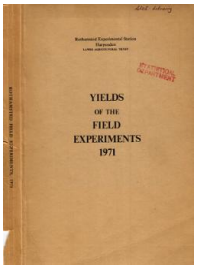
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ROTHAMSTED RESEARCH

Yields of the Field Experiments 1971

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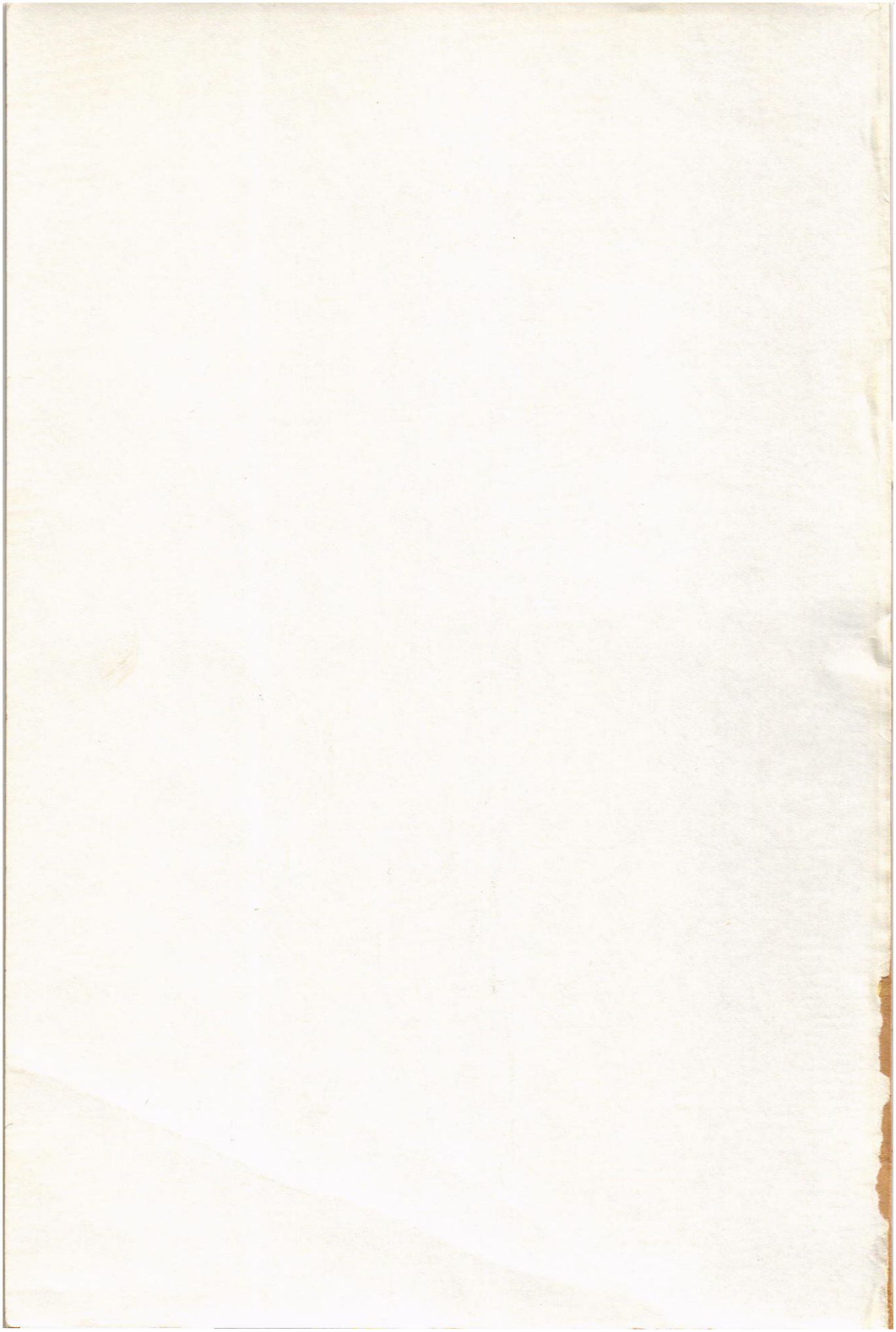
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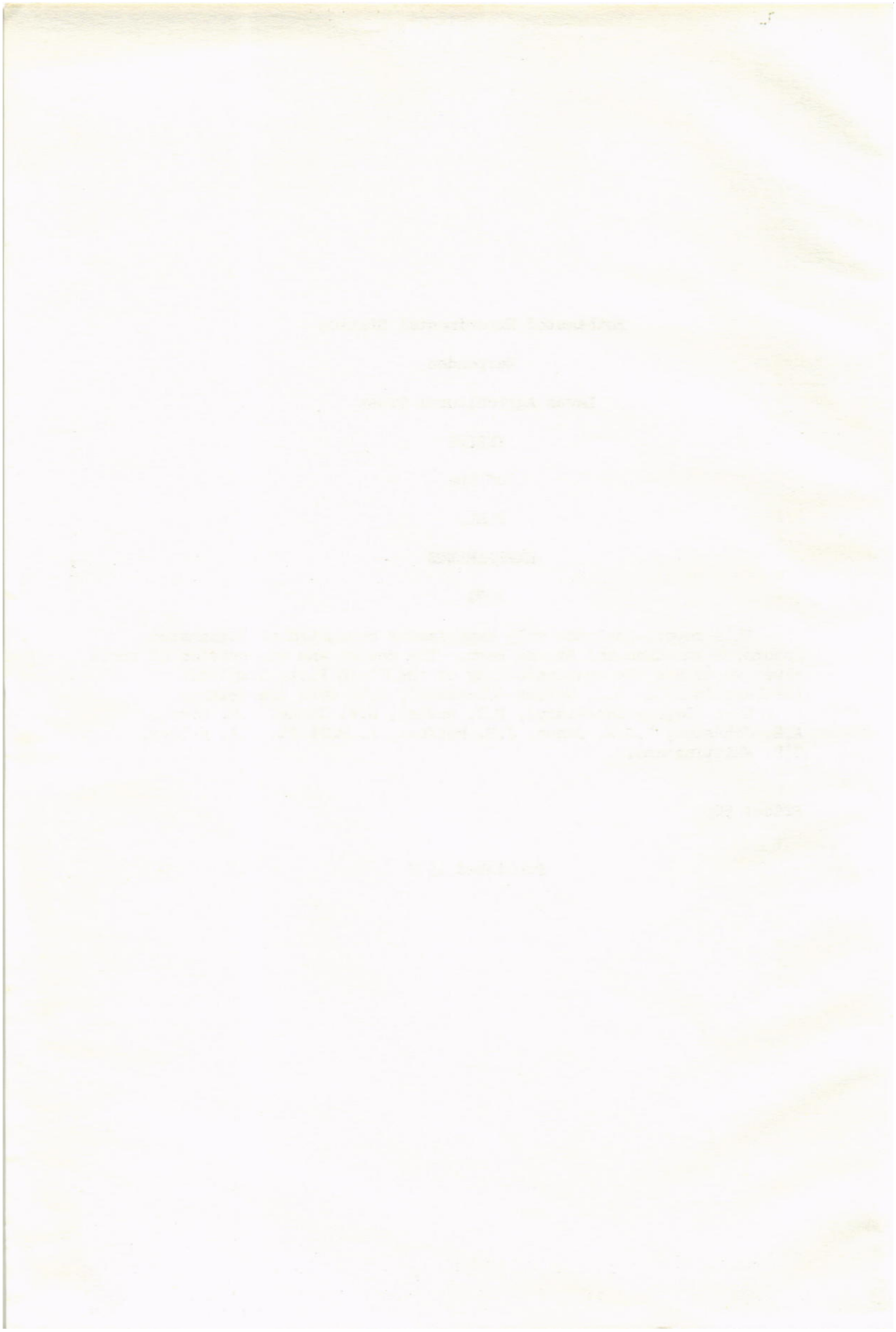
1971

This report includes only experiments conducted at Rothamsted, Woburn, Saxmundham and Brooms Barn. The design and supervision of these experiments are the responsibility of the Field Plots Committee (members in 1971: D.J. Watson (Chairman), G.V. Dyke (Secretary), J. McEwen (Deputy Secretary), F.C. Bawden, G.W. Cooke, J.M. Hirst, A.E. Johnston, F.G.W. Jones, J.R. Moffatt, R. Moffitt, J.A. Nelder, C.P. Whittingham).

Price: 50p

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R = Rothamsted W = Woburn S = Saxmundham BB = Broom's Barn

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CONVENTIONS 1971

In this report 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.

For each experiment, other than annuals, references are given for previous years. These refer to the '(Numerical) Results of the Field Experiments' - (t) indicates a year when treatments were described. For the classical and some long-term experiments reference is made to 'Details' - a separate publication with full title 'Details of the Classical and Long Term Experiments up to 1967'.

Compound fertilisers indicated thus - (20:10:10) = compound fertiliser (20% N, 10% P_2O_5, 10% K_2O), granular unless otherwise stated.

Treatment symbols are used in many summaries of results, and for annual experiments the key is given with the treatment descriptions.

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For the classical and some long term experiments the full description of the treatments up to 1967 was given in the 'Details': modifications are given whenever treatments change. For other long term experiments the key is given in the first year of the experiment with modifications as they arise.

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. 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. fallow paths made after the crop has established.

The 'Area harvested' in the 'Results', 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. long) was 7.8% greater with blank rows than without.

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 area as width x length where each is measured to the centre of 'paths' up to a maximum of 18 in.

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71/R/BK/1

BROADBALK

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

The 128th year, wheat, potatoes, beans. The fourth year of revised scheme.

For previous years see 'Details' 1967, Station Report for 1966, pp. 229-231, Station Report for 1968, Part 2, 68/A/1(t) and 69 - 70/R/BK/1.

Areas harvested:

Wheat:	Section 0	0.00433
	Section 1	0.00798
	Sections 3, 4 and 5	0.00659
	Sections 8 and 9	0.00694
Potatoes:	Section 7	0.00659
Beans:	Section 2	0.00741

Standard applications:-

Winter wheat: Weedkillers: Paraquat at 0.84 kg ion in 225 l to Section 0 only. Terbutryne and related triazines ('Prebane' at 4.48 kg in 225 l), MCPA, mecoprop and dicamba ('Banlene Plus' at 5.6 l in 225 l) to all sections except 8.

Potatoes: Weedkillers: Paraquat at 0.56 kg ion in 225 l. Linuron at 0.84 kg plus paraquat at 0.42 kg ion in 427 l. Fungicide: Mancozeb at 1.34 kg in 438 l on 2 occasions.

Spring beans: Weedkiller: Paraquat at 0.56 kg ion in 225 l. Insecticide: Demeton-s-methyl at 245 g in 438 l.

Cultivations, etc.:-

ALL SECTIONS: Autumn fertilisers applied: 18 Sept, 1970. FYM applied: 22 Sept. Ploughed: 21 - 23 Sept.

CROPPED SECTIONS:

Winter wheat: Paraquat applied to Section 0: 11 Sept, 1970. Seed drilled at 202 kg: 9 Oct. 'Prebane' applied: 10 Oct. N applied: 8 Apr, 1971. MCPA/mecoprop/dicamba applied: 15 Apr. Plot 19, Section 8 cut green and all produce removed (because of excessive weed infestation) and then deep-tine cultivated twice: 28 July. Combine harvested: 27 Aug. Variety: Cappelle.

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Potatoes: Paraquat applied: 4 Feb, 1971. N applied, plots rotary cultivated: 2 Apr. Potatoes machine planted: 3 Apr. Linuron plus paraquat applied: 8 May. Plots 01, 21 and 22 grubbed: 3 June and rotary ridged: 4 June. Remaining plots grubbed: 5 June and rotary ridged: 10 June. Fungicide applied: 23 June and 16 Aug. Haulm destroyed mechanically: 26 Aug - 8 Sept. Lifted: 14 Sept. Variety: King Edward.

Spring beans: Paraquat applied: 4 Feb, 1971. N applied: 24 Feb. Seed drilled at 224 kg: 25 Feb. Insecticide applied: 1 July. Combine harvested: 2 Sept. Variety: Maris Bead.

FALLOW SECTION: Ploughed second time: 19 Apr, 1971, third time: 8 July.

BROADBALK WILDERNESS:-

Ungrazed meadow (north): Topped with rotary grass cutter: 23 Oct, 1970.

Grazed meadow (centre): Grazed by sheep: 5 - 26 May, 1971, 8 - 16 June, 6 - 16 July, 13 - 19 Aug, 10 - 21 Sept. Grass topped: 27 May, 16 June, 16 July, 22 Sept.

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71/R/BK/1

SUMMARY OF RESULTS

WHEAT

GRAIN: TONNES/HECTARE

Section	3	5	4	1	8	9	0	
Years after fallow	1	2	**	5	8*	13	20	Mean
Plot								
01	6.37	5.76	5.86					
21	6.10	5.30	4.88	5.38	3.91	5.54	4.86	5.14
22	7.31	6.65	6.88	6.68	3.29	6.62	6.54	6.28
03	3.13	2.21	2.53	2.08	1.57	2.05	2.08	2.24
05	3.78	1.95	2.64	2.00	2.10	2.20	2.54	2.46
06	4.66	4.17	4.93	4.29	1.39	4.09	4.52	4.01
07	5.14	6.29	6.37	5.57	2.85	5.94	5.95	5.44
08	5.33	5.97	6.05	5.36	3.65	6.23	5.73	5.48
09	5.45	5.81	5.95	5.37	2.58	5.91	5.27	5.19
10	4.14	5.38	5.44	4.66	3.53	4.06	3.30	4.36
11	2.95	4.98	5.11	3.46	2.45	3.46	4.23	3.81
12	4.40	5.74	5.74	5.55	2.90	5.79	5.31	5.06
13	5.07	6.00	6.35	5.51	2.75	6.29	5.57	5.36
14	4.89	6.13	6.38	6.04	3.66	6.09	5.58	5.54
15	5.44	6.06	6.18	6.00	3.80	6.99	5.82	5.76
16	5.43	5.67	6.14	5.32	2.36	5.49	4.93	5.05
17	5.36	5.81	6.18	5.23	2.22	5.85	5.52	5.17
18	5.40	5.84	6.16	5.42	2.80	6.23	5.17	5.29
19	5.25	5.29	5.70	4.26	+	4.90	4.56	
20				4.64			4.42	

Mean D.M. %: 80.8

* No herbicide
** After beans
\+ Cut green - no yield taken

% Weed seeds + rubbish

Plot	Section	
05	8	46.7
06	8	60.6
10	8	1.9
10	9	0.8
11	3	0.9
11	4	0.4
16	0	0.3

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71/R/BK/1

WHEAT

STRAW: TONNES/HECTARE

Section	3	5	4	1	8	9	0	
Years after fallow	1	2	**	5	8*	13	20	Mean
Plot								
01	5.25	5.80	6.15					5.73
21	7.29	6.83	9.02	6.04	9.04	7.43	5.96	7.37
22	7.37	6.84	7.72	8.01	10.01	7.23	8.04	7.89
03	1.81	1.61	2.21	2.13	2.51	1.36	1.82	1.92
05	3.05	1.52	2.00	2.09	5.10	1.80	1.95	2.50
06	4.51	3.40	4.68	3.99	5.12	3.79	4.00	4.21
07	4.27	6.35	6.23	4.98	8.25	5.71	5.15	5.85
08	4.67	6.21	7.24	5.83	9.99	5.95	4.51	6.34
09	4.78	5.61	5.85	5.80	9.98	5.48	4.56	6.01
10	2.19	3.88	3.56	3.61	6.77	3.94	3.09	3.86
11	1.78	3.21	3.74	2.79	6.45	3.11	2.88	3.42
12	3.04	4.36	5.15	4.21	7.12	4.81	5.90	4.94
13	4.50	5.48	6.57	5.40	7.73	7.97	4.40	6.01
14	3.88	4.87	6.65	4.99	8.08	6.00	5.22	5.67
15	4.74	6.14	6.14	5.06	8.61	7.15	5.86	6.24
16	4.84	5.36	6.18	4.90	8.30	5.62	4.72	5.70
17	4.47	5.31	6.13	4.69	8.86	6.19	4.79	5.78
18	4.93	5.52	5.68	5.08	10.70	5.54	4.77	6.03
19	3.05	4.61	5.26	4.37	7.28	4.24	4.54	4.77
20				4.17			3.84	4.00

Mean D.M. %: 90.2

* No herbicide
** After beans

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71/R/BK/1

Section	2		2	
	SPRING BEANS		POTATOES	
Plot	GRAIN: TONNES/ HECTARE	STRAW: TONNES/ HECTARE	TOTAL TUBERS: TONNES/ HECTARE	% WARE 3.81 CM (1.5 INCH) RIDDLE
01	1.94	2.20	36.2	84.9
21	2.60	4.15	49.4	87.6
22	2.59	3.54	36.2	85.9
03	2.02	1.41	7.8	59.7
05	2.69	2.11	9.6	52.3
06	2.53	3.04	20.2	67.2
07	2.56	3.37	35.4	80.2
08	2.41	3.01	42.4	84.3
09	2.52	3.07	45.6	86.5
10	1.53	0.68	9.2	69.0
11	0.49	1.84	6.2	26.0
12	1.06	1.75	12.0	38.8
13	2.19	2.78	25.8	71.0
14	2.07	2.22	22.8	66.0
15	2.14	2.52	36.5	80.4
16	2.32	2.87	35.8	83.6
17	2.46	2.29	35.7	85.4
18	2.63	2.63	35.6	85.7
19	2.05	2.18	23.3	80.0
Mean D.M. %:	79.5	49.5		

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71/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 120th year, potatoes, beans, barley. The 4th year of revised scheme.

For previous years see 'Details' 1967, Station Report for 1966, 68/A/2(t), 69/R/HB/2(t) and 70/R/HB/2.

Standard applications:
Potatoes: Weedkillers: Paraquat at 0.28 kg ion in 225 l. Linuron at 1.68 kg in 427 l. Fungicide: Mancozeb at 1.34 kg in 438 l.
Spring beans: Weedkiller: Paraquat at 0.28 kg ion in 225 l. Insecticide: Demeton-s-methyl at 245 g in 427 l.
Barley: Weedkillers: Paraquat at 0.28 kg ion in 225 l. Ioxynil octanoate, bromoxynil octanoate and the iso-octyl ester of dichlorprop ('Oxytril P' at 1.4 l in 225 l).

Cultivations, etc.: Fertilisers, except N, applied: 16 Oct, 1970. FYM applied: 21 Oct. Ploughed: 22 Oct.
Potatoes: Paraquat applied: 19 Sept, 1970. N applied, plots rotary cultivated, potatoes machine planted: 2 Apr, 1971. Linuron applied: 15 Apr. Grubbed: 3 June. Rotary ridged: 4 June. Fungicide applied: 13 Aug. Haulm destroyed mechanically: 8 Sept. Lifted: 15 Sept. Variety: King Edward.
Spring beans: Paraquat applied: 19 Sept, 1970. Seed drilled at 224 kg: 24 Feb, 1971. Insecticide applied: 1 July. Combine harvested: 2 Sept. Variety: Maris Bead.
Barley: Paraquat applied: 19 Sept, 1970. Seed drilled at 157 kg: 24 Feb, 1971. N applied: 23 Mar. 'Oxytril P' applied: 10 May. Combine harvested, large combine plots: 11 Aug, small combine plots: 18 Aug. Variety: Julia.

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NOTES: (1) Strip 3 (K Na Mg) received an overdose of 72.8 kg of total mineral fertiliser to the strip.

(2) Equisetum infestation was greatest on certain plots without N. In places the edge of a patch of Equisetum coincided with the boundary of a plot receiving N.

(3) After barley harvest, shed grain sprouted in patches, apparently where the combine stopped at the end of each yield strip. The patches were larger at the South than the North ends, and were absent or very slight on the small combine plots. A rough calculation from one plot indicated a loss of about 100 kg per ha from the area taken for yield.

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71/R/HB/2

SUMMARY OF RESULTS

BARLEY

N: KG/HA

Treatment**		0	48	96	144	Mean
1852-1971	1852-1966	GRAIN: TONNES/HECTARE				
-	-	1.36	2.63	3.15	2.91	2.51
-	N	1.74	1.94	2.17	1.96	1.95
P	-	1.66	3.11	3.35	3.46	2.89
P	N	1.96	2.69	2.36	1.41	2.10
K Na Mg	-	0.98	3.23	3.86	4.59	3.17
K Na Mg	N	1.75	2.64	2.38	2.82	2.40
P K Na Mg	-	1.48	3.94	5.45	6.08	4.24
P K Na Mg	N	2.53	3.74	6.30	5.79	4.59
	D	5.02	5.55	4.76	4.67	5.00
	(D)	1.04	2.76	4.20	4.19	3.05
	(Ashes)	1.98	3.87	4.11	4.73	3.67
	-	1.22	2.80	2.47	3.90	2.60
		STRAW: TONNES/HECTARE				
-	-	0.57	1.42	1.84	1.85	1.42
-	N	0.58	1.13	1.28	1.14	1.03
P	-	0.84	1.84	2.28	2.42	1.84
P	N	0.73	1.72	1.88	1.43	1.44
K Na Mg	-	0.41	1.96	3.13	3.45	2.24
K Na Mg	N	0.71	1.73	1.84	2.12	1.60
P K Na Mg	-	0.55	2.34	3.95	5.39	3.06
P K Na Mg	N	1.16	2.46	3.59	1.90	2.28
	D	4.18	5.18	5.50	5.47	5.08
	(D)	1.06	2.42	4.22	4.51	3.05
	(Ashes)	0.72	2.25	2.99	3.21	2.29
	-	0.55	1.52	2.06	2.63	1.69

** For explanation of symbols see 'Details' 1967

Mean D.M. % (all plots): Grain: 81.4
Straw: 89.8

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71/R/HB/2

BARLEY

N: KG/HA

Treatment**		0	48	96	144	Mean
		GRAIN: TONNES/HECTARE				
1852-1971	1852-1966					
-	N*	2.17	2.36	2.55	2.56	2.41
Si	N*	2.31	4.62	5.34	4.34	4.15
P	N*	2.12	3.74	3.93	3.54	3.33
P Si	N*	2.59	4.83	5.14	6.03	4.65
K Na Mg	N*	1.28	3.18	3.59	3.41	2.86
K Na Mg Si	N*	2.33	4.43	5.28	5.99	4.51
P K Na Mg	N*	1.90	4.47	5.56	5.84	4.44
P K Na Mg Si	N*	2.11	4.90	6.70	6.04	4.94
-	R(c)	2.42	4.58	5.64	6.12	4.69
-	R(r)	3.92	5.06	5.82	5.86	5.17
P	R(c)	2.85	4.66	5.19	4.39	4.28
P	R(r)	3.85	5.21	5.40	5.01	4.87
K Na Mg	R(c)	2.67	4.29	5.19	6.23	4.60
K Na Mg	R(r)	3.44	4.46	5.43	5.72	4.76
P K Na Mg	R(c)	2.76	4.41	6.22	5.96	4.84
P K Na Mg	R(r)	4.19	5.61	5.92	6.30	5.50
		STRAW: TONNES/HECTARE				
-	N*	0.99	0.98	0.99	1.45	1.10
Si	N*	0.95	2.99	3.47	2.94	2.59
P	N*	1.02	2.49	2.45	2.52	2.12
P Si	N*	1.00	3.60	3.89	4.48	3.24
K Na Mg	N*	0.96	1.91	2.37	2.24	1.87
K Na Mg Si	N*	0.97	2.96	3.77	4.80	3.12
P K Na Mg	N*	0.90	3.04	4.11	4.57	3.16
P K Na Mg Si	N*	0.92	3.40	5.02	5.10	3.61
-	R(c)	1.01	3.08	4.12	4.53	3.19
-	R(r)	1.96	3.02	4.03	4.04	3.26
P	R(c)	1.50	3.07	3.59	3.61	2.94
P	R(r)	2.01	3.57	3.60	3.08	3.06
K Na Mg	R(c)	0.99	2.92	4.08	5.09	3.27
K Na Mg	R(r)	1.49	3.03	4.05	4.97	3.39
P K Na Mg	R(c)	1.48	3.02	4.07	4.56	3.28
P K Na Mg	R(r)	2.49	3.52	4.53	4.85	3.85

** For explanation of symbols see 'Details' 1967

NOTE: (c) = continuous (i.e. barley after barley)
(r) = rotational (i.e. barley after beans)

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71/R/HB/2

BARLEY

Plots	Treatment**			GRAIN: TONNES/ HECTARE	STRAW: TONNES/ HECTARE
	1852-1971		1852-1966		
551	N2	PK	N	4.30	3.20
561	-	PK	-	1.19	0.58
571	N2	-	N*	3.89	2.41
581	N2	-	N*	2.87	1.77

** For explanation of symbols see 'Details' 1967

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71/R/HB/2

BEANS

1969

N: KG/HA

Treatment**		0	48	96	144	Mean
		GRAIN: TONNES/HECTARE				
1852-1971 1852-1966						
-	R	1.79	1.28	2.37	1.62	1.77
P	R	1.08	1.39	1.64	1.69	1.45
K Na Mg	R	1.71	1.67	1.66	1.60	1.66
P K Na Mg	R	2.04	2.47	2.39	2.54	2.36
Mean		1.66	1.70	2.01	1.86	1.81
		STRAW: TONNES/HECTARE				
-	R	1.37	0.72	1.30	0.99	1.10
P	R	0.69	1.23	0.90	1.08	0.98
K Na Mg	R	2.16	1.13	1.56	1.39	1.56
P K Na Mg	R	2.06	2.28	2.67	3.27	2.57
Mean		1.57	1.34	1.61	1.69	1.55

Mean D.M. %: Grain: 81.5
Straw: 52.7

** For explanation of symbols see 'Details' 1967

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71/R/HB/2

POTATOES

Treatments**			N: KG/HA 1970 0	48	96	144	Mean
TOTAL TUBERS: TONNES/HECTARE							
1852-1970	1852-1966						
-		N*	8.3	9.0	7.4	8.1	8.2
	Si	N*	7.4	7.5	8.1	8.3	7.8
P		N*	7.8	7.2	6.6	8.1	7.4
P	Si	N*	7.2	7.1	7.2	8.2	7.4
K Na Mg		N*	23.1	23.8	21.0	22.1	22.5
K Na Mg Si		N*	27.7	25.9	26.5	26.3	26.6
P K Na Mg		N*	35.5	34.8	38.4	35.0	35.9
P K Na Mg Si		N*	38.7	37.0	32.0	36.0	35.9
-		R	18.3	20.1	18.4	18.4	18.8
P		R	13.4	11.6	10.2	16.6	13.0
K Na Mg		R	26.6	26.2	25.9	30.0	27.2
P K Na Mg		R	38.1	34.1	35.8	38.3	36.6
% WARE: 3.81 (1.5 INCH) RIDDLE							
-		N*	67.3	69.6	62.0	77.9	69.2
	Si	N*	63.4	66.4	68.8	67.1	66.4
P		N*	45.3	34.3	28.8	36.1	36.1
P	Si	N*	39.4	35.3	44.2	44.6	40.9
K Na Mg		N*	89.1	89.6	87.0	87.9	88.4
K Na Mg Si		N*	91.1	89.9	90.1	90.2	90.3
P K Na Mg		N*	79.3	77.7	75.4	82.9	78.8
P K Na Mg Si		N*	79.3	78.5	76.8	80.1	78.7
-		R	79.1	79.9	80.9	81.5	80.4
P		R	53.1	46.6	36.9	59.0	48.9
K Na Mg		R	82.1	80.2	84.2	82.5	82.3
P K Na Mg		R	80.4	76.6	75.7	77.2	77.5

** For explanation of symbols see 'Details 1967'

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71/R/WF/3

WHEAT AND FALLOW

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

The 116th year, winter wheat.

For previous years see 'Details' 1967, 68/A/3(t) and 69-70/R/WF/3.

Whole plot dimensions: 9.6 x 52.1. Area harvested: 0.01483.

Cultivations, etc.:
Cropped plots: Ploughed: 4 Sept, 1970. Seed drilled at 202 kg: 9 Oct. Sprayed with ioxynil at 0.63 kg and mecoprop at 1.9 kg in 225 l: 15 Apr, 1971. Combine harvested: 27 Aug. Variety: Cappelle.
Fallow plots: Ploughed 3 times: 4 Sept, 1970, 19 Apr, 1971, 8 July.

SUMMARY OF RESULTS

Plot No.	6	8	2
No. of years of fallow	1	1	3
	GRAIN: TONNES/HECTARE		
	1.82	1.22	1.81
	STRAW: TONNES/HECTARE		
	1.20	0.92	1.01

Mean D.M. %: Grain: 79.6
Straw: 85.0

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71/R/EX/4

EXHAUSTION LAND

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

The 116th year, barley.

For previous years see 'Details' 1967, 68/A/7 and 69-70/R/EX/4.

Area harvested: 0.03000.

Cultivations, etc.: Ploughed: 9 Sept, 1970. Seed combine drilled at 157 kg: 25 Feb, 1971. Sprayed with ioxynil octanoate, bromoxynil octanoate and the iso-octyl ester of dichlorprop ('Oxytril P' at 1.4 l in 225 l): 11 May. Combine harvested: 17 Aug. Variety: Julia.

SUMMARY OF RESULTS

Plot	1876 - 1901	TONNES/HECTARE GRAIN	STRAW
1	-	1.72	0.69
2	-	1.84	1.14
3	D	4.69	2.97
4	D	4.69	2.98
5	N	1.89	0.99
6	N*	1.87	1.34
7	N PKNa Mg	4.05	2.60
8	N* PKNa Mg	4.18	2.62
9	P	3.56	2.58
10	PKNa Mg	4.45	2.83
Mean		3.29	2.07
Mean D.M. %:		83.8	87.7

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71/R/PG/5

PARK GRASS

Object: To study the effects of organic and inorganic manures on permanent grass (for hay). The effects of liming are also studied.

The 116th year, hay.

For previous years see 'Details' 1967, 68/A/6(t) and 69-70/R/PG/5.

Cultivations, etc.: Mineral fertilisers applied, fish meal applied: 10 Nov, 1970. N applied: 1st dressing - 30 Mar, 1971, 2nd dressing - 19 Apr. Cut twice: 24 June, 15 Sept.

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SUMMARY OF RESULTS

DRY MATTER: TONNES/HECTARE

Plot	1st cut a	b	c	d	Mean	2nd cut a	b	c	d	Mean	Total of 2 cuts a	b	c	d	Mean
1	2.49	2.26	1.66	0.52	1.73	1.43	1.32	0.50	0.48	0.93	3.92	3.57	2.16	1.00	2.66
2	1.78	1.71	1.74	1.73	1.74	1.17	1.00	0.83	1.02	1.01	2.95	2.72	2.56	2.75	2.75
3	1.61	1.80	1.59	1.50	1.62	0.84	0.86	0.82	0.83	0.83	2.44	2.66	2.40	2.33	2.46
4-1	2.26	2.25	2.09	2.15	2.19	1.19	1.18	1.14	1.12	1.16	3.45	3.43	3.24	3.27	3.35
4-2	3.41	3.41	3.99	3.21	3.50	1.19	1.18	0.88	1.19	1.11	4.60	4.59	4.88	4.40	4.62
7	5.57	5.38	2.97	3.49	4.35	3.66	3.58	2.00	1.81	2.76	9.23	8.97	4.97	5.30	7.12
8	2.52	2.34	2.80	2.71	2.59	1.53	1.30	1.47	1.47	1.44	4.05	3.64	4.27	4.18	4.04
9	6.94	7.03	7.66	5.93	6.89	2.93	2.79	1.62	1.03	2.09	9.87	9.82	9.28	6.96	8.98
10	4.54	4.74	5.09	3.99	4.59	1.55	1.50	1.34	1.17	1.39	6.09	6.24	6.43	5.16	5.98
11-1	7.52	7.68	9.10	7.57	7.97	2.97	2.32	2.52	3.01	2.70	10.49	10.00	11.62	10.58	10.67
11-2	7.45	7.99	7.17	7.90	7.63	3.88	3.56	2.35	2.48	3.07	11.32	11.56	9.53	10.38	10.70
12	2.35		2.94		2.64	1.52		1.18		1.35	3.87		4.12		4.00
13	5.37	5.50	5.00	4.46	5.08	3.24	2.99	2.31	1.96	2.62	8.61	8.49	7.30	6.42	7.71
14	6.37	5.07	6.16	6.45	6.01	1.10	2.53	3.17	3.38	2.54	7.47	7.60	9.33	9.83	8.56
15	4.80		2.57		3.68	2.85		1.44		2.14	7.65		4.00		5.83
16	5.36	5.48	4.42	4.26	4.88	2.59	2.73	2.22	1.88	2.36	7.95	8.21	6.64	6.14	7.24
17	2.52	2.46	3.01	3.05	2.76	1.34	1.26	1.34	1.56	1.38	3.85	3.72	4.36	4.61	4.14
18-1			3.92	1.69	2.80			1.40	0.93	1.17			5.32	2.62	3.97
18-2					3.02					1.98					5.00
18-3	3.58	3.61			3.60	1.89	1.98			1.94	5.48	5.60			5.54
19-1					4.54					2.58					7.12
19-2					5.45					3.16					8.61
19-3					5.07					2.78					7.85
20-1					5.98					2.87					8.85
20-2					5.62					2.32					7.94
20-3					5.52					2.46					7.98

Mean D.M. %: 1st cut: 24.4 2nd cut: 26.2 Total of 2 cuts: 25.3

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71/R/AG/6

AGDELL

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

The second year of revised scheme. Rotation: Sugar beet, barley, potatoes. Crops in 1971: Barley and potatoes.

For previous years see 'Details' 1967, 68/A/4, 69/R/AG/6 and 70/R/AG/6(t).

Sub plot dimensions:
Fallow: Plots 1, 2, 3, 4 - 12.1 x 6.04. Plots 5, 6 - 10.9 x 6.04.
Barley and potatoes: Plots 1, 2, 3, 4 - 6.04 x 3.02. Plots 5, 6 - 5.43 x 3.02.

Area harvested: Barley: 0.00066, potatoes: 0.00069.

The remaining grass sub plots were rotary cultivated in autumn 1970 and bare-fallowed in 1971.

New superphosphate treatments:
Barley: As 1970.
Potatoes: None (0), 188 kg (3) P_2O_5 as single superphosphate.

Standard applications:
Barley: Manures as 1970.
Potatoes: Manures: 251 kg N, 251 kg K_2O, 100 kg MgO as 'Nitro-Chalk' 21, muriate of potash and kieserite. Weedkillers: Linuron at 0.84 kg plus paraquat at 0.84 kg ion in 449 l. Couch was spot-sprayed with paraquat. Fungicide: Mancozeb at 1.34 kg in 449 l on 3 occasions, followed by captafol at 1.68 kg in 449 l on one occasion. Insecticide: Menazon ('Saphicol' at 0.7 l) applied with each application of fungicide.

Cultivations, etc.:
Grass and fallow: Grass plots rotary cultivated: 21 Oct, 1970. All fallows sprayed with paraquat at 1.12 kg ion in 225 l: 6 Nov. All fallows rotary cultivated: 21 Apr, 1971, 11 May, 2 June.
Barley: Ploughed: 29 Oct, 1970. Test P applied, seed drilled at 168 kg, basal NK applied: 10 Mar, 1971. Combine harvested: 9 Aug. Variety: Julia.
Potatoes: Ploughed: 29 Oct, 1970. Test P, basal NK and Mg applied, plots rotary cultivated, potatoes planted: 5 Apr, 1971. Linuron and paraquat applied: 10 May. Couch spot sprayed with paraquat: 2 June. Insecticide and fungicide applied: 16 June, 6 and 28 July, 18 Aug. Lifted 28 Sept. Variety: King Edward.

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71/R/AG/6

SUMMARY OF RESULTS

BARLEY

GRAIN: TONNES/HECTARE

Treatment 1848-1951		Plot 5 None	6 None	3 PK	4 PK	1 NPK	2 NPK	Mean
P		Previous cropping 1958-69, Arable or fallow						
1964	1970-71							
0	0	3.06	4.06	5.43	4.09	3.30	4.08	4.01
1	0	4.10	3.03	5.33	4.42	3.44	4.41	4.12
2	0	4.79	4.79	5.37	4.86	3.87	4.84	4.75
4	0	4.60	5.55	5.74	5.58	3.69	5.31	5.08
0	1	4.38	4.95	5.09	4.31	2.73	5.00	4.41
1	1	4.72	4.76	5.44	4.39	4.34	5.13	4.80
2	1	5.49	4.91	5.56	5.37	3.73	4.53	4.93
4	1	5.87	5.51	5.91	5.54	4.65	5.04	5.42
Mean		4.63	4.70	5.48	4.82	3.72	4.79	4.69
P		Previous cropping 1958-69, Grass						
1964-69	1970							
0	0	2.99	3.25	3.35	4.00	5.39	4.85	3.97
1	0	5.30	6.34	6.35	5.46	6.05	6.20	5.95
2	0	6.17	6.15	6.16	6.16	5.72	6.04	6.07
4	0	5.86	6.52	6.48	6.72	6.17	5.80	6.26
0	1	4.96	5.88	5.61	5.34	5.64	5.67	5.52
1	1	6.13	6.25	6.58	6.53	6.27	6.21	6.33
2	1	6.22	6.44	6.19	6.16	6.21	6.38	6.27
4	1	6.12	6.73	6.20	5.96	5.98	5.97	6.16
Mean		5.47	5.95	5.87	5.79	5.93	5.89	5.81

Mean D.M. %: 78.0

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71/R/AG/6

BARLEY

STRAW: TONNES/HECTARE

Treatment 1848-1951		Plot 5 None	6 None	3 PK	4 PK	1 NPK	2 NPK	Mean
P		Previous cropping 1958-69, Arable or fallow						
1964	1970-71							
0	0	2.14	2.72	4.00	2.72	2.35	2.85	2.80
1	0	3.16	2.20	3.59	2.85	2.55	2.77	2.85
2	0	3.60	3.27	3.62	3.28	2.69	3.18	3.27
4	0	3.37	4.25	3.80	3.67	2.58	3.26	3.49
0	1	3.16	4.05	3.73	2.85	2.23	3.58	3.27
1	1	3.59	3.39	3.81	3.00	3.11	3.27	3.36
2	1	3.89	3.55	3.72	3.92	2.67	3.06	3.47
4	1	4.22	4.38	4.04	3.99	3.17	3.02	3.80
Mean		3.39	3.48	3.79	3.28	2.67	3.12	3.29
P		Previous cropping 1958-69, Grass						
1964-69	1970							
0	0	1.85	2.30	2.29	2.64	4.04	3.36	2.75
1	0	3.83	4.76	4.90	3.95	4.16	4.12	4.29
2	0	4.62	4.71	4.35	4.84	4.45	4.62	4.60
4	0	4.90	5.27	5.36	5.58	4.43	4.34	4.98
0	1	3.60	4.23	4.22	4.30	4.32	4.33	4.17
1	1	4.70	4.88	5.02	5.35	4.32	4.76	4.84
2	1	4.91	5.14	4.49	5.31	4.68	4.42	4.83
4	1	4.69	5.23	5.01	5.12	4.65	4.55	4.87
Mean		4.14	4.56	4.46	4.64	4.38	4.31	4.41

Mean D.M. %: 61.2

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71/R/AG/6

POTATOES

TOTAL TUBERS: TONNES/HECTARE

Treatment 1848-1951		Plot 5 None	6 None	3 PK	4 PK	1 NPK	2 NPK	Mean
P		Previous cropping 1958-69, Arable or fallow						
1964	1970-71							
0	0	26.6	28.4	31.8	28.8	30.6	24.9	28.5
1	0	29.0	27.7	38.1	33.1	37.9	26.8	32.1
2	0	31.8	33.1	36.2	31.4	34.3	28.6	32.6
4	0	31.8	30.6	38.7	34.7	38.1	34.2	34.7
0	1	37.7	37.4	29.9	28.3	38.1	19.6	31.8
1	1	29.8	31.8	42.7	36.1	40.4	25.0	34.3
2	1	39.6	34.4	47.1	40.5	41.7	36.8	40.0
4	1	41.2	35.7	44.6	38.8	43.6	41.2	40.8
Mean		33.4	32.4	38.6	34.0	38.1	29.6	34.4
P		Previous cropping 1958-69, Grass						
1964-69	1970							
0	0	22.6	16.9	27.9	24.8	46.9	30.5	28.3
1	0	32.5	40.0	33.9	32.2	44.7	40.9	37.4
2	0	40.6	42.5	38.2	40.7	42.4	44.6	41.5
4	0	37.5	35.2	46.2	38.4	39.9	39.4	39.4
0	1	34.6	37.2	43.2	42.4	47.4	45.9	41.8
1	1	39.7	46.2	45.9	36.9	45.9	43.2	43.0
2	1	39.7	42.7	44.1	41.3	48.6	49.8	44.4
4	1	45.9	42.6	49.4	35.4	52.8	47.7	45.6
Mean		36.7	37.9	41.1	36.5	46.1	42.7	40.2

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71/R/AG/6

POTATOES

% WARE: 4.44 CM (1.75 INCH) RIDDLE

Treatment 1848-1951		Plot 5	6	3	4	1	2	Mean
		None		PK		NPK		
P		Previous cropping 1958-69, Arable or fallow						
1964	1970-71							
0	0	57.9	63.6	57.9	67.3	56.6	47.0	58.4
1	0	59.7	59.5	67.2	61.6	62.6	55.7	61.1
2	0	65.7	56.4	49.7	62.0	62.4	58.9	59.2
4	0	53.7	58.1	63.6	70.6	58.9	40.0	57.5
0	1	62.0	68.7	47.1	59.4	61.7	43.1	57.0
1	1	72.2	59.2	66.0	65.7	57.6	41.1	60.3
2	1	62.5	61.6	56.4	72.0	56.9	51.4	60.1
4	1	55.2	76.6	59.1	67.3	52.9	42.0	58.8
Mean		61.1	63.0	58.4	65.7	58.7	47.4	59.0
P		Previous cropping 1958-69, Grass						
1964-69	1970							
0	0	52.3	54.8	63.9	58.9	67.3	59.3	59.4
1	0	61.7	67.5	68.3	59.4	65.7	62.8	64.3
2	0	68.9	70.5	56.4	62.5	61.5	66.1	64.3
4	0	59.6	61.5	72.3	65.2	61.5	61.7	63.6
0	1	59.0	70.1	63.9	76.9	67.9	63.4	66.9
1	1	67.0	63.6	65.0	64.3	64.4	52.5	62.8
2	1	68.9	71.0	58.5	57.3	63.7	55.7	62.5
4	1	65.3	63.5	65.0	49.2	54.9	60.2	59.7
Mean		62.8	65.3	64.2	61.7	63.4	60.2	62.9

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71/R/BN/7

BARNFIELD

Object: Originally studied the effects of organic and inorganic manures on continuous roots. The experiment has been modified to study effects on a four-course rotation and on continuous beans.

The fourth year of new scheme, beans, sugar beet, potatoes.

For previous years see 'Details' 1967, 68/A/5(t), 69/R/BN/7 and 70/R/BN/7(t).

Plot dimensions and areas harvested:
Potatoes and sugar beet (quarter plot): 4.27 x 28.5.
(Strip 1: 2.74 x 28.5). Area harvested: Potatoes - 0.00390, sugar beet, roots - 0.00130, tops - 0.00065.
Beans, Section 1 (half plot): 10.7 x 27.4.
(Strips 1 and 8: 7.01 x 27.4). Area harvested: 0.00878.
Section 2 (half plot): 10.7 x 19.5.
(Strips 1 and 8: 7.01 x 19.5). Area harvested: 0.00624.

Continuous spring beans: Fresh simazine was applied only to the quarter plots which tested simazine residues (1967 - 69) in 1970. There were thus three combinations:-

	1967	1968	1969	1970	1971
(1)	+	-	-	-	-
(2)	+	+	+	-	+
(3)	+	+	+	+	-

+ = simazine, - = no simazine (mechanical cultivation as needed).
On Section 1 treatment (1) was duplicated, Section 2 had only treatments (1) and (3).

Standard applications:
Spring beans: Weedkiller: Paraquat at 0.84 kg ion in 225 l.
Insecticide: Demeton-s-methyl at 245 g in 438 l.
Potatoes: Weedkillers: Paraquat at 0.28 kg ion in 225 l. Linuron at 1.68 kg in 427 l. Fungicide: Mancozeb at 1.35 kg in 438 l.
Sugar beet: Weedkiller: Paraquat at 0.28 kg ion in 225 l.
Insecticide: Demeton-s-methyl at 245 g in 438 l.

Cultivations, etc.: P,K, Na and Mg applied*: 15 Oct, 1970. FYM applied, all plots ploughed: 19 Oct.
Spring beans: Paraquat applied: 11 Sept, 1970. Seed drilled at 224 kg: 4 Mar, 1971. Simazine applied to appropriate quarter plots at 1.12 kg in 225 l: 10 Mar. Insecticide applied: 1 July. Combine harvested: 2 Sept. Variety: Maris Bead.

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Potatoes: Paraquat applied: 19 Sept, 1970. N applied: 31 Mar, 1971. All plots rotary cultivated, strips 1 and 2 twice, potatoes machine planted: 2 Apr. Linuron applied: 15 Apr. Grubbed: 4 June. Rotary ridged: 5 June. Fungicide applied: 23 June, 13 Aug. Haulm destroyed mechanically: 8 Sept. Sprayed with undiluted BOV at 169 l: 17 Sept. Lifted: 23 Sept. Variety: King Edward.

Sugar beet: Paraquat applied: 19 Sept, 1970. N applied: 31 Mar, 1971. Seed drilled at 5.6 kg: 2 Apr. Singled: 1 June. Insecticide applied: 25 June. Lifted: 3 Nov. Variety: Klein E.

* All plots of Strip 5 received extra fertiliser in error - 5.6 kg P.

Erratum to 70/R/BN/7, p.35. Cultivations to spring beans: 'Simazine applied to half plots .....' should be 'Simazine applied to appropriate sub plots.....', simazine was applied to one quarter plot per strip on Section 1 and one half plot on Section 2.

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71/R/BN/7

SUMMARY OF RESULTS

POTATOES

TOTAL TUBERS: TONNES/HECTARE

Strip	N	N	A	AC	C
1	0	22.8	-	-	19.4
	1	-	34.4	22.0	-
	2	45.5	-	-	31.0
	3	-	31.6	31.9	-
2	0	-	15.8	18.4	-
	1	34.0	-	-	33.0
	2	-	30.5	37.3	-
	3	44.1	-	-	48.7
4	0	11.9	-	-	15.4
	1	-	22.8	24.0	-
	2	27.6	-	-	33.2
	3	-	32.7	37.0	-
5	0	10.2	-	-	9.3
	1	-	8.9	8.8	-
	2	16.0	-	-	15.4
	3	-	8.6	9.3	-
6	0	-	11.0	12.8	-
	1	18.4	-	-	19.7
	2	-	23.1	30.6	-
	3	29.6	-	-	29.8
7	0	-	9.1	9.7	-
	1	11.3	-	-	12.7
	2	-	7.9	8.5	-
	3	18.7	-	-	15.8
8	0	-	5.8	6.3	-
	1	9.3	-	-	9.8
	2	-	6.4	6.8	-
	3	17.7	-	-	7.3
9	0			8.4	
	1			17.8	
	2			24.3	
	3			29.7	

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71/R/BN/7

POTATOES

% WARE: 3.81 CM (1.5 INCH) RIDDLE

Strip	N	N	A	AC	C
1	0	65.5	-	-	68.4
	1	-	78.5	64.7	-
	2	80.3	-	-	68.5
	3	-	67.5	61.9	-
2	0	-	62.0	61.9	-
	1	77.3	-	-	67.6
	2	-	71.7	65.7	-
	3	73.7	-	-	70.9
4	0	74.3	-	-	57.4
	1	-	70.3	64.4	-
	2	77.2	-	-	73.5
	3	-	72.5	70.1	-
5	0	73.3	-	-	60.2
	1	-	42.0	45.8	-
	2	73.2	-	-	65.4
	3	-	43.2	46.1	-
6	0	-	63.3	61.3	-
	1	76.6	-	-	70.1
	2	-	68.4	74.1	-
	3	87.3	-	-	81.6
7	0	-	61.0	64.5	-
	1	50.0	-	-	60.9
	2	-	37.9	53.2	-
	3	77.0	-	-	65.6
8	0	-	56.6	59.4	-
	1	78.0	-	-	64.0
	2	-	71.7	45.1	-
	3	85.1	-	-	60.0
9	0			71.3	
	1			82.1	
	2			85.0	
	3			77.0	

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71/R/BN/7

SUGAR BEET

CLEAN BEET: TONNES/HECTARE

Strip	N	N	A	AC	C
1	0	-	34.2	30.9	-
	1	35.4	-	-	48.3
	2	-	49.7	49.1	-
	3	51.8	-	-	44.9
2	0	32.2	-	-	27.4
	1	-	43.7	41.7	-
	2	48.8	-	-	50.0
	3	-	50.9	54.1	-
4	0	-	26.1	25.7	-
	1	32.3	-	-	31.1
	2	-	38.8	35.9	-
	3	49.5	-	-	47.9
5	0	-	28.8	32.8	-
	1	25.4	-	-	29.3
	2	-	36.5	35.4	-
	3	34.2	-	-	43.0
6	0	22.4	-	-	26.8
	1	-	26.8	30.1	-
	2	34.4	-	-	41.4
	3	-	43.4	46.9	-
7	0	11.1	-	-	16.6
	1	-	28.9	32.8	-
	2	36.6	-	-	39.3
	3	-	41.9	42.2	-
8	0	21.5	-	-	18.8
	1	-	21.1	25.4	-
	2	28.5	-	-	33.3
	3	-	30.4	27.2	-

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71/R/BN/7

SUGAR BEET

SUGAR %

Strip	N	N	A	AC	C
1	0	-	18.3	18.0	-
	1	18.2	-	-	17.5
	2	-	17.4	18.4	-
	3	17.4	-	-	17.2
2	0	18.3	-	-	18.2
	1	-	18.1	18.5	-
	2	18.2	-	-	18.6
	3	-	18.4	18.1	-
4	0	-	18.7	18.4	-
	1	19.1	-	-	18.9
	2	-	19.2	19.0	-
	3	18.4	-	-	18.5
5	0	-	18.9	18.5	-
	1	18.3	-	-	18.7
	2	-	18.8	18.5	-
	3	17.5	-	-	18.1
6	0	18.3	-	-	18.3
	1	-	19.4	18.8	-
	2	18.6	-	-	19.0
	3	-	18.7	18.5	-
7	0	18.7	-	-	18.2
	1	-	18.0	19.1	-
	2	18.2	-	-	19.1
	3	-	18.6	18.6	-
8	0	18.6	-	-	18.2
	1	-	19.2	19.0	-
	2	18.3	-	-	17.9
	3	-	17.4	16.8	-

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71/R/BN/7

SUGAR BEET

TOTAL SUGAR: TONNES/HECTARE

Strip	N	N	A	AC	C
1	0	-	6.26	5.55	-
	1	6.47	-	-	8.42
	2	-	8.65	9.03	-
	3	9.02	-	-	7.72
2	0	5.90	-	-	4.98
	1	-	7.92	7.72	-
	2	8.90	-	-	9.27
	3	-	9.35	9.79	-
4	0	-	4.90	4.73	-
	1	6.15	-	-	5.89
	2	-	7.46	6.81	-
	3	9.11	-	-	8.86
5	0	-	5.45	6.07	-
	1	4.66	-	-	5.48
	2	-	6.85	6.55	-
	3	6.00	-	-	7.76
6	0	4.09	-	-	4.90
	1	-	5.19	5.65	-
	2	6.40	-	-	7.87
	3	-	8.11	8.69	-
7	0	2.09	-	-	3.03
	1	-	5.19	6.26	-
	2	6.65	-	-	7.50
	3	-	7.80	7.83	-
8	0	4.00	-	-	3.43
	1	-	4.04	4.84	-
	2	5.21	-	-	5.97
	3	-	5.29	4.57	-

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71/R/BN/7

SUGAR BEET

TOPS: TONNES/HECTARE

Strip	N	N	A	AC	C
1	0	-	14.0	13.3	-
	1	16.7	-	-	24.4
	2	-	32.1	25.8	-
	3	32.8	-	-	32.1
2	0	18.8	-	-	11.9
	1	-	18.1	15.3	-
	2	27.2	-	-	22.3
	3	-	27.2	30.7	-
4	0	-	4.2	4.9	-
	1	7.0	-	-	7.0
	2	-	10.5	16.7	-
	3	18.8	-	-	24.4
5	0	-	4.9	5.6	-
	1	7.7	-	-	10.5
	2	-	16.0	18.8	-
	3	23.0	-	-	20.2
6	0	3.5	-	-	2.8
	1	-	6.3	8.4	-
	2	12.6	-	-	16.0
	3	-	14.0	17.4	-
7	0	3.5	-	-	5.6
	1	-	8.4	9.1	-
	2	15.3	-	-	13.3
	3	-	15.3	18.1	-
8	0	4.9	-	-	4.9
	1	-	9.1	10.5	-
	2	15.3	-	-	18.1
	3	-	22.3	22.3	-

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71/R/BN/7

BEANS

SIMAZINE

Strip	1967*	1967-70	1967-69 & 1971	Mean
	GRAIN: TONNES/HECTARE			
1	1.25	1.40	1.65	1.39
2	1.41	0.99	0.68	1.13
4	1.52	1.26	0.39	1.17
5	1.86	1.43	0.43	1.40
6	1.73	1.46	0.54	1.37
7	1.69	1.98	0.28	1.41
8	1.34	0.80	0.34	0.95
Mean	1.54	1.33	0.62	1.26
	STRAW: TONNES/HECTARE			
1	0.91	1.59	1.14	1.13
2	1.41	1.52	1.07	1.35
4	1.51	1.27	0.31	1.15
5	1.69	1.05	0.23	1.17
6	1.52	1.18	0.39	1.15
7	0.90	1.66	1.39	1.21
8	0.93	0.41	0.20	0.62
Mean	1.27	1.24	0.67	1.11

Mean D.M. %: Grain: 82.1
Straw: 77.8

* Duplicated treatment

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71/R/GC/8

GARDEN CLOVER

Object: To study the effects of nitrogen and magnesium on continuous red clover - **Manor Garden.**

The 118th year, red clover.

