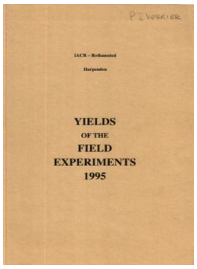
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ROTHAMSTED RESEARCH

Yields of the Field Experiments 1995

Full Table of Content



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P. J. VERRIER

IACR – Rothamsted

Harpenden

YIELDS

OF THE

FIELD

EXPERIMENTS

1995

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YIELDS

OF THE

FIELD

EXPERIMENTS

1995

This report is produced by members of the Statistics and Crop and Disease Management Departments. It includes only experiments at Rothamsted and Woburn. Only those experiments which have the determination of crop yields as an object are included. For many of these, other determinations are of equal or greater importance.

Published 1996

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CONVENTIONS 1995

For each experiment current treatments are shown with the factor and level names which are used in the tables.

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

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

The following conventions are observed unless otherwise stated.

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

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

All yields and plant numbers are per hectare.

The following abbreviations are used in variate headings:

Wheat, barley, oats, beans etc.

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

Sugar beet

Roots:	Roots (washed) (fresh weight)
Sugar %:	Sugar percentage of washed roots

Potatoes

Tubers	Unwashed (fresh weight)

All crops

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

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

'Nitro-Chalk' contains 27% N and 'Nitram' 34.5% N.

'34.5% N' means 34.5% N as ammonium nitrate.

'Dolomite' means magnesian limestone.

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

Cereal straw is removed unless otherwise stated.

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Tables of means

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

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

Standard errors

NOTES: (1) This report gives standard errors of differences, not of means.
(2) Annotations (e.g. * min rep, max-min, max rep) to S.E.Ds are only explained the first time they occur in any experiment.

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PESTICIDES USED

The following list of pesticides is based on The UK Pesticides Guide, C.A.B. International and British Crop Protection Council. Published by University Press, Cambridge.

KEY TO ABBREVIATIONS

A	Acaricide	**AD**	Adjuvant
D	Desiccant	**F**	Fungicide
GR	Growth regulator	**H**	Herbicide
I	Insecticide	**M**	Molluscicide
N	Nematicide		

TRADE NAME	FUNCTION	ACTIVE INGREDIENT
Actipron	AD	Adjuvant oil containing 97% refined mineral oil
Adjust	GR	620 g/l chlormequat
Ally	H	20 % w/w metsulfuron-methyl
Alpha Isoproturon 500	H	500 g/l isoproturon
Ashlade Adjuvant Oil	AD	Adjuvant oil containing 99% highly refined mineral oil
Ashlade Maneb Flowable	F	480 g/l maneb
Atlas Adjuvant Oil	AD	Adjuvant oil containing 95% refined mineral oil
Atlas Dimethoate 40	I,A	400 g/l dimethoate
Atlas Simazine	H	500 g/l simazine
Auger	H	500 g/l isoproturon
Avadex BW Granular	H	10 % w/w tri-allate
Barclay Eyetak	F	450 g/l prochloraz
Barclay Gallup	H	360 g/l glyphosate
Barclay Hurler	H	200 g/l fluroxypyr
Basagran	H	480 g/l bentazone
Baytan	F	3:25 % w/w fuberidazole + triadimenol
Benlate Fungicide	F	50 % w/w benomyl
Beret 050FS	F	50 g/l fenpiclonil
Birlane 24	I	240 g/l chlorfenvinphos
Bombardier	F	500 g/l chlorothalonil
Brasoran 50 WP	H	50 % w/w aziprotryne
Bravo 500	F	500 g/l chlorothalonil
Butisan S	H	500 g/l metazachlor
Calixin	F	750 g/l tridemorph
Campbell's Linuron 45% Flowable	H	450 g/l linuron
Carbate Flowable	F	500 g/l carbendazim (MBC)
Cerevax	F	378:23 g/l carboxin + thiabendazole
Cerevax Extra	F	300:20:25 g/l carboxin + imazalil + thiabendazole
Cheetah R	H	60 g/l fenoxaprop-ethyl
Cheetah Super	H	55 g/l fenoxaprop-P-ethyl
Corbel	F	750 g/l fenpropimorph
Cultar	GR	250 g/l paclobutrazol
Cyclone	F	94:300 g/l flutriafol + iprodione

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TRADE NAME	FUNCTION	ACTIVE INGREDIENT
Danadim Dimethoate 40	I,A	400 g/l dimethoate
Decis	I	25 g/l deltamethrin
Dow Shield	H	200 g/l clopyralid
Draza	M,I	4 % w/w methiocarb
Duplosan New System CMPP	H	600 g/l mecoprop-P
Eagle	H	75 % w/w amidosulfuron
Falcon	H	100 g/l propaquizafop
Farmon PDQ	H,D	80:120 g/l diquat + paraquat
Fastac	I	100 g/l alpha-cypermethrin
Folicur	F	250 g/l tebuconazole
Frigate	AD	800 g/l tallow amine ethoxylate
Fusilade 5	H	125 g/l fluazifop-P-butyl
Glyphogan	H	360 g/l glyphosate
Glytex	H	3.4:70 % w/w isoxaben + methabenzthiazuron
Gramoxone 100	H	200 g/l paraquat
Halo	F	375:47 g/l chlorothalonil + flutriafol
Harvest	H	150 g/l glufosinate-ammonium
Hispor 45 WP	F	20:25 g/l carbendazim + propiconazole
Hytane 500 SC	H	500 g/l isoproturon
Intracrop BLA	AD	52 % synthetic latex and 20 % alkyl phenol ethylene oxide condensate
Isoproturon 500	H	500 g/l isoproturon
Kerb Flo	H	400 g/l propyzamide
Laser	H	200 g/l cycloxydim
Legumex Extra	H	27:237:42.8 g/l benazolin + 2,4-DB + MCPA
Lentagran WP	H	45 % w/w pyridate
Leyclene	H	50:200:25 g/l bromoxynil + ethofumesate + ioxynil
Lindex-Plus FS	F,I	43:545:73 g/l fenpropimorph + gamma-HCH + thiram
Lo-gran 20 WG	H	20 % w/w triasulfuron
Lorate 20 DF	H	20 % w/w metsulfuron-methyl
Mallard 750 EC	F	750 g/l fenpropidin
Mixture B	AD	500:500 g/l nonyl phenol ethylene oxide condensate + primary alcohol ethylene oxide condensate
MSS Optica	H	600 g/l mecoprop
New 5C Cycocel	GR	645:32 g/l chlormequat + choline chloride
New Kotol	I	12.5 % w/w gamma-HCH
Opogard 500 SC	H	150:350 g/l terbuthylazine + terbutryn
Oxytril CM	H	200:200 g/l bromoxynil + ioxynil
Panoctine	F	300 g/l guazatine
Panther	H	50:500 g/l diflufenican + isoproturon
Patrol	F	750 g/l fenpropidin
Pirimicarb 50 DG	I	50 % w/w pirimicarb

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TRADE NAME	FUNCTION	ACTIVE INGREDIENT
Plover	F	250 g/l difenoconazole
Prelude 20LF	F	500 g/l prochloraz
Punch C	F	125:250 g/l carbendazim + flusilazole
Rappor	F	300 g/l guazatine
Rappor Plus	F	300:25 g/l guazatine + imazalil
Reglone	H,D	200 g/l diquat
Ripcord	I	100 g/l cypermethrin
Rizolex	F	10 % w/w tolclofos-methyl
Roundup	H	360 g/l glyphosate
Roundup Biactive	H	360 g/l glyphosate
Rovral Flo	F	250 g/l iprodione
Silvacur	F	250:125 g/l tebuconazole + triadimenol
Sportak 45	F	450 g/l prochloraz
Sprint	F	375:225 g/l fenpropimorph + prochloraz
Standon Diquat	H,D	200 g/l diquat
Starane 2	H	200 g/l fluroxypyr
Stefes Diquat	H,D	200 g/l diquat
Stefes IPU	H	500 g/l isoproturon
Sting CT	H	120 g/l glyphosate
Stomp 400	H	400 g/l pendimethalin
Super-Tin 4L	F	480 g/l fentin hydroxide
Tern 750 EC	F	750 g/l fenpropidin
Terpal	GR	155:305 g/l 2-chloroethylphosphonic acid + mepiquat chloride
Tigress	H	313:14 g/l diclofop-methyl + fenoxaprop-P-ethyl
Tilt Turbo 475 EC	F	125:350 g/l propiconazole + tridemorph
Topik 240EC	H	240 g/l clodinafop-propargyl
Treflan	H	480 g/l trifluralin
Tripart Defensor FL	F	500 g/l carbendazim (MBC)
Vassgro Spreader	AD	nonyl phenol-ethylene oxide condensates
Vindex	H	240:50 g/l bromoxynil + clopyralid
Vydate 10G	I,N	10 % w/w oxamyl
Yaltox	I,N	5 % w/w carbofuran

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95/R/BK/1

BROADBALK

Object: To study the effects of organic and inorganic manures on continuous w. wheat. From 1968 two three-year rotations were included: potatoes, beans, w. wheat and fallow, w. wheat, w. wheat. In 1979 the first rotation was changed to fallow, potatoes, w. wheat. In 1980 the second rotation reverted to continuous w. wheat. Since 1985 part of the second rotation has been added to the first to extend the rotation to fallow, potatoes, w. wheat, w. wheat, w. wheat.

The 152nd year, w. wheat, fallow and potatoes.

For previous years see 'Details' 1967 and 1973, Station Report for 1966, pp. 229-231, Station Report for 1968, Part 2, Station Report for 1982, Part 2, pp. 5-44 and 74-94/R/BK/1.

Areas harvested:

	Section	
Wheat:	0	0.00351
	1	0.00645
	2,3,6 and 7	0.00533
	8 and 9	0.00561
Potatoes:	4	0.00348

Treatments:

Whole plots

PLOT		Fertilizers and organic manures:-		
	Plot	Treatments until 1967	Treatments from 1968	Treatments from 1985
01DN4PK	01	-	D N2 P K	D N4 P K
21DN2	21	D	D N2	D N2
22D	22	D	D	D
030	03	None	None	None
05F	05	P K Na Mg	P K (Na) Mg	PK Mg
06N1F	06	N1 P K Na Mg	N1 P K (Na) Mg	N1 P K Mg
07N2F	07	N2 P K Na Mg	N2 P K (Na) Mg	N2 P K Mg
08N3F	08	N3 P K Na Mg	N3 P K (Na) Mg	N3 P K Mg
09N4F	09	N*1 P K Na Mg	N4 P K (Na) Mg	N4 P K Mg
10N2	10	N2	N2	N2
11N2P	11	N2 P	N2 P	N2 P
12N2PNA	12	N2 P Na	N2 P Na	N2 P Na
13N2PK	13	N2 P K	N2 P K	N2 P K
14N2PKMG	14	N2 P Mg	N2 P K Mg	N2 P K Mg
15N5F	15	N2 P K Na Mg	N3 P K (Na) Mg	N5 P K Mg
16N6F	16	N*2 P K Na Mg	N2 P K (Na) Mg	N6 P K Mg
17N0+3FH	17	N2(A)	N2 1/2(P K (Na) Mg)	N0+3 1/2(PK Mg)+
18N1+3FH	18	P K Na Mg(A)	N2 1/2(P K (Na) Mg)	N1+3 1/2(PK Mg)+
19(C)	19	C	C	(C) (since 1989)
20N2KMG	20	N2 K Na Mg	N2 K (Na) Mg	N2 K Mg

(A) Alternating

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95/R/BK/1

\+ This change since 1980. Treatments shown are those to w. wheat; autumn N alternates. Potatoes receive N3 1/2 (PK Mg) on both Plots 17 and 18.

N1,N2,N3,N4,N5,N6: 48, 96, 144, 192, 240, 288 kg N (as sulphate of ammonia until 1967, except N* which was nitrate of soda. All as 'Nitro-Chalk' in spring from 1968 to 1985, as 34.5% N since 1986.)

N0+3; N1+3: None in autumn + 144 kg N in spring; 48 kg N in autumn + 144 kg N in spring

P: 35 kg P as triple superphosphate in 1974 and since 1988, single superphosphate in other years

K: 90 kg K as sulphate of potash

Na: 55 kg Na as sulphate of soda

(Na): 16 kg Na as sulphate of soda until 1973

Mg: 30 kg Mg annually to Plot 14, 35 kg Mg every third year to other plots since 1974. All as kieserite since 1974, previously as sulphate of magnesia annually

D: Farmyard manure at 35 t

(C): Castor meal to supply 96 kg N until 1988, none since

F: P K (Na) Mg H: Half rate

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

SECTION	1/W29	9/W37	0/W44	8/W1	6/W18	5/F	3/W3	7/W1	4/P	2/W2
Section	1	9	0*	8+	6**	5	3	7	4	2
Year										
1968	W	W	W	W	F	W	W	P	W	BE
1969	W	W	W	W	W	F	W	BE	P	W
1970	W	W	W	W	W	W	F	W	BE	P
1971	W	W	W	W	F	W	W	P	W	BE
1972	W	W	W	W	W	F	W	BE	P	W
1973	W	W	W	W	W	W	F	W	BE	P
1974	W	W	W	W	F	W	W	P	W	BE
1975	W	W	W	W	W	F	W	BE	P	W
1976	W	W	W	W	W	W	F	W	BE	P
1977	W	W	W	W	F	W	W	P	W	BE
1978	W	W	W	W	W	F	W	BE	P	W
1979	W	W	W	W	W	W	F	W	P	F
1980	W	W	W	W	W	W	W	F	W	P
1981	W	W	W	F	W	W	W	P	F	W
1982	W	W	W	W	W	W	W	W	P	F
1983	W	W	W	W	W	W	W	F	W	P
1984	W	W	W	W	W	W	W	P	F	W
1985	W	W	W	W	W	F	W	W	P	W
1986	W	W	W	W	W	P	F	W	W	W
1987	W	W	W	W	W	W	P	W	W	F
1988	W	W	W	F	W	W	W	F	W	P
1989	W	W	W	W	W	W	W	P	F	W
1990	W	W	W	W	W	F	W	W	P	W

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95/R/BK/1

SECTION	1/W29	9/W37	0/W44	8/W1	6/W18	5/F	3/W3	7/W1	4/P	2/W2
Section	1	9	0*	8+	6**	5	3	7	4	2
Year										
1991	W	W	W	W	W	P	F	W	W	W
1992	W	W	W	W	W	W	P	W	W	F
1993	W	W	W	W	W	W	W	F	W	P
1994	W	W	W	F	W	W	W	P	F	W
1995	W	W	W	W	W	F	W	W	P	W

W = w. wheat, P = potatoes, BE = s. beans, F = fallow

* Straw incorporated since autumn 1986. ** No sprays except weedkillers since 1985. + No weedkillers.

