MO WE	4.92
MEAN	4.85

***** STANDARD ERRORS OF DIFFERENCES OF MEANS *****

TABLE	VAR FUNG
SED	0.215

***** STRATUM STANDARD ERRORS AND COEFFICIENTS OF VARIATION *****

STRATUM	DF	SE	CV%
BLOCK.WP	23	0.300	6.2

GRAIN MEAN DM% 80.8

PLOT AREA HARVESTED 0.00260

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78/R/O/1

WINTER OATS

SOWING DATES AND INSECTICIDES

Object: To study the effects of dates of sowing and times of applying insecticides on the incidence of cereal aphids, barley yellow dwarf virus (BYDV) and on the yield of winter oats - White Horse II.

Sponsor: R.T. Plumb.

Design: 3 randomised blocks of 12 plots.

Whole plot dimensions: 6.40 x 18.3.

Treatments: All combinations of:-

1. SOW DATE Sowing dates:

30 SEP	30 September, 1977
28 OCT	28 October
25 NOV	25 November

2. INSCTCDE(1) Phorate granules to seedbed:

NONE	None
PHORATE	Phorate at 5 kg

3. INSCTCDE(2) Menazon spray:

NONE	None
MENAZON	Menazon (0.7 l 'Saphi-Col' in 220 l on 14 June, 1978).

Basal applications: Manures: (0:20:20) at 310 kg, combine drilled. 'Nitra-Shell 34' at 270 kg. Weedkillers: Mecoprop at 2.8 kg in 220 l.

Seed: Peniarth, sown at 190 kg.

Cultivations, etc.:- Ploughed: 1 Sept, 1977. Heavy spring-tine cultivated: 16 Sept. Rotary harrowed: 28 Sept. Treatment applied to SOW DATE 30 SEP and these plots only rotary harrowed and sown: 30 Sept, and rolled: 3 Oct. Treatments applied to SOW DATE 28 OCT and these plots only power harrowed and sown: 28 Oct. Treatments applied to SOW DATE 25 NOV and these plots only rotary harrowed, sown and spring-tine cultivated: 25 Nov. N applied: 9 Apr, 1978. Weedkiller applied: 25 Apr. Combine harvested: 14 Aug.

NOTE: Plant emergence counts and aphid and virus assessments were made during the season, counts of grains per panicle were made shortly before harvest.

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78/R/O/1

GRAIN TONNES/HECTARE

***** TABLES OF MEANS *****

INSCTCDE(1) SOW DATE	NONE	PHORATE	MEAN
30 SEP	6.71	6.94	6.82
28 OCT	6.23	6.24	6.24
25 NOV	5.88	5.97	5.92
MEAN	6.27	6.38	6.33

INSCTCDE(2) SOW DATE	NONE	MENAZON	MEAN
30 SEP	6.77	6.88	6.82
28 OCT	6.31	6.16	6.24
25 NOV	6.04	5.81	5.92
MEAN	6.37	6.28	6.33

INSCTCDE(2) INSCTCDE(1)	NONE	MENAZON	MEAN
NONE	6.26	6.28	6.27
PHORATE	6.48	6.29	6.38
MEAN	6.37	6.28	6.33

INSCTCDE(1)	NONE		PHORATE	
INSCTCDE(2)	NONE	MENAZON	NONE	MENAZON
SOW DATE				
30 SEP	6.60	6.82	6.95	6.94
28 OCT	6.29	6.17	6.33	6.16
25 NOV	5.89	5.86	6.18	5.76

***** STANDARD ERRORS OF DIFFERENCES OF MEANS *****

TABLE	SOW DATE	INSCTCDE(1)	INSCTCDE(2)	SOW DATE INSCTCDE(1)
SED	0.118	0.096	0.096	0.166

TABLE	SOW DATE INSCTCDE(2)	INSCTCDE(1) INSCTCDE(2)	SOW DATE INSCTCDE(1) INSCTCDE(2)
SED	0.166	0.136	0.235

***** STRATUM STANDARD ERRORS AND COEFFICIENTS OF VARIATION *****

STRATUM	DF	SE	CV%
BLOCK.WP	22	0.288	4.6

GRAIN MEAN DM% 79.7

PLOT AREA HARVESTED 0.00260

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78/R/BE/1

WINTER BEANS

CONTROL OF CHOCOLATE SPOT

Object: To study the effects of irrigation and benomyl on Chocolate Spot (Botrytis spp.) and yield of winter beans - Long Hoos I/II.

Sponsors: A. Bainbridge, M.E. Finney.

Design: 2 blocks, each a 4 x 4 Latin square (with IRRIGTN on blocks)

Whole plot dimensions: 4.27 x 9.14.

Treatments: All combinations of:-

Blocks

1. IRRIGTN	Irrigation:
NONE	None
FULL	Full (72.5 mm)

Plots

2. BENOMYL	Frequency of applying benomyl (at 0.56 kg in 340 l on each occasion):-
0+0+0+0	Never
0+1+1+0	Twice, on 26 May, 1978 and 16 June
0+1+1+1	Three times, on 26 May, 16 June, 18 July
1+1+1+1	Four times, on 28 Apr, 26 May, 16 June, 18 July

NOTE: IRRIGTN FULL plots were given 12.5 mm of irrigation on each of the following dates: 29 May, 31 May, 14 June, 19 June, 17 July and 10 mm on 25 July.

Basal applications: Manures: Chalk at 7.5 t.

Seed: Throws MS sown at 250 kg.

Cultivations, etc.:- Ploughed: 20 Sept, 1977. Rolled: 3 Oct. Chalk applied: 11 Oct. Heavy spring-tine cultivated: 12 Oct. Rotary harrowed: 13 Oct. Seed sown: 14 Oct. Combine harvested: 19 Sept. Previous crops: Wheat 1976, barley 1977.

NOTE: Counts were made of seedling emergence, percentage leaf area affected by Botrytis spp, stems per row, and pods per stem.

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78/R/BE/1

GRAIN TONNES/HECTARE

IRRIGATN NONE

***** TABLES OF MEANS *****

BENOMYL	0+0+0+0	0+1+1+0	0+1+1+1	1+1+1+1	MEAN
	5.82	6.13	6.61	6.74	6.33

***** STANDARD ERRORS OF DIFFERENCES OF MEANS *****

TABLE	BENOMYL
SED	0.123

***** STRATUM STANDARD ERRORS AND COEFFICIENTS OF VARIATION *****

STRATUM	DF	SE	CV%
ROW.COLUMN	6	0.174	2.8

GRAIN TONNES/HECTARE

IRRIGATN FULL

***** TABLES OF MEANS *****

BENOMYL	0+0+0+0	0+1+1+0	0+1+1+1	1+1+1+1	MEAN
	4.65	5.13	5.55	5.82	5.29

***** STANDARD ERRORS OF DIFFERENCES OF MEANS *****

TABLE	BENOMYL
SED	0.549

***** STRATUM STANDARD ERRORS AND COEFFICIENTS OF VARIATION *****

STRATUM	DF	SE	CV%
ROW.COLUMN	6	0.776	14.7

GRAIN MEAN DM% 84.0

PLOT AREA HARVESTED 0.00279

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78/R/BE/2

WINTER BEANS

CONTROL OF SITONA

Object: To study the effects of three chemicals on the control of Sitona larvae and on the yield of winter beans - Long Hoos I/II.

Sponsors: R. Bardner, K.E. Fletcher, D.C. Griffiths.

Design: 4 randomised blocks of 5 plots.

Whole plot dimensions: 5.33 x 13.7.

Treatments:

CHEMICAL	Chemicals and times of application:
NONE	None (duplicated)
ALDICARB	Aldicarb at 5 kg applied to the seedbed
FONOFOS	Fonofos at 5 kg applied to the seedbed
PERMETH	Permethrin at 0.15 kg applied as foliar spray in 340 l on 11 May, 1978

Basal applications: Manures: Chalk at 7.5 t. Fungicide: Benomyl at 0.56 kg in 220 l.

Seed: Throws MS, sown at 250 kg.

Cultivations, etc.:- Ploughed: 20 Sept, 1977. Chalk applied: 11 Oct. Heavy spring-tine cultivated: 12 Oct. Treatments applied, rotary harrowed in and seed sown: 16 Nov. Fungicide applied: 19 May, 1978. Combine harvested: 19 Sept. Previous crops: Wheat 1976, barley 1977.

NOTE: Sitona damage to leaves and stems was assessed in April and May. Incidence of Sitona larvae was assessed in June and July. Aldicarb residues in plants and soil were assessed in November and May.

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78/R/BE/2

GRAIN TONNES/HECTARE

***** TABLES OF MEANS *****

CHEMICAL	NONE	ALDICARB	FONOFOS	PERMETH	MEAN
	4.88	4.74	4.46	4.87	4.77

***** STANDARD ERRORS OF DIFFERENCES OF MEANS *****

TABLE	CHEMICAL	
SED	0.268	MIN REP
	0.232	MAX-MIN

	CHEMICAL
MAX-MIN	NONE V ANY OF REMAINDER
MIN REP	ANY OF REMAINDER

***** STRATUM STANDARD ERRORS AND COEFFICIENTS OF VARIATION *****

STRATUM	DF	SE	CV%
BLOCK.WP	13	0.379	8.0

GRAIN MEAN DM% 83.8

PLOT AREA HARVESTED 0.00279

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78/R/BE/5

SPRING BEANS

APHIDS AND ENTOMOPHTHORA

Object: To study the effects of a range of factors on the incidence of Entomophthora infection of aphids and on the yield of spring beans - Gt. Knott I.

Sponsor: N. Wilding.

Design: One experiment (78/R/BE/5/1) 4 randomised blocks of 3 plots
One experiment (78/R/BE/5/2) 3 randomised blocks of 8 plots

Whole plot dimensions: 9.22 x 9.14.

Treatments to 78/R/BE/5/1 (all plots irrigated - total 49 mm):

TREATMNT(1)	Biological and chemical control of aphids:
NONE	None
ENT APH	Entomophthora species applied in live infected aphids
PIRIMICA	Insecticide: Pirimicarb at 0.14 kg in 340 l

Treatments to 78/R/BE/5/2 (all plots unirrigated):

TREATMNT(2)	Biological and chemical control of aphids, fungicides to control Entomophthora:
NONE	None
ENT APH	Entomophthora species applied in live infected aphids
CARBARYL	Insecticide: Carbaryl at 1.49 kg
PIRIMICA	Insecticide: Pirimicarb at 0.14 kg
BENOMYL	Fungicide: Benomyl at 0.61 kg
CAPTAFOL	Fungicide: Captafol at 1.74 kg
MANCOZEB	Fungicide: Mancozeb at 1.36 kg
TRIDEMOR	Fungicide: Tridemorph at 0.52 kg

NOTES: (1) On all treatments except PIRIMICA aphid colonies were artificially established between 31 May, 1978 and 2 June (10-20 colonies were initiated in each 9.14 m length of row).
(2) All spray treatments were applied in 340 l.
(3) Sprays were applied on the following dates:- Pirimicarb: 19 June, 1978. Carbaryl: 12, 28 June and 6 July. Mancozeb, captafol, benomyl and tridemorph: 19 and 28 June, 6, 13, 19 and 26 July.
(4) Irrigation was applied to BE/5/1 at 25 mm on 1 June, 1978 and 8 mm on each of 19 June, 21 and 25 July.

Basal applications: Manures: FYM at 35 t. Weedkillers: Simazine at 1.1 kg in 220 l. Paraquat at 0.6 kg ion in 220 l.

Seed: Minden, sown at 200 kg.

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78/R/BE/5

Cultivations, etc.:- Paraquat applied: 8 Nov, 1977. FYM applied, ploughed: 24 Nov. Rotary harrowed: 8 Mar, 1978. Seed sown: 9 Mar. Simazine applied to BE/5/2: 25 Mar, to BE/5/1: 30 Mar. Combine harvested: 25 Sept. Previous crops: Winter barley (BE/5/2), wheat (BE/5/1) 1976, wheat 1977.