For previous years see 'Details' 1967, 68/A/8(t) **and** 69-70/R/GC/8.

Whole plot dimensions: 2.13 x 3.05. Area harvested: 0.00010.

Cultivations, etc.: Area hand dug, all plants removed: 14 Oct, 1970. Basal PK and test Mg applied: 11 Mar, 1971. Area raked down to seedbed, seed sown at 33.6 kg, test N applied: 2 Apr. Cut, basal K, test N and Mg applied: 15 July. Cut second time, basal K and test N applied: 23 Aug. Cut third time: 6 Oct. Variety: Essex Broad Red.

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

SUMMARY OF RESULTS

DRY MATTER: TONNES/HECTARE

	N0Mg0	N1Mg0	N0Mg1	N1Mg1	Mean
1st cut	1.73	2.89	3.09	3.07	2.70
2nd cut	1.87	2.17	2.74	2.37	2.29
3rd cut	1.14	1.30	1.27	1.37	1.27
Total of 3 cuts	4.74	6.36	7.11	6.81	6.25

Mean D.M. %: 1st cut: 26.0
2nd cut: 12.6
3rd cut: 18.3
Total of 3 cuts: 19.0

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71/S/RN/1

ROTATION I

Object: To compare nutrient cycles, uptakes of nutrients and responses to fresh P and K of lucerne and grass leys. To obtain an estimate of the rate of release of nutrients, particularly K, from Saxmundham soil. The effects of lucerne and grass leys will be compared on subsequent arable crops - Saxmundham.

For previous years see 'Details' 1967, 68/A/9(t) and 69-70/S/RN/1(t).

Whole plot dimensions (new plots): 5.49 x 17.1. Area harvested: Grass: 0.00139, lucerne: 0.00111.

Cultivations, etc.:-

Grass: P and K applied: 21 Jan, 1971. Bonemeal applied: 19 Feb. N applied: 1 Apr. Cut: blocks 1 and 2 - 11 May, 1 July, 6 Oct, blocks 3 and 4 - 18 May, 6 July, 6 Oct. N applied after each cut except the last. Varieties: Timothy (S.352) and Meadow Fescue (S.215).

Lucerne: P and K applied: 21 Jan, 1971. Bonemeal applied: 19 Feb. Cut: 25 May, 27 July, 7 Sept. Variety: Europe.

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'71/S/RN/1

SUMMARY OF RESULTS

OLD TREATMENTS

GRASS, DRY MATTER: TONNES/HECTARE

Treatment 1899-1971	1st cut	2nd cut	3rd cut	Total of 3 cuts
D	4.39	1.27	1.18	6.84
B	2.57	0.93	0.41	3.91
N	3.83	1.94	1.60	7.37
P	1.95	0.96	0.36	3.27
K	1.49	0.83	0.24	2.56
-	1.84	0.84	0.44	3.12
PK	2.18	0.85	0.31	3.34
NK	3.50	1.87	1.92	7.29
NP	3.68	2.40	2.08	8.16
NPK	4.01	2.43	2.15	8.58
Mean	2.94	1.43	1.07	5.44

Mean D.M. %: 1st cut: 26.0
2nd cut: 30.4
3rd cut: 40.6
Total of 3 cuts: 32.3

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71/S/RN/1

NEW TREATMENTS

GRASS, DRY MATTER: TONNES/HECTARE

Treatment 1899-1965	Treatment* from 1966	1st cut	2nd cut	3rd cut	Total of 3 cuts
D	DN1	4.95	3.61	4.72	13.28
B	B	3.81	3.30	4.54	11.65
N	N2P2	4.55	3.49	4.22	12.25
P	N1P1	4.10	3.66	4.39	12.16
K	N1P2K	3.62	3.52	4.20	11.34
-	N1P2	4.57	3.49	4.31	12.36
PK	N1P1K	3.82	3.72	4.15	11.70
NK	N2P2K	4.22	3.47	4.41	12.11
NP	N2P1	4.22	3.39	4.31	11.92
NPK	N2P1K	3.97	3.51	4.39	11.86
Mean		4.18	3.52	4.36	12.06

Mean D.M. %: 1st cut: 23.1
2nd cut: 20.7
3rd cut: 40.0
Total of 3 cuts: 27.9

* N not tested since 1970 - all treatments receive basal N at 100 kg for each cut. FYM last applied autumn 1969.

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71/S/RN/1

NEW TREATMENTS

LUCERNE, DRY MATTER: TONNES/HECTARE

Treatment 1899-1965	Treatment* from 1966	1st cut	2nd cut	3rd cut	Total of 3 cuts
D	DN1	5.74	5.34	3.21	14.30
B	B	4.75	4.86	2.75	12.37
N	N2P2	4.83	4.81	2.75	12.39
P	N1P1	4.89	4.92	2.72	12.53
K	N1P2K	4.88	5.36	2.93	13.17
-	N1P2	5.06	5.17	2.82	13.05
PK	N1P1K	5.08	5.32	2.93	13.33
NK	N2P2K	5.22	5.29	2.93	13.44
NP	N2P1	5.08	4.62	2.74	12.43
NPK	N2P1K	5.25	4.85	3.03	13.13
Mean		5.08	5.05	2.88	13.01

Mean D.M. %: 1st cut: 17.1
2nd cut: 24.7
3rd cut: 22.1
Total of 3 cuts: 21.3

* N not applied since 1970. FYM last applied sutumn 1969.

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71/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 - Saxmundham.

The third year of revised scheme, potatoes, barley, sugar beet.

For previous years see 'Details' 1967, 68/A/10(t), 69/S/RN/2(t) and 70/S/RN/2.

Whole plot dimensions: 3.56 x 5.49. Sub plot area harvested: Potatoes - 0.00078, sugar beet: 0.00100, barley: 0.00050.

Basal applications:-

Potatoes: 251 kg N and 160 kg K2O as (25:0:16). Weedkiller: Linuron at 0.84 kg plus paraquat at 0.84 kg ion in 449 l. Fungicide: Mancozeb at 2.69 kg in 449 l on 5 occasions. Insecticide: Menazon ('Saphicol' at 0.70 l in 449 l) applied with the first four applications of fungicide.

Barley: Manures as previously. Weedkiller: Mecoprop at 2.52 kg plus 2,4-D at 0.63 kg in 225 l.

Sugar beet: 188 kg N and 120 kg K2O as (25:0:16). Insecticides: DDT at 0.34 kg in 281 l on 2 occasions. Menazon ('Saphicol' at 0.70 l in 449 l) on 5 occasions.

Cultivations, etc.:-

Potatoes: Ploughed: 20 Oct, 1970. Test P and basal NK applied, plots rotary cultivated, potatoes planted: 14 Apr, 1971. Weedkiller applied: 11 May. Insecticide and fungicide applied: 17 June, 30 June, 14 July, 27 July. Fungicide applied: 10 Aug. Lifted: 21 Sept. Variety: King Edward.

Barley: Ploughed: 20 Oct, 1970. Seed drilled at 168 kg and basal NK applied: 31 Mar, 1971. Weedkiller applied: 18 May. Harvested by hand: 11 Aug. Variety: Julia.

Sugar beet: Ploughed: 20 Oct, 1970. Test P and basal NK applied, seed drilled: 6 Apr, 1971. DDT applied: 19 May, 3 June. Singled: 28 May. Menazon applied: 17 June, 30 June, 14 July, 27 July, 10 Aug. Lifted: 12 Oct. Variety: Klein E.

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71/S/RN/2

SUMMARY OF RESULTS

POTATOES

TOTAL TUBERS: TONNES/HECTARE

Plot	Treatment 1966 and 1967	1971 P0*	P1	P2	P3	Mean
1	P0	26.0	41.0	38.4	48.5	36.0
2	P0	37.2	44.5	54.6	52.9	45.3
3	P0	50.1	50.0	46.2	50.0	49.3
4	D	45.6	43.9	53.2	58.4	49.3
5	DP1	53.3	48.0	58.1	52.3	53.0
6	P1	54.5	54.6	50.9	50.9	53.1
7	P2	53.9	61.9	49.7	60.7	56.0
8	P0	49.3	50.9	54.9	50.0	50.9
Mean		46.2	49.3	50.8	53.0	49.1

SUGAR BEET

ROOTS (WASHED): TONNES/HECTARE

1	P0	20.3	35.7	41.2	37.7	31.0
2	P0	35.0	38.7	41.0	39.4	37.8
3	P0	43.7	51.2	45.8	45.6	46.0
4	D	45.8	44.8	42.4	47.0	45.2
5	DP1	44.3	50.1	42.2	48.4	45.9
6	P1	45.9	43.1	53.1	53.6	48.3
7	P2	45.1	42.8	49.5	45.4	45.6
8	P0	42.0	41.9	42.3	48.9	43.4
Mean		40.3	43.5	44.7	45.8	42.9

* Duplicated treatment

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71/S/RN/2

SUGAR BEET

Plot	Treatment 1966 and 1967	1971 P0*	P1	P2	P3	Mean
		SUGAR %				
1	P0	16.0	16.7	16.6	16.9	16.5
2	P0	16.6	16.7	16.8	17.0	16.7
3	P0	17.0	16.7	17.1	17.1	17.0
4	D	17.0	17.0	17.1	16.5	16.9
5	DP1	17.0	16.8	16.9	17.0	16.9
6	P1	16.8	16.9	16.8	16.7	16.8
7	P2	17.0	16.9	17.2	16.5	16.9
8	P0	16.9	16.7	17.0	16.7	16.9
Mean		16.8	16.8	16.9	16.8	16.8
		TOTAL SUGAR: TONNES/HECTARE				
1	P0	3.25	5.94	6.85	6.37	5.14
2	P0	5.80	6.46	6.86	6.68	6.32
3	P0	7.44	8.57	7.82	7.82	7.82
4	D	7.79	7.59	7.22	7.77	7.63
5	DP1	7.53	8.40	7.14	8.21	7.76
6	P1	7.72	7.28	8.93	8.96	8.12
7	P2	7.68	7.24	8.50	7.50	7.72
8	P0	7.11	7.00	7.20	8.16	7.32
Mean		6.79	7.31	7.57	7.68	7.23

* Duplicated treatment

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71/S/RN/2

SUGAR BEET

Plot	Treatment 1966 and 1967	1971 P0*	P1	P2	P3	Mean
		TOPS: TONNES/HECTARE				
1	P0	26.2	38.4	51.3	37.5	35.9
2	P0	39.8	40.2	38.4	45.9	40.8
3	P0	41.7	44.1	42.9	43.6	42.8
4	D	43.5	45.9	40.5	40.5	42.8
5	DP1	47.8	51.1	41.4	41.1	45.8
6	P1	46.3	43.2	49.1	50.0	47.0
7	P2	43.1	46.3	45.0	47.9	45.1
8	P0	50.2	41.4	47.7	48.6	47.6
Mean		42.3	43.8	44.5	44.4	43.5
		PLANT NUMBER: THOUSANDS/HECTARE				
1	P0	80.7	98.7	88.7	101.7	90.1
2	P0	92.2	90.7	99.7	91.7	93.3
3	P0	94.7	100.7	97.7	99.7	97.5
4	D	87.7	82.7	86.7	99.7	88.9
5	DP1	95.7	90.7	84.7	92.7	91.9
6	P1	91.7	90.7	95.7	101.7	94.3
7	P2	84.2	87.7	96.7	76.7	85.9
8	P0	97.2	89.7	90.7	91.7	93.3
Mean		90.5	91.4	92.6	94.4	91.9

* Duplicated treatment

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71/S/RN/2

BARLEY AFTER POTATOES

Plot	Treatment 1966 and 1967	1970 P0*	P1	P2	P3	Mean
		GRAIN: TONNES/HECTARE				
1	P0	2.40	4.13	3.68	4.27	3.37
2	P0	4.00	4.32	5.00	4.83	4.43
3	P0	4.40	4.51	4.52	4.60	4.49
4	D	4.82	4.79	4.62	4.76	4.76
5	DP1	5.02	5.07	4.76	4.01	4.78
6	P1	5.06	4.82	4.58	4.90	4.89
7	P2	5.00	5.07	4.49	5.16	4.94
8	P0	4.87	4.82	4.94	4.71	4.84
Mean		4.44	4.69	4.57	4.65	4.56
		STRAW: TONNES/HECTARE				
1	P0	2.82	4.42	4.97	4.90	3.99
2	P0	4.95	5.01	5.91	5.89	5.34
3	P0	5.28	5.17	5.06	5.71	5.30
4	D	5.93	5.45	5.75	6.00	5.81
5	DP1	5.65	6.04	5.42	5.48	5.65
6	P1	5.89	5.48	5.50	5.77	5.70
7	P2	5.73	5.46	5.32	5.57	5.56
8	P0	5.44	5.34	5.47	5.25	5.39
Mean		5.21	5.29	5.42	5.57	5.34

Mean D.M. %: Grain: 75.4
Straw: 51.4

* Duplicated treatment

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71/S/RN/2

BARLEY AFTER SUGAR BEET

Plot	Treatment 1966 and 1967	1970 P0*	P1	P2	P3	Mean
		GRAIN: TONNES/HECTARE				
1	P0	1.42	2.80	4.02	4.21	2.77
2	P0	3.76	4.35	4.11	4.22	4.04
3	P0	4.58	4.51	3.56	4.09	4.27
4	D	4.60	4.64	4.98	4.55	4.67
5	DP1	4.77	4.20	5.34	4.65	4.74
6	P1	4.79	4.74	4.98	4.57	4.78
7	P2	4.81	4.81	4.38	4.62	4.69
8	P0	4.41	4.10	5.11	4.78	4.56
Mean		4.14	4.27	4.56	4.46	4.32
		STRAW: TONNES/HECTARE				
1	P0	2.18	3.49	3.99	4.91	3.35
2	P0	4.38	5.15	4.22	4.92	4.61
3	P0	4.73	4.69	5.82	4.50	4.89
4	D	5.49	5.07	5.83	5.16	5.41
5	DP1	5.19	5.00	5.69	5.19	5.25
6	P1	5.22	5.09	5.56	4.72	5.16
7	P2	5.02	5.19	5.10	5.08	5.08
8	P0	4.97	4.66	5.32	4.81	4.94
Mean		4.65	4.79	5.19	4.91	4.84

Mean D.M. %: Grain: 74.6
Straw: 53.5

* Duplicated treatment

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71/R/RN/1 and 71/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. Since 1968, continuous winter wheat has been grown after the three test crops to study the build-up and decline of take-all (Ophiobolus graminis) after the different cropping sequences - Highfield and Fosters.

The 23rd year, old grass, leys, barley, wheat.

For previous years see 'Details' 1967, 68/B/1(t), 69/R/RN/1&2(t) and 70/R/RN/1&2(t).

Continuous winter wheat: The basal PK for blocks in continuous winter wheat is now 75 kg P_2O_5, 75 kg K_2O as (0:20:20) combine drilled, the N test is unchanged.

Management of hay plots (H): These plots now receive 75 kg N, 75 kg P_2O_5, 75 kg K_2O as (15:15:15) in spring and 75 kg N, 48 kg K_2O as (25:0:16) after each cut except the last. They are cut at the same times as the leys.

HIGHFIELD

2nd year Treatment Crops:

All-grass ley: PK applied: 20 Oct, 1970. NK applied: 17 Mar, 1971. Cut four times: 19 May, 8 July, 13 Sept, 2 Nov. NK applied after first three cuts.

Clover-grass ley: PK applied: 20 Oct, 1970. K applied: 17 Mar, 1971. Cut four times: 19 May, 8 July, 13 Sept, 2 Nov. K applied after first three cuts.

Lucerne: PK applied: 20 Oct, 1970. Sprayed with paraquat at 0.56 kg ion in 225 l: 4 Feb, 1971. Cut three times: 4 June, 14 July, 7 Sept. Variety: Du Puits.

Hay: Seed undersown in barley at 32 kg: 7 May, 1970. NPK applied: 17 Mar, 1971. Cut four times: 26 May, 14 July, 13 Sept, 2 Nov. NK applied after first three cuts.

2nd Test Crop. Wheat:-

PK applied: 26 Sept, 1970. Deep-tine cultivated twice: 28 Sept. Seed combine drilled at 202 kg: 5 Oct. N applied, plots sprayed with 2,4-D at 0.56 kg plus dichlorprop at 2.24 kg in 225 l:14 Apr, 1971. Combine harvested: 24 Aug. Variety: Joss Cambier.

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3rd Test Crop. Barley:-
Ground chalk applied: 11 Sept, 1970. Ploughed twice: 11 Sept, 15 Dec. Seed combine drilled at 157 kg: 25 Feb, 1971. N applied: 5 Mar. Sprayed with ioxynil at 0.53 kg plus mecoprop at 1.57 kg in 225 l: 3 May. Combine harvested: 16 Aug. Variety: Julia.

4th, 6th and 7th Test Crops. Wheat:-
Ploughed: 11 Sept, 1970. Seed combine drilled at 202 kg: 5 Oct. N applied: 13 Apr, 1971. Sprayed with 2,4-D at 0.56 kg plus dichlorprop at 2.24 kg in 225 l: 14 Apr. Combine harvested: 24 Aug. Variety: Joss Cambier.

Permanent Grasses:
The 23rd experimental year permanent (old) grass, blocks 1, 2 and 4, the 23rd year reseeded grass, blocks 1 and 4. PK applied: 20 Oct, 1970. NK applied to 'all-grass' half plots, K to 'clover-grass' half plots: 17 Mar, 1971. Cut four times: 19 May, 8 July, 13 Sept, 2 Nov. NK applied to 'all-grass' half plots and K to 'clover-grass' half plots after each cut except the last.

FOSTERS

2nd year Treatment Crops:
All-grass ley: PK applied: 20 Oct, 1970. NK applied: 17 Mar, 1971. Cut four times: 19 May, 8 July, 13 Sept, 2 Nov. NK applied after first three cuts.
Clover-grass ley: PK applied: 20 Oct, 1970. K applied: 17 Mar, 1971. Cut four times: 19 May, 8 July, 13 Sept, 2 Nov. K applied after first three cuts.
Lucerne: PK applied: 20 Oct, 1970. Sprayed with paraquat at 0.56 kg ion in 225 l: 4 Feb, 1971. Cut three times: 4 June, 14 July, 7 Sept. Variety: Du Puits.
Hay: Seed undersown in barley at 32 kg: 7 May, 1970. NPK applied: 17 Mar, 1971. Cut four times: 26 May, 14 July, 13 Sept, 2 Nov. NK applied after first three cuts.

2nd Test Crop. Wheat:-
PK applied: 26 Sept, 1970. Deep-tine cultivated twice: 28 Sept. Seed combine drilled at 202 kg: 5 Oct. N applied: 13 Apr, 1971. Sprayed with 2,4-D at 0.56 kg plus dichlorprop at 2.24 kg ion 225 l: 15 Apr. Combine harvested: 24 Aug. Variety: Joss Cambier.

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3rd Test Crop. Barley:-
Ploughed twice: 10 Sept, 14 Dec, 1970. Seed combine drilled at 157 kg: 25 Feb, 1971. N applied: 5 Mar. Sprayed with ioxynil at 0.53 kg plus mecoprop at 1.57 kg in 225 l: 3 May. Combine harvested: 16 Aug. Variety: Julia.

4th, 6th and 7th Test Crops. Wheat:-
Ploughed: 10 Sept, 1970. Seed combine drilled at 202 kg: 6 Oct. N applied: 13 Apr, 1971. Sprayed with 2,4-D at 0.56 kg plus dichlorprop at 2.24 kg in 225 l: 15 Apr. Combine harvested: 24 Aug. Variety: Joss Cambier.

Permanent Grasses:
The 23rd year reseeded grass, blocks 1 and 3. PK applied: 20 Oct, 1970. NK applied to 'all-grass' half plots, and K to 'clover-grass' half plots: 17 Mar, 1971. Cut four times: 19 May, 8 July, 13 Sept, 2 Nov. NK applied to 'all-grass' half plots and K to 'clover-grass' half plots after each cut except the last.

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71/R/RN/1 and 71/R/RN/2

SUMMARY OF RESULTS

WHEAT 2ND TEST CROP

GRAIN: TONNES/HECTARE

HIGHFIELD

	1967 - 69					1949-63
	LU	LC	LN	AH	Mean	R*
Mean	6.65	6.17	6.86	6.62	6.58	6.06
1971						
N0	6.18	5.72	5.46	5.43	5.70	5.74
N1	7.24	6.32	7.35	6.71	6.90	6.07
N2	7.32	6.64	7.61	7.10	7.17	6.42
N3	5.87	6.01	7.03	7.24	6.54	5.99
1970						
F	6.74	6.22	6.78	6.70	6.61	6.51
D	6.57	6.12	6.95	6.54	6.54	5.60
1970						
N0	7.33	6.30	6.72	6.85	6.80	5.97
N1	7.03	6.61	7.32	6.89	6.96	6.50
N2	6.31	6.09	6.46	6.36	6.31	5.74
N3	5.94	5.69	6.94	6.38	6.23	6.02

Mean D.M. %: 79.8

* AH since 1964

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71/R/RN/1 and 71/R/RN/2

WHEAT 2ND TEST CROP

STRAW: TONNES/HECTARE

HIGHFIELD

	1967 - 69					1949-63
	LU	LC	LN	AH	Mean	R*
Mean	7.66	7.68	7.17	6.97	7.37	7.14
1971						
N0	7.02	7.02	6.36	5.57	6.49	6.14
N1	8.56	7.94	7.44	7.11	7.76	7.28
N2	7.90	7.92	7.87	7.45	7.78	7.84
N3	7.17	7.85	7.01	7.73	7.44	7.32
1970						
F	7.54	7.59	7.09	6.82	7.26	6.99
D	7.79	7.77	7.25	7.11	7.48	7.30
1970						
N0	7.53	7.26	6.89	6.72	7.10	7.03
N1	7.84	7.74	7.39	7.09	7.51	7.03
N2	7.72	7.75	6.98	6.81	7.32	7.30
N3	7.56	7.97	7.43	7.24	7.55	7.21

Mean D.M. %: 87.6

* AH since 1964

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71/R/RN/1 and 71/R/RN/2

WHEAT 2ND TEST CROP

GRAIN: TONNES/HECTARE

FOSTERS

	1967 - 69					1949-63
	LU	LC	LN	AH	Mean	R*
Mean	6.74	6.67	6.46	6.17	6.51	6.56
1971						
NO	6.03	6.09	5.83	5.04	5.75	5.31
N1	7.21	7.09	6.87	6.24	6.85	6.92
N2	7.27	7.19	7.05	6.94	7.11	7.25
N3	6.47	6.30	6.10	6.48	6.34	6.75
1970						
F	6.64	6.54	6.34	5.69	6.30	6.68
D	6.85	6.80	6.59	6.66	6.72	6.44
1970						
NO	7.00	6.62	6.47	5.91	6.50	6.48
N1	6.79	6.83	6.14	5.91	6.42	6.32
N2	6.52	6.58	6.81	6.46	6.59	6.47
N3	6.66	6.64	6.43	6.41	6.54	6.96

Mean D.M. %: 79.0

* AH since 1964

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71/R/RN/1 and 71/R/RN/2

WHEAT 2ND TEST CROP

STRAW: TONNES/HECTARE

FOSTERS

	1967 - 69					1949-63
	LU	LC	LN	AH	Mean	R*
Mean	7.08	7.19	6.61	6.54	6.86	7.02
1971						
N0	5.77	6.02	5.53	4.90	5.55	5.73
N1	7.07	7.49	6.69	6.28	6.88	7.07
N2	8.18	7.54	7.71	7.25	7.67	7.78
N3	7.29	7.72	6.53	7.73	7.32	7.51
1970						
F	6.71	6.76	6.17	6.03	6.42	6.77
D	7.45	7.63	7.06	7.05	7.30	7.27
1970						
N0	7.12	7.15	6.33	5.73	6.58	6.87
N1	7.07	6.98	6.39	6.21	6.66	6.71
N2	6.74	7.27	6.85	6.78	6.91	6.93
N3	7.38	7.38	6.88	7.43	7.27	7.58

Mean D.M. %: 87.3

* AH since 1964

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71/R/RN/1 and 71/R/RN/2

BARLEY 3RD TEST CROP

GRAIN: TONNES/HECTARE

HIGHFIELD

	1966 - 68					1951-62	1951-68		
	LU	LC	LN	AH	Mean	R*	GC	GN	Mean
Mean	5.78	6.14	6.04	5.89	5.96	6.27	6.09	5.94	6.01
1971									
N0	5.29	5.82	5.24	4.91	5.31	6.07	6.27	6.27	6.27
N1	6.27	6.29	6.76	6.37	6.42	6.61	6.55	5.96	6.20
N2	5.92	6.05	5.93	6.15	6.01	6.22	5.52	5.88	5.70
N3	5.64	6.40	6.25	6.14	6.11	6.19	6.01	5.64	5.82
1970									
N0	6.35	6.09	5.70	5.85	6.00				
N1	5.47	6.18	6.04	5.82	5.88				
N2	5.75	5.84	6.22	6.01	5.96				
N3	5.56	6.45	6.22	5.89	6.03				
1969									
F	5.71	6.12	6.10	5.59	5.88	6.14			
D	5.85	6.16	5.99	6.19	6.05	6.40			

Mean D.M. %: 76.3
* AH since 1963

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71/R/RN/1 and 71/R/RN/2

BARLEY 3RD TEST CROP

GRAIN: TONNES/HECTARE

FOSTERS

	1966 - 68					1951-62
	LU	LC	LN	AH	Mean	R*
Mean	6.30	6.22	6.19	5.92	6.16	6.31
1971						
N0	5.19	5.85	5.41	4.64	5.27	5.32
N1	6.25	6.17	6.44	6.12	6.24	6.49
N2	7.26	6.75	6.38	6.29	6.67	6.69
N3	6.51	6.12	6.55	6.65	6.46	6.76
1970						
N0	6.21	6.21	6.21	5.31	5.98	6.65
N1	6.18	6.24	5.87	6.27	6.14	6.11
N2	6.64	6.14	6.22	5.94	6.24	6.34
N3	6.18	6.30	6.47	6.17	6.28	6.16
1969						
F	6.33	6.03	6.15	5.93	6.11	5.94
D	6.27	6.42	6.24	5.91	6.21	6.69

Mean D.M. %: 78.8

* AH since 1963

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71/R/RN/1 and 71/R/RN/2

WHEAT 4TH TEST CROP

GRAIN: TONNES/HECTARE

HIGHFIELD

	1965 - 67					1950 - 67				
	LU	LC	LN	AH	Mean	RC	RN	GC	GN	Mean
1971										
N1	4.87	6.47	6.69	6.10	6.03	7.01	7.42	6.72	6.73	6.97
N2	5.17	6.76	6.57	6.32	6.21	6.35	7.08	5.83	7.35	6.65
N3	5.23	6.57	6.82	5.72	6.08	6.56	5.67	5.93	5.99	6.04
N4	5.71	5.76	5.75	5.96	5.80	5.32	5.58	4.68	5.79	5.34
Mean	5.24	6.39	6.46	6.03	6.03	6.31	6.44	5.79	6.46	6.25

Mean D.M. %: 82.1

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71/R/RN/1 and 71/R/RN/2

WHEAT 4TH TEST CROP

GRAIN: TONNES/HECTARE

FOSTERS

	1965 - 67					1950 - 67		
	LU	LC	LN	AH	Mean	RC	RN	Mean
1971								
N1	6.18	6.22	6.34	5.72	6.12	7.14	7.01	7.07
N2	7.02	6.41	6.87	6.46	6.69	6.62	6.27	6.45
N3	6.57	6.51	6.42	6.49	6.50	5.82	5.72	5.77
N4	6.00	6.00	5.94	6.37	6.08	6.55	5.90	6.23
Mean	6.45	6.28	6.39	6.26	6.35	6.53	6.23	6.38

Mean D.M. %: 79.5

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71/R/RN/1 and 71/R/RN/2

WHEAT 6TH TEST CROP

GRAIN: TONNES/HECTARE

HIGHFIELD

	1963 - 65					1951 - 68				
	LU	LC	LN	AH	Mean	RC	RN	GC	GN	Mean
1971										
N1	4.90	5.30	3.41	4.76	4.59	5.54	5.39	5.45	4.20	5.14
N2	5.98	5.70	4.21	5.56	5.36	4.26	5.72	6.39	4.10	5.12
N3	5.25	5.16	4.40	5.80	5.16	4.28	5.35	3.90	4.42	4.49
N4	5.70	4.53	3.94	5.70	4.97	4.26	4.39	5.28	3.94	4.47
Mean	5.46	5.17	3.99	5.45	5.02	4.58	5.21	5.26	4.16	4.80

Mean D.M. %: 84.7

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71/R/RN/1 and 71/R/RN/2

WHEAT 6TH TEST CROP

GRAIN: TONNES/HECTARE

FOSTERS

	1963 - 65					1951 - 68		
	LU	LC	LN	AH	Mean	RC	RN	Mean
1971								
N1	5.42	5.94	5.40	5.61	5.59	6.42	5.79	6.11
N2	6.39	6.78	6.48	6.90	6.63	6.82	6.76	6.79
N3	6.52	6.64	6.43	6.52	6.53	6.38	6.48	6.43
N4	6.12	5.77	6.16	6.36	6.10	5.90	5.63	5.77
Mean	6.11	6.28	6.12	6.35	6.21	6.38	6.17	6.27

Mean D.M. %: 79.9

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71/R/RN/1 and 71/R/RN/2

WHEAT 7TH TEST CROP

GRAIN: TONNES/HECTARE

HIGHFIELD

	1962 - 64				1950-64		1950 - 67		
	LU	LC	LN	AH	R	Mean	GC	GN	Mean
N1	5.09	5.17	5.54	5.83	6.51	5.63	4.07	2.86	3.46
N2	5.56	5.45	6.08	6.62	6.55	6.05	3.81	4.19	4.00
N3	5.57	6.18	6.00	6.71	6.06	6.11	4.94	3.60	4.27
N4	5.62	4.92	5.61	6.01	5.23	5.48	4.87	4.64	4.75
Mean	5.46	5.43	5.81	6.29	6.09	5.82	4.42	3.82	4.12

Mean D.M. %: 81.8

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71/R/RN/1 and 71/R/RN/2

WHEAT 7TH TEST CROP

GRAIN: TONNES/HECTARE

FOSTERS

	1962 - 64				1950-64	
	LU	LC	LN	AH	R	Mean
1971						
N1	5.17	4.85	5.35	4.68	5.46	5.10
N2	6.59	6.35	6.59	6.07	5.90	6.30
N3	6.38	6.15	6.05	6.45	6.26	6.26
N4	5.78	5.73	5.68	5.82	5.77	5.76
Mean	5.98	5.77	5.92	5.75	5.85	5.85

Mean D.M. %: 78.7

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71/R/RN/1 and 71/R/RN/2

HAY

DRY MATTER: TONNES/HECTARE

1st cut	2nd cut	3rd cut	4th cut	Total
		HIGHFIELD		
6.50	3.01	4.13	1.86	15.50

Mean D.M. %: 1st cut: 15.9
2nd cut: 21.6
3rd cut: 25.2
4th cut: 22.5
Total of 4 cuts: 21.3

		FOSTERS		
6.25	3.72	2.25	1.32	13.54

Mean D.M. %: 1st cut: 16.3
2nd cut: 22.1
3rd cut: 24.9
4th cut: 22.3
Total of 4 cuts: 21.4

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71/R/RN/1 and 71/R/RN/2

	HIGHFIELD Mean	FOSTERS Mean
LUCERNE, DRY MATTER: TONNES/HECTARE		
TOTAL OF 3 CUTS		
2nd year	4.66	5.56
ALL-GRASS LEY, DRY MATTER: TONNES/HECTARE		
TOTAL OF 4 CUTS		
2nd year	7.33	6.79
CLOVER-GRASS LEY, DRY MATTER: TONNES/HECTARE		
TOTAL OF 4 CUTS		
2nd year	3.22	4.06
RESEEDED GRASS, DRY MATTER: TONNES/HECTARE		
TOTAL OF 4 CUTS		

	HIGHFIELD			FOSTERS		
	Blocks	RC	RN	Blocks	RC	RN
23rd Exptl year	1 & 4	3.46	11.17	1 & 4	5.90	9.56

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71/R/RN/1 and 71/R/RN/2

PERMANENT GRASS, DRY MATTER: TONNES/HECTARE

TOTAL OF 4 CUTS

	GC	GN
	HIGHFIELD	
23rd Exptl year		
Blocks 1 & 4	3.21	10.41
Block 2	2.97	10.24

(C) Clover-grass management
(N) All-grass management

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71/W/RN/3

LEY/ARABLE

Object: To compare the effects on soil fertility of rotations with or without three-year leys. The effects of the cropping systems on soil-borne pathogens are also studied - Woburn Stackyard D.

The 34th year, leys, potatoes, rye, carrots, barley.

For previous years see 'Details' 1967, 68/B/2(t), 69/W/RN/3(t) and 70/W/RN/3(t).

The first test crop was changed from barley to potatoes.

Corrective K dressings (in kg K_2O) as muriate of potash applied to first test crop, potatoes.

	No FYM half plots	FYM half plots
Continuous rotations		
Ley	126	126
Sainfoin	126	126
Arable with hay	188	188
Arable	0	0
Alternating rotations (last two rotations in order)		
Arable/ley	188	439
Arable with hay/sainfoin	126	126
Ley/arable with hay	63	63
Sainfoin/arable	188	314

Treatments to first test crop potatoes:-

1. Residues of fumigant applied to potatoes 1968 (Arable and Arable with hay only) on quarter plots: None (O), 448 kg (C) chloropicrin.
2. Fresh fumigants on eighth plots: None (O), 448 kg chloropicrin plus 11.2 kg aldicarb (F).
3. Varieties, on half plots after Ley and Sainfoin and quarter plots after Arable and Arable with hay: Maris Piper (R), Pentland Crown (S).

Treatments to rye:-

1. Residues of fumigant applied to potatoes in 1970 on quarter plots: None (O), 448 kg (F) chloropicrin.

Treatments to carrots:-

1. Residues of fumigant applied to potatoes in 1969 on quarter plots: None (O), 448 kg (C) chloropicrin.

NOTE: Red clover, S 123, replaced sainfoin after the first and second year sainfoin failed. Third year sainfoin also failed and the plots were fallowed.

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Basal manuring to both test and treatment potatoes changed to 252 kg N, 252 kg P2O5, 376 kg K2O as (13:13:20).

Cultivations, etc.:

Treatment crops.

Ley 1st year: Ploughed: 4 Sept, 1970. NPK applied: 31 Mar, 1971. Power harrowed, seed sown at 45 kg: 22 Apr. NK applied: 11 Aug. Cut twice: 2 Aug, 8 Sept.

Ley 2nd year: NK applied: 10 Mar, 1971, 15 June, 10 Aug. Cut three times: 1 June, 2 Aug, 8 Sept.

Ley 3rd year: NK applied: 10 Mar, 1971, 15 June, 10 Aug. Cut three times: 1 June, 2 Aug, 8 Sept.

Sainfoin 1st year: Ploughed: 4 Sept, 1970. NPK applied: 31 Mar, 1971. Power harrowed, seed drilled at 45 kg: 22 Apr. Seed redrilled, because of bird damage, at 34 kg: 12 May. Deep-tine cultivated because of second failure: 24 June. Red clover sown at 45 kg: 23 July. Varieties: Sainfoin: Common, Red clover: S 123.

Sainfoin 2nd year: Sprayed with paraquat at 0.6 kg ion in 281 l: 5 Feb, 1971. NK applied: 10 Mar. Cut once: 1 June. Deep-tine cultivated because of crop failure: 22 July. Red clover sown at 45 kg: 23 July. Variety: Red clover S 123.

Sainfoin 3rd year: Sprayed with paraquat at 0.6 kg ion in 281 l: 5 Feb, 1971. NK applied: 10 Mar. Sprayed with paraquat at 1.1 kg ion in 281 l: 4 June. Rotary cultivated after crop failure: 30 June. Deep-tine cultivated: 9 Aug.

Potatoes: Ploughed: 4 Sept, 1970. NPK applied: 26 Mar, 1971. Rotary cultivated: 29 Mar. Potatoes planted: 30 Mar. Sprayed with linuron at 1.12 kg in 371 l: 5 May. Rotary ridged: 1 June. Sprayed with mancozeb at 1.34 kg plus demeton-s-methyl at 245 g in 416 l: 28 June. Haulm destroyed mechanically: 23 Aug. Lifted: 24 Aug. Variety: Maris Piper.

Rye: Deep-tine cultivated twice: 29 Sept, 1970. Seed combine drilled at 190 kg: 14 Oct. N applied 13 Apr, 1971. Seeds hay undersown at 45 kg (AH plots): 22 Apr. Combine harvested: 31 Aug. Variety: King II.

Seeds hay: Seeds undersown in rye at 34 kg: 24 Apr, 1970. NPK applied: 10 Mar, 1971. NK applied: 16 Aug. Cut three times: 1 June, 2 Aug, 8 Sept.

Carrots: Ploughed twice: 4 Sept, 1970, 26 Sept. NPK applied: 1 Apr, 1971. Power harrowed: 15 Apr. Seed drilled at 4.5 kg: 16 Apr. Sprayed with demeton-s-methyl at 245 g in 281 l: 19 July. Mechanically hoed: 4 - 5 June. Hand hoed twice: 7 June, 2 July. Lifted: 14 - 18 Oct. Variety: Autumn King.

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Test crops.

Potatoes, 1st test crop: Half corrective K applied to all plots except 35 and 36 after carrots: 23 Sept, 1970. Half corrective K applied to plots 35 and 36: 27 Oct. Ploughed: 3 Nov. Chloropicrin applied: 18 Dec. Remaining corrective K applied to all plots: 5 Mar, 1971. NPK applied: 26 Mar. Aldicarb applied, rotary cultivated: 29 Mar. Potatoes planted: 30 Mar. Sprayed with linuron at 1.12 kg in 371 l: 5 May. Rotary ridged: 1 June. Sprayed with mancozeb at 1.34 kg plus demeton-s-methyl at 245 g in 416 l: 28 June. Sprayed with mancozeb at 1.34 kg in 371 l: 12 Aug. Haulm destroyed mechanically: 17 Sept. Sprayed with undiluted BOV at 225 l: 20 Sept. Lifted: 28 - 30 Sept. Varieties: Maris Piper and Pentland Crown.

Barley, 2nd test crop: Magnesian limestone applied at 5020 kg: 8 Oct, 1970. Ploughed: 26 Oct. Seed combine drilled at 168 kg: 10 Mar, 1971. Sprayed with ioxynil at 0.53 kg and mecoprop at 1.58 kg in 281 l: 30 Apr. Combine harvested: 18 Aug. Variety: Julia.

NOTE: Soil samples were taken from the potato plots monthly, throughout the growing season and in the barley stubble, for counts of nematodes.

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71/W/RN/3

SUMMARY OF RESULTS

RYE

GRAIN: TONNES/HECTARE

	LE	SA	AH	AR	Mean
O	4.15	3.83	3.11	3.17	3.57
D*	3.86	3.68	3.16	3.04	3.44
O	3.71	4.11	3.23	2.99	3.51
F	4.30	3.39	3.04	3.22	3.49
Mean	4.01	3.75	3.14	3.11	3.50

Mean D.M. %: 71.0

* Last applied to test crop sugar beet 1963

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71/W/RN/3

POTATOES TREATMENT CROP

	LE	SA	AH	AR	Mean
	TOTAL TUBERS: TONNES/HECTARE				
0	39.1	31.0	27.0	26.2	30.8
D*	43.2	34.4	30.7	30.5	34.7
Mean	41.2	32.7	28.8	28.4	32.7
	% WARE: 3.81 CM (1.5 INCH) RIDDLE				
0	97.8	94.7	92.8	94.4	94.9
D*	96.9	95.5	95.2	95.4	95.7
Mean	97.3	95.1	94.0	94.9	95.3

* Last applied to test crop sugar beet 1964

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71/W/RN/3

POTATOES 1ST TEST CROP

TOTAL TUBERS: TONNES/HECTARE

	LE	SA	Mean	AH	AR	Mean
R	68.0	74.4	71.2	68.9	62.8	65.8
S	62.6	59.6	61.1	56.2	59.8	58.0
O	64.1	65.3	64.7	60.1	56.9	58.5
D*	66.5	68.8	67.6	65.0	65.6	65.3
O	60.1	63.0	61.5	56.0	56.1	56.1
F	70.5	71.0	70.8	69.1	66.5	67.8
O				59.4	59.3	59.3
C				65.7	63.2	64.5
Mean	65.3	67.0	66.2	62.6	61.3	61.9

* Last applied to test crop sugar beet 1966

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71/W/RN/3

POTATOES 1ST TEST CROP

% WARE: 3.81 CM (1.5 INCH) RIDDLE

	LE	SA	Mean	AH	AR	Mean
R	98.0	97.6	97.8	97.6	97.4	97.5
S	97.6	97.2	97.4	96.7	97.5	97.1
O	97.8	97.6	97.7	97.0	97.2	97.1
D*	97.7	97.2	97.5	97.3	97.7	97.5
O	97.8	97.4	97.6	96.9	97.3	97.1
F	97.8	97.4	97.6	97.3	97.7	97.5
O				96.9	97.2	97.1
C				97.3	97.7	97.5
Mean	97.8	97.4	97.6	97.1	97.5	97.3

* Last applied to test crop sugar beet 1966

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71/W/RN/3

CARROTS

ROOTS: TONNES/HECTARE

	O	D*	O	C	Mean
SA	97.5	97.2	92.2	102.5	97.4
AR	89.3	96.4	89.4	96.3	92.9
Mean	93.4	96.8	90.8	99.4	95.1

* Last applied to test crop sugar beet 1967

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71/W/RN/4

MARKET GARDEN

Object: To study direct and residual effects of phosphate, applied either as fertiliser or in organic manures in the period 1942 - 67, on yields of three crops grown in rotation - Woburn Lansome I.

The second year of revised scheme, barley and potatoes.

For previous years see 'Details' 1967, 68/B/4(t), 69/W/RN/4 and 70/W/RN/4(t).

Whole plot dimensions: 8.53 x 5.18. Area harvested: 0.00074.

Superphosphate treatments (applied to whole plots with confounding of certain two and three factor interactions):-
Series A: Barley: None (0), 63 kg P205 (P)
Series B: Potatoes: None (0), 188 kg P205 (P)

Basal applications:-
Series A: Barley: Manures: 2510 kg ground chalk. 100 kg muriate of potash (60% K20), 290 kg 'Nitro-Chalk' 21. Weedkiller: Ioxynil at 0.53 kg and mecoprop at 1.58 kg in 281 l.
Series B: Potatoes: Manures: 2510 kg ground chalk. 417 kg muriate of potash (60% K20), 1345 kg 'Nitro-Chalk' 21, 605 kg Epsom salts (16% MgO). Weedkiller: Linuron at 1.12 kg in 371 l. Fungicide with insecticide: Mancozeb at 1.34 kg plus demeton-s-methyl at 245 g in 416 l. Fungicide: Mancozeb at 1.34 kg in 371 l.

Cultivations, etc.:
Series A: Barley: Ground chalk applied: 13 Nov, 1970. Ploughed: 14 Nov. N and K applied: 1 Mar, 1971. P treatments applied: 3 Mar. Seed drilled at 157 kg: 17 Mar. Weedkiller applied: 30 Apr. Combine harvested: 16 Aug. Variety: Julia.
Series B: Potatoes: Ground chalk applied, ploughed: 11 Sept, 1970. Deep-tine cultivated: 21 Oct. N, K and Mg applied: 30 Mar, 1971. P treatments applied, rotary cultivated, potatoes planted: 31 Mar. Weedkiller applied: 5 May. Rotary ridged: 1 June. Fungicide with insecticide applied: 28 June. Fungicide applied: 12 Aug. Haulm mechanically destroyed: 17 Sept. Sprayed with undiluted BOV at 225 l: 20 Sept. Lifted: 28 - 30 Sept. Variety: Pentland Crown.

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71/W/RN/4

SUMMARY OF RESULTS

SERIES A

BARLEY

Organic 1942-61*	Organic 1962-67	POKO O	POKO P	P1K1 O	P1K1 P	P2K2 O	P2K2 P
		GRAIN: TONNES/HECTARE					
0	0			5.70	5.50	4.33	6.05
S1	0					5.58**	6.18**
S2	0					5.38**	5.77**
T1	0					5.68**	5.76**
T2	0					5.61**	5.77**
D1	D1	4.78	5.64	5.65	5.46		
D2	D2	5.81	5.99	6.21	5.82		
C1	D1	5.84	5.77	4.60	6.22		
C2	D2	6.08	6.18	5.84	6.16		
		STRAW: TONNES/HECTARE					
0	0			3.62	3.79	2.98	4.25
S1	0					3.95**	4.50**
S2	0					3.90**	3.89**
T1	0					3.56**	4.38**
T2	0					4.24**	3.96**
D1	D1	3.62	4.59	4.31	2.66		
D2	D2	4.26	4.57	4.25	3.96		
C1	D1	4.27	3.87	2.85	4.82		
C2	D2	4.70	4.54	3.91	4.54		

General mean: Grain: 5.67
Straw: 3.99
Mean D.M. %: Grain: 76.1
Straw: 67.2

* Last applied to Leeks 1961/62
** P1K1 1962-65

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71/W/RN/4

SERIES B

POTATOES

Organic 1942-61	Organic 1962-64	Organic 1966-67	P0K0 0	P0K0 P	P1K1 0	P1K1 P	P2K2 0	P2K2 P
TOTAL TUBERS: TONNES/HECTARE								
0	0	0			51.7	50.5	55.6	59.1
0	0	PT			50.8	58.2	59.0	61.7
S1	0	0	56.1*	57.9*				
S2	0	0	57.8*	60.6*				
T1	0	0	57.0*	58.0*				
T2	0	0	60.7*	62.7*				
D1	D1	D1	46.5	60.6	58.8	59.9		
D1	D1	0	49.5	58.3	58.8	56.3		
D2	D2	D2	53.2	62.0	63.5	65.4		
D2	D2	0	52.8	54.3	57.9	56.6		
C1	D1	D1	56.9	59.8	64.3	58.1		
C2	D2	D2	61.4	55.2	59.6	62.5		
% WARE: 3.81 CM (1.5 INCH) RIDDLE								
0	0	0			97.2	96.5	96.9	97.1
0	0	PT			97.5	97.8	97.7	97.2
S1	0	0	98.0*	97.9*				
S2	0	0	97.7*	97.2*				
T1	0	0	97.1*	97.0*				
T2	0	0	97.9*	97.5*				
D1	D1	D1	97.4	98.7	96.9	96.4		
D1	D1	0	97.5	97.9	97.6	97.3		
D2	D2	D2	97.1	97.3	96.9	98.4		
D2	D2	0	97.1	98.0	97.6	97.8		
C1	D1	D1	97.2	97.5	97.6	97.1		
C2	D2	D2	97.5	97.1	97.2	97.5		

General mean: Total tubers: 58.1
% ware: 97.4

* P1K1 1962-64

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70/W/RN/4. Replacement for page 81.

70/W/RN/4

SERIES B

BARLEY

Organic 1942-61	Organic 1962-64	Organic 1966-67	P0K0 0	P0K0 P	P1K1 0	P1K1 P	P2K2 0	P2K2 P
GRAIN: CWT								
0	0	0			37.0	37.1	40.0	37.6
0	0	PT			34.3	30.8	37.3	36.3
S1	0	0	36.3*	37.1*				
S2	0	0	32.1*	37.5*				
T1	0	0	42.2*	39.8*				
T2	0	0	30.0*	38.1*				
D1	D1	D1	35.0	36.9	41.3	31.0		
D1	D1	0	36.0	36.7	38.3	37.3		
D2	D2	D2	40.2	38.0	41.1	41.0		
D2	D2	0	45.5	36.4	39.3	42.1		
C1	D1	D1	38.3	42.3	43.1	44.8		
C2	D2	D2	35.0	36.6	37.4	41.4		
STRAW: CWT								
0	0	0			20.2	16.1	20.7	18.2
0	0	PT			18.4	20.2	19.5	19.7
S1	0	0	20.4*	17.1*				
S2	0	0	15.2*	18.3*				
T1	0	0	22.9*	18.6*				
T2	0	0	18.0*	20.1*				
D1	D1	D1	18.7	17.7	18.9	16.3		
D1	D1	0	14.3	16.7	25.5	16.3		
D2	D2	D2	13.1	15.7	18.8	18.8		
D2	D2	0	27.2	12.7	19.7	21.0		
C1	D1	D1	18.6	20.5	23.1	22.7		
C2	D2	D2	18.2	17.9	20.4	22.3		

General mean: Grain: 37.9
Straw: 19.1
Mean D.M. %: Grain: 84.0
Straw: 78.4

* P1K1 1962-64

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71/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.

The sixteenth year of the rotation barley, ley, potatoes, winter wheat, kale. The twelfth year of the same rotation on the additional plots. The fifteenth 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 69-70/R/RN/5.

Whole plot dimensions: 2.13 x 2.44.

Cultivations, etc.: Ground chalk applied at 3.76 tonnes to all plots of the main experiment: 27 Nov, 1970.

Winter wheat: Balancing Mg applied to half plots: 25 Sept, 1970. Plots dug by hand, test Mg applied: 2 Oct. P, K, Ca and S applied, seed drilled: 5 Oct. First half N dressing applied: 9 Mar, 1971. Trace element spray applied: 19 Apr. All N applied to additional plots, second half N dressing applied: 27 Apr. Harvested: 13 Aug. Variety: Maris Nimrod.

Kale: FYM applied, plots dug by hand: 3 Nov, 1970. P, K, Ca, Mg and S applied to additional plots: 29 Jan, 1971. P and K applied to remainder: 19 Feb. First half N dressing applied to additional plots, all N to remainder, plots rotary cultivated, seed drilled: 7 Apr. Trace element spray applied: 11 June. Second half N dressing applied to additional plots: 15 June. Sprayed with menazon ('Saphicol' at 0.7 l in 450 l): 6 July. Harvested: 22 Oct. Variety: Thousand headed.

Barley: Plots dug by hand: 3 Nov, 1970. P, K, Mg, Ca and S applied to additional plots: 29 Jan, 1971. P and K applied to remainder: 19 Feb. N applied, plots rotary cultivated, seed drilled: 31 Mar. Trace element spray applied: 24 May. Sprayed (excluding additional plots) with tridemorph fungicide at 0.53 kg in 450 l): 15 June. Harvested - additional plots: 13 Aug, remainder: 16 Aug. Variety: Deba Abed (Midas on additional plots, seed dressed with ethirimol).

Grass-clover ley: Seed drilled in barley stubble: 14 Aug, 1970. P, K, Ca, Mg and S applied: 17 Dec. N applied: 9 Mar, 1971. Trace element spray applied: 19 Apr. Cut three times: 4 June, 23 July, 20 Sept. Varieties: R.V.P. Italian Ryegrass and Dorset Marl Clover.

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Potatoes: FYM applied and plots dug by hand: 4 Nov, 1970. P, K, Ca, Mg and S applied to additional plots: 29 Jan, 1971. P and K applied to remainder: 19 Feb. First half N dressing applied to additional plots, all N to remainder, plots rotary cultivated, Mg applied to half plots, potatoes planted: 7 Apr. Trace element spray applied: 11 June. Second half N dressing applied to additional plots: 15 June. All plots sprayed on 2 occasions with mancozeb at 1.35 kg plus menazon ('Saphicol' at 0.7 l) in 450 l: 16 June, 28 July. Additional plots only sprayed once as above described: 6 July. Lifted: Plots of main experiment with neither K nor FYM and no fertiliser plots of additional plots: 30 July. Remainder sprayed with captafol fungicide at 1.68 kg plus menazon ('Saphicol' at 0.7 l) in 450 l: 18 Aug. Remaining plots lifted: 14 Sept. Variety: King Edward.

Permanent grass: P and K applied: 17 Dec, 1970. FYM applied: 22 Feb, 1971. N applied: 9 Mar, 20 May, 15 July. Cut three times: 20 May, 15 July, 11 Oct.

NOTES: (1) Yields of dry matter were obtained for each crop.
(2) The percentages of N, P and K were measured in each crop.
(3) The percentage of Mg was measured in potato tubers on the main experiment.
(4) The percentage of K in potato leaves was measured on the main experiment.