NOTES: (1) For a fuller record of treatments see 'Details' etc.
(2) From autumn 1975 to autumn 1986, chalk was applied at 2.9 t each autumn to all plots in sets of Sections on a three-year cycle. Year 1: Sections 1,2,3. Year 2: Sections 6,7,8,9. Year 3: Sections 0,4,5. From autumn 1988 until autumn 1992 a five-year cycle was used. Year 1: Sections 1,3. Year 2: Sections 2,8. Year 3: Sections 7,9. Year 4: Sections 4,6. Year 5: Sections 0,5. None applied since autumn 1991.

Experimental diary:
All sections:
10-Oct-94 : **T** : Mg and Na applied.
11-Oct-94 : **T** : P and K applied.
13-Oct-94 : **T** : Farmyard manure applied.
: B : Ploughed and furrow pressed.
Cropped sections:
W. wheat:
24-Aug-94 : **T** : Straw chopped (section 0 only).
30-Aug-94 : **T** : Straw baled (sections 1, 2, 3, 5, 6, and 9).
12-Sep-94 : **T** : Weeds topped (section 8 only).
12-Oct-94 : **T** : Autumn N treatments applied.
16-Nov-94 : **T** : Rotary harrowed, Apollo, dressed New Kotol, drilled at 380 seeds per m^2.
21-Mar-95 : **T** : Stefes IPU at 3.0 l with Stomp 400 at 3.3 l in 200 l (except section 8).
11-Apr-95 : **T** : Spring N treatments applied.
28-Apr-95 : **T** : Halo at 2.0 l with Mallard 750 EC at 0.5 l and New 5C Cycocel at 2.8 l in 200 l (except section 6).
19-Jun-95 : **T** : Sprint at 1.5 l in 300 l (except section 6).
05-Jul-95 : **T** : Pirimicarb 50 DG at 280 g in 200 l (except section 6).
18-Jul-95 : **T** : Pulled wild oats by hand.
27-Jul-95 : **T** : Roundup at 6.0 l with Mixture B at 2.94 l in 150 l (except section 8).
06-Aug-95 : **T** : Combine harvested.
Potatoes:
12-Sep-94 : **T** : Weeds topped.
11-Apr-95 : **T** : N treatments applied.
24-Apr-95 : **T** : Heavy spring-tine cultivated twice, rotary harrowed, planted Estima, undressed.
04-May-95 : **T** : Rotary ridged.

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95/R/BK/1

Experimental diary:

Potatoes:

01-Jun-95 : **T** : Basagran at 3.0 l in 400 l.
20-Jun-95 : **T** : Ashlade Maneb Flowable at 2.75 l in 200 l.
30-Jun-95 : **T** : Ashlade Maneb Flowable at 2.75 l in 200 l.
19-Jul-95 : **T** : Ashlade Maneb Flowable at 2.75 l in 300 l.
01-Aug-95 : **T** : Ashlade Maneb Flowable at 2.75 l in 300 l.
14-Aug-95 : **T** : Super-Tin 4L at 560 ml with Intracrop BLA at 200 ml in 200 l.
24-Aug-95 : **T** : Haulm pulverised.
15-Sep-95 : **T** : Lifted.

Fallow:

30-Aug-94 : **T** : Straw baled.
24-Apr-95 : **T** : Heavy spring-tine cultivated twice.
09-Jun-95 : **T** : Cultivated by rotary-grubber.
17-Jul-95 : **T** : Spring-tine cultivated.

NOTE: Samples of grain and straw from sections 1 and 7 and samples of potato tubers were taken for chemical analysis.

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95/R/BK/1 W. WHEAT

GRAIN TONNES/HECTARE

***** Tables of means *****

SECTION PLOT	7/W1	8/W1	2/W2	3/W3	6/W18	1/W29	9/W37	0/W44
01DN4PK	9.65	*	9.08	8.88	8.17	*	*	*
21DN2	9.62	7.91	8.27	7.19	7.04	8.44	7.38	6.55
22D	7.43	6.95	6.78	5.91	5.66	7.36	5.27	6.09
030	1.91	2.32	0.78	0.61	1.82	1.13	1.10	1.54
05F	1.56	4.86	0.57	1.04	1.70	1.32	0.86	1.48
06N1F	4.57	4.82	3.03	3.13	3.73	3.60	4.33	3.79
07N2F	6.71	5.69	4.81	3.30	4.99	5.25	5.32	4.67
08N3F	7.75	5.93	6.31	4.14	5.76	6.08	5.56	5.88
09N4F	8.02	5.71	6.30	5.19	6.07	6.16	6.67	5.86
10N2	4.87	4.54	4.04	2.45	2.99	2.56	2.67	2.29
11N2P	5.20	3.22	4.07	3.24	2.70	3.11	2.74	2.52
12N2PNA	5.27	3.64	3.99	3.60	3.83	3.27	3.04	3.64
13N2PK	6.19	5.42	4.56	3.87	4.71	4.73	4.86	4.54
14N2PKMG	5.77	6.32	4.58	3.79	5.23	5.35	4.58	5.38
15N5F	7.75	5.58	7.37	6.58	6.75	6.94	6.48	7.21
16N6F	8.13	6.18	7.48	7.11	7.14	7.37	7.58	7.56
17N0+3FN	7.51	6.07	5.95	5.16	6.29	6.34	6.22	5.46
18N1+3FN	7.80	5.85	7.15	6.03	6.95	7.03	6.84	6.45
19(C)	1.63	4.83	0.82	1.64	1.75	2.40	1.49	1.70
20NKMG	*	*	*	*	*	3.25	*	3.10

GRAIN MEAN DM% 89.1

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95/R/BK/1 W. WHEAT

STRAW TONNES/HECTARE

***** Tables of means *****

SECTION / PLOT	7/W1	1/W29
01DN4PK	5.61	*
21DN2	4.16	4.83
22D	2.10	3.32
030	0.29	0.37
05F	0.08	0.31
06N1F	0.90	0.92
07N2F	1.81	1.93
08N3F	2.50	2.59
09N4F	2.58	2.72
10N2	1.40	1.57
11N2P	1.48	1.56
12N2PNA	1.11	1.33
13N2PK	1.24	1.64
14N2PKMG	1.03	1.54
15N5F	2.54	2.85
16N6F	3.37	2.86
17N0+3FN	1.91	1.94
18N1+3FN	2.56	2.33
19(C)	0.14	0.27
20NKMG	*	1.32

STRAW MEAN DM% 93.2

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95/R/BK/1 POTATOES

***** Tables of means *****

PLOT	TOTAL TUBERS TONNES/ HECTARE	% WARE 3.81 CM (1.5 INCH) RIDDLE
01DN4PK	8.9	76.2
21DN2	11.2	70.4
22D	10.1	68.9
030	1.8	24.6
05F	3.5	30.7
06N1F	6.7	43.4
07N2F	6.7	47.9
08N3F	10.2	67.1
09N4F	10.1	74.1
10N2	2.4	20.7
11N2P	3.5	14.9
12N2PNA	4.3	22.9
13N2PK	7.7	51.5
14N2PKMG	10.9	69.5
15N5F	11.4	74.5
16N6F	11.7	74.4
17N3FH	6.3	51.7
18N3FH	9.3	64.1
19(C)	3.7	22.4

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95/R/HB/2

HOOS BARLEY

Object: To study the effects of organic and inorganic manures on continuous s. barley. From 1968 to 1978 a rotation of potatoes, beans and s. barley was practised. The rotation was discontinued in 1979 and the experiment reverted to continuous s. barley.

The 144th year, s. barley.

For previous years see 'Details' 1967 and 1973, Station Report for 1966 and 74-94/R/HB/2.

Treatments: All combinations of:-

Whole plots

1. **MANURE** Plot Fertilizers and organic manures:

		Form of N 1852-1966	Additional treatments 1852-1979	Changes since 1980
---	11	None	-	-
-P-	21	None	P	-
--K	31	None	K(Na)Mg	-
-PK	41	None	PK(Na)Mg	-
A--	12	A	-	-
AP-	22	A	P	-
A-K	32	A	K(Na)Mg	-
APK	42	A	PK(Na)Mg	-
N----	131	N	-	-
NP---	231	N	P	-
N-K--	331	N	K(Na)Mg	-
NPK--	431	N	PK(Na)Mg	-
N--S-	134	N	Si	Si omitted
NP-S-	234	N	P Si	"
N-KS-	334	N	K(Na)MgSi	"
NPKS-	434	N	PK(Na)MgSi	"
N---S	132	N	-	Si added
NP--S	232	N	P	"
N-K-S	332	N	K(Na)Mg	"
NPK-S	432	N	PK(Na)Mg	"
N--SS	133	N	Si	-
NP-SS	233	N	P Si	-
N-KSS	333	N	K(Na)MgSi	-
NPKSS	433	N	PK(Na)MgSi	-
C(--)	14	C	-	PKMg omitted
C(P-)	24	C	P	"
C(-K)	34	C	K(Na)Mg	"
C(PK)	44	C	PK(Na)Mg	"
D	72	None	D	-
(D)	71	(D)	-	-
(A)	62	(Ashes)	-	-
-	61	None	-	-

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95/R/HB/2

```
Form of N: A, sulphate of ammonia: N, nitrate of soda - each to supply
               48 kg N: C, castor meal to supply 96 kg N
        P: 35 kg P as triple superphosphate in 1974 and since 1988,
               single superphosphate in other years
        K: 90 kg K as sulphate of potash
     (Na): 16 kg Na as sulphate of soda until 1973
       Mg: 35 kg Mg, as kieserite every third year since 1974 (sulphate
               of magnesia annually until 1973)
       Si: Silicate of soda at 450 kg
        D: Farmyard manure at 35 t.  (D): until 1871 only
  (Ashes): Weed ash 1852-1916, furnace ash 1917-1932, none since

Sub-plots

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

     0
    48
    96
   144

Plus extra plots testing all combinations of:-

Whole plots

1  MANURE           Fertilizers other than magnesium:

   55AN2PK          Plot 55  AN2PK
   56--PK           Plot 56  --PK
   57NN2--          Plot 57  NN2
   58NN2--          Plot 58  NN2

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

Sub-plots

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

    0
   35

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

Experimental diary:
   08-Aug-94 : B : Straw baled.
   03-Nov-94 : T : P applied.
   07-Nov-94 : T : K applied.
   08-Nov-94 : T : Mg applied.
   10-Nov-94 : T : Si applied.
   15-Nov-94 : B : Stubble topped.
   15-Dec-94 : T : Farmyard manure applied.
```


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95/R/HB/2

Experimental diary:

22-Dec-94 : B : Ploughed.
16-Mar-95 : B : Spring-tine cultivated, rotary harrowed, Alexis, dressed Baytan, drilled at 350 seeds per m^2.
04-May-95 : **T** : N applied.
23-May-95 : B : Duplosan New System CMPP at 1.5 l with Vindex at 1.4 l in 260 l.
08-Aug-95 : B : Combine harvested.

NOTE: Samples of grain and straw were taken from selected plots for chemical analysis.

MAIN PLOTS GRAIN TONNES/HECTARE

**** Tables of means *****

N / MANURE	0	48	96	144	Mean
---	0.44	0.84	1.26	0.88	0.85
-P-	1.87	2.79	2.79	3.43	2.72
--K	1.15	1.95	2.82	2.47	2.10
-PK	2.00	3.65	4.29	4.71	3.66
A--	0.66	1.10	1.29	1.43	1.12
AP-	1.90	3.11	2.56	2.35	2.48
A-K	1.10	1.48	1.63	2.08	1.57
APK	1.96	3.43	4.37	4.34	3.52
N----	0.60	1.41	1.55	1.21	1.19
NP---	2.13	3.50	3.86	2.98	3.12
N-K--	1.27	1.60	1.69	1.74	1.58
NPK--	2.17	3.74	4.61	4.97	3.87
N--S-	1.41	2.57	2.23	1.76	1.99
NP-S-	2.20	3.11	2.77	3.59	2.92
N-KS-	1.89	1.90	2.51	2.73	2.26
NPKS-	2.52	3.75	4.51	4.51	3.82
N---S	1.20	1.89	2.02	1.95	1.76
NP--S	2.42	3.70	3.88	3.62	3.40
N-K-S	1.49	2.18	2.51	2.65	2.21
NPK-S	2.03	4.29	4.97	4.82	4.03
N--SS	1.68	1.61	2.15	2.36	1.95
NP-SS	1.93	3.32	3.33	3.89	3.12
N-KSS	1.62	2.30	2.86	2.99	2.44
NPKSS	2.44	3.95	4.57	4.76	3.93
C(--)	1.61	2.68	2.90	3.34	2.63
C(P-)	2.20	3.09	3.28	3.97	3.14
C(-K)	1.61	2.65	3.68	3.46	2.85
C(PK)	2.23	3.61	4.13	4.82	3.70
D	5.99	6.20	6.20	6.44	6.21
(D)	2.37	3.43	3.33	3.26	3.10
(A)	2.08	2.03	2.29	2.38	2.20
-	1.13	1.77	1.93	2.56	1.85
Mean	1.85	2.77	3.09	3.20	2.73

GRAIN MEAN DM% 88.6

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95/R/HB/2 MAIN PLOTS

STRAW TONNES/HECTARE

***** Tables of means *****

N	0	48	96	144	Mean
MANURE					
---	0.17	0.52	0.60	0.32	0.40
-P-	0.67	1.08	1.66	2.08	1.37
--K	0.26	0.78	1.11	1.01	0.79
-PK	0.60	1.57	2.15	2.59	1.73
A--	0.22	0.45	0.43	0.60	0.42
AP-	0.56	1.40	1.40	1.60	1.24
A-K	0.22	0.54	0.59	0.80	0.54
APK	0.67	1.49	2.06	2.16	1.59
D	3.06	3.55	3.67	3.82	3.52
(D)	0.94	1.61	1.40	1.69	1.41
(A)	0.66	0.70	0.75	0.85	0.74
-	0.30	0.69	0.91	1.14	0.76
Mean	0.69	1.20	1.39	1.56	1.21

STRAW MEAN DM% 88.8

EXTRA PLOTS

GRAIN TONNES/HECTARE

***** Tables of means *****

MANURE	551AN2PK	561--PK	571NN2--	581NN2--	Mean
MGNESIUM					
0	4.30	0.69	3.47	1.75	2.55
35	4.12	0.91	3.01	1.81	2.46
Mean	4.21	0.80	3.24	1.78	2.51

GRAIN MEAN DM% 88.9

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95/R/WF/3

WHEAT AND FALLOW

Object: To study the effects of fallowing on unmanured w. wheat - Hoosfield.