NOTE: Weekly assessments of aphid population density and proportion of aphids infected with Entomophthora were made from June to August.

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78/R/BE/5/1

GRAIN TONNES/HECTARE

***** TABLES OF MEANS *****

TREATMNT(1)	NONE	ENT APH	PIRIMICA	MEAN
	5.33	5.65	5.22	5.40

***** STANDARD ERRORS OF DIFFERENCES OF MEANS *****

TABLE	TREATMNT(1)
SED	0.448

***** STRATUM STANDARD ERRORS AND COEFFICIENTS OF VARIATION *****

STRATUM	DF	SE	CV%
BLOCK.WP	6	0.634	11.7

GRAIN MEAN DM% 81.6

PLOT AREA HARVESTED 0.00244

78/R/BE/5/2

GRAIN TONNES/HECTARE

***** TABLES OF MEANS *****

TREATMNT(2)	
NONE	4.36
ENT APH	4.89
CARBARYL	4.09
PIRIMICA	5.13
BENOMYL	5.29
CAPTAFOL	4.76
MANCOZEB	5.12
TRIDEMOR	4.40
MEAN	4.75

***** STANDARD ERRORS OF DIFFERENCES OF MEANS *****

TABLE	TREATMNT(2)
SED	0.412

***** STRATUM STANDARD ERRORS AND COEFFICIENTS OF VARIATION *****

STRATUM	DF	SE	CV%
BLOCK.WP	14	0.504	10.6

GRAIN MEAN DM% 81.2

PLOT AREA HARVESTED 0.00244

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78/R/BE/6

SPRING BEANS

COMPARISON OF SPRAYERS

Object: To study the performance of an electrostatic spraying system on distribution of spray material and on yield of beans - Gt. Harpenden II.

Sponsor: A.J. Arnold.

Design: 3 randomised blocks of 6 plots.

Whole plot dimensions: 2.67 x 9.14.

Treatments:

SPRAYER	Sprayer used to apply permethrin:
NONE	None (duplicated)
E C C	Electrostatic sprayer, spraying charged particles with controlled current
E C N	Electrostatic sprayer, spraying charged particles with normal current
E U	Electrostatic sprayer, spraying uncharged particles
F U	Standard farm sprayer, spraying uncharged particles

NOTES: (1) Electrostatic sprayer applied permethrin at 84 g in 34 l.
(2) Farm sprayer applied permethrin at 84 g in 340 l.
(3) Permethrin was applied as a water-based spray. A planned comparison of oil and water-based sprays was not achieved.
(4) Sprays were applied on 11 July, 1978.

Basal applications: Manures: Chalk at 7.5 t.

Seed: Minden, sown at 200 kg.

Cultivations, etc.:- Chalk applied: 12 Oct, 1977. Ploughed: 11 Nov. Spring-tine cultivated: 9 Mar, 1978. Heavy spring-tine cultivated, seed sown: 11 Mar. Tractor hoed: 19 May and 8 June. Combine harvested: 25 Sept. Previous crops: Barley 1976 and 1977.

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78/R/BE/6

GRAIN TONNES/HECTARE

***** TABLES OF MEANS *****

SPRAYER	NONE	E C C	E C N	E U	F U	MEAN
	5.69	5.72	5.97	5.74	6.04	5.81

***** STANDARD ERRORS OF DIFFERENCES OF MEANS *****

TABLE	SPRAYER	
SED	0.541	MIN REP
	0.468	MAX-MIN

	SPRAYER
MAX-MIN	NONE V ANY OF REMAINDER
MIN REP	ANY OF REMAINDER

***** STRATUM STANDARD ERRORS AND COEFFICIENTS OF VARIATION *****

STRATUM	DF	SE	CV%
BLOCK.WP	11	0.662	11.4

GRAIN MEAN DM% 83.9

PLOT AREA HARVESTED 0.00244

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78/R/BE/8

SPRING BEANS

RED TICK LINES

Object: To compare agronomic characters and yields of several lines of red-seeded field beans with two standard white varieties - Garden Plot 15.

Sponsor: J. McEwen.

Design: 4 randomised blocks of 7 plots.

Whole plot dimensions: 2.03 x 2.13.

Treatments:

VARIETY	Varieties:
RT1-RT4	Four red-seeded lines selected at Rothamsted
RT B	Bulk seed from the four red-seeded lines
BLAZE	Maris Blaze (white-seeded)
MINDEN	Minden (white-seeded)

NOTE: Seed was sown by hand in rows 51 cm apart, seed spaced 5 cm apart in the row.

Basal applications: Manures: (0:14:28) at 720 kg. Chalk at 2.9 t. Weedkiller: Simazine at 0.84 kg in 340 l. Insecticide: Permethrin at 0.15 kg in 340 l on 2 occasions. Pirimicarb at 0.14 kg in 340 l.

Cultivations, etc.:- PK applied: 4 Oct, 1977. Ploughed: 24 Nov. Power harrowed, seed sown: 6 Apr, 1978. Weedkiller applied: 24 Apr. Permethrin applied: 17 May and 9 June. Pirimicarb applied: 5 July. Harvested by hand: 5 Oct. Previous crops: Potatoes 1976, barley 1977.

NOTE: Plant counts were made after establishment and again before harvest. Components of yield were measured at harvest. Nitrogen percentages of grain were measured.

GRAIN TONNES/HECTARE

***** TABLES OF MEANS *****

VARIETY	RT1	RT2	RT3	RT4	RT B	BLAZE	MINDEN	MEAN
	6.25	5.22	6.57	5.83	6.37	7.12	6.62	6.28

***** STANDARD ERRORS OF DIFFERENCES OF MEANS *****

TABLE	VARIETY
SED	0.344

***** STRATUM STANDARD ERRORS AND COEFFICIENTS OF VARIATION *****

STRATUM	DF	SE	CV%
BLOCK.WP	18	0.487	7.7

GRAIN MEAN DM% 85.4

PLOT AREA HARVESTED 0.00015

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78/R/BE/9

SPRING BEANS

DRILLS AND PLANT POPULATIONS

Object: To study the effects of precision sowing, plant populations and pathogen control on yields and incidence of pests and diseases - Gt. Harpenden II.

Sponsors: R. Bardner, A.J. Cockbain, J.M. Day, K.E. Fletcher, J. McEwen, R.J. Roughley, G.A. Salt, J.F. Witty.

Design: 3 randomised blocks of 2 plots split into 8 sub plots.

Whole plot dimensions: 18.2 x 38.4.

Treatments: All combinations of:-

Whole plots

1. PATHCONT — Pathogen control:

STANDARD	Standard, pirimicarb foliar spray only
ENHANCED	Aldicarb at 10 kg to seedbed plus pirimicarb foliar spray

Sub plots

2. DRILL — Drill and row spacing:

MF 18	Massey-Ferguson, irregularly spacing seed in rows 18 cm (7 ins) apart
ST 20	Stanhay, precision-sown in rows 20 cm (8 ins) apart

3. POPULATN — Populations of plants:

	Population planned	Population achieved MF 18	Population achieved ST 20
3	300,000	147,000	126,000
4	400,000	187,000	203,000
5	500,000	276,000	188,000
6	600,000	348,000	272,000

NOTE: Seedbed conditions were unusually poor and both drills malfunctioned leading to gaps in rows and a failure to achieve the planned populations. The yields reported from these treatments should not be regarded as representing those likely under normal conditions.

Basal applications: Manures: Chalk applied at 7.5 t. Weedkiller: Simazine at 0.56 kg in 220 l. Insecticide: Pirimicarb at 0.14 kg in 220 l.

Seed: Minden.

Cultivations, etc.:- Chalk applied: 12 Oct, 1977. Ploughed: 11 Nov. Spring-tine cultivated: 9 Mar, 1978. Test aldicarb applied: 13 Mar. Spike rotary cultivated after treatments: 15 Mar. Spring-tine cultivated: 6 Apr. Harrowed, seed sown: 7 Apr. Weedkiller applied: 17 Apr. Insecticide applied: 10 July. Combine harvested: 29 Sept. Previous crops: Barley 1976 and 1977.

NOTE: Plant counts were made after establishment and again before harvest. Components of yield were measured before harvest. Nitrogenase activity of the roots was measured at fortnightly intervals. Incidence of Sitona and viruses was measured at intervals through the season.

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78/R/BE/9

GRAIN TONNES/HECTARE

***** TABLES OF MEANS *****

DRILL PATHCONT	MF 18	ST 20	MEAN
STANDARD	5.21	5.02	5.12
ENHANCED	5.37	5.55	5.46
MEAN	5.29	5.29	5.29

POPULATN PATHCONT	3	4	5	6	MEAN
STANDARD	4.22	5.58	5.22	5.44	5.12
ENHANCED	4.78	5.66	5.44	5.94	5.46
MEAN	4.50	5.62	5.33	5.69	5.29

POPULATN DRILL	3	4	5	6	MEAN
MF 18	4.30	5.47	5.47	5.90	5.29
ST 20	4.70	5.77	5.19	5.48	5.29
MEAN	4.50	5.62	5.33	5.69	5.29

POPULATN	3	4	5	6
PATHCONT DRILL				
STANDARD MF 18	4.03	5.54	5.35	5.90
STANDARD ST 20	4.40	5.62	5.09	4.98
ENHANCED MF 18	4.57	5.41	5.60	5.90
ENHANCED ST 20	4.99	5.92	5.29	5.98

***** STANDARD ERRORS OF DIFFERENCES OF MEANS *****

TABLE	PATHCONT	DRILL	POPULATN	PATHCONT DRILL
SED	0.240	0.152	0.216	0.284
EXCEPT WHEN COMPARING MEANS WITH SAME LEVEL(S) OF:				
PATHCONT				0.216

TABLE	PATHCONT POPULATN	DRILL POPULATN	PATHCONT DRILL POPULATN
SED	0.357	0.305	0.469
EXCEPT WHEN COMPARING MEANS WITH SAME LEVEL(S) OF:			
PATHCONT	0.305		0.431

***** STRATUM STANDARD ERRORS AND COEFFICIENTS OF VARIATION *****

STRATUM	DF	SE	CV%
BLOCK.WP.SP	28	0.528	10.0

GRAIN MEAN DM% 80.4

SUB PLOT AREA HARVESTED 0.00251

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78/R/BE/13

SPRING BEANS

COMPARISON OF FUNGICIDES

Object: To study the effects of a range of fungicides and methods of application on the incidence of diseases and on yield - Fosters O & E IV.

Sponsors: G.A. Salt, J. McEwen, D. Yeoman.

Design: 3 randomised blocks of 12 plots.

Whole plot dimensions: 2.03 x 2.13.

Treatments: All combinations of:-

1. FUNGCIDE — Fungicide:

AL TRI	Aluminium tris (ethylphosphonate). 'Aliette'
BEN	Benomyl
DL ME	DL-methyl N-(2,6 dimethylphenyl)-N-(2 methoxyacetyl) alaninate. 'Ridomil'
THIABEND	Thiabendazole

2. METHOD — Method of application:

FOLIAR	Foliar spray
SEEDRESS	Seed dressing (using a methyl cellulose sticker)

plus four extra treatments:

EXTRA

NONE	No fungicides
NONE S	No fungicides, seed treated with methyl cellulose sticker
BEN SB	Benomyl worked in to seedbed
DL ME SB	'Ridomil' worked in to seedbed

NOTES: (1) Rates of application were as follows (foliar sprays were applied in 1250 l):

	Seedbed kg	Seed dressing g/kg seed	Foliar spray kg
AL TRI	-	4.0	3.38
BEN	20.0	8.8	0.50
DL ME	1.5	0.4	0.34
THIABEND	-	11.3	0.50

(2) Seed was sown by hand in rows 51 cm apart, seed spaced 5 cm apart in the row.