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71/R/RN/5

SUMMARY OF RESULTS

GREAT FIELD IV (R): ORIGINAL PLOTS

TONNES/HECTARE

Treatment	WINTER WHEAT: GRAIN	WINTER WHEAT: STRAW	KALE: FRESH WEIGHT	BARLEY: GRAIN	BARLEY: STRAW	LEY: DRY MATTER 1st cut	LEY: DRY MATTER 2nd cut	LEY: DRY MATTER 3rd cut	Total of 3 cuts	POTATOES TOTAL TUBERS	PERMANENT GRASS: DRY MATTER 1st cut	PERMANENT GRASS: DRY MATTER 2nd cut	PERMANENT GRASS: DRY MATTER 3rd cut	PERMANENT GRASS: DRY MATTER Total of 3 cuts
0	3.22	5.20	15.7	2.25	2.36	2.19	0.81	0.97	3.97	7.1	0.73	1.17	1.00	2.90
N1	1.34	4.62	20.9	2.73	3.42	5.16	1.20	1.34	7.70	8.1	1.14	1.39	1.41	3.94
P	2.78	4.34	27.5	3.40	2.87	2.86	0.67	0.50	4.03	13.4	0.59	0.94	0.67	2.20
N1P	0.88	3.56	37.5	2.56	3.28	5.23	0.93	0.36	6.52	8.0	1.75	1.50	1.66	4.91
K	4.18	5.68	12.6	3.11	2.58	3.72	1.95	1.83	7.50	33.8	0.76	1.05	1.11	2.92
N1K	5.69	7.53	13.1	1.53	2.98	4.78	1.86	2.29	8.93	37.1	2.12	1.90	2.03	6.05
PK	4.41	5.93	27.5	3.76	2.79	4.74	3.43	3.26	11.43	36.3	1.00	1.74	1.17	3.91
N1PK	6.52	9.34	42.7	4.79	5.24	6.35	2.71	2.81	11.87	43.4	2.39	1.98	1.60	5.97
N2PK	8.50	11.48	48.4	5.15	5.55	7.40	2.18	2.20	11.78	51.0	4.12	2.49	2.55	9.16
D	5.02	7.74	34.4	4.49	3.81	5.97	2.29	2.26	10.52	45.9	3.75	1.67	1.54	6.96
N1PKD	7.44	11.75	53.2	5.84	5.80	6.45	2.26	2.26	10.97	58.1	3.68	2.59	2.38	8.65
N2PKD	5.00	13.33	61.0	5.55	7.31	7.72	2.09	1.93	11.74	64.9	4.50	4.33	2.43	11.26
Mean D.M.%:	80.0	65.1		74.7	61.2	27.3	25.8	29.6	27.6		27.8	29.2	33.0	30.0

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71/R/RN/5

GREAT FIELD IV (R): ADDITIONAL PLOTS

TONNES/HECTARE

Treatment	WINTER WHEAT: GRAIN	STRAW	KALE: FRESH WEIGHT	BARLEY: GRAIN	STRAW	LEY: DRY MATTER 1st cut	2nd cut	3rd cut	Total of 3 cuts	POTATOES TOTAL TUBERS
None	3.33	4.73	17.9	2.86	3.36	2.84	0.76	1.02	4.62	7.0
N2 PK	6.38	7.52	57.6	5.87	7.49	7.31	2.28	2.12	11.71	41.8
N2 PK Mg Ca	7.42	8.67	60.2	4.94	7.93	7.39	2.56	1.86	11.81	32.3
N2 PK Mg S	7.38	8.74	59.7	4.89	6.94	6.65	1.76	1.73	10.14	38.4
N2 PK Ca S	7.39	9.25	59.7	5.29	7.39	7.45	2.13	1.98	11.56	34.4
N2 PK Mg Ca S	7.48	9.22	60.6	6.07	7.46	8.91	2.85	2.46	14.22	34.0
N2 PK Mg Ca S TE	6.66	8.84	61.5	5.81	7.34	7.74	2.31	2.24	12.29	31.4
Mean D.M. %:	80.2	67.5		81.1	78.3	28.5	26.1	28.8	27.8	

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71/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.

The 12th year, oats, sugar beet, barley, ley, potatoes and old 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 and 70/W/RN/6(t).

Whole plot dimensions: 2.74 x 2.13.

Cultivations, etc.:-

Winter oats: Balancing Mg applied to half plots, plots dug by hand: 1 Oct, 1970. P and K applied, seed drilled: 6 Oct. First N applied: 1 Mar, 1971. Sprayed ioxynil at 0.63 kg and mecoprop at 1.89 kg in 450 l: 15 Apr. Second N applied: 3 May. Harvested: 6 Aug. Variety: Peniarth.

Sugar beet: FYM applied, plots dug by hand: 1 Dec, 1970. P and K applied: 12 Dec. First N applied, rotary cultivated, Mg applied to half plots, seed drilled: 2 Apr, 1971. Singled, second N applied: 2 June. Sprayed menazon at 0.28 kg in 450 l on three occasions: 18 June, 7 July, 29 July. Harvested: 7 Oct. Variety: Klein E.

Barley: Balancing Mg applied: 29 Oct, 1970. Plots dug by hand: 2 Dec. P and K applied: 12 Feb, 1971. First N applied, rotary cultivated, seed drilled: 1 Mar. Second N applied: 4 May. Harvested: 6 Aug. Variety: Julia.

Grass-clover ley: Seed drilled in barley stubble: 14 Aug, 1970. P and K applied: 1 Dec. N applied: 1 Mar, 1971. Cut three times: 2 June, 29 July, 17 Sept. Varieties: R.V.P. Italian Ryegrass and Dorset Marl Clover.

Potatoes: FYM applied, plots dug by hand: 1 Dec, 1970. P and K applied: 12 Feb, 1971. First N applied, rotary cultivated, Mg applied to half plots, potatoes planted: 15 Apr. Second N applied: 2 June. Earthed up: 3 June. Sprayed mancozeb at 1.34 kg plus menazon at 0.28 kg in 450 l twice: 18 June, 7 July. Lifted plots **without K**, sprayed menazon at 0.28 kg plus captafol at 1.68 kg in 450 l to remaining plots: 29 July. Remaining plots lifted: 3 Sept. Variety: Desiree.

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Permanent grass: P and K applied: 1 Dec, 1970. FYM applied: 12 Feb, 1971. N applied: 1 Mar, 2 June, 20 July. Cut three times: 2 June, 20 July, 8 Oct.

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

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71/W/RN/6

SUMMARY OF RESULTS

TONNES/HECTARE

Treatment	OATS		SUGAR BEET		BARLEY	
	GRAIN	STRAW	ROOTS	TOPS	GRAIN	STRAW
None	1.39	1.76	12.8	12.8	1.72	1.31
N1	3.49	4.55	19.5	24.2	2.08	2.04
P	1.74	2.27	15.7	12.6	1.82	1.34
N1P	3.48	4.64	19.5	25.0	0.93*	1.32*
K	1.49	2.56	18.2	16.1	2.07	1.74
N1K	3.45	5.05	32.0	29.1	4.12	4.46
PK	1.65	2.25	20.5	14.1	2.00	1.65
N1PK	3.56	6.33	39.5	32.2	4.28	3.93
N2PK	4.85	8.02	42.7	41.3	4.64	5.41
D	1.93	2.89	36.7	30.4	2.49	1.88
N1PKD	3.98	6.92	51.3	42.0	4.65	4.92
N2PKD	4.92	9.49	57.1	56.2	4.47	5.42
Mean D.M. %:	78.6	44.0			80.3	73.0

* Much of crop destroyed by mice

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71/W/RN/6

TONNES/HECTARE

Treatment	LEY: DRY MATTER 1st cut	2nd cut	3rd cut	Total of 3 cuts	POTATOES TOTAL TUBERS	OLD GRASS: DRY MATTER 1st cut	2nd cut	3rd cut	Total of 3 cuts
None	2.71	0.52	0.32	3.55	8.4	1.86	0.17	0.76	2.79
N1	4.64	0.83	0.29	5.76	7.6	3.51	0.84	2.58	6.93
P	2.54	0.63	0.30	3.47	9.0	1.42	0.16	0.61	2.19
N1P	4.63	0.92	0.29	5.84	8.2	3.13	0.70	2.31	6.14
K	3.27	1.28	1.48	6.03	7.9	2.11	0.35	1.18	3.64
N1K	5.34	1.35	1.20	7.89	11.8	4.58	1.24	3.30	9.12
PK	3.98	1.70	1.48	7.16	5.4	1.84	0.21	0.88	2.93
N1PK	6.10	1.38	0.96	8.44	20.2	4.13	1.27	3.21	8.61
N2PK	6.72	1.83	0.99	9.54	26.3	5.28	1.47	2.73	9.48
D	4.14	1.49	1.35	6.98	20.2	3.64	0.44	1.30	5.38
N1PKD	6.73	1.79	1.11	9.63	30.7	5.18	1.55	3.99	10.72
N2PKD	7.59	2.41	1.13	11.13	40.6	4.54	2.38	4.09	11.01
Mean D.M. %:	29.2	31.1	20.6	27.0		28.9	36.5	30.5	32.0

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71/R/RN/7

RESIDUAL PHOSPHATE

Object: To study direct and residual effects of phosphate fertiliser on yields of three crops grown in rotation - Sawyers I and Great Field IV.

The 12th year, potatoes, barley, swedes.

For previous years see 'Details' 1967 and 68/B/5(t), 69/R/RN/7 and 70/R/RN/7(t).

Whole plot dimensions:-
Sawyers I: 4.27 x 20.1. Area harvested: Potatoes and barley - 0.00572, Swedes - 0.00429.
Great Field IV: 4.27 x 19.3. Area harvested: Potatoes and barley - 0.00520, Swedes - 0.00390.

Standard applications:
Potatoes: Weedkillers: Linuron at 0.84 kg plus paraquat at 0.42 kg ion in 427 l. Fungicide: Mancozeb at 1.34 kg in 438 l on 2 occasions. Insecticide: Demeton-s-methyl at 245 g applied with the fungicide on the first occasion.
Barley: Ground chalk at 3140 kg. Weedkiller: Ioxynil octanoate, bromoxynil octanoate and the iso-octyl ester of dichlorprop ('Oxytril P' at 1.4 l in 225 l).

Cultivations, etc. (both fields):- Ploughed: 27 Oct, 1970.
Potatoes: Fertilisers applied: 6 Apr, 1971. Plots rotary cultivated, potatoes machine planted: 7 Apr. Weedkiller applied: 10 May. Grubbed: 5 June. Rotary ridged: 7 June. Fungicide plus insecticide applied: 24 June. Fungicide applied: 13 Aug. Sprayed with undiluted BOV at 168 l: 15 Sept. Lifted: 24 Sept. Variety: Majestic.
Barley: Chalk applied: 12 Oct, 1970. Treatment P fertilisers applied: 3 Mar, 1971. Seed combine drilled at 157 kg: 10 Mar. Weedkiller applied: 4 May. Combine harvested: 17 Aug. Variety: Julia.
Swedes: Treatment P and basal K applied: 21 Apr, 1970. N applied: 14 May. Seed drilled at 1.7 kg: 18 May. Singled: 28 June. Lifted: 20 Oct. Variety: Wilhelmsburger.

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Standard errors per plot.

Sawyers I:

Potatoes, total tubers, tonnes/hectare:	2.11 or 6.7% (11 d.f.)
Barley, grain, tonnes/hectare:	0.224 or 4.0% (11 d.f.)
Swedes, roots, tonnes/hectare:	2.30 or 10.4% (11 d.f.)

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71/R/RN/7

SUMMARY OF RESULTS

POTATOES

Treatment	TOTAL TUBERS: TONNES/HECTARE Great Field IV	Sawyers I	% WARE: 3.81 CM (1.5 INCH) Great Field IV	Sawyers I
		(±1.49)		
0	27.9	23.6	96.6	97.3
A1	32.1	31.8	94.8	95.0
A2	34.3	36.9	94.3	93.1
A3	40.2	42.6	94.6	93.2
A4	46.3	42.3	93.4	93.6
T1	28.1	26.3	96.1	95.5
T2	31.7	28.0	93.8	93.6
R2	34.5	29.4	95.6	95.2
R3	29.5	31.0	93.0	93.6
R4	39.8	38.8	93.7	93.1
G1	28.9	23.8	94.8	95.5
S1	27.8	22.6	95.7	96.2
Mean	33.4	31.4	94.7	94.6

BARLEY

	GRAIN: TONNES/HECTARE		STRAW: TONNES/HECTARE	
		(±0.158)		
0	3.58	4.90	2.98	3.12
A1	4.72	5.70	4.54	3.71
A2	4.60	5.78	3.82	3.79
A3	4.56	5.95	4.01	4.08
A4	5.06	6.28	4.17	4.21
T1	3.94	5.62	3.98	3.69
T2	4.02	5.64	2.86	3.79
R2	4.47	5.41	3.48	3.26
R3	4.60	5.77	4.02	3.94
R4	4.40	5.87	3.67	4.18
G1	4.55	5.35	3.59	3.76
S1	3.09	5.19	3.54	3.56
Mean	4.30	5.62	3.72	3.76
Mean D.M.%:	82.4	83.8	83.8	87.2

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71/R/RN/7

SWEDES, ROOTS: TONNES/HECTARE

Treatment	Great Field IV	Sawyers I
		(±1.63)
0	10.7	9.3
A1	22.0	23.5
A2	28.5	28.0
A3	30.6	27.4
A4	25.5	29.3
T1	19.1	19.0
T2	23.9	21.5
R2	23.8	21.5
R3	26.4	28.9
R4	30.7	28.7
G1	16.0	13.7
S1	13.4	15.5
Mean	22.5	22.2

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71/R/RN/8

CULTIVATION/WEEDKILLER

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

The 11th year, beans, wheat, potatoes, barley.

For previous years see 'Details' 1967, 68/B/6(t), 69/R/RN/8(t) and 70/R/RN/8.

Paraquat, at 1.68 kg ion in 225 l, was applied to all bean stubble (and not, as hitherto, to half plots) in September 1970 for spring wheat 1971.

Beans tested dinoseb acetate, at 2.80 kg in 425 l, on SY plots and simazine, at 1.12 kg in 225 l, on SX, A, B and C plots.

Whole plot dimensions: 12.8 x 15.2. Area harvested: Beans - 0.00487, Wheat, potatoes and barley - 0.00434.

Cultivations, etc.:-

Spring beans: Barley straw burnt on B plots: 29 Aug, 1970. Paraquat applied to B plots and to G sub plots: 11 Sept. T and B plots deep-tine cultivated once: 30 Oct. T plots deep-tine cultivated second time: 4 Nov. R plots rotary cultivated, P and C plots ploughed: 5 Nov. P, R, T, B and C plots power-harrowed, A plots rotary cultivated, all plots placement drilled at 224 kg: 26 Feb, 1971. Simazine applied to SX, A, B and C plots: 10 Mar. M plots tractor hoed: 30 Apr. Dinoseb acetate applied to SY plots: 4 May. Sprayed with demeton-s-methyl at 245 g in 438 l: 1 July. Combine harvested: 3 Sept. Variety: Maris Bead.

Spring wheat: Bean straw raked off B plots (insufficient to burn): 7 Sept, 1970. Paraquat applied to all plots: 11 Sept. All plots disced twice: 23 Sept. All plots disced: 12 Oct. B plots deep-tine cultivated: 30 Oct. T plots deep-tine cultivated twice: 4 Nov. R plots rotary cultivated, P and C plots ploughed: 5 Nov. P, R, T, B and C plots power-harrowed, A plots rotary cultivated: 31 Mar, 1971. Seed combine drilled at 190 kg: 2 Apr. H sub plots and B and C plots sprayed with ioxynil at 0.84 kg and mecoprop at 2.52 kg in 225 l: 12 May. Combine harvested: 1 Sept. Variety: Kolibri.

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Potatoes: Wheat straw burnt on B plots: 29 Aug. Paraquat applied to B plots and G sub plots: 11 Sept. T plots deep-tine cultivated: 30 Oct, and 4 Nov. R plots rotary cultivated: 5 Nov. P and C plots ploughed: 6 Nov. Basal NPK applied: 6 Apr, 1971. P and T plots power-harrowed, R, A, B and C plots rotary cultivated, potatoes machine planted: 8 Apr. All ridges rolled: 14 Apr. M plots chain harrowed: 30 Apr. M plots grubbed: 4 May. S plots sprayed: 8 May. M plots mechanically weeded: 12 May. M and Y plots grubbed: 3 June. M and Y plots rotary ridged: 4 June. All plots sprayed with mancozeb at 1.35 kg in 438 l: 23 June. Sprayed twice with mancozeb at 1.35 kg in 438 l: 14 Aug and 16 Aug (heavy rain followed the application on 14 Aug). Haulm destroyed mechanically: 9 Sept. Sprayed with undiluted BOV at 169 l: 13 Sept. Lifted: 20 Sept. Variety: Pentland Crown.

Barley: T plots deep-tine cultivated: 30 Oct, 1970. T plots deep-tine cultivated once, C plots twice: 4 Nov. R plots rotary cultivated, B plots spring-tine cultivated, P plots ploughed: 5 Nov. P, R, T, B and C plots power-harrowed, A plots rotary cultivated twice, seed combine drilled at 157 kg: 26 Feb, 1971. H sub plots and B and C plots sprayed with ioxynil at 0.84 kg and mecoprop at 2.52 kg in 225 l: 4 May. Combine harvested: 11 Aug. Variety: Julia.

NOTE: Docks were hand pulled on wheat, coltsfoot on wheat and beans and thistles on all crops. Weed counts were taken.

Standard errors per plot.

Spring beans:	Grain, tonnes/hectare:	Whole plot:	0.488 or 24.2% (8 d.f.)
		Sub plot:	0.158 or 7.8%(9 d.f.)
Spring wheat:	Grain, tonnes/hectare:	Whole plot:	0.366 or 8.9% (8 d.f.)
		Sub plot:	0.116 or 2.8% (9 d.f.)
Potatoes:	Total tubers, tonnnes/hectare:		
		Whole plot:	4.71 or 12.6% (8 d.f.)
		Sub plot:	4.71 or 12.6% (9 d.f.)
Barley:	Grain, tonnes/hectare:	Whole plot:	0.155 or 2.6% (8 d.f.)
		Sub plot:	0.229 or 3.9% (9 d.f.)

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71/R/RN/8

SUMMARY OF RESULTS

SPRING BEANS

GRAIN: TONNES/HECTARE

	P	R	T	Mean
Mean (0.141)	2.18	1.97	1.90	2.02
		(±0.244)		(±0.141)
M	2.39	2.13	1.89	2.14
SX	2.23	1.85	1.85	1.98
SY	1.92	1.92	1.95	1.93
		(1) and (2)		(±0.037)
O	2.09	1.94	1.83	1.95
G	2.27	2.00	1.96	2.08

A	AG	BG	C	CG
2.30	2.24	1.77	2.04	2.34

General mean: 2.03

Mean D.M. %: 81.3

(1) (±0.065) For use in horizontal and diagonal comparisons only
(2) (±0.148) For use in vertical and interaction comparisons only

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71/R/RN/8

SPRING WHEAT

GRAIN: TONNES/HECTARE

	P	R	T	Mean
Mean (±0.106)	4.18	4.15	4.04	4.12
1970				
M (±0.183)	4.28	4.16	3.85	4.09 (±0.106)
S*(±0.129)	4.13	4.14	4.14	4.14 (±0.074)
		(1) and (2)		(±0.027)
1971				
O	4.21	4.08	3.98	4.09
H	4.15	4.21	4.10	4.15

A	AH	BH	CH
3.85	3.99	4.20	4.15

General mean: 4.11

* Duplicated level

Mean D.M. %: 80.9

(1) (±0.047) For use in horizontal and diagonal comparisons only
(2) (±0.111) For use in vertical and interaction comparisons only

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71/R/RN/8

POTATOES

TOTAL TUBERS: TONNES/HECTARE

	P	R	T	Mean
Mean (±1.36)	41.3	33.8	37.2	37.4
		(±2.36)		(±1.36)
M	41.8	34.7	36.9	37.8
SX	40.9	32.7	38.1	37.2
SY	41.1	33.9	36.6	37.2
		(1) and (2)		(±1.11)
O	38.5	32.0	36.3	35.6
G	44.0	35.6	38.1	39.2

A	AG	BG	C	CG
34.1	39.0	33.8	40.4	43.9

General mean: 37.4

(1) (±1.92) For use in horizontal and diagonal comparisons only
(2) (±1.92) For use in vertical and interaction comparisons only

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71/R/RN/8

POTATOES

% WARE: 3.81 CM (1.5 INCH) RIDDLE

	P	R	T	Mean
Mean	94.4	92.6	93.8	93.6
M	94.6	93.3	94.1	94.0
SX	94.4	91.7	93.8	93.3
SY	94.3	92.8	93.4	93.5
O	94.1	92.1	93.4	93.2
G	94.8	93.0	94.1	94.0

A	AG	BG	C	CG
91.2	94.5	92.8	94.1	95.3

General mean: 93.5

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71/R/RN/8

BARLEY

GRAIN: TONNES/HECTARE

	P	R	T	Mean
Mean (±0.045)	6.00	5.76	5.82	5.86
		(±0.077)		(±0.045)
1970				
M	5.95	5.68	5.88	5.84
SX	6.06	5.83	5.86	5.92
SY	5.99	5.77	5.73	5.83
		(1) and (2)		(±0.054)
1971				
O	5.93	5.65	5.73	5.77
H	6.07	5.87	5.92	5.95

A	AH	BH	CH
5.73	5.84	5.61	6.04

General mean: 5.85

Mean D.M. %: 80.2

(1) (±0.093) For use in horizontal and diagonal comparisons only
(2) (±0.080) For use in vertical and interaction comparisons only

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71/R/RN/9

CEREAL DISEASE REFERENCE PLOTS

Object: To study the effects of intensive cereal cropping on the incidence of soil-borne diseases, especially in relation to seasonal variation - Pennell's Piece.

The ninth year, winter wheat, spring wheat, oats, beans.

For previous years see 63/C/10(t), 64-65/C/9, 66/C/7, 67-68/C/5 and 69-70/R/RN/9.

Whole plot dimensions: 17.1 x 4.27. Area harvested: Winter wheat - 0.00479, spring wheat: 0.00473.

Cultivations, etc.: Ploughed: 7 Sept, 1970. All plots except winter wheat plots sprayed with paraquat at 0.56 kg ion in 225 l: 4 Feb, 1971.

Winter wheat: Seed combine drilled at 202 kg: 9 Oct, 1970. Sprayed with terbutryne and related triazines ('Prebane' at 4.48 kg in 225 l): 10 Oct. N applied: 24 Mar, 1971. Sprayed with ioxynil at 0.63 kg and mecoprop at 1.90 kg in 225 l: 15 Apr. Combine harvested: 24 Aug. Variety: Cappelle.

Spring wheat: N applied: 24 Mar, 1971. Seed combine drilled at 191 kg: 31 Mar. Sprayed with ioxynil octanoate, bromoxynil octanoate and the iso-octyl ester of dichlorprop ('Oxytril P' at 1.4 l in 225 l): 11 May. Combine harvested: 1 Sept. Variety: Kolibri.

Oats: Seed combine drilled at 191 kg: 4 Mar, 1971. N applied: 24 Mar. Combine harvested: 16 Aug. Variety: Manod.

Spring beans: Seed placement drilled at 224 kg: 4 Mar, 1971. Sprayed with demeton-s-methyl at 245 g in 438 l: 1 July. Combine harvested: 2 Sept. Variety: Maris Bead.

NOTES: (1) Yields were taken for winter and spring wheat only (Crop sequences 3, 4, 5 and 6).
(2) Estimates were made in spring and summer of incidence of take-all (Ophiobolus graminis) and eyespot (Cercosporella herpotrichoides).

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71/R/RN/9

SUMMARY OF RESULTS

GRAIN: TONNES/HECTARE

Crop in	C3	C4	C5	C6	
1963	W	BE	O	W	
1964	BE	O	W	W	
1965	O	W	W	W	
1966	W	W	W	W	
1967	W	W	BE	W	
1968	W	BE	O	W	
1969	BE	O	W	W	
1970	O	W	W	W	Mean
			WINTER WHEAT		
	5.85	6.76	6.65	6.61	6.47
			SPRING WHEAT		
	3.95	3.85	3.65	3.44	3.72

Mean D.M. %: Winter wheat: 78.9
Spring wheat: 81.5

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71/R/RN/11

IRRIGATION

Object: To study the effects of different timing and intensity of irrigation on a rotation of crops. Other agronomic factors are included from time to time - Great Field I and II.

The eighth year, potatoes, spring beans.

For previous years see 64/C/15(t), 65/C/14(t), 66/C/9(t), 67/C/7(t), 68/C/6(t), 69/R/RN/11(t), and 70/R/RN/11(t).

Design: Potatoes: 4 randomised blocks of 4 plots split into half and quarter plots.
Spring beans: 8 randomised blocks of 2 plots split into half and quarter plots.

Whole plot dimensions:-
Potatoes: 15.2 x 32.0. Sub plot area harvested: 0.00303.
Spring beans: 14.9 x 30.5. Sub plot area harvested: 0.00530.

Treatments:-
Potatoes: All combinations of:-
Whole plots: 1. Irrigation: None (O), full irrigation (I).
2. Chitting and time of planting: Chitted seed planted early (CE), unchitted seed planted late (OL).
Half plots: 3. Planting distances: Ridges 71.1 cm (28 inches) apart, seed 38.2 cm (15 inches) apart (N), ridges 142.2 cm (56 inches) apart, seed 76.3 cm (30 inches) apart (W).
Quarter plots: 4. Fertiliser rates: 1255 (F1), 2510 (F2) kg (13:13:20).
Spring beans: All combinations of:-
Whole plots: 1. Irrigation: None (O), full irrigation (I).
Half plots: 2. Distance between rows and seed rate: 25.4 cm (10 inches), seed rate 336 kg (C), 50.8 cm (20 inches), seed rate 112 kg (W).
Quarter plots: 3. Malathion insecticide: None (O), sprayed at 1.26 l in 809 l on 2 occasions (20 May, 7 June) (M).

Standard applications:
Potatoes: Manures: None. Weedkiller: Linuron at 0.84 kg plus paraquat at 0.42 kg ion in 427 l. Fungicide: Mancozeb at 1.35 kg in 438 l on 2 occasions.

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Spring beans: 405 kg (0:14:28) applied by 'Tume' drill across plots. Weedkillers: Paraquat at 0.28 kg ion in 225 l. Simazine at 1.12 kg in 427 l. Insecticide: Demeton-s-methyl at 245 g in 438 l.

Cultivations, etc.: Ploughed: 2 Nov, 1970.
Potatoes: NPK applied to CE plots: 5 Apr, 1971. Rotary cultivated and machine planted CE plots: 7 Apr. NPK applied to OL plots, rotary cultivated and machine planted OL plots: 5 May. Weedkiller applied to CE plots: 10 May. Weedkiller applied to OL plots: 18 May. CE plots grubbed and rotary ridged: 4 June. OL plots rotary ridged: 18 June. Fungicide applied: 23 June, 13 Aug. Sprayed with undiluted BOV at 168 l: 14 Sept. Haulm destroyed mechanically: 21 Sept. Lifted: 5 Oct. Variety: King Edward.
Spring beans: Paraquat applied: 19 Sept, 1970. PK applied: 24 Feb, 1971. Rotary cultivated*: 26 Feb * 30 Mar. Seed drilled*: 30 Apr. Simazine applied: 3 May. Demeton-s-methyl applied: 6 July. Combine harvested: 16 Sept. Variety: Maris Bead.

* Originally it was intended to include 2 different sowing dates for beans. Early sown plots were rotary cultivated and drilled on 26 Feb, late sown plots were rotary cultivated and drilled on 30 Mar. Because of severe bird damage all plots were power harrowed on 30 Apr for re-drilling as shown above.

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RAINFALL AND IRRIGATION: MM

Week-ending	Rainfall	IRRIGATION Potatoes	IRRIGATION Beans
		I	I
May 1	3.8		
May 8	17.3		
May 15	7.6		
May 22	7.0		
May 29	17.1		
June 5	0.1		
June 12	37.9		
June 19	60.2		
June 26	2.2		
July 3	3.2	15.0	15.0
July 10	1.2		
July 17	0.0	25.0	25.0
July 24	0.9	25.0	25.0
July 31	13.1	15.0	15.0
Aug 7	31.2		
Aug 14	21.5		
Aug 21	5.0		
Aug 28	3.0		
Sept 4	2.9		
Sept 11	TR		
Sept 18	0.0		
Sept 25	3.0		
Oct 2	10.3		
	248.5	80.0	80.0

Standard errors per plot.
Potatoes, total tubers: tonnes/hectare:
Whole plot: 2.45 or 7.6% (9 d.f.)
1/2 plot: 2.82 or 8.7% (12 d.f.)
1/4 plot: 5.09 or 15.7% (24 d.f.)
Spring beans, grain: tonnes/hectare:
Whole plot: 0.140 or 8.1% (7 d.f.)
1/2 plot: 0.187 or 10.9% (14 d.f.)
1/4 plot: 0.234 or 13.6% (28 d.f.)

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71/R/RN/11

SUMMARY OF RESULTS

POTATOES

TOTAL TUBERS: TONNES/HECTARE

	CE	OL	N	W	F1	F2	Mean
	(±1.22)		(1) and (2)		(3) and (4)		(±0.86)
O	28.2	27.8	37.7	18.3	25.0	31.0	28.0
I	36.3	37.3	47.9	25.7	34.7	38.9	36.8
			(1) and (2)		(3) and (4)		(±0.86)
		CE	43.1	21.4	28.9	35.6	32.3
		OL	42.4	22.7	30.7	34.3	32.5
					(5) and (6)		(±0.71)
				N	39.5	46.0	42.8
				W	20.1	23.9	22.0
Mean (±0.90)					29.8	35.0	32.4

(1) (±1.12) (3) (±1.25) (5) (±1.14) For use in vertical and diagonal comparisons only

(2) (±1.00) (4) (±1.27) (6) (±1.27) For use in horizontal and interaction comparisons only

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71/R/RN/11

POTATOES

% WARE: 4.44 CM (1.75 INCH) RIDDLE

	CE	OL	N	W	F1	F2	Mean
O	75.7	74.6	71.0	79.3	74.6	75.8	75.2
I	86.2	83.9	80.1	90.0	84.4	85.7	85.1
		CE	77.5	84.4	79.5	82.5	81.0
		OL	73.6	85.0	79.5	79.0	79.3
				N	73.5	77.6	75.6
				W	85.5	83.9	84.7
Mean					79.5	80.7	80.1

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BEANS

GRAIN: TONNES/HECTARE

	C	W	O	M	Mean
	(1) and (2)		(3) and (4)		(±0.049)
O	2.33	1.24	1.69	1.88	1.79
I	2.25	1.04	1.64	1.65	1.65
			(3) and (4)		(±0.047)
		C	2.22	2.37	2.29
		W	1.11	1.16	1.14
Mean (±0.041)			1.67	1.77	1.72

(1) (±0.068) (3) (±0.064) For use in vertical and diagonal comparisons only

(2) (±0.066) (4) (±0.058) For use in horizontal and interaction comparisons only

Mean D.M. %: 74.2

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71/W/RN/12

ORGANIC MANURING

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

The seventh year, leys and rye.

For previous years see 66/C/31(t), 67/C/24(t), 68/C/18(t), 69/W/RN/12(t) and 70/W/RN/12(t).

Whole plot dimensions: 8.53 x 30.5. Area harvested: Leys - 0.00524, rye - 0.00421.

Fertilisers applied autumn 1970 (kg)

Treatment	P2O5	K2O	MgO
DG	-	-	-
ST	63	-	25
PT	63	126	-
GM	63	138	38
FD	113	427	38
FS	75	126	38
LC	63	126	38
LN	63	126	38

Fertilisers applied spring 1971 (kg)

Treatment	P2O5	K2O
ST	-	50
LC	63	126
LN	88	251

No P,K, or Mg was required in spring for DG, PT, GM, FD or FS.

NOTE: Residues of N to sugar beet 1969
(N1), (N3), (N5), (N7). 25, 75, 125, 175 kg N as 'Nitro-Chalk' 21.

Basal applications: Rye: 31 kg N as 'Nitro-Chalk' 21.
LN plots: 126 kg N as 'Nitro-Chalk' 21 in spring and after each cut except the last.

Cultivations, etc.:
LC and LN plots: P, K, Mg applied: 6 Oct, 1970. P, K applied: 9 Mar, 1971. N applied to LN plots: 16 Mar, 29 June. Cut: 23 June, 10 Sept.
Rye: P, K, Mg applied: 17 - 18 Sept, 1970. Peat, straw applied: 15 Oct. FYM applied, ploughed: 16 - 17 Oct. Seed drilled

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at 191 kg: 17 Oct. GM plots undersown with Late Flowering Red Clover at 72 kg: 19 Oct. K applied to ST plots only: 9 Mar, 1971. N applied: 14 Apr. Red Clover resown at 72 kg: 22 Apr. Combine harvested: 31 Aug. Variety: King II.

NOTE: Soil samples were taken in the stubble for P, K and Mg analysis.

Standard errors per plot. Rye, grain, tonnes/hectare:
Whole plot: 0.266 or 7.3% (15 d.f.)
Sub plot: 0.199 or 5.5% (54 d.f.)

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71/W/RN/12

SUMMARY OF RESULTS

LEYS

DRY MATTER: TONNES/HECTARE

LC		LN
	1ST CUT	
2.15		6.51
	2ND CUT	
2.13		4.40
	TOTAL OF 2 CUTS	
4.28		10.91

Mean D.M. %: 1st cut: 24.6
2nd cut: 24.1
Total of 2 cuts: 24.4

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71/W/RN/12

RYE

1969

	N1	N3	N5	N7	Mean
	GRAIN: TONNES/HECTARE				
	(1) and (2)				(±0.133)
DG	4.76	4.63	4.46	4.63	4.62
ST	3.61	3.63	3.48	3.76	3.62
PT	3.48	3.43	3.48	3.58	3.49
GM	3.33	3.18	3.46	3.44	3.35
FD	3.29	3.38	3.48	3.32	3.37
FS	3.33	3.46	3.36	3.03	3.29
Mean (±0.041)	3.63	3.62	3.62	3.63	3.62

(1) (±0.158) For use in vertical and diagonal comparisons only
(2) (±0.099) For use in horizontal and interaction comparisons only

STRAW: TONNES/HECTARE

DG	6.27	6.34	5.68	6.11	6.10
ST	4.53	4.46	4.18	4.56	4.43
PT	4.40	4.26	4.40	4.33	4.35
GM	4.25	4.70	5.20	4.53	4.67
FD	4.22	4.41	4.32	4.48	4.36
FS	4.05	4.09	4.05	4.05	4.06
Mean	4.62	4.71	4.64	4.67	4.66

Mean D.M. %: Grain: 75.1
Straw: 88.0

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71/W/RN/13

INTENSIVE CEREALS

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

The sixth year, ley, potatoes, winter wheat, barley.

For previous years see 66/B/9(t), 67/B/9, 68/B/7(t) and 69-70/W/RN/13(t).

Design: For each cereal: 2 randomised blocks of 6 plots, split into 4.

Whole plot dimensions: 8.53 x 20.4. Sub plot area harvested: Potatoes - 0.00343, wheat - 0.00271, barley - 0.00277.

NOTE: The magnesium test on all crops is now ended.

Basal applications: All crops: 5020 kg magnesian limestone three-quarters ploughed in, a quarter applied to plough furrow. 126 kg P_2O_5, 252 kg K_2O as (0:14:28), half ploughed in, half applied to plough furrow.
Weedkiller: Paraquat at 1.12 kg ion in 281 l.
Ley: 63 kg N in seedbed, 63 kg N 8 weeks after sowing, 75 kg N after each cut except the last as 'Nitro-Chalk' 21.
Potatoes: 150 kg N as 'Nitro-Chalk' 21. Weedkiller: Linuron at 1.12 kg in 371 l. Fungicide: Mancozeb at 1.34 kg in 416 l on the first occasion, and 371 l on the second. Insecticide: Demeton-s-methyl at 246 ml applied with first mancozeb spray.
Wheat and barley: Weedkiller: Ioxynil at 0.53 Kg and mecoprop at 1.58 kg in 281 l.

Cultivations, etc.: All plots: Paraquat applied: 16 Sept, 1970. Half PK applied: 24 Sept. Three-quarters magnesian limestone applied: 6 Oct. Ploughed: 10 Oct. Remaining PK and magnesian limestone applied: 14 Oct.
Leys: Deep-tine cultivated barley blocks: 21 Oct, 1970. N applied: 1 Apr. Seeds sown at 33 kg: 22 Apr. First cut: 16 July. N applied: 19 July. Second cut: 8 Sept. Variety: Italian Ryegrass S22.
Potatoes: Deep-tine cultivated barley blocks: 21 Oct, 1970. N applied: 29 Mar, 1971. Rotary cultivated, potatoes planted: 30 Mar. Weedkiller applied: 5 May. Rotary ridged: 1 June. Fungicide plus insecticide applied: 28 June. Fungicide applied: 12 Aug. Haulm mechanically destroyed: 13 Sept. Lifted: 14 Sept. Variety: Majestic.
Wheat: Seed drilled at 191 kg: 14 Oct, 1970. N applied: 14 Apr, 1971. Weedkiller applied: 28 Apr. Combine harvested: 28 Aug. Variety: Cappelle.

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Barley: Deep-tine cultivated: 21 Oct, 1970. N applied, seed drilled at 157 kg: 17 Mar, 1971. Power harrowed, re-drilled at 157 kg: 9 Apr. Weedkiller applied: 18 May. Combine harvested: 25 Aug. Variety: Julia.

NOTE: Estimates of eyespot (Cercosporella herpotrichoides) and take-all (Ophiobolus graminis) were made on both cereal crops.

Standard errors per sub plot.
Wheat, grain, tonnes/hectare: Sub plot: 0.391 or 10.6% (12 d.f.)
Barley, grain, tonnes/hectare: Sub plot: 0.194 or 4.5% (11 d.f.)

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71/W/RN/13

SUMMARY OF RESULTS

POTATOES

N: KG/HA 1969

63	126	189	252	Mean
		PERMANENT WHEAT BLOCKS		
		TOTAL TUBERS: TONNES/HECTARE		
33.0	32.2	36.7	36.8	34.7
		% WARE: 3.81 CM (1.5 INCH) RIDDLE		
94.1	93.1	95.1	95.3	94.4
		PERMANENT BARLEY BLOCKS		
		TOTAL TUBERS: TONNES/HECTARE		
46.0	42.9	44.3	48.7	45.5
		% WARE: 3.81 CM (1.5 INCH) RIDDLE		
93.5	92.9	94.4	93.8	93.6

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71/W/RN/13

WINTER WHEAT

Crop in 1966	1967	1968	1969	1970	N: KG/HA 63	126	189	252	Mean
					GRAIN: TONNES/HECTARE				
						(1) and (2)			(±0.209)
W	W	W	L	P	3.22	4.77	4.97	4.63	4.40
W	W	L	P	W	2.70	3.95	3.96	3.59	3.55
W	L	P	W	W	2.09	3.53	4.03	4.19	3.46
W	W	W	W	W	2.88	3.55	3.85	3.17	3.36
Mean (±0.138)					2.72	3.95	4.20	3.90	3.69

(1) (±0.317) For use in vertical and diagonal comparisons only
(2) (±0.276) For use in horizontal and interaction comparisons only

Mean D.M. %: 82.1

					STRAW: TONNES/HECTARE				
W	W	W	L	P	3.32	4.06	4.15	3.70	3.81
W	W	L	P	W	2.64	3.87	3.95	3.82	3.57
W	L	P	W	W	2.58	3.38	3.96	4.41	3.58
W	W	W	W	W	3.02	3.66	4.04	3.77	3.62
Mean					2.89	3.74	4.02	3.93	3.64

Mean D.M. %: 87.1

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71/W/RN/13

BARLEY

Crop in 1966	1967	1968	1969	1970	N: KG/HA 63	126	189	252	Mean
					GRAIN: TONNES/HECTARE				
						(1) and (2)			(±0.147)
B	B	B	L	P	3.59	4.58	4.40	4.82	4.35
B	B	L	P	B	3.82	4.55	5.14	5.36	4.72
B	L	P	B	B	3.71	4.64	4.82	4.69	4.47
B	B	B	B	B	3.07	3.62	4.34	4.64	3.92
Mean (±0.069)					3.55	4.35	4.67	4.88	4.36

(1) (±0.189) For use in vertical and diagonal comparisons only
(2) (±0.138) For use in horizontal and interaction comparisons only

Mean D.M. %: 82.4

					STRAW: TONNES/HECTARE				
B	B	B	L	P	2.48	3.30	3.55	3.94	3.32
B	B	L	P	B	2.16	2.87	3.94	3.92	3.22
B	L	P	B	B	2.20	3.17	3.71	3.62	3.18
B	B	B	B	B	1.85	2.83	3.42	3.91	3.00
Mean					2.17	3.04	3.66	3.85	3.18

Mean D.M. %: 87.4

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71/W/RN/14

LONG TERM PHOSPHATE

Object: To study direct and residual effects of superphosphate on yields of three crops grown in rotation - Woburn Stackyard III.

The fourth year, barley and potatoes.

For previous years see 68/B/8(t), 69/W/RN/14 and 70/W/RN/14(t).

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

Whole plot dimensions: 8.53 x 15.8. Area harvested: Barley - 0.00442, potatoes - 0.00451.

Treatments:
Sub plots: Superphosphate:
Barley: None (0), 63 kg P_2O_5 (P).
Potatoes: None (0), 188 kg P_2O_5 (P).

Basal applications:-
Barley: Manures: 2510 kg ground chalk, 61 kg of K_2O as muriate of potash, 148 kg N as 'Nitro-Chalk' 21. Weedkiller: Ioxynil at 0.525 kg and mecoprop at 1.58 kg in 281 l.
Potatoes: Manures: 2510 kg ground chalk, 258 kg of K_2O as muriate of potash in autumn, 250 kg of K_2O as muriate of potash in spring, 251 kg N as 'Nitro-Chalk' 21, 99 kg MgO as Epsom salts. Weedkiller: Linuron at 1.12 kg in 371 l. Fungicide and insecticide: Mancozeb at 1.34 kg and demeton-s-methyl at 246 ml in 416 l. Fungicide: Mancozeb at 1.34 kg in 371 l.

Cultivations, etc.:
Barley: Ground chalk applied: 26 Nov, 1970. Ploughed: 10 Dec. N and K applied: 1 Mar, 1971. P applied: 4 Mar. Seed drilled at 157 kg: 23 Mar. Power harrowed, redrilled because of bird damage: 13 Apr. Sprayed weedkiller: 18 May. Combine harvested: 25 Aug. Variety: Julia.
Potatoes: Sub soiled, tines 142 cm apart and 61 cm deep, ground chalk and K applied: 11 Sept, 1970. Deep-tine cultivated: 12 Sept. Ploughed: 21 Oct. P applied: 29 Mar, 1971. N, K and Mg applied: 1 Apr. Rotary cultivated, potatoes planted: 2 Apr. Weedkiller applied: 5 May. Rotary ridged: 1 June. Fungicide with insecticide applied: 28 June. Fungicide applied: 12 Aug. Haulm destroyed mechanically: 13 Sept. Lifted: 14 Sept. Variety: Pentland Crown.

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Standard errors per plot.

Barley: Grain, tonnes/hectare:	Whole plot:	0.234 or 6.0% (9 d.f.)
	Sub plot:	0.343 or 8.8% (10 d.f.)
Potatoes: Total tubers, tonnes/hectare:		
	Whole plot:	2.71 or 7.1% (10 d.f.)
	Sub plot:	3.88 or 10.1% (12 d.f.)

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71/W/RN/14

SUMMARY OF RESULTS

BARLEY

	R0*	R1	R2	R4	R6	Mean
			GRAIN: TONNES/HECTARE			
	(1) & (2)		(3) & (4)			(±0.081)
0	3.15	3.67	3.91	4.08	4.21	3.69
P	3.81	4.31	3.98	4.45	4.37	4.12
Mean	3.48 (±0.096)	3.99	3.94 (±0.135)	4.26	4.29	3.91

(1) (±0.138) (3) (±0.194) For use in horizontal and diagonal comparisons only

(2) (±0.140) (4) (±0.198) For use in vertical and interaction comparisons only

STRAW: TONNES/HECTARE

0	2.11	2.65	2.87	3.04	2.87	2.61
P	2.76	2.98	2.83	3.10	3.15	2.93
Mean	2.43	2.81	2.85	3.07	3.01	2.77

Mean D.M. %: Grain: 80.6
Straw: 83.5

* Duplicated treatment

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71/W/RN/14

ROTATOES

	R0*	R1	R2	R4	R6	Mean
	TOTAL TUBERS: TONNES/HECTARE					
	(1) & (2)		(3) & (4)			(±0.91)
O	32.1	34.4	37.0	41.8	38.4	36.0
P	38.5	42.0	43.2	41.7	40.1	40.7
Mean	35.3 (±1.11)	38.2	40.1 (±1.56)	41.8	39.2	38.3

(1) (±1.57) (3) (±2.23) For use in horizontal and diagonal comparisons only

(2) (±1.58) (4) (±2.24) For use in vertical and interaction comparisons only

% WARE: 3.81 CM (1.5 INCH) RIDDLE

O	97.7	97.2	97.8	98.0	97.2	97.6
P	97.1	96.8	97.7	97.4	97.0	97.2
Mean	97.4	97.0	97.7	97.7	97.1	97.4

* Duplicated treatment

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71/W/RN/15

ROTATION AND FUMIGATION

Object: To study different ways of using nematicides with a three-course rotation and to determine the effects of the nematicides on crop yields and incidence of pathogenic nematodes - Woburn Butt Close.

The third year, potatoes, barley, sugar beet.

For previous years see 69/W/RN/15(t) and 70/W/RN/15(t).

Whole plot dimensions: 5.33 x 31.1. Sub plot area harvested: Barley - 0.00052, potatoes - 0.00104, sugar beet - 0.00127.

Basal applications:

Barley: Manures: 303 kg (0:20:20). Weedkiller: Ioxynil at 0.53 kg plus mecoprop at 1.58 kg in 281 l.

Potatoes: Manures: 1103 kg (0:14:28). Weedkiller: Linuron at 1.12 kg in 371 l. Fungicide with insecticide: Mancozeb at 1.34 kg plus demeton-s-methyl at 245 g in 416 l. Fungicide: Mancozeb at 1.34 kg in 371 l.

Sugar beet: Manures: 2510 kg magnesian limestone, 1103 kg (0:14:28), 'Solubor' at 13.4 kg B203 in 157 l. Insecticide: Demeton-s-methyl at 245 g in 281 l.

Cultivations, etc.:

Barley: Ploughed: 28 Oct, 1970. 'D-D' injected: 16 Dec. Dazomet applied, all plots rotary cultivated: 17 Dec. Ploughed: 11 Feb, 1971. N applied: 1 Mar. Seed combine drilled at 168 kg: 10 Mar. Weedkiller applied: 3 May. Combine harvested: 16 Aug. Variety: Julia.

Potatoes: Ploughed: 9 Nov, 1970. 'D-D' injected: 16 Dec. Dazomet applied, all plots rotary cultivated: 17 Dec. Ploughed: 11 Feb, 1971. PK applied: 29 Mar. N applied, rotary cultivated, potatoes planted: 31 Mar. Weedkiller applied: 5 May. Rotary ridged: 1 June. Fungicide with insecticide applied: 28 June. Fungicide applied: 13 Aug. Haulm destroyed mechanically: 14 Sept. Lifted: 17 Sept. Variety: Pentland Crown.

Sugar beet: Rotary cultivated: 4 Sept, 1970. Magnesian limestone applied: 7 Oct. Ploughed: 28 Oct. 'D-D' injected: 16 Dec. Dazomet applied, all plots rotary cultivated: 17 Dec. Ploughed: 11 Feb, 1971. PK applied: 29 Mar. N applied: 31 Mar. Power harrowed, seed drilled at 6 kg: 8 Apr. Singled: 19 - 20 May. Boron spray applied: 1 June. Hoed by hand twice: 1 - 2 June, 17 - 21 June. Insecticide applied: 19 July. Lifted: 20 Oct. Variety: Klein E.

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NOTE: Samples of soil were taken after harvest for eelworm counts.

Standard errors per sub plot.

Barley, grain, tonnes/hectare: 0.417 or 9.6% (18 d.f.)

Potatoes, total tubers, tonnes/hectare:
5.14 or 13.6% (18 d.f.)

Sugar beet, roots, tonnes/hectare:
2.77 or 5.6% (18 d.f.)

Total sugar, tonnes/hectare:
0.507 or 6.0% (18 d.f.)

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71/W/RN/15

SUMMARY OF RESULTS

BARLEY

	O&R	P	S	B	A	AZ	Mean
N: KG/HA		GRAIN: TONNES/HECTARE					
	(±0.208)*			(±0.295)*			
38	3.07	4.03	4.25	3.24	2.61	5.19	3.64
75	4.71	4.59	5.30	3.96	4.67	5.30	4.75
113	4.52	5.07	4.87	4.22	4.38	4.83	4.63
Mean	4.10 (±0.120)	4.56	4.81	3.80 (±0.170)	3.89	5.11	4.34

* For use in horizontal and interaction comparisons only

STRAW: TONNES/HECTARE

38	2.14	3.06	3.15	2.42	1.95	3.48	2.62
75	3.42	3.68	3.85	2.64	3.54	3.79	3.48
113	3.38	3.74	3.59	3.37	3.20	3.87	3.51
Mean	2.98	3.50	3.53	2.81	2.90	3.71	3.20

Mean D.M. %: Grain: 80.9
Straw: 85.7

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71/W/RN/15

POTATOES

	O&R	P	S	B	A	AZ	Mean
N: KG/HA	TOTAL TUBERS: TONNES/HECTARE						
	(±2.57)*			(±3.63)*			
75	22.5	29.8	26.5	26.5	36.3	38.9	29.0
150	23.8	44.9	37.2	45.1	46.0	45.5	38.1
225	32.9	50.7	48.0	48.3	55.3	56.6	46.4
Mean	26.4 (±1.48)	41.8	37.2	40.0 (±2.10)	45.9	47.0	37.8

* For use in horizontal and interaction comparisons only

% WARE: 3.81 CM (1.5 INCH) RIDDLE

75	90.6	92.2	93.4	90.7	93.4	93.5	92.1
150	94.4	97.7	96.6	94.9	94.7	96.5	95.6
225	95.9	97.5	97.2	96.9	97.2	96.5	96.7
Mean	93.6	95.8	95.7	94.2	95.1	95.5	94.8

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71/W/RN/15

SUGAR BEET

	O&R	P	S	B	A	AZ	Mean
N: KG/HA	ROOTS (WASHED): TONNES/HECTARE						
	(±1.39)*			(±1.96)*			
75	46.3	48.7	48.9	50.0	48.1	53.7	48.9
150	44.5	45.8	48.3	52.1	53.2	46.9	47.9
225	49.3	50.6	53.2	53.4	52.6	50.1	51.2
Mean	46.7 (±0.80)	48.4	50.1	51.8 (±1.13)	51.3	50.2	49.3
	SUGAR %						
75	17.4	17.5	17.1	17.1	16.5	17.4	17.2
150	17.3	17.4	17.0	17.5	16.7	16.8	17.1
225	16.8	16.8	16.7	16.9	16.1	16.7	16.7
Mean	17.2	17.3	16.9	17.2	16.4	16.9	17.0
	TOTAL SUGAR: TONNES/HECTARE						
	(±0.253)*			(±0.358)*			
75	8.03	8.54	8.37	8.57	7.93	9.34	8.40
150	7.67	7.96	8.19	9.14	8.86	7.88	8.20
225	8.31	8.51	8.89	9.04	8.46	8.34	8.55
Mean	8.01 (±0.146)	8.33	8.49	8.92 (±0.207)	8.42	8.52	8.38

* For use in horizontal and interaction comparions only

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71/R/CS/1

LEVELS OF N AND K

Object: To study the effects of N, P and K fertilisers, applied to grass 1958 - 1967 and of fresh P and K applied 1971, on yields of potatoes - Harwoods Piece.

The 14th year, potatoes.

For previous years see 58/Cg/2(t), 59/Cg/2(t), 60/Ci/1, 61/Dg/1, 62/C/11, 63/C/7, 64/C/6(t), 65/C/6(t), 66/C/5, 67/C/4, 68/C/4(t), 69/R/CS/1(t) and 70/R/CS/1(t).

Whole plot dimensions: 2.13 x 16.5. Sub plot area harvested: 0.00095.

Treatments:-
Whole plots:- P and K, cumulative with treatments applied to grass 1958 - 1967.
P: None (P0), 125 (P1), 251 (P2) kg P205 as granular superphosphate.
K: None (K0), 125 (K1), 251 (K2) kg K20 as muriate of potash.
N residues : Nitrogen treatments to grass 1958 - 1967:
None (R0), 38 (R1), 75 (R2), 113 (R3) kg N for each cut.
Half plots: K cumulative since 1969: None (K0), 125 kg (KK) K20 as muriate of potash.

Basal applications: 7530 kg ground chalk. 188 kg N as 'Nitro-Chalk' broadcast by drill.
Weedkillers: Paraquat at 0.28 kg ion in 225 l. Linuron at 0.84 kg plus paraquat at 0.42 kg ion in 427 l.
Fungicide: Mancozeb at 1.34 kg in 438 l.
Insecticide: Demeton-s-methyl at 245 g applied with the fungicide.