The 140th year, w. wheat.

For previous years see 'Details' 1967, 1973 and 74-94/R/WF/3.

Whole plot dimensions: 9.0 x 211.

Treatments:
Each year there are two plots, one is sown to w. wheat, one is fallow; they alternate in successive years.

Experimental diary:
Wheat plot:
06-Oct-94 : B : Roundup at 4.0 l in 200 l.
16-Nov-94 : **T** : Spring-tine cultivated.
17-Nov-94 : **T** : Rotary harrowed, Apollo, dressed New Kotol, drilled at 380 seeds per m^2.
16-Jun-95 : **T** : Halo at 2.0 l with Patrol at 0.5 l in 300 l.
29-Jun-95 : **T** : Pirimicarb 50 DG at 280 g in 200 l.
06-Aug-95 : **T** : Combine harvested.
Fallow plot:
06-Oct-94 : B : Roundup at 4.0 l in 200 l.
14-Oct-94 : **T** : Ploughed.
31-May-95 : **T** : Heavy spring-tine cultivated.
09-Jun-95 : **T** : Cultivated by rotary grubber.
17-Jul-95 : **T** : Spring-tine cultivated.

GRAIN AND STRAW TONNES/HECTARE

	GRAIN	STRAW
YIELD	1.93	0.67
MEAN DM%	88.0	94.1
PLOT AREA HARVESTED	0.044605	

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95/R/EX/4

EXHAUSTION LAND

Object: To study the residual effects of manures applied 1876-1901, and of additional phosphate applied since 1986, on the yield of continuous s. barley up to 1991, w. wheat since - Hoosfield.

The 140th year, w. wheat.

For previous years see 'Details' 1967, 1973 and 74-94/R/EX/4.

Treatments: All combinations of:-

Whole plots (P test)

1. **OLD RES**		Residues of manures applied annually 1876-1901:
	O	None
	D	Farmyard manure at 35 t
	N	96 kg N as ammonium salts
	P	34 kg P as superphosphate
	NPKNAMG	N and P as above plus 137 kg K as sulphate of potash, 16 kg Na as sulphate of soda, 11 kg Mg as sulphate of magnesia
2. **P RES**		Residues of phosphate (kg P) applied annually from 1986, as single superphosphate in 1986 and 1987, triple superphosphate from 1988 until 1992, none since:
	O	None
	P1	44
	P2	87
	P3	131

plus

Whole plots (K test, previously N test until 1991)

	OLD RES	Residues of manures applied annually 1876-1901:
	O	None
	D	Farmyard manure at 35 t
	N*	96 kg N as nitrate of soda
	PK	34 kg P as superphosphate, 137 kg K as sulphate of potash
	N*PK	N, P and K as above

Experimental diary:

P test:

13-Oct-94 : **T** : Muriate of potash at 167 kg.

K test:

13-Oct-94 : **T** : Triple superphosphate at 319 kg.

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95/R/EX/4

Experimental diary:
All plots:
21-Aug-94 : B : Straw baled and removed.
06-Oct-94 : B : Roundup at 4.0 l in 200 l.
14-Oct-94 : B : Ploughed.
17-Oct-94 : B : Rotary harrowed.
18-Oct-94 : B : Rotary harrowed, Mercia, dressed Rappor, drilled at 380 seeds per m^2.
24-Nov-94 : B : Alpha Isoproturon 500 at 3.0 l with Stomp 400 at 3.3 l in 200 l.
13-Apr-95 : B : 34.5% N at 556 kg.
16-Jun-95 : B : Halo at 2.0 l with Patrol at 0.5 l in 300 l.
29-Jun-95 : B : Pirimicarb 50 DG at 280 g in 200 l.
03-Aug-95 : B : Combine harvested.

NOTE: Samples of grain and straw were taken for chemical analysis.

P TEST

GRAIN TONNES/HECTARE

***** Tables of means *****

P RES / OLD RES	O	P1	P2	P3	Mean
O	1.97	4.78	5.87	6.29	4.73
D	5.10	6.06	6.43	6.41	6.00
N	2.93	5.35	6.21	6.41	5.23
P	4.51	6.17	6.63	6.23	5.88
NPKNAMG	4.20	5.45	6.23	6.65	5.63
Mean	3.74	5.56	6.27	6.40	5.49

GRAIN MEAN DM% 90.7

STRAW TONNES/HECTARE

***** Tables of means *****

P RES / OLD RES	O	P1	P2	P3	Mean
O	0.70	1.59	2.56	2.55	1.85
D	1.56	2.26	2.60	2.48	2.23
N	0.96	1.80	2.44	2.65	1.96
P	1.40	2.05	2.40	2.02	1.97
NPKNAMG	0.93	1.81	2.31	2.53	1.89
Mean	1.11	1.90	2.46	2.45	1.98

STRAW MEAN DM% 91.6

PLOT AREA HARVESTED 0.00589

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95/R/EX/4

K TEST

GRAIN TONNES/HECTARE

***** Tables of means *****

OLD RES	
O	5.93
D	6.32
N*	6.50
PK	6.95
N*PK	6.71
Mean	6.48

GRAIN MEAN DM% 90.7

STRAW TONNES/HECTARE

***** Tables of means *****

OLD RES	
O	2.56
D	2.73
N*	2.43
PK	2.61
N*PK	2.57
Mean	2.58

STRAW MEAN DM% 93.2

PLOT AREA HARVESTED 0.00589

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95/R/PG/5

PARK GRASS

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

The 140th year, hay.

For previous years see 'Details' 1967 and 1973 and 74-94/R/PG/5.

Treatments: Combinations of:-

Whole plots

1. **MANURE** Fertilizers and organic manures:

N1	Plot 1	N1
O(D)	Plot 2	None (D until 1863)
O	Plot 3	None
P	Plot 4/1	P
N2P	Plot 4/2	N2 P
N1MN	Plot 6	N1 P K Na Mg
MN	Plot 7	P K Na Mg
PNAMG	Plot 8	P Na Mg
MN(N2)	Plot 9/1	P K Na Mg (N2 until 1989)
N2MN	Plot 9/2	N2 P K Na Mg
N2PNAMG	Plot 10	N2 P Na Mg
N3MN	Plot 11/1	N3 P K Na Mg
N3MNSI	Plot 11/2	N3 P K Na Mg Si
O	Plot 12	None
(D/F)	Plot 13/1	None (D/F until 1994)
D/F	Plot 13/2	D/F
MN(N2*)	Plot 14/1	P K Na Mg (N2* until 1989)
N2*MN	Plot 14/2	N2* P K Na Mg
MN(N2*)	Plot 15	P K Na Mg (N2* until 1875)
N1*MN	Plot 16	N1* P K Na Mg
N1*	Plot 17	N1*
N2KNAMG	Plot 18	N2 K Na Mg
D	Plot 19	D
D/N*PK	Plot 20	D/N*P K

N1, N2, N3:	48, 96, 144 kg N as sulphate of ammonia
N1*, N2*:	48, 96 kg N as nitrate of soda (30 kg N to Plot 20, only in years with no farmyard manure)
P:	35 kg P (15 kg P to Plot 20, only in years with no farmyard manure) as triple superphosphate in 1974 and since 1987, single superphosphate in other years
K:	225 kg K (45 kg K to Plot 20, only in years with no farmyard manure) as sulphate of potash
Na:	15 kg Na as sulphate of soda
Mg:	10 kg Mg as sulphate of magnesia
Si:	Silicate of soda at 450 kg
D:	Farmyard manure at 35 t every fourth year
F:	Fishmeal every fourth year to supply 63 kg N
MN:	P K Na Mg

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95/R/PG/5

Sub-plots

2. **LIME** Liming plots 1-17:

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

NOTE: Lime was applied regularly, and at the same rate, to all 'a' and 'b' sub-plots of Plots 1 to 17 (except 12) from 1924. Differential liming started in 1965 on certain 'b' and 'c' sub-plots (except on Plot 12) and in 1976 on certain 'a' sub-plots (including Plot 12) and 12b. Lime last applied in 1994.

Liming plots 18-20:

Differential rates of lime were applied to sub-plots 2 and 3 regularly 1920-1964. Since 1965 Plot 18-1 has been split into two for treatments 'c' and 'd' above and Plot 18-3 split into two for treatments 'a' and 'b'. Plots 19 and 20 received no further chalk after 1968; plot 18/2 no further chalk after 1972.

For 1995 plot 13 was split in two, 13/1 to receive no more manure, 13/2 to receive organic manures as hitherto.

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

Experimental diary:

02-Dec-94	**T**	P applied, except plot 20.
14-Dec-94	**T**	K, Na, Mg, Si and fishmeal applied.
	T	Plot 20: P applied.
27-Apr-95	**T**	N applied.
21-Jun-95	B	Cut.
22-Jun-95	B	Hay turned.
23-Jun-95	B	Hay turned, rowed up and baled.
25-Oct-95	B	Cut and herbage removed.

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95/R/PG/5

1ST CUT (21/6/95) DRY MATTER TONNES/HECTARE

***** Tables of means *****

LIME / MANURE		A	B	C	D	MEAN
N1	1	2.39	2.31	2.16	0.60	1.86
O(D)	2	2.01	2.31	1.81	1.63	1.94
O	3	2.10	1.98	1.33	1.30	1.68
P	4/1	2.51	3.21	2.28	2.12	2.53
N2P	4/2	2.31	2.81	2.07	1.09	2.07
N1MN	6	3.61	3.10			3.36
MN	7	3.24	3.61	3.54	1.96	3.09
PNAMG	8	1.99	2.53	2.08	1.92	2.13
MN(N2)	9/1	2.97	1.77	0.83	0.45	1.50
N2MN	9/2	3.93	3.38	2.19	1.45	2.74
N2PNAMG	10	2.95	2.75	1.93	1.37	2.25
N3MN	11/1	5.43	4.60	3.24	3.40	4.17
N3MNSI	11/2	5.37	4.15	3.54	3.26	4.08
O	12	1.46	1.54	1.20	1.12	1.33
(D/F)	13/1	2.85	3.23	2.46	2.54	2.77
D/F	13/2	3.33	4.34	4.34	3.68	3.92
MN(N2*)	14/1	3.77	3.40	2.79	2.63	3.15
N2*MN	14/2	5.55	4.74	5.04	5.15	5.12
MN(N2*)	15	3.64	4.63	2.80	2.22	3.32
N1*MN	16	4.00	4.37	4.00	3.43	3.95
N1*	17	2.29	2.49	2.66	2.69	2.53
N2KNAMG0	18/1			1.98	0.10	1.04
N2KNAMG2	18/2					2.58
N2KNAMG1	18/3	2.41	2.47			2.44
D0	19/1					3.14
D2	19/2					3.82
D1	19/3					3.40
D/N*PK0	20/1					4.14
D/N*PK2	20/2					4.67
D/N*PK1	20/3					4.68

1ST CUT MEAN DM% 29.4

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95/R/PG/5

2ND CUT (25/10/95) DRY MATTER TONNES/HECTARE

***** Tables of means *****

LIME / MANURE		A	B	C	D	MEAN
N1	1	0.50	0.33	0.09	0.00	0.23
O(D)	2	0.05	0.12	0.13	0.25	0.14
O	3	0.07	0.07	0.12	0.27	0.13
P	4/1	0.18	0.23	0.38	0.39	0.30
N2P	4/2	0.65	0.64	0.17	0.07	0.38
N1MN	6	0.57	0.56			0.56
MN	7	0.87	0.98	0.68	0.43	0.74
PNAMG	8	0.35	0.40	0.40	0.38	0.38
MN(N2)	9/1	0.48	0.22	0.02	0.04	0.19
N2MN	9/2	1.00	0.80	0.18	0.27	0.56
N2PNAMG	10	0.30	0.68	0.30	0.27	0.39
N3MN	11/1	1.52	1.06	0.47	0.20	0.81
N3MNSI	11/2	1.83	1.47	0.74	0.29	1.08
O	12	0.04	0.08	0.24	0.29	0.16
(D/F)	13/1	0.67	0.80	0.31	0.56	0.58
D/F	13/2	0.72	1.05	0.66	0.77	0.80
MN(N2*)	14/1	0.48	0.63	0.32	0.30	0.43
N2*MN	14/2	1.45	1.64	1.81	1.96	1.72
MN(N2*)	15	0.57	0.65	0.37	0.44	0.51
N1*MN	16	0.89	0.95	0.68	0.64	0.79
N1*	17	0.27	0.26	0.45	0.60	0.39
N2KNAMG0	18/1			0.27	0.00	0.14
N2KNAMG2	18/2					0.65
N2KNAMG1	18/3	0.37	0.58			0.47
D0	19/1					0.82
D2	19/2					0.85
D1	19/3					0.58
D/N*PK0	20/1					1.01
D/N*PK2	20/2					1.22
D/N*PK1	20/3					0.96

2ND CUT MEAN DM% 22.6

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95/R/PG/5

TOTAL OF 2 CUTS DRY MATTER TONNES/HECTARE

***** Tables of means *****

LIME / MANURE		A	B	C	D	MEAN
N1	1	2.89	2.63	2.25	0.60	2.09
O(D)	2	2.06	2.44	1.94	1.88	2.08
O	3	2.17	2.05	1.45	1.57	1.81
P	4/1	2.70	3.44	2.66	2.51	2.83
N2P	4/2	2.96	3.45	2.25	1.16	2.46
N1MN	6	4.17	3.66			3.92
MN	7	4.12	4.59	4.22	2.39	3.83
PNAMG	8	2.33	2.93	2.48	2.30	2.51
MN(N2)	9/1	3.45	1.99	0.85	0.49	1.69
N2MN	9/2	4.93	4.18	2.38	1.71	3.30
N2PNAMG	10	3.25	3.43	2.22	1.64	2.64
N3MN	11/1	6.95	5.65	3.71	3.60	4.98
N3MNSI	11/2	7.19	5.62	4.28	3.55	5.16
O	12	1.50	1.62	1.43	1.41	1.49
(D/F)	13/1	3.51	4.03	2.77	3.10	3.35
D/F	13/2	4.05	5.39	5.00	4.46	4.73
MN(N2*)	14/1	4.25	4.03	3.10	2.93	3.58
N2*MN	14/2	7.00	6.38	6.85	7.11	6.84
MN(N2*)	15	4.21	5.28	3.16	2.66	3.83
N1*MN	16	4.89	5.32	4.68	4.07	4.74
N1*	17	2.56	2.75	3.10	3.28	2.92
N2KNAMG0	18/1			2.25	0.10	1.17
N2KNAMG2	18/2					3.24
N2KNAMG1	18/3	2.78	3.06			2.92
D0	19/1					3.95
D2	19/2					4.67
D1	19/3					3.98
D/N*PK0	20/1					5.14
D/N*PK2	20/2					5.89
D/N*PK1	20/3					5.64

TOTAL OF 2 CUTS MEAN DM% 26.1

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95/R/BN/7

BARNFIELD

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

Sections 1 and 2, 11 years of grass/clover, 1st year of clover. 20 years of grass, 1st year of grass/clover on the rest of the experiment. All re-sown in 1995.