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78/R/BE/13

Basal applications: Weedkillers: Simazine at 0.84 kg in 340 l. Insecticides: Permethrin at 0.15 kg in 340 l. Pirimicarb at 0.14 kg in 340 l.

Seed: Minden.

Cultivations, etc.:- Ploughed: 11 Oct, 1977. Spring-tine cultivated, seedbed treatments applied: 15 Mar, 1978. Rotary cultivated, seed sown: 31 Mar. Simazine applied: 24 Apr. Weedkiller applied: 10 May. Permethrin applied: 17 May. Pirimicarb applied: 5 July. Foliar spray treatments applied: 18 July. Harvested by hand: 11 Oct. Previous crops: Fallow 1976, spring oats 1977.

NOTE: Observations were made on root and foliar diseases during the season.

GRAIN TONNES/HECTARE

***** TABLES OF MEANS *****

METHOD / FUNGCIDE	FOLIAR	SEEDRESS	MEAN
AL TRI	5.66	5.80	5.73
BEN	5.70	6.00	5.85
DL ME	5.81	5.62	5.71
THIABEND	5.54	4.59	5.07
MEAN	5.68	5.50	5.59

EXTRA	NONE	NONE S	BEN SB	DL ME SB	MEAN
	5.67	5.79	5.39	5.43	5.57

GRAND MEAN 5.58

***** STANDARD ERRORS OF DIFFERENCES OF MEANS *****

TABLE	EXTRA	FUNGCIDE	METHOD	FUNGCIDE METHOD & EXTRA
SED	0.441	0.312	0.220	0.441

***** STRATUM STANDARD ERRORS AND COEFFICIENTS OF VARIATION *****

STRATUM	DF	SE	CV%
BLOCK.WP	22	0.540	9.7

GRAIN MEAN DM% 80.7

PLOT AREA HARVESTED 0.00015

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78/R/BE/14

SPRING BEANS

TIMES OF APPLYING PERMETHRIN

Object: To study the effects of applying foliar sprays of permethrin at a range of dates on the incidence of Sitona and on the yield of spring beans - Gt. Harpenden II.

Sponsors: R. Bardner, D.C. Griffiths, K.E. Fletcher.

Design: 4 randomised blocks of 5 plots.

Whole plot dimensions: 5.33 x 9.14.

PER DATE	Dates of applying permethrin (at 150 g on each occasion):
-	Not applied
11 MAY	Single spray on 11 May
9 JUNE	Single spray on 9 June
6 JULY	Single spray on 6 July
MA JN JL	Sprayed on all three above dates

NOTE: Permethrin was applied in 340 l.

Basal applications: Manures: Chalk at 7.5 t. Insecticide: Pirimicarb at 0.14 kg in 220 l.

Seed: Minden, sown at 200 kg.

Cultivations, etc.:- Chalk applied: 12 Oct, 1977. Ploughed: 11 Nov. Spring-tine cultivated: 9 Mar, 1978. Heavy spring-tine cultivated, seed sown: 11 Mar. Tractor hoed: 19 May and 8 June. Basal insecticide applied: 10 July. Combine harvested: 25 Sept. Previous crops: Barley 1976 and 1977.

NOTE: Sitona damage to leaves was assessed in May. Incidence of Sitona larvae was assessed in June and July. Aphid incidence was assessed before and after treatments were applied. Persistence of permethrin was assessed.

GRAIN TONNES/HECTARE

***** TABLES OF MEANS *****

PER DATE	-	11 MAY	9 JUNE	6 JULY	MA JN JL	MEAN
	4.88	5.02	5.25	5.17	4.96	5.06

***** STANDARD ERRORS OF DIFFERENCES OF MEANS *****

TABLE	PER DATE
SED	0.262

***** STRATUM STANDARD ERRORS AND COEFFICIENTS OF VARIATION *****

STRATUM	DF	SE	CV%
BLOCK.WP	12	0.371	7.3

GRAIN MEAN DM% 84.6 PLOT AREA HARVESTED 0.00293

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78/R/PE/1 and 78/W/PE/1

PEAS

CONTROL OF PATHOGENS

Object: To study the effects of a range of pesticides on the incidence of pathogens and on the yield of leafless peas - Rothamsted (R), Long Hoos V 2 and Woburn (W) Gt. Hill Bottom I.

Sponsors: A.J. Cockbain, K.E. Fletcher, J. McEwen, G.A. Salt, C. Wall, A.G. Whitehead.

Design: 3 blocks of 2 x 2 x 2. Randomisation restricted.

Whole plot dimensions: 4.19 x 5.49.

Treatments: All combinations of:-

1. NEMACIDE — Nematicide:

   NONE — None
   ALDICARB — Aldicarb at 10 kg to the seedbed

2. INSCTCDE — Insecticide:

   NONE — None
   TRIAZOPH — Triazophos at 0.34 l in 680 l

3. FUNGCIDE — Fungicide:

   NONE — None
   BEN+ZIN — Benomyl at 0.56 + zineb at 1.6 kg in 340 l

Basal applications:
Long Hoos V 2 (R): Manures: (0:14:28) at 720 kg. Weedkillers: Trietazine plus simazine ('Remtal' at 2.2 kg in 340 l). Desiccant: Diquat at 0.78 kg ion in 340 l.
Great Hill Bottom I (W): Manures: (0:14:28) at 340 kg. Weedkillers: Trietazine plus simazine ('Remtal' at 1.7 kg in 340 l).

Seed: Filby, sown at 220 kg, on both sites.

Cultivations, etc.:-
Long Hoos V 2 (R): PK applied: 3 Oct, 1977. Ploughed: 10 Oct. Spring-tine cultivated: 13 Mar, 1978. Aldicarb applied, power harrowed, seed sown: 6 Apr. Weedkiller applied: 24 Apr. Insecticide and fungicide treatments applied: 12 July. Haulm desiccant applied: 5 Sept. Combine harvested: 13 Sept. Previous crops: Oats 1976, spring wheat 1977.
Great Hill Bottom I (W): Spring-tine cultivated twice: 13 Mar, 1978, 15 Mar. PK applied, spring-tine cultivated with crumbler attached, aldicarb applied, spring-tine cultivated with crumbler attached, seed sown: 5 Apr. Weedkiller applied: 19 Apr. Insecticide and fungicide treatments applied: 13 July. Combine harvested: 11 Sept. Previous crops: Wheat 1976, barley 1977.

NOTE: Pea moth was monitored throughout the season at both sites and pea moth damage was assessed. Observations were made on diseases and pests throughout the season.

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78/R/PE/1

GRAIN TONNES/HECTARE

***** TABLES OF MEANS *****

INSCTCDE NEMACIDE	NONE	TRIAZOPH	MEAN
NONE	4.87	4.77	4.82
ALDICARB	5.20	5.10	5.15
MEAN	5.04	4.93	4.98

FUNGCIDE NEMACIDE	NONE	BEN+ZIN	MEAN
NONE	4.77	4.88	4.82
ALDICARB	5.08	5.21	5.15
MEAN	4.92	5.05	4.98

FUNGCIDE INSCTCDE	NONE	BEN+ZIN	MEAN
NONE	4.96	5.12	5.04
TRIAZOPH	4.89	4.97	4.93
MEAN	4.92	5.05	4.98

INSCTCDE	NONE		TRIAZOPH	
FUNGCIDE	NONE	BEN+ZIN	NONE	BEN+ZIN
NEMACIDE				
NONE	4.81	4.94	4.72	4.82
ALDICARB	5.10	5.30	5.06	5.13

***** STANDARD ERRORS OF DIFFERENCES OF MEANS *****

TABLE	NEMACIDE	INSCTCDE	FUNGCIDE	NEMACIDE INSCTCDE
SED	0.072	0.072	0.072	0.101

TABLE	NEMACIDE FUNGCIDE	INSCTCDE FUNGCIDE	NEMACIDE INSCTCDE FUNGCIDE
SED	0.101	0.101	0.143

***** STRATUM STANDARD ERRORS AND COEFFICIENTS OF VARIATION *****

STRATUM	DF	SE	CV%
BLOCK.WP	14	0.176	3.5

GRAIN MEAN DM% 83.4

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78/R/PE/1

STRAW TONNES/HECTARE

***** TABLES OF MEANS *****

INSCTCDE	NONE	TRIAZOPH	MEAN
NEMACIDE			
NONE	3.38	3.48	3.43
ALDICARB	3.94	3.50	3.72
MEAN	3.66	3.49	3.57

FUNGCIDE	NONE	BEN+ZIN	MEAN
NEMACIDE			
NONE	3.49	3.37	3.43
ALDICARB	3.45	3.98	3.72
MEAN	3.47	3.68	3.57

FUNGCIDE	NONE	BEN+ZIN	MEAN
INSCTCDE			
NONE	3.55	3.77	3.66
TRIAZOPH	3.40	3.59	3.49
MEAN	3.47	3.68	3.57

INSCTCDE	NONE		TRIAZOPH	
FUNGCIDE	NONE	BEN+ZIN	NONE	BEN+ZIN
NEMACIDE				
NONE	3.39	3.37	3.59	3.37
ALDICARB	3.71	4.16	3.20	3.80

STRAW MEAN DM% 78.4

PLOT AREA HARVESTED 0.00095

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78/W/PE/1

GRAIN TONNES/HECTARE

***** TABLES OF MEANS *****

INSCTCDE NEMACIDE	NONE	TRIAZOPH	MEAN
NONE	3.37	3.14	3.25
ALDICARB	4.13	3.93	4.03
MEAN	3.75	3.53	3.64

FUNGCIDE NEMACIDE	NONE	BEN+ZIN	MEAN
NONE	3.25	3.25	3.25
ALDICARB	3.81	4.24	4.03
MEAN	3.53	3.75	3.64

FUNGCIDE INSCTCDE	NONE	BEN+ZIN	MEAN
NONE	3.79	3.71	3.75
TRIAZOPH	3.28	3.79	3.53
MEAN	3.53	3.75	3.64

INSCTCDE	NONE		TRIAZOPH	
FUNGCIDE	NONE	BEN+ZIN	NONE	BEN+ZIN
NEMACIDE				
NONE	3.45	3.29	3.06	3.21
ALDICARB	4.13	4.13	3.50	4.36

***** STANDARD ERRORS OF DIFFERENCES OF MEANS *****

TABLE	NEMACIDE	INSCTCDE	FUNGCIDE	NEMACIDE INSCTCDE
SED	0.226	0.226	0.226	0.319

TABLE	NEMACIDE FUNGCIDE	INSCTCDE FUNGCIDE	NEMACIDE INSCTCDE FUNGCIDE
SED	0.319	0.319	0.452

***** STRATUM STANDARD ERRORS AND COEFFICIENTS OF VARIATION *****

STRATUM	DF	SE	CV%
BLOCK.WP	14	0.553	15.2

GRAIN MEAN DM% 80.5

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78/W/PE/1

STRAW TONNES/HECTARE

***** TABLES OF MEANS *****

INSCTCDE	NONE	TRIAZOPH	MEAN
NEMACIDE			
NONE	3.13	3.07	3.10
ALDICARB	3.43	3.48	3.46
MEAN	3.28	3.28	3.28

FUNGCIDE	NONE	BEN+ZIN	MEAN
NEMACIDE			
NONE	3.25	2.95	3.10
ALDICARB	3.41	3.50	3.46
MEAN	3.33	3.23	3.28

FUNGCIDE	NONE	BEN+ZIN	MEAN
INSCTCDE			
NONE	3.43	3.14	3.28
TRIAZOPH	3.24	3.32	3.28
MEAN	3.33	3.23	3.28

INSCTCDE	NONE		TRIAZOPH	
FUNGCIDE	NONE	BEN+ZIN	NONE	BEN+ZIN
NEMACIDE				
NONE	3.46	2.81	3.05	3.10
ALDICARB	3.40	3.47	3.43	3.53

STRAW MEAN DM% 76.3

PLOT AREA HARVESTED 0.00255

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78/R/RA/1

WINTER OILSEED RAPE

FOLIAR FUNGICIDES

Object: To study the effects of two fungicides, applied as foliar sprays, on the incidence of foliar diseases and on the yield of winter oilseed rape - Gt. Field I.