Cultivations, etc.: Paraquat applied: 18 Sept, 1970. Chalked: 21 Sept. Ploughed: 29 Oct. P and K and basal N applied, K applied to half plots, all plots rotary cultivated, potatoes planted: 6 Apr, 1971. Linuron plus paraquat applied: 10 May. Grubbed: 4 June. Rotary ridged: 7 June. Fungicide plus insecticide applied: 24 June. Haulm destroyed mechanically: 26 Aug. Lifted: 16 Sept. Variety: King Edward.

NOTE: The percentages of P and K in tubers, and of P, K and Mg in the leaves in July, were determined.

Standard errors per plot. Total tubers, tonnes/hectare.
Whole plot: 2.44 or 12.4% (33 d.f.)
Sub plot: 2.86 or 14.5% (36 d.f.)

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71/R/CS/1

SUMMARY OF RESULTS

TOTAL TUBERS: TONNES/HECTARE

1969 - 71

	KD	KK	Mean
	(1) and (2)		(±1.22)
N P K			
0 1 0	10.4	21.8	16.1
1 1 0	9.7	20.4	15.0
1 1 1	18.0	23.1	20.5
1 1 2	22.3	27.8	25.0
2 1 0	8.3	20.0	14.1
2 1 1	19.0	26.1	22.5
2 1 2	21.0	24.7	22.9
3 1 0	7.8	20.7	14.3
3 1 1	17.1	21.5	19.3
3 1 2	21.5	24.0	22.7
3 0 2	19.1	22.5	20.8
3 2 2	21.2	23.9	22.5
Mean (±0.41)	16.3	23.0	19.6

(1) (±1.58) For use in vertical and diagonal comparisons only
(2) (±1.43) For use in horizontal and interaction comparisons only

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71/R/CS/1

% WARE: 3.81 CM (1.5 INCH) RIDDLE

1969 - 71

N P K	KD	KK	Mean
0 1 0	64.9	82.4	73.7
1 1 0	66.6	78.7	72.7
1 1 1	78.4	81.9	80.1
1 1 2	83.5	84.7	84.1
2 1 0	56.0	80.6	68.3
2 1 1	78.7	82.9	80.8
2 1 2	78.6	84.6	81.6
3 1 0	58.7	78.7	68.7
3 1 1	80.0	79.7	79.9
3 1 2	81.7	83.0	82.3
3 0 2	83.4	83.6	83.5
3 2 2	77.1	79.9	78.5
Mean	74.0	81.7	77.9

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71/R/CS/2

GRAZED REFERENCE PLOTS

Object: To study the residual effects of N, P and K fertiliser, applied to grazed grass 1959 - 1970, on the yield of grass from which livestock are now excluded - Highfield IX.

The thirteenth year, old grass.

For previous years see 64/B/11(t), 65/B/2, 66/B/2(t), 67/B/2, 68/B/3 and 69-70/R/CS/2.

The experiment is now fenced to exclude livestock. Yields are taken by self-propelled scythe.

Whole plot dimensions: 4.57 x 7.32. Area harvested: 0.00059.

Basal N was applied at 125.5 kg as 'Nitro-Chalk' for each of the three cuts taken.

Cultivations, etc.: First basal N applied: 3 Mar, 1971. Cut three times: 24 May, 12 July, 2 Nov. Basal N applied after each of first two cuts.

NOTE: The percentages of P and K in the dry grass were measured for each cut.

Standard errors per plot. Dry matter, tonnes/hectare:

1st cut:	0.562	or 9.7% (39 d.f.)
2nd cut:	0.234	or 7.5% (39 d.f.)
3rd cut:	0.313	or 9.3% (39 d.f.)
Total of 3 cuts:	0.690	or 5.6% (39 d.f.)

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71/R/CS/2

SUMMARY OF RESULTS

GRASS: DRY MATTER: TONNES/HECTARE

1959-70	1st cut	2nd cut	3rd cut	Total of 3 cuts
PK	(±0.281)	(±0.117)	(±0.156)	(±0.345)
N0 00	4.89	3.29	3.18	11.36
N1 00	4.47	2.59	3.25	10.31
A1 00	4.95	2.49	3.21	10.66
N0 10	5.65	3.61	3.01	12.27
N1 10	5.70	2.58	3.05	11.33
A1 10	5.72	2.73	2.92	11.37
N0 01	4.68	3.71	3.40	11.80
N1 01	5.68	3.10	3.65	12.42
A1 01	5.41	2.63	3.73	11.77
N0 11	6.00	4.01	3.27	13.28
N1 11	6.59	3.26	3.50	13.34
A1 11	7.27	3.21	3.72	14.20
N2 11	6.69	3.14	3.56	13.39
A2 11	7.22	3.03	3.52	13.77
Mean	5.78	3.10	3.35	12.23

Mean D.M. %: 1st cut: 17.4
2nd cut: 19.9
3rd cut: 27.9
Total of 3 cuts: 21.7

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71/R/CS/6

WHEAT AFTER INTENSIVE BARLEY

Object: To study the effects of different periods of pre-cropping with barley on yields and incidence of take-all (Ophiobolus graminis) in wheat - Little Knott I.

The eleventh year, winter wheat.

For previous years see 61/C/8(t), 62/C/7, 63-66/C/2, 67/C/2(t), 68/C/2(t), 69/R/CS/6(t) and 70/R/CS/6(t).

Whole plot dimensions: 4.27 x 20.1. Sub plot area harvested: 0.00266.

Blocks were split across all plots for a test of none (U) v. ground chalk at 12.6 tonnes (L).

Basal applications: Manures: 251 kg (0:14:28) combine drilled, 605 kg 'Nitro-Chalk' in spring. Weedkillers: Paraquat at 0.84 kg ion in 225 l. Terbutryne and related triazines ('Prebane' at 4.48 kg in 225 l).

Cultivations, etc.: Paraquat applied: 11 Sept, 1970. Ground chalk applied to half plots: 12 Sept. Ploughed: 23 Sept. Seed drilled at 179 kg: 7 Oct. 'Prebane' applied: 10 Oct. N applied: 13 Apr, 1971. Combine harvested: 25 Aug. Variety: Joss Cambier.

NOTE: Estimates of take-all (Ophiobolus graminis) were made in April and early July.

Standard errors per plot.
Grain, tonnes/hectare: Whole plot: 0.461 or 7.7% (39 d.f.)
Sub plot: 0.626 or 10.4% (40 d.f.)

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71/R/CS/6

SUMMARY OF RESULTS

GRAIN: TONNES/HECTARE

Crop Sequences

Crop in	1	2	3	4	5	6	7	8	9	10	
1961	O	WS	O	BE	WS	WS	B	WS	WS	BE	
62	BE	O	WS	O	BE	WS	B	WS	WW	WW	
63	B	BE	O	WS	O	BE	B	WS	WW	P	
64	B	B	BE	O	WS	O	B	WS	WW	B	
65	B	B	B	BE	O	WS	B	WS	WW	BE	
66	B	B	B	B	BE	O	B	WS	WW	WW	
67	B	B	B	B	B	BE	B	WS	WW	P	
68	B	B	B	B	B	B	B	WS	F	B	
69	WW	WW	WW	WW	WW	WW	WW	WW	WW	F	
70	F	WW	WW	WW	WW	WW	WW	WW	WW	WW	Mean
RESIDUAL					(±0.326)						(±0.103)
N3	6.55	6.02	5.77	6.17	6.14	5.56	5.89	5.97	4.80	6.32	5.92
N5	6.91	5.79	6.25	6.34	6.00	6.01	6.16	6.00	4.96	6.10	6.05
N7	7.00	6.27	6.11	6.18	5.61	5.61	6.35	5.95	6.26	6.04	6.14
N9	7.01	6.29	5.35	5.95	5.89	5.91	5.85	5.94	5.21	6.09	5.95
					(±0.221)*						
U	6.72	5.95	5.95	6.20	5.86	5.74	6.01	6.14	5.33	6.48	6.04
L	7.01	6.24	5.78	6.12	5.96	5.81	6.12	5.79	5.29	5.80	5.99
Mean (±0.163)	6.87	6.09	5.87	6.16	5.91	5.77	6.06	5.96	5.31	6.14	6.01

RESIDUAL

	N3	N5	N7	N9
	(±0.140)*			
U	5.88	6.19	6.11	5.98
L	5.95	5.92	6.17	5.92

* For use in horizontal and interaction comparisons only

Mean D.M. %: 81.8

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71/R/CS/10 and 71/W/CS/10

LONG TERM LIMING

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

The tenth year, barley.

Design: 2 blocks of 16 plots.

For previous years see 'Details' 1967, 68/C/3(t), 69/R&W/CS/10 and 70/R&W/CS/10(t).

Whole plot dimensions: 6.40 x 18.3. Area harvested: Sawyers I (R): 0.00516, Stackyard C (W): 0.00520.

Basal applications:-

Sawyers I (R): 94 kg N as 'Nitro-Chalk' combine drilled. Weedkillers: Paraquat at 0.84 kg ion in 225 l. Ioxynil octanoate, bromoxynil octanoate and the iso-octyl ester of dichlorprop ('Oxytril P' at 1.4 l in 225 l).

Stackyard C (W): 126 kg N as 'Nitro-Chalk' broadcast before planting. Weedkillers: Paraquat at 0.56 kg ion in 281 l*. Ioxynil at 0.525 kg and mecoprop at 1.58 kg in 281 l.

* Treatment CA0 P0 K1 received 1.12 kg ion in 281 l.

Cultivations, etc.:-

Sawyers I (R): Paraquat applied: 22 Sept, 1970. Ploughed: 28 Oct. P and K applied: 3 Mar, 1971. Seed combine drilled at 157 kg: 10 Mar. 'Oxytril P' applied: 4 May. Combine harvested: 16 Aug. Variety: Julia.

Stackyard C (W): Paraquat applied: 16 Sept, 1970. Ploughed: 28 Oct. N, P and K applied: 4 Mar, 1971. Seed drilled at 157 kg: 17 Mar. Weedkiller applied: 17 May. Combine harvested: 17 Aug. Variety: Julia.

NOTE: On both fields no yields were taken from some of the CA0 plots and those recorded for the remainder were very small. The yields from the CA0 plots were omitted from the analysis.

Standard errors per plot. Grain, tonnes/hectare:

Sawyers I (R):	0.773 or 18.7%	(11 d.f.)
Stackyard C (W):	0.270 or 6.5%	(11 d.f.)

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71/R/CS/10 and 71/W/CS/10

SUMMARY OF RESULTS

SAWYERS I (R)

GRAIN: TONNES/HECTARE

	CA2	CA4	CA8	Mean
Mean (±0.273)	3.54	4.34	4.53	4.14
		(±0.386)		(±0.223)
P0	2.87	3.89	4.15	3.64
P1	4.21	4.79	4.91	4.64
K0	3.31	4.04	4.34	3.90
K1	3.77	4.64	4.72	4.38

	P0	P1
	(±0.316)	
K0	3.57	4.23
K1	3.71	5.05

	CA2		CA4		CA8	
	K0	K1	K0	K1	K0	K1
	(±0.547)					
P0	3.05	2.69	3.53	4.25	4.12	4.19
P1	3.56	4.85	4.56	5.03	4.56	5.26

CA0 PLOTS

P0K0*	P1K0*	P0K1	P1K1
0.85	0.97	-	1.69

General mean: 3.74
Mean D.M. % (all plots): 80.6

* 1 block only

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71/R/CS/10 and 71/W/CS/10

SAWYERS I (R)

STRAW: TONNES/HECTARE

	CA2	CA4	CA8	Mean
Mean	2.20	2.94	2.98	2.71
P0	1.67	2.70	2.74	2.37
P1	2.72	3.18	3.22	3.04
K0	1.88	2.80	2.70	2.46
K1	2.51	3.08	3.26	2.95

	P0	P1
K0	2.18	2.75
K1	2.57	3.34

	CA2		CA4		CA8	
	K0	K1	K0	K1	K0	K1
P0	1.56	1.78	2.59	2.82	2.37	3.11
P1	2.20	3.24	3.02	3.35	3.03	3.41

CA0 PLOTS

P0K0*	P1K0*	P0K1	P1K1
0.20	0.49	-	0.94

General mean: 2.42
Mean D.M. % (all plots): 78.9

* 1 block only

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71/R/CS/10 and 71/W/CS/10

STACKYARD SERIES C (W)

GRAIN: TONNES/HECTARE

	CA2	CA4	CA8	Mean
Mean (±0.096)	4.13	4.19	4.24	4.19
		(±0.135)		(±0.078)
P0	3.59	4.03	4.04	3.89
P1	4.66	4.36	4.43	4.48
K0	4.09	3.82	3.75	3.89
K1	4.16	4.57	4.73	4.49

	P0	P1
	(±0.110)	
K0	3.50	4.27
K1	4.28	4.70

	CA2		CA4		CA8	
	K0	K1	K0	K1	K0	K1
	(±0.191)					
P0	3.40	3.79	3.64	4.42	3.46	4.62
P1	4.78	4.53	4.00	4.72	4.03	4.84

CA0 PLOTS

P0K0*	P1K0*	P0K1	P1K1
-	1.30	-	3.64

General mean: 4.05
Mean D.M. % (all plots): 84.3

* 1 block only

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71/R/CS/10 and 71/W/CS/10

STACKYARD SERIES C (W)

STRAW: TONNES/HECTARE

	CA2	CA4	CA8	Mean
Mean	2.52	2.73	2.82	2.69
P0	2.23	2.55	2.79	2.52
P1	2.81	2.90	2.85	2.86
K0	2.25	2.33	2.41	2.33
K1	2.79	3.12	3.23	3.05

	P0	P1
K0	2.15	2.51
K1	2.89	3.20

	CA2		CA4		CA8	
	K0	K1	K0	K1	K0	K1
P0	1.96	2.50	2.10	3.00	2.39	3.19
P1	2.53	3.09	2.56	3.25	2.43	3.27

CAD PLOTS

P0K0*	P1K0*	P0K1	P1K1
-	0.70	-	2.16

General mean: 2.58
Mean D.M. % (all plots): 84.4

* 1 block only

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71/W/CS/11

SOIL STRUCTURE

Object: To study the residual effects of peat, applied 1963 - 1968, and simazine, applied 1969 - 1970, on the yield of wheat - Woburn Stackyard II.

The ninth year, winter wheat.

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

Design: 4 randomised blocks of 5 plots.

Whole plot dimensions: 2.13 x 3.05. Area harvested: 0.00054.

Basal applications: 597 kg 'Nitro-Chalk'.

Cultivations, etc.: Hand cultivated, seed drilled: 7 Oct, 1970. N applied: 19 Apr, 1971. Hand harvested: 17 Aug. Variety: Cappelle.

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71/W/CS/11

SUMMARY OF RESULTS

	0	Sb65	DG1	DG2	DG3	Mean
	GRAIN: TONNES/HECTARE					
SO	3.71	3.70	3.66	2.64	2.72	3.29
SA	3.02	2.30	2.69	4.08	2.75	2.97
SB	2.99	3.77	3.79	3.59	3.23	3.47
SC	3.02	3.08	4.13	3.97	3.52	3.54
Mean	3.18	3.21	3.57	3.57	3.05	3.32
	STRAW: TONNES/HECTARE					
SO	7.82	8.00	8.15	8.11	8.31	8.08
SA	7.57	6.94	8.11	9.04	8.34	8.00
SB	7.55	7.91	8.26	8.27	9.15	8.23
SC	6.64	6.97	8.62	7.85	8.61	7.74
Mean	7.39	7.45	8.29	8.32	8.60	8.01

Mean D.M. %: Grain: 80.2
Straw: 56.7

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71/R/CS/13

N AND Mg LEVELS TO OLD GRASS

Object: To study the effects of a range of nitrogen levels on the production of very old permanent pasture. To see whether application of magnesium sulphate will increase the magnesium content of such pasture when large dressings of nitrogen are applied - Park Grass old plot 6.

The seventh year, old grass.

For previous years see 65/C/33(t), 66/C/14, 67/C/10(t), 68/C/8(t) and 69-70/R/CS/13(t).

Whole plot dimensions: 1.83 x 10.1. Area harvested: 0.00086.

Cultivations, etc.: Basal PK and test Mg applied: 8 Dec, 1970. N applied: 9 Mar, 1971. S plots sprayed with mecoprop at 3.14 kg a.e. in 449 l: 22 Apr and 12 July. Plots cut: 13 May, 21 June, 2 Aug, 14 Oct. N applied after each cut except the last.

Standard errors per plot. Dry matter, tonnes/hectare:

1st cut:	0.358 or 12.3% (14 d.f.)
2nd cut:	0.205 or 8.6% (14 d.f.)
3rd cut:	0.219 or 10.7% (14 d.f.)
4th cut:	0.182 or 6.9% (14 d.f.)
Total of 4 cuts:	0.486 or 4.9% (14 d.f.)

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71/R/CS/13

SUMMARY OF RESULTS

DRY MATTER: TONNES/HECTARE

1971

	N0	N1	N2	N3	Mean	SN0
			1ST CUT			
1969			(±0.179)		(±0.089)	
C3	1.08	2.21	4.02	4.46	2.95	0.45
C6	1.15	2.23	3.94	4.16	2.87	0.44
1971						
M1	1.12	2.24	3.89	4.28	2.88	0.42
M2	1.11	2.20	4.07	4.34	2.93	0.47
Mean (±0.126)	1.12	2.22	3.98	4.31	2.91	0.44
			2ND CUT			
1969			(±0.103)		(±0.051)	
C3	1.84	2.53	2.69	2.46	2.38	1.01
C6	1.79	2.44	2.73	2.52	2.37	0.92
1971						
M1	1.76	2.58	2.71	2.49	2.39	1.00
M2	1.87	2.40	2.70	2.49	2.37	0.93
Mean (±0.073)	1.82	2.49	2.71	2.49	2.38	0.96

	General mean:	Mean D.M. %:
1st cut:	2.41	21.2
2nd cut:	2.09	17.8

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71/R/CS/13

DRY MATTER: TONNES/HECTARE

1971

	N0	N1	N2	N3	Mean	SN0
			3RD CUT			
1969			(±0.109)		(±0.055)	
C3	1.66	1.67	2.34	2.28	1.99	0.51
C6	1.88	1.63	2.25	2.61	2.09	0.68
1971						
M1	1.78	1.66	2.29	2.49	2.05	0.48
M2	1.75	1.65	2.30	2.40	2.03	0.70
Mean (±0.077)	1.77	1.65	2.30	2.44	2.04	0.59
			4TH CUT			
1969			(±0.091)		(±0.045)	
C3	1.83	2.30	2.80	3.28	2.55	0.90
C6	1.83	2.39	3.07	3.45	2.69	0.89
1971						
M1	1.81	2.42	2.90	3.32	2.61	0.90
M2	1.85	2.28	2.96	3.42	2.63	0.90
Mean (±0.064)	1.83	2.35	2.93	3.37	2.62	0.90

	General mean:	Mean D.M. %:
3rd cut:	1.75	21.9
4th cut:	2.27	21.4

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71/R/CS/13

DRY MATTER: TONNES/HECTARE

1971

	N0	N1	N2	N3	Mean	SN0
			TOTAL OF 4 CUTS			
1969			(±0.243)		(±0.121)	
C3	6.41	8.71	11.85	12.49	9.86	2.87
C6	6.65	8.70	11.99	12.74	10.02	2.92
1971						
M1	6.47	8.89	11.80	12.58	9.93	2.78
M2	6.58	8.52	12.04	12.65	9.95	3.00
Mean (±0.172)	6.53	8.70	11.92	12.61	9.94	2.89

General mean: 8.53

Mean D.M. %: 20.6

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71/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.

The seventh year, old grass.

For previous years see 65/C/22(t), 66/C/13(t), 67/C/9(t), 68/C/7, 69 - 70/R/CS/14.

Whole plot dimensions: 1.83 x 10.1. Area harvested: 0.00086.

Cultivations, etc.: P and K applied: 8 Dec, 1970. N applied: 9 Mar, 1971. Cut twice: 7 June and 4 Oct. N applied after 1st cut.

Standard errors per plot. Dry matter, tonnes/hectare.

Plot 5/1:	1st cut:	0.394 or 12.2%	(11 d.f.)
	2nd cut:	0.302 or 9.9%	(11 d.f.)
	Total of 2 cuts:	0.538 or 8.5%	(11 d.f.)
Plot 5/2:	1st cut:	0.549 or 13.3%	(11 d.f.)
	2nd cut:	0.287 or 8.8%	(11 d.f.)
	Total of 2 cuts:	0.564 or 7.6%	(11 d.f.)

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71/R/CS/14

SUMMARY OF RESULTS

PLOT 5/1: DRY MATTER, TONNES/HECTARE

1ST CUT

Excluding K1 and K6 plots

	P0	P1	P2	P4	Mean
Mean (±0.139)	2.41	3.69	4.08	3.88	3.51
		(±0.279)			(±0.139)
K0	2.13	3.19	3.21	2.84	2.84
K2	2.78	4.48	4.41	4.32	4.00
K4	2.46	3.70	4.42	4.27	3.71
K8	2.26	3.38	4.27	4.07	3.50
		(±0.197)			(±0.098)
N1	2.24	3.17	3.43	3.40	3.06
N2	2.58	4.20	4.73	4.35	3.96

	K0	K2	K4	K8
		(±0.197)		
N1	2.85	3.44	2.99	2.95
N2	2.84	4.55	4.43	4.04

K1 and K6 plots

	K1*	K6*	Mean
	(±0.279)		(±0.197)
N1	2.13	1.50	1.82
N2	2.57	2.41	2.49
Mean (±0.197)	2.35	1.95	2.15

* Applied 1965

General mean: 3.24
Mean D.M. %: 23.2

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71/R/CS/14

PLOT 5/1: DRY MATTER, TONNES/HECTARE

2ND CUT

Excluding K1 and K6 plots

	P0	P1	P2	P4	Mean
Mean (±0.107)	3.09	3.12	3.34	3.20	3.19
		(±0.214)			(±0.107)
K0	2.85	2.43	2.65	2.24	2.54
K2	2.92	3.13	3.53	2.90	3.12
K4	3.25	3.26	3.51	3.74	3.44
K8	3.35	3.66	3.66	3.91	3.64
		(±0.151)			(±0.076)
N1	2.67	2.67	2.65	2.95	2.73
N2	3.52	3.56	4.02	3.45	3.64

	K0	K2	K4	K8
		(±0.151)		
N1	2.34	2.65	2.82	3.13
N2	2.74	3.59	4.07	4.15

K1 and K6 plots

	K1*	K6*	Mean
	(±0.214)		(±0.151)
N1	2.57	1.92	2.25
N2	2.75	2.89	2.82
Mean (±0.151)	2.66	2.41	2.53

* Applied 1965

General mean: 3.06
Mean D.M. %: 28.3

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71/R/CS/14

PLOT 5/1: DRY MATTER, TONNES/HECTARE

TOTAL OF 2 CUTS

Excluding K1 and K6 plots

	P0	P1	P2	P4	Mean
Mean (±0.190)	5.50	6.81	7.41	7.08	6.70
		(±0.380)			(±0.190)
K0	4.99	5.62	5.86	5.09	5.39
K2	5.69	7.61	7.94	7.22	7.12
K4	5.71	6.96	7.93	8.01	7.15
K8	5.61	7.04	7.92	7.98	7.14
		(±0.269)			(±0.134)
N1	4.90	5.85	6.08	6.35	5.79
N2	6.10	7.77	8.75	7.80	7.60

	K0	K2	K4	K8
		(±0.269)		
N1	5.19	6.09	5.81	6.08
N2	5.58	8.14	8.49	8.19

K1 and K6 plots

	K1*	K6*	Mean
	(±0.380)		(±0.269)
N1	4.70	3.42	4.06
N2	5.32	5.30	5.31
Mean (±0.269)	5.01	4.36	4.69

* Applied 1965

General mean: 6.30
Mean D.M. %: 25.8

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71/R/CS/14

PLOT 5/2: DRY MATTER, TONNES/HECTARE

1ST CUT

Excluding K1 and K6 plots

	P0	P1	P2	P4	Mean
Mean (±0.194)	4.02	4.19	4.19	3.82	4.06
		(±0.388)			(±0.194)
K0	3.76	3.59	3.59	3.45	3.60
K2	3.99	4.51	4.67	4.17	4.34
K4	4.63	4.39	4.58	4.03	4.41
K8	3.71	4.29	3.93	3.63	3.89
		(±0.274)			(±0.137)
N1	2.91	2.39	2.85	2.60	2.69
N2	5.14	5.99	5.54	5.04	5.43

	K0	K2	K4	K8
		(±0.274)		
N1	2.34	2.87	2.95	2.59
N2	4.85	5.80	5.86	5.19

K1 and K6 plots

	K1*	K6*	Mean
	(±0.388)		(±0.274)
N1	3.04	3.31	3.17
N2	5.31	5.94	5.63
Mean (±0.274)	4.18	4.63	4.40

* Applied 1965

General mean: 32.9
Mean D.M. %: 25.6

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71/R/CS/14

PLOT 5/2: DRY MATTER, TONNES/HECTARE

2ND CUT

Excluding K1 and K6 plots

	P0	P1	P2	P4	Mean
Mean (±0.102)	3.27	3.12	3.21	3.31	3.23
		(±0.203)			(±0.102)
K0	3.46	3.49	2.91	3.46	3.33
K2	3.28	2.97	3.50	3.20	3.24
K4	3.35	2.90	3.30	3.27	3.20
K8	3.00	3.13	3.13	3.33	3.15
		(±0.144)			(±0.072)
N1	3.04	2.62	2.96	2.81	2.86
N2	3.50	3.62	3.46	3.82	3.60

	K0	K2	K4	K8
		(±0.144)		
N1	2.94	3.12	2.76	2.62
N2	3.72	3.35	3.65	3.67

K1 and K6 plots

	K1*	K6*	Mean
	(±0.203)		(±0.144)
N1	3.30	2.97	3.14
N2	3.65	3.44	3.55
Mean (±0.144)	3.48	3.21	3.34

* Applied 1965

General mean: 3.25
Mean D.M. %: 32.5

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71/R/CS/14

PLOT 5/2: DRY MATTER, TONNES/HECTARE

TOTAL OF 2 CUTS

Excluding K1 and K6 plots

	P0	P1	P2	P4	Mean
Mean (±0.200)	7.29	7.31	7.40	7.14	7.29
		(±0.399)			(±0.200)
K0	7.22	7.08	6.50	6.92	6.93
K2	7.27	7.48	8.17	7.37	7.57
K4	7.98	7.29	7.88	7.30	7.61
K8	6.71	7.42	7.06	6.96	7.03
		(±0.282)			(±0.141)
N1	5.95	5.02	5.81	5.41	5.55
N2	8.63	9.61	8.99	8.87	9.03

	K0	K2	K4	K8
		(±0.282)		
N1	5.28	5.99	5.71	5.21
N2	8.58	9.15	9.51	8.86

K1 and K6 plots

	K1*	K6*	Mean
	(±0.399)		(±0.282)
N1	6.34	6.28	6.31
N2	8.97	9.38	9.18
Mean (±0.282)	7.65	7.83	7.74

* Applied 1965

General mean: 7.38
Mean D.M. %: 25.6

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71/W/CS/15

DIRECT SEEDING

Object: To study the effects of direct seeding on yields of wheat, grown continuously for six years, and on populations of soil animals - Woburn White Horse Field.

The sixth year, winter wheat.

For previous years see 66/C/33(t), 67/C/26(t), 68/C/20(t) and 69-70/W/CS/15(t).

Design: 4 randomised blocks of 4 plots, split into 2.

Whole plot dimensions: 6.40 x 19.8. Sub plot area harvested: 0.00288.

Treatments: All combinations of:-

Whole plots: 1. Seedbed preparations: Direct seeding after paraquat at 1.12 kg ion in 281 l followed by 1.68 kg ion in 337 l (SP), normal cultivations (M).

2. Seed dressing: No insecticide, fungicide only (SO), combined insecticide fungicide (SI).

Sub plots: 3. Insecticide: None (DO), phorate granules at 11 kg a.i. applied in autumn (DD).

NOTE: Treatments 1966-1971 inclusive are cumulative.

Basal applications: 635 kg (0:14:28) combine drilled. 592 kg 'Nitro-Chalk' top dressed. Weedkillers: 2,4-D at 0.56 kg plus dichlorprop at 2.24 kg in 281 l.

Cultivations, etc.: M plots ploughed: 7 Sept, 1970. Paraquat applied to SP plots: 16 Sept and 7 Oct. Phorate applied, seed combine drilled at 213 kg: 8 Oct. 2,4-D plus dichlorprop applied: 31 Mar, 1971. N applied: 14 Apr. Combine harvested: 27 Aug. Variety: Cappelle.

NOTES: (1) Plant samples were taken in March and July for counts of damage to tillers. Counts of soil fauna were made at monthly intervals and counts of earthworms before and after harvest.

(2) Samples were taken for estimates of take-all (Ophiobolus graminis).

Standard errors per plot.

Grain, tonnes/hectare: Whole plot: 0.589 or 16.1% (9 d.f.)
Sub plot: 0.614 or 16.8% (12 d.f.)

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71/W/CS/15

SUMMARY OF RESULTS

GRAIN: TONNES/HECTARE

	SO	SI	DO	DD	Mean
	(±0.295)		(1) and (2)		(±0.208)
SP	3.39	3.80	3.72	3.47	3.59
M	3.57	3.90	4.12	3.35	3.74
			(1) and (2)		(±0.208)
		SO	3.96	3.01	3.48
		SI	3.89	3.81	3.85
Mean (±0.153)			3.92	3.41	3.67

Mean D.M. %: 81.8

(1) (±0.259) For use in vertical and diagonal comparisons only
(2) (±0.217) For use in horizontal and interaction comparisons only

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71/W/CS/16

IRRIGATION AND EELWORMS

Object: To study the effects of dazomet and irrigation on the yield and incidence of Heterodera rostochiensis on potatoes grown continuously. Susceptible and resistant varieties are studied either grown continuously or alternately - Woburn Butt Close Series I and IV.

The sixth year, potatoes.

For previous years see 66/C/32(t), 67/C/25, 68/C/19, 69/W/CS/16(t) and 70/W/CS/16.

Whole plot dimensions: 15.2 x 15.2. Area sub plot harvested: 0.00092.

Irrigation to C plots 1971 (mm water):

	Series I		Series IV
9 - 10 June	12.7	8 - 9 June	12.7
2 July	12.7	5 - 6 July	12.7
13 - 14 July	25.4	12 - 13 July	25.4
20 July	25.4	16 July	25.4
23 July	25.4	26 July	25.4
Total	101.6		101.6

Basal applications: 1547 kg (13:13:20). Weedkiller: Linuron at 1.12 kg in 371 l. Fungicide and insecticide: Mancozeb at 1.34 kg. Demeton-s-methyl at 246 ml in 416 l on one occasion.

Cultivations, etc.: Deep-tine cultivated: 2 Oct, 1970. Fumigated, all plots rotary cultivated and rolled: 21 Oct. Ploughed, (Series I): 9 Feb, 1971, (Series IV): 16 Feb. Fertiliser applied: 31 Mar. Deep-tine cultivated (Series IV): 5 Apr. Rotary cultivated, potatoes planted (Series I): 5 Apr. Rotary cultivated, potatoes planted (Series IV): 6 Apr. Weedkiller applied: 5 May. Rotary ridged: 2 June. Fungicide with insecticide applied: 29 June. Haulm destroyed mechanically (Series I): 20 Aug, (Series IV): 24 Aug. Lifted: (Series I): 23 Aug, (Series IV): 25 Aug. Varieties: Susceptible: Pentland Dell, resistant: Maris Piper.

NOTE: Soil samples were taken before planting and after lifting for egg counts of Heterodera rostochiensis and larval invasion tests were made in pots of soil taken before planting but after fumigation.

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Standard errors per plot. Total tubers, tonnes/hectare:

Series I

Strip:	4.18	or 16.9% (6 d.f.)
1/2 plots:	5.79	or 23.4% (8 d.f.)
1/4 plots:	3.69	or 14.9% (16 d.f.)
Pooled (used for calculation of standard errors in summary):	4.40	or 18.0% (30 d.f.)

Series IV

Strip:	3.75	or 14.6% (6 d.f.)
1/2 plots:	3.99	or 15.5% (8 d.f.)
1/4 plots:	4.08	or 15.9% (16 d.f.)
Pooled (used for calculation of standard errors in summary):	3.99	or 15.5% (30 d.f.)

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71/W/CS/16

SUMMARY OF RESULTS

SERIES I

1966 1967 1968 1969 1970 1971	MP MP MP MP MP MP	PD MP PD MP PD MP	PD PD PD PD PD PD	MP PD MP PD MP PD	Mean
	TOTAL TUBERS: TONNES/HECTARE				
	(±1.81)				(±0.91)
O	32.3	27.8	10.7	17.1	22.0
C	37.8	32.7	14.4	24.8	27.4
O	30.7	21.8	4.2	9.5	16.5
F	39.4	38.7	20.9	32.4	32.9
Mean (±1.28)	35.1	30.3	12.6	20.9	24.7
	% WARE: 3.81 CM (1.5 INCH) RIDDLE				
O	91.8	93.7	54.2	68.2	77.0
C	94.5	94.1	69.1	80.7	84.6
O	92.0	93.0	45.6	60.4	72.8
F	94.3	94.8	77.7	88.5	88.8
Mean	93.2	93.9	61.7	74.5	80.8

Varieties MP = Maris Piper
PD = Pentland Dell

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71/W/CS/16

SERIES IV

1966	MP	PD	PD	MP	
1967	MP	MP	PD	PD	
1968	MP	PD	PD	MP	
1969	MP	MP	PD	PD	
1970	MP	PD	PD	MP	
1971	MP	MP	PD	PD	Mean
	TOTAL TUBERS: TONNES/HECTARE				
	(±1.63)				(±0.82)
O	28.7	30.6	11.9	18.5	22.4
C	43.7	37.8	13.8	20.5	28.9
O	32.5	24.7	4.4	8.3	17.5
F	40.0	43.7	21.3	30.7	33.9
Mean (±1.15)	36.2	34.2	12.9	19.5	25.7
	% WARE: 3.81 CM (1.5 INCH) RIDDLE				
O	91.9	93.4	69.4	79.1	83.4
C	96.4	95.5	66.7	78.3	84.2
O	93.0	92.9	48.7	65.9	75.1
F	95.3	96.0	87.4	91.6	92.6
Mean	94.2	94.4	68.0	78.7	83.8

Varieties MP = Maris Piper
PD = Pentland Dell

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71/W/CS/20

PLACEMENT OF FUMIGANT

Object: To study the cumulative effects of soil fumigation on *Heterodera rostochiensis* and yield of potatoes grown continuously for five years - Woburn Butt Furlong.

The fifth year, potatoes.

For previous years see 67/C/34(t), 68/C/27(t), 69/W/CS/20 and 70/W/CS/20(t).

Whole plot dimensions: 2.13 x 4.57. Area harvested: 0.00098.

Treatments:
0, 84, 168, 336, 672 kg dazomet (applied cumulatively to previous rates of treatment).

Basal applications: 1380 kg (13:13:20). Weedkiller: Linuron at 1.12 kg in 371 l. Fungicide with insecticide: Mancozeb at 1.34 kg plus demeton-s-methyl at 246 ml in 416 l.

Cultivations, etc.: Ploughed: 10 Oct, 1970. Dazomet applied, rotary cultivated: 20 Oct. Deep-tine cultivated, NPK applied, potatoes planted, inter-row rotary cultivated and earthed up: 8 Apr, 1971. Weedkiller applied: 6 May. Fungicide with insecticide applied: 28 June. Haulm destroyed mechanically: 17 Sept. Sprayed with undiluted BUV at 225 l: 20 Sept. Lifted by hand: 8 Oct. Variety: Majestic.

NOTE: Soil samples were taken before planting and after harvest for cyst counts.

Standard error per plot.
Total tubers, tonnes/hectare: 3.84 or 15.6% (8 d.f.)

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71/W/CS/20

SUMMARY OF RESULTS

DAZOMET: KG/HA

0	84	168	336	672	Mean
TOTAL TUBERS: TONNES/HECTARE					
		(±2.22)			
15.3	21.2	22.7	28.9	35.2	24.6
% WARE: 3.81 CM (1.5 INCH) RIDDLE					
48.2	64.9	74.2	84.4	82.9	70.9

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71/R/CS/24

PK AND TAKE-ALL

Object: To study the effects of different amounts of phosphate, potash and nitrogen fertiliser on the yields and incidence of take-all (Ophiobolus graminis) in continuous barley - West Barnfield II.

The fourth year, barley.

For previous years see 68/C/16(t), 69/R/CS/24 and 70/R/CS/24(t).

Whole plot dimensions: 5.33 x 20.1. Sub plot area harvested: 0.00266.

Cultivations, etc.: Sprayed with paraquat at 0.28 kg ion in 225 l: 18 Sept, 1970. Ploughed: 25 Sept. N, P and K applied: 4 Mar, 1971. Seed drilled at 157 kg: 11 Mar. Sprayed with ioxynil octanoate, bromoxynil octanoate and the iso-octyl ester of dichlorprop ('Oxytril P' at 1.4 l in 225 l): 11 May. Combine harvested: 17 Aug. Variety: Julia.

NOTE: Estimates of take-all (Ophiobolus graminis) and eyespot (Cercosporella herpotrichoides) were made in early July.

Standard errors per plot. Grain, tonnes/hectare:
Whole plot: 0.519 or 10.6% (17 d.f.)
Sub plot: 0.450 or 9.2% (20 d.f.)
Pooled (used for calculation of standard errors in summary): 0.598 or 12.2% (37 d.f.)

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71/R/CS/24

SUMMARY OF RESULTS

GRAIN: TONNES/HECTARE

	P0	P1	P4	P6*	P24*	Mean
			(±0.211)			(±0.095)
K1	3.70	5.10	5.62	4.59	5.54	4.91
K4	3.67	4.77	5.52	5.07	5.56	4.92
			(±0.299)			(±0.134)
N1	3.42	4.77	5.43	4.99	5.71	4.86
N2	3.31	4.96	6.03	4.78	5.70	4.96
N3	4.19	4.85	5.35	5.08	5.79	5.05
N4	3.82	5.16	5.47	4.47	5.00	4.79
Mean (±0.149)	3.69	4.94	5.57	4.83	5.55	4.91

	N1	N2	N3	N4
			(±0.189)	
K1	4.68	5.26	4.80	4.89
K4	5.05	4.65	5.30	4.68

* Applied 1968 only

Mean D.M. %: 82.1

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71/R/CS/24

GRAIN: TONNES/HECTARE

	K1					K4				
	P0	P1	P4	P6*	P24*	P0	P1	P4	P6*	P24*
	(±0.423)									
N1	3.71	4.60	5.23	4.23	5.64	3.13	4.95	5.63	5.75	5.77
N2	3.79	5.51	6.27	4.89	5.85	2.83	4.41	5.78	4.67	5.56
N3	3.31	4.70	5.48	4.77	5.76	5.07	5.01	5.21	5.39	5.82
N4	3.98	5.61	5.49	4.47	4.90	3.66	4.71	5.45	4.48	5.11

* Applied 1968 only

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71/R/CS/24

STRAW: TONNES/HECTARE

	P0	P1	P4	P6*	P24*	Mean
K1	2.90	3.87	3.89	3.57	4.23	3.69
K4	2.66	4.05	4.37	3.73	4.34	3.83
N1	2.48	3.20	3.55	3.31	3.62	3.23
N2	2.37	4.26	4.30	3.25	4.26	3.69
N3	3.05	4.17	4.17	4.20	4.65	4.05
N4	3.23	4.22	4.51	3.83	4.60	4.08
Mean	2.78	3.96	4.13	3.65	4.28	3.76

	N1	N2	N3	N4
K1	3.16	3.58	4.00	4.02
K4	3.30	3.79	4.10	4.13

* Applied 1968 only

Mean D.M. %: 80.4

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71/R/CS/24

STRAW: TONNES/HECTARE

	K1					K4				
	P0	P1	P4	P6*	P24*	P0	P1	P4	P6*	P24*
N1	2.62	2.96	3.23	3.21	3.77	2.34	3.43	3.86	3.42	3.47
N2	2.65	4.16	4.05	3.06	4.00	2.08	4.36	4.54	3.45	4.52
N3	2.70	4.13	3.88	4.33	4.94	3.40	4.21	4.45	4.07	4.35
N4	3.62	4.23	4.39	3.69	4.20	2.84	4.21	4.64	3.96	5.01

* Applied 1968 only

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71/W/CS/28

FUMIGANTS AND IRRIGATION

Object: To study the residual effects of 'D-D', chloropicrin and aldicarb, applied in 1968, on Pratylenchus and yield of barley grown continuously - Woburn Butt Close Series III.

The fourth year, barley.

For previous years see 68/C/34(t), 69/CS/28(t), 70/W/CS/28.

Whole plot dimensions: 14.5 x 15.2. Sub plot area harvested: 0.00080.

Basal applications: 303 kg (0:20:20). Weedkiller: Ioxynil at 0.525 kg and mecoprop at 1.58 kg in 281 l.

Cultivations, etc.: Sub soiled: 8 Sept, 1970. Rotary cultivated: 28 Sept and 17 Oct. Ploughed: 28 Oct. Seed combine drilled at 168 kg: 10 Mar, 1970. 'Nitro-Chalk' applied: 12 Mar. Weedkiller applied: 30 Apr. Irrigation applied at 38.1 mm: 20 - 21 May, at 12.7 mm: 8 June, 12.7 mm: 6 July, 25.4 mm: 9 July, 25.4 mm: 19 July. Combine harvested: 16 Aug. Variety: Maris Badger.

NOTE: Crop and soil samples were taken at intervals through the growing season for nematode counts.

Standard errors per plot.

Grain, tonnes/hectare:	Whole plot:	0.247 or 7.4% (6 d.f.)
	Quarter plot:	0.212 or 6.4% (24 d.f.)
	Eighth plot:	0.263 or 7.9% (32 d.f.)

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71/W/CS/28

SUMMARY OF RESULTS

GRAIN: TONNES/HECTARE

1968

	O	C	D	T	Mean
1968 - 71		(1) and (2)			(±0.101)
O	3.19	3.44	3.43	3.25	3.33
I	3.42	3.24	3.32	3.26	3.31

N: KG/HA 1968 - 71

	0	50	100	150	
		(3) and (4)			
O	1.37	3.55	4.30	4.11	
I	1.42	3.42	4.47	3.92	
1968		(5) and (6)			(±0.061)
O	1.36	3.51	4.40	3.94	3.31
C	1.49	3.14	4.65	4.08	3.34
D	1.25	3.79	4.36	4.11	3.38
T	1.47	3.51	4.12	3.93	3.26
Mean (±0.054)	1.39	3.49	4.38	4.01	3.32

(1) (±0.126) (3) (±0.120) (5) (±0.111) For use in vertical and diagonal comparisons only

(2) (±0.087) (4) (±0.076) (6) (±0.107) For use in horizontal and interaction comparisons only

Mean D.M. %: 82.4

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71/W/CS/28

STRAW: TONNES/HECTARE

1968

	O	C	D	T	Mean
1968 - 71					
O	2.89	3.25	3.10	2.89	3.03
I	3.53	3.21	3.52	3.45	3.43

N: KG/HA 1968 - 71

	0	50	100	150
O	0.97	3.23	3.91	4.01
I	1.25	3.43	4.62	4.40

1968

O	1.10	3.14	4.34	4.25	3.21
C	1.18	2.98	4.56	4.18	3.23
D	1.03	3.56	4.21	4.44	3.31
T	1.14	3.65	3.94	3.93	3.17
Mean	1.11	3.33	4.26	4.20	3.23

Mean D.M. %: 81.4

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71/W/CS/33

RATES OF NEMATICIDES DOSAGE

Object: To study the residual effects on yield of barley of several nematicides applied at a range of rates (to potatoes 1969 and sugar beet 1970) - Woburn Butt Close.

The third year, barley.

For previous years see 69/W/CS/33(t) and 70/W/CS/33(t).

Whole plot dimensions: 10.7 x 1.93. Area harvested: 0.00027.

Basal applications: 398 kg (20:10:10). Weedkiller: Ioxynil at 0.525 kg and mecoprop at 1.58 kg in 281 l.

Cultivations, etc.: Ploughed: 10 Dec, 1970. Seed combine drilled at 157 kg: 17 Mar, 1971. Weedkiller applied: 30 Apr. Harvested by hand: 16 Aug. Variety: Julia.

NOTE: Soil samples were taken after harvest for cyst counts.

Standard error per plot.
Grain, tonnes/hectare: Whole plot: 0.361 or 8.0% (26 d.f.)
Sub plot: 0.430 or 9.5% (28 d.f.)

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71/W/CS/33

SUMMARY OF RESULTS

GRAIN: TONNES/HECTARE

	0	M	D1	D2	D3	D4	T1	T2	T3	T4	Z1	Z2	Z3	Z4	Mean
							(1) and (2)								(±0.069)
R		4.68	4.81	3.99	4.52	4.74	4.22	4.12	4.20	4.70	4.44	4.52	4.62	4.55	4.47
C		4.50	4.59	4.13	4.81	4.52	4.37	4.72	4.53	4.66	4.47	4.86	4.76	4.91	4.60
Mean (±0.209)	4.51	4.59	4.70	4.06	4.67	4.63	4.29	4.42	4.36	4.68	4.46	4.69	4.69	4.73	4.53*

* General mean

Mean D.M. %: 86.3

(1) (±0.273) For use in horizontal and diagonal comparisons only
(2) (±0.248) For use in vertical and interaction comparisons only

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71/W/CS/34

NEMATICIDES IN CROP SEQUENCE

Object: To study the effects of three nematicides on Heterodera rostochiensis and yield of potatoes grown continuously for three years - Woburn Great Hill II and III.

The third year of continuous potatoes - first year of treatments.

Design: 4 series of 3 blocks of 10 plots.

NOTE: Only Series I received treatments, the other three series continued in untreated susceptible potatoes.

Whole plot dimensions: 4.27 x 9.14. Area harvested: 0.00130.

Treatments: None (0), together with all combinations of:-
(1) Nematicides: Aldicarb (A), Du Pont 1410 (D), Nemacur P (N).
(2) Levels: 2.8, 6.0, 11.0 kg a.i.

Basal applications: 1883 kg (13:13:20). Weedkiller: Linuron at 1.12 kg in 371 l. Fungicide with insecticide: Mancozeb at 1.34 kg with demeton-s-methyl at 246 ml in 416 l.

Cultivations, etc.: Deep-tine cultivated: 24 Oct, 1970. NPK applied: 2 Apr, 1971. Treatments applied, rotary cultivated: 5 Apr. Potatoes planted: 6 Apr. Weedkiller applied: 5 - 6 May. Rotary ridged: 1 June. Fungicide with insecticide applied: 28 - 29 June. Haulm mechanically destroyed: 17 Sept. Sprayed with undiluted BOV at 225 l: 20 Sept. Lifted: 5 Oct. Variety: Pentland Crown.

NOTE: Soil samples were taken before treatment applications and after harvest for cyst, egg and larvae counts of Heterodera rostochiensis.

Standard error per plot.
Total tubers, tonnes/hectare: 3.63 or 9.9% (6 d.f.)

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71/W/CS/34

SUMMARY OF RESULTS

A.I: KG/HA

	2.8	6.0	11.0	Mean
	TOTAL TUBERS: TONNES/HECTARE			
		(±2.10)'		(±1.21)
A	39.9	36.9	46.4	41.1
D	35.6	38.3	43.2	39.0
N	27.9	29.8	31.3	29.7
Mean (±1.21)	34.4	35.0	40.3	36.6

O 15.1 (±2.10)

General mean: 34.4

% WARE: 3.81 CM (1.5 INCH) RIDDLE

A	92.3	91.6	93.6	92.5
D	90.4	91.1	91.4	90.9
N	87.1	87.6	88.6	87.8
Mean	89.9	90.1	91.2	90.4

O 77.5

General mean: 89.1

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71/R/CS/41

CULTIVATIONS AND SOIL INVERTEBRATES

Object: To study the effects of cultivation on yields of pasture and on populations of soil animals - Road Piece.

The third year, old grass, new grass.

For previous years see 69/R/CS/41(t) and 70/R/CS/41(t).

Whole plot dimensions: 6.40 x 7.32. Area harvested: 0.00074.

Cultivations, etc.: Basal PK applied: 19 Oct, 1970. AMR plots ploughed: 23 Oct. SMR and SFR plots ploughed: 16 Feb, 1971. All plots rolled: 4 Mar. Basal NK applied: 26 Mar. Disced AMR and SMR plots 4 times, SFR plots twice, harrowed, seed hand sown at 22.4 kg and covered in with weeder: 7 Apr. Sown plots rolled: 8 Apr. SFR, SMR and AMR plots topped: 22 June. SFR, SMR and AMR plots cut once: 13 Sept, other plots 3 times: 20 May, 8 July, 13 Sept. NK applied to all plots except SFR, SMR and AMR: 26 May, 15 July, 16 Sept and to SFR, SMR and AMR plots: 16 Sept only. Seeds mixture for 1971: 1.68 kg British certified Aberystwyth S48 Timothy, 3.36 kg British certified Aberystwyth S215 Meadow Fescue, 0.56 kg New Zealand Grassland Huia certified motherseed big white clover.

NOTE: Soil cores were taken for total fauna on 23 Feb, 24 Mar, 10 May, 19 May, 25 June, 13 Aug, 3 Nov. Quadrats (61 cm square) were sampled on each plot for earthworms on 14 Apr, 10 May, 14 Oct.

Standard errors per plot. Dry matter, tonnes/hectare:

1st cut:	0.629 or 14.6% (12 d.f.)
2nd cut:	0.447 or 13.8% (12 d.f.)
3rd cut:	0.450 or 17.8% (21 d.f.)
Total of 3 cuts:	1.029 or 10.6% (12 d.f.)

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71/R/CS/41

SUMMARY OF RESULTS

DRY MATTER: TONNES/HECTARE

	O*	SF	SM	AM	Mean	SFR	SMR	AMR	Mean
	(±0.222)		(±0.314)						
1st cut	4.35	4.46	4.54	3.78	4.29				
	(±0.158)		(±0.224)						
2nd cut	2.89	3.46	3.52	3.43	3.24				
	(±0.159)		(±0.225)				(±0.225)		
3rd cut	2.20	1.80	2.49	2.08	2.14	2.92	3.32	3.21	2.53**
	(±0.364)		(±0.515)						
Total of 3 cuts	9.43	9.72	10.56	9.30	9.69				

Mean D.M. %: 1st cut: 20.0
2nd cut: 20.9
3rd cut: 26.4
Total of 3 cuts: 22.4

* Duplicated level
** General mean

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71/R/CS/42

EFFECT OF INVERTEBRATES ON YIELD

Object: To study the effect of a range of invertebrate-killing chemicals on the yield of old grass - Road Piece.

The third year, old grass.

For previous years see 69/R/CS/42(t) and 70/R/CS/42(t).

Whole plot dimensions: 2.74 x 6.40. Area harvested: 0.00065.

Basal applications: 505 kg (0:14:28) in winter, 440 kg (25:0:16) in spring, 224 kg (25:0:16) after each cut except the last.

Cultivations, etc.: PK applied: 19 Oct, 1970. NK applied: 26 Mar, 1971. Cut 3 times: 20 May, 8 July, 14 Sept. NK applied after first two cuts. Chemical treatments applied:

Chlorbenside:	15 Jan, 5 Mar, 7 Apr, 12 May, 11 June, 16 July, 23 Aug, 9 Dec.
Menazon:	14 Jan, 4 Mar, 6 Apr, 11 May, 10 June, 15 July, 23 Aug, 9 Dec.
Dimethoate:	14 Jan, 5 Mar, 7 Apr, 11 May, 11 June, 16 July, 23 Aug, 9 Dec.
Parathion:	15 Jan, 5 Mar, 7 Apr, 12 May, 11 June, 19 July, 23 Aug.
Metaldehyde bait:	11 May, 10 June, 15 July, 23 Aug, 9 Dec.
Metaldehyde spray:	14 Jan, 4 Mar, 6 Apr.
Aldrin:	8 Dec, 1971.
Chlordane:	8 Dec, 1971.

NOTES: (1) Formalin and C14421 were not applied in 1971.
(2) Samples were taken for botanical analysis. Samples for fauna were taken throughout the year.

ERRATUM, 69/R/CS/42:- Treatments - 'Parathion bran bait - parathion at 0.8 oz (against leatherjackets)' and not as shown, (0.8 oz per acre = 56 g per hectare).

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Standard errors per plot. Dry matter, tonnes/hectare:
1st cut: 0.508 or 9.8% (33 d.f.)
2nd cut: 0.259 or 8.4% (33 d.f.)
3rd cut: 0.310 or 16.7% (33 d.f.)
Total of 3 cuts: 0.662 or 6.5% (33 d.f.)

SUMMARY OF RESULTS

DRY MATTER: TONNES/HECTARE

	1ST CUT	2ND CUT	3RD CUT	TOTAL OF 3 CUTS
OS	5.06	2.99	1.86	9.92
FCB	5.07	3.05	1.79	9.91
FMZ	5.27	3.06	1.69	10.03
F3	4.91	3.03	2.07	10.01
O	5.22	3.36	1.83	10.40
SFO	5.81 (±0.254)	2.97 (±0.129)	1.81 (±0.155)	10.59 (±0.331)
SL	5.17	3.10	1.90	10.16
SN	4.94	3.07	1.83	9.84
SMT	5.51	3.18	1.73	10.43
S3	5.36	3.03	1.94	10.34
S4	4.82	2.89	1.93	9.65
F3+S4	5.21	3.17	1.93	10.31
Mean	5.20	3.08	1.86	10.13

Mean D.M. %: 1st cut: 20.3
2nd cut: 20.1
3rd cut: 25.0
Total of 3 cuts: 20.8

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71/R/CS/43

AQUA AMMONIA

Object: To study the effects of injecting large single dressings of aqueous ammonia on the yield of grazed grassland - Highfield IX.