For previous years see 'Details' 1967 and 1973 and 74-94/R/BN/7.

Plot dimensions: 10.7 x 55.9.

Treatments to grass: All combinations of:-

Whole plots

1. **MANURE**	Fertilizers and organic manures:	
	(D)	(D)
	(D)PK	(D) P K
	PKMG	P K (Na) Mg
	P	P
	PK	P K
	PMG	P (Na) Mg
	0	0

P: 35 kg P as triple superphosphate in 1974 and since 1987, single superphosphate in other years
K: 225 kg K as sulphate of potash
(Na): 90 kg Na as sodium chloride until 1973, none since
Mg: 90 kg Mg as kieserite every fourth year since 1974 (sulphate of magnesia until 1973)
(D): Farmyard manure at 35 t until 1975, none since

Sub-plots

2. **N PERCUT**	Nitrogen fertilizer in 1994 (kg N per cut) as 34.5% N, cumulative to previous dressings, and residues of forms of N previously each supplying 96 kg N per annum:	
	(75)	75, previously nitrate of soda, section 3
	(100)	100, previously sulphate of ammonia, section 4
	(125)	125, previously sulphate of ammonia + castor meal, section 5
	(150)	150, previously castor meal, section 6

No nitrogen fertilizer applied in 1995. Castor meal last applied 1961, nitrate of soda and sulphate of ammonia until 1959.

Plus one plot **MANURE** KMG 100

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95/R/BN/7

Treatments to clover, sections 1 and 2 (not given nitrogen fertilizer):

MANURE Fertilizers and organic manures as for grass above, excluding KMG.

NOTES: (1) P, K and D treatments were applied to Sections 1 and 2 until 1980. None were applied subsequently until the resumption of P and K treatments only, from 1985.
(2) Yields were not taken from section 2.
(3) Only one cut was taken for yield, in the autumn. There was insufficient growth to justify a yield cut earlier in the season.

Experimental diary:

13-Sep-94	B	Roundup at 5.0 l in 200 l.
03-Nov-94	**T**	P applied.
07-Nov-94	**T**	K applied.
16-Nov-94	B	Ploughed.
06-Apr-95	B	Rotary harrowed, spring-tine cultivated.
07-Apr-95	**T**	Sections 3-6: Rotary harrowed, 33% Hercules perennial ryegrass, 33% Condessa tet ryegrass, 13% Bundy meadow fescue, 13% Motin Timothy and 7% Ensign white clover drilled at 30 kg.
	T	Sections 1-2: Rotary harrowed, Olwen white clover drilled at 6.6 kg.
	B	Rolled.
16-May-95	B	Part irrigated 25 mm, started.
22-May-95	B	Part irrigated 25 mm.
24-May-95	B	Part irrigated 25 mm.
26-May-95	B	Part irrigated 25 mm, finished.
21-Jun-95	B	Topped.
05-Jul-95	B	Legumex Extra at 7.0 l in 200 l.
13-Jul-95	B	Part irrigated 25 mm, started.
14-Jul-95	B	Part irrigated 25 mm.
16-Jul-95	B	Part irrigated 25 mm.
17-Jul-95	B	Part irrigated 25 mm.
18-Jul-95	B	Part irrigated 25 mm, finished.
28-Jul-95	**T**	Sections 3-6: Patch re-drilled grass mixture at 30 kg, to failed areas.
	B	Part irrigated 25 mm, started.
29-Jul-95	B	Part irrigated 25 mm.
30-Jul-95	B	Part irrigated 25 mm.
31-Jul-95	B	Part irrigated 25 mm, finished.
04-Aug-95	B	Part irrigated 25 mm, started.
05-Aug-95	B	Part irrigated 25 mm.
06-Aug-95	B	Part irrigated 25 mm.
12-Aug-95	B	Part irrigated 25 mm, finished.
31-Aug-95	B	Topped.
31-Oct-95	B	Cut.
02-Nov-95	B	Herbage baled and removed.

NOTE: Herbage samples were taken for chemical analysis.

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95/R/BN/7

GRASS/CLOVER

1ST CUT (31/10/95) DRY MATTER TONNES/HECTARE

***** Tables of means *****

N PERCUT / MANURE	(75)	(100)	(125)	(150)	Mean
(D)	2.17	2.37	2.40	2.87	2.45
(D)PK	2.46	2.62	2.84	2.97	2.72
PKMG	1.53	2.19	2.31	2.05	2.02
P	0.44	1.08	1.35	0.87	0.93
PK	1.53	1.43	2.19	2.61	1.94
PMG	0.89	0.75	1.12	0.66	0.85
0	0.31	0.43	0.29	0.08	0.28
Mean	1.33	1.55	1.79	1.73	1.60

MANURE KMG 100 2.11

Grand mean 1.62

1ST CUT MEAN DM% 19.6

PLOT AREA HARVESTED 0.00155

CLOVER

1ST CUT (31/10/95) DRY MATTER TONNES/HECTARE

***** Tables of means *****

MANURE	(D)	(D)PK	PKMG	P	PK	PMG	0	Mean
	1.43	2.14	0.60	0.53	0.40	0.42	0.90	0.92

1ST CUT MEAN DM% 16.3

PLOT AREA HARVESTED 0.00155

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95/R/GC/8

GARDEN CLOVER

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

The 142nd year, red clover.

For previous years see 'Details' 1967 and 1973, and 74-94/R/GC/8.

Design: 2 blocks of 2 plots.

Whole plot dimensions: 1.00 x 1.40.

Treatments:

FUNG RES	Residual effects of fungicide to control *Sclerotinia trifoliorum*:
NONE	None
BENOMYL	Benomyl sprays during previous winters, last applied November 1989.

NOTE: Hungaropoly, sown at 30 kg in 1990.

Experimental diary:

02-Nov-94 : B : Chalk at 1.25 t, PK as (0:18:36) at 420 kg and Epsom salts at 530 kg.
16-Jun-95 : B : First cut, hand weeded.
09-Aug-95 : B : Second cut, hand weeded.

NOTE: Crop samples were taken for chemical analysis.

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95/R/GC/8

1ST CUT (16/6/95) DRY MATTER TONNES/HECTARE

***** Tables of means *****

FUNG RES	NONE	BENOMYL	Mean
	5.08	4.06	4.57

1ST CUT MEAN DM% 17.9

2ND CUT (9/8/95) DRY MATTER TONNES/HECTARE

***** Tables of means *****

FUNG RES	NONE	BENOMYL	Mean
	3.87	2.85	3.36

2ND CUT MEAN DM% 33.6

TOTAL OF 2 CUTS DRY MATTER TONNES/HECTARE

***** Tables of means *****

FUNG RES	NONE	BENOMYL	Mean
	8.95	6.92	7.93

TOTAL OF 2 CUTS MEAN DM% 25.7

PLOT AREA HARVESTED 0.00010

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95/W/RN/3

LEY/ARABLE

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

Sponsor: P.R. Poulton.

The 58th year, leys, w. beans, w. wheat, w. rye, s. barley.

For previous years see 'Details' 1967 & 1973 and 74-94/W/RN/3.

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

Whole plot dimensions: 8.53 x 40.7.

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

ROTATION

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

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

Rotations themselves followed different cycles:

On four plots in each block the rotations were repeated

On four plots in each block arable rotations alternated each five years with ley rotations

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

LN 3	(Previous LEY) LN, LN, LN, W, R
LC 3	(Previous CLO) LC, LC, LC, W, R
AF	(Previous A) F, F, BE, W, R
AB	(Previous A H) B, B, BE, W, R

LN1 to LN3 = three year grass ley with N, 1st year to 3rd year, LC = clover/grass ley no N, BE = beans (s. oats until 1980), F = fallow

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95/W/RN/3

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

LLN	LN, LN, LN, LN, LN, LN, LN, LN, W, R
LLC	LC, LC, LC, LC, LC, LC, LC, LC, W, R

LLN1 to LLN8 = eight year grass ley with N, first year to eighth year, similarly for LLC

The new scheme started by sowing these new leys in spring 1976 on four phases and in spring 1977 on the fifth phase (2nd test crop in 1976).

In 1992 w. rye (R) replaced s. barley (B) as the second test crop.

Yields are taken only from the leys and the test crops.

Treatments to first test crop w. wheat, all combinations of:

Whole plots

1. **ROTATION** Rotations:

   LN 8
   LN 3
   LC 8
   LC 3
   AF
   AB

1/2 plots

2. **FYMRES64** Farmyard manure residues, last applied 1964:

   NONE
   FYM 38 t on each occasion

1/8 plots

3. **N** Nitrogen fertilizer (kg N) as 27% N:

   0
   70
   140
   210

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95/W/RN/3

Treatments to second test crop w. rye, all combinations of:

Whole plots

1. **ROTATION** Rotations:

   LN 8
   LN 3
   LC 8
   LC 3
   AF
   AB

1/2 plots

2. **FYMRES63** Farmyard manure residues, last applied 1963:

   NONE
   FYM 38 t on each occasion

1/8 plots

3. **N** Nitrogen fertilizer (kg N) as 27% N:

   0
   30
   60
   90

Treatments to leys:

FYM RES Farmyard manure residues:

NONE
FYM 38 t on each occasion, last applied 1962 to 1st and 6th year leys, 1966 to 2nd and 7th year leys, 1965 to 3rd and 8th year leys, 1964 to 4th year leys, 1963 to 5th year leys

Corrective K dressings (kg K_2O) as muriate of potash, applied to first test crop w. wheat and long-term leys in the wheat block, applied: 5 Oct, 1994:

Continuous rotations	No FYM half plots	FYM half plots
LN	0	0
LC	0	0
AF	420	420
AB	420	420

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95/W/RN/3

Ex-alternating rotations		
LN 8 ploughed for w. wheat	0	0
LN 8 not ploughed	0	0
LC 8 ploughed for w. wheat	0	0
LC 8 not ploughed	0	0

Experimental diary:

Treatment crops:

Grass ley and clover/grass ley, 1st year (**ROTATION** LN1, LC1, LLN1 and LLC1):

30-Aug-94 : **T** : Roundup Biactive at 4.0 l in 200 l.
05-Sep-94 : **T** : Ploughed.
23-Sep-94 : **T** : LN1 and LLN1 only: 27% N at 278 kg, rotary harrowed, 50% Rossa meadow fescue and 50% Erecta Timothy mixture drilled at 30 kg.
: **T** : LC1 and LLC1 only: 27% N at 185 kg, rotary harrowed, 40% Rossa meadow fescue, 48% Erecta RVP Timothy and 12% Huia white clover mixture drilled at 30 kg.
06-Apr-95 : **T** : Rolled.
12-Apr-95 : **T** : PK as (0:20:32) at 469 kg.
: **T** : LN1 and LLN1 only: NK as 25:0:16 at 300 kg.
: **T** : LC1 and LLC1 only: Muriate of potash at 80 kg.
13-Jun-95 : **T** : First cut.
15-Jun-95 : **T** : Produce removed.
19-Jun-95 : **T** : LN1 and LLN1 only: NK as (25:0:16) at 300 kg.
: **T** : LC1 and LLC1 only: Muriate of potash at 80 kg.
19-Dec-95 : **T** : Second cut.

Grass leys, 2nd to 8th years (**ROTATION** LN2-3, LLN2-8):

04-Oct-94 : **T** : LLN5 only: Dolomite at 5.0 t.
05-Apr-95 : **T** : Chain harrowed.
06-Apr-95 : **T** : Rolled.
12-Apr-95 : **T** : PK as (0:20:32) at 469 kg, NK as (25:0:16) at 300 kg.
13-Jun-95 : **T** : First cut.
15-Jun-95 : **T** : Produce removed.
19-Jun-95 : **T** : NK as (25:0:16) at 300 kg.
19-Dec-95 : **T** : Second cut.

Clover/grass leys, 2nd to 8th years (**ROTATION** LC2-3 and LLC2-8):

04-Oct-94 : **T** : LLC5 only: Dolomite at 5.0 t.
05-Apr-95 : **T** : Chain harrowed.
06-Apr-95 : **T** : Rolled.
12-Apr-95 : **T** : PK as (0:20:32) at 469 kg, muriate of potash at 80 kg.
13-Jun-95 : **T** : First cut.
15-Jun-95 : **T** : Produce removed.
19-Jun-95 : **T** : Muriate of potash at 80 kg.
19-Dec-95 : **T** : Second cut.

S. barley, 1st and 2nd treatment crops (**ROTATION** AB):

30-Aug-94 : **T** : Roundup Biactive at 4.0 l in 200 l.
05-Sep-94 : **T** : 1st treatment crop only: Ploughed.
21-Mar-95 : **T** : 2nd treatment crop only: Ploughed.
24-Mar-95 : **T** : NPK applied as (20:10:10) at 400 kg. Rotary harrowed, Alexis, dressed Baytan, drilled at 350 seeds per m^2.
02-Jun-95 : **T** : Ally at 30 g with Starane 2 at 0.5 l in 300 l.
07-Aug-95 : **T** : Combine harvested.

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95/W/RN/3

Experimental diary:

W. beans, 3rd treatment crop (**ROTATION** AF and AB):
- 30-Aug-94 : **T** : AB only: Roundup Biactive at 4.0 l in 200 l.
- 06-Oct-94 : **T** : PK as (0:24:24) at 168 kg. Punch broadcast at 16 seeds per m^2, ploughed.
- 02-Jun-95 : **T** : Rovral Flo at 2.0 l in 300 l.
- 07-Aug-95 : **T** : Combine harvested.

Fallow, 1st and 2nd treatment years (**ROTATION** AF):
- 30-Aug-94 : **T** : 1st year only: Roundup Biactive at 4.0 l in 200 l.
- 05-Sep-94 : **T** : 1st year only: Ploughed.
- 21-Mar-95 : **T** : 2nd year only: Ploughed.
- 06-Jun-95 : **T** : Rotary cultivated.
- 19-Jul-95 : **T** : Spiked rotary cultivated.