Sponsor: C.J. Rawlinson.

Design: 4 randomised blocks of 6 plots.

Whole plot dimensions: 8.53 x 4.27.

Treatments:

FUNGCIDE	Fungicides (kg) and frequency of application:
NONE	None (duplicated)
BEN 1	Benomyl foliar spray at 1.1 kg applied early
BEN 2	Benomyl foliar spray at 1.1 kg applied early and late
TRI 1	Triadimefon foliar spray at 0.25 kg applied early
TRI 2	Triadimefon foliar spray at 0.25 kg applied early and late

NOTE: Fungicide treatments were applied on 5 Oct, 1977 and 18 Jan, 1978 in 340 l.

Basal applications: Manures: (10:24:24) at 310 kg, 'Nitro-Chalk 25' at 800 kg. Weedkillers: Dalapon at 0.95 kg with propyzamide at 0.56 kg in 220 l. Haulm desiccant: Diquat at 0.69 kg ion plus 'Agral' (a wetting agent) at 0.3 l in 220 l.

Seed: Self-sown Victor.

Cultivations, etc.:- NPK applied: 30 Aug, 1977. Weedkillers applied: 23 Sept. N applied: 7 Mar, 1978. Haulm desiccant applied: 4 Aug. Combine harvested: 11 Aug. Previous crops: Oilseed rape 1976 & 1977.

NOTES: (1) Disease assessments were made in October and November 1977 and in January, May and June 1978.
(2) Spores were trapped and counted weekly from September 1977 to August 1978.

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78/R/RA/1

GRAIN TONNES/HECTARE

***** TABLES OF MEANS *****

FUNGCIDE	NONE	BEN 1	BEN 2	TRI 1	TRI 2	MEAN
	0.43	0.48	0.58	0.43	0.50	0.48

***** STANDARD ERRORS OF DIFFERENCES OF MEANS *****

TABLE	FUNGCIDE	
SED	0.093	MIN REP
	0.081	MAX-MIN

	FUNGCIDE
MAX-MIN	NONE V ANY OF REMAINDER
MIN REP	ANY OF REMAINDER

***** STRATUM STANDARD ERRORS AND COEFFICIENTS OF VARIATION *****

STRATUM	DF	SE	CV%
BLOCK.WP	16	0.132	27.6

GRAIN MEAN DM% 80.8

PLOT AREA HARVESTED 0.00260

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78/R/RA/2

WINTER OILSEED RAPE

SEED DRESSINGS AND FOLIAR FUNGICIDES

Object: To study the effects of two fungicides, applied as seed dressings and foliar sprays, on the incidence of foliar diseases and on the yield of winter oilseed rape - Gt. Field II.

Sponsor: C.J. Rawlinson.

Design: 2 randomised blocks of 3 plots split into 4.

Whole plot dimensions: 4.27 x 33.2.

Treatments: All combinations of:-

Whole plots

1. SEEDRESS	Seed dressings:
NONE	None
BENOMYL	Benomyl at 5 g per kg seed
TRIADIM	Triadimefon at 2 g per kg seed

Sub plots

2. FOLSPRAY	Foliar sprays:
NONE	None (duplicated)
BENOMYL	Benomyl at 1.12 kg
TRIADIM	Triadimefon at 0.25 kg

NOTE: Foliar sprays were applied on 28 April, 1978 in 340 l.

Basal applications: Manures: (10:24:24) at 310 kg, 'Nitro-Chalk 25' at 800 kg. Weedkillers: Dalapon at 0.95 kg with propyzamide at 0.56 kg in 340 l. Haulm desiccant: Diquat at 0.69 kg ion plus 'Agral' (a wetting agent) at 0.3 l in 220 l.

Seed: Primor, sown at 9 kg.

Cultivations, etc.:- Straw burnt: 5 Sept, 1977. Deep-tine cultivated twice, rotary harrowed: 6 Sept. NPK applied: 12 Sept. Seed sown, harrowed in and rolled: 15 Sept. Weedkiller applied: 28 Nov. N applied: 7 Mar, 1978. Desiccant applied: 4 Aug. Combine harvested: 11 Aug. Previous crops: Barley 1976 and 1977.

NOTE: Plots were scored for plant vigour, emergence, disease incidence and plant density at intervals during the growing season.

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78/R/RA/2

GRAIN TONNES/HECTARE

***** TABLES OF MEANS *****

FOLSPRAY / SEEDRESS	NONE	BENOMYL	TRIADIM	MEAN
NONE	2.04	2.28	1.89	2.06
BENOMYL	2.00	2.22	2.04	2.07
TRIADIM	2.43	2.88	2.20	2.49
MEAN	2.16	2.46	2.04	2.21

***** STANDARD ERRORS OF DIFFERENCES OF MEANS *****

TABLE	FOLSPRAY	SEEDRESS* FOLSPRAY	
SED	0.292	0.505	MIN REP
	0.253	0.437	MAX-MIN

* WITHIN SAME LEVEL OF SEEDRESS ONLY
FOLSPRAY
MAX-MIN NONE V ANY OF REMAINDER
MIN REP ANY OF REMAINDER

***** STRATUM STANDARD ERRORS AND COEFFICIENTS OF VARIATION *****

STRATUM	DF	SE	CV%
BLOCK.WP.SP	12	0.505	22.9

GRAIN MEAN DM% 75.5

SUB PLOT AREA HARVESTED 0.00232

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78/R/P/1 and 78/W/P/1

POTATOES

FUNGICIDES AND RHIZOCTONIA

Object: To study the effects of different methods of applying a range of fungicides on the incidence of Rhizoctonia and on the yield of potatoes - Rothamsted (R) Fosters Corner and Woburn (W) Horsepool Lane Close E.

Sponsors: G.A. Hide, G.R. Cayley.

Design: 3 randomised blocks of 3 plots split into 12.

Whole plot dimensions: 5.69 x 28.6.

Treatments: All combinations of:-

Whole plots

1. INOCULUM	Source of Rhizoctonia inoculum:	
0	None applied to soil and none on seed tubers	
SEED RH	None applied to soil, seed tubers with Rhizoctonia	
SOIL RH	Rhizoctonia applied to soil, none on seed tubers	

Sub plots

2. FUNGCIDE	Fungicides and methods of application:	
0	None	
SE BEN	Seed treated with	benodanil
SE IPR	" " "	iprodione
SE MAN	" " "	maneb
SE THI	" " "	thiabendazole
SP BEN	Sprouts dusted with	benodanil
SP IPR	" " "	iprodione
SP MAN	" " "	maneb
SP THI	" " "	thiabendazole
SO BEN	Soil treated with	benodanil
SO IPR	" " "	iprodione
SO THI	" " "	thiabendazole

NOTES: (1) Treatments to seed tubers were applied as 5% dusts at 0.23 kg a.i. per tonne of seed before planting.
(2) Treatments to sprouts were applied by dipping seed in 5% dusts pre-planting.
(3) Treatments to soil were applied as 5% dusts, at 11.2 kg a.i., broadcast on the soil surface and worked in just before planting.

Basal applications:
Fosters Corner (R): Manures: (13:13:20) at 1510 kg. Weedkillers: Linuron at 1.3 kg with paraquat at 0.42 kg ion in 220 l. Fungicides: Mancozeb at 1.3 kg in 220 l on three occasions, with insecticide on the second and third. Fentin acetate and maneb (as 'Fennite A' at 1.7 kg in 220 l) on two occasions. Insecticide: Pirimicarb at 0.14 kg. Haulm desiccant: Undiluted BOV at 170 l.

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78/R/P/1 and 78/W/P/1

Horsepool Lane Close E (W): Manures: (13:13:20) at 1760 kg. Weedkillers: Linuron at 1.3 kg with paraquat at 0.14 kg ion in 280 l. Fungicide: Mancozeb at 1.3 kg on three occasions, on the first and second in 280 l and on the third with insecticide in 420 l. Fentin acetate with maneb (as 'Fennite A' at 1.7 kg in 280 l). Insecticide: Pirimicarb at 0.14 kg. Haulm desiccant: Undiluted BOV at 170 l.

Seed: Pentland Crown at both sites.

Cultivations, etc.:-

Fosters Corner: Ploughed: 9 Nov, 1977. Heavy spring-tine cultivated: 5 Apr, 1978. NPK applied: 24 Apr. Rhizoctonia inoculum and fungicide treatments applied, spike rotary cultivated, ridged, potatoes planted, split back: 25 Apr. Grubbed: 17 May. Rotary ridged: 19 May. Weedkillers applied: 22 May. Mancozeb applied: 5 July, 18 July, 4 Aug. Insecticide applied with mancozeb: 18 July, 4 Aug. Fentin acetate with maneb applied: 18 Aug, 8 Sept. Haulm desiccant applied: 2 Oct. Lifted: 18 Oct. Previous crops: Barley 1976, beans 1977.

Horsepool Lane Close E (W): Heavy spring-tine cultivated twice: 22 Sept, 1977. Ploughed: 5 Dec. NPK applied: 4 Apr, 1978. Deep-tine cultivated: 5 Apr. Rhizoctonia inoculum applied to the soil: 27 Apr. Fungicide treatments applied, rotary cultivated, ridged up, potatoes planted: 5 May. Split back: 8 May. Grubbed, earthed up: 11 May. Weedkiller applied: 26 May. Grubbed: 12 June. Earthed up: 13 June. Mancozeb applied: 6 July, 21 July, 11 Aug. Insecticide applied with mancozeb: 11 Aug. Fentin acetate with maneb applied: 23 Aug. Haulm desiccant applied: 23 Sept. Lifted: 10 Oct. Previous crops: Barley 1976, W. oats 1977.

NOTES: (1) Emergence counts were made in May.
(2) Plant samples were taken in July for estimates of corticium (White hose) at the base of the stem.
(3) Plant samples were taken in July and September for estimates of incidence of stem canker and stolon pruning and for yield.
(4) After harvest and grading samples were taken for estimates of infection by black scurf.
(5) At Woburn yields from 3 plots were lost with the following treatment combinations

INOCULUM	SOIL RH	0	0
FUNGCIDE	SP MAN	SO BEN	SO THI

(6) At Woburn on one occasion the spraying tractor was driven along one set of sub-plots, not in the 'spray-paths' as was intended. Effects of damage to the haulm have been estimated by covariance and adjusted yields etc. are presented.