The third year, grazed grass.

For previous years see 69/R/CS/43(t) and 70/R/CS/43.

Whole plot dimensions: 4.27 x 15.2. Area harvested: 0.00008.

Cultivations, etc.: Basal PK applied: 9 Nov, 1970. Aqueous ammonia injected: 11 Feb, 1971. N applied, sample cages placed: 24 Feb. Sample cuts taken: 27 Apr, 1 June*, 28 June, 4 Aug, 6 Sept, 1 Nov. 'Nitro-Chalk' applied and sample cage moved after each of first 5 cuts.

* Grass cut with shears because it was too long to cut with mower.

NOTES: (1) Visual estimates were made of the percentage surface area within each cage covered by clover leaves immediately before cutting.
(2) The percentage of N in the dry grass was determined.

Standard errors per plot. Dry matter, tonnes/hectare:

1st cut:	0.581	or 23.9% (21 d.f.)
2nd cut:	0.376	or 7.8% (21 d.f.)
3rd cut:	0.335	or 11.9% (21 d.f.)
4th cut:	0.437	or 10.5% (21 d.f.)
5th cut:	0.546	or 15.4% (21 d.f.)
6th cut:	0.260	or 11.0% (21 d.f.)
Total of 6 cuts:	1.535	or 7.6% (21 d.f.)

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71/R/CS/43

SUMMARY OF RESULTS

DRY MATTER: TONNES/HECTARE

	N1	N2	N3	N4	Mean
		1ST CUT			
		(±0.290)			(±0.145)
I	2.38	2.54	2.99	2.01	2.48
B	2.26	2.57	2.16	2.50	2.37
Mean (±0.205)	2.32	2.55	2.58	2.25	2.43

NO: 1.27
General mean: 2.30

		2ND CUT			
		(±0.188)			(±0.094)
I	4.54	5.31	5.27	5.40	5.13
B	3.73	4.79	4.61	4.81	4.49
Mean (±0.133)	4.14	5.05	4.94	5.11	4.81

NO: 2.43
General mean: 4.54

		3RD CUT			
		(±0.167)			(±0.084)
I	2.76	2.98	3.00	3.01	2.94
B	2.16	2.86	2.88	2.93	2.71
Mean (±0.118)	2.46	2.92	2.94	2.97	2.82

NO: 1.98
General mean: 2.73

Mean D.M. %: 1st cut: 17.4
2nd cut: 15.9
3rd cut: 18.6

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71/R/CS/43

DRY MATTER: TONNES/HECTARE

	N1	N2	N3	N4	Mean
		4TH CUT			
		(±0.219)			(±0.109)
I	3.47	4.05	4.76	4.64	4.23
B	3.86	4.09	4.57	3.94	4.12
Mean (±0.155)	3.67	4.07	4.67	4.29	4.17

NO: 3.03
General mean: 4.05

5TH CUT

		(±0.273)			(±0.136)
I	3.20	3.69	3.75	4.08	3.68
B	3.17	3.54	3.26	3.62	3.40
Mean (±0.193)	3.19	3.62	3.50	3.85	3.54

NO: 2.82
General mean: 3.46

6TH CUT

		(±0.130)			(±0.065)
I	2.45	2.17	2.53	2.21	2.34
B	2.33	2.55	2.42	2.29	2.40
Mean (±0.092)	2.39	2.36	2.48	2.25	2.37

NO: 2.43
General mean: 2.38

Mean D.M. %: 4th cut: 20.1
5th cut: 24.3
6th cut: 24.5

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71/R/CS/43

DRY MATTER: TONNES/HECTARE

	N1	N2	N3	N4	Mean
	TOTAL OF 6 CUTS				
		(±0.767)			(±0.384)
I	18.81	20.75	22.31	21.37	20.81
B	17.51	20.41	19.90	20.09	19.48
Mean (±0.543)	18.16	20.58	21.10	20.73	20.14

NO: 13.97
General mean: 19.46

Mean D.M. %: 20.1

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71/R/CS/44

BREAK CROPS AND WHEAT

Object: To study the effects of different break crops on yields and soil-borne pathogens of a following sequence of cereals - Long Hoos III.

The third year, barley.

For previous years see 69/R/CS/44(t) and 70/R/CS/44(t).

Design: 3 randomised blocks of 12 plots, split into 4.

Whole plot dimensions: 4.27 x 39.3. Sub plot area harvested: 0.00258.

Treatments:

Whole plots: Crops and nitrogen 1969:- Spring beans (2 plots per block) (BE), clover (2 plots per block) (CL) and all combinations of:-

1. Crops: Barley (B), oats (O).
2. Nitrogen: 50 (R1), 100 (R2) kg as 'Nitro-Chalk' in the seedbed.
3. Undersowing: None (O), trefoil (T).

Sub plots:

4. Nitrogen 1970 and 1971: None, 50, 100, 150 kg as 'Nitro-Chalk'.

Basal applications: 314 kg (0:20:20) combine drilled. Weedkiller: Ioxynil octanoate, bromoxynil octanoate and the iso-octyl ester of dichlorprop ('Oxytril P' at 1.4 l in 225 l).

Cultivations, etc.: Ploughed: 1 Oct, 1970. Seed combine drilled at 157 kg: 12 Mar, 1971. N applied: 24 Mar. Weedkiller applied: 4 May. Combine harvested: 17 Aug. Variety: Julia.

NOTE: Estimates were made of take-all (Ophiobolus graminis).

Standard errors per plot. Grain, tonnes/hectare.

Whole plot: 0.169 or 3.4% (14 d.f.)
Sub plot: 0.550 or 11.2% (47 d.f.)

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71/R/CS/44

SUMMARY OF RESULTS

GRAIN: TONNES/HECTARE

	N: KG/HA 1969				N: KG/HA 1970 & 71				
	50	100	0	T	0	50	100	150	Mean
	(±0.069)		(±0.069)			(1) and (2)			(±0.049)
B	5.01	4.87	4.87	5.01	3.49	4.93	5.83	5.51	4.94
O	4.85	4.96	4.91	4.89	3.59	5.16	5.50	5.36	4.90
	N: KG/HA 1969		(±0.069)			(1) and (2)			(±0.049)
	50		4.84	5.01	3.54	5.14	5.67	5.35	4.93
	100		4.94	4.89	3.53	4.95	5.66	5.51	4.91
						(1) and (2)			(±0.049)
				O	3.46	4.86	5.73	5.51	4.89
				T	3.61	5.22	5.60	5.36	4.95
Mean (±0.112)					3.54	5.04	5.67	5.43	4.92
						(3) and (4)			
				BE	3.11	5.27	5.70	5.40	4.87
				CL	3.82	3.51	5.73	5.45	5.10

(1) (±0.146) (3) (±0.206) For use in vertical and diagonal comparisons only
(2) (±0.159) (4) (±0.224) For use in horizontal and interaction comparisons only

General mean: 4.94

Mean D.M. % all plots: 84.4

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71/R/CS/49 and 71/W/CS/49

FUMIGANT AND N

Object: To study the direct and residual effects of formalin applied at different times on the development of take-all (Ophiobolus graminis) on winter and spring sown wheat - Rothamsted (R) Furzefield and Woburn (W) Butt Close.

The second year, winter and spring wheat.

For previous year see 70/R&W/CS/49(t).

Design: A single replicate of 4 x 4 x 2 x 2 in 4 blocks of 4 plots each of 4 sub plots.

Whole plot dimensions: 2.16 x 21.0. Sub plot area harvested: 0.00064.

Treatments: All combinations of:-

Whole plots:

1. Crops, sowing dates and times of application of formalin: Cappelle winter wheat sown in autumn, formalin applied in early autumn (WWA), Cappelle sown in spring, formalin applied early autumn (WWS), Kolibri spring wheat sown in spring, formalin applied in early autumn (WSS) or in early spring (WSS*).

Sub plots:

2. Nitrogen: 75, 125, 176, 226 kg N as 'Nitro-Chalk'.
3. Formalin in 1970: None (0), formalin (F) at 2990 l of 38% formaldehyde in 54,300 l. (N.B. The spring applications were in 40,700 l on Furzefield (R) and in 27,200 l on Butt Close (W).
4. Formalin in 1971: None (0), formalin (F) at 2990 l of 38% formaldehyde in 47,000 l.

Standard applications:

Furzefield (R): Autumn sowing, 314 kg (0:20:20), spring sowing, 336 kg (0:20:20) each broadcast.

Butt Close (W): Autumn sowing, 314 kg (0:20:20), spring sowing, 360 kg (0:20:20) each broadcast.

Weedkiller (both fields): Ioxynil at 0.63 kg and mecoprop at 1.89 kg in 337 l.

Cultivations, etc.:

Furzefield (R): Ploughed: 8 Sept, 1970. Formalin applied (WWA, WWS and WSS): 7 Oct. Winter wheat drilled at 202 kg: PK applied: 20 Oct. Formalin applied (WSS*): 8 Feb, 1971. Spring sown wheat drilled at 185 kg, PK applied: 25 Feb. N applied: 14 Apr. Weedkiller applied: 19 Apr. Combine harvested: 28 Aug.

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71/R/CS/49 and 71/W/CS/49

Butt Close (W): Ploughed: 3 Sept, 1970. Formalin applied (WWA, WWS and WSS): 9 Oct. PK applied, winter wheat drilled at 202 kg: 23 Oct. Formalin applied (WSS*): 9 Feb, 1971. PK applied, spring sown wheat drilled at 185 kg: 10 Mar. N applied: 7 Apr. Weedkiller applied: 8 Apr. Combine harvested: 27 Aug.

NOTES: (1) Incidence of root pathogens was recorded in spring and at harvest.
(2) On Butt Close (W) the yields have been adjusted for a linear trend North to South across each whole plot.

Standard errors per plot. Grain, tonnes/hectare:
Furzefield (R).
Whole plot: 0.393 or 7.8% (9 d.f.)
Sub plot: 0.581 or 11.6% (21 d.f.)
Butt Close (W).
Whole plot: 0.219 or 9.9% (9 d.f.)
Sub plot: 0.186 or 8.4% (20 d.f.)

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71/R/CS/49 and 71/W/CS/49

SUMMARY OF RESULTS

FURZEFIELD (R)

GRAIN: TONNES/HECTARE

	N1	N2	N3	N4	1970 RO	1970 RF	1971 FO	1971 FF	Mean
	(1) and (2)				(3) and (4)		(3) and (4)		(±0.196)
WWA	6.25	6.18	5.99	5.88	6.04	6.11	5.90	6.25	6.08
WWS	4.32	4.84	5.08	3.82	4.60	4.43	4.86	4.17	4.52
WSS	4.53	4.78	4.79	4.96	4.72	4.81	4.72	4.81	4.76
WSS*	4.55	4.77	4.73	4.86	4.76	4.70	4.53	4.93	4.73
					(±0.205)		(±0.205)		(±0.145)
				N1	4.75	5.08	4.97	4.86	4.91
				N2	5.09	5.20	5.05	5.23	5.14
				N3	5.16	5.14	5.08	5.21	5.15
				N4	5.13	4.63	4.91	4.85	4.88
							(±0.145)		(±0.103)
						RO	4.93	5.13	5.03
						RF	5.08	4.94	5.01
Mean (±0.103)							5.00	5.04	5.02

(1) (±0.319) (3) (±0.244) For use in vertical and diagonal comparisons only

(2) (±0.290) (4) (±0.205) For use in horizontal and interaction comparisons only

Mean D.M. %: 80.9

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71/R/CS/49 and 71/W/CS/49

BUTT CLOSE (W)

GRAIN: TONNES/HECTARE

	N1	N2	N3	N4	1970 RO	1970 RF	1971 FO	1971 FF	Mean
	(1) and (2)				(3) and (4)		(3) and (4)		(±0.109)
WWA	2.21	2.59	2.66	2.53	2.50	2.50	2.28	2.72	2.50
WWS	1.72	1.93	1.89	1.64	1.78	1.81	1.62	1.96	1.79
WSS	2.18	2.25	2.34	2.21	2.29	2.21	2.22	2.27	2.25
WSS*	2.30	2.32	2.21	2.29	2.27	2.29	2.23	2.33	2.28
					(±0.066)		(±0.066)		(±0.047)
				N1	2.13	2.08	1.99	2.22	2.11
				N2	2.25	2.30	2.09	2.46	2.27
				N3	2.30	2.25	2.14	2.41	2.28
				N4	2.16	2.17	2.14	2.20	2.17
							(±0.047)		(±0.033)
						RO	2.08	2.34	2.21
						RF	2.10	2.30	2.20
Mean (±0.033)							2.09	2.32	2.21

(1) (±0.136) (3) (±0.119) For use in vertical and diagonal comparisons only

(2) (±0.093) (4) (±0.066) For use in horizontal and interaction comparisons only

Mean D.M. %: 70.0

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71/W/CS/51

AUTUMN AND SPRING FUMIGANTS

Object: To study the effects of rates and methods of applying dazomet on Heterodera rostochiensis and yield of potatoes grown continuously for two years (ignoring times and methods of application in 1970) - Butt Close, Woburn.

The second year, potatoes.

For previous year see 70/W/CS/51(t).

Design: 4 blocks of 8 plots.

Whole plot dimensions: 2.84 x 6.10. Area harvested: 0.00087.

Treatments: Nematicides:-

1970	1971	
None	None	(O) O
336 kg dazomet	336 kg dazomet before ploughing	(D) D2
336 kg dazomet	336 kg dazomet before ploughing, 168 kg after ploughing	(D) D2+1
336 kg dazomet	168 kg dazomet before ploughing, 168 kg after ploughing	(D) D1+1
336 kg dazomet	168 kg dazomet before ploughing, 168 kg after ploughing but ridged in autumn	(D) D1+1R
336 kg 'Telone'	168 kg dazomet before ploughing, 168 kg after ploughing	(T) D1+1
336 kg 'Telone'	168 kg dazomet before ploughing, 168 kg after ploughing rolled flat after ploughing	(T) D1+1F

Each application of dazomet (1971) was rotary cultivated in.

Basal applications: 1255 kg (13:13:20). Weedkiller: Linuron at 1.12 kg in 371 l. Fungicide with insecticide: Mancozeb at 1.34 kg and demeton-s-methyl at 246 ml in 416 l. Fungicide: Mancozeb at 1.34 kg in 371 l.

Cultivations, etc.: First dazomet treatments applied all plots, rotary cultivated, ploughed: 19 Oct, 1970. Second dazomet treatments applied and these plots only rotary cultivated, R plots ridged up, F plots rolled: 20 Oct. Fertiliser applied, potatoes planted, inter-row rotary cultivated and ridged up: 7 Apr, 1971. Weedkiller applied: 5 May. Fungicide with insecticide applied: 28 June. Fungicide applied: 13 Aug. Haulm destroyed mechanically: 17 Sept. Sprayed with undiluted BUV at 225 l: 20 Sept. Potatoes lifted: 5 Oct. Variety: Majestic.

NOTE: Soil samples were taken after harvest at 20.3 cm and 61.0 cm for nematode counts.

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Standard error per plot.
Total tubers, tonnes/hectare: 4.29 or 12.0% (21 d.f.)

SUMMARY OF RESULTS

(0)0	(D)D2	(D)D2+1	(D)D1+1	(D)D1+1R	(T)D1+1	(T)D1+1F	Mean
TOTAL TUBERS: TONNES/HECTARE							
(±1.52)			(±2.15)				
10.3	41.5	51.4	39.1	38.6	47.2	48.0	35.8
% WARE: 3.81 CM (1.5 INCH) RIDDLE							
62.4	90.2	94.1	91.4	89.7	92.4	93.5	84.5

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71/W/CS/52

FUMIGANTS, TEMIK AND N

Object: To study the effects of dazomet, formalin and aldicarb, at a range of nitrogen levels, on nematodes and yield of spring wheat - Woburn Butt Close.

The first year, spring wheat.

Design: 4 blocks of 12 plots.

Whole plot dimensions: 2.13 x 9.14. Area harvested: 0.00130.

Treatments: All combinations of:-
1. Fumigants: None (O) 381 kg (D) dazomet 2987 l(F) formalin (38% formaldehyde) 9 kg (T) aldicarb.
2. Nitrogen: 63, 126, 189 kg N as 'Nitro-Chalk'.

Dazomet was applied as a prill rotary cultivated in, formalin as a drench with water 54,400 l both applied in the autumn. Aldicarb was applied in the spring.

Basal applications: 381 kg (0:20:20). Weedkiller: Ioxynil at 0.525 kg and mecoprop at 1.58 kg in 281 l.

Cultivations, etc.: Ploughed: 3 Sept, 1970. Dazomet applied, rotary cultivated: 28 Sept. Formalin applied: 12 - 13 Oct. Ploughed: 9 Feb, 1971. Aldicarb applied: 8 Mar. Seed combine drilled at 191 kg: 17 Mar. N applied: 25 Mar. Weedkiller applied: 30 Apr. Combine harvested: 17 Aug. Variety: Kolibri. Previous crops: Barley 1969 and 1970.

NOTE: Soil samples were taken before fumigating and after harvest, and crop samples were taken in June, for counts of Heterodera avenae.

Standard error per plot.
Grain, tonnes/hectare: 0.375 or 14.9% (33 d.f.)

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71/W/CS/52

SUMMARY OF RESULTS

N: KG/HA

	63	126	189	Mean
		GRAIN: TONNES/HECTARE		
		(±0.188)		(±0.108)
O	2.33	2.24	2.04	2.20
D	2.78	2.38	2.22	2.46
F	2.32	2.08	2.13	2.18
T	3.21	3.51	2.91	3.21
Mean (±0.094)	2.66	2.55	2.33	2.51
		STRAW: TONNES/HECTARE		
O	2.55	2.31	2.37	2.41
D	2.70	2.61	2.64	2.65
F	2.53	2.24	2.12	2.30
T	2.92	3.01	2.87	2.94
Mean	2.68	2.54	2.50	2.57

Mean D.M. %: Grain: 80.8
Straw: 79.7

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71/W/CS/55

FUMIGATION AND N

Object: To study the cumulative effects of dazomet and nitrogen fertiliser on pathogens and yield of spring beans grown continuously - Woburn Butt Furlong.

The third year, spring beans.

For previous years see 69/W/BE/1(t) and 70/W/CS/55.

Whole plot dimensions: 2.13 x 4.27. Area harvested: 0.00020.

Basal applications: 448 kg (0:14:28).

Cultivations, etc.: Ploughed: 3 Sept, 1970. Dazomet applied, all plots rotary cultivated, rolled: 23 Sept. Ploughed second time: 9 Feb, 1971. Fertiliser placed, seed drilled at 224 kg: 12 Mar. First half N applied: 24 Mar. Second half N applied: 12 May. Hand harvested: 1 Sept. Variety: Tarvin.

NOTES: (1) Soil samples taken for counts of ectoparasitic nematodes.
(2) Plant samples taken for observations of fungal pathogens.
(3) Counts made of germination %, number of stems and pods before harvest, 1000 grain weights and % nitrogen in grain.

Standard error per plot.
Grain, tonnes/hectare: 0.410 or 20.4% (10 d.f.)

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71/W/CS/55

SUMMARY OF RESULTS

GRAIN: TONNES/HECTARE

N: KG/HA

Dazomet: KG/HA	0	126	252	Mean
		(±0.237)		(±0.137)
0	1.75	1.32	1.24	1.44
450	2.38	2.57	2.77	2.57
Mean (±0.167)	2.07	1.94	2.01	2.01

Mean D.M. %: 80.7

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71/W/CS/56

NEMATODES AND VERTICILLIUM

Object: To study the effects, direct and residual of methyl bromide, residual only of aldicarb, on Heterodera rostochiensis and Verticillium on potatoes grown continuously for three years - Woburn Broad Mead I.

The third year, potatoes.

For previous years see 69/W/P/2(t) and 70/W/CS/56(t).

Design: 4 blocks of 6 plots.

Whole plot dimensions: 2.84 x 13.4. Area harvested: 0.00147.

Treatments:
Chemicals 1971: 487 (M1), 975 (M2) kg methyl bromide.

NOTE: These treatments were balanced over (OW) and (BO) applied in 1969. No fresh treatments were applied in 1970.

Basal applications: 1530 kg (13:13:20), 605 kg Epsom salts. Weedkiller: Linuron at 1.12 kg in 281 l. Fungicide with insecticide: Mancozeb at 1.34 kg with demeton-s-methyl at 246 ml in 416 l. Fungicide: Mancozeb at 1.34 kg in 371 l.

Cultivations, etc.: Deep-tine cultivated 1st stroke: 29 Oct, 1970, 2nd stroke: 30 Oct, 3rd stroke: 18 Dec. Methyl bromide applied under gas tight sheets: 21 Apr, 1971. Gas tight sheets removed: 26 Apr. NPK applied: 27 Apr. Mg applied, rotary cultivated, potatoes planted: 28 Apr. Weedkiller applied: 17 May. Rotary ridged twice: 21 June, 25 June. Fungicide with insecticide applied: 29 June. Fungicide applied: 12 Aug. Lifted: 13 Sept. Variety: Pentland Crown.

NOTE: Soil samples were taken after treatments were applied and after harvest for numbers of cysts, eggs and larvae of Heterodera rostochiensis and propagules of Verticillium.

Standard error per plot.
Total tubers, tonnes/hectare: 3.75 or 21.6% (15 d.f.)

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71/W/CS/56

SUMMARY OF RESULTS

	1969			1971		
OO	MO	MW	TO	M1	M2	Mean
TOTAL TUBERS: TONNES/HECTARE						
		(±1.88)				
5.9	6.2	7.7	8.8	37.3	38.1	17.3
% WARE: 4.44 CM (1.75 INCH) RIDDLE						
29.7	33.9	45.2	42.5	87.5	89.8	54.8

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71/R/CS/58

CROP SEQUENCES AND TAKE-ALL

Object: To study the seasonal changes in amounts of take-all (Ophiobolus graminis) in continuous spring wheat and to compare these with behaviour after break crops - Harwoods Piece.

The second year, spring wheat and beans.

For previous year see 70/R/CS/58(t).

Design: 3 randomised blocks of 3 plots, split into 4.

Whole plot dimensions: 4.27 x 63.7. Sub plot area harvested: 0.00373.

Treatments: Whole plots (crops 1970) were divided into half plots for crops 1971:-

1970	1971
Spring wheat (WS)	Spring wheat (WS) on both half plots
Spring beans (BE)	Spring wheat (WS), spring beans (BE)
Fallow (F)	Spring wheat (WS), fallow (F)

Half plots were divided into quarter plots for none (0) and sampling (S). Sampled quarter plots were the same as in 1970. The continuous spring wheat was sampled on only one quarter plot per block.

Basal applications: Weedkiller: Paraquat at 0.28 kg ion in 225 l.
Spring wheat: 437 kg (20:10:10) combine drilled. Weedkiller: Ioxynil octanoate, bromoxynil octanoate and the iso-octyl ester of dichlorprop ('Oxytril P' at 1.4 l in 225 l).
Spring beans: 404 kg (0:14:28) placement drilled. Insecticide: Demeton-s-methyl at 245 g in 438 l.

Cultivations, etc.: Paraquat applied: 18 Sept, 1970. Ploughed: 29 Oct.
Spring wheat: Seed combine drilled at 190 kg: 31 Mar, 1971. 'Oxytril P' applied: 18 May. Combine harvested: 1 Sept. Variety: Kolibri.
Spring beans: Seed placement drilled at 224 kg: 27 Feb, 1971. Insecticide applied: 1 July. Straw removed: 6 Sept (the crop was not worth harvesting). Variety: Maris Bead.
Fallow: Rotary cultivated: 2 June, 1971.

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NOTE: Soil and crop samples were taken throughout the season and the following observations made:

Estimates of take-all (Ophiobolus graminis) in the soil, in wheat seedlings and in wheat plants.

Growth stages of wheat.

Height of beans at each sampling date.

Standard errors per plot. Grain, tonnes/hectare:

Whole plot: 0.688 or 30.9% (6 d.f.)

Sub plot: 0.321 or 14.4% (8 d.f.)

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71/R/CS/58

SUMMARY OF RESULTS

GRAIN: TONNES/HECTARE

	Not sampled 1971	Sampled 1971			
	WS	WS	BE	F	Mean
			(1) and (2)		(±0.107)
O		2.15	3:31	1.89	2.45
S		1.83	2.73	1.74	2.10
Mean (±0.397)	2.09	2.04	3.02	1.81	**2.23***

(1) (±0.419) For use in horizontal and diagonal comparisons only
(2) (±0.185) For use in vertical and interaction comparisons only

Mean D.M. %: 81.6

* General mean

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71/R/CS/59

BREAK CROPS AND WHEAT

Object: To study the effects of different break crops on yields and soil-borne pathogens of a following sequence of cereals - Geescroft.

The second year, winter wheat.

For previous year see 70/R/CS/59(t).

Design: 3 randomised blocks of 14 plots, split into 4.

Whole plot dimensions: 4.27 x 33.2. Sub plot area harvested: 0.00215.

Treatments:-
Whole plots: Crops and nitrogen 1970:-
Maize receiving N at 100 (MA2), 200 (MA4) kg as 'Nitro-Chalk' in seedbed, spring beans (2 plots per block) (BE), clover (2 plots per block) (CL).
and all combinations of:-
1. Crops: Barley (B), oats (O).
2. Undersowing: None (O), trefoil (T).
3. Nitrogen: 50 (1), 100 (2) kg as 'Nitro-Chalk' in seedbed.
Sub plots:
4. Nitrogen 1971: None, 50, 100, 150 kg as 'Nitro-Chalk'.

Basal and other applications: Corrective K to clover plots at 126 kg K20 as muriate of potash. 314 kg (0:20:20) combine drilled. Weedkiller: 2,4-D at 0.56 kg and dichlorprop at 2.24 kg in 225 l.

Cultivations, etc.: Corrective K applied: 20 Oct, 1970. Ploughed: 3 Nov. Seed combine drilled at 202 kg: 5 Nov. N applied: 8 Apr, 1971. Weedkiller applied: 14 Apr. Combine harvested: 25 Aug. Variety: Joss Cambier.

NOTE: Estimates were made of take-all (Ophiobolus graminis) and eyespot (Cercosporella herpotrichoides).

Standard errors per plot.
Grain, tonnes/hectare: Whole plot: 0.238 or 4.9% (26 d.f.)
Sub plot: 0.363 or 7.5% (84 d.f.)

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71/R/CS/59

SUMMARY OF RESULTS

GRAIN: TONNES/HECTARE

N: KG/HA 1971

Crop and N 1970	Under-sowing 1970	0	50	100	150	Mean
			(1) and (2)			(±0.137)
B1	0	2.73	3.94	4.32	4.26	3.81
B2	0	2.51	3.90	4.13	4.61	3.79
B1	T	3.38	3.74	4.48	4.20	3.95
B2	T	3.73	4.47	4.36	4.42	4.25
O1	0	3.52	4.97	5.50	5.36	4.84
O2	0	4.06	5.66	5.71	5.42	5.21
O1	T	3.65	5.27	5.66	5.18	4.94
O2	T	4.40	5.10	5.60	5.36	5.11
MA2	0	4.79	5.59	5.72	5.07	5.29
MA4	0	5.20	5.70	5.63	5.10	5.41
			(3) and (4)			(±0.097)
BE*	0	4.53	5.72	5.81	5.54	5.40
CL*	0	4.49	5.56	5.50	5.16	5.18
Mean (±0.056)		4.00	5.07	5.27	5.03	4.84

Mean D.M. %: 83.9

(1) (±0.228) (3) (±0.161) For use in vertical and diagonal comparisons only

(2) (±0.210) (4) (±0.148) For use in horizontal and interaction comparisons only

* Duplicated treatments

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71/W/CS/60

GLYCOLURIL FOR GRASS

Object: To study the residual effects of glycoluril, applied in 1970, used as a slow-N fertiliser for grass, Woburn, Stackyard D.

The second year, ryegrass.

For previous year see 70/W/CS/60(t).

Whole plot dimensions: 0.84 x 1.52. Area harvested: 0.00154.

Basal applications: 628 kg (0:14:28).

Cultivations, etc.: PK applied to all plots, 'Nitro-Chalk' applied to ND plots: 17 Mar, 1971. Cut once: 21 May. Variety: S24 Ryegrass.

NOTES: (1) The 'Nitro-Chalk' to ND plots was the third dressing, which should have been applied in 1970, but was delayed because of drought.
(2) Grass samples were taken to determine dry matter and percentage N.

Standard error per plot. Dry matter, tonnes/hectare:
1st and only cut: 0.375 or 15.5% (30 d.f.)

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71/W/CS/60

SUMMARY OF RESULTS

DRY MATTER: TONNES/HECTARE

1ST AND ONLY CUT

N: KG/HA

	0	112	224	336	Mean
		(±0.217)			(±0.215)
GP		1.44	2.90	4.44	2.92
GG		1.55	3.25	5.06	3.29
NS		0.84	0.89	1.63	1.12
ND		2.48	5.02	6.34	4.61
Mean (±0.108)	0.75	1.58	3.01	4.37	2.43*

* General mean

Mean D.M. %: 20.9

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71/R/CS/61

FUNGICIDES

Object: To study the effects of three fungicides on yield and pathogens of old grass - Road Piece.

The first year, old grass.

Design: 3 randomised blocks of 4 plots, split into 2.

Whole plot dimensions: 5.49 x 7.32. Sub plot area harvested: 0.00074.

Treatments: All combinations of:-
Whole plots: 1. Fungicides: None (0), benomyl at 1.12 kg (B), carboxin at 1.12 kg (C), mancozeb at 1.12 kg (M).
Sub plots: 2. Nitrogen: 125 kg N in spring plus 75 kg N after each cut except the last (N2), 188 kg N in spring plus 113 kg N after each cut except the last (N3).
All N was applied as NK compound (25:0:16).
The funcigides were each applied in 281 l on 4 occasions (26 Nov, 1970, 12 Mar, 1971, 28 May, 16 Aug).

Basal applications: 500 kg (0:14:28) in winter.

Cultivations, etc.: PK applied: 19 Oct, 1970. NK applied: 26 Mar, 1971. Cut 3 times: 20 May, 8 July, 13 Sept. NK applied after each cut including* the last.

* It was intended to take a fourth cut, but growth was insufficient.

Standard errors per plot. Dry matter, tonnes/hectare:

1st cut:	Whole plot:	0.260 or 5.1%	(6 d.f.)
	Sub plot:	0.314 or 6.1%	(8 d.f.)
2nd cut:	Whole plot:	0.262 or 7.8%	(6 d.f.)
	Sub plot:	0.205 or 6.2%	(8 d.f.)
3rd cut:	Whole plot:	0.077 or 5.5%	(6 d.f.)
	Sub plot:	0.167 or 12.0%	(8 d.f.)
Total of 3 cuts:	Whole plot:	0.279 or 2.8%	(6 d.f.)
	Sub plot:	0.316 or 3.2%	(8 d.f.)

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71/R/CS/61

SUMMARY OF RESULTS

DRY MATTER: TONNES/HECTARE

	N2	N3	Mean
	1ST CUT		
	(1) and (2)		(±0.150)
O	5.34	5.00	5.17
B	5.09	5.27	5.18
C	5.19	5.02	5.11
M	5.08	4.93	5.00
Mean (±0.091)	5.18	5.05	5.11

	2ND CUT		
	(3) and (4)		(±0.151)
O	3.40	3.29	3.35
B	3.28	3.37	3.33
C	3.17	3.04	3.10
M	3.30	3.48	3.39
Mean (±0.059)	3.28	3.30	3.29

(1) (±0.198) (3) (±0.173) For use in vertical and diagonal comparisons only

(2) (±0.181) (4) (±0.118) For use in horizontal and interaction comparisons only

Mean D.M. %: 1st cut: 20.6
2nd cut: 19.9

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71/R/CS/61

DRY MATTER: TONNES/HECTARE

	N2	N3	Mean
	3RD CUT		
	(5) and (6)		(±0.044)
O	1.53	1.12	1.33
B	1.36	1.13	1.25
C	1.75	1.21	1.48
M	1.79	1.22	1.51
Mean (±0.048)	1.61	1.17	1.39

TOTAL OF 3 CUTS

	(7) and (8)		(±0.161)
O	10.27	9.41	9.84
B	9.73	9.78	9.75
C	10.11	9.27	9.69
M	10.17	9.63	9.90
Mean (±0.091)	10.07	9.52	9.80

(5) (±0.081) (7) (±0.206) For use in vertical and diagonal comparisons only

(6) (±0.096) (8) (±0.182) For use in horizontal and interaction comparisons only

Mean D.M. %: 3rd cut: 23.7
Total of 3 cuts: 21.4

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71/W/CS/63

NEMATODES AND VERTICILLIUM

Object: To study the residual effects of methyl bromide, aldicarb and benomyl (applied to potatoes in 1970) on Heterodera rostochiensis and Verticillium on a second potato crop in 1971 - Woburn Broadmead I.

The second year, potatoes.

For previous year see 70/W/P/2(t).

Design: 4 blocks of 4 plots.

Whole plot dimensions: 2.84 x 13.4. Area harvested: 0.00147.

Treatments:
Fresh treatments were not applied in 1971.

Basal applications: 1530 kg (13:13:20). 897 kg Epsom salts. Weedkillers: Linuron at 1.12 kg in 281 l. Paraquat was applied at a concentration of 0.03 kg ion in 4.55 l to the inter-row area - rate per hectare not recorded. Fungicide with insecticide: Mancozeb at 1.34 kg with demeton-s-methyl at 246 ml in 416 l.

Cultivations, etc.: Deep-tine cultivated 1st stroke: 27 Oct, 1970, 2nd stroke: 30 Oct, 3rd stroke: 18 Dec. NPK and Mg applied, rotary cultivated, potatoes planted: 27 Apr, 1971. Linuron applied: 17 May. Paraquat applied to inter-row area: 7 - 8 June. Rotary ridged 1st stroke: 21 June, 2nd stroke: 25 June. Fungicide and insecticide applied: 29 June. Lifted: 13 Sept. Variety: Pentland Dell.

NOTE: Soil samples were taken before planting and after harvest for number of cysts, eggs and larvae of Heterodera rostochiensis and propagules of Verticillium.

Standard error per plot.
Total tubers, tonnes/hectare: 3.01 or 25.4% (9 d.f.)

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71/W/CS/63

SUMMARY OF RESULTS

O	B	M	T	Mean
TOTAL TUBERS: TONNES/HECTARE				
	(±1.51)			
3.5	18.4	15.2	10.3	11.9
% WARE: 4.44 CM (1.75 INCH) RIDDLE				
0.7	56.9	44.5	30.5	33.1

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71/W/CS/64

FUMIGANTS AND DITYLENCHUS

Object: To study the effects of a range of rates of aldicarb and dazomet on yield of onions and incidence of Ditylenchus dipsaci - Woburn Butt Close.

First year, onions.

Design: 3 blocks of 10 plots.

Whole plot dimensions: 1.52 x 6.10. Area harvested: 0.00056.

Treatments:
Fumigants: None (0) 2 plots per block, 2.25 (T1), 4.5 (T2), 6.75 (T3), 9.0 (T4) kg aldicarb, 225 (D1), 450 (D2), 675 (D3), 900 (D4) kg dazomet.

NOTE: Dazomet applied in autumn and rotary cultivated in, aldicarb applied in spring before sowing.

Basal applications: 1260 kg (13:13:20).
Irrigation (mm water):

29 Mar 2mm	16 Apr 3mm	3 June 3mm
1 Apr 3mm	30 Apr 3mm	7 June 3mm
5 Apr 2mm	4 May 3mm	5 July 12mm
8 Apr 3mm	13 May 3mm	15 July 24mm
13 Apr 2mm	21 May 3mm	21 July 24mm Total 93 mm

Inoculum: Field bean stems infected with Ditylenchus dipsaci. Weed-killers: Propachlor at 4.7 kg in 24.7 l. Pyrazon at 1.12 kg with chlorbufam at 0.91 kg in 24.7 l.

Cultivations, etc.: Ploughed: 3 Sept, 1970. Deep-tine cultivated, field bean stems applied, rotary cultivated: 24 Oct. Dazomet applied, all plots rotary cultivated: 15 Dec. NPK applied: 9 Mar, 1971. Aldicarb applied, all plots rotary cultivated, seed drilled at 6.7 kg: 10 Mar. Propachlor applied: 25 Mar. Hand weeded: 18 May. Pyrazon with chlorbufam applied: 1 June. Hand lifted: 25 Aug. Variety: Robusta. Previous crops: Barley 1969, spring beans 1970.

NOTE: Soil samples were taken in December and August for counts of Ditylenchus dipsaci.

Standard error per plot.
Total weight, tonnes/hectare: 4.64 or 14.7% (18 d.f.)

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71/W/CS/64

SUMMARY OF RESULTS

C*	T1	T2	T3	T4	D1	D2	D3	D4	Mean
				TOTAL WEIGHT: TONNES/HECTARE					
(±1.89)				(±2.68)					
14.2	25.6	22.0	23.5	30.6	36.7	45.7	49.1	53.0	31.5
				WEIGHT OVER 3.81 CM (1.5 INCH): TONNES/HECTARE					
9.2	20.8	16.1	17.3	23.8	31.6	42.3	47.5	51.1	26.9
				TOTAL NUMBER: THOUSANDS/HECTARE					
373	506	529	472	636	684	553	485	535	514

* Duplicated level

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71/W/CS/66

DAZOMET AND NITROGEN

Object: To study the effects of dazomet and nitrogen on yield and pathogens of maize - Woburn Butt Furlong.

The first year, maize.

Design: 4 blocks of 2 plots split into 4.

Whole plot dimensions: 2.13 x 16.5. Sub-plot area harvested: 0.00039.

Treatments:
Whole plots: 1. Fumigant: None, 450 kg dazomet.
Sub-plots: 2. Nitrogen rates: 50, 100, 150 kg N at planting.
100 kg N at planting plus 50 kg N at tasselling.

Basal applications: 900 kg (0:14:28).

Cultivations, etc.: Sub-soiled, tines 142 cm apart, 61 cm deep: 8 Sept, 1970. Ploughed: 9 Sept. Dazomet applied, all plots rotary cultivated twice to 10 cm and 15 cm, rolled: 23 Sept. First N applied: 5 Apr, 1971. PK applied: 14 Apr. Power harrowed, seed drilled at 31 kg: 29 Apr. First two blocks redrilled at 31 kg because of bird damage: 9 June. Second N applied to second two blocks only: 28 July. Hand harvested, second two blocks only: 27 Oct. Variety: Pioneer 131. Previous crops: Barley 1969 and 1970.

NOTES: (1) Soil samples were taken in autumn, before dazomet applied and in spring before sowing for counts of ectoparasitic nematodes.
(2) Plant samples were taken for observation of fungal pathogens.
(3) The second two blocks were also damaged by birds. Gaps were filled with transplants, from the same treatments on the first two blocks.

Standard error per sub plot.
Grain, tonnes/hectare: 1.101 or 20.2% (6 d.f.)

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71/W/CS/66

SUMMARY OF RESULTS

GRAIN: TONNES/HECTARE

	N: KG/HA				
Dazomet: KG/HA	50	100	150	100+50	Mean
		(±0.778)*			
0	4.47	4.99	4.84	4.17	4.62
450	5.98	7.06	5.95	6.21	6.30
Mean (±0.550)	5.22	6.03	5.40	5.19	5.46

Mean D.M. %: 64.5

* For use in horizontal and interaction comparisons only

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71/W/CS/67

MUCH FERTILISER AND FYM

Object: To study the residual effects of large dressings of FYM and NPK fertiliser applied to potatoes 1970, on the yields of a following winter wheat - Woburn Stackyard C.

The second year, winter wheat.

For previous year see 70/W/P/3(t).

Design: 3 blocks of 10 plots, split into 2.

Whole plot dimensions: 3.05 x 2.74. Area harvested: 0.00033.

NOTE: In 1971 plots were split for fresh treatment 63 v. 126 kg N as 'Nitro-Chalk' 21.

Basal applications: Weedkiller: 2,4-D at 0.84 kg plus dichlorprop at 3.4 kg in 449 l.

Cultivations, etc.: Spring-tine cultivated: 7 Oct, 1970. Seed drilled at 212 kg: 8 Oct. N applied: 15 Apr, 1971. Weedkiller applied: 20 Apr. Harvested by hand: 19 Aug. Variety: Cappelle.

Standard errors per plot.

Grain, tonnes/hectare:	Whole plot:	0.290 or 6.0% (18 d.f.)
	Sub plot:	0.299 or 6.2% (20 d.f.)

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SUMMARY OF RESULTS

	F2DE	F4DE	F2DES	F4DES	F2S	F4S	D2	D4	D2F2DE	D4F2DE	Mean
N:KG/HA 1971	GRAIN: TONNES/HECTARE										
					(1) and (2)						(±0.055)
63	4.15	4.46	4.04	4.47	4.15	4.17	4.06	4.31	4.32	4.64	4.28
126	5.62	5.54	5.85	5.56	5.11	4.22	5.80	5.49	5.66	5.59	5.44
Mean (±0.167)	4.89	5.00	4.95	5.02	4.63	4.20	4.93	4.90	4.99	5.12	4.86
N:KG/HA 1971	STRAW: (FRESH) TONNES/HECTARE										
63	7.36	8.73	7.56	9.10	7.27	9.20	7.48	8.41	8.02	8.70	8.18
126	9.49	9.68	9.09	10.16	8.41	10.80	9.09	9.22	9.56	10.66	9.62
Mean	8.42	9.20	8.32	9.63	7.84	10.00	8.29	8.82	8.79	9.68	8.90

(1) (±0.207) For use in horizontal and diagonal comparisons only
(2) (±0.173) For use in vertical and interaction comparisons only

Mean D.M. %: Grain: 79.8

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71/R/CS/68

AMMONIUM PHOSPHATES

Object: To study the residual P effects of different forms of NP fertilisers, applied in 1970 to grass - West Barnfield II.

The second year, ryegrass.

For previous year see 70/R/M/4(t).

Whole plot dimensions: 1.5 x 2.7. Area harvested: 0.00022.

The area in barley 1970 was abandoned. The area in ryegrass was continued

Treatments:

To the four plots per block which did not receive N or P in 1970, all combinations of:-

1. 'Nitro-Chalk': None (0), 112 kg N (N) for each cut.
2. Superphosphate: None (0), 11.2 kg P (P) in spring.

Remaining plots received 'Nitro-Chalk' only at 112 kg N for each cut.

Basal applications: 112 kg K as potassium chloride.

Cultivations, etc.: Basal K and first N applied: 8 Mar, 1971. Cut 3 times: 12 May, 28 June, 7 Sept. N applied after first 2 cuts. Variety: S22 Italian Ryegrass.

NOTE: Crop samples were taken for determination of nitrogen percentage.

Standard errors per plot. Dry matter: tonnes/hectare.

1st cut:	0.276	or 5.8% (22 d.f.)
2nd cut:	0.205	or 6.5% (22 d.f.)
3rd cut:	0.168	or 9.2% (22 d.f.)
Total of 3 cuts:	0.527	or 5.4% (22 d.f.)

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71/R/CS/68

SUMMARY OF RESULTS

DRY MATTER: TONNES/HECTARE

	A	M	D	T	Mean
	1ST CUT				
		(±0.159)			(±0.080)
1+N	4.98	4.93	4.72	4.73	4.84
2+N	4.88	4.88	5.16	5.25	5.04
2	4.55	4.49	4.67	4.40	4.53
Mean (±0.092)	4.81	4.77	4.85	4.79	4.80

0 0.89
N 4.07 (±0.159)
P 1.02
NP 4.53

General mean: 4.26
Mean D.M. %: 19.6

2ND CUT

		(±0.118)			(±0.059)
1+N	2.94	3.03	3.06	2.90	2.98
2+N	3.00	2.90	3.36	2.93	3.05
2	3.59	3.22	3.47	3.26	3.39
Mean (±0.068)	3.18	3.05	3.30	3.03	3.14

0 0.97
N 3.11 (±0.118)
P 1.08
NP 3.50

General mean: 2.90
Mean D.M. %: 19.7

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71/R/CS/68

DRY MATTER: TONNES/HECTARE

	A	M	D	T	Mean
	3RD CUT				
		(±0.097)			(±0.048)
1+N	2.03	1.78	1.67	1.89	1.84
2+N	1.67	1.88	1.99	1.81	1.84
2	1.75	1.90	1.85	1.73	1.81
Mean (±0.056)	1.82	1.85	1.84	1.81	1.83

0	0.67
N	1.63 (±0.097)
P	0.73
NP	1.78

General mean: 1.67
Mean D.M. %: 39.2

TOTAL OF 3 CUTS

		(±0.304)			(±0.152)
1+N	9.95	9.74	9.45	9.52	9.66
2+N	9.55	9.66	10.51	9.99	9.93
2	9.89	9.61	10.00	9.38	9.72
Mean (±0.176)	9.80	9.67	9.98	9.63	9.77

0	2.53
N	8.81 (±0.304)
P	2.83
NP	9.81

General mean: 8.83
Mean D.M. %: 26.2

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71/R/CS/69

EARLY AND LATE MILDEW

Object: To study the residual effects of ethirimol applied to barley in 1970 - Long Hoos V.

The second year, barley.

For previous year see 70/R/B/4(t).

Design: 4 randomised blocks of 4 plots.

Dimensions of whole plot: 4.27 x 24.4 Area harvested: 0.00694.

Treatments: Residues of fungicide (ethirimol) applied in 1970.

None	(0)
224 g as seed dressing	(1D)
1.80 kg as seed dressing plus 0.90 kg in 393 l as a foliar spray on two occasions	(8D8S)
0.90 kg in 393 l as a foliar spray on two occasions.	(8S)

Basal applications: 1255 kg (0:14:28) broadcast by drill, 405 kg (20:10:10) combine drilled. Weedkillers: Paraquat at 0.28 kg ion in 225 l. Ioxynil at 0.536 kg and mecoprop at 1.58 kg in 225 l.

Cultivations, etc.: Paraquat applied: 23 Sept, 1970. Basal PK applied: 27 Oct. Deep-tine cultivated twice (depth 15 cm): 28 Oct. Seed combine drilled at 157 kg: 5 Mar, 1971. Ioxynil/mecoprop applied: 3 May. Combine harvested: 18 Aug. Variety: Zephyr.

NOTES: (1) Samples were taken for assessment of mildew (Erysiphe graminis) and other foliar diseases.
(2) The rates of ethirimol shown above are the correct ones. Those shown in 70/R/B/4 as ethirimol were amounts of 'Milstem' (80% ethirimol).

Standard error per plot.
Grain, tonnes/hectare: 0.110 or 2.2% (9 d.f.)

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71/R/CS/69

SUMMARY OF RESULTS

GRAIN: TONNES/HECTARE

Applied 1970

0	1D	8D8S	8S	Mean
		(±0.055)		
5.00	5.08	5.19	5.10	5.09

Mean D.M. %: 84.6

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71/R/CS/71

WEEDKILLER AND AQUEOUS N

Object: To study the effects of a combined spray of liquid nitrogen fertiliser and a hormone weedkiller as a top dressing on old grass - Road Piece.

The second year, old grass.

For previous year see 70/R/G/3(t).

Whole plot dimensions: 1.37 x 2.13. Area harvested: 0.00017.

All treatments were repeated cumulatively on the same plots except the four 1970 additional treatments which were altered to:-

DN2 HR, DN2 H1, DN2 H2, DN2 H3 **respectively**

where D indicates liquid N fertiliser applied separately before the weedkiller which was applied on the same day, after the foliage had dried. HR indicates dalapon applied 1970 only.

All treatments were applied on 3 occasions in 1971.

Basal applications: 565 kg (0:14:28).

Cultivations, etc.: Basal PK applied: 21 Dec, 1970. Grass lightly topped: 26 Mar, 1971. All treatments applied: 27 Apr. Cut: 26 May. All treatments re-applied: 16 June. Cut: 22 July. All treatments re-applied: 5 Aug. Cut: 14 Oct.

NOTES: (1) Observations were made of weedkiller scorch and weed control.
(2) The yield of weeds from two blocks was measured at the third cut.
(3) The percentage N in the dry grass was measured.

Standard errors per plot. Dry matter: tonnes/hectare.

1st cut:	0.406	or 11.3% (69 d.f.)
2nd cut:	0.336	or 11.1% (69 d.f.)
3rd cut:	0.310	or 15.1% (69 d.f.)
Total of 3 cuts:	0.661	or 7.6% (69 d.f.)

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71/R/CS/71

SUMMARY OF RESULTS

DRY MATTER: TONNES/HECTARE

1ST CUT

	N1	N2	N3	H0	H1	H2	H3	Mean
	(±0.101)			(±0.117)				(±0.059)
S	3.22	4.13	4.65	4.01	4.11	4.08	3.80	4.00
L	2.50	3.25	3.82	3.18	3.50	3.12	2.97	3.19
				(±0.143)				(±0.072)
			N1	2.95	3.00	2.78	2.73	2.86
			N2	3.71	3.88	3.72	3.44	3.69
			N3	4.12	4.53	4.31	3.99	4.24
Mean (±0.083)				3.59	3.80	3.60	3.39	3.60

DN2 HR	3.92	
DN2 H1	3.98	(±0.203)
DN2 H2	3.42	
DN2 H3	3.22	

General mean: 3.60
Mean D.M. %: 18.1

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71/R/CS/71

DRY MATTER: TONNES/HECTARE

2ND CUT

	N1	N2	N3	H0	H1	H2	H3	Mean
	(±0.084)				(±0.097)			(±0.048)
S	2.49	3.43	3.88	3.40	3.25	3.17	3.24	3.26
L	2.05	2.79	3.55	3.08	2.78	2.68	2.65	2.80
					(±0.119)			(±0.059)
			N1	2.41	2.25	2.21	2.22	2.27
			N2	3.25	3.24	2.91	3.03	3.11
			N3	4.06	3.56	3.65	3.58	3.71
Mean (±0.068)				3.24	3.02	2.92	2.94	3.03

DN2 HR	3.62	
DN2 H1	3.33	(±0.168)
DN2 H2	3.17	
DN2 H3	2.90	

General mean: 3.06
Mean D.M. %: 29.3

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71/R/CS/71

DRY MATTER: TONNES/HECTARE

3RD CUT

	N1	N2	N3	H0	H1	H2	H3	Mean
	(±0.078)			(±0.090)				(±0.045)
S	1.71	2.37	2.52	2.19	2.19	2.18	2.23	2.20
L	1.25	1.98	2.50	2.05	1.80	1.88	1.91	1.91
				(±0.110)				(±0.055)
			N1	1.53	1.53	1.40	1.46	1.48
			N2	2.30	1.98	2.11	2.32	2.18
			N3	2.53	2.49	2.59	2.43	2.51
Mean (±0.063)				2.12	2.00	2.03	2.07	2.06

DN2 HR	2.18	
DN2 H1	2.28	(±0.155)
DN2 H2	2.42	
DN2 H3	2.29	

General mean: 2.09
Mean D.M. %: 23.2

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71/R/CS/71

DRY MATTER: TONNES/HECTARE

TOTAL OF 3 CUTS

	N1	N2	N3	H0	H1.	H2	H3	Mean
	(±0.165)			(±0.191)				(±0.095)
S	7.42	9.92	11.05	9.60	9.56	9.43	9.27	9.46
L	5.81	8.02	9.87	8.31	8.08	7.68	7.53	7.90
				(±0.234)				(±0.117)
			N1	6.89	6.78	6.38	6.41	6.62
			N2	9.26	9.10	8.73	8.79	8.97
			N3	10.71	10.57	10.55	10.00	10.46
Mean (±0.135)				8.95	8.82	8.56	8.40	8.68

DN2	HR	9.72
DN2	H1	9.59 (±0.330)
DN2	H2	9.01
DN2	H3	8.41

General mean: 8.75
Mean D.M. %: 23.5

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71/R/CS/74

BREAK CROPS AND WHEAT

Object: To study the effects of different break crops on yields and soil-borne pathogens of a following sequence of cereals - Fosters West Side.

The first year, barley, oats, beans, maize, clover, undersown trefoil.

Design: 3 randomised blocks of 10 plots.

Whole plot dimensions: 4.27 x 39.3. Area harvested: Barley: 0.01112, Oats: 0.00839, Beans: 0.01258, Clover: 0.00399.

Treatments: Crops:- Maize receiving N at 100 kg, 200 kg as 'Nitro-Chalk' in the seedbed, spring beans (2 plots per block), clover (2 plots per block) and all combinations of:-
1. Crops: Barley, oats, each receiving N at 50 kg as 'Nitro-Chalk' in the seedbed.
2. Undersowing: None (O), trefoil (T).

Basal and standard applications:- 505 kg (0:20:20) across the plough furrow. Weedkillers: Paraquat at 0.56 kg ion in 225 l. Ioxynil octanoate, bromoxynil octanoate and the iso-octyl ester of dichlorprop ('Oxytril P' at 1.4 l in 225 l) to barley and oats (not undersown). MCPB at 2.8 kg in 225 l to undersown barley and oats. Insecticide: Demeton-s-methyl at 245 g in 438 l to beans.