W. wheat, 1st test crop (W):
- 26-Sep-94 : **T** : Barclay Gallup at 4.0 l in 200 l.
- 05-Oct-94 : **T** : Ploughed.
- 06-Oct-94 : **T** : PK applied as (0:24:24) at 260 kg. Yaltox at 150 kg, rotary harrowed, Mercia, dressed Rappor, drilled at 300 seeds per m^2, rolled.
- 28-Nov-94 : **T** : Panther at 2.0 l with Decis at 200 ml in 200 l.
- 25-Apr-95 : **T** : **N** 70, 140 and 210: Applied as 27% N.
- 28-Apr-95 : **T** : Halo at 2.0 l in 200 l.
- 01-Jun-95 : **T** : Cyclone at 1.0 l with Mallard 750EC at 0.3 l in 200 l.
- 29-Jun-95 : **T** : Pirimicarb 50 DG at 280 g in 300 l.
- 04-Aug-95 : **T** : Combine harvested.

W. rye, 2nd test crop (R):
- 30-Aug-94 : **T** : Roundup Biactive at 4.0 l in 200 l.
- 05-Sep-94 : **T** : Ploughed.
- 04-Oct-94 : **T** : Dolomite at 5 t.
- 06-Oct-94 : **T** : PK as (0:24:24) at 260 kg, Yaltox at 150 kg. Rolled, harrowed.
- 11-Oct-94 : **T** : Rotary harrowed, Amando, dressed Cerevax, drilled at 400 seeds per m^2.
- 25-Apr-95 : **T** : **N** 30, 60 and 90: Applied as 27% N.
- 28-Apr-95 : **T** : Punch C at 0.625 l with Calixin at 0.35 l and Starane 2 at 1.0 l in 200 l.
- 29-Jun-95 : **T** : Pirimicarb 50 DG at 280 g in 300 l.
- 07-Aug-95 : **T** : Combine harvested.

NOTE: Samples of grass, clover/grass, wheat and rye grain were taken for chemical analysis.

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95/W/RN/3

LEYS

1ST CUT (13/6/95) DRY MATTER TONNES/HECTARE

***** Tables of means *****

FYM RES LEY	NONE	FYM	Mean
LC1	2.12	2.09	2.11
LC2	5.19	5.50	5.35
LC3	4.40	4.30	4.35
LN1	4.55	4.43	4.49
LN2	5.89	5.74	5.82
LN3	4.01	4.00	4.01
LLC1	1.22	1.47	1.35
LLC2	5.17	5.01	5.09
LLC3	4.30	4.03	4.16
LLC4	3.12	2.82	2.97
LLC5	4.03	3.89	3.96
LLC6	4.90	4.63	4.77
LLC7	4.51	4.72	4.62
LLC8	3.90	4.34	4.12
LLN1	4.14	4.65	4.40
LLN2	6.32	6.30	6.31
LLN3	4.48	4.60	4.54
LLN4	3.69	5.00	4.35
LLN5	4.66	4.26	4.46
LLN6	6.00	5.85	5.92
LLN7	4.14	4.99	4.56
LLN8	5.63	5.63	5.63
Mean	4.38	4.47	4.42

1ST CUT MEAN DM% 23.7

https://doi.org/10.23637/ERADOC-1-50 **pp 43**

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95/W/RN/3

LEYS

2ND CUT (19/12/95) DRY MATTER TONNES/HECTARE

***** Tables of means *****

FYM RES LEY	NONE	FYM	Mean
LC1	0.37	0.56	0.47
LC2	0.92	1.10	1.01
LC3	0.00	0.00	0.00
LN1	0.67	0.62	0.65
LN2	1.03	1.01	1.02
LN3	0.00	0.00	0.00
LLC1	0.30	0.43	0.36
LLC2	1.15	1.05	1.10
LLC3	0.15	0.62	0.38
LLC4	0.14	0.14	0.14
LLC5	0.60	0.55	0.58
LLC6	0.41	0.85	0.63
LLC7	0.56	0.61	0.59
LLC8	0.00	0.00	0.00
LLN1	0.67	1.04	0.86
LLN2	1.78	2.39	2.08
LLN3	0.41	0.27	0.34
LLN4	0.06	0.08	0.07
LLN5	0.68	0.73	0.70
LLN6	0.79	0.49	0.64
LLN7	0.25	0.25	0.25
LLN8	0.00	0.00	0.00
Mean	0.50	0.58	0.54

2ND CUT MEAN DM% 17.2

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95/W/RN/3

LEYS

TOTAL OF 2 CUTS DRY MATTER TONNES/HECTARE

***** Tables of means *****

FYM RES LEY	NONE	FYM	Mean
LC1	2.50	2.65	2.57
LC2	6.11	6.61	6.36
LC3	4.40	4.30	4.35
LN1	5.22	5.05	5.14
LN2	6.91	6.75	6.83
LN3	4.01	4.00	4.01
LLC1	1.52	1.90	1.71
LLC2	6.32	6.06	6.19
LLC3	4.45	4.65	4.55
LLC4	3.26	2.96	3.11
LLC5	4.63	4.44	4.54
LLC6	5.32	5.48	5.40
LLC7	5.07	5.33	5.20
LLC8	3.90	4.34	4.12
LLN1	4.82	5.69	5.25
LLN2	8.09	8.69	8.39
LLN3	4.89	4.87	4.88
LLN4	3.75	5.08	4.41
LLN5	5.33	4.99	5.16
LLN6	6.79	6.33	6.56
LLN7	4.39	5.24	4.82
LLN8	5.63	5.63	5.63
Mean	4.88	5.05	4.96

TOTAL OF 2 CUTS MEAN DM% 20.4

PLOT AREA HARVESTED 0.00200

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95/W/RN/3

W. WHEAT 1ST TEST CROP

GRAIN TONNES/HECTARE

***** Tables of means *****

FYMRES64	NONE	FYM	Mean
ROTATION			
LN 8	4.66	5.40	5.03
LN 3	4.53	4.65	4.59
LC 8	6.01	5.29	5.65
LC 3	5.46	4.79	5.13
AF	3.73	3.59	3.66
AB	3.91	3.20	3.55
Mean	4.72	4.49	4.60

N	0	70	140	210	Mean
ROTATION					
LN 8	2.52	5.71	5.36	6.53	5.03
LN 3	2.17	5.01	5.39	5.79	4.59
LC 8	3.52	6.60	6.36	6.14	5.65
LC 3	2.57	5.70	6.46	5.78	5.13
AF	1.27	3.82	4.60	4.96	3.66
AB	1.30	4.21	4.35	4.35	3.55
Mean	2.22	5.17	5.42	5.59	4.60

N	0	70	140	210	Mean
FYMRES64					
NONE	2.17	5.24	5.59	5.88	4.72
FYM	2.28	5.11	5.25	5.30	4.49
Mean	2.22	5.17	5.42	5.59	4.60

N		0	70	140	210
ROTATION	**FYMRES64**				
LN 8	NONE	1.92	5.61	4.61	6.51
	FYM	3.12	5.81	6.10	6.56
LN 3	NONE	2.02	5.07	5.41	5.63
	FYM	2.32	4.95	5.37	5.94
LC 8	NONE	3.72	7.04	6.61	6.68
	FYM	3.32	6.16	6.11	5.59
LC 3	NONE	2.95	5.89	6.87	6.14
	FYM	2.19	5.51	6.05	5.42
AF	NONE	1.04	3.72	5.33	4.84
	FYM	1.50	3.92	3.86	5.08
AB	NONE	1.38	4.08	4.68	5.49
	FYM	1.22	4.33	4.01	3.22

GRAIN MEAN DM% 90.2

PLOT AREA HARVESTED 0.00183

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95/W/RN/3

W. RYE 2ND TEST CROP

GRAIN TONNES/HECTARE

***** Tables of means *****

FYMRES63	NONE	FYM	Mean
ROTATION			
LN 8	5.35	4.91	5.13
LN 3	5.25	4.75	5.00
LC 8	4.59	4.69	4.64
LC 3	4.50	4.80	4.65
AF	3.15	3.01	3.08
AB	3.09	3.03	3.06
Mean	4.32	4.20	4.26

N	0	30	60	90	Mean
ROTATION					
LN 8	3.24	4.10	5.80	7.37	5.13
LN 3	3.50	4.15	5.68	6.69	5.00
LC 8	3.27	4.20	5.06	6.03	4.64
LC 3	2.99	4.70	5.21	5.71	4.65
AF	1.50	1.99	4.03	4.81	3.08
AB	1.36	2.74	3.57	4.56	3.06
Mean	2.64	3.65	4.89	5.86	4.26

N	0	30	60	90	Mean
FYMRES63					
NONE	2.65	3.62	5.12	5.90	4.32
FYM	2.63	3.67	4.66	5.82	4.20
Mean	2.64	3.65	4.89	5.86	4.26

N	0	30	60	90
ROTATION	**FYMRES63**				
LN 8	NONE	3.24	4.43	6.66	7.05
	FYM	3.23	3.76	4.94	7.69
LN 3	NONE	3.35	4.38	6.17	7.12
	FYM	3.65	3.92	5.19	6.26
LC 8	NONE	3.41	3.98	5.06	5.93
	FYM	3.13	4.42	5.06	6.14
LC 3	NONE	2.90	4.26	5.18	5.67
	FYM	3.07	5.14	5.25	5.75
AF	NONE	1.48	2.29	3.67	5.17
	FYM	1.53	1.68	4.39	4.46
AB	NONE	1.53	2.37	3.98	4.47
	FYM	1.19	3.12	3.16	4.65

GRAIN MEAN DM% 88.2

PLOT AREA HARVESTED 0.00183

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95/W/RN/12

ORGANIC MANURING

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

Sponsor: P.R. Poulton.

The 31st year, w. wheat.

For previous years see 'Details' 1973 and 74-94/W/RN/12.

Design: 4 blocks of 8 plots split into 6 sub-plots.

Whole plot dimensions: 8.0 x 30.5.

Treatments: From 1966 to 1971 the experiment had a preliminary period designed to build up organic matter, derived from different sources. An arable rotation was started on two blocks in 1972 and the remaining two blocks in 1973. After a period of testing the residues built up, a further period of accumulation was started; on two blocks (which included ley sown in 1979) in 1981 and on the other two (which included ley sown in 1980) in 1982. A second test phase began when leys on the first pair of blocks were ploughed for the 1st test crop in 1987 and on the second pair for the 1st test crop in 1988.

Whole blocks

1. **CROPSEQ**

WHEAT 4	4th wheat, after w. wheat 1988, potatoes 1989, w. wheat 1990, w. beans 1991
WHEAT 5	5th wheat, after w. wheat 1987, potatoes 1988, w. wheat 1989, w. beans 1990

Whole plots

2. **TREATMNT** Previous treatments:

LC 8 GM	Eight-year clover/grass ley until 1987 (WHEAT 4) or 1986 (WHEAT 5), green manure in the preliminary period
LC 8 PT	As above, peat in the preliminary period
LC 6 LC	Six-year clover/grass ley until 1987 (WHEAT 4) or 1986 (WHEAT 5), clover/grass ley in the preliminary period
LC 6 LN	As above, grass ley with N in the preliminary period
FYM	Farmyard manure annually 1981 to 1986 (WHEAT 4) or 1985 (WHEAT 5) and in the preliminary period
STRAW	Straw in both periods
FERT-FYM	Fertilizers only in both periods, rates of P, K & Mg equivalent to amounts in FYM
FERT-STR	Fertilizers only in both periods, rates of P, K & Mg equivalent to amounts in straw (+P)

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95/W/RN/12

Sub-plots

3. **N** Residual effects of nitrogen fertilizer applied in 1994 (kg N) as 'Nitro-Chalk':

(0)
(50)
(100)
(150)
(200)
(250)

NOTE: In 1995 nitrogen was applied to all plots at 100 kg N.

Experimental diary:

09-Sep-94 : B : Dolomite at 7.5 t.
26-Sep-94 : B : Barclay Gallup at 4.0 l in 200 l.
03-Oct-94 : B : Ploughed.
07-Oct-94 : B : Rotary harrowed, Mercia, dressed Rappor, drilled at 300 seeds per m^2.
28-Nov-94 : B : Panther at 2.0 l with Decis at 0.20 l in 200 l.
21-Apr-95 : B : 34.5% N at 290 kg.
28-Apr-95 : B : Halo at 2.0 l in 200 l.
01-Jun-95 : B : Cyclone at 1.0 l with Mallard at 0.30 l in 200 l.
29-Jun-95 : B : Pirimicarb 50 DG at 280 g in 300 l.
03-Aug-95 : B : Combine harvested.

NOTE: Straw yields were recorded on the **CROPSEQ** WHEAT 5 plots. Grain and straw samples were taken for chemical analysis.

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95/W/RN/12

CROPSEQ WHEAT 4

GRAIN TONNES/HECTARE

***** Tables of means *****

N TREATMNT	(0)	(50)	(100)	(150)	(200)	(250)	Mean
LC 8 GM	4.35	3.98	3.84	2.98	3.63	3.29	3.68
LC 8 PT	5.02	4.15	4.20	4.09	3.93	3.56	4.16
LC 6 LC	5.20	3.73	4.00	4.37	3.71	4.27	4.21
LC 6 LN	4.51	4.85	4.75	4.60	3.83	3.45	4.33
FYM	4.19	3.18	3.46	3.88	3.55	3.13	3.56
STRAW	5.36	5.03	4.82	4.90	4.73	5.15	5.00
FERT-FYM	3.56	2.88	3.24	3.08	3.10	3.29	3.19
FERT-STR	4.89	4.48	3.85	3.49	3.59	3.72	4.00
Mean	4.63	4.04	4.02	3.92	3.76	3.73	4.02

*** Standard errors of differences of means ***

TREATMNT	N	TREATMNT N
1.133	0.207	1.253

Except when comparing means with the same level(s) of TREATMNT 0.586

***** Stratum standard errors and coefficients of variation *****

Stratum	d.f.	s.e.	cv%
BLOCK.WP	7	1.133	28.2
BLOCK.WP.SP	40	0.586	14.6

GRAIN MEAN DM% 91.6

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95/W/RN/12

CROPSEQ WHEAT 5

GRAIN TONNES/HECTARE

***** Tables of means *****

N TREATMNT	(0)	(50)	(100)	(150)	(200)	(250)	Mean
LC 8 GM	4.76	5.21	4.57	4.29	3.84	3.83	4.41
LC 8 PT	5.52	5.10	4.39	4.54	4.25	4.57	4.73
LC 6 LC	5.09	3.71	4.94	5.24	4.11	4.20	4.55
LC 6 LN	5.43	5.40	5.43	4.32	4.08	4.40	4.84
FYM	5.14	4.51	4.74	3.82	3.86	4.15	4.37
STRAW	3.30	3.19	2.73	2.55	3.09	2.84	2.95
FERT-FYM	4.61	4.01	4.24	3.18	3.65	3.00	3.78
FERT-STR	3.46	3.27	3.14	3.01	3.02	3.00	3.15
Mean	4.66	4.30	4.27	3.87	3.74	3.75	4.10

*** Standard errors of differences of means ***

TREATMNT	N	TREATMNT N
0.346	0.167	0.553

Except when comparing means with the same level(s) of **TREATMNT** 0.473

***** Stratum standard errors and coefficients of variation *****

Stratum	d.f.	s.e.	cv%
BLOCK.WP	7	0.346	8.5
BLOCK.WP.SP	40	0.473	11.5

GRAIN MEAN DM% 91.3

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95/W/RN/12

CROPSEQ WHEAT 5

STRAW TONNES/HECTARE

***** Tables of means *****

N TREATMNT	(0)	(50)	(100)	(150)	(200)	(250)	Mean
LC 8 GM	3.05	3.20	2.95	3.14	2.94	2.82	3.02
LC 8 PT	3.50	2.93	2.57	2.77	2.77	2.91	2.91
LC 6 LC	3.41	2.40	2.95	2.94	2.43	2.68	2.80
LC 6 LN	3.88	3.53	3.47	2.87	3.14	3.26	3.36
FYM	3.06	2.83	3.05	2.66	2.44	2.77	2.80
STRAW	2.41	2.21	2.09	2.24	2.16	2.33	2.24
FERT-FYM	2.80	2.33	2.37	1.78	2.43	1.95	2.28
FERT-STR	2.49	2.19	2.18	1.93	2.04	2.15	2.16
Mean	3.07	2.70	2.70	2.54	2.54	2.61	2.70

STRAW MEAN DM% 93.9

SUB PLOT AREA HARVESTED 0.00202

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95/R/CS/10 and 95/W/CS/10

LONG TERM LIMING

Object: To study the effects of different amounts of lime, phosphate and sulphur on the yields and compositions of a sequence of crops - Rothamsted (R) Sawyers I and Woburn (W) Stackyard C.