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78/R/P/1 FOSTERS CORNER

TOTAL TUBERS TONNES/HECTARE

***** TABLES OF MEANS *****

INOCULUM / FUNGCIDE	0	SEED RH	SOIL RH	MEAN
0	45.2	46.7	45.5	45.8
SE BEN	48.6	45.9	46.7	47.1
SE IPR	44.7	49.9	43.3	46.0
SE MAN	46.9	48.9	46.6	47.5
SE THI	45.8	50.4	46.4	47.5
SP BEN	44.3	48.5	45.6	46.1
SP IPR	46.1	49.1	43.3	46.2
SP MAN	48.4	49.1	44.9	47.5
SP THI	46.7	47.7	45.6	46.7
SO BEN	44.3	44.3	46.4	45.0
SO IPR	48.1	46.1	47.3	47.2
SO THI	44.3	47.6	46.7	46.2
MEAN	46.1	47.9	45.7	46.6

***** STANDARD ERRORS OF DIFFERENCES OF MEANS *****

TABLE	INOCULUM	FUNGCIDE	INOCULUM FUNGCIDE
SED	0.91	0.97	1.86
EXCEPT WHEN COMPARING MEANS WITH SAME LEVEL(S) OF:			
INOCULUM			1.69

***** STRATUM STANDARD ERRORS AND COEFFICIENTS OF VARIATION *****

STRATUM	DF	SE	CV%
BLOCK.WP	4	1.12	2.4
BLOCK.WP.SP	66	2.07	4.4

PERCENTAGE WARE 4.44CM (1.75 INCH) RIDDLE

***** TABLES OF MEANS *****

INOCULUM / FUNGCIDE	0	SEED RH	SOIL RH	MEAN
0	85.6	86.0	84.0	85.2
SE BEN	85.8	86.9	86.5	86.4
SE IPR	81.9	83.4	82.3	82.5
SE MAN	85.3	85.6	85.9	85.6
SE THI	85.6	89.1	88.2	87.6
SP BEN	87.9	87.0	84.8	86.6
SP IPR	83.5	86.1	83.8	84.5
SP MAN	88.8	87.3	87.3	87.8
SP THI	87.5	88.0	85.6	87.0
SO BEN	88.9	88.2	89.1	88.7
SO IPR	82.1	87.0	85.1	84.8
SO THI	88.8	90.2	87.3	88.8
MEAN	86.0	87.1	85.8	86.3

SUB PLOT AREA HARVESTED 0.00084

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78/W/P/1 HORSEPOOL LANE CLOSE E

TOTAL TUBERS TONNES/HECTARE

***** TABLES OF MEANS *****

INOCULUM FUNGCIDE	0	SEED RH	SOIL RH	MEAN
0	47.8	45.1	40.4	44.4
SE BEN	46.6	39.9	45.7	44.0
SE IPR	47.6	46.7	44.2	46.2
SE MAN	47.4	45.9	44.7	46.0
SE THI	43.4	45.0	41.8	43.4
SP BEN	40.1	47.1	45.1	44.1
SP IPR	46.3	44.8	44.8	45.3
SP MAN	47.5	45.8	37.6	43.6
SP THI	47.2	45.6	46.1	46.3
SO BEN	46.0	46.7	44.6	45.8
SO IPR	43.8	46.4	44.4	44.9
SO THI	43.6	46.4	46.3	45.4
MEAN	45.6	45.5	43.8	45.0

***** STANDARD ERRORS OF DIFFERENCES OF MEANS *****

TABLE	INOCULUM	FUNGCIDE	INOCULUM FUNGCIDE
SED	0.93	1.67	2.91
EXCEPT WHEN COMPARING MEANS WITH SAME LEVEL(S) OF:			
INOCULUM			2.94

***** STRATUM STANDARD ERRORS AND COEFFICIENTS OF VARIATION *****

STRATUM	DF	SE	CV%
BLOCK.WP	4	0.90	2.0
BLOCK.WP.SP	61	3.49	7.8

PERCENTAGE WARE 4.44CM (1.75 INCH) RIDDLE

***** TABLES OF MEANS *****

INOCULUM FUNGCIDE	0	SEED RH	SOIL RH	MEAN
0	86.9	90.7	85.6	87.7
SE BEN	87.3	89.8	86.2	87.8
SE IPR	83.9	80.1	82.4	82.2
SE MAN	89.6	89.0	86.5	88.3
SE THI	88.9	88.0	87.6	88.2
SP BEN	87.2	87.5	86.8	87.1
SP IPR	82.7	87.2	84.5	84.8
SP MAN	89.6	92.1	89.2	90.3
SP THI	86.9	88.9	87.2	87.6
SO BEN	89.2	87.0	87.8	88.0
SO IPR	84.7	82.9	78.1	81.9
SO THI	86.0	89.9	86.6	87.5
MEAN	86.9	87.8	85.7	86.8

SUB PLOT AREA HARVESTED 0.00081

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78/R/P/3

POTATOES

GROWTH STUDY

Object: To study the effects of modifying haulm structure by mechanical or chemical means on growth, tuber bulking, radiation interception, photosynthesis rates and yield of potatoes - Long Hoos IV 3.

Sponsor: D.W. Wood.

Design: 2 randomised blocks of 2 plots split into 4.

Whole plot dimensions: 11.6 x 22.0.

Treatments: All combinations of:-

Whole plots

1. TBR SIZE	Seed tuber sizes:	
	SMALL	In the weight range 60- 80 g per tuber
	LARGE	In the weight range 95-125 g per tuber

Sub plots

2. TREATMNT	Treatments:	
	NONE	None
	APEX R	Stem apex removed after tuber initiation
	BRANCH R	Lateral branches removed after tuber initiation
	GRTH REG	Growth regulator, chlorflurenol methyl ester applied as foliar spray at tuber initiation

NOTE: Chlorflurenol methyl ester applied at 8.4 g in 840 l on 28 June, 1978.

Basal applications: Manures: (0:14:28) at 720 kg. (20:14:14) at 600 kg. 'Nitro-Chalk 25' at 280 kg. Weedkiller: Metribuzin at 0.98 kg in 430 l. Insecticide: Pirimicarb at 0.14 kg. Fungicide: Mancozeb at 1.3 kg in 430 l on the first occasion, applied with the insecticide, at 1.9 kg in 900 l on the second and third occasions.

Seed: Pentland Crown.

Cultivations, etc.:- Autumn PK applied: 4 Oct, 1977. Ploughed: 10 Oct. NPK and additional N applied: 18 Apr, 1978. Heavy spring-tine cultivated: 9 May. Rotary cultivated, ridged, hand planted and split back: 10 May. Rotary ridged: 25 May. Weedkiller applied: 16 June. Insecticide and fungicide applied: 10 July. Fungicide applied: 17 Aug and 28 Aug. Lifted: 9 Oct. Previous crops: Beans 1976, spring wheat 1977.

NOTE: Seed sprout characteristics were assessed at planting. Emergence counts were made daily in early June. Full growth analyses were done at fortnightly intervals between early July and mid-September. Photosynthetic and respiration rates of leaves were assessed. Radiation interception was measured in July.

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78/R/P/3

TOTAL TUBERS TONNES/HECTARE

***** TABLES OF MEANS *****

TREATMNT TBR SIZE	NONE	APEX R	BRANCH R	GRTH REG	MEAN
SMALL	44.3	44.3	45.9	37.3	43.0
LARGE	46.9	43.5	44.7	41.2	44.1
MEAN	45.6	43.9	45.3	39.2	43.5

***** STANDARD ERRORS OF DIFFERENCES OF MEANS *****

TABLE	TREATMNT	TBR SIZE* TREATMNT
SED	0.67	0.95

* WITHIN SAME LEVEL OF TBR SIZE ONLY

***** STRATUM STANDARD ERRORS AND COEFFICIENTS OF VARIATION *****

STRATUM	DF	SE	CV%
BLOCK.WP.SP	6	0.95	2.2

PLOT AREA HARVESTED 0.00181

PERCENTAGE WARE 4.45CM (1.75INCH) RIDDLE

***** TABLES OF MEANS *****

TREATMNT TBR SIZE	NONE	APEX R	BRANCH R	GRTH REG	MEAN
SMALL	47.0	41.8	31.5	26.8	36.8
LARGE	28.6	22.2	29.7	22.0	25.6
MEAN	37.8	32.0	30.6	24.4	31.2

PLOT AREA HARVESTED 0.00181

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78/W/P/4

POTATOES

OXAMYL SPRAYS AGAINST PCN

Object: To study the effects of a range of rates and times of applying foliar sprays of oxamyl on the control of potato cyst-nematode (PCN) and on the yield of potatoes - Butt Close I.

Sponsor: A.G. Whitehead.

Design: 2 randomised blocks of 14 plots.

Whole plot dimensions: 2.84 x 9.14.

Treatments: All combinations of:-

1. OX RATE	Rates of applying oxamyl on each spraying occasion (kg):	
	1	
	2	
	4	
2. OX FREQ	Frequency of applying oxamyl	
	2	Twice (20 June and 5 July)
	4	Four times (20 June, 5 July, 19 July and 9 Aug)
	6	Six times (duplicated) (20 June, 5 July, 19 July, 9 Aug, 22 Aug and 7 Sept)
EXTRA	Plus one extra treatment not given oxamyl	
NONE	None (duplicated)	

NOTES: (1) The first spray on 1 June was applied at a quarter of the intended rate.
(2) The site of this experiment was sown to winter wheat given (10:24:24) at 250 kg, combine drilled. The crop failed and was ploughed up for potatoes.

Basal applications: Manures: (13:13:20) at 1870 kg. Weedkillers: Linuron at 1.3 kg plus paraquat at 0.42 kg ion in 280 l. Fungicide: Fentin acetate with maneb ('Fennite A' at 1.7 kg in 280 l). Haulm desiccant: Undiluted BOV at 170 l.

Seed: Pentland Crown.

Cultivations, etc.:- Ploughed: 4 Nov, 1977. Spring-tine cultivated with crumbler attached, winter wheat sown: 15 Nov. Ploughed: 6 Mar, 1978. NPK applied, deep-tine cultivated: 5 Apr. Rotary cultivated, ridged up, potatoes planted: 21 Apr. Weedkillers applied: 18 May. Grubbed, earthed up: 9 June. Hand hoed: 27 July. Fungicide applied: 23 Aug. Haulm desiccant applied: 23 Sept. Lifted: 2 Oct.

Note: Soil samples were taken before applying treatments and after harvest for counts of cysts, eggs and larvae of Globodera rostochiensis.

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78/W/P/4

TOTAL TUBERS TONNES/HECTARE

***** TABLES OF MEANS *****

OX FREQ	2	4	6	MEAN
OX RATE				
1	18.1	24.4	27.9	24.6
2	26.9	29.2	28.0	28.0
4	24.3	19.3	25.1	23.5
MEAN	23.1	24.3	27.0	25.3

EXTRA NONE 24.6

GRAND MEAN 25.2

***** STANDARD ERRORS OF DIFFERENCES OF MEANS *****

TABLE	OX RATE	OX FREQ	OX RATE OX FREQ & EXTRA NONE	
SED		3.04	5.28	MIN REP
	2.64	2.64	4.58	MAX-MIN
			3.74	MAX REP

	OX FREQ
MAX-MIN	6 OR EXTRA NONE V ANY OF REMAINDER
MIN REP	ANY OF REMAINDER
MAX REP	6 ONLY

***** STRATUM STANDARD ERRORS AND COEFFICIENTS OF VARIATION *****

STRATUM	DF	SE	CV%
BLOCK.WP	17	5.28	20.9

PERCENTAGE WARE 3.81CM (1.5 INCH) RIDDLE

***** TABLES OF MEANS *****

OX FREQ	2	4	6	MEAN
OX RATE				
1	91.9	89.3	89.9	90.2
2	87.8	91.8	87.8	88.8
4	89.4	92.0	91.6	91.1
MEAN	89.7	91.1	89.7	90.1

EXTRA NONE 89.2

GRAND MEAN 89.9

PLOT AREA HARVESTED 0.00130

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78/R/P/6

POTATOES

POLYTHENE SHEET AND APHIDS

Object: To study the effects of protecting potatoes with a polythene sheet during early growth on the incidence of aphids and on the yield of potatoes - Highfield IV.

Sponsor: A. Cameron.

Design: 3 randomised blocks of 4 plots.

Whole plot dimensions: 15.6 x 15.2.

Treatments: All combinations of:-

1. PLANTDTE Dates of planting:

   25 APRIL
   21 JUNE

2. POLYTHNE Polythene covering:

   NONE
   COVERED

NOTE: 'PLANTDTE 25 APRIL COVERED' plots covered on 17 May. The covers were removed between 9 and 21 June. 'PLANTDTE 21 JUNE COVERED' plots covered on 29 June. The covers were removed between 17 and 21 July.

Basal applications: Manures: (13:13:20) at 1500 kg. Weedkillers: Glyphosate at 1.5 l in 220 l. Linuron at 1.2 kg in 220 l. Paraquat at 0.42 kg ion in 220 l. Haulm desiccant: Undiluted BOV at 170 l.

Seed: Pentland Crown.