Cultivations, etc.: Paraquat applied: 14 Oct, 1970. Ploughed: 13 Oct. PK applied: 24 Feb, 1971.
Barley: Seed drilled at 157 kg: 25 Feb, 1971. N applied: 24 Mar. Trefoil (variety English) undersown at 27 kg: 13 Apr. 'Oxytril P' applied: 18 May. Combine harvested: 11 Aug. Variety: Julia.
Oats: Seed drilled at 191 kg: 4 Mar, 1971. N applied: 24 Mar. Trefoil (variety English) undersown at 27 kg: 13 Apr. 'Oxytril P' applied: 18 May. Combine harvested: 16 Aug. Variety: Manod.
Spring beans: Seed drilled at 224 kg: 25 Feb, 1971. Insecticide applied: 1 July. Combine harvested: 2 Sept. Variety: Maris Bead.
Maize: N applied, seed drilled at 7.8 kg: 6 May, 1971. Seed resown at 58 kg: 10 May. Cut twice: 30 Oct, 1 Nov. Variety: First sowing - Kelvedon 59A, second - Pioneer 131,
Clover: Seed sown at 34 kg: 28 Apr, 1971. Topped and weeds carted of: 22 June. Topped second time: 19 July. Cut twice: 18 Aug, 29 Oct. Variety: Essex Broadleaf Red.

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71/R/CS/74

Previous crops: Spring oilseed rape 1969, winter wheat 1970.

NOTE: Barley plots were sampled in summer for eyespot (Cercosporella herpotrichoides) and take-all (Ophiobolus graminis). Trefoil and clover were sampled before ploughing in and estimates made of the dry matter and N per acre.

SUMMARY OF RESULTS

GRAIN: TONNES/HECTARE

O	T	Mean
BARLEY		
	(±0.078)	
5.04	4.88	4.96

Mean D.M. %: 79.9

OATS		
	(±0.012)	
3.95	4.07	4.01

Mean D.M. %: 77.6

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71/R/CS/74

BEANS

GRAIN: TONNES/HECTARE

	Mean
	2.50

CLOVER

DRY MATTER: TONNES/HECTARE

	Mean
1st cut:	3.37
2nd cut:	1.72
Total of 2 cuts:	5.09

Mean D.M. %

Beans	79.5
Clover, 1st cut:	12.6
2nd cut:	18.8
Total of 2 cuts:	15.7

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71/R/CS/76 and 71/W/CS/76

RATES OF NPK FERTILISER

Object: To study the effects of a range of rates of compound NPK fertiliser on the yields of potatoes - Rothamsted (R) Long Hoos III and Woburn (W) Lansome II.

The first year, potatoes.

Design:
Long Hoos III (R): 3 randomised blocks of 8 plots split into 2.
Lansome II (W): 2 randomised blocks of 8 plots split into 2.

Whole plot dimensions:-
Long Hoos III (R): 4.27 x 21.0. Sub plot area harvested: 0.00143.
Lansome II (W): 4.27 x 21.0. Sub plot area harvested: 0.00143.

Treatments:-
Whole plots: All combinations of:-
1. Rates of compound fertiliser (13:13:20): 1255, 1882, 2510, 3137 kg.
2. Spacing: Seed potatoes 30.5 cm (12 inches) (S1), 45.7 cm (18 inches) (S2) apart within the row.

Sub plots: 3. Varieties:-
Long Hoos III (R): King Edward (KE), Pentland Crown (PC).
Lansome II (W): Pentland Crown (PC), Record (R).

All rows were planted 71.1 cm (27 inches) apart. Seed of King Edward and Pentland Crown was chitted but Record was not.

Basal applications:-
Long Hoos III (R): Manures: None: Weedkiller: Linuron at 0.84 kg in 427 l. Fungicide: Mancozeb at 1.34 kg in 438 l on 2 occasions. Insecticide: Demeton-s-methyl at 245 g applied with the fungicide on the first occasion.
Lansome II (W): Manures: None. Weedkiller: Linuron at 1.12 kg in 371 l. Fungicide with insecticide: Mancozeb at 1.34 kg with demeton-s-methyl at 245 g in 416 l. Fungicide: Mancozeb at 1.34 kg in 371 l.

Cultivations, etc.:-
Long Hoos III (R): Ploughed: 30 Sept, 1970. NPK applied and rotary cultivated in, potatoes machine planted: 6 Apr, 1971. Weedkiller applied: 10 May. Grubbed: 3 June. Earthed up: 4 June. Fungicide and insecticide applied: 24 June. Fungicide applied: 13 Aug. Sprayed with undiluted BOV at 168 l: 16 Sept. Previous crops: Barley 1969, fallow 1970.

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71/R/CS/76 and 71/W/CS/76

Lansome II (W): Ploughed: 4 Sept, 1970. Deep-tine cultivated: 21 Oct. NPK applied: 29 Mar, 1971. Rotary cultivated 1st stroke: 30 Mar, 2nd stroke: 31 Mar. Potatoes planted: 2 Apr. Weed-killer applied: 5 May. Rotary ridged: 2 June. Fungicide with insecticide applied: 29 June. Fungicide applied: 13 Aug. Haulm destroyed mechanically: 17 Sept.. Sprayed with undiluted BOV at 225 l: 20 Sept. Lifted: 24 Sept. Previous crops: Barley 1969, beans 1970.

NOTE: The percentages of N, P and K in the tubers and of K and Mg in the leaves, were determined.

Standard errors per plot. Total tubers: tonnes/hectare:

Long Hoos III (R):	Whole plot:	2.59 or 5.2% (14 d.f.)
	Sub plot:	2.89 or 5.8% (16 d.f.)
Lansome II (W):	Whole plot:	3.00 or 10.9% (7 d.f.)
	Sub plot:	4.67 or 16.9% (8 d.f.)

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71/R/CS/76 and 71/W/CS/76

SUMMARY OF RESULTS

LONG HDOS III (R)

COMPOUND FERTILISER (13:13:20) KG/HA

	1255	1882	2510	3137	Mean
	TOTAL TUBERS: TONNES/HECTARE				
		(±1.49)			(±0.75)
S1	42.5	48.3	54.3	60.2	51.3
S2	40.9	43.9	53.0	52.0	47.5
		(1) and (2)			(±0.59)
KE	38.2	41.8	51.6	54.0	46.4
PC	45.1	50.4	55.8	58.1	52.4
Mean (±1.06)	41.7	46.1	53.7	56.1	49.4

(1) (±1.18) For use in horizontal and diagonal comparisons only
(2) (±1.35) For use in vertical and interaction comparisons only

% WARE: 4.44 CM (1.75 INCH) RIDDLE

S1	69.5	73.3	78.3	81.7	75.7
S2	76.8	77.9	81.7	81.1	79.4
KE	65.3	69.1	73.2	76.7	71.1
PC	81.0	82.1	86.8	86.2	84.0
Mean	73.1	75.6	80.0	81.4	77.5

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71/R/CS/76 and 71/W/CS/76

LANSOME II (W)

COMPOUND FERTILISER (13:13:20) KG/HA

	1255	1882	2510	3137	Mean
	TOTAL TUBERS: TONNES/HECTARE				
			(±2.12)		(±1.06)
S1	20.4	25.7	33.6	32.8	28.1
S2	18.9	23.8	27.9	37.5	27.0
			(1) and (2)		(±1.17)
PC	27.2	31.2	38.4	45.4	35.5
R	12.0	18.4	23.2	24.9	19.6
Mean (±1.50)	19.6	24.8	30.8	35.1	27.6

(1) (±2.34) For use in horizontal and diagonal comparisons only
(2) (±2.23) For use in vertical and interaction comparisons only

% WARE: 4.44 CM (1.75 INCH) RIDDLE

S1	48.1	57.0	68.4	72.7	61.6
S2	51.5	63.6	68.3	79.6	65.7
PC	71.0	70.1	77.3	86.7	76.3
R	28.6	50.4	59.5	65.6	51.0
Mean	49.8	60.3	68.4	76.2	63.7

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71/W/CS/77

MUCH FERTILISER AND FYM

Object: To study the effects of large dressings of FYM and NPK fertiliser on the yield of potatoes - Woburn Stackyard C.

The first year, potatoes.

Design: 3 blocks of 12 plots.

Whole plot dimensions: 2.74 x 3.05. Area harvested: 0.00073.

Treatments: FYM, fertiliser and methods of application:
F1D, F2D, F4D, F6D, F2S, F4S, D2, D4, D2F2D, D2F4D, D4F2D, D4F4D.
D2,D4 = 40, 80 tonnes FYM dug in.
F1 = 126 kg N, 188 kg P_2O_5, 188 kg K_2O.
F2 = 252 kg N, 376 kg P_2O_5, 376 kg K_2O.
F4 = 504 kg N, 752 kg P_2O_5, 752 kg K_2O.
F6 = 756 kg N, 1128 kg P_2O_5, 1128 kg K_2O.
D,S = 'Nitro-Chalk' rotary cultivated in, (0:20:20) dug in: 'Nitro-Chalk' and (0:20:20) raked in shallowly after rotary cultivation.

Basal applications: 627 kg kieserite. Fungicide with insecticide: Mancozeb at 1.34 kg plus menazon at 0.28 kg in 450 l on two occasions, captafol at 1.68 kg plus menazon at 0.27 kg in 450 l on two occasions.

Cultivations, etc.: FYM and fertilisers applied to D plots, all plots dug by hand: 16 Mar, 1971. Mg applied, all plots rotary cultivated twice in opposite directions along the plots, fertilisers applied to S plots and raked in, potatoes planted: 15 Apr. Rotary cultivated between rows: 4 May. Mancozeb and menazon applied: 18 June, 7 July. Captafol and menazon applied: 29 July, 17 Aug. Lifted: 23 - 24 Sept. Variety: Desiree. Previous crops: Fallow 1969 and 1970.

NOTES: (1) Leaf samples were taken on 7 July for percentage of Mg and K.
(2) Tuber samples were taken at grading for percentage of N, P and K.

Standard error per plot.
Total tubers, tonnes/hectare: 2.97 or 7.3% (22 d.f.)

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71/W/CS/77

SUMMARY OF RESULTS

F1D	F2D	F4D	F6D	F2S	F4S	D2	D4	D2F2D	D2F4D	D4F2D	D4F4D	Mean
TOTAL TUBERS: TONNES/HECTARE (±1.71)												
23.2	36.4	51.8	51.8	40.9	42.7	17.0	28.1	45.6	53.6	44.7	51.8	40.6
% WARE: 4.44 CM (1.75 INCH) RIDDLE												
49.5	63.1	80.4	77.9	72.4	71.5	28.6	52.5	76.1	82.3	73.5	80.4	67.3

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71/W/CS/78

NEMATODES AND VERTICILLIUM

Object: To study the effects of methyl bromide, aldicarb, benomyl and dazomet on Heterodera rostochiensis and Verticillium on potatoes - Woburn Broadmead I.

The first year, potatoes.

Design: 4 blocks of 6 plots.

Whole plot dimensions: 2.84 x 12.8. Area harvested: 0.00147.

Treatments:
Chemicals: None (O), aldicarb at 6.7 kg (A), benomyl at 22.4 kg (B), aldicarb at 6.7 kg plus benomyl at 22.4 kg (A+B), dazomet at 336 kg (D), methyl bromide at 975 kg (M).

Basal applications: 1534 kg (13:13:20), 605 kg Epsom salts. Weedkiller: Linuron at 1.12 kg in 281 l. Fungicide with insecticide: Mancozeb at 1.34 kg with demeton-s-methyl at 246 ml in 416 l. Fungicide: Mancozeb at 1.34 kg in 371 l.

Cultivations, etc.: Deep-tine cultivated 1st stroke: 27 Oct, 1970, 2nd stroke: 30 Oct, 3rd stroke: 18 Dec. Dazomet applied, all plots rotary cultivated: 23 Mar, 1971. Methyl bromide applied under gas tight sheets: 22 Apr. Gas tight sheets removed: 26 Apr. Aldicarb and benomyl applied, NPK and Mg applied, rotary cultivated, potatoes planted: 27 Apr. Weedkiller applied: 17 May. Rotary ridged: 21 June. Fungicide with insecticide applied: 29 June. Fungicide applied: 13 Aug. Lifted: 13 Sept. Variety: Pentland Dell. Previous crops: Barley 1969 and potatoes 1970.

NOTE: Soil samples were taken after treatments were applied and after harvest for numbers of cysts eggs and larvae of Heterodera rostochiensis and propagules of Verticillium.

Standard error per plot.
Total tubers, tonnes/hectare: 3.09 or 9.0% (15 d.f.)

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71/W/CS/78

SUMMARY OF RESULTS

O	A	B	A+B	D	M	Mean
TOTAL TUBERS: TONNES/HECTARE						
		(±1.55)				
21.5	33.8	35.1	36.0	36.3	43.9	34.4
% WARE: 4.44 CM (1.75 INCH) RIDDLE						
65.8	78.8	82.5	81.1	77.6	82.4	78.0

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71/W/CS/79

CHEMICALS AND SCAB

Object: To study the effects of a range of fungicides on yield and common scab of potatoes - Woburn School Field.

The first year, potatoes.

Design: 5 blocks of 6 plots.

Whole plot dimensions: 2.84 x 6.10. Area harvested: 0.00214.

Treatments: Chemicals: None (0), captafol 39 kg (C1), captafol 78 kg (C2), 'MC 2810' 78 kg a.i. (MC), pentachloropyridine 78 kg (P), quintozene 78 kg (Q).
All treatments were applied to the soil and rotary cultivated in just before planting.

Basal applications: 377 kg(20:10:10), 969 kg (0:14:28), 538 kg 'Nitro-Chalk' 21. Weedkiller: Linuron at 1.12 kg in 281 l. Fungicide with insecticide: Mancozeb at 1.34 kg with demeton-s-methyl at 246 ml in 416 l. Fungicide: Mancozeb at 1.34 kg in 371 l.

Cultivations, etc.: Sub-soiled, tines 142 cm apart 61 cm deep: 9 Sept, 1970. Rotary cultivated: 11 Sept. Deep-tine cultivated 1st stroke: 25-26 Sept, 2nd stroke: 1 Oct. NPK applied: 11 Mar, 1971. PK and N applied: 29 Mar. Treatments applied, rotary cultivated, potatoes planted: 21 Apr. Weedkiller applied: 11 May. Fungicide with insecticide applied: 30 June. Fungicide applied: 13 Aug. Haulm mechanically destroyed: 17 Sept. Sprayed with undiluted BCV at 225 l: 20 Sept. Lifted: 30 Sept. Variety: Maris Piper. Previous crops: Barley 1969 and 1970.

NOTE: Tuber samples were taken at harvest for scab assessments.

Standard error per plot.
Total tubers, tonnes/hectare: 6.52 or 15.8% (20 d.f.)

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71/W/CS/79

SUMMARY OF RESULTS

O	C1	C2	MC	P	Q	Mean
TOTAL TUBERS: TONNES/HECTARE						
		(±2.92)				
45.4	49.6	49.4	44.9	20.2	38.8	41.4
% WARE: 3.81 CM (1.5 INCH) RIDDLE						
95.9	97.1	97.2	98.2	79.7	96.1	94.0

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71/S/CS/1

ROW SPACING AND SEED RATES AFTER INTENSIVE WHEAT

Object: To study the effects of seed rate and row spacing on the yields of winter wheat. The effects of different periods of pre-cropping with winter wheat are also studied - Saxmundham, Oldershaw's and Garner's plots.

The sixth year on this site, first year of row spacing and seed rate treatments, winter wheat.

For previous years see 66/C/30(t), 67/C/23(t), 68/C/39 and 69-70/S/CS/1.

Design: A single replicate of 4 x 2 x 4 in 4 blocks of 4 plots each split lengthways into 2, plus one additional plot (not split into 2) per block. Additionally, all the plots are split breadthways into 3.

Whole plot dimensions: 5.49 x 40.2. Sub plot area harvested: 0.00273.

Treatments:-

Additional plots: One immediately previous continuous winter wheat crop (1), row spacing 18.9 cm (8.25 inches) and seed rate 212 kg (S), and N to sub plots as shown below,

and all combinations of:-

Whole plots:

1. Cropping history: 2, 3, 4 and 5 years of immediately previous continuous winter wheat crops 1966-1970 (2, 3, 4, 5).

Half plots:

2. Row spacing: 15.2 cm (6 inches) (C), 30.5 cm (12 inches) (W).
3. Seed rates: 70.6 (R1), 141 (R2), 212 (R3), 283 (R4) kg.

One third plots:

4. N rates: 50.2 (N1), 100.4 (N2), 150.6 (N3) kg N as 'Nitro-Chalk'.

Basal applications: 1255 kg (0:20:20) applied to stubble in autumn before ploughing. Weedkiller: Metoxuron ('Dosanex' at 5.6 kg in 449 l).

Cultivations, etc.: Basal PK applied and ploughed in: 14 Sept, 1970. Seed drilled and basal NPK applied: 5 Oct. Weedkiller applied: 15 Apr, 1971. Test N applied: 21 Apr. Combine harvested: 25 Aug. Variety: Cappelle.

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NOTE: Green crop samples for estimates of total weight, grain straw ratios and leaf areas were taken.

Standard errors per sub plot.
Grain, tonnes/hectare: 0.337 or 5.9% (6 d.f.)

SUMMARY OF RESULTS

GRAIN: TONNES/HECTARE

	R1	R2	R3	R4	N1	N2	N3	Mean
		(±0.106)				(±0.084)*		(±0.053)
C	4.67	6.11	6.20	5.87	5.09	5.99	6.06	5.71
W	5.75	5.79	5.71	5.35	4.96	5.93	6.05	5.65
						(±0.119)*		(±0.075)
				R1	4.68	5.47	5.48	5.21
				R2	5.25	6.19	6.41	5.95
				R3	5.18	6.29	6.40	5.96
				R4	4.99	5.90	5.94	5.61
Mean (±0.060)					5.02	5.96	6.06	5.68

S 5.92
General mean: 5.73

Mean D.M. %: 89.5

* For use in horizontal and interaction comparisons only

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71/R/WW/1 and 71/W/WW/1

WINTER WHEAT

VARIETIES AND N

Object: To study the yield of newer varieties of wheat grown at a range of nitrogen levels on land in rotation or after several cereals - Rothamsted (R) Summerdells I (pathogen free) and Claycroft (pathogen infected), and Woburn (W) White Horse Field (pathogen free).

Design: 3 randomised blocks of 8 plots, split into 4.

Whole plot dimensions:- Summerdells (R): 4.27 x 36.9. Claycroft (R) and White Horse Field (W): 4.27 x 39.3. Sub plot area harvested: Summerdells (R): 0.00243. Claycroft (R) and White Horse Field (W): 0.00260.

Treatments: All combinations of:-
Whole plots: 1. Varieties: Champlein (CH), Cama (CM), Cappelle (CP), Joss Cambier (JC), Maris Beacon (MB), Maris Nimrod (MN), Maris Widgeon (MW), Tommy (TO).
Sub plots: 2. Rates of nitrogen (in kg N): 63, 126, 189 in spring, and 126 in spring plus 63 at flowering. All N as 'Nitro-Chalk'.

Basal applications:-
All fields: 314 kg (8:20:16) combine drilled. Weedkiller: 2,4-D at 0.56 kg plus dichlorprop at 2.2 kg in 225 l (281 l on White Horse Field (W)).
Claycroft (R) only: Weedkiller: Paraquat at 0.28 kg ion in 225 l.

Cultivations, etc.:
Summerdells (R): Ploughed: 18 Sept, 1970. Seed combine drilled at 200 kg: 8 Oct. Weedkiller applied: 13 Apr, 1971. Spring N applied: 16 Apr. Late N applied: 3 June. Combine harvested: 26 Aug. Previous crops: Spring beans 1969 and 1970.
Claycroft (R): Paraquat applied: 17 Sept, 1970. Deep-tine cultivated: 23 Sept. Deep-tine cultivated 2nd time: 5 Oct. Seed combine drilled at 200 kg: 8 Oct. Weedkiller applied: 13 Apr, 1971. Spring N applied: 16 Apr. Late N applied: 3 June. Combine harvested: 26 Aug. Previous crops: Winter wheat 1969 and 1970.

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71/R/WW/1 and 71/W/WW/1

White Horse Field (W): Deep-tine cultivated: 12 Oct, 1970. Seed combine drilled at 191 kg: 13 Oct. Weedkiller applied: 31 Mar, 1971. Spring N applied: 15 Apr. Late N applied: 3 June. Combine harvested: 27 Aug. Previous crops: Fallow 1969, potatoes 1970.

Standard errors per plot. Grain, tonnes/hectare:		
Summerdells (R):	Whole plot:	0.433 or 6.3% (14 d.f.)
	Sub plot:	0.492 or 7.1% (48 d.f.)
Claycroft (R):	Whole plot:	0.300 or 4.5% (14 d.f.)
	Sub plot:	0.661 or 9.8% (48 d.f.)
White Horse Field (W):	Whole plot:	0.225 or 4.0% (14 d.f.)
	Sub plot:	0.349 or 6.2% (48 d.f.)

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71/R/WW/1 and 71/W/WW/1

SUMMARY OF RESULTS

GRAIN: TONNES/HECTARE

	CH	CM	CP	JC	MB	MN	MW	TO	Mean
	SUMMERDELLS (R) PATHOGEN FREE								
N: KG/HA	(1) and (2)								(±0.100)
63	7.73	7.35	6.57	7.28	7.11	8.60	6.13	6.71	7.18
126	8.12	6.87	7.04	7.09	6.24	7.71	5.84	7.24	7.02
189	7.77	6.73	6.43	6.37	5.36	6.06	5.76	6.90	6.42
126+63	7.93	7.03	7.04	7.09	6.01	7.34	6.28	7.36	7.01
Mean (±0.250)	7.89	6.99	6.77	6.96	6.18	7.43	6.00	7.05	6.91

(1) (±0.351) For use in horizontal and interaction comparisons only
(2) (±0.284) For use in vertical and diagonal comparisons only

Mean D.M. %: 81.5

CLAYCROFT (R) PATHOGEN INFECTED

N: KG/HA	(1) and (2)								(±0.135)
63	6.43	5.72	5.75	6.85	7.15	7.14	5.43	6.33	6.35
126	7.21	6.36	6.19	6.81	7.38	8.24	5.96	6.84	6.87
189	6.97	6.95	6.48	6.51	5.96	7.57	5.82	6.64	6.61
126+63	7.51	6.59	6.74	7.14	7.38	8.06	6.11	6.64	7.02
Mean (±0.173)	7.03	6.40	6.29	6.83	6.97	7.75	5.83	6.61	6.71

(1) (±0.373) For use in horizontal and interaction comparisons only
(2) (±0.381) For use in vertical and diagonal comparisons only

Mean D.M. %: 82.0

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71/R/WW/1 and 71/W/WW/1

GRAIN: TONNES/HECTARE

WHITE HORSE FIELD (W) PATHOGEN FREE

	CH	CM	CP	JC	MB	MN	MW	TO	Mean
N: KG/HA				(1) and (2)					(±0.071)
63	5.57	5.73	5.40	5.56	5.82	5.75	5.16	5.59	5.57
126	6.39	5.65	6.20	5.49	6.49	6.50	5.42	5.61	5.97
189	5.78	4.87	5.31	4.37	5.82	6.45	4.88	4.86	5.29
126+63	5.72	5.40	5.68	5.17	6.19	6.63	5.19	5.18	5.65
Mean (±0.130)	5.86	5.41	5.65	5.15	6.08	6.33	5.16	5.31	5.62

(1) (±0.218) For use in horizontal and interaction comparisons only
(2) (±0.202) For use in vertical and diagonal comparisons only

Mean D.M. %: 81.4

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71/R/WW/2

WINTER WHEAT

SEPTORIA

Object: To study the effects of different amounts of seed infection on yield and incidence of Septoria - Great Knott II.

Design: 4 x 4 Latin square. Each whole plot was split into 5, the middle sub plot being treated, and the flanking ones untreated and used to assess Septoria spread.

Whole plot dimensions: 13.3 x 9.14. Sub plot area harvested: 0.00013.

Treatments: Infection with Septoria:-

None	(0)
Low infection	(L)
Medium infection	(M)
High infection	(H)

The levels of infection were achieved by mixing different quantities of Septoria infected seed with seed which had been disinfected by soaking in thiram fungicide. Levels of infection were reinforced by spraying plants with spore suspensions.

Basal applications: 380 kg (8:20:16) combine drilled and 600 kg 'Nitro-Chalk' in spring. Weedkiller: 2,4-D at 0.56 kg and dichlorprop at 2.24 kg in 225 l.

Cultivations, etc.: Deep-tine cultivated on two occasions: 6 and 7 Oct, 1970. Seed combine drilled at 202 kg: 22 Oct. Weedkiller applied: 14 Apr, 1971. N applied: 16 Apr. Combine harvested: 28 Aug. Variety: Champlein. Previous crops: Fallow 1969, potatoes 1970.

NOTE: (1) Seedling infection with Septoria was assessed and estimates made of foliar diseases at intervals.
(2) The yields presented are from the treated sub plots only.

Standard error per sub plot.
Grain, tonnes/hectare: 0.228 or 2.8% (6 d.f.)

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71/R/WW/2

SUMMARY OF RESULTS

GRAIN: TONNES/HECTARE

O	L	M	H	Mean
	(±0.114)			
8.32	8.11	8.30	7.89	8.16

Mean D.M. %: 82.6

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71/R/WW/3

WINTER WHEAT

GAINES, SEED RATES, N AND CCC

Object: To study the effects of CCC (chlormequat) and a range of nitrogen levels on the semi-dwarf variety Gaines grown at two seed rates - Great Knott II.

Design: 2 randomised blocks of 9 plots split into 3.

Whole plot dimensions: 2.16 x 21.9. Sub plot area harvested: 0.00087.

Treatments:
Whole plots: All combinations of:-
1. Varieties and seed rates: Cappelle at 188 kg (CH), Gaines at 126 kg (GL), Gaines at 188 kg (GH).
2. Chlormequat: None, 1.12 kg, 2.24 kg in 337 l.

Sub plots:
3. Nitrogen: 75 kg, 150 kg, 300 kg N as 'Nitro-Chalk'.

Basal applications: 314 kg (0:20:20). Weedkiller: 2,4-D at 0.56 kg plus dichlorprop at 2.24 kg in 337 l.

Cultivations, etc.: Deep-tine cultivated twice: 6 Oct, 1970. Seed drilled, basal PK applied: 14 Oct. N applied: 16 Apr, 1971. Weedkiller applied: 19 Apr. Chlormequat applied: 22 Apr. Combine harvested: 28 Aug. Previous crops: Fallow 1969, potatoes 1970.

NOTE: Shoot heights were measured and plant numbers counted. Samples were taken just before harvest for total dry matter and components of yield.

Standard error per plot.
Grain, tonnes/hectare: Whole plot: 0.093 or 1.4% (8 d.f.)
Sub plot: 0.401 or 6.2% (18 d.f.)

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71/R/WW/3

SUMMARY OF RESULTS

GRAIN: TONNES/HECTARE

	CHLORMEQUAT: KG/HA			N: KG/HA			Mean
	0	1.12	2.24	75	150	300	
	(±0.065)			(1) and (2)			(±0.038)
CH	7.26	7.50	7.62	7.85	7.74	6.79	7.46
GL	5.74	5.87	5.75	6.23	5.84	5.29	5.78
GH	6.10	6.13	5.99	6.69	6.29	5.23	6.07
	CHLORMEQUAT: KG/HA			(1) and (2)			(±0.038)
	0			7.04	6.44	5.61	6.37
	1.12			6.85	6.85	5.79	6.50
	2.24			6.88	6.58	5.90	6.45
Mean (±0.095)				6.92	6.62	5.77	6.44

Mean D.M. %: 83.9

(1) (±0.139) For use in vertical and diagonal comparisons only
(2) (±0.164) For use in horizontal and interaction comparisons only

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71/R/WW/4

WINTER WHEAT

ETHREL, DUST AND SPRAY

Object: To compare the effects of 'Ethrel', applied as dust or spray, on height and yield of winter wheat - Great Knott II.

Design: 5 randomised blocks of 6 plots.

Whole plot dimensions: 2.16 x 6.71. Area harvested: 0.00087.

Treatments: 'Ethrel' (2-chloroethylphosphonic acid):
None (0)
Dust: 3.4 kg a.i. at 2-leaf stage (D2), at 4-leaf stage (D4), at 6-leaf stage (D6).
Spray: 1.1 kg a.i. in 337 l at 6-leaf stage (S6), at 8-leaf stage (S8).

Basal applications: 314 kg (0:20:20), 538 kg 'Nitro-Chalk'. Weedkiller: 2,4-D at 0.56 kg plus dichloprop at 2.24 kg in 337l.

Cultivations, etc.: Deep-tine cultivated twice: 6 Oct, 1970. Seed drilled at 188 kg, basal PK applied: 14 Oct. Dusts applied: D2 - 3 Dec, D4 - 5 Feb, 1971. Weedkiller applied: 19 Apr. N applied: 21 Apr. D6 and S6 treatments applied: 22 Apr, S8: 21 May. Combine harvested: 28 Aug. Variety: Cappelle, Previous crops: Fallow 1969, potatoes 1970.

NOTE: Shoot heights were measured and plant numbers counted. Samples were taken just before harvest for total dry matter and components of yield.

Standard error per plot.
Grain, tonnes/hectare: 0.255 or 3.3% (20 d.f.).

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71/R/WW/4

SUMMARY OF RESULTS

GRAIN: TONNES/HECTARE

0	D2	D4	D6	S6	S8	Mean
		(±0.114)				
8.09	7.61	7.89	7.75	7.95	7.17	7.74

Mean D.M.%: 83.0

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71/R/WW/5

WINTER WHEAT

WEEDKILLER AND AQUEOUS N

Object: To study the effects of a combined spray of liquid nitrogen fertiliser and a hormone weedkiller as a top dressing on wheat - Great Knott II.

Design: 4 randomised blocks of 28 plots.

Whole plot dimensions: 2.13 x 2.74. Area harvested: 0.00038.

Treatments: All combinations of:-

1. Weedkiller (dichlorprop/MCPA): None (H0), 1.40 (H1), 2.80 (H2), 4.20 (H3) kg total a.e.
2. Forms of nitrogen: Solid, as 'Nitro-Chalk' (21% N) applied immediately after the weedkiller (S), liquid, as urea/ammonium nitrate (26% N) mixed with the weedkiller (L).
3. Rates of nitrogen: 37.7, 75.3, 113.0 kg N.

Together with 4 additional treatments

SN2 E H0, SN2 E H1, SN2 E H2, SN2 E H3 (N2 = 75.3)

where 'Nitro-Chalk' was applied early (E) and the H0 plots were hand weeded.

NOTE: The weedkiller was applied in 337 l where solid fertiliser was used. The liquid fertiliser (with or without weedkiller) was applied as a spray in 112, 225, 337 l for rates 1, 2 and 3 respectively.

Basal applications: 377 kg (0:20:20) combine drilled.

Cultivations, etc.: Deep-tine cultivated: 6 Oct, 1970. Deep-tine cultivated second time: 7 Oct. Seed combine drilled at 202 kg: 14 Oct. N applied to E plots: 7 Apr, 1971. Remaining N treatments and weedkiller applied: 21 Apr. H0 plots hand weeded: 3 June. Cut by sickle: 18 Aug, Variety: Cappelle. Previous crops: Fallow 1969, potatoes 1970.

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NOTE: Soil samples were taken for pH in April. Scores were made of weedkiller scorch, growth and colour of crop and weed control. Weeds were identified on HO plots, and their dry matter determined. Plots were examined in July for ear deformities from spraying. Thousand grain weights and the percentage of N in grain and straw were determined.

Standard error per plot.
Grain, tonnes/hectare: 0.386 or 6.2% (69 d.f.)

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71/R/WW/5

SUMMARY OF RESULTS

GRAIN: TONNES/HECTARE

	H0	H1	H2	H3	Mean
		(±0.112)			(±0.056)
S	6.29	6.35	6.38	6.41	6.36
L	6.03	6.11	5.97	6.04	6.04
N: KG/HA		(±0.137)			(±0.068)
37.7	5.65	5.42	5.62	5.63	5.58
75.3	6.34	6.38	6.26	6.47	6.36
113.0	6.49	6.88	6.65	6.59	6.65
Mean (±0.079)	6.16	6.23	6.18	6.23	6.20

N: KG/HA

	37.7	75.3	113.0
		(±0.097)	
S	5.72	6.52	6.83
L	5.44	6.20	6.47

SN2 E H0 6.63
SN2 E H1 6.41 (±0.193)
SN2 E H2 6.59
SN2 E H3 6.33

General mean: 6.24

Mean D.M. %: 81.5

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71/R/WW/5

STRAW: TONNES/HECTARE

	H0	H1	H2	H3	Mean
S	9.75	9.30	9.05	9.21	9.33
L	9.37	9.03	8.71	8.68	8.95
N: KG/HA					
37.7	8.93	8.08	8.15	8.09	8.31
75.3	9.54	9.34	9.04	9.26	9.30
113.0	10.21	10.07	9.46	9.48	9.81
Mean	9.56	9.16	8.88	8.94	9.14

N: KG/HA

	37.7	75.3	113.0
S	8.46	9.56	9.96
L	8.16	9.03	9.65

SN2 E H0 10.35
SN2 E H1 10.08
SN2 E H2 9.23
SN2 E H3 10.29

General mean: 9.26

Mean D.M. %: 57.9

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71/R/WW/6 and 71/BB/WW/6

WINTER WHEAT

GROWTH AND YIELD ON CONTRASTED SITES

Object: To try to account for yields and differences between yields of wheat on sites at Rothamsted and Broom's Barn by studying crop growth rates, nutrient uptake, water use etc. at a wide range of nitrogen levels, with and without irrigation. Also to study the interaction between site differences and crops (see also 71/R & BB/B/1) - Rothamsted (R) Great Knott II and Broom's Barn (BB) Flint Ridge Field.

Design: 3 randomised blocks of 2 plots, split into 6.

Whole plot dimensions:-
Great Knott II (R): 13.7 x 48. Sub plot area harvested: 0.00390.
Flint Ridge Field (BB): 15.2 x 45.7. Sub plot area harvested: 0.00413.

Treatments: All combinations of:-
Whole plots: 1. Irrigation: None (0), full irrigation (I).
Sub plots: 2. Nitrogen: 31, 63, 94, 125, 157, 188 kg N as 'Nitro-Chalk'.
Total irrigation was 61.0 mm applied on four occasions (R) and 76.7 mm applied on four occasions (BB).

Basal applications:
Great Knott II (R): 1260 kg (0:20:20) plus 900 kg Epsom salts in seedbed. 380 kg (8:20:16) combine drilled.
Flint Ridge Field (BB): In seedbed, as above. 392 kg (8:20:16) combine drilled.
Weedkiller (both fields):- 2,4-D at 0.56 kg plus dichlorprop at 2.24 kg in 225 l.
Fungicide (both fields): - Tridemorph at 0.47 kg in 427 l.

Cultivations, etc.:-
Great Knott II (R): Deep-tine cultivated on 2 occasions: 6 Oct and 7 Oct, 1970. Basal PK and Epsom salts applied: 12 Oct. Seed combine drilled at 202 kg: 13 Oct. Weedkiller applied: 14 Apr, 1971. N applied: 16 Apr. Fungicide applied: 12 May.

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71/R/WW/6 and 71/BB/WW/6

Irrigated: 14 May - 5.08 mm, 19 May - 5.08 mm, 20 May - 25.4 mm, 7 June - 25.4 mm. Combine harvested: 27 Aug. Variety: Cappelle. Previous crops: Fallow 1969, potatoes 1970.

Flint Ridge Field (BB): Ploughed: 1 Sept, 1970. Rotary cultivated: 19 Sept. Epsom salts applied: 7 Oct. Basal PK applied, seed combine drilled at 202 kg: 12 Oct. N applied: 19 Apr, 1971. Weedkiller applied: 28 Apr. Fungicide applied: 10 May. Irrigated: 11 May - 3.8 mm, 14 May - 25.4 mm, 21 May - 26.7 mm, 26 May - 20.8 mm. Combine harvested: 25 Aug. Variety: Cappelle. Previous crop: 1 year ley for hay 1970.

NOTE: At Rothamsted straw was gathered by pick-up baler. At Broom's Barn straw was collected on a sheet behind the combine.

Standard errors per plot.

Grain, tonnes/hectare: Great Knott III (R): Sub plot: 0.335 or 4.8% (20 d.f.)

Flint Ridge Field (BB): Sub plot: 0.454 or 7.6% (20 d.f.)

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71/R/WW/6 and 71/BB/WW/6

SUMMARY OF RESULTS

GREAT KNOTT II (R)

N: KG/HA

	31	63	97	125	157	188	Mean
	GRAIN: TONNES/HECTARE (±0.193)*						
0	7.40	7.22	7.54	6.73	6.36	5.98	6.87
I	6.98	7.36	7.24	6.91	6.60	6.45	6.92
Mean (±0.137)	7.19	7.29	7.39	6.82	6.48	6.21	6.90

* For use in horizontal and interaction comparisons only

	STRAW: TONNES/HECTARE						
0	6.50	7.10	6.76	7.23	7.37	6.54	6.92
I	6.58	7.17	7.19	7.33	8.23	7.44	7.32
Mean	6.54	7.13	6.98	7.28	7.80	6.99	7.12

Mean D.M. %: Grain: 80.9
Straw: 83.9

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71/R/WW/6 and 71/BB/WW/6

FLINT RIDGE FIELD (BB)

N: KG/HA

	31	63	94	125	157	188	Mean
	GRAIN: TONNES/HECTARE (±0.262)*						
0	4.61	5.56	5.64	6.06	6.35	6.36	5.76
I	5.13	5.74	6.40	6.80	6.88	6.36	6.22
Mean (±0.185)	4.87	5.65	6.02	6.43	6.61	6.36	5.99

* For use in horizontal and interaction comparisons only

	STRAW: TONNES/HECTARE						
0	4.42	5.64	5.51	6.04	6.39	6.35	5.73
I	5.27	6.08	6.57	7.76	7.35	7.76	6.80
Mean	4.85	5.86	6.04	6.90	6.87	7.05	6.26

Mean D.M. %: Grain: 82.6
Straw: 77.4

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71/R/WW/7

WINTER WHEAT

SYSTEMIC FUNGICIDES

Object: To study the effects of a range of systemic fungicides on yield and pathogens of wheat - West Barnfield II.

Design: 3 randomised blocks of 9 plots.

Whole plot dimensions: 2.67 x 9.14. Area harvested: 0.00087.

Treatments:

No fungicide (plus 337 l) (2 plots per block) (O)

and

Seed dressings	Sprays (applied on two occasions)	
Benomyl 0.28 kg	1.12 kg in 337 l	(B)
Ethirimol 1.12 kg	1.12 kg in 337 l	(E)
Furidazole 0.28 kg	1.12 kg in 674 l	(F)
EL 273 0.034 kg a.i.	44.5 ml a.i. in 337 l	(L)
Organo-mercury 0.42 kg of formulated material	Nil (plus 337 l)	(M)
Thiophanate methyl 1.35 kg	1.68 kg in 337 l	(T)
W524 0.42 kg a.i.	400 ml a.i. in 674 l	(W)

Basal applications: 380 kg (8:20:16) combine drilled. 600 kg 'Nitro-Chalk' in spring. Weedkiller: Paraquat at 0.28 kg ion in 225 l.

Cultivations, etc.: Paraquat applied: 18 Sept, 1970. Ploughed: 25 Sept. Seed combine drilled at 179 kg: 16 Oct. N applied: 14 Apr, 1971. Fungicide sprays applied: 4 May, 2 June. Combine harvested: 27 Aug. Variety: Cama*. Previous crops: Barley 1969, winter wheat 1970.

* Variety susceptible to eyespot (Cercosporella herpotrichoides) and mildew (Erysiphe graminis).

NOTE: Samples were taken for mildew (Erysiphe graminis), yellow rust (Puccinia striiformis), Septoria and foot and root diseases.

Standard error per plot.

Grain, tonnes/hectare: 0.361 or 6.0% (16 d.f.)

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71/R/WW/7

SUMMARY OF RESULTS

GRAIN: TONNES/HECTARE

O*	B	E	F	L	M	T	W	Mean
(±0.147)				(±0.208)				
6.10	6.31	6.01	5.82	5.51	6.08	6.30	5.61	5.98

Mean D.M. %: 82.9

* Duplicated level

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71/R/WW/8

WINTER WHEAT

BENOMYL AND EYESPOT

Object: To test the effects of benomyl on the yields and incidence of eyespot (Cercosporella herpotrichoides) of winter wheat - West Barnfield II.

Design: 3 randomised blocks of 12 plots.

Whole plot dimensions: 2.67 x 9.14. Area harvested: 0.00124.

Treatments: All combinations of:-
1. Varieties: Cappelle (C), Gaines (G).
2. Seed dressings and sprays: None (O) 2 plots per block, organo-mercury seed dressing at 2.24 g per kg of seed (MD), benomyl seed dressing at 1.56 g per kg of seed (BD), benomyl spray at 1.12 kg in 1120 l (BS), benomyl seed dressing and spray each at above rates (BDS).

Basal applications: 380 kg (8:20:16) combine drilled. 600 kg 'Nitro-Chalk' in spring. Weedkiller: Paraquat at 0.28 kg ion in 225 l.

Cultivations, etc.: Paraquat applied: 18 Sept, 1970. Ploughed: 25 Sept. Seed combine drilled at 179 kg: 14 Oct. Benomyl sprays applied: 23 Mar, 1971. N applied: 14 Apr. Combine harvested: 27 Aug. Previous crops: Barley 1969, winter wheat 1970.

NOTE: Samples were taken for estimation of eyespot (Cercosporella herpotrichoides) and sharp eyespot (Rhizoctonia solani) in spring and at harvest.

Standard error per plot.
Grain, tonnes/hectare: 0.463 or 8.1% (22 d.f.)

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71/R/WW/8

SUMMARY OF RESULTS

GRAIN: TONNES/HECTARE

	O*	MD	BD	BS	BDS	Mean
	(±0.189)		(±0.267)			(±0.109)
C	6.18	6.48	5.91	6.19	6.71	6.28
G	5.06	5.07	4.94	5.45	5.36	5.16
Mean	5.62 (±0.134)	5.77	5.42	5.82 (±0.189)	6.04	5.72

Mean D.M. %: 82.2

* Duplicated level

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71/R/WS/2

SPRING WHEAT

ETHREL, DUST AND SPRAY

Object: To compare the effects of 'Ethrel', applied as dust or spray, on height and yield of spring wheat - Long Hoos IV.

Design: 6 randomised blocks of 6 plots.

Whole plot dimensions: 2.16 x 6.71. Area harvested: 0.00087.

Treatments: 'Ethrel' (2-chloroethylphosphonic acid):-
None (0)
Dust: 3.4 kg a.i. at 2-leaf stage (D2), at 4-leaf stage (D4), at 6-leaf stage (D6)
Spray: 1.1 kg a.i. in 337 l at 6-leaf stage (S6), at 8-leaf stage (S8)

Basal applications: 377 kg (20:10:10). Weedkiller: 2,4-D at 0.56 kg plus dichlorprop at 2.24 kg in 337 l.

Cultivations, etc.: Deep-tine cultivated on two occasions: 10 and 12 Oct, 1970. Seed drilled at 188 kg, basal NPK applied: 2 Apr, 1971. D2 treatment applied: 27 Apr. Weedkiller applied: 11 May. Remaining dusts applied: D4 - 19 May, D6 - 1 June. Sprays applied: S6 - 7 June, S8 - 16 June. Combine harvested: 2 Sept. Variety: Kolibri. Previous crops: Spring beans 1969, potatoes 1970.

NOTE: Shoot heights were measured and plant numbers counted. Samples were taken just before harvest for total dry matter and components of yield.

Standard error per plot.
Grain, tonnes/hectare: 0.479 or 16.7% (25 d.f.)

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71/R/WS/2

SUMMARY OF RESULTS

GRAIN: TONNES/HECTARE

0	D2	D4	D6	S6	S8	Mean
		(±0.196)				
2.55	2.75	3.02	3.01	3.04	2.87	2.87

Mean D.M. %: 80.2

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71/R/WS/3

SPRING WHEAT

DWARF SPRING WHEAT, VARIETIES, N AND CCC

Object: To study the effects of CCC (chlormequat) and a range of nitrogen levels on three semi-dwarf spring wheat varieties - Long Hoos IV.

Design: A single replicate of 4 x 4 x 4 in 4 blocks of 4 whole plots, split into 4 sub-plots, with split plot confounding of 3 factor interactions with blocks.

Whole plot dimensions: 2.16 x 29.6. Sub plot area harvested: 0.00087.

Treatments:
Whole plots: 1. Varieties: Benoist 257 (B), Inia (I), Kolibri (K), VR 6/57 (V).
Sub plots: All combinations of:-
2. Nitrogen: 75, 150, 225, 300 kg N as 'Nitro-chalk'.
3. Chlormequat: None, 1.12, 2.24, 3.36 kg in 337 l.

Basal applications: 336 kg (0:20:20). Weedkiller: 2,4-D at 0.56 kg plus dichlorprop at 2.24 kg in 337 l.

Cultivations, etc.: Deep-tine cultivated on 2 occasions: 10 and 12 Oct, 1970. Seed drilled at 188 kg, PK applied: 2 Apr, 1971. N applied: 16 Apr. Weedkiller applied: 11 May. Chlormequat applied: 21 May. Combine harvested: 2 Sept. Previous crops: Spring beans 1969, potatoes 1970.

NOTES: (1) Shoot heights were measured and plant numbers counted. Samples were taken just before harvest for components of yield and dry matter.
(2) Mildew (Erysiphe graminis) was severe on Inia and there was considerable bird damage on all plots.

Standard error per plot estimated from unconfounded 3 factor interaction.
Grain, tonnes/hectare: Whole plot: 0.297 or 8.6% (9 d.f.)
Sub plot: 0.166 or 4.8% (15 d.f.)

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71/R/WS/3

SUMMARY OF RESULTS

GRAIN: TONNES/HECTARE

	N: KG/HA				CHLORMEQUAT: KG/HA				
	75	150	225	300	0	1.12	2.24	3.36	Mean
	(1) and (2)				(1) and (2)				(±0.149)
B	3.91	4.14	4.44	4.21	3.62	4.29	4.42	4.36	4.17
I	2.21	2.30	2.51	2.63	2.27	2.54	2.40	2.45	2.41
K	2.04	2.45	2.94	3.25	2.56	2.76	2.67	2.70	2.67
V	4.30	4.65	4.64	4.64	4.26	4.59	4.60	4.77	4.56
	N: KG/HA				(±0.083)				(±0.042)
				75	3.01	3.02	3.36	3.07	3.12
				150	3.00	3.69	3.32	3.53	3.38
				225	3.40	3.91	3.56	3.66	3.63
				300	3.29	3.57	3.86	4.02	3.68
Mean (±0.042)					3.18	3.55	3.52	3.57	3.45

Mean D.M. %: 81.9

(1) (±0.165) For use in vertical and diagonal comparisons only
(2) (±0.083) For use in horizontal and interaction comparisons only

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71/R/WS/7

SPRING WHEAT

EFFECTS OF BLUE/GREEN ALGAE

Object: To study the effects of blue/green algae, at a range of nitrogen levels, on yield of spring wheat - Garden Plot 2.

Design: 2 randomised blocks of 24 plots.

Whole plot dimensions: 2.16 x 4.42. Area harvested: 0.00062.

Treatments: All combinations of:-
1. Cultures: None (O), culture A (A), culture B (B).
2. Time of application: Early (E) on 3 May, 1971, late (L) on 16 June, 1971.
3. Nitrogen: None, 45, 90, 135 kg as 'Nitro-Chalk'.

Basal applications: 565 kg (0:20:20) ploughed down in Autumn.

Cultivations, etc.: PK applied, all plots ploughed: 11 Dec, 1970. Seed drilled at 188 kg: 29 Mar, 1971. N applied: 19 Apr. Combine harvested: 27 Aug. Variety: Sirius. Previous crops: Mixed cereals 1969, sugar beet 1970.

NOTE: The yields have been adjusted for a trend across the blocks.

Standard error per plot.
Grain, tonnes/hectare: 0.859 or 18.6% (22 d.f.)

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71/R/WS/7

SUMMARY OF RESULTS

GRAIN: TONNES/HECTARE

N: KG/HA

	0	45	90	135	Mean
		(±0.430)			(±0.215)
O	4.05	4.53	3.83	6.42	4.71
A	3.62	5.08	5.09	5.23	4.75
B	3.44	4.98	4.30	4.91	4.41
Mean (±0.248)	3.71	4.86	4.40	5.52	4.62
		(±0.430)			(±0.215)
E	3.53	4.91	5.31	4.75	4.63
L	3.54	5.15	4.07	5.39	4.54

	E	L
	(±0.304)	
A	4.75	4.76
B	4.51	4.31

Mean D.M. %: 79.4

NOTE: The 'no culture' yields were excluded from the tables involving time of application.

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71/R/B/1 and 71/BB/B/1

BARLEY

GROWTH AND YIELD ON CONTRASTED SITES

Object: To try to account for yields and differences between yields of barley on sites at Rothamsted and Broom's Barn by studying crop growth rates, nutrient uptake, water use etc. at a wide range of nitrogen levels, with and without irrigation. Also to study the interaction between site differences and crops (see also 71/R&BB/WW/6)- Rothamsted (R) Great Knott III and Broom's Barn (BB) Marl Pit Field.

Design: 3 randomised blocks of 2 plots, split into 6.

Whole plot dimensions:-
Great Knott III (R): 15.2 x 48.0. Sub plot area harvested: 0.00434.
Marl Pit Field (BB): 15.2 x 45.7. Sub plot area harvested: 0.00413.

Treatments: All combinations of:-
Whole plots: 1. Irrigation: None (0), full irrigation (I).
Sub plots: 2. Nitrogen: 31, 63, 94, 125, 157, 188 kg N as 'Nitro-Chalk'.
Total irrigation was 33.0 mm applied on two occasions (R) and 58.4 mm applied on three occasions (BB).

Basal applications:
Great Knott III (R): 1260 kg (0:20:20) plus 900 kg Epsom salts ploughed in in autumn, 360 kg (0:20:20) combine drilled.
Marl Pit Field (BB): 1260 kg (0:20:20) plus 900 kg Epsom salts ploughed in in autumn 251 kg (0:20:20) combine drilled.
Weedkiller (both fields): MCPA, mecoprop and dicamba ('Banlene Plus' at 5.6 l in 225 l).
Fungicide (both fields): Tridemorph at 0.53 kg applied with the weedkiller.
Weedkiller to Great Knott III (R) only: Paraquat at 0.56 kg ion in 225 l.

Cultivations, etc.:
Great Knott III (R): Basal PK and Epsom salts applied: 15 Sept, 1970. Paraquat applied: 14 Oct. Ploughed: 2 - 10 Nov. N applied, seed combine drilled at 180 kg: 11 Mar, 1971. Weedkiller plus fungicide applied: 10 May. Irrigated: 20 May - 5.1 mm, 8 June - 27.9 mm. Combine harvested: 18 Aug. Variety: Julia. Previous crops: Potatoes 1969, winter wheat 1970.

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71/R/B/1 and 71/BB/B/1

Marl Pit Field (BB): Basal PK applied: 18 Sept, 1970. Epsom salts applied: 16 Oct. Ploughed: 20 Oct. Seed combine drilled at 180 kg: 5 Mar, 1971. N applied: 23 Mar. Weedkiller plus fungicide applied: 10 May. Irrigated: 14 May - 26.7 mm, 21 May - 16.5 mm, 26 May - 15.2 mm. Combine harvested: 12 Aug. Variety: Julia. Previous crops: Sugar beet 1969, barley 1970.

Standard errors per plot. Grain, tonnes/hectare:
Great Knott III (R): Sub plot: 0.303 or 4.8% (20 d.f.)
Marl Pit Field (BB): Sub plot: 0.266 or 4.9% (20 d.f.)

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71/R/B/1 and 71/BB/B/1

SUMMARY OF RESULTS

GREAT KNOTT III (R)

N: KG/HA

	31	63	94	125	157	188	Mean
	GRAIN: TONNES/HECTARE (±0.175)*						
0	5.65	6.40	6.71	6.64	6.64	6.21	6.37
I	5.36	6.42	6.56	6.60	6.85	6.19	6.33
Mean (±0.124)	5.50	6.41	6.64	6.62	6.75	6.20	6.35
	STRAW: TONNES/HECTARE						
0	3.25	5.35	5.60	5.77	5.90	5.58	5.24
I	3.61	5.11	5.89	5.65	6.34	5.88	5.41
Mean	3.43	5.23	5.74	5.71	6.12	5.73	5.33

Mean D.M. %: Grain: 83.5
Straw: 77.6

* For use in horizontal and interaction comparisons only

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71/R/B/1 and 71/BB/B/1

MARL PIT FIELD (BB)

N: KG/HA

	31	63	94	125	157	188	Mean
	GRAIN: TONNES/HECTARE						
	(±0.154)*						
0	4.07	4.99	5.37	5.85	5.90	5.77	5.33
I	4.76	5.34	6.01	5.93	6.11	5.56	5.62
Mean (±0.109)	4.41	5.16	5.69	5.89	6.00	5.67	5.47
	STRAW: TONNES/HECTARE						
0	3.30	4.28	4.81	5.56	5.72	6.08	4.96
I	3.97	5.04	6.08	6.25	6.72	6.36	5.74
Mean	3.63	4.66	5.45	5.91	6.22	6.22	5.35

Mean D.M. %: Grain: 82.7
Straw: 82.8

* For use in horizontal and interaction comparisons only

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71/R/B/2 and 71/W/B/2

BARLEY

VARIETIES, N AND ETHIRIMOL

Object: To study the yield of newer varieties of barley grown at a range of nitrogen levels. The effects of ethirimol on the incidence of mildew (Erysiphe graminis) are also studied - Rothamsted (R) Great Knott III and Woburn (W) Horsepool.