Sponsor: S.P. McGrath.

The 34rd year, w. wheat.

For previous years see 'Details' 1967, 1973 and 74-94/R&W/CS/10.

Design: 2 randomised blocks of 16 plots split into 2 sub-plots.

Whole plot dimensions: 6.0 x 16.1 (R), 6.0 x 16.1 (W).

Treatments: All combinations of:-

Whole plots

1. **CHALK** Residual effects of ground chalk (tonnes CaCO3) (total applied 1962-87):

		Rothamsted total		Woburn total	
R	W	1962-78	1982-87	1962-78	1982-87
0	0	0	0	0	0
15	9	7	8	6	3
24.5	25.5	15	9.5	14	11.5
52.5	45.5	30	22.5	23	22.5

2. **P** Residual effects of P fertilizer applied:

	Until 1978	1981	1982	1983		1988	
	R & W	R & W	R & W	R	W	R	W
0	0	0	0	0	0	0	0
P1	0	P1	P1	0	P2	P1	P1
P2	P	P1	0	P2	P2	P1	P1
P3	P	P3	P1	P2	P4	P3	P3

Rates 1981-83 and 1988 P1, P2, P3, P4 = 25, 50, 75, 100 kg P as superphosphate

Sub-plots

3. **SULPHUR** Sulphur (kg S, as calcium sulphate), applied cumulatively since 1991:

0
30

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95/R/CS/10 and 95/W/CS/10

NOTES: (1) Until 1978 test P was applied cumulatively, rates varied with crop, none in 1979 and 1980. K was also applied cumulatively, to P1 and P3 plots. Since 1981 K has been applied basally (none in 1986, 1987, 1989, 1990, 1993, 1994 and 1995).
(2) Test manganese was applied cumulatively, 1987-90.

Experimental diary:

Sawyers I (R):

06-Sep-94 : B : Barclay Gallup at 4.0 l in 200 l.
12-Sep-94 : B : Topped.
14-Sep-94 : B : Ploughed.
29-Sep-94 : B : Disced, heavy spring-tine cultivated.
30-Sep-94 : B : Rotary harrowed, Genesis, dressed Rappor, drilled at 380 seeds per m^2.
24-Nov-94 : B : Alpha Isoproturon 500 at 2.5 l with Stomp 400 at 2.5 l in 200 l.
13-Apr-95 : B : 34.5% N at 435 kg.
01-May-95 : **T** : **SULPHUR** 30: Gypsum (17.5% S) at 171 kg.
10-May-95 : B : Halo at 2.0 l in 200 l.
16-Jun-95 : B : Halo at 2.0 l with Patrol at 0.5 l in 300 l.
02-Aug-95 : B : Combine harvested.

Stackyard C (W):

23-Sep-94 : B : Ploughed
30-Sep-94 : B : Rotary harrowed, Genesis, dressed Rappor, drilled at 300 seeds per m^2. Rolled.
28-Nov-94 : B : Panther at 2.0 l with Decis at 0.20 l in 200 l.
13-Mar-95 : **T** : **SULPHUR** 30: Gypsum (17.5% S) at 171 kg.
15-Mar-95 : B : 34.5% N at 116 kg.
21-Apr-95 : B : 34.5% N at 348 kg.
28-Apr-95 : B : Halo at 2.0 l in 200 l.
01-Jun-95 : B : Cyclone at 1.0 l with Mallard at 0.3 l in 200 l.
30-Jun-95 : B : Pirimicarb 50 DG at 280 g in 300 l.
04-Aug-95 : B : Combine harvested.

N.B. At Rothamsted, **CHALK** 0 plots failed, and have been omitted from the analyses.

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

GRAIN TONNES/HECTARE

***** Tables of means *****

P	-	P1	P2	P3	Mean
CHALK					
15	5.97	6.84	7.27	7.15	6.81
24.5	7.35	7.27	8.17	8.26	7.76
52.5	6.80	7.88	8.20	8.46	7.83
Mean	6.71	7.33	7.88	7.96	7.47

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

GRAIN TONNES/HECTARE

***** Tables of means *****

SULPHUR	0	30	Mean
CHALK			
15	6.76	6.85	6.81
24.5	7.66	7.87	7.76
52.5	7.78	7.89	7.83
Mean	7.40	7.54	7.47

SULPHUR	0	30	Mean
P			
-	6.81	6.60	6.71
P1	7.15	7.51	7.33
P2	7.78	7.98	7.88
P3	7.85	8.07	7.96
Mean	7.40	7.54	7.47

	SULPHUR	0	30
CHALK	P		
15	-	6.36	5.58
	P1	6.63	7.05
	P2	7.24	7.30
	P3	6.82	7.49
24.5	-	7.36	7.34
	P1	6.93	7.62
	P2	7.89	8.45
	P3	8.46	8.06
52.5	-	6.71	6.88
	P1	7.89	7.86
	P2	8.22	8.18
	P3	8.28	8.65

*** Standard errors of differences of means ***

CHALK	P	SULPHUR	CHALK P
0.321	0.370	0.159	0.641

CHALK SULPHUR	P SULPHUR	CHALK P SULPHUR
0.375	0.433	0.750

Except when comparing means with the same level(s) of

CHALK	0.275
P	0.318
CHALK.P	0.551

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

GRAIN TONNES/HECTARE

***** Stratum standard errors and coefficients of variation *****

Stratum	d.f.	s.e.	cv%
BLOCK.WP	11	0.641	8.6
BLOCK.WP.SP	12	0.551	7.4

GRAIN MEAN DM% 90.2

SUB PLOT AREA HARVESTED 0.00150

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

GRAIN TONNES/HECTARE

***** Tables of means *****

P	-	P1	P2	P3	Mean
CHALK					
0	1.12	0.82	2.24	1.38	1.39
9	7.37	7.74	8.25	7.78	7.78
25.5	7.10	7.13	7.72	7.52	7.37
45.5	6.48	8.12	7.21	7.52	7.33
Mean	5.52	5.95	6.36	6.05	5.97

SULPHUR	0	30	Mean
CHALK			
0	1.45	1.32	1.39
9	7.76	7.81	7.78
25.5	7.30	7.44	7.37
45.5	7.14	7.52	7.33
Mean	5.91	6.02	5.97

SULPHUR	0	30	Mean
P			
-	5.33	5.71	5.52
P1	5.86	6.05	5.95
P2	6.38	6.33	6.36
P3	6.09	6.01	6.05
Mean	5.91	6.02	5.97

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

GRAIN TONNES/HECTARE

***** Tables of means *****

CHALK	SULPHUR P	0	30
0	-	0.89	1.34
	P1	0.63	1.00
	P2	2.28	2.21
	P3	2.01	0.74
9	-	6.94	7.79
	P1	8.01	7.47
	P2	8.27	8.24
	P3	7.84	7.72
25.5	-	7.12	7.09
	P1	6.93	7.33
	P2	7.67	7.77
	P3	7.48	7.57
45.5	-	6.36	6.61
	P1	7.86	8.37
	P2	7.32	7.10
	P3	7.04	8.00

*** Standard errors of differences of means ***

CHALK	P	SULPHUR	CHALK P
0.244	0.244	0.128	0.489

CHALK SULPHUR	P SULPHUR	CHALK P SULPHUR
0.304	0.304	0.608

Except when comparing means with the same level(s) of

CHALK	0.255
P	0.255
CHALK.P	0.510

***** Stratum standard errors and coefficients of variation *****

Stratum	d.f.	s.e.	cv%
BLOCK.WP	15	0.489	8.2
BLOCK.WP.SP	16	0.510	8.5

GRAIN MEAN DM% 91.1

SUB PLOT AREA HARVESTED 0.00143

https://doi.org/10.23637/ERADOC-1-50

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95/R/CS/140

CHEMICAL REFERENCE PLOTS

Object: To study the persistence in soil of agricultural chemicals applied annually, singly and in combination, and their effects on soil microflora and on yield of continuous s. barley - Long Hoos V 3.

Sponsors: R.H. Bromilow, A.A. Evans, P.H. Nicholls.

The 22nd year, s. barley.

For previous years see 74-94/R/CS/140.

Design: Single replicate of 32 plots.

Whole plot dimensions: 4.06 x 4.57.

Treatments: Applied cumulatively every year until 1993, none since.

All combinations of:-

1.	**WEEDKLLR**	Weedkiller in autumn:
	(NONE)	None
	(GLYPHOS)	Glyphosate to barley stubble each autumn
2.	**FUNGCIDE[1]**	Fungicide in autumn:
	(NONE)	None
	(TRIADIM)	Triadimefon in autumn
3.	**FUNGCIDE[2]**	Fungicide in spring:
	(NONE)	None
	(BENOMYL)	Benomyl to the seedbed
4.	**INSCTCDE**	Insecticide:
	(NONE)	None
	(CHLORFEN)	Chlorfenvinphos to the seedbed
5.	**NEMACIDE**	Nematicide:
	(NONE)	None
	(ALDICARB)	Aldicarb to the seedbed

Experimental diary:

```
09-Aug-94 : B : Straw baled.
15-Nov-94 : B : Stubble topped.
01-Dec-94 : B : Ploughed.
23-Mar-95 : B : Heavy spring-tine cultivated.  Rotary harrowed, Alexis,
                undressed, drilled at 310 seeds per m².
11-May-95 : B : 34.5% N at 435 kg.
15-Jun-95 : B : Lorate 20 DF at 30 g in 300 l.
```


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95/R/CS/140

Experimental diary:
15-Jun-95 : B : Starane 2 at 0.5 l in 300 l.
08-Aug-95 : B : Combine harvested.

GRAIN TONNES/HECTARE

***** Tables of means *****

FUNGCIDE[1]	(NONE)	(TRIADIM)	Mean
WEEDKLLR			
(NONE)	3.87	3.78	3.83
(GLYPHOS)	3.65	3.91	3.78
Mean	3.76	3.85	3.80

FUNGCIDE[2]	(NONE)	(BENOMYL)	Mean
WEEDKLLR			
(NONE)	3.86	3.80	3.83
(GLYPHOS)	3.61	3.95	3.78
Mean	3.73	3.87	3.80

FUNGCIDE[2]	(NONE)	(BENOMYL)	Mean
FUNGCIDE[1]			
(NONE)	3.82	3.69	3.76
(TRIADIM)	3.64	4.05	3.85
Mean	3.73	3.87	3.80

INSCTCDE	(NONE)	(CHLORFEN)	Mean
WEEDKLLR			
(NONE)	3.95	3.71	3.83
(GLYPHOS)	3.82	3.73	3.78
Mean	3.89	3.72	3.80

INSCTCDE	(NONE)	(CHLORFEN)	Mean
FUNGCIDE[1]			
(NONE)	3.69	3.83	3.76
(TRIADIM)	4.09	3.61	3.85
Mean	3.89	3.72	3.80

INSCTCDE	(NONE)	(CHLORFEN)	Mean
FUNGCIDE[2]			
(NONE)	3.74	3.73	3.73
(BENOMYL)	4.04	3.71	3.87
Mean	3.89	3.72	3.80

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95/R/CS/140

GRAIN TONNES/HECTARE

***** Tables of means *****

NEMACIDE / WEEDKLLR	(NONE)	(ALDICARB)	Mean
(NONE)	3.80	3.86	3.83
(GLYPHOS)	3.73	3.82	3.78
Mean	3.77	3.84	3.80

NEMACIDE / FUNGCIDE[1]	(NONE)	(ALDICARB)	Mean
(NONE)	3.76	3.76	3.76
(TRIADIM)	3.77	3.92	3.85
Mean	3.77	3.84	3.80

NEMACIDE / FUNGCIDE[2]	(NONE)	(ALDICARB)	Mean
(NONE)	3.67	3.80	3.73
(BENOMYL)	3.86	3.88	3.87
Mean	3.77	3.84	3.80

NEMACIDE / INSCTCDE	(NONE)	(ALDICARB)	Mean
(NONE)	3.79	3.99	3.89
(CHLORFEN)	3.74	3.70	3.72
Mean	3.77	3.84	3.80

FUNGCIDE[2] / WEEDKLLR / FUNGCIDE[1]	(NONE)	(BENOMYL)
(NONE) / (NONE)	4.00	3.74
(NONE) / (TRIADIM)	3.72	3.85
(GLYPHOS) / (NONE)	3.65	3.65
(GLYPHOS) / (TRIADIM)	3.57	4.25

INSCTCDE / WEEDKLLR / FUNGCIDE[1]	(NONE)	(CHLORFEN)
(NONE) / (NONE)	3.90	3.85
(NONE) / (TRIADIM)	4.00	3.57
(GLYPHOS) / (NONE)	3.47	3.82
(GLYPHOS) / (TRIADIM)	4.17	3.64