Cultivations, etc.:- Glyphosate applied: 18 Nov, 1977. Ploughed: 20 Dec. Heavy spring-tine cultivated: 6 Apr, 1978. NPK applied: 17 Apr. First planting date plots spike rotary cultivated and planted: 25 Apr. Linuron applied to these plots only: 8 May. Second planting date plots spike rotary cultivated and planted: 21 June. First planting date uncovered plots grubbed, all plots ridged: 26 June. Linuron and paraquat applied to second planting date plots: 28 June. Haulm pulverized: 23 Sept. BOV applied: 2 Oct. Lifted: 20 Oct. Previous crops: Barley 1976, W. oats 1977.

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78/R/P/6

TOTAL TUBERS TONNES/HECTARE

***** TABLES OF MEANS *****

POLYTHNE PLANTDTE	NONE	COVERED	MEAN
25 APRIL	40.9	35.9	38.4
21 JUNE	26.5	25.9	26.2
MEAN	33.7	30.9	32.3

***** STANDARD ERRORS OF DIFFERENCES OF MEANS *****

TABLE	PLANTDTE	POLYTHNE	PLANTDTE POLYTHNE
SED	1.94	1.94	2.74

***** STRATUM STANDARD ERRORS AND COEFFICIENTS OF VARIATION *****

STRATUM	DF	SE	CV%
BLOCK.WP	6	3.36	10.4

PERCENTAGE WARE 3.81CM (1.5 INCH) RIDDLE

***** TABLES OF MEANS *****

POLYTHNE PLANTDTE	NONE	COVERED	MEAN
25 APRIL	97.1	95.9	96.5
21 JUNE	94.0	92.8	93.4
MEAN	95.6	94.3	94.9

PLOT AREA HARVESTED 0.00434

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78/R/G/1 and 78/W/G/1

GRASS

AQUEOUS UREA AND NITRIFICATION INHIBITORS

Object: To study the effects of adding nitrification inhibitors to liquid fertilisers on the yield and nitrogen uptake of grass cut for silage - Rothamsted (R) Great Harpenden I and Woburn (W) Stackyard II.

Sponsors: J. Ashworth, A. Penny, M.V. Hewitt, A.J. Gibbs.

Design: 2 randomised blocks of 28 plots.

Whole plot dimensions: 2.43 x 9.14.

Treatments: All combinations of:-

1. U T1 N — Rates of nitrogen fertiliser applied as aqueous urea as a single application, injection tines spaced 30 cm apart (kg N):

2	250
3	375

2. N TIME — Times of applying aqueous urea:

AUTUMN
SPRING

3. NI FORM — Forms of nitrification inhibitors added to aqueous urea:

NONE	None
NITRAPYR	Nitrapyrin
SOD TRI	Sodium trithiocarbonate
NIT CS	Nitrapyrin + carbon disulphide

plus twelve extra treatments:

EXTRA

Aqueous urea, tines spaced 60 cm apart, no inhibitors:

UT2 N2A	Supplying 250 kg N in autumn
UT2 N2S	Supplying 250 kg N in spring
UT2 N3A	Supplying 375 kg N in autumn
UT2 N3S	Supplying 375 kg N in spring

Aqueous urea + ammonium nitrate, tines spaced 30 cm apart, supplying 375 kg N applied in spring

UATIN3SO	No nitrification inhibitor
UATIN3ST	Sodium trithiocarbonate
UATIN3SN	Nitrapyrin
UATIN3SM	Mixture of nitrapyrin and carbon disulphide

'Nitro-Chalk', dressing divided (kg N total):

NC N2	250
NC N3	375
NC N4	500
NONE	None

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78/R/G/1 and 78/W/G/1

Basal applications:
Great Harpenden I (R): Manures: (0:14:28) at 500 kg.
Stackyard II (W): Manures: (0:14:28) at 970 kg.

Seed: Great Harpenden I (R): S24 perennial ryegrass, sown May, 1977.
Stackyard II (W): Old ley, sown Sept, 1971.

Cultivations, etc.:-
Great Harpenden I (R): N and NI TIME AUTUMN applied: 25 Nov, 1977. PK applied: 19 Dec. N and NI TIME SPRING applied: 10 Mar, 1978. 'Nitro-Chalk' applied: 10 Mar, 2 June, 19 July, 1 Sept. Cut three times: 31 May, 14 July, 18 Oct. Previous crops: Oats 1976, ley 1977.
Stackyard II (W): PK applied: 10 Nov, 1977. N and NI TIME AUTUMN applied: 24 Nov. N and NI TIME SPRING applied: 8 Mar, 1978. 'Nitro-Chalk' applied: 8 Mar, 25 May, 27 July, 18 Aug. Cut four times: 23 May, 12 July, 18 Aug, 26 Oct. Previous crops: Ley 1976 and 1977.

NOTES: (1) Grass samples were taken for N determination.
(2) N in the injected soil profile was measured at regular intervals and ammonia evaporation measured.

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78/R/G/1 GREAT HARPENDEN I (R)
1ST CUT (31/5/78) DRY MATTER TONNES/HECTARE

***** TABLES OF MEANS *****

N TIME / U T1 N	AUTUMN	SPRING	MEAN
2	9.36	7.97	8.66
3	8.93	8.29	8.61
MEAN	9.14	8.13	8.63

NI FORM / U T1 N	NONE	NITRAPYR	SOD TRI	NIT CS	MEAN
2	8.57	8.62	8.93	8.52	8.66
3	8.14	8.33	8.77	9.19	8.61
MEAN	8.36	8.48	8.85	8.85	8.63

NI FORM / N TIME	NONE	NITRAPYR	SOD TRI	NIT CS	MEAN
AUTUMN	8.69	8.91	9.28	9.69	9.14
SPRING	8.02	8.04	8.43	8.02	8.13
MEAN	8.36	8.48	8.85	8.85	8.63

U T1 N	NI FORM / N TIME	NONE	NITRAPYR	SOD TRI	NIT CS
2	AUTUMN	9.06	9.28	9.61	9.48
	SPRING	8.09	7.96	8.25	7.56
3	AUTUMN	8.32	8.54	8.95	9.90
	SPRING	7.95	8.12	8.60	8.48

EXTRA	
UT2 N2A	8.75
UT2 N2S	7.29
UT2 N3A	8.73
UT2 N3S	7.80
UAT1N3SO	7.23
UAT1N3ST	8.47
UAT1N3SN	8.08
UAT1N3SM	8.30
NC N2	6.72
NC N3	7.98
NC N4	8.77
NONE	2.80
MEAN	7.58
GRAND MEAN	8.18

***** STANDARD ERRORS OF DIFFERENCES OF MEANS *****

TABLE	EXTRA	U T1 N	N TIME	NI FORM
SED	0.586	0.207	0.207	0.293

TABLE	U T1 N / N TIME	U T1 N / NI FORM	N TIME / NI FORM	U T1 N / N TIME / NI FORM & EXTRA
SED	0.293	0.414	0.414	0.586

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78/R/G/1 GREAT HARPENDEN I (R)
2ND CUT(14/7/78)DRY MATTER TONNES/HECTARE

***** TABLES OF MEANS *****

N TIME U T1 N	AUTUMN	SPRING	MEAN
2	1.11	2.01	1.56
3	2.07	3.45	2.76
MEAN	1.59	2.73	2.16

NI FORM U T1 N	NONE	NITRAPYR	SOD TRI	NIT CS	MEAN
2	1.32	1.56	1.48	1.86	1.56
3	2.54	2.84	2.70	2.97	2.76
MEAN	1.93	2.20	2.09	2.41	2.16

NI FORM N TIME	NONE	NITRAPYR	SOD TRI	NIT CS	MEAN
AUTUMN	1.58	1.67	1.32	1.78	1.59
SPRING	2.28	2.73	2.86	3.04	2.73
MEAN	1.93	2.20	2.09	2.41	2.16

NI FORM U T1 N N TIME	NONE	NITRAPYR	SOD TRI	NIT CS
2 AUTUMN	1.21	1.08	0.86	1.27
2 SPRING	1.42	2.05	2.11	2.44
3 AUTUMN	1.95	2.27	1.78	2.29
3 SPRING	3.13	3.41	3.61	3.64

EXTRA	
UT2 N2A	1.03
UT2 N2S	2.13
UT2 N3A	2.41
UT2 N3S	3.77
UAT1N3SO	2.60
UAT1N3ST	2.71
UAT1N3SN	2.88
UAT1N3SM	3.25
NC N2	2.57
NC N3	3.61
NC N4	3.56
NONE	0.27
MEAN	2.57
GRAND MEAN	2.33

***** STANDARD ERRORS OF DIFFERENCES OF MEANS *****

TABLE	EXTRA	U T1 N	N TIME	NI FORM
SED	0.294	0.104	0.104	0.147

TABLE	U T1 N N TIME	U T1 N NI FORM	N TIME NI FORM	U T1 N N TIME NI FORM & EXTRA
SED	0.147	0.208	0.208	0.294

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78/R/G/1 GREAT HARPENDEN I (R)
3RD CUT(18/10/78) DRY MATTER TONNES/HECTARE

***** TABLES OF MEANS *****

N TIME U T1 N	AUTUMN	SPRING	MEAN
2	0.22	0.27	0.25
3	0.37	0.49	0.43
MEAN	0.29	0.38	0.34

NI FORM U T1 N	NONE	NITRAPYR	SOD TRI	NIT CS	MEAN
2	0.24	0.20	0.19	0.35	0.25
3	0.40	0.46	0.41	0.44	0.43
MEAN	0.32	0.33	0.30	0.40	0.34

NI FORM N TIME	NONE	NITRAPYR	SOD TRI	NIT CS	MEAN
AUTUMN	0.33	0.30	0.23	0.32	0.29
SPRING	0.31	0.36	0.38	0.47	0.38
MEAN	0.32	0.33	0.30	0.40	0.34

U T1 N	NI FORM N TIME	NONE	NITRAPYR	SOD TRI	NIT CS
2	AUTUMN	0.29	0.17	0.16	0.27
	SPRING	0.19	0.23	0.23	0.43
3	AUTUMN	0.37	0.42	0.30	0.38
	SPRING	0.43	0.50	0.52	0.51

EXTRA	
UT2 N2A	0.19
UT2 N2S	0.17
UT2 N3A	0.54
UT2 N3S	0.85
UAT1N3SO	0.33
UAT1N3ST	0.35
UAT1N3SN	0.43
UAT1N3SM	0.46
NC N2	2.85
NC N3	4.25
NC N4	4.24
NONE	0.02
MEAN	1.22
GRAND MEAN	0.72

***** STANDARD ERRORS OF DIFFERENCES OF MEANS *****

TABLE	EXTRA	U T1 N	N TIME	NI FORM
SED	0.105	0.037	0.037	0.053

TABLE	U T1 N N TIME	U T1 N NI FORM	N TIME NI FORM	U T1 N N TIME NI FORM & EXTRA
SED	0.053	0.074	0.074	0.105

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78/R/G/1 GREAT HARPENDEN I (R)
TOTAL OF 3 CUTS DRY MATTER TONNES/HECTARE

***** TABLES OF MEANS *****

N TIME / U T1 N	AUTUMN	SPRING	MEAN
2	10.69	10.24	10.46
3	11.37	12.23	11.80
MEAN	11.03	11.23	11.13

NI FORM / U T1 N	NONE	NITRAPYR	SOD TRI	NIT CS	MEAN
2	10.13	10.39	10.61	10.72	10.46
3	11.08	11.63	11.88	12.60	11.80
MEAN	10.61	11.01	11.25	11.66	11.13

NI FORM / N TIME	NONE	NITRAPYR	SOD TRI	NIT CS	MEAN
AUTUMN	10.61	10.88	10.83	11.79	11.03
SPRING	10.60	11.14	11.66	11.53	11.23
MEAN	10.61	11.01	11.25	11.66	11.13