Design: 4 randomised blocks of 12 plots, split into 3.

Whole plot dimensions:-
Great Knott III (R): 4.27 x 24.7. Sub plot area harvested: 0.00163.
Horsepool (W): 4.27 x 20.1. Sub plot area harvested: 0.00173.

Treatments:
Whole plots: All combinations of:-
1. Varieties: Gerkra (G), Julia (J), Midas (M), Sultan (S), Vada (V), Zephyr (Z).
2. Fungicidal seed dressing: None (O), ethirimol at 0.70 kg (F).

Sub plots:
3. Nitrogen: 38, 75, 113 kg (R) and 50, 100, 150 kg (W) as 'Nitro-Chalk'.

Basal applications:-
Great Knott III (R): 246 kg (0:20:20) combine drilled. Weedkillers: Paraquat at 0.56 kg ion in 225 l. Ioxynil octanoate, bromoxynil octanoate and the iso-octyl ester of dichlorpop ('Oxytril P' at 1.4 l in 225 l).
Horsepool (W): 252 kg (0:20:20) combine drilled. Weedkillers: Paraquat at 0.84 kg ion in 281 l (to kill remains of first sowing badly damaged by birds). Ioxynil at 0.525 kg plus mecoprop at 1.58 kg in 281 l.

Cultivations, etc.:-
Great Knott III (R): Paraquat applied: 14 Oct, 1970. Ploughed: 2 - 10 Nov. Seed combine drilled at 157 kg: 10 Mar, 1971. N applied: 23 Mar. 'Oxytril P' applied: 11 May. Combine harvested: 20 Aug. Previous crops: Potatoes 1969, winter wheat 1970.

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71/R/B/2 and 71/W/B/2

Horsepool (W): Subsoiled, tines 142 cm apart, 61 cm deep: 11 Sept, 1970. Rotary cultivated: 15 Sept. Rotary cultivated second stroke: 2 Oct. Deep-tine cultivated: 11 Oct. Seed combine drilled at 157 kg: 23 Mar, 1971. N applied: 24 Mar. Paraquat applied: 20 Apr. Power harrowed, seed redrilled at 157 kg: 21 Apr. Ioxynil/mecoprop applied: 17 May. Combine harvested: 25 Aug. Previous crops: Spring beans 1969, winter wheat 1970.

NOTE: Samples were taken for assessment of mildew (Erysiphe graminis) and other foliar diseases.

Standard errors per plot. Grain, tonnes/hectare.

Great Knott III (R):	Whole plot:	0.195 or 3.5%	(33 d.f.)
	Sub plot:	0.330 or 5.9%	(72 d.f.)
Horsepool (W):	Whole plot:	0.307 or 6.6%	(33 d.f.)
	Sub plot:	0.374 or 8.1%	(72 d.f.)

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71/R/B/2 and 71/W/B/2

SUMMARY OF RESULTS

GRAIN: TONNES/HECTARE

GREAT KNOTT III (R)

	G	J	M	S	V	Z	Mean
			(±0.098)				(±0.040)
0	5.16	5.65	4.85	5.10	5.97	5.15	5.32
F	5.67	6.45	5.31	5.47	6.56	5.84	5.88
N: KG/HA			(1) and (2)				(±0.048)
38	5.01	5.57	4.71	5.10	5.63	5.01	5.17
75	5.54	6.24	5.18	5.48	6.58	5.68	5.78
113	5.70	6.34	5.35	5.27	6.60	5.80	5.84
Mean (±0.069)	5.42	6.05	5.08	5.28	6.27	5.49	5.60

N: KG/HA

	38	75	113
	(3) and (4)		
0	4.97	5.40	5.58
F	5.37	6.17	6.11

(1) (±0.117) (3) (±0.068) For use in vertical and diagonal comparisons only

(2) (±0.118) (4) (±0.067) For use in horizontal and interaction comparisons only

Mean D.M. %: 81.5

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71/R/B/2 and 71/W/B/2

GRAIN: TONNES/HECTARE

HORSEPOOL (W)

	G	J	M	S	V	Z	Mean
			(±0.154)				(±0.063)
O	4.67	4.56	3.82	3.38	5.59	4.14	4.36
F	4.86	4.78	4.48	4.51	6.00	4.88	4.92
N: KG/HA			(1) and (2)				(±0.054)
50	4.86	5.06	4.60	4.26	5.72	4.75	4.88
100	4.83	4.79	4.10	3.94	5.77	4.64	4.68
150	4.61	4.16	3.75	3.63	5.90	4.15	4.37
Mean (±0.109)	4.77	4.67	4.15	3.94	5.80	4.51	4.64

N: KG/HA

	50	100	150
	(3) and (4)		
O	4.59	4.38	4.11
F	5.16	4.97	4.62

(1) (±0.132) (3) (±0.088) For use in vertical and diagonal comparisons only

(2) (±0.153) (4) (±0.076) For use in horizontal and interaction comparisons only

Mean D.M. %: 82.3

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71/R/B/3 and 71/W/B/3

BARLEY

RATES, FORMS AND METHODS OF APPLYING N

Object: To study the effects of urea, liquid or solid, broadcast or injected, on the yields of barley - Rothamsted, Great Knott III (R) and Woburn, Horsepool (W).

Design: Great Knott III (R): 4 randomised blocks of 14 plots.
Horsepool (W): 3 randomised blocks of 14 plots.

Whole plot dimensions: 2.13 x 30.5. Area harvested: 0.00650.

Treatments: No nitrogen (2 plots per block) (NO) and all combinations of:-

1. Forms of nitrogen: 'Nitro-Chalk' 21% N (NC). Solid (prilled) urea 46% N (SU). Urea solution 18% N (LU).
2. Methods of applying nitrogen: Injected (I), broadcast (sprayed for LU treatment) (B).
3. Rates of nitrogen: 63 kg, 126 kg.

Basal applications: 250 kg (0:20:20) broadcast by drill. Weedkillers:-
Great Knott III (R): Paraquat at 0.56 kg ion in 225 l. Ioxynil octanoate, bromoxynil octanoate and the iso-octyl ester of dichlorprop ('Oxytril P' at 1.4 l in 225 l).
Horsepool (W): Ioxynil at 0.53 kg and mecoprop at 1.58 kg in 281 l.

Cultivations, etc.:-
Great Knott III (R): Paraquat applied: 14 Oct, 1970. Ploughed: 2 - 10 Nov. Basal PK applied: 24 Feb, 1971. Treatments applied, seed drilled at 157 kg: 27 Feb. 'Oxytril P' applied: 11 May. Combine harvested: Aug 18. Variety: Julia. Previous crops: Potatoes 1969, winter wheat 1970.
Horsepool (W): Sub-soiled 142 cm wide by 61 cm deep: 11 Sept, 1970. Rotary cultivated 1st stroke: 15 - 17 Sept, 2nd stroke: 2 - 3 Oct. Deep-tine cultivated: 11 Oct. Treatments and basal PK applied, seed drilled at 157 kg: 26 Feb, 1971. Weedkiller applied: 11 May. Combine harvested: 17 Aug. Variety: Julia. Previous crops: Spring beans 1969, winter wheat 1970.

Standard errors per plot. Grain, tonnes/hectare.
Great Knott III (R): 0.195 or 3.3% (33 d.f.)
Horsepool (W): 0.288 or 5.0% (22 d.f.)

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71/R/B/3 and 71/W/B/3

SUMMARY OF RESULTS

GRAIN: TONNES/HECTARE

GREAT KNOTT III (R)

N: KG/HA

	I	B	63	126	Mean
	(±0.069)		(±0.069)		(±0.049)
NC	6.01	5.85	5.67	6.18	5.93
SU	5.99	6.04	5.78	6.26	6.02
LU	6.01	5.98	5.74	6.24	5.99
			(±0.056)		(±0.040)
		I	5.75	6.26	6.00
		B	5.72	6.20	5.96
Mean (±0.040)			5.73	6.23	5.98

NO 3.99 (±0.069)

General Mean: 5.70

Mean D.M. %: 84.8

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71/R/B/3 and 71/W/B/3

GRAIN: TONNES/HECTARE

HORSEPOOL (W)

N: KG/HA

	I	B	63	126	Mean
	(±0.118)		(±0.118)		(±0.083)
NC	5.83	5.64	5.95	5.53	5.74
SU	5.86	5.86	6.21	5.51	5.86
LU	5.68	5.75	5.88	5.55	5.71
			(±0.096)		(±0.068)
		I	6.09	5.49	5.79
		B	5.93	5.57	5.75
Mean (±0.068)			6.01	5.53	5.77

NO 5.80 (±0.118)

General mean: 5.78

Mean D.M. %: 83.1

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71/R/B/5

BARLEY

CONTROL OF CEREAL APHIDS AND BYDV

Object: To study the effects of controlling cereal aphids on the incidence of barley yellow dwarf virus - Great Knott III.

Design: 4 blocks of 2 x 2 x 2 randomisation restricted.

Whole plot dimensions: 6.40 x 24.4. Area harvested: 0.00390.

Treatments: Insecticides. All combinations of:-
1. Granules broadcast at sowing: None (0), 4.50 kg phorate (GE).
2. Spray in May: None (0), menazon ('Saphicol' at 0.70 l in 449 l) (SM).
3. Spray in June: None (0), menazon ('Saphicol' at 0.70 l in 449 l) (SL).

Basal applications: 437 kg (20:10:10) combine drilled. Weedkillers: Paraquat at 0.56 kg ion in 225 l. Ioxynil octanoate, bromoxynil octanoate and the iso-octyl ester of dichlorprop ('Oxtyril P' at 1.40 l in 225 l).

Cultivations, etc.: Paraquat applied: 14 Oct, 1970. Ploughed: 2 Nov. Phorate applied to GE plots, all plots rotary cultivated, seed combine drilled at 157 kg: 12 Mar, 1971. 'Oxytril P' applied: 11 May. Menazon applied: SM plots - 24 May, SL plots - 23 June. Combine harvested: 19 Aug. Variety: Julia. Previous crops: Potatoes 1969, winter wheat 1970.

NOTE: Virus infection was assessed and samples were taken for aphid incidence.

Standard error per plot.
Grain, tonnes/hectare: 0.154 or 2.6% (21 d.f.)

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71/R/B/5

SUMMARY OF RESULTS

GRAIN: TONNES/HECTARE

	O	SM	O	SL	Mean
	(±0.055)		(±0.055)		(±0.039)
O	5.75	5.93	5.84	5.84	5.84
GE	6.12	6.23	6.19	6.16	6.18
			(±0.055)		(±0.039)
		O	5.95	5.92	5.93
		SM	6.08	6.09	6.08
Mean (±0.039)			6.01	6.00	6.01

	O		GE	
	O	SL	O	SL
	(±0.077)			
O	5.72	5.77	6.18	6.07
SM	5.95	5.92	6.20	6.25

Mean D.M. %: 85.5

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71/R/B/6

BARLEY

WEEDKILLER AND AQUEOUS N

Object: To study the effects of a combined spray of liquid nitrogen fertiliser and a hormone weedkiller as a top dressing on barley - Great Knott III.

Design: 4 randomised blocks of 28 plots.

Whole plot dimensions: 2.13 x 2.74. Area harvested: 0.00038.

Treatments: All combinations of:-
1. Weedkiller (dichlorprop/MCPA): None (H0), 1.4 (H1), 2.8 (H2), 4.2 (H3) kg total a.e.
2. Forms of nitrogen: Solid, as 'Nitro-Chalk' 21% N applied immediately after the weedkiller (S), liquid, as urea/ammonium nitrate (26% N) mixed with the weedkiller (L).
3. Levels of nitrogen: 37.7, 75.3, 113.0 kg N.

Together with 4 additional treatments
SN2 E H0, SN2 E H1, SN2 E H2, SN2 E H3 (N2 = 75.3)
where 'Nitro-Chalk' was applied early (E) and the H0 plots were hand weeded.

NOTE: The weedkiller was applied in 337 l where solid fertiliser was used. The liquid fertiliser (with or without weedkiller) was applied as a spray at 112, 225 and 337 l for rates 1, 2 and 3 respectively.

Basal applications: 224 kg (8:20:16) combine drilled. Weedkiller: Paraquat at 0.56 kg ion in 225 l.

Cultivations, etc.: Paraquat applied: 14 Oct, 1970. Ploughed: 2 - 10 Nov. Seed combine drilled at 157 kg: 1 Mar, 1971. N applied to E plots: 20 Apr. Remaining N treatments and weedkiller applied: 11 May. H0 plots hand weeded: 29 June. Cut by sickle: 10 Aug. Variety: Julia. Previous crops: Potatoes 1969, winter wheat 1970.

NOTE: Soil samples were taken in April for pH and the site examined for weed species. Scores were made of weedkiller scorch, growth and weed control and plots examined for ear deformities. Weeds were identified on the H0 plots. The percentage of N in grain was determined.

Standard error per plot.
Grain, tonnes/hectare: 0.373 or 6.9% (68 d.f.)

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71/R/B/6

SUMMARY OF RESULTS

GRAIN: TONNES/HECTARE

	H0	H1	H2	H3	Mean
		(±0.108)			(±0.054)
S	5.50	5.42	5.39	5.58	5.47
L	5.52	5.48	5.18	5.13	5.33
N: KG/HA		(±0.132)			(±0.066)
37.7	5.05	5.03	4.73	4.78	4.90
75.3	5.71	5.51	5.46	5.50	5.54
113.0	5.77	5.82	5.67	5.78	5.76
Mean (±0.076)	5.51	5.45	5.28	5.36	5.40

N: KG/HA

	37.7	75.3	113.0
		(±0.093)	
S	5.01	5.64	5.76
L	4.78	5.45	5.76

SN2 E H0	5.71	
SN2 E H1	5.67	(±0.186)
SN2 E H2	5.62	
SN2 E H3	5.44	

General mean: 5.43

Mean D.M. %: 80.6

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71/R/B/6

STRAW: TONNES/HECTARE

	H0	H1	H2	H3	Mean
S	5.12	5.09	5.15	5.16	5.13
L	5.36	5.12	4.79	4.78	5.01
N: KG/HA					
37.7	4.68	4.58	4.30	4.35	4.48
75.3	5.28	5.10	5.13	5.11	5.16
113.0	5.75	5.63	5.49	5.45	5.58
Mean	5.24	5.10	4.97	4.97	5.07

N: KG/HA

	37.7	75.3	113.0
S	4.54	5.25	5.60
L	4.41	5.06	5.56

SN2 E H0 5.88
SN2 E H1 5.73
SN2 E H2 5.61
SN2 E H3 5.50

General mean: 5.15

Mean D.M. %: 72.3

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71/R/B/7

BARLEY

SEED RATES, ROW SPACING AND ETHIRIMOL

Object: To study the effects on yield and mildew incidence (Erysiphe graminis) of growing barley at small seed rates and close row spacing - Pastures.

Design: 4 randomised blocks of 12 plots.

Whole plot dimensions: 4.27 x 9.14. Area harvested: R1 - 0.00260, R2 - 0.00279.

Treatments: All combinations of:-
1. Seed rate: 39 (S1), 78.5 (S2), 157 (S4) kg.
2. Row spacing: 10.2 cm (4 inches) between rows (R1), 20.3 cm (8 inches) between rows (R2).
3. Seed dressing: Organo-mercury (O), organo-mercury, plus ethirimol at 1.8 kg (F).

The two smaller seed rates were made up to 157 kg by the addition of seed which had been killed by heat in an oven.

Basal applications: 377 kg (20:10:10) broadcast. Weedkiller: Ioxynil at 0.53 kg plus mecoprop at 157 kg in 225 l.

Cultivations, etc.: Ploughed: 5 Nov, 1970. Basal NPK applied: 24 Feb, 1971. Seed drilled: 13 Mar. Weedkiller applied: 2 May. Combine harvested: 18 Aug. Variety: Zephyr. Previous crops: Barley 1969, spring beans 1970.

NOTE: Samples were taken for assessment of mildew (Erysiphe graminis) and brown rust (Puccinia hordei). Tiller counts were made and ear samples taken for estimation of number of grains per ear.

Standard error per plot.
Grain, tonnes/hectare: 0.344 or 7.4% (33 d.f.)

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71/R/B/7

SUMMARY OF RESULTS

GRAIN: TONNES/HECTARE

	R1	R2	O	F	Mean
	(±0.121)		(±0.121)		(±0.086)
S1	3.88	3.90	3.69	4.08	3.89
S2	4.92	4.73	4.37	5.28	4.83
S4	5.27	5.31	4.87	5.70	5.29
			(±0.099)		(±0.070)
		R1	4.37	5.01	4.69
		R2	4.26	5.04	4.65
		Mean (±0.070)	4.31	5.02	4.67

	S1		S2		S4	
	O	F	O	F	O	F
	(±0.172)					
R1	3.74	4.02	4.51	5.34	4.87	5.66
R2	3.65	4.14	4.24	5.23	4.87	5.75

Mean D.M. %: 85.6

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71/R/B/8

BARLEY

TIMES OF APPLYING ETHIRIMOL

Object: To study the effects of ethirimol, applied at defined stages of mildew (Erysiphe graminis) epidemic and crop growth on subsequent mildew development and yield - Pastures.

Design: 4 randomised blocks of 5 plots.

Whole plot dimensions: 4.27 x 9.14. Area harvested: 0.00260.

Treatments: No systemic fungicide (O)
Seed dressing ethirimol at 1.8 kg (D)
Spray application of 0.90 kg ethirimol in 337 l at different times:
When mildew developing on lowest leaf sheaths (S1)
At start of flag leaf emergence (S2)
At start of ear emergence (S3)

Basal applications: 377 kg (20:10:10) combine drilled. Weedkiller: Ioxynil at 0.53 kg plus mecoprop at 1.58 kg in 225 l.

Cultivations, etc.: Ploughed: 5 Nov, 1970. Seed combine drilled at 156 kg: 12 Mar, 1971. Weedkiller applied: 12 May. Ethirimol sprays applied: S1 - 12 May, S2 - 4 June, S3 - 15 June. Combine harvested: 18 Aug. Variety: Zephyr. Previous crops: Barley 1969, spring beans 1970.

NOTE: Samples were taken for assessment of mildew (Erysiphe graminis) and other foliar diseases.

Standard error per plot.
Grain, tonnes/hectare: 0.383 or 7.5% (12 d.f.)

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71/R/B/8

SUMMARY OF RESULTS

GRAIN: TONNES/HECTARE

O	D	S1	S2	S3	Mean
		(±0.192)			
4.69	5.61	5.21	4.90	5.23	5.13

Mean D.M. %: 85.2

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71/R/B/9

BARLEY

ETHREL, DUST AND SPRAY

Object: To compare the effects of 'Ethrel', applied as dust or spray, on height and yield of barley - Pastures.

Design: 6 randomised blocks of 6 plots.

Whole plot dimensions: 2.16 x 6.71. Area harvested: 0.00087.

Treatments: 'Ethrel' (2-chloroethylphosphonic acid):-
None (0)
Dust: 3.4 kg a.i. at 2-leaf stage (D2), at 4-leaf stage (D4), at 6-leaf stage (D6)
Spray: 1.1 kg a.i. in 337 l at 6-leaf stage (S6), at 8-leaf stage (S8)

Basal applications: 370 kg (20:10:10). Weedkiller: 2,4-D at 0.56 kg plus dichlorprop at 2.24 kg in 337 l.

Cultivations, etc.: Ploughed: 5 Nov, 1970. Seed drilled at 188 kg, basal NPK applied: 29 Mar, 1971. D2 treatment applied: 27 Apr. Weedkiller applied: 11 May. Remaining dusts applied: D4 - 19 May, D6 - 1 June. Sprays applied: S6 - 7 June, S8 - 16 June. Combine harvested: 25 Aug. Variety: Julia. Previous crops: Barley 1969, spring beans 1970.

NOTE: Shoot heights were measured and plant numbers counted. Samples were taken just before harvest for total dry matter and components of yield.

Standard error per plot.
Grain, tonnes/hectare: 0.327 or 6.5% (25 d.f.)

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71/R/B/9

SUMMARY OF RESULTS

GRAIN: TONNES/HECTARE

0	D2	D4	D6	S6	S8	Mean
		(±0.134)				
5.44	5.33	5.33	4.95	4.32	4.91	5.05

Mean D.M. %: 83.7

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71/R/B/10

BARLEY

SYSTEMIC FUNGICIDES

Object: To study the effects of a range of fungicides on yield and pathogens of barley - Drapers.

Design: 3 randomised blocks of 10 plots.

Whole plot dimensions: 4.27 x 13.4. Area harvested: 0.00190.

Treatments:

No fungicidal treatment	(O)
Seed dressings per kg of seed:	
3191 F at 2 g	(BA)
3191 F plus confidential ingredient, at 3 g	(BAC)
3200 F at 4 g	(BB)
Organo-mercury at 2.2 g	(ME)
MC 833 at 2.0 g	(MC)
'Vitavax' plus thiram, at 2.2 g	(VT)
NF 48 at 24 g	(NF)
'Vitavax' plus organo-mercury, at 2.2 g	(V)
Soil drench after sowing:	
Sandoz Fungicide at 11.0 l a.i. in 5600 l	(SF)

Basal applications: 505 kg (20:10:10) combine drilled. Weedkillers: Paraquat at 0.28 kg ion in 225 l.

Cultivations, etc.: Paraquat applied: 23 Sept, 1970. Ploughed: 3 Oct. Seed combine drilled at 157 kg: 26 Mar, 1971. Soil drench applied: 29 Mar. Combine harvested: 19 Aug. Variety: Sultan. Previous crops: Barley 1969 and 1970.

NOTE: Samples were taken for mildew (Erysiphe graminis), brown rust (Puccinia hordei), smut (Ustilago nuda) and root diseases.

Standard error per plot.
Grain, tonnes/hectare: 0.285 or 7.3% (18 d.f.)

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71/R/B/10

SUMMARY OF RESULTS

GRAIN: TONNES/HECTARE

O	BA	BAC	BB	ME	MC	VT	NF	V	SF	Mean
				(±0.165)						
3.69	3.66	3.09	4.38	3.95	4.01	3.63	4.83	4.11	3.72	3.91

Mean D.M.%: 82.0

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71/R/B/11

BARLEY

METHODS OF APPLYING SYSTEMIC FUNGICIDES

Object: To study the effects on yield and pathogens of barley of different times and methods of applying systemic fungicides - Drapers.

Design: 3 randomised blocks of 11 plots.

Whole plot dimensions: 2.13 x 13.4. Area harvested: 0.00195.

Treatments:

No fungicidal treatment	(O)
Seed dressings per kg of seed:-	
Organo-mercury plus 'Vitavax', at 2.2 g	(MD)
EL273 at 33.6 g a.i.	(ED)
Thiophanate methyl at 1.35 kg a.i.	(TD)
W524 at 0.77 kg a.i.	(WD)
Foliar sprays, each applied early (E) or late (L)	
EL273 at 44.5 ml a.i. in 337 l	(ES)
Thiophanate methyl at 1.68 kg a.i. in 337 l	(TS)
W524 at 0.4 l a.i. in 674 l	(WS)

Basal applications: 505 kg (20:10:10) combine drilled. Weedkillers: Paraquat at 0.28 kg ion in 225 l.

Cultivations, etc.: Paraquat applied: 23 Sept, 1970. Ploughed: 25 Oct - 18 Dec. Seed combine drilled at 157 kg: 26 Mar, 1971. 2,4-D/dichlorprop applied: 10 May. Sprays applied: E - 17 May, L - 15 June. Combine harvested: 19 Aug. Variety: Sultan. Previous crops: Barley 1969 and 1970.

NOTE: Samples were taken for mildew (Erysiphe graminis), brown rust (Puccinia hordei), smut (Ustilago nuda) and root diseases.

Standard error per plot.
Grain, tonnes/hectare: 0.210 or 5.0% (20 d.f.)

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71/R/B/11

SUMMARY OF RESULTS

GRAIN: TONNES/HECTARE

O	MD	ED	TD	WD	ESE	ESL	TSE	TSL	WSE	WSL	Mean
					(±0.121)						
3.90	3.87	4.04	4.26	4.39	4.60	4.15	4.41	4.28	4.73	3.93	4.23

Mean D.M. %: 82.1

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71/R/B/12

BARLEY

EARLY AND LATE MILDEW

Object: To study the effects of mildew epidemics at various times - Long Hoos IV.

Design: 8 randomised blocks of 4 plots.

Dimensions of whole plot: 4.27 x 24.4. Area harvested: 0.00390.

Treatments: Fungicides, ethirimol:-

None	(0)
224 g as seed dressing	(1D)
1.80 kg as seed dressing	(8D)
0.90 kg in 337 l on 15 June (growth stage 10) and on 9 July (growth stage 11.1)	(8S)

Basal applications: 377 kg (20:10:10) combine drilled. Weedkiller: Ioxynil octanoate, bromoxynil octanoate and the iso-octyl ester of dichlorprop ('Oxytril P' at 1.4 l in 225 l).

Cultivations, etc.: Deep-tine cultivated twice: 10 Oct, 1970. Seed combine drilled at 157 kg: 30 Mar, 1971. Weedkiller applied: 11 May. Combine harvested: 18 Aug. Variety: Zephyr. Previous crops: Spring beans 1969, potatoes 1970.

NOTE: Samples were taken for assessment of mildew (Erysiphe graminis) and other foliar diseases and for assessment of tiller numbers, tiller length and ear sizes.

Standard error per plot.
Grain, tonnes/hectare: 0.081 or 1.6% (21 d.f.)

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71/R/B/12

SUMMARY OF RESULTS

0	1D	8D	8S	Mean
		GRAIN: TONNES/HECTARE		
		(±0.029)		
4.59	4.97	5.48	4.70	4.94
		STRAW: TONNES/HECTARE		
3.78	3.85	4.57	3.92	4.03

Mean D.M. %: Grain: 85.0
Straw: 85.3

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71/R/B/13

BARLEY

METHODS OF APPLYING NPK

Object: To study the effect of injecting NPK fertiliser between bands of seed, using the Tume Combi drill, on the yields of barley - West Barnfield I.

Design: 6 randomised blocks of 4 plots.

Dimensions of whole plot: 4.88 x 15.2. Area harvested: 0.00464.

Treatments: All combinations of:-
1. Drills and row spacing: Combine drill, 17.8 cm (7 inches) between rows (C), Tume Combi drill 25.4 cm (10 inches) between band centres (T).
2. Rates of compound fertiliser (25:10:10): 264, 505 kg.

Basal applications: No manures. Weedkillers: Paraquat at 0.28 kg ion in 225 l and later at 0.56 kg ion in 225 l, ioxynil octanoate, bromoxynil octanoate and the iso-octyl ester of dichlorprop ('Oxytril P' at 1.4 l in 225 l).

Cultivations, etc.: Paraquat applied: 19 Sept, 1970. Ploughed: 24 Sept. Paraquat applied: 5 Feb, 1971. Seed combine drilled at 157 kg: 26 Mar. 'Oxytril P' applied: 11 May. Combine harvested: 17 Aug. Variety: Julia. Previous crops: Spring oilseed rape 1969, winter wheat 1970.

Standard error per plot.
Grain, tonnes/hectare: 0.276 or 5.4% (15 d.f.)

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71/R/B/13

SUMMARY OF RESULTS

GRAIN: TONNES/HECTARE

(25:10:10): KG/HA

	264	505	Mean
	(±0.113)		(±0.080)
C	5.03	5.14	5.09
T	4.99	5.17	5.08
Mean (±0.080)	5.01	5.16	5.09

Mean D.M. %: 85.0

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71/S/B/1

BARLEY

VARIETIES, N RATES AND TIMES OF APPLICATION

Object: To study the effects of a range of nitrogen levels applied to the seedbed or in May, on the yield of two barley varieties. The effects of dressing seed with phenylphosphonic acid are also studied - Saxmundham Grove Plot.

Design: Two randomised blocks of 6 plots split into 4.

Whole plot dimensions: 2.74 x 12.2. Sub plot area harvested: 0.00052.

Treatments:-

Whole plots: All combinations of:-

1. Varieties: Midas (M), Sultan (S).
2. N levels: 50, 100, 150 kg N as calcium nitrate.

Sub plots: All combinations of:-

3. Times of applying N: To seedbed (E), top-dressed in May (L), (across whole plots).
4. Seed dressing: None (O), phenylphosphonic acid (0.2 % a.i.) sprayed over the seed as a seed dressing (D) (along whole plots).

Basal applications: 314 kg (0:20:20) broadcast. Weedkiller: Dichlorprop plus MCPA ('Mephetol Plus' at 5.61 l in 562 l). Fungicide: Tridemorph at 0.53 kg in 562 l.

Cultivations, etc.: Ploughed: 28 Oct, 1970. Seed drilled at 188 kg, seedbed N and basal PK applied: 31 Mar, 1971. Weedkiller applied: 18 May. Late N applied: 19 May. Fungicide applied: 17 June. Harvested by sickle: 11 Aug. Previous crops: Barley 1969, sugar beet 1970.

Standard errors per plot.

Grain, tonnes/hectare: Whole plot: 0.164 or 6.4% (5 d.f.)
Sub plot (T): 0.410 or 16.3% (6 d.f.)
(S): 0.231 or 9.2% (6 d.f.)
(TS): 0.289 or 11.5% (6 d.f.)
Pooled used for calculation of standard error in the summary:
0.320 or 12.7% (23 d.f.)

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71/S/B/1

SUMMARY OF RESULTS

GRAIN: TONNES/HECTARE

	N: KG/HA 50	100	150	E	L	O	D	Mean
		(±0.113)		(±0.092)		(±0.092)		(±0.065)
M	2.47	2.50	2.37	2.62	2.28	2.32	2.58	2.45
S	2.64	2.68	2.45	2.70	2.48	2.52	2.66	2.59
			N: KG/HA	(±0.113)		(±0.113)		(±0.080)
			50	2.65	2.45	2.44	2.66	2.55
			100	2.79	2.39	2.44	2.74	2.59
			150	2.53	2.29	2.37	2.46	2.41
						(±0.092)		(±0.065)
					E	2.50	2.82	2.66
					L	2.33	2.43	2.38
Mean (±0.047)						2.42	2.62	2.52

Mean D.M. %: 76.4

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71/S/B/1

STRAW: TONNES/HECTARE

	N: KG/HA 50	100	150	E	L	O	D	Mean
M	3.88	4.56	4.54	4.55	4.11	4.22	4.43	4.33
S	3.52	3.92	4.23	3.96	3.82	3.69	4.09	3.89
			N: KG/HA					
			50	3.85	3.55	3.70	3.71	3.70
			100	4.55	3.93	4.09	4.39	4.24
			150	4.36	4.41	4.09	4.69	4.39
					E	4.09	4.42	4.25
					L	3.83	4.10	3.96
Mean						3.96	4.26	4.11

Mean D.M. %: 69.9

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71/S/B/2

BARLEY

N RATES AFTER GRASS AND ARABLE

Object: To study the effects of a wide range of nitrogen levels on the yield of barley grown after grass (1967-69) or arable (1967-69) - Saxmundham Grove Plot.

Design: 4 randomised blocks (2 after grass and 2 after arable) of 8 plots.

Whole plot dimensions: 1.52 x 12.2. Area harvested: 0.00063.

Treatments:- Nitrogen: None, 25, 50, 75, 100, 125, 150, 175 kg N as 'Nitro-Chalk'.

Basal applications: Manures: 628 kg (0:20:20) broadcast. Weedkiller: Dichlorprop plus MCPA ('Mephetol Plus' at 5.6 l in 449 l).

Cultivations, etc.: Ploughed: 28 Oct, 1970. N and PK applied, seed drilled: 31 Mar, 1971. Weedkiller applied: 18 May. Harvested by sickle: 10 Aug. Variety: Midas. Previous crop: Barley 1970.

Standard error per plot. Grain, tonnes/hectare:
Sub plot: 0.334 or 14.4% (14 d.f.)

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71/S/B/2

SUMMARY OF RESULTS

N: KG/HA

	0	25	50	75	100	125	150	175	Mean
	GRAIN: TONNES/HECTARE								
AFTER	(±0.236)*								
Grass	1.30	2.44	2.50	1.72	2.08	2.71	2.61	2.07	2.18
Arable	1.70	2.29	3.18	2.38	2.56	2.69	2.79	2.16	2.47
Mean (±0.167)	1.50	2.37	2.84	2.05	2.32	2.70	2.70	2.12	2.32
	STRAW: TONNES/HECTARE								
AFTER									
Grass	2.35	4.00	4.27	4.76	4.49	5.14	5.63	4.72	4.42
Arable	2.47	3.51	4.72	4.10	4.49	4.69	5.16	4.78	4.24
Mean	2.41	3.75	4.50	4.43	4.49	4.92	5.39	4.75	4.33

Mean D.M. %: Grain: 75.1
Straw: 68.1

* For use in horizontal and interaction comparisons only

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71/R/BE/1

SPRING BEANS

CHEMICAL CONTROL OF SOIL-BORNE PATHOGENS

Object: To study the effects of a range of chemicals on wilting and yield of beans grown continuously for five years - Barnfield Section I Plot 3 (unmanured).

Design: 4 blocks of 6 plots.

Whole plot dimensions: 3.73 x 2.29. Area harvested: 0.00039.

Treatments: Chemicals applied as dusts, except formalin:-

None	(O)
Fungicide, 70% 'Dexon' at 78.5 kg a.i.	(F)
Insecticide, 25% gamma BHC at 4.5 kg a.i.	(I)
Nematicide, 10% aldicarb ('Temik') at 11.2 kg a.i.	(N)
Biocide, formalin at 3000 l of a 38% solution of formaldehyde in 54400 l	(B)
Aldicarb and formalin together at the rates shown above	(NB)

The plots which received dusts were rotary cultivated immediately after the application.

Basal applications: Manures-none. Weedkillers: Paraquat at 0.84 kg ion in 225 l. Simazine at 1.12 kg in 225 l. Insecticide: Demeton-s-methyl at 245 g in 438 l.

Cultivations, etc.: Paraquat applied: 11 Sept, 1970. Ploughed: 19 Oct. Formalin applied: 25 Nov. Chemical dusts applied and rotary cultivated in: 26 Feb, 1971. Seed drilled at 224 kg: 4 Mar. Simazine applied: 10 Mar. Insecticide applied: 1 July. Harvested by hand: 25 Aug. Variety: Maris Bead.

NOTE: Wilted and virus infected plants were counted during the season. Crop samples were taken for root disease assessment. Counts were made of stem eelworm (Ditylenchus dipsaci).

Standard error per plot.
Grain, tonnes/hectare: 0.219 or 13.0% (15 d.f.)

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71/R/BE/1

SUMMARY OF RESULTS

GRAIN: TONNES/HECTARE

O	F	I	N	B	NB	Mean
			(±0.110)			
1.07	1.96	1.51	2.43	1.23	1.89	1.68

Mean D.M. %: 78.2

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71/W/BE/1

CONTROL OF SITONA

Object: To compare the effects of a range of insecticides on yield and incidence of Sitona on beans - Woburn Lansome II.

Design: 4 blocks of 10 plots.

Whole plot dimensions: 2.13 x 4.27. Area harvested: 0.00023.

Treatments:

Insecticides:	None, no rotary cultivation	(OO)
	None, rotary cultivation before sowing	(OR)
	4.4 kg aldicarb, rotary cultivated in	(AL)
	2.2 kg gamma BHC, rotary cultivated in	(B2)
	4.4 kg gamma BHC, rotary cultivated in	(B4)
	4.4 kg a.i. 'C 10015', rotary cultivated in	(CA)
	4.4 kg a.i. 'C 18244', rotary cultivated in	(CB)
	4.4 kg a.i. 'DP 1410', rotary cultivated in	(DP)
	4.4 kg a.i. 'MC 2420', rotary cultivated in	(MC)
	4.4 kg phorate, rotary cultivated in	(PH)

Basal applications: 448 kg (0:14:28). Weedkiller: Simazine at 0.84 kg in 371 l. Insecticide: Demeton-s-methyl at 246 ml in 416 l.

Cultivations, etc.: Ploughed: 4 - 7 Sept, 1970. Deep-tine cultivated: 21 Oct. Treatments applied, all plots rotary cultivated except (OO) plots, PK placed and seed drilled at 224 kg: 12 Mar, 1971. Weed-killer applied: 27 Mar. Insecticide applied: 30 June. Hand harvested: 27 Aug. Variety: Maris Bead. Previous crops: Barley 1969, beans 1970.

NOTES: (1) Soil samples were taken early and late in the season for counts of Sitona larvae.
(2) Plant growth assessments were made throughout the growing season.

Standard error per plot.
Grain: tonnes/hectare: 0.411 or 20.5% (27 d.f.)

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71/W/BE/1

SUMMARY OF RESULTS

GRAIN: TONNES/HECTARE

OO	OR	AL	B2	B4	CA	CB	DP	MC	PH	Mean
				(±0.206)						
1.96	1.78	2.64	1.85	1.79	1.98	1.75	2.35	1.67	2.28	2.01

Mean D.M. %: 86.0

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71/R/BE/2 and 71/W/BE/2

SPRING BEANS

EFFECTS OF SITONA ON YIELD

Object: To study the effects of two rates of BHC on yield and control of Sitona larvae on beans - Rothamsted (R) Long Hoos VII and Woburn (W) Lansome II.

Design: 6 randomised blocks of 3 plots.

Whole plot dimensions: 5.33 x 9.14. Area harvested 0.00293.

Treatments: Insecticide: None, 2.2, and 4.4 kg BHC applied as a slurry and rotary cultivated in.

Basal applications:-
Long Hoos VII (R): 7530 kg ground chalk. 405 kg (0:14:28) placement drilled. Weedkiller: Simazine at 1.12 kg in 225 l. Insecticide: Demeton-s-methyl at 245 g in 438 l.
Lansome II (W): 448 kg (0:14:28) placement drilled. Weedkiller: Simazine at 0.84 kg in 371 l. Insecticide: Demeton-s-methyl at 245 g in 416 l.

Cultivations, etc.:
Long Hoos VII (R): Chalk applied: 21 Sept, 1970. Ploughed: 30 Oct. Treatment insecticide applied and rotary cultivated in, seed placement drilled at 224 kg: 1 Mar, 1971. Weedkiller applied: 11 Mar. Basal insecticide applied: 2 July. Combine harvested: 3 Sept. Variety: Maris Bead. Previous crops: Winter wheat 1969 and 1970.
Lansome II (W): Ploughed: 4 Sept, 1970. Deep-tine cultivated: 21 Oct. Treatment insecticide applied and rotary cultivated in: 12 Mar, 1971. Seed placement drilled at 224 kg: 13 Mar. Weedkiller applied: 27 Mar. Basal insecticide applied: 30 June. Combine harvested: 2 Sept. Variety: Maris Bead. Previous crops: Barley 1969 and 1970.

NOTE: Estimates of Sitona larvae on roots and in soil were made, also estimates of plant growth.

Standard errors per plot. Grain, tonnes/hectare:
Long Hoos VII (R): 0.131 or 4.9% (10 d.f.)
Lansome II (W): 0.224 or 11.0% (10 d.f.)

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71/R/BE/2 and 71/W/BE/2

SUMMARY OF RESULTS

GRAIN: TONNES/HECTARE

BHC: KG/HA

0	2.2	4.4	Mean
	LONG HOOS VII (R)		
	(±0.053)		
2.59	2.74	2.71	2.68
	LANSOME II (W)		
	(±0.092)		
2.01	2.06	2.07	2.05

Mean D.M. %: Long Hoos VII (R): 80.4
Lansome II (W): 80.3

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71/R/BE/3

SPRING BEANS

CONTROL OF VECTORS AND VIRUSES

Object: To study the effects of a range of insecticide treatments on yield and incidence of weevils, aphids and virus diseases of beans - Long Hoos VI.

Design: 4 randomised blocks of 6 plots.

Whole plot dimension: 10.7 x 12.2. Area harvested: 0.00293.

Treatments: Insecticides:

None	(0)
Applied to soil:-	
Aldicarb 1.12 kg	(AS1)
Aldicarb 11.2 kg	(AS2)
Foliar sprays on 3 occasions:-	
BHC 0.56 kg	(BF)
Malathion 1.12 kg	(MAF)
Menazon 0.28 kg	(MEF)

The first and second sprays were applied in 524 l, the third in 700 l.

Basal applications: 7530 kg ground chalk. 405 kg (0:14:28) placement drilled. Weedkiller: Simazine at 1.12 kg in 225 l.

Cultivations, etc.: Ground chalk applied: 21 Sept, 1970. Ploughed: 30 Oct. Aldicarb applied, all plots rotary cultivated, seed placement drilled at 224 kg: 1 Mar, 1971. Weedkiller applied: 11 Mar. Foliar sprays applied: 27 Apr, 18 May, 30 June. Combine harvested: 3 Sept. Variety: Maris Bead. Previous crops: Lucerne and Cocksfoot (fallowed after 1st cut) 1969, winter wheat 1970.

NOTE: Aphid and weevil counts were made and virus incidence assessed.

Standard error per plot.
Grain, tonnes/hectare: 0.232 or 7.6% (15 d.f.)

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71/R/BE/3

SUMMARY OF RESULTS

GRAIN: TONNES/HECTARE

0	AS1	AS2	BF	MAF	MEF	Mean
		(±0.116)				
2.84	3.04	3.30	2.96	3.14	3.12	3.07

Mean D.M. %: 80.7

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71/R/BE/5

SPRING BEANS

EFFECTS OF APHIDS

Object: To study the effects of applying liquid or granular insecticides at different times on yield of beans and aphid control - Long Hoos I and II.

Design: 5 randomised blocks of 6 plots.

Whole plot dimensions: 5.33 x 12.2. Area harvested: 0.00390.

Treatments: Insecticides:-

- None (O)
- Treated with 1.19 kg of phorate in granules:-
  - At start of flowering (GE)
  - At end of flowering (GL)
- Sprayed with demeton-s-methyl at 2.45 g in 562 l:-
  - At start of flowering (SE)
  - At end of flowering (SL)
  - At start and again at end of flowering (SEL)

Basal applications: 7530 kg ground chalk. 405 kg (0:14:28) applied by 'Tume' drill across plots. Weedkiller: Simazine at 1.12 kg in 225 l.

Cultivations, etc.: Chalk applied: 7 Sept, 1970. Ploughed: 29 Sept. Basal PK applied: 24 Feb, 1971. Seed drilled at 224 kg: 27 Feb. Weedkiller applied: 12 Mar. Phorate applied: GE plots - 16 June, GL plots - 9 July. Demeton-s-methyl applied: SE and SEL plots - 30 June, SL and SEL plots - 17 July. Combine harvested: 7 Sept. Variety: Maris Bead. Previous crops: Winter wheat 1969, spring wheat 1970.

NOTE: Aphid counts and estimates of plant growth were made in the earlier part of the season but were discontinued after mid-July because Aphis fabae was not present on the experimental area.

Standard error per plot.
Grain, tonnes/hectare: 0.187 or 8.5% (20 d.f.)

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71/R/BE/5

SUMMARY OF RESULTS

GRAIN: TONNES/HECTARE

0	GE	GEL	SE	SL	SEL	Mean
		(±0.084)				
2.15	2.42	1.94	2.16	2.30	2.26	2.20

Mean D.M. %: 84.6

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71/R/BE/6

SPRING BEANS

VARIETIES AND BROAD BEAN STAIN VIRUS

Object: To study the susceptibility of different varieties and sources of beans to broad bean stain virus and to compare yields - Long Hoos I and II.

Design: 4 randomised blocks of 13 plots.

Whole plot dimensions: 4.05 x 15.2. Area harvested: 0.00464.

Treatments: Varieties:

Blue Rock		(BR)
Francks Ackerperle		(FA)
F1 hybrid 6 x S45		(F1)
Herz Freya		(HF)
Maxime		(MA)
Maris Bead:	Cambridge stock	(MBC)
	Cheshire stock	(MBN)
	Rothamsted stock	(MBR)
	Lincolnshire stock	(MBL)
Minor		(MI)
Ostlers		(OS)
Tarvin		(TA)
Throws MS		(TH)

Basal applications: 7530 kg ground chalk. 405 kg (0:14:28) applied by Tume drill across plots. Weedkiller: Dinoseb acetate at 2.7 kg in 426 l. Insecticide: Demeton-s-methyl at 245 g in 438 l. Irrigation: 25.4 mm (1 inch).

Cultivations, etc.: Chalk applied: 7 Sept, 1970. Ploughed: 29 Sept. Basal PK applied: 24 Feb, 1971. Seed drilled at 224 kg: 11 Mar. Weedkiller applied: 11 May. Irrigated: 15 May. Insecticide applied: 3 July. Combine harvested: 9 Sept. Previous crops: Winter wheat 1969, spring wheat 1970.

NOTE: Incidence of virus was recorded on all plots. Aphid and weevil infestations were recorded. The dinoseb acetate spray severely scorched all plants and probably affected yield.

Standard error per plot:
Grain, tonnes/hectare: 0.187 or 9.5% (36 d.f.)

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71/R/BE/6

SUMMARY OF RESULTS

GRAIN: TONNES/HECTARE

	BR	FA	F1	HF	MA	MBC	MBN	MBR	MBL	MI	OS	TA	TH	Mean
							(±0.094)							
306	1.87	1.82	2.04	1.86	2.06	1.94	2.07	2.00	2.05	2.13	2.01	1.97	1.90	1.98

Mean D.M.%: 85.6

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71/R/BE/7

SPRING BEANS

ROW SPACING, DRILLS AND WEEDKILLERS

Object: To compare the performance of different drills, sowing at different row spacings and depths and to compare the effects of different weedkillers - Long Hoos I and II.

Design: Four randomised blocks of 14 plots.

Whole plot dimensions: 4.27 x 15.2. Area harvested: 0.00488.

Treatments: All combinations of:-

1. Drills and row spacing:-

Drills	Distance apart of rows cm	(inches)	
Smythe:-	53.3	(21)	(S21)
Fiona (NIAE):-	17.8	(7)	(F7)
	35.6	(14)	(F14)
	53.3	(21)	(F21)
New Tume:-	15.2	(6)	(NT6)
	30.5	(12)	(NT12)
Old Tume:-	25.4	(10)	(OT10)

2. Weedkillers: Dinoseb acetate at 2.7 kg in 426 l (D), simazine at 1.12 kg in 225 l (S).

Basal applications: Ground chalk at 7530 kg. 405 kg (0:14:28) applied by Tume drill across the plots. Insecticide: Demeton-s-methyl at 245 g in 438 l.

Cultivations, etc.: Chalk applied: 7 Sept, 1970. Ploughed: 29 Sept. Basal PK applied: 24 Feb, 1971. Seed drilled at 224 kg: 10 - 11 Mar. Simazine applied: 13 Mar. Dinoseb acetate applied: 4 May. Insecticide applied: 1 July. Combine harvested: 9 Sept. Variety: Maris Bead. Previous crops: Winter wheat and barley 1969, spring wheat 1970.

Standard error per plot.
Grain, tonnes/hectare: 0.159 or 8.3% (39 d.f.)

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71/R/BE/7

SUMMARY OF RESULTS

GRAIN: TONNES/HECTARE

	S21	F7	F14	F21	NT6	NT12	OT10	Mean
				(±0.079)				(±0.030)
D	2.07	1.91	1.75	1.84	2.12	1.99	2.14	1.97
S	1.96	1.82	1.73	1.71	1.91	1.97	1.95	1.86
Mean (±0.056)	2.01	1.86	1.74	1.78	2.01	1.98	2.04	1.92

Mean D.M. %: 86.0

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71/R/BE/8

SPRING BEANS

PHOTOSYNTHETIC ZONES

Object: To study the effects of defoliating different zones of the bean plant on yield - **Long Hoos V.**

Design: 3 blocks of 2 x 2 x 2 randomisation restricted.

Whole plot dimensions: 2.03 x 4.27. Area harvested: 0.00019.

Treatments: All combinations of:-

1. Defoliation in Zone A: none (O), leaves removed when first flower buds formed (A).
2. Defoliation in Zone B: none (O), leaves removed when first flower buds formed on 9th flowering node (B).
3. Decapitation of Zone C: none (O), decapitation (C) on 3 July.

where (1) Zone A is the section of stem (about 9 nodes) below the first flowering node.
(2) Zone B is the section of stem with the 9 nodes which flower first.
(3) Zone C is the section of stem above the 9th flowering node.

Basal applications: 415 kg (0:14:28) broadcast and rotary cultivated in before sowing. Weedkiller: Simazine at 0.84 kg in 337 l. Insecticide: Demeton-s-methyl at 245 g in 337 l.

Cultivations, etc.: Ploughed: 29 Oct, 1970. Basal PK applied: 4 Mar, 1971. Rotary cultivated, seed drilled at 224 kg: 12 Mar. Weedkiller applied: 17 Mar. Zone A defoliated: 8 June. Insecticide applied: 29 June. Zone B defoliated: 30 June. Zone C decapitated: 3 July. Harvested by hand: 2 Sept. Variety: Tarvin. Previous crops: Potatoes 1969, spring wheat 1970.

NOTE: Counts were made of the number of stems and pods. 1000 grain weights were measured.

Standard error per plot.
Grain, tonnes/hectare: 0.177 or 7.9% (14 d.f.)

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71/R/BE/8

SUMMARY OF RESULTS

GRAIN: TONNES/HECTARE

	O	B	O	C	Mean
	(±0.072)		(±0.072)		(±0.051)
O	3.15	1.76	2.76	2.15	2.46
A	2.86	1.14	2.41	1.58	2.00
			(±0.072)		(±0.051)
		O	3.06	2.95	3.00
		B	2.12	0.78	1.45
Mean (±0.051)			2.59	1.87	2.23

	O		A	
	O	B	O	B
	(±0.102)			
O	3.22	3.08	2.89	2.82
C	2.31	1.22	1.93	0.35

Mean D.M. %: 82.6

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71/R/BE/9

SPRING BEANS

SEED RATES, ROW SPACING AND GROWTH REGULATORS

Object: To study the effects of plant density and growth regulators on yield of beans- **Long Hoos V.**

Design: 3 randomised blocks of 4 plots, split into 4.

Whole plot dimensions: 2.74 x 17.1. Sub plot area harvested: 0.00019.

Treatments:

Whole plots: All combinations of:-

1. Seed rates: 224 (1), 448 (2) kg.
2. Distance between rows: 50.8 cm (20 inches) (W), 12.7 cm (5 inches) (C).

Sub plots:

3. Growth regulators: None (0), 'B9' at 4.48 kg a.i. on one occasion (B1), B9 at 4.48 kg a.i. on each of three occasions (B3), PP412 at 4.48 kg a.i. on one occasion (F1). Each as a spray in 629 l.

Basal applications: 415 kg (0:14:28) broadcast and rotary cultivated in. Weedkiller: Simazine at 0.84 kg in 337 l. Insecticide: Demeton-s-methyl at 245 g in 337 l.

Cultivations, etc.: Ploughed: 29 Oct, 1970. Basal PK applied: 4 Mar, 1971. Rotary cultivated, seed drilled: 12 Mar. Weedkiller applied: 17 Mar. Growth regulators applied: B1 and B3 - 11 May, B3 - 2 June and 23 June, F1 - 23 June. Insecticide applied: 29 June. Harvested by hand: 6 Sept. Variety: Tarvin. Previous crops: Potatoes 1969, spring wheat 1970.

NOTE: Stem heights were measured. Counts were made of the number of stems and pods. 1000 grain weights were measured.

Standard errors per plot.

Grain, tonnes/hectare: Whole plot: 0.209 or 5.8% (6 d.f.)
Sub plot: 0.267 or 7.5% (24 d.f.)

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71/R/BE/9

SUMMARY OF RESULTS

GRAIN: TONNES/HECTARE

	1	2	0	B1	B3	F1	Mean
	(±0.120)			(1) and (2)			(±0.085)
W	3.35	3.68	3.35	3.48	4.24	2.99	3.51
C	3.50	3.75	3.29	3.65	4.25	3.30	3.62
				(1) and (2)			(±0.085)
		1	3.16	3.38	4.09	3.06	3.42
		2	3.48	3.75	4.40	3.23	3.71
Mean (±0.077)			3.32	3.57	4.25	3.14	3.57

Mean D.M. %: 83.3

(1) (±0.127) For use in vertical and diagonal comparisons only
(2) (±0.109) For use in horizontal and interaction comparisons only

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71/R/P/1

POTATOES

SEED STOCKS, DISEASES AND FUNGICIDES

Object: To study the effects of systemic fungicides and re-infection with Oospora and Rhizoctonia, on potato stocks either freed from these diseases by the use of stem cuttings, or not. Varieties and the effects of chitting are also studied - Whittlocks.

Design: 4 randomised blocks of 12 plots (plus one extra block for sampling). Plots split into 4.

Whole plot dimensions: 5.69 x 9.52. Sub-plot area harvested: 0.00135.