INSCTCDE / WEEDKLLR / FUNGCIDE[2]	(NONE)	(CHLORFEN)
(NONE) / (NONE)	3.80	3.92
(NONE) / (BENOMYL)	4.10	3.50
(GLYPHOS) / (NONE)	3.67	3.54
(GLYPHOS) / (BENOMYL)	3.97	3.92

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95/R/CS/140

GRAIN TONNES/HECTARE

***** Tables of means *****

	INSCTCDE	(NONE)	(CHLORFEN)
FUNGCIDE[1]	FUNGCIDE[2]		
(NONE)	(NONE)	3.58	4.07
	(BENOMYL)	3.80	3.59
(TRIADIM)	(NONE)	3.90	3.39
	(BENOMYL)	4.28	3.82

	NEMACIDE	(NONE)	(ALDICARB)
WEEDKLLR	FUNGCIDE[1]		
(NONE)	(NONE)	3.82	3.92
	(TRIADIM)	3.77	3.80
(GLYPHOS)	(NONE)	3.69	3.60
	(TRIADIM)	3.77	4.05

	NEMACIDE	(NONE)	(ALDICARB)
WEEDKLLR	FUNGCIDE[2]		
(NONE)	(NONE)	3.80	3.92
	(BENOMYL)	3.80	3.79
(GLYPHOS)	(NONE)	3.54	3.67
	(BENOMYL)	3.92	3.97

	NEMACIDE	(NONE)	(ALDICARB)
FUNGCIDE[1]	FUNGCIDE[2]		
(NONE)	(NONE)	3.80	3.85
	(BENOMYL)	3.72	3.67
(TRIADIM)	(NONE)	3.54	3.74
	(BENOMYL)	4.00	4.10

	NEMACIDE	(NONE)	(ALDICARB)
WEEDKLLR	INSCTCDE		
(NONE)	(NONE)	3.93	3.97
	(CHLORFEN)	3.67	3.75
(GLYPHOS)	(NONE)	3.65	4.00
	(CHLORFEN)	3.82	3.64

	NEMACIDE	(NONE)	(ALDICARB)
FUNGCIDE[1]	INSCTCDE		
(NONE)	(NONE)	3.70	3.67
	(CHLORFEN)	3.82	3.85
(TRIADIM)	(NONE)	3.87	4.30
	(CHLORFEN)	3.67	3.54

	NEMACIDE	(NONE)	(ALDICARB)
FUNGCIDE[2]	INSCTCDE		
(NONE)	(NONE)	3.68	3.80
	(CHLORFEN)	3.67	3.80
(BENOMYL)	(NONE)	3.90	4.17
	(CHLORFEN)	3.82	3.59

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GRAIN TONNES/HECTARE

***** Tables of means *****

	FUNGCIDE[1]	(NONE)		(TRIADIM)	
WEEDKLLR	**FUNGCIDE[2]**	(NONE)	(BENOMYL)	(NONE)	(BENOMYL)
(NONE)		4.00	3.74	3.72	3.85
(GLYPHOS)		3.65	3.65	3.57	4.25

	FUNGCIDE[1]	(NONE)		(TRIADIM)	
WEEDKLLR	**INSCTCDE**	(NONE)	(CHLORFEN)	(NONE)	(CHLORFEN)
(NONE)		3.90	3.85	4.00	3.57
(GLYPHOS)		3.47	3.82	4.17	3.64

	FUNGCIDE[2]	(NONE)		(BENOMYL)	
WEEDKLLR	**INSCTCDE**	(NONE)	(CHLORFEN)	(NONE)	(CHLORFEN)
(NONE)		3.80	3.92	4.10	3.50
(GLYPHOS)		3.67	3.54	3.97	3.92

	FUNGCIDE[2]	(NONE)		(BENOMYL)	
FUNGCIDE[1]	**INSCTCDE**	(NONE)	(CHLORFEN)	(NONE)	(CHLORFEN)
(NONE)		3.58	4.07	3.80	3.59
(TRIADIM)		3.90	3.39	4.28	3.82

	FUNGCIDE[1]	(NONE)		(TRIADIM)	
WEEDKLLR	**NEMACIDE**	(NONE)	(ALDICARB)	(NONE)	(ALDICARB)
(NONE)		3.82	3.92	3.77	3.80
(GLYPHOS)		3.69	3.60	3.77	4.05

	FUNGCIDE[2]	(NONE)		(BENOMYL)	
WEEDKLLR	**NEMACIDE**	(NONE)	(ALDICARB)	(NONE)	(ALDICARB)
(NONE)		3.80	3.92	3.80	3.79
(GLYPHOS)		3.54	3.67	3.92	3.97

	FUNGCIDE[2]	(NONE)		(BENOMYL)	
FUNGCIDE[1]	**NEMACIDE**	(NONE)	(ALDICARB)	(NONE)	(ALDICARB)
(NONE)		3.80	3.85	3.72	3.67
(TRIADIM)		3.54	3.74	4.00	4.10

	INSCTCDE	(NONE)		(CHLORFEN)	
WEEDKLLR	**NEMACIDE**	(NONE)	(ALDICARB)	(NONE)	(ALDICARB)
(NONE)		3.93	3.97	3.67	3.75
(GLYPHOS)		3.65	4.00	3.82	3.64

	INSCTCDE	(NONE)		(CHLORFEN)	
FUNGCIDE[1]	**NEMACIDE**	(NONE)	(ALDICARB)	(NONE)	(ALDICARB)
(NONE)		3.70	3.67	3.82	3.85
(TRIADIM)		3.87	4.30	3.67	3.54

	INSCTCDE	(NONE)		(CHLORFEN)	
FUNGCIDE[2]	**NEMACIDE**	(NONE)	(ALDICARB)	(NONE)	(ALDICARB)
(NONE)		3.68	3.80	3.67	3.80
(BENOMYL)		3.90	4.17	3.82	3.59

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95/R/CS/140

GRAIN TONNES/HECTARE

*** Standard errors of differences of means ***

Margins of two factor tables	0.202
Two factor tables	0.285
Three factor tables	0.404

***** Stratum standard errors and coefficients of variation *****

Stratum	d.f.	s.e.	cv%
WP	6	0.571	15.0

GRAIN MEAN DM% 89.9

PLOT AREA HARVESTED 0.00105

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95/R/CS/302

EYESPOT RESISTANCE TO MBC

Object: To study the development of resistance to MBC fungicides in eyespot and the ability of resistant strains to survive, spread and infect - Meadow.

Sponsor: G.L. Bateman.

The eleventh year, w. wheat after set-aside.

For previous years see 85-93/R/CS/302

Design: 2 randomised blocks of 4 plots split into 6 sub-plots.

Whole plot dimensions: 12.0 x 24.0.
Sub-plot dimensions: 4.5 x 6.0.

Treatments: All combinations of:-

Whole plots

1.	**FUNGCIDE**	Fungicide applied cumulatively 1985-93 and 1995:
	NONE	None
	CARB	Carbendazim at 0.25 kg
	PRO	Prochloraz at 0.40 kg (0.50 kg in 1993 and 1995)
	CARB+PRO	Carbendazim at 0.25 kg with prochloraz at 0.40 kg (0.50 kg in 1993 and 1995)

Sub-plots

2.	**EYE INOC**	Eyespot inoculum, applied in first year only:
	NATURAL	Natural background population (duplicated)
	W 19R 1S	Inoculated with wheat strains in proportion 19 resistant to one sensitive
	W 1R 19S	As above but one resistant to 19 sensitive
	R 19R 1S	Inoculated with rye strains, 19 resistant to one sensitive
	R 1R 19S	As above but one resistant to 19 sensitive

NOTE: The inoculum was colonized on oat seed and broadcast in October, 1984.

Experimental diary:

19-Jul-94 : B : PK as (0:20:32) at 1406 kg.
05-Aug-94 : B : Barclay Gallup at 2.0 l with Frigate at 1.0 l in 200 l.
15-Aug-94 : B : Ploughed.
27-Sep-94 : B : Rotary harrowed, Mercia, dressed Cerevax, drilled at 380 seeds per m^2.
28-Sep-94 : B : Rolled.
21-Nov-94 : B : Auger at 2.5 l with Stomp 400 at 2.5 l and Decis at 200 ml in 200 l.
13-Mar-95 : B : 34.5% N at 118 kg.

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95/R/CS/302

Experimental diary:

```
   14-Mar-95 : T : FUNGCIDE CARB: Tripart Defensor FL at 0.5 l in 200 l.
             : T : FUNGCIDE PRO: Sportak 45 at 1.1 l in 200 l.
             : T : FUNGCIDE CARB+PRO: Sportak 45 at 1.1 l with Tripart
                   Defensor FL at 0.5 l in 200 l.
   11-Apr-95 : T : FUNGCIDE CARB: Tripart Defensor FL at 0.5 l in 200 l.
             : T : FUNGCIDE PRO: Barclay Eyetak at 1.1 l in 200 l.
             : T : FUNGCIDE CARB+PRO: Barclay Eyetak at 1.1 l with Tripart
                   Defensor FL at 0.5 l in 200 l.
   12-Apr-95 : B : 34.5% N at 463 kg.
   10-May-95 : B : Calixin at 0.35 l with Halo at 2.0 l in 200 l.
   16-Jun-95 : B : Halo at 2.0 l with Patrol at 0.5 l in 300 l.
   02-Aug-95 : B : Combine harvested.
```

NOTE: Samples were taken in July to assess eyespot.

GRAIN TONNES/HECTARE

***** Tables of means *****

EYE INOC / FUNGCIDE	NATURAL	W 19R 1S	W 1R 19S	R 19R 1S	R 1R 19S	Mean
NONE	9.78	9.40	8.70	9.22	10.01	9.48
CARB	9.09	9.29	9.45	8.97	9.50	9.23
PRO	9.13	8.72	9.36	9.26	8.93	9.09
CARB+PRO	9.79	8.87	9.78	9.70	10.01	9.66
Mean	9.45	9.07	9.32	9.29	9.61	9.36

*** Standard errors of differences of means ***

EYE INOC	FUNGCIDE* EYE INOC	
0.243	0.485	min.rep
0.210	0.420	max-min

* Within the same level of **FUNGCIDE** only.

***** Stratum standard errors and coefficients of variation *****

Stratum	d.f.	s.e.	cv%
BLOCK.WP.SP	24	0.485	5.2

GRAIN MEAN DM% 91.7

SUB-PLOT AREA HARVESTED 0.00137

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95/R/CS/309 and 95/W/CS/309

LONG-TERM STRAW INCORPORATION

Object: To study the effects of rotational ploughing and time of sowing after the incorporation or burning of straw on soil conditions and pests, diseases, weeds and yield of w. wheat - Rothamsted (R) Great Knott III and Woburn (W) Far Field I.

Sponsors: R.D. Prew, A.D. Todd, E.T.G. Bacon, J.F. Jenkyn, R.J. Gutteridge, W. Powell.

The eleventh year, w. wheat.

For previous years see 85-94/R & W/CS/309.

Design: 4 randomised blocks of 12 plots split into 2 sub-plots (R).
2 randomised blocks of 12 plots split into 2 sub-plots (W).

Whole plot dimensions: 9.0 x 28.0 (R).
9.0 x 30.0 (W).

Treatments: All combinations of:-

Whole plots

1. **STRAWCUL** Treatment of straw of previous crop and type of cultivation up to 1994 (before the space) and subsequently (after the space):

   BT1 BTT
   BT1T2 CTT
   BP2 BPP
   BT1P2 CPP
   CT1 CTT
   CT1 CPT
   CT1T2 CTP
   CT1T2 CTT
   CP2 CPP
   CP2 CPT
   CT1P2 CTP
   CT1P2 CTT

Sub-plots

2. **SOW DATE** Date of sowing:

   E Early
   L Late

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95/R/CS/309 and 95/W/CS/309

NOTES: (1) The following codes are used:
B Straw burnt
C Straw chopped and spread
T1 Cultivated to 10 cm depth
T1P2 Cultivated to 10 cm depth, ploughed to 20 cm
T1T2 Cultivated to 10 cm depth and again to 20 cm
P2 Ploughed to 20 cm depth
(2) From 1994 T plots were cultivated to 10 cm and P plots were ploughed to 20 cm depth.
(3) In the experimental diary only the code after the space is used. i.e. BTT, CTT, BPP, CPP, etc.

Experimental diary:
Great Knott III (R).
06-Aug-94 : **T** : **STRAWCUL** CTT, CPP, CPT, CTP: Straw chopped.
08-Aug-94 : **T** : **STRAWCUL** BTT, BPP: Straw burnt, ash incorporated with discs.
02-Sep-94 : B : PK as (0:20:32) at 1317 kg.
27-Sep-94 : B : Sting CT at 2.0 l in 200 l.
03-Oct-94 : **T** : **STRAWCUL** CTT, CPT, BTT: Heavy spring-tine cultivated, twice.
: **T** : **STRAWCUL** BPP, CPP, CTP: Ploughed.
10-Oct-94 : **T** : **STRAWCUL** CTT, CPT, BTT, **SOW DATE** E: Cultivated by rotary grubber, rotary harrowed.
: **T** : **STRAWCUL** BPP, CPP, CTP, **SOW DATE** E: Spring-tine cultivated.
11-Oct-94 : **T** : **SOW DATE** E: Rotary harrowed, Soissons, dressed Beret 050FS, drilled at 380 seeds per m^2.
17-Nov-94 : **T** : **SOW DATE** L: Rotary harrowed, Soissons, dressed Beret 050FS drilled at 450 seeds per m^2.
24-Nov-94 : B : Draza at 5.5 kg.
25-Nov-94 : B : Avadex BW Granular at 22.5 kg.
10-Mar-95 : B : 34.5% N at 118 kg.
16-Mar-95 : B : Stefes IPU at 5.0 l in 200 l.
11-Apr-95 : B : 34.5% N at 463 kg.
10-May-95 : B : Halo at 2.0 l in 200 l.
16-Jun-95 : B : Bravo 500 at 1.0 l with Silvacur at 0.5 l in 300 l.
04-Aug-95 : B : Combine harvested.
Far Field I (W).
08-Sep-94 : B : PK as (0:20:32) at 781 kg.
26-Sep-94 : B : Gramoxone 100 at 3.0 l in 200 l.
28-Sep-94 : **T** : **STRAWCUL** BTT, BPP: Straw burnt.
29-Sep-94 : **T** : **STRAWCUL** BPP, CPP, CTP: Ploughed.
30-Sep-94 : B : Rotary harrowed.
: **T** : **STRAWCUL** BTT, CTT, CPT: Spring-tine cultivated.
: **T** : **STRAWCUL** BPP, CPP, CTP: Rolled.
: **T** : **SOW DATE** E Soissons dressed Beret 050FS drilled at 350 seeds per m^2.
02-Nov-94 : **T** : **SOW DATE** E: Avadex BW Granules at 22.5 kg.
16-Nov-94 : **T** : **SOW DATE** L: Rotary harrowed. Soissons dressed Beret 050FS, drilled at 400 seeds per m^2.
28-Nov-94 : **T** : **SOW DATE** L: Avadex BW Granules at 22.5 kg.
02-Dec-94 : B : Stomp 400 at 3.3 l with Stefes IPU at 3.0 l in 200 l.