U T1 N	NI FORM / N TIME	NONE	NITRAPYR	SOD TRI	NIT CS
2	AUTUMN	10.57	10.53	10.63	11.02
	SPRING	9.70	10.25	10.59	10.43
3	AUTUMN	10.65	11.23	11.03	12.57
	SPRING	11.51	12.03	12.74	12.63

EXTRA	
UT2 N2A	9.97
UT2 N2S	9.60
UT2 N3A	11.68
UT2 N3S	12.42
UAT1N3SO	10.17
UAT1N3ST	11.54
UAT1N3SN	11.39
UAT1N3SM	12.01
NC N2	12.14
NC N3	15.84
NC N4	16.57
NONE	3.09
MEAN	11.37
GRAND MEAN	11.23

***** STANDARD ERRORS OF DIFFERENCES OF MEANS *****

TABLE	EXTRA	U T1 N	N TIME	NI FORM
SED	0.551	0.195	0.195	0.275

TABLE	U T1 N / N TIME	U T1 N / NI FORM	N TIME / NI FORM	U T1 N / N TIME / NI FORM & EXTRA
SED	0.275	0.389	0.389	0.551

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78/R/G/1 GREAT HARPENDEN I (R)

1ST CUT (31/5/78) DRY MATTER TONNES/HECTARE

***** STRATUM STANDARD ERRORS AND COEFFICIENTS OF VARIATION *****

STRATUM	DF	SE	CV%
BLOCK.WP	27	0.586	7.2

1ST CUT MEAN DM% 19.6

1ST CUT PLOT AREA HARVESTED 0.00104

2ND CUT(14/7/78)DRY MATTER TONNES/HECTARE

***** STRATUM STANDARD ERRORS AND COEFFICIENTS OF VARIATION *****

STRATUM	DF	SE	CV%
BLOCK.WP	27	0.294	12.6

2ND CUT MEAN DM% 24.3

2ND CUT PLOT AREA HARVESTED 0.00111

3RD CUT(18/10/78) DRY MATTER TONNES/HECTARE

***** STRATUM STANDARD ERRORS AND COEFFICIENTS OF VARIATION *****

STRATUM	DF	SE	CV%
BLOCK.WP	27	0.105	14.7

3RD CUT MEAN DM% 38.7

3RD CUT PLOT AREA HARVESTED 0.00104

TOTAL OF 3 CUTS DRY MATTER TONNES/HECTARE

***** STRATUM STANDARD ERRORS AND COEFFICIENTS OF VARIATION *****

STRATUM	DF	SE	CV%
BLOCK.WP	27	0.551	4.9

TOTAL OF 3 CUTS MEAN DM% 27.5

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78/W/G/1 STACKYARD II
1ST CUT (31/5/78) DRY MATTER TONNES/HECTARE

***** TABLES OF MEANS *****

N TIME	AUTUMN	SPRING	MEAN
U T1 N			
2	2.98	2.29	2.63
3	3.39	2.69	3.04
MEAN	3.18	2.49	2.84

NI FORM	NONE	NITRAPYR	SOD TRI	NIT CS	MEAN
U T1 N					
2	2.73	2.67	2.65	2.49	2.63
3	3.15	3.16	2.91	2.93	3.04
MEAN	2.94	2.92	2.78	2.71	2.84

NI FORM	NONE	NITRAPYR	SOD TRI	NIT CS	MEAN
N TIME					
AUTUMN	3.27	3.19	3.26	3.00	3.18
SPRING	2.61	2.65	2.30	2.42	2.49
MEAN	2.94	2.92	2.78	2.71	2.84

	NI FORM	NONE	NITRAPYR	SOD TRI	NIT CS
U T1 N	N TIME				
2	AUTUMN	3.08	3.03	3.13	2.67
	SPRING	2.38	2.31	2.17	2.31
3	AUTUMN	3.46	3.34	3.40	3.34
	SPRING	2.83	2.98	2.43	2.53

EXTRA	
UT2 N2A	2.62
UT2 N2S	1.53
UT2 N3A	2.98
UT2 N3S	1.92
UAT1N3SO	3.27
UAT1N3ST	2.55
UAT1N3SN	2.98
UAT1N3SM	2.73
NC N2	2.16
NC N3	2.72
NC N4	3.12
NONE	0.78
MEAN	2.45
GRAND MEAN	2.67

***** STANDARD ERRORS OF DIFFERENCES OF MEANS *****

TABLE	EXTRA	U T1 N	N TIME	NI FORM
SED	0.249	0.088	0.088	0.125

TABLE	U T1 N N TIME	U T1 N NI FORM	N TIME NI FORM	U T1 N N TIME NI FORM
SED	0.125	0.176	0.176	0.249

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78/W/G/1 STACKYARD II
2ND CUT (12/7/78) DRY MATTER TONNES/HECTARE

***** TABLES OF MEANS *****

N TIME / U T1 N	AUTUMN	SPRING	MEAN
2	2.48	3.03	2.76
3	2.86	3.24	3.05
MEAN	2.67	3.14	2.90

NI FORM / U T1 N	NONE	NITRAPYR	SOD TRI	NIT CS	MEAN
2	3.02	2.93	2.59	2.48	2.76
3	3.17	3.13	2.86	3.04	3.05
MEAN	3.10	3.03	2.73	2.76	2.90

NI FORM / N TIME	NONE	NITRAPYR	SOD TRI	NIT CS	MEAN
AUTUMN	2.76	2.74	2.65	2.52	2.67
SPRING	3.43	3.32	2.80	3.00	3.14
MEAN	3.10	3.03	2.73	2.76	2.90

U T1 N	NI FORM / N TIME	NONE	NITRAPYR	SOD TRI	NIT CS
2	AUTUMN	2.65	2.53	2.40	2.33
	SPRING	3.40	3.34	2.77	2.63
3	AUTUMN	2.88	2.95	2.89	2.71
	SPRING	3.46	3.30	2.84	3.37

EXTRA	
UT2 N2A	2.47
UT2 N2S	2.15
UT2 N3A	2.92
UT2 N3S	3.59
UAT1N3SO	3.12
UAT1N3ST	2.81
UAT1N3SN	3.16
UAT1N3SM	3.25
NC N2	2.72
NC N3	3.47
NC N4	2.64
NONE	1.82
MEAN	2.84
GRAND MEAN	2.88

***** STANDARD ERRORS OF DIFFERENCES OF MEANS *****

TABLE	EXTRA	U T1 N	N TIME	NI FORM
SED	0.336	0.119	0.119	0.168

TABLE	U T1 N / N TIME	U T1 N / NI FORM	N TIME / NI FORM	U T1 N / N TIME / NI FORM
SED	0.168	0.238	0.238	0.336

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78/W/G/1 STACKYARD II
3RD CUT (18/8/78) DRY MATTER TONNES/HECTARE

***** TABLES OF MEANS *****

N TIME / U T1 N	AUTUMN	SPRING	MEAN
2	0.64	1.10	0.87
3	0.85	1.63	1.24
MEAN	0.75	1.37	1.06

NI FORM / U T1 N	NONE	NITRAPYR	SOD TRI	NIT CS	MEAN
2	0.79	1.09	0.75	0.84	0.87
3	1.19	1.28	1.21	1.30	1.24
MEAN	0.99	1.19	0.98	1.07	1.06

NI FORM / N TIME	NONE	NITRAPYR	SOD TRI	NIT CS	MEAN
AUTUMN	0.67	0.94	0.62	0.75	0.75
SPRING	1.31	1.43	1.34	1.39	1.37
MEAN	0.99	1.19	0.98	1.07	1.06

U T1 N	NI FORM / N TIME	NONE	NITRAPYR	SOD TRI	NIT CS
2	AUTUMN	0.55	0.94	0.51	0.57
	SPRING	1.04	1.24	1.00	1.11
3	AUTUMN	0.80	0.94	0.74	0.94
	SPRING	1.58	1.62	1.68	1.66

EXTRA	
UT2 N2A	0.74
UT2 N2S	1.26
UT2 N3A	1.17
UT2 N3S	1.39
UAT1N3SO	1.30
UAT1N3ST	1.49
UAT1N3SN	1.37
UAT1N3SM	1.41
NC N2	1.29
NC N3	1.72
NC N4	1.80
NONE	0.87
MEAN	1.32
GRAND MEAN	1.17

***** STANDARD ERRORS OF DIFFERENCES OF MEANS *****

TABLE	EXTRA	U T1 N	N TIME	NI FORM
SED	0.264	0.094	0.094	0.132

TABLE	U T1 N / N TIME	U T1 N / NI FORM	N TIME / NI FORM	U T1 N / N TIME / NI FORM
SED	0.132	0.187	0.187	0.264

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78/W/G/1 STACKYARD II
4TH CUT (26/10/78) DRY MATTER TONNES/HECTARE

***** TABLES OF MEANS *****

N TIME U T1 N	AUTUMN	SPRING	MEAN
2	0.47	0.50	0.49
3	0.50	0.77	0.64
MEAN	0.49	0.64	0.56

NI FORM U T1 N	NONE	NITRAPYR	SOD TRI	NIT CS	MEAN
2	0.37	0.78	0.37	0.43	0.49
3	0.66	0.67	0.51	0.71	0.64
MEAN	0.51	0.73	0.44	0.57	0.56

NI FORM N TIME	NONE	NITRAPYR	SOD TRI	NIT CS	MEAN
AUTUMN	0.44	0.74	0.33	0.44	0.49
SPRING	0.58	0.72	0.55	0.69	0.64
MEAN	0.51	0.73	0.44	0.57	0.56

U T1 N	NI FORM N TIME	NONE	NITRAPYR	SOD TRI	NIT CS
2	AUTUMN	0.29	0.92	0.33	0.36
	SPRING	0.45	0.64	0.41	0.50
3	AUTUMN	0.59	0.56	0.33	0.52
	SPRING	0.72	0.79	0.69	0.89

EXTRA	
UT2 N2A	0.62
UT2 N2S	0.61
UT2 N3A	0.55
UT2 N3S	0.63
UAT1N3SO	0.71
UAT1N3ST	0.78
UAT1N3SN	0.59
UAT1N3SM	0.70
NC N2	0.89
NC N3	1.12
NC N4	0.81
NONE	0.89
MEAN	0.74
GRAND MEAN	0.64

***** STANDARD ERRORS OF DIFFERENCES OF MEANS *****

TABLE	EXTRA	U T1 N	N TIME	NI FORM
SED	0.254	0.090	0.090	0.127

TABLE	U T1 N N TIME	U T1 N NI FORM	N TIME NI FORM	U T1 N N TIME NI FORM
SED	0.127	0.179	0.179	0.254

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78/W/G/1 STACKYARD II
TOTAL OF 4 CUTS DRY MATTER TONNES/HECTARE

***** TABLES OF MEANS *****

N TIME	AUTUMN	SPRING	MEAN
U T1 N			
2	6.57	6.92	6.75
3	7.60	8.34	7.97
MEAN	7.08	7.63	7.36

NI FORM	NONE	NITRAPYR	SOD TRI	NIT CS	MEAN
U T1 N					
2	6.91	7.48	6.35	6.24	6.75
3	8.16	8.24	7.50	7.98	7.97
MEAN	7.54	7.86	6.93	7.11	7.36

NI FORM	NONE	NITRAPYR	SOD TRI	NIT CS	MEAN
N TIME					
AUTUMN	7.15	7.61	6.86	6.72	7.08
SPRING	7.93	8.11	6.99	7.50	7.63
MEAN	7.54	7.86	6.93	7.11	7.36

	NI FORM	NONE	NITRAPYR	SOD TRI	NIT CS
U T1 N	N TIME				
2	AUTUMN	6.56	7.42	6.36	5.92
	SPRING	7.26	7.54	6.35	6.55
3	AUTUMN	7.74	7.79	7.37	7.51
	SPRING	8.59	8.69	7.63	8.45