Treatments: All combinations of:-

Whole plots: 1. Seed stocks, diseases and fungicides: F, FB, FC, FCB, H, HC, HCB, HCBP, HCOE, HCOL, HCRL, HCORL

where F = Once grown seed from Rothamsted*
H = Healthy seed (from stem cuttings)
B = Seed treated with fungicide (Benomyl 5% dust at 4.47 kg per tonne of seed)
P = Seed treated with fungicide ('Plantvax' 5% dust at 4.47 kg per tonne of seed)
C = Chitted seed
O = Seed inoculated with Oospora
R = Seed inoculated with Rhizoctonia
E = Early inoculation (inoculated on 20 Jan, 1971 using vermiculite as a carrier)
L = Late inoculation (applied to furrow at planting, using vermiculite as a carrier)

Quarter plots: 2. Varieties: King Edward (KE), Majestic (M), Pentland Crown (PC), Record (R)

* For Record 'A' stock was used.

Basal applications: 1506 kg (13:13:20). Weedkiller: Linuron at 0.84 kg in 427 l. Fungicide: Mancozeb at 1.35 kg in 438 l on 2 occasions. Insecticide: Demeton-s-methyl at 245 g with the first application of mancozeb.

Cultivations, etc.: Ploughed: 1 Oct, 1970. NPK applied: 6 Apr, 1971. Rotary cultivated: 19 Apr. Potatoes hand planted: 20 Apr. Weedkiller applied: 11 May. Fungicide and insecticide applied: 24 June.

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Fungicide applied: 16 Aug. Sprayed with undiluted BOV at 168 l: 16 Sept. Lifted: 30 Sept. Previous crops: Spring wheat 1969, fallow 1970.

NOTE: Stem and plant numbers were recorded before lifting. During the season samples were taken from the sampling block for disease assessment on progeny tubers. At harvest a sub-sample was taken for disease assessment in the eyes.

Standard errors per plot. Total tubers, tonnes/hectare:
Whole plot: 1.53 or 2.9% (33 d.f.)
Sub plot: 2.55 or 4.8% (108 d.f.)

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71/R/P/1

SUMMARY OF RESULTS

	KE	M	PC	R	Mean
	TOTAL TUBERS: TONNES/HECTARE				
	(1) and (2)				(±0.76)
F	48.0	50.5	47.2	33.2	44.7
FB	45.7	50.0	45.0	35.8	44.1
FC	56.2	56.4	52.4	37.9	50.7
FCB	55.0	62.4	54.9	42.1	53.6
H	54.0	54.1	42.7	44.2	48.7
HC	60.5	60.0	56.7	44.6	55.5
HCB	60.5	64.5	56.4	45.4	56.7
HCBP	62.3	62.1	57.3	46.1	57.0
HCOE	58.9	59.9	55.5	45.0	54.8
HCOL	59.4	58.9	57.2	42.8	54.6
HCRL	59.8	59.1	57.9	44.4	55.3
HCORL	61.0	63.1	54.3	43.5	55.5
Mean (±0.37)	56.8	58.4	53.1	42.1	52.6

(1) (±1.34) For use in vertical and diagonal comparisons only
(2) (±1.27) For use in horizontal and interaction comparisons only

	% WARE: 4.44 CM (1.75 INCH) RIDDLE				
F	72.2	82.6	84.6	80.1	79.9
FB	62.0	80.4	81.0	75.9	74.8
FC	75.6	79.8	85.0	81.6	80.5
FCB	73.0	80.3	82.8	79.6	79.0
H	67.1	80.7	79.3	74.4	75.4
HC	73.6	79.2	81.1	77.6	77.9
HCB	71.9	82.1	81.3	79.2	78.6
HCBP	71.2	83.0	83.7	79.3	79.3
HCOE	73.2	82.7	82.7	81.9	80.1
HCOL	75.1	83.3	84.5	82.0	81.3
HCRL	74.7	82.1	83.4	80.9	80.3
HCORL	76.1	81.9	82.2	80.0	80.1
Mean	72.2	81.5	82.6	79.4	78.9

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71/W/P/1

POTATOES

SEED STOCKS, DISEASES AND FUNGICIDES

Object: To study the effects of systemic fungicides and re-infection with Oospora and Rhizoctonia on potato stocks either freed from these diseases by the use of stem cuttings, or not. Varieties and the effects of chitting are also studied - Woburn Great Hill II.

Design: 4 blocks of 3 plots split into 12 (plus one extra block for sampling).

Whole plot dimensions: 5.69 x 37.7. Sub plot area harvested: 0.00135.

Treatments: All combinations of:-
Whole plots: 1. Varieties: Majestic (M), Pentland Crown (PC), Record (R).
Twelfth plots: 2. Seed stocks, chitting, diseases, times of inoculation and fungicides:

F, FB, FC, FCB, H, HC, HCB, HCBP, HCOE, HCOL, HCRL, HCORL,

where F = Once grown seed Rothamsted grown*.
H = Healthy seed (from stem cuttings).
B = Seed treated with fungicide (Benomyl 5% dust at 4.46 kg per tonne of seed).
P = Seed treated with fungicide ('Plantvax' 10% dust at 4.46 kg per tonne of seed).
C = Chitted seed.
O = Seed inoculated with Oospora.
R = Seed inoculated with Rhizoctonia.
E = Early inoculation.
L = Late inoculation.

* For Record an 'A' stock was used.

Basal applications: 1883 kg (13:13:20). Weedkiller: Linuron at 1.12 kg in 371 l. Fungicide with insecticide: Mancozeb at 1.34 kg plus demeton-s-methyl at 245 g in 416 l. Fungicide: Mancozeb at 1.34 kg in 371 l.

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Cultivations, etc.: Ploughed: 10 - 11 Nov, 1970. NPK applied, rotary cultivated: 6 Apr, 1971. Potatoes planted: 7 Apr. Weedkiller applied: 5 May. Rotary ridged: 1 June. Fungicide with insecticide applied: 29 June. Fungicide applied: 13 Aug. Sprayed with undiluted BUV at 225 l: 20 Sept. Lifted: 29 Sept. Previous crops: Barley 1969, fallow 1970.

NOTE: Samples were taken throughout the season from the sample blocks for tuber weights and numbers of different sizes. After harvest estimates were made of tuber infection with Oospora, Rhizoctonia, Helminthosporium and Phoma.

Standard errors per plot. Total tubers, tonnes/hectare:
Whole plot: 2.56 or 5.6% (6 d.f.)
Sub plot: 4.27 or 9.3% (99 d.f.)

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71/W/P/1

SUMMARY OF RESULTS

	M	PC	R	Mean
	TOTAL TUBERS: TONNES/HECTARE			
	(1) and (2)			(±1.23)
F	49.0	45.4	26.7	40.4
FB	45.7	45.0	32.3	41.0
FC	55.2	43.9	32.2	43.8
FCB	55.9	56.2	34.0	48.7
H	48.6	40.3	34.6	41.2
HC	61.6	52.0	39.8	51.2
HCB	59.7	54.7	40.6	51.6
HCBP	60.4	54.7	38.6	51.3
HCOE	57.5	47.6	38.1	47.7
HCOL	60.1	48.1	37.9	48.7
HCRL	54.8	41.2	35.4	43.8
HCORL	52.9	40.9	34.5	42.8
Mean (±1.28)	55.1	47.5	35.4	46.0

(1) (±2.41) For use in horizontal and diagonal comparisons only
(2) (±2.14) For use in vertical and interaction comparisons only

% WARE: 4.44 CM (1.75 INCH) RIDDLE

F	73.1	75.4	66.4	71.6
FB	64.9	72.7	72.2	70.0
FC	75.5	78.8	72.3	75.5
FCB	71.1	80.5	65.4	72.3
H	65.4	67.9	47.3	60.2
HC	74.2	83.5	64.1	73.9
HCB	75.5	81.0	66.6	74.3
HCBP	73.2	79.7	63.8	72.3
HCOE	74.6	78.5	66.1	73.1
HCOL	76.1	78.4	68.5	74.3
HCRL	77.7	74.1	70.7	74.2
HCORL	78.3	72.5	64.6	71.8
Mean	73.3	76.9	65.7	72.0

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71/R/P/2

POTATOES

CHEMICALS AND SEED-BORNE FUNGI

Object: To study the effects of different rates of three systemic fungicides, applied to seed tubers, on yield and tuber health of potatoes - Whittlocks.

Design: 4 randomised blocks of 2 plots, split into 8. (Plus one extra block for sampling).

Whole plot dimensions: 5.69 x 24.8. Sub plot area harvested: 0.00135.

Treatments:
All combinations of:-
Whole plots: 1. Varieties: Pentland Crown (PC), King Edward (KE).
Sub plots: 2. Seed treatment with chemicals: Benomyl powder (B), thiabendazole powder (T), EL 273 powder (L).
3. Rates of application: Diluted with kaolin dust to give 1% (1), 5% (5), (1% (1) and 4% (4) for EL 273).
Together with additional treatments to sub plots: None (0), kaolin dust (K). All dust treatments were applied at 4.5 kg per tonne of seed potatoes.

Basal applications: 1506 kg (13:13:20). Weedkiller: Linuron at 0.84 kg in 427 l. Fungicide: Mancozeb at 1.35 kg in 438 l on 2 occasions. Insecticide: Demeton-s-methyl at 245 g applied with the first mancozeb spray.

Cultivations, etc.: Ploughed: 1 Oct, 1970. Basal NPK applied: 6 Apr, 1971. Rotary cultivated, potatoes machine planted: 19 Apr. Weedkiller applied: 11 May. Grubbed: 4 June. Rotary cultivated: 7 June. Fungicide and insecticide applied: 24 June. Fungicide applied: 16 Aug. Sprayed with undiluted BOV at 168 l: 16 Sept. Lifted: 1 Oct. Previous crops: Spring wheat 1969, fallow 1970.

NOTE: Emergence counts were made. Diseases in the eyes of tubers were assessed after riddling.

Standard errors per plot.
Total tubers, tonnes/hectare: Whole plot: 1.17 or 2.7% (3 d.f.)
Sub plot: 2.62 or 6.1% (42 d.f.)

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SUMMARY OF RESULTS

	O	K	B1	B5	T1	T5	L1	L4	Mean
	TOTAL TUBERS: TONNES/HECTARE								
	(1) and (2)								(±0.59)
KE	47.6	47.9	45.4	47.6	47.3	49.4	23.5	5.1	39.2
PC	51.6	50.2	49.7	50.4	50.4	53.8	35.3	29.3	46.3
Mean (±0.93)	49.6	49.1	47.6	49.0	48.8	51.6	29.4	17.2	42.8

(1) (±1.36) For use in vertical and diagonal comparisons only
(2) (±1.31) For use in horizontal and interaction comparisons only

% WARE: 4.44 CM (1.75 INCH) RIDDLE

KE	71.5	74.4	69.0	68.6	71.7	72.6	81.7	89.0	74.8
PC	83.5	83.5	84.5	82.7	83.5	85.5	91.6	93.7	86.1
Mean	77.5	79.0	76.7	75.7	77.6	79.0	86.7	91.3	80.4

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71/R/P/10

POTATOES

SPACING, SEED SIZE AND FERTILISER

Object: To study the effects of different spacings within and between rows, seed size and fertiliser rates on yield and size grades of potatoes - Whittlocks.

Design: 4 blocks of 8 plots, randomisation restricted. Plots split into 4.

Whole plot dimensions: N plots: 2.84 x 44.7. Sub plot area harvested: 0.00116.
W plots: 3.66 x 44.7. Sub plot area harvested: 0.00149.

Treatments:
Whole plots: All combinations of:-
1. Distance between rows: 71.1 cm (28 inches) (N), 91.4 cm (36 inches) (W).
2. Seed size: Small (S), large (L). All seed chitted.
3. Fertiliser rate: 1510 kg (F1), 2510 kg (F2) (13:13:20).

Sub plots:
4. Spacing of seed within the row: Seed 30.5 cm (12 inches) (3), 40.6 cm (16 inches) (4), 50.8 cm (20 inches) (5), 61.0 cm (24 inches) (6) apart within the row.

The seed was dusted with 4% 'Benlate' at approximately 3.57 kg per tonne, after being sorted into 2 seed sizes, 3.18 cm to 4.76 cm, and 4.76 cm to 5.72 cm, for the S and L treatments.

Basal applications: Manures: None. Weedkiller: Linuron at 0.84 kg in 427 l. Fungicide: Mancozeb at 1.35 kg in 438 l on 3 occasions. Insecticide: Demeton-s-methyl at 245 g applied with first mancozeb application.

Cultivations, etc.: Ploughed: 1 Oct, 1970. NPK applied to F1 plots: 6 Apr, 1971. NPK applied to F2 plots, all plots rotary cultivated: 20 Apr. Potatoes hand planted: 21 Apr. Weedkiller applied: 11 May. Fungicide plus insecticide applied: 24 June. Fungicide applied: 14 Aug, 16 Aug*. Sprayed with undiluted BOV at 168 l: 16 Sept. Lifted: 27 Sept. Variety: King Edward. Previous crops: Spring wheat 1969, fallow 1970.

* Because the spray on 14 Aug was followed by heavy rain.

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NOTE: After harvest a sample from the produce of each plot was graded into 6 sizes.

Standard errors per plot. Total tubers, tonnes/hectare.
Whole plot: 3.58 or 7.1% (21 d.f.)
Sub plot: 2.81 or 5.6% (72 d.f.)

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71/R/P/10

SUMMARY OF RESULTS

TOTAL TUBERS: TONNES/HECTARE

	S	L	F1	F2	3	4	5	6	Mean
	(±1.26)		(±1.26)			(1) and (2)			(±0.89)
N	51.0	54.4	51.2	54.2	54.6	52.2	51.6	52.4	52.7
W	46.5	49.4	46.3	49.6	49.5	48.6	46.9	46.8	48.0
			(±1.26)			(1) and (2)			(±0.89)
		S	47.6	49.9	50.9	48.7	47.5	47.8	48.8
		L	49.9	53.9	53.2	52.1	51.0	51.4	51.9
						(1) and (2)			(±0.89)
				F1	50.6	48.9	47.5	48.0	48.8
				F2	53.5	51.9	51.1	51.2	51.9
Mean (±0.50)					52.1	50.4	49.3	49.6	50.3

(1) (±1.08) For use in vertical and diagonal comparisons only
(2) (±0.70) For use in horizontal and interaction comparisons only

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% WARE: 4.44 CM (1.75 INCH) RIDDLE

	S	L	F1	F2	3	4	5	6	Mean
N	69.0	69.0	67.5	70.5	62.2	67.0	71.1	75.5	69.0
W	75.5	74.4	74.8	75.1	70.5	73.4	75.2	80.7	75.0
		S	71.8	72.7	66.5	70.7	73.5	78.3	72.3
		L	70.5	72.9	66.3	69.7	72.9	78.0	71.7
				F1	64.0	70.0	72.1	78.4	71.1
				F2	68.8	70.4	74.3	77.9	72.8
Mean					66.4	70.2	73.2	78.1	72.0

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71/R/P/11

POTATOES

BLIGHT AND APHID REFERENCE PLOTS

Object: To study the separate and combined effects of sprays to control blight and aphids on potatoes - Whittlocks.

Design: 4 randomised blocks of 5 plots, split into 3.

Whole plot dimensions: 8.53 x 9.53. Sub plot area harvested: 0.00271

Treatments:
Whole plots: Sprayed with blight fungicide, as treatment (F), plot used for sampling (no yields recorded) and all combinations of:-
1. Fungicide: None (0), sprayed on 2 occasions with mancozeb at 1.35 kg in 449 l (F).
2. Aphicide: None (0), sprayed with demeton-s-methyl at 245 g in 449 l (A).

Sub plots:
3. Varieties: King Edward (KE), Majestic (M), Pentland Crown (PC).

Basal applications: 1510 kg (13:13:20). Weedkiller: Linuron at 0.84 kg in 438 l.

Cultivations, etc.: Ploughed: 1 Oct, 1970. Basal NPK applied: 6 Apr, 1971. Plots rotary cultivated, potatoes machine planted: 19 Apr. Weedkiller applied: 11 May. Grubbed: 4 June. Rotary ridged: 7 June. Mancozeb treatment applied: 24 June. Demeton-s-methyl treatment applied: 25 June. Mancozeb treatment applied: 16 Aug. Haulm destroyed mechanically: 21 Sept. Lifted: 1 Oct. Previous crops: Spring wheat 1969, fallow 1970.

NOTE: Aphid counts were made and estimates made of the percentage of tubers blighted and of haulm destroyed by blight (Phytophthora infestans).

Standard errors per plot.
Total tubers, tonnes/hectare: Whole plot: 2.02 or 3.7% (9 d.f.)
Sub plot: 2.60 or 4.8% (24 d.f.)

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71/R/P/11

SUMMARY OF RESULTS

TOTAL TUBERS: TONNES/HECTARE

	O	A	KE	M	PC	Mean
	(±1.01)			(1) and (2)		(±0.71)
O	55.5	53.4	50.7	57.9	54.8	54.4
F	53.0	55.0	51.2	55.9	54.9	54.0
				(1) and (2)		(±0.71)
		O	50.9	57.4	54.5	54.2
		A	51.0	56.4	55.2	54.2
Mean (±0.65)			50.9	56.9	54.8	54.2

(1) (±1.03) For use in vertical and diagonal comparisons only
(2) (±0.92) For use in horizontal and interaction comparisons only

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71/R/P/11

% WARE: 3.81 CM (1.5 INCH) RIDDLE

	O	A	KE	M	PC	Mean
O	93.5	94.2	91.4	94.4	95.7	93.9
F	94.1	94.9	92.4	95.7	95.5	94.5
		O	91.8	94.5	95.2	93.8
		A	92.0	95.6	96.0	94.6
Mean			91.9	95.0	95.6	94.2

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71/R/P/13

POTATOES

COMPARISON OF FUNGICIDES

Object: To test the effects of organo-tin fungicides on yield and foliar blight (Phytophthora infestans) of potatoes - Fosters Corner.

Design: 6 x 6 Latin square.

Whole plot dimensions: 4.27 x 10.7. Area harvested: 0.00152.

Treatments:

No fungicide	(O)
Fentin acetate at 112 g plus maneb at 34 g	(1AM)
Fentin acetate at 336 g plus maneb at 112 g	(3AM)
Fentin acetate at 112 g plus maneb at 34 g plus 11.2 kg wax	(1AMW)
Dibutyltin diacetate at 785 g	(D)
Fentin sulphide at 392 g	(S)

All the fungicides were applied, on two occasions, in 785 l.

Basal applications: 1506 kg (13:13:20). Weedkiller: Linuron at 0.84 kg in 427 l. Insecticide: Demeton-s-methyl at 245 g in 438 l.

Cultivations, etc.: Ploughed: 28 Sept, 1970. Basal NPK applied: 30 Mar, 1971. Rotary cultivated, potatoes machine planted: 5 Apr. Weedkiller applied: 10 May. Grubbed: 3 June. Rotary ridged: 5 June. Insecticide applied: 25 June. Fungicide sprays applied: 27 July, 17 Aug. Haulm destroyed mechanically: 8 Sept. Sprayed with undiluted BOV at 168 l: 15 Sept. Lifted: 4 Oct. Variety: King Edward. Previous crops: Barley 1969, fallow 1970.

Standard error per plot.
Total tubers, tonnes/hectare: 2.14 or 4.5% (20 d.f.)

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71/R/P/13

SUMMARY OF RESULTS

	1AM	3AM	1AMW	D	S	Mean
TOTAL TUBERS: TONNES/HECTARE						
		(±0.88)				
46.4	45.9	50.1	46.8	46.6	48.4	47.4
% WARE: 3.81 CM (1.5 INCH) RIDDLE						
93.4	93.0	94.0	92.9	93.8	93.0	93.3

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71/R/P/15

POTATOES

ETHREL AND N

Object: To study the effects of soaking potato seed in 'Ethrel', at a range of nitrogen levels, on yield and bulking rate of early potatoes - Long Hoos III.

Design: 4 blocks of 9 plots, randomisation restricted.

Whole plot dimensions: 2.84 x 7.62. Area harvested: 0.00033.

Treatments: All combinations of:-
1. 'Ethrel'* (seed soaked before planting): 0, 60, 120 mg per l.
2. Nitrogen: 75, 150, 225 kg.

* 2-chloroethylphosphonic acid.

Basal applications: 1250 kg (0:14:28). Weedkiller: Linuron at 0.84 kg in 427 l. Fungicide: Mancozeb at 1.4 kg in 438 l. Insecticide: Demeton-s-methyl at 0.25 kg applied with the mancozeb.

Cultivations, etc.: Ploughed: 30 Sept, 1970. N and basal PK applied: 5 Apr, 1971. Rotary cultivated: 13 Apr. Potatoes machine planted: 15 Apr. Weedkiller applied: 10 May. Grubbed: 3 June. Earthed up: 4 June. Insecticide and fungicide applied: 24 June. Haulm destroyed mechanically: 11 Aug. Lifted by hand: 12 Aug. Variety: Arran Pilot. Previous crops: Barley 1969, fallow 1970.

NOTE: Samples were taken throughout the growing season for estimation of leaf areas, tuber numbers and tuber size distribution.

Standard error per plot.
Total tubers, tonnes/hectare: 4.15 or 12.2% (24 d.f.)

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71/R/P/15

SUMMARY OF RESULTS

N: KG/HA

	75	150	225	Mean
	TOTAL TUBERS: TONNES/HECTARE			
ETHREL MG		(±2.07)		(±1.20)
0	29.3	34.9	36.6	33.6
60	28.4	35.2	36.1	33.2
120	32.0	35.7	38.5	35.4
Mean (±1.20)	29.9	35.3	37.1	34.1

% WARE: 3.81 CM (1.5 INCH) RIDDLE

ETHREL MG				
0	57.5	67.2	70.3	65.0
60	54.8	66.5	72.4	64.6
120	62.0	71.0	75.1	69.4
Mean	58.1	68.2	72.6	66.3

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71/R/SC/1

SWEET CORN

SEED SPACING AND N

Object: To study the effects of seed spacing and levels of nitrogen on yield of sweet corn - Long Hoos V 1.

Design: 4 randomised blocks of 12 plots.

Whole plot dimensions: 2.44 x 5.18.

Treatments: All combinations of:
1. Seed spacing: Seed 7.6 cm (3 inches), 15.2 cm (6 inches) 30.5 cm (12 inches) apart in rows 61.0 cm (2 feet) apart.
2. Nitrogen: None, 63, 126, 188 kg N as 'Nitro-Chalk'.

Basal applications: 1255 kg (0:14:28). Weedkiller: Atrazine at 1.68 kg in 337 l. Insecticide: Phorate granules at 1.8 kg a.i. applied by hand-blower.

Cultivations, etc.: Basal PK applied: 27 Oct, 1970. Ploughed: 29 Oct. Rotary cultivated: 4 May, 1971. Seed precision drilled: 5 May. N applied: 18 May. Weedkiller and insecticide applied: 21 May. Harvested: 16-28 Sept. Variety: Early King. Previous crops: Potatoes 1969, barley 1970.

NOTE: Because phorate granules were irregularly applied a subsequent attack of frit fly (Oscinella frit) was only controlled on parts of plots. Yields were therefore not taken.

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71/R/K/1

KALE

VIRUS CONTROL

Object: To study the effects of insecticides on virus infection and yield of kale - Great Field I.

Design: 4 randomised blocks of 4 plots.

Whole plot dimensions: 10.7 x 10.7. Area harvested: 0.00114.

Treatments: Insecticides:-
All combinations of:
(1) Menazon: None (0), 'Saphicol' at 1.05 l in 674 l (M)
(2) BHC: None (0), 0.21 kg in 674 l (B)
The treatments were applied on 3 occasions (17 June, 16 July, 19 Aug).

Basal applications: 251 kg (0:20:20), 942 kg (20:10:10). Weedkiller: Linuron at 0.84 kg in 427 l.

Cultivations, etc.: Ploughed: 2 Nov, 1970. PK applied: 3 Apr, 1971. NPK applied: 5 Apr. Seed drilled at 2.24 kg: 7 Apr. Weedkiller applied: 22 May. Singled: 2 June. Harvested: 17 Dec. Variety: Maris Kestrel. Previous crops: Spring wheat 1969, spring beans 1970.

NOTE: Observations were made on aphid infestation and virus infection.

Standard error per plot.
Fresh weight, tonnes/hectare: 10.01 or 13.4% (9 d.f.)

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71/R/K/1

SUMMARY OF RESULTS

FRESH WEIGHT: TONNES/HECTARE

	O	B	Mean
	(±5.01)		(±3.54)
O	76.2	76.1	76.1
M	72.5	74.0	73.3
Mean (±3.54)	74.3	75.0	74.7

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71/R/BS/1

BRUSSELS SPROUTS

APHIDS AND VIRUS

Object: To study the effects of different times of applying insecticide on the yield of brussels sprouts and the incidence of aphids and virus - Garden Plot 11.

Design: 8 randomised blocks of 4 plots.

Whole plot dimensions: 6.10 x 4.57. Area harvested: 0.00046.

Treatments: Demeton-s-methyl at 326 g in 674 l, (by knapsack sprayer)
applied early on 18 June (E)
applied late on 24 Aug (L)
applied early (18 June), in mid-season (29 July), and late (24 Aug) (EML)

Basal applications: 565 kg (0:20:20), 628 kg 'Nitro-Chalk'.

Cultivations, etc.: PK applied: 27 Nov, 1970. Ploughed: 11 Dec. Seed drilled at 4.2 kg 'Nitro-Chalk' broadcast: 28 Apr, 1971. Singled: 14 June. Sampled for yield: 8 Nov. Variety: Roem Kloosterburen. Previous crops: Sweet corn 1969, potatoes 1970.

NOTE: Aphid counts were made and virus incidence assessed.

Standard error per plot.
Sprouts, tonnes/hectare: 2.50 or 24.6% (19 d.f.)

SUMMARY OF RESULTS

SPROUTS, TONNES/HECTARE

O	E	L	EML	Mean
	(±0.89)			
10.7	10.3	9.5	10.3	10.2

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71/R/SB/1

SUGAR BEET

ETHREL AND PRE-TREATMENT

Object: To study the effects of 'Ethrel'* and different pre-treatments to seedlings, on yield of sugar beet - Garden Plot 3.

* 2-chloroethylphosphonic acid.

Design: 4 randomised blocks of 3 plots split into 2.

Whole plot dimensions: 12.2 x 3.05. Sub plot area harvested: 0.00012.

Treatments: All combinations of:-
Whole plots: 1. Pre-treatment+: Drilled seed - no pre-treatment (D), planted seedlings pre-treated at 20° C (P1), at 25° C (P2).
Sub plots: 2. 'Ethrel': None (0), sprayed at 2.91 kg in 224 l (E).

+ With heat and artificial light for 16 hours per day for 21 days at each temperature.

Basal applications: 565 kg (0:20:20) ploughed in, 673 kg (20:10:10 + boron) in the seedbed. Insecticide: Demeton-s-methyl at 245 g in 337 l.

Cultivations, etc.: Basal PK applied and ploughed in: 27 Nov, 1970. Ploughed: 11 Dec. Basal PK plus boron applied: 31 Mar, 1971. D plots drilled at 10.1 kg: 2 Apr. Remaining plots rotary cultivated, P2 plots planted: 10 May. P1 plots planted: 11 May. Insecticide applied: 7 July. 'Ethrel' applied: 14 July. Lifted: 11 Oct. Variety: Klein E. Previous crops: Fallow 1969, cereals 1970.

NOTES: (1) The distance between rows was 50.8 cms (20 ins).
(2) Monthly samples were taken for leaf area assessments and dry weights.

Standard errors per plot. Roots, tonnes/hectare:
Whole plot: 1.51 or 3.2% (6 d.f.)
Sub plot: 8.81 or 18.6% (9 d.f.)

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71/R/SB/1

SUMMARY OF RESULTS

ROOTS: TONNES/HECTARE

	O	E	Mean
	(1) and (2)		(±0.76)
D	48.6	38.6	43.6
P1	53.1	49.1	51.1
P2	50.1	45.6	47.8
Mean (±2.54)	50.6	44.4	47.5

(1) (±3.21) For use in vertical and diagonal comparisons only
(2) (±4.41) For use in horizontal and interaction comparisons only

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71/R/G/1

GRASS

WEEDKILLER AND AQUEOUS N

Object: To study the effects of a combined spray of liquid nitrogen fertiliser and a hormone weedkiller as a top dressing on new grass - Long Hoos III.

Design: 4 randomised blocks of 28 plots.

Whole plot dimensions: 2.74 x 2.13. Area harvested: 0.00022.

Treatments. (Applied per cut): All combinations of :-

1. Weedkiller (dichlorprop/MCPA): None (H0), 1.4 (H1), 2.8 (H2), 4.2 (H3) kg total a.e. (using fan jet size 00).
2. Forms of nitrogen: Solid, as 'Nitro-Chalk' 21% N applied immediately after the weedkiller (S), liquid, as urea/ammonium nitrate (26% N), mixed with the weedkiller (L) (using fan jet size 00).
3. Levels of nitrogen: 37.7 (N1), 75.3 (N2), 113.0 (N3) kg N, together with 4 additional treatments.
   L1N3 H0, L1N3 H1, L1N3 H2, L1N3 H3 where fan jet size 1 was used (L1).

NOTE: The weedkiller was applied in 337 l where solid fertiliser was used. The liquid fertiliser (with or without weedkiller) was applied as a spray at 112, 225 and 337 l for rates 1, 2 and 3 respectively.

Basal applications: 750 kg (6:15:15) broadcast.

Cultivations, etc.: Spring-tine cultivated: 17 Sept, 1970. Seed drilled at 56 kg in rows 15.2 cm (6 inches) apart, basal NPK applied: 18 Sept. Grass lightly topped: 22 Apr, 1971. All treatments applied: 29 Apr. Cut: 28 May. All treatments re-applied: 9 June. Cut: 21 July. All treatments re-applied: 2 Aug. Cut: 21 Oct. Variety: S24 Perennial Ryegrass. Previous crops: Barley 1969, fallow 1970.

NOTE: Scores were made for leaf scorch. The percentage of N in the dry grass was measured for each cut.

Standard errors per plot. Dry matter, tonnes/hectare:

1st cut:	0.704 or 11.2% (69 d.f.)
2nd cut:	0.395 or 9.8% (69 d.f.)
3rd cut:	0.331 or 10.9% (69 d.f.)
Total of 3 cuts:	0.918 or 6.9% (69 d.f.)

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71/R/G/1

SUMMARY OF RESULTS

1ST CUT. DRY MATTER: TONNES/HECTARE

N: KG/HA

	S	L	37.7	75.3	113.0	Mean
	(±0.203)			(±0.249)		(±0.144)
H0	6.61	6.04	6.23	6.25	6.49	6.33
H1	6.52	6.38	6.37	6.43	6.54	6.45
H2	6.46	5.95	5.84	6.14	6.64	6.21
H3	6.42	5.78	5.87	6.21	6.21	6.10
				(±0.176)		(±0.102)
		S	6.49	6.45	6.56	6.50
		L	5.67	6.07	6.38	6.04
Mean (±0.124)			6.08	6.26	6.47	6.27

L1N3 H0	6.44
L1N3 H1	6.68
L1N3 H2	6.62
L1N3 H3	6.03

General mean: 6.29
Mean D.M.%: 17.0

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71/R/G/1

2ND CUT. DRY MATTER: TONNES/HECTARE

N: KG/HA

	S	L	37.7	75.3	113.0	Mean
	(±0.114)			(±0.140)		(±0.081)
H0	4.85	3.71	3.43	4.40	5.00	4.28
H1	4.53	3.52	3.01	4.15	4.92	4.03
H2	4.43	3.57	3.01	4.07	4.92	4.00
H3	4.34	3.39	2.59	4.17	4.83	3.87
				(±0.099)		(±0.057)
		S	3.56	4.62	5.43	4.54
		L	2.46	3.78	4.41	3.55
Mean (±0.070)			3.01	4.20	4.92	4.04

L1N3 H0	4.48
L1N3 H1	4.69
L1N3 H2	4.65
L1N3 H3	4.54

General mean: 4.12
Mean D.M.%: 24.1

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71/R/G/1

3RD CUT. DRY MATTER: TONNES/HECTARE

N: KG/HA

	S	L	37.7	75.3	113.0	Mean
	(±0.096)			(±0.117)		(±0.068)
H0	3.50	2.74	2.25	3.28	3.83	3.12
H1	3.41	2.80	2.21	3.40	3.71	3.11
H2	3.21	2.64	2.08	3.16	3.54	2.93
H3	3.33	2.69	2.11	3.32	3.60	3.01
				(±0.083)		(±0.048)
		S	2.57	3.65	3.87	3.36
		L	1.75	2.93	3.47	2.72
Mean (±0.058)			2.16	3.29	3.67	3.04

L1N3 H0	3.53
L1N3 H1	3.61
L1N3 H2	3.57
L1N3 H3	3.17

General mean: 3.10
Mean D.M.%: 26.6

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71/R/G/1

TOTAL OF 3 CUTS. DRY MATTER: TONNES/HECTARE

N: KG/HA

	S	L	37.7	75.3	113.0	Mean
	(±0.265)			(±0.325)		(±0.187)
H0	14.96	12.49	11.91	13.93	15.33	13.72
H1	14.46	12.70	11.60	13.97	15.17	13.58
H2	14.10	12.17	10.93	13.37	15.10	13.14
H3	14.08	11.86	10.57	13.70	14.64	12.97
				(±0.230)		(±0.133)
		S	12.63	14.71	15.86	14.40
		L	9.88	12.78	14.26	12.31
Mean (±0.162)			11.25	13.75	15.06	13.35

L1N3 H0	14.45
L1N3 H1	14.98
L1N3 H2	14.84
L1N3 H3	13.74

General mean: 13.5
Mean D.M.%: 22.6

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71/R/M/4

BARLEY

NP FERTILISER (PHENYLPHOSPHONIC ACID) FOR BARLEY

Object: To study the effects of phenylphosphonic acid on barley - West Barnfield I.

Design: 3 randomised blocks of 18 plots.

Whole plot dimensions: 1.83 x 3.66. Area harvested: 0.00026.

Treatments: All combinations of:-
1. Varieties: Julia (J), Sultan (S).
2. Nitrogen: 56 kg (N1), 112 kg (N2) as 'Nitro-Chalk'.
3. Seed treated with phenylphosphonic acid: Untreated (P0), 0.25 (P1), 0.5 (P2), 1.0 (P4) % of weight of seed.

Two additional treatments were included, SN1A1, SN2A1 (where A1 was phenylphosphonic acid at 2% sprayed over seed by Scottish Agricultural Industries).

Basal applications: 336 kg (0:20:20). Weedkillers: Paraquat at 0.28 kg ion in 225 l, and later at 0.56 kg ion in 225 l. 2,4-D at 0.56 kg plus dichlorprop at 2.24 kg in 449 l.

Cultivations, etc.: Paraquat applied: 19 Sept, 1970. Ploughed: 24 Sept. Paraquat applied: 5 Feb, 1971. N and basal PK applied, seed drilled at 191 kg: 12 Mar. 2,4-D/dichlorprop applied: 5 May. Harvested by hand: 17 Aug. Previous crops: Spring oilseed rape 1969, winter wheat 1970.

Standard error per plot.
Barley: Grain, tonnes/hectare: 0.383 or 9.6% (30 d.f.)

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71/R/M/4

SUMMARY OF RESULTS

	N1	N2	P0	P1	P2	P4	Mean
	GRAIN: TONNES/HECTARE						
	(±0.111)		(±0.156)				(±0.078)
J	4.41	4.81	4.57	4.71	4.70	4.45	4.61
S	3.50	3.30	3.50	3.37	3.49	3.24	3.40
			(±0.156)				(±0.078)
		N1	3.96	4.18	3.88	3.80	3.96
		N2	4.11	3.90	4.31	3.89	4.05
Mean (±0.111)			4.04	4.04	4.09	3.85	4.00

SN1A1 3.55 (±0.221)
SN2A1 3.58

	STRAW: TONNES/HECTARE						
J	4.85	5.73	5.32	5.33	5.15	5.37	5.29
S	4.05	4.45	4.33	4.35	4.37	3.95	4.25
		N1	4.48	4.67	4.35	4.29	4.45
		N2	5.17	5.00	5.17	5.03	5.09
Mean			4.82	4.84	4.76	4.66	4.77

SN1A1 4.08
SN2A1 4.67

General mean: Grain: 3.96
Straw: 4.73

Mean D.M. %: Grain: 84.3
Straw: 86.7

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71/R/M/5

MIXED CROPS

AMIDOPHOSPHATES FOR BARLEY (RESOWN WITH RYEGRASS), POTATOES AND KALE

Object: To compare different forms of NP fertiliser on a range of crops - West Barnfield I.

Design: 3 randomised blocks of 9 plots for each crop.

Whole plot dimensions:
Barley (resown with ryegrass): 3.66 x 1.83. Area harvested: 1st cut, 0.00037, 2nd cut, 0.00038, 3rd cut, 0.00028.
Potatoes: 3.66 x 2.85. Area harvested: 0.00048.
Kale: 3.66 x 2.13. Area harvested: 1st and 2nd cut, 0.00005, 3rd cut, 0.00026.

Treatments: None (0) and additional treatments DS, TS (Not applied to barley or ryegrass - see note at end),
where T = Phosphoryltriamide
D = Sodium di-amidophosphate
S = Sprayed on to the crop. Rates: To give 11.2 kg P for potatoes, 8.41 kg P for kale.
and all combinations of:-
1. NP fertilisers: Ammonium phosphate (A), sodium di-amidophosphate (D), urea phosphate (U).
2. Rates of NP fertilisers: To give:-
To barley (resown with ryegrass): 11.2 kg (1), 22.4 kg (2) P.
To potatoes: 22.4 kg (1), 44.8 kg (2) P.
To kale: 16.8 kg (1), 33.6 kg (2) P.

Basal applications: Weedkiller: Paraquat at 0.28 kg in 225 l, and later at 0.56 kg ion in 225 l.

Standard applications:
Barley (resown with ryegrass): 56 kg N, 56 kg K in seedbed for barley, 56 kg N to ryegrass after the first cut and 112 kg N after the second.
Potatoes: 112 kg N, 168 kg K. Weedkiller: Linuron at 0.84 kg plus paraquat at 0.42 kg ion in 562 l. Fungicide plus insecticide: Mancozeb at 1.35 kg plus menazon ('Saphicol' at 0.70 l) in 449 l on 3 occasions.
Kale: 112 kg N, 112 kg K, plus 112 kg N in mid-season.
Insecticide: Menazon ('Saphicol' at 0.70 l in 449 l).
For all crops N was applied as 'Nitro-Chalk', K as muriate of potash.

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Cultivations, etc.: Paraquat applied: 19 Sept, 1970. Ploughed: 24 Sept. Paraquat applied: 5 Feb, 1971.
Barley (resown with ryegrass): NP and NK fertilisers applied, barley seed drilled at 1.91 kg: 1 Apr, 1971. Resown with ryegrass: 28 Apr. Cut, N applied: 8 June. Cut: 14 July. N applied: 23 July. Cut: 7 Sept. Variety: Western Wolths. (Barley: Julia).
Potatoes: NP and NK fertilisers applied, potatoes planted: 13 Apr, 1971. Weedkiller applied: 12 May. Fungicide plus insecticide applied: 16 June. Amidophosphate sprays applied: 22 June. Fungicide plus insecticide applied: 6 July, 28 July. Lifted: 1 Sept. Variety: King Edward.
Kale: NP and NK fertilisers applied, seed drilled: 2 Apr, 1971. Amidophosphate sprays applied, midseason N applied: 22 June. Insecticide applied: 6 July. Harvested: 5 Oct. Variety: Thousand Headed.
Previous crops: Spring Oilseed Rape 1969, winter wheat, 1970.

NOTE: After sowing the barley there was considerable bird damage. Ryegrass was sown between the rows and the barley cut as a green crop. Amidophosphate sprays were not applied to these crops.

Standard errors per plot.
Barley (resown with ryegrass): Grain, tonnes/hectare:

1st cut:	0.247	or 21.9% (16 d.f.)
2nd cut:	0.240	or 7.6% (16 d.f.)
3rd cut:	0.123	or 6.4% ((16 d.f.)
Total of 3 cuts:	0.266	or 4.3% (16 d.f.)

Potatoes: Total tubers, tonnes/hectare: 3.20 or 8.9% (16 d.f.)
Kale: Dry matter, tonnes/hectare: 0.942 or 9.8% (16 d.f.)

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71/R/M/5

SUMMARY OF RESULTS

BARLEY AND RYEGRASS, DRY MATTER: TONNES/HECTARE

0	A1	A2	D1	D2	U1	U2	Mean
			1ST CUT				
0.91 (±0.082)	1.18	1.19	1.42 (±0.143)	1.55	0.99	1.07	1.13
			2ND CUT				
3.21 (±0.080)	2.96	3.29	2.97 (±0.139)	3.24	3.06	3.20	3.15
			3RD CUT				
1.85 (±0.041)	2.03	1.90	1.84 (±0.071)	2.05	1.93	2.02	1.92
			TOTAL OF 3 CUTS				
5.98 (±0.089)	6.17	6.37	6.22 (±0.153)	6.84	5.98	6.30	6.20

Mean D.M. %: 1st cut: 15.5
2nd cut: 22.4
3rd cut: 37.6
Total of 3 cuts: 25.2

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71/R/M/5

0	A1	A2	D1	D2	DS	U1	U2	TS	Mean
POTATOES, TOTAL TUBERS: TONNES/HECTARE									
				(±1.85)					
34.5	36.2	37.6	37.0	37.2	34.1	31.5	38.7	35.7	35.8
KALE, DRY MATTER: TONNES/HECTARE									
				(±0.544)					
8.20	8.97	9.28	9.53	9.92	9.47	9.53	11.56	10.19	9.63

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71/E/1

METEOROLOGICAL RECORDS 1971 - ROTHAMSTED

(Departure from long-period means in brackets)

Month	Total sunshine: hours	Mean temperature: °C Air(1)	Dew point	In ground 30cm.	In ground 100cm.	Ground(2) frosts	Total rainfall:mm. 0.000405 HA (1/1000 acre) gauge	Rain(3) days	Drainage through 50.8 cm (20 in.) soil:mm.	Wind(4) miles per hour
Jan	30.8 (-21.2)	3.7 (+0.8)	2.3	4.8	6.3	14	86 (+22)	19	90.4	5.6
Feb	74.6 (+ 6.4)	4.1 (+0.7)	1.6	4.8	6.1	21	27 (-22)	9	18.5	5.1
Mar	95.5 (-20.5)	4.4 (-0.8)	1.0	5.2	5.8	18	68 (+20)	19	38.1	6.1
Apr	122.5 (-29.7)	7.3 (-0.4)	3.4	7.5	6.9	13	38 (-11)	10	13.7	6.6
May	227.6 (+33.6)	11.5 (+0.4)	6.8	11.5	9.3	6	51 (- 4)	11	10.7	4.8
June	131.2 (-71.8)	12.3 (-1.8)	9.0	13.1	11.3	0	105 (+49)	14	64.5	5.8
July	222.2 (+31.5)	16.8 (+0.9)	12.7	16.2	13.5	0	16 (-49)	7	TRACE	3.9
Aug	130.1 (-49.5)	15.7 (+0.1)	12.6	16.2	14.5	0	67 (+ 1)	19	9.7	4.9
Sept	166.5 (+21.6)	13.9 (+0.5)	11.2	14.3	14.1	1	14 (-47)	4	TRACE	3.3
Oct	142.6 (+39.8)	11.1 (+1.5)	9.3	11.9	12.7	7	75 (+ 1)	9	44.2	4.8
Nov	84.0 (+23.3)	5.3 (-0.5)	3.8	7.7	10.0	17	71 (- 1)	16	45.5	5.6
Dec	25.7 (-19.2)	5.7 (+2.1)	4.3	6.7	8.1	10	20 (-47)	7	14.0	5.4
Year	1453.3 (-55.7)	9.3 (+0.3)	6.5	10.0	9.9	107	638 (-88)	144	349.3	5.1

(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.

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METEOROLOGICAL RECORDS 1971 - WOBURN

(Departure from long-period means in brackets)

Month	Total sunshine: hours	Mean temperature: °C Air(1)	Dew point	In ground 30cm.	In ground 100cm.	Ground(2) frosts	Total rainfall:mm 12.7 cm (5 in.gauge)	Rain(3) days	Wind(4) miles per hour
Jan	44.9 (- 6.6)	4.1 (+1.1)	2.9	4.5	6.6	12	87 (+33)	18	5.4
Feb	68.9 (+ 2.2)	4.1 (+0.8)	2.2	4.7	6.3	19	15 (-25)	7	4.7
Mar	84.6 (-33.2)	4.5 (-0.9)	2.5	5.3	6.1	17	48 (+ 7)	14	5.2
Apr	108.7 (-35.9)	7.3 (-0.8)	3.8	7.9	7.3	14	33 (-12)	7	4.7
May	223.9 (+39.9)	11.1 (0.0)	7.1	12.2	9.6	11	35 (-19)	13	3.7
June	123.9 (-75.9)	12.1 (-2.3)	9.1	13.6	11.5	0	84 (+35)	13	4.9
July	230.1 (+50.0)	16.7 (+0.7)	12.7	17.6	14.1	1	37 (-20)	6	3.3
Aug	135.6 (-36.1)	15.8 (0.0)	12.5	16.8	15.1	0	86 (+23)	19	4.9
Sept	152.2 (+17.3)	13.3 (-0.4)	11.6	14.8	14.7	5	16 (-37)	5	2.9
Oct	147.8 (+46.2)	11.2 (+1.2)	8.9	12.1	13.3	7	79 (+25)	8	5.3
Nov	96.2 (+37.5)	5.7 (-0.6)	3.6	7.2	10.5	15	67 (+ 2)	13	5.0
Dec	30.1 (-14.4)	5.9 (+2.1)	4.2	6.5	8.4	11	21 (-32)	10	5.6
Year	1446.9 (-9.0)	9.3 (+0.1)	6.7	10.3	10.3	112	608 (-20)	133	4.6

(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.

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METEOROLOGICAL RECORDS 1971 - 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) miles per hour
Jan	3.8	0.6	4.3	13	86	17	6.6
Feb	4.4	0.0	5.0	13	20	8	5.8
Mar	4.3	0.0	5.1	14	39	18	6.9
Apr	6.9	2.8	7.9	9	15	5	6.4
May	11.2	6.7	12.5	3	23	8	4.1
June	11.9	8.9	12.7	0	83	12	5.2
July	16.3	13.9	18.2	0	76	6	3.0
Aug	16.7	13.3	17.2	0	60	15	4.4
Sept	14.6	11.1	15.3	0	39	5	3.7
Oct	11.7	8.9	11.8	5	62	10	5.7
Nov	6.5	4.4	7.0	12	102	17	7.0
Dec	6.0	4.4	5.0	7	29	9	6.2
Year	9.5	6.2	10.2	76	634	130	5.4

(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.

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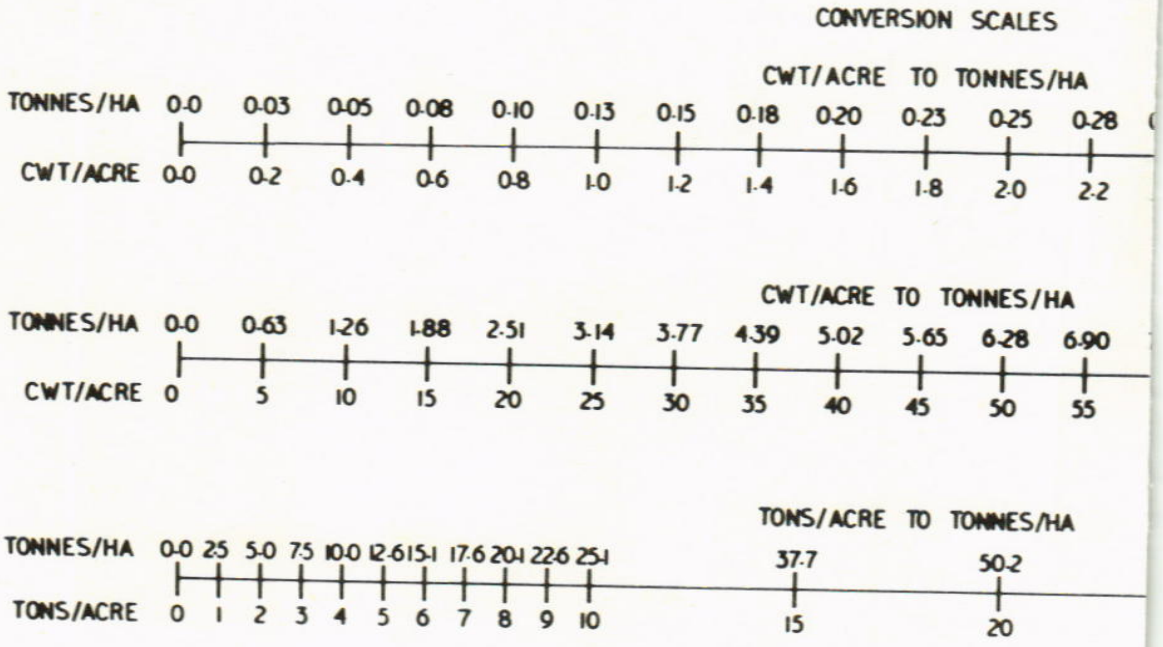
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CONVERSION FACTORS

Factors for the Conversion of Imperial to Metric Units

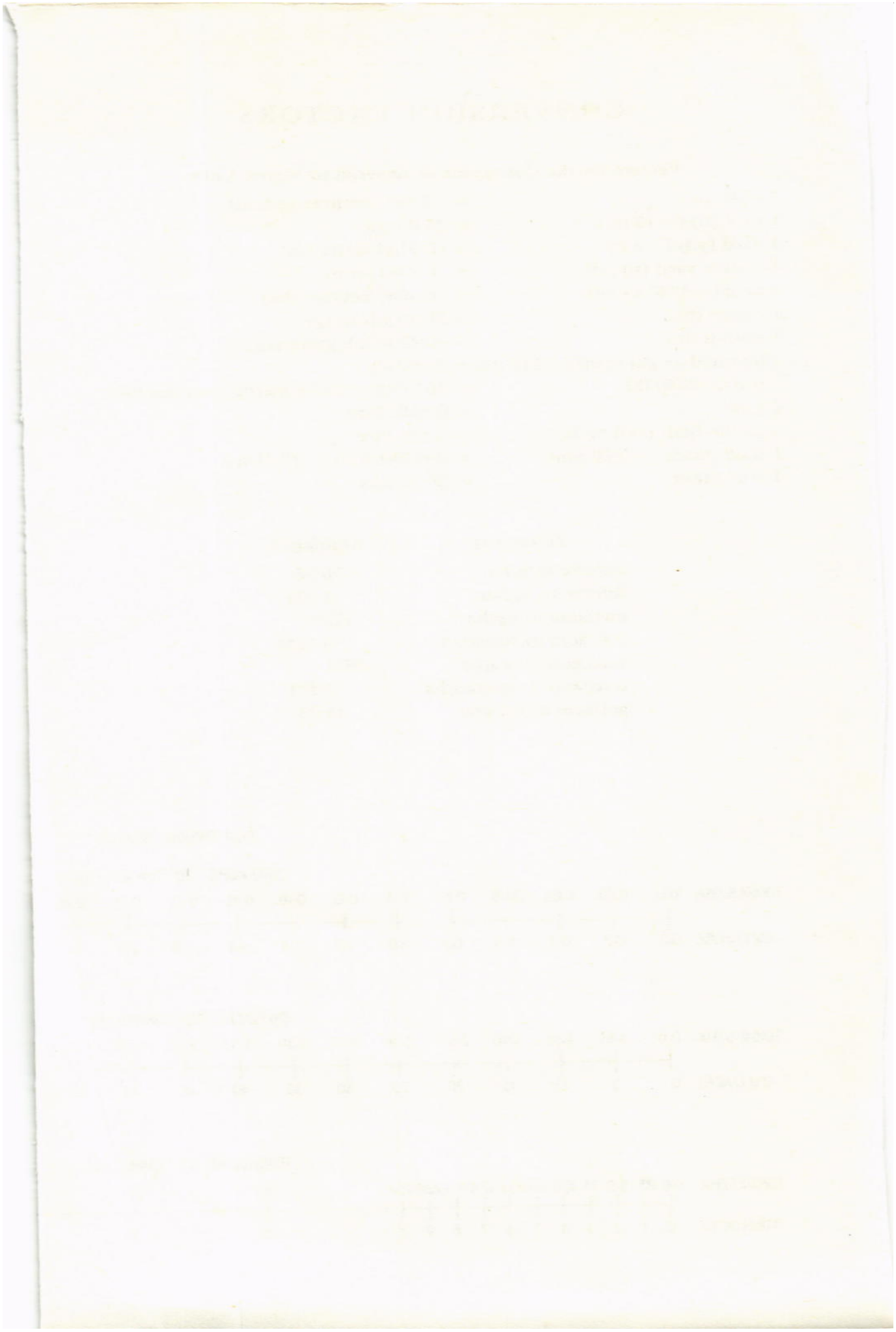
1 inch (in.)	= 2·540 centimetres (cm)
1 foot (ft) (=12 in.)	= 30·48 cm
1 yard (yd) (=3 ft)	= 0·9144 metre (m)
1 square yard (sq yd)	= 0·8361 sq m
1 acre (=4840 sq yd)	= 0·4047 hectare (ha)
1 ounce (oz)	= 28·35 grams (g)
1 pound (lb)	= 0·4536 kilogram (kg)
1 hundredweight (cwt) (=112 lb)	= 50·80 kg
1 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



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