EXTRA	
UT2 N2A	6.46
UT2 N2S	5.55
UT2 N3A	7.63
UT2 N3S	7.54
UAT1N3SO	8.40
UAT1N3ST	7.63
UAT1N3SN	8.10
UAT1N3SM	8.09
NC N2	7.06
NC N3	9.03
NC N4	8.37
NONE	4.35
MEAN	7.35
GRAND MEAN	7.35

***** STANDARD ERRORS OF DIFFERENCES OF MEANS *****

TABLE	EXTRA	U T1 N	N TIME	NI FORM
SED	0.813	0.287	0.287	0.406

TABLE	U T1 N N TIME	U T1 N NI FORM	N TIME NI FORM	U T1 N N TIME NI FORM
SED	0.406	0.575	0.575	0.813

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78/W/G/1 STACKYARD II

1ST CUT (31/5/78) DRY MATTER TONNES/HECTARE

***** STRATUM STANDARD ERRORS AND COEFFICIENTS OF VARIATION *****

STRATUM	DF	SE	CV%
BLOCK.WP	27	0.249	9.3

1ST CUT MEAN DM% 19.5

1ST CUT PLOT AREA HARVESTED 0.00104

2ND CUT (12/7/78) DRY MATTER TONNES/HECTARE

***** STRATUM STANDARD ERRORS AND COEFFICIENTS OF VARIATION *****

STRATUM	DF	SE	CV%
BLOCK.WP	27	0.336	11.7

2ND CUT MEAN DM% 24.1

2ND CUT PLOT AREA HARVESTED 0.00104

3RD CUT (18/8/78) DRY MATTER TONNES/HECTARE

***** STRATUM STANDARD ERRORS AND COEFFICIENTS OF VARIATION *****

STRATUM	DF	SE	CV%
BLOCK.WP	27	0.264	22.6

3RD CUT MEAN DM% 21.6

3RD CUT PLOT AREA HARVESTED 0.00104

4TH CUT 826/10/78) DRY MATTER TONNES/HECTARE

***** STRATUM STANDARD ERRORS AND COEFFICIENTS OF VARIATION *****

STRATUM	DF	SE	CV%
BLOCK.WP	27	0.254	39.7

4TH CUT MEAN DM% 25.3

4TH CUT PLOT AREA HARVESTED 0.00097

TOTAL OF 4 CUTS DRY MATTER TONNES/HECTARE

***** STRATUM STANDARD ERRORS AND COEFFICIENTS OF VARIATION *****

STRATUM	DF	SE	CV%
BLOCK.WP	27	0.813	11.1

TOTAL OF 4 CUTS DM% 22.6

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78/E/1

METEOROLOGICAL RECORDS 1978 - ROTHAMSTED

(Departure from long-period means in brackets)

MONTH	Total sunshine: hours	Mean temperature: C Air(1)	Dew point	In ground under grass 30cm	100cm
JAN	44 (-7)	2.4 (-0.5)	0.8	4.4	6.6
FEB	53 (-14)	2.4 (-1.1)	0.2	3.1	5.0
MAR	122 (+6)	6.4 (+1.2)	3.7	5.9	5.9
APR	110 (-41)	6.1 (-1.5)	3.0	6.8	6.7
MAY	205 (+11)	11.0 (0.0)	7.0	10.9	8.8
JUNE	161 (-43)	13.4 (-0.6)	9.3	14.0	11.9
JULY	146 (-46)	14.6 (-1.2)	11.1	14.7	12.9
AUG	166 (-14)	15.0 (-0.6)	11.0	15.7	14.2
SEPT	156 (+12)	14.2 (+0.8)	10.0	14.2	13.9
OCT	102 (-1)	11.5 (+2.0)	9.0	11.9	12.5
NOV	87 (+25)	8.0 (+2.2)	6.1	10.0	11.3
DEC	36 (-9)	3.7 (0.0)	2.2	6.0	8.4
YEAR*	1388(-121)	9.0 (0.0)	6.1	9.8	9.8

MONTH	Ground(2) frosts	Total rainfall:mm 0.000405 ha (1/1000 acre) gauge	Rain(3) days	Drainage through 50.8cm (20 in) soil:mm	Wind(4) km per hour
JAN	23	104 (+40)	20	92	10.1
FEB	21	61 (+11)	16	48	10.3
MAR	18	80 (+31)	22	46	12.6
APR	15	57 (+8)	16	27	10.7
MAY	5	69 (+15)	12	47	7.5
JUNE	1	87 (+30)	13	14	7.1
JULY	0	60 (-3)	12	17	6.7
AUG	1	37 (-28)	13	9	5.9
SEPT	1	31 (-30)	9	TRACE	9.4
OCT	8	5 (-68)	9	0	6.6
NOV	10	23 (-48)	11	0	10.0
DEC	17	131 (+65)	23	108	10.5
YEAR*	120	745 (+23)	176	408	8.9

(1)Mean of maximum and minimum
(2)Number of nights grass min. was below 0.0 C
(3)Number of days rainfall was 0.2 mm or more
(4)At 2 metres above ground level

*Mean or total

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78/E/1

METEOROLOGICAL RECORDS 1978 - WOBURN

(Departure from long-period means in brackets)

MONTH	Total sunshine: hours	Mean temperature:C Air(1)	In ground under grass Dew point	30 cm	100 cm	Ground(2) frosts	Total rainfall:mm 12.7 cm (5in) gauge	Rain(3) days	Wind(4) km per hour
JAN	40 (-10)	2.4 (-0.8)	0.9	4.3	7.0	21	71 (+17)	19	10.4
FEB	47 (-18)	2.4 (-1.1)	2.1	3.3	5.5	21	53 (+12)	18	8.3
MAR	113 (-2)	6.6 (+1.2)	4.3	6.1	6.2	17	65 (+22)	22	12.8
APR	102 (-40)	6.2 (-1.8)	3.3	7.1	7.0	17	50 (+5)	16	8.3
MAY	190 (+7)	10.7 (-0.3)	7.9	10.9	8.8	8	54 (0)	9	5.6
JUNE	151 (-49)	13.5 (-0.7)	10.3	14.8	11.9	2	54 (+4)	13	7.4
JULY	131 (-50)	14.9 (-1.1)	11.9	15.8	13.3	0	64 (+11)	11	7.8
AUG	143 (-29)	14.8 (-1.0)	12.8	16.5	14.6	1	44 (-17)	12	6.1
SEPT	146 (+12)	14.4 (+0.8)	11.6	14.8	14.4	3	30 (-23)	9	10.6
OCT	83 (-18)	11.5 (+1.5)	9.5	12.1	13.0	7	3 (-51)	5	6.3
NOV	77 (+16)	8.0 (+1.8)	6.0	9.8	11.6	9	26 (-38)	7	10.2
DEC	27 (-17)	3.7 (-0.2)	2.3	5.5	8.5	15	107 (+55)	22	8.8
YEAR*	1250(-198)	9.1 (-0.1)	6.9	10.1	10.1	121	621 (-3)	163	8.5

METEOROLOGICAL RECORDS 1978 - SAXMUNDHAM

MONTH	Mean temperature: C Air(1)	Dew point	In ground under bare soil 30 cm	Ground(2) frosts	Total rainfall :mm 12.7 cm (5 in) gauge	Rain(3) days	Wind(4) km per hour
JAN	3.4 (-1.0)	1.7	3.7	18	63 (+5)	14	13.9
FEB	2.6 (-1.2)	1.7	3.1	17	41 (-1)	11	13.4
MAR	6.6 (+1.4)	4.4	5.8	14	73 (+35)	18	14.8
APR	6.3 (-0.9)	4.4	6.9	15	44 (+10)	11	12.4
MAY	10.8 (0.0)	8.3	11.0	2	17 (-23)	5	9.2
JUNE	13.9 (0.0)	13.3	15.7	1	81 (+46)	11	8.5
JULY	14.8 (-1.2)	13.9	15.6	0	38 (-18)	10	7.5
AUG	15.4 (-0.9)	13.3	29.6	0	33 (-15)	13	7.4
SEPT	14.2 (+0.3)	11.7	14.4	2	39 (-36)	9	11.0
OCT	11.9 (+1.0)	8.9	12.2	2	8 (-34)	4	8.0
NOV	8.8 (+2.5)	3.9	8.9	8	20 (-62)	6	12.2
DEC	4.6 (0.0)	1.7	5.8	12	120 (+77)	12	13.3
YEAR*	9.4 (0.0)	7.3	11.1	91	577 (-16)	124	11.0

(1)Mean of maximum and minimum
(2)Number of nights grass min. was below 0.0 C
(3)Number of days rainfall was 0.2 mm or more
(4)At 2 metres above ground leve

*Mean or total

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CONVERSION FACTORS

Factors for the Conversion of Imperial to Metric Units

1 inch (in.)	=	2·540 centimetres (cm)
1 foot (ft) (= 12 in.)	=	30·48 cm
1 yard (yd) (= 3 ft)	=	0·9144 metre (m)
1 square yard (sq yd)	=	0·8361 sq m
1 acre (= 4840 sq yd)	=	0·4047 hectare (ha)
1 ounce (oz)	=	28·35 grams (g)
1 pound (lb)	=	0·4536 kilogram (kg)
1 hundredweight (cwt) (= 112 lb)	=	50·80 kg
1 ton (= 2240 lb)	=	1016 kg = 1·016 metric tons (tonnes)
1 pint	=	0·5682 litre
1 gallon (gal) (= 8 pints)	=	4·546 litre
1 fluid ounce = 1/20 pint	=	0·02841 litre = 28·41 ml
1 cubic foot	=	28·32 litre

To convert	*Multiply by*
oz/acre to g/ha	70·06
lb/acre to kg/ha	1·121
cwt/acre to kg/ha	125·5
cwt/acre to tonnes/ha	0·1255
tons/acre to kg/ha	2511
tons/acre to tonnes/ha	2·511
gal/acre to litre/ha	11·23

CONVERSION SCALES

CWT/ACRE TO TONNES/HA

TONNES/HA 0·0 0·03 0·05 0·08 0·10 0·13 0·15 0·18 0·20 0·23 0·25 0·28 0·30 0·33

CWT/ACRE 0·0 0·2 0·4 0·6 0·8 1·0 1·2 1·4 1·6 1·8 2·0 2·2 2·4 2·6

CWT/ACRE TO TONNES/HA

TONNES/HA 0·0 0·63 1·26 1·88 2·51 3·14 3·77 4·39 5·02 5·65 6·28 6·90 7·53 8·16

CWT/ACRE 0 5 10 15 20 25 30 35 40 45 50 55 60 65

TONS/ACRE TO TONNES/HA

TONNES/HA 0·0 25 5·0 75 10·0 12·615 17·6 20 22·6 25

TONS/ACRE 0 1 2 3 4 5 6 7 8 9 10 15 20 25

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Temperatures

To convert °F into °C subtract 32 and multiply by $\frac{5}{9}$ (0·5556)
To convert °C into °F multiply by $\frac{9}{5}$ (1·8) and add 32

Factors for the Conversion of Metric to Imperial Units

1 centimetre (cm)	=	0·3937 inch (in.) = 0·03281 ft
1 metre (m)	=	1·094 yards (yd)
1 square metre (sq m)	=	1·196 square yards (sq yd)
1 hectare (ha)	=	2·471 acres
1 gram (g)	=	0·03527 ounce (oz)
1 kilogram (kg)	=	2·205 pounds (lb)
1 kg	=	0·01968 hundredweight (cwt) = 0·0009842 ton
1 metric ton (tonne)	=	0·9842 ton
1 litre	=	1·760 pints = 0·2200 gallon (gal)
1 litre = 1000 millilitres (ml)	=	35·20 fluid ounces = 0·03531 cubic foot

To convert	*Multiply by*
g/ha to oz/acre	0·01427
kg/ha to lb/acre	0·8921
kg/ha to cwt/acre	0·007966
tonnes/ha to cwt/acre	7·966
kg/ha to tons/acre	0·0003983
tonnes/ha to tons/acre	0·3983
litre/ha to gal/acre	0·08902

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