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95/R/CS/309 and 95/W/CS/309

Experimental diary:
Far Field I (W).
15-Mar-95 : B : 34.5% N at 116 kg.
28-Apr-95 : B : 34.5% N at 464 kg.
02-May-95 : B : Starane 2 at 1.0 l with Halo at 2.0 l in 200 l.
01-Jun-95 : B : Cyclone at 1.0 l in 300 l.
30-Jun-95 : B : Pirimicarb 50 DG at 280 g in 300 l.
02-Aug-95 : B : Combine harvested.

NOTES: (1) On W/CS/309 three late-sown, tined sub-plots on one side of the experiment grew poorly after being waterlogged, with treatment combinations **STRAWCUL** CT1T2-CTT, CT1-CPT, BT1-BTT. These plots have been treated as missing values and estimated values have been used in the analysis.
(2) Establishment counts were made in winter. Numbers of grass weeds were counted in March and April and numbers of ears of grass weeds were counted in June.
(3) Crop samples were taken in April (R) and June (R and W) to measure diseases affecting the stem bases and roots.

95/R/CS/309 GREAT KNOTT III(R)

GRAIN TONNES/HECTARE

***** Tables of means *****

SOW DATE	E	L	Mean
STRAWCUL			
BT1 BTT	6.38	8.59	7.48
BT1T2 CTT	6.04	6.33	6.19
BP2 BPP	8.10	8.96	8.53
BT1P2 CPP	7.68	8.51	8.10
CT1 CTT	6.24	7.13	6.68
CT1 CPT	7.27	7.05	7.16
CT1T2 CTP	7.60	8.27	7.94
CT1T2 CTT	6.11	6.62	6.36
CP2 CPP	7.58	8.02	7.80
CP2 CPT	7.17	7.07	7.12
CT1P2 CTP	8.50	8.40	8.45
CT1P2 CTT	7.37	6.58	6.98
Mean	7.17	7.63	7.40

*** Standard errors of differences of means ***

STRAWCUL	**SOW DATE**	**STRAWCUL SOW DATE**
0.410	0.117	0.500

Except when comparing means with the same level(s) of
STRAWCUL 0.405

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95/R/CS/309 GREAT KNOTT III(R)

GRAIN TONNES/HECTARE

***** Stratum standard errors and coefficients of variation *****

Stratum	d.f.	s.e.	cv%
BLOCK.WP	33	0.579	7.8
BLOCK.WP.SP	36	0.573	7.7

GRAIN MEAN DM% 91.4

SUB-PLOT AREA HARVESTED 0.00644

95/W/CS/309 FAR FIELD I (W)

GRAIN TONNES/HECTARE

***** Tables of means *****

SOW DATE	E	L	Mean
STRAWCUL			
BT1 BTT	2.61	3.54	3.08
BT1T2 CTT	1.36	4.91	3.13
BP2 BPP	6.08	5.97	6.02
BT1P2 CPP	5.38	5.14	5.26
CT1 CTT	2.16	4.34	3.25
CT1 CPT	4.06	3.78	3.92
CT1T2 CTP	6.63	6.78	6.70
CT1T2 CTT	1.12	4.57	2.85
CP2 CPP	5.62	5.77	5.69
CP2 CPT	3.26	4.18	3.72
CT1P2 CTP	5.66	5.42	5.54
CT1P2 CTT	3.59	5.01	4.30
Mean	3.96	4.95	4.46

*** Standard errors of differences of means ***

STRAWCUL	**SOW DATE**	**STRAWCUL SOW DATE**
0.790	0.116	0.839

Except when comparing means with the same level(s) of **STRAWCUL** 0.401

***** Stratum standard errors and coefficients of variation *****

Stratum	d.f.	s.e.	cv%
BLOCK.WP	11	0.790	17.7
BLOCK.WP.SP	9	0.401	9.0

GRAIN MEAN DM% 91.4 SUB-PLOT AREA HARVESTED 0.00660

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95/R/CS/311

EFFECTS OF SHALLOW STRAW INCORPORATION

Object: To study the effects of straw incorporation by rotational ploughing, with shallow cultivation in the intervening years, on diseases and yield of winter wheat - West Barnfield I.

Sponsors: J.F. Jenkyn, R.J. Gutteridge, A.D. Todd.

The eleventh year, w. wheat.

For previous years see 85-94/R/CS/311.

Design: 6 x 4 criss-cross split into 2 sub-plots. Originally a single replicate of 3 x 2 x 2 x 2 x 2.

Whole plot dimensions: 4.5 x 12.0.

Treatments: Combinations of:-

Whole plots

1. **STRAW** Treatments to straw of previous wheat:

BURNT	Burnt (duplicated)
BALED	Baled and removed (duplicated)
CHOPPED	Chopped and incorporated (duplicated)

Criss-cross with

2. **CULTIVTN**

S	Shallow tine cultivated to 10 cm (duplicated)
S(P)	Shallow tine cultivated to 10 cm, ploughed to 23 cm in autumn 1993
P	Ploughed to 23 cm

Experimental diary:

08-Aug-94	**T**	**STRAW** BALED: Straw baled and removed.
	T	**STRAW** BURNT: Straw burnt and ash incorporated with discs.
	T	**STRAW** CHOPPED: Straw chopped with trailed chopper.
02-Sep-94	B	PK as (0:20:32) at 1317 kg.
06-Sep-94	B	Sting CT at 2.0 l in 200 l.
04-Oct-94	**T**	**CULTIVTN** P: Ploughed.
	T	**CULTIVTN** S, S(P): Heavy spring-tine cultivated twice.
07-Oct-94	B	Rotary harrowed.
	T	**CULTIVTN** S, S(P): Cultivated by rotary grubber.
	B	Rotary harrowed, Soissons, dressed Beret 050FS, drilled at 380 seeds per m^2.
18-Nov-94	B	Auger at 3.0 l with Stomp 400 at 2.5 l in 200 l.
25-Nov-94	B	Atlas Dimethoate 40 at 850 ml in 200 l.
10-Mar-95	B	34.5% N at 118 kg.
11-Apr-95	B	34.5% N at 580 kg.
03-May-95	B	Halo at 2.0 l in 200 l.

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95/R/CS/311

Experimental diary:
16-Jun-95 : B : Bravo 500 at 1.0 l with Silvacur at 0.5 l in 300 l.
04-Aug-95 : B : Combine harvested.

NOTES: (1) All plots were shallow cultivated until the rotational ploughing was introduced in autumn 1993.
(2) Ears of volunteers and grass weeds were counted in June. Crop samples were taken in April and June to measure disease affecting the stem bases and roots.

GRAIN TONNES/HECTARE

***** Tables of means *****

CULTIVTN / STRAW	S	S(P)	P	Mean
BU	8.60	8.48	8.70	8.59
BA	8.00	8.54	8.42	8.24
CH	8.58	8.70	8.45	8.58
Mean	8.39	8.57	8.52	8.47

GRAIN MEAN DM% 92.1

SUB-PLOT AREA HARVESTED 0.00276

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95/R/CS/323

CEREAL SEQUENCES AND TAKE-ALL

Object: To study the effects on take-all (*Gaeumannomyces graminis*) and yield of different cereals grown in various cereal sequences - West Barnfield II.

Sponsors: R.J. Gutteridge, R.D. Prew.

The eighth year, w. barley, w. oats, w. triticale, w. wheat.

For previous years see 88-94/R/CS/323

Design: 3 randomised blocks of 26 plots.

Whole plot dimensions: 3.0 x 10.0.

CROPSEQ Crop sequences (1988 to 1995 respectively):

TTTTTTTT
OTTTOTTT
TOTTTOTT
TTOTTTOT
TTTOTTTO
WWWWWWWW
OWWWOWWW
WOWWWOWW
WWOWWWOW
WWWOWWWO
BBBBBBBB
OBBBOBBB
BOBBBOBB
BBOBBBOB
BBBOBBBO
WTWTWTWT
WBWBWBWB
TBTBTBTB
SBSBSBSB
WWTTTWWW
WWBBBWWW
TTBBBTTT
TTWWWTTT
BBWWWBBB
BBTTTBBB
WWSSSWWW

W = W. wheat
S = S. barley
B = W. barley
O = W. oats
T = W. triticale

NOTE: Only the last letter of the crop sequence, the crop in 1995, is used in the experimental diary.

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95/R/CS/323

Experimental diary:

22-Jul-94	: B	:	Straw baled.
06-Sep-94	: B	:	Sting CT at 2.0 l in 200 l.
07-Sep-94	: B	:	Dolomite at 5.0 t.
08-Sep-94	: B	:	PK as(0:20:32) at 300 kg.
16-Sep-94	: B	:	Ploughed and furrow pressed.
23-Sep-94	: **T**	:	**CROPSEQ** B: Rotary harrowed, Magie, dressed Rappor Plus, drilled at 350 seeds per m^2.
	: **T**	:	**CROPSEQ** O: Rotary harrowed, Image, dressed Panoctine, drilled at 350 seeds per m^2.
	: **T**	:	**CROPSEQ** T: Rotary harrowed, Lasko, dressed Cerevax, drilled at 400 seeds per m^2.
	: **T**	:	**CROPSEQ** W: Rotary harrowed, Mercia, dressed Rappor, drilled at 380 seeds per m^2.
26-Sep-94	: **T**	:	**CROPSEQ** O: Glytex at 2.25 kg in 200 l.
	: **T**	:	**CROPSEQ** B, T, W: Hytane 500 SC at 2.5 l with Stomp 400 at 3.3 l in 200 l.
10-Mar-95	: B	:	34.5% N at 92 kg.
10-Apr-95	: **T**	:	**CROPSEQ** T, O: 34.5% N at 354 kg.
	: **T**	:	**CROPSEQ** B: 34.5% N at 442 kg.
	: **T**	:	**CROPSEQ** W: 34.5% N at 500 kg.
28-Apr-95	: B	:	Starane 2 at 0.75 l in 200 l.
	: **T**	:	**CROPSEQ** B: Tigress at 2.5 l in 200 l.
	: **T**	:	**CROPSEQ** W, T: Topik 240EC at 125 ml with Actipron at 1.2 l in 200 l.
16-Jun-95	: **T**	:	**CROPSEQ** W: Halo at 2.0 l with Patrol at 0.5 l in 300 l.
20-Jul-95	: **T**	:	**CROPSEQ** B, O: Combine harvested.
02-Aug-95	: **T**	:	**CROPSEQ** W, T: Combine harvested.

NOTE: Plant samples were taken in April, June and July for take-all and eyespot assessments. Soil cores were taken after harvest to assess take-all infectivity.

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95/R/CS/323

GRAIN TONNES/HECTARE

***** Tables of means *****

CROPSEQ	
TTTTTTTT	4.71
OTTTOTTT	4.92
TOTTTOTT	5.65
TTOTTTOT	5.80
TTTOTTTO	4.84
WWWWWWWW	6.90
OWWWOWWW	6.17
WOWWWOWW	7.74
WWOWWWOW	7.47
WWWOWWWO	5.22
BBBBBBBB	5.62
OBBBOBBB	5.37
BOBBBOBB	6.15
BBOBBBOB	5.82
BBBOBBBO	6.24
WTWTWTWT	4.79
WBWBWBWB	5.63
TBTBTBTB	6.01
SBSBSBSB	5.50
WWTTTWWW	6.73
WWBBBWWW	6.51
TTBBBTTT	5.25
TTWWWTTT	4.84
BBWWWBBB	5.95
BBTTTBBB	5.80
WWSSSWWW	6.18
Mean	5.84

*** Standard errors of differences of means ***

CROPSEQ
0.416

***** Stratum standard errors and coefficients of variation *****

Stratum	d.f.	s.e.	cv%
BLOCK.WP	50	0.510	8.7

GRAIN MEAN DM% 89.7

PLOT AREA HARVESTED 0.00228

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95/R/CS/326 and 95/W/CS/326

AMOUNTS OF STRAW

Object: To study the effects of different amounts of straw, incorporated into the soil, on w.wheat - Rothamsted (R) Great Knott III, Woburn (W) Far Field I.

Sponsors: N.J. Bradbury, M.J. Glendining, J.F. Jenkyn.

The ninth year, w. wheat.

For previous years see 87-94/R & W/CS/326.

Design: 4 randomised blocks of 4 plots (R).
3 randomised blocks of 4 plots (W).

Whole plot dimensions: 3.0 x 13.5 (R).
3.0 x 14.5 (W).

Treatments:

STRAW Amounts of straw incorporated into the seedbed (t per ha 85% DM), cumulative to previous annual dressings:

		R	W
NONE	None	-	-
NORMAL	Normal	6.5	3.8
2 NORMAL	Twice normal	13.0	7.6
4 NORMAL	Four times normal	26.0	15.2

Experimental diary:

Great Knott III (R)

16-Aug-94 : **T** : **STRAW** NORMAL, 2 NORMAL, 4 NORMAL: Straw applied.
: **T** : **STRAW** NONE: Straw removed.
: B : Straw and stubble chopped.
02-Sep-94 : B : PK as(0:20:32) at 1317 kg.
27-Sep-94 : B : Sting CT at 2.0 l in 200 l.
04-Oct-94 : B : Ploughed.
07-Oct-94 : B : Rolled.
10-Oct-94 : B : Spring-tine cultivated.
11-Oct-94 : B : Rotary harrowed, Soissons, dressed Beret 050FS, drilled at 380 seeds per m^2.
24-Nov-94 : B : Draza at 5.5 kg.
25-Nov-94 : B : Avadex BW Granular at 22.5 kg.
10-Mar-95 : B : 34.5% N at 118 kg.
16-Mar-95 : B : Stefes IPU at 5.0 l in 200 l.
11-Apr-95 : B : 34.5% N at 463 kg.
10-May-95 : B : Halo at 2.0 l in 200 l.
16-Jun-95 : B : Bravo 500 at 1.0 l with Silvacur at 0.5 l in 300 l.
04-Aug-95 : B : Combine harvested.

Far Field I (W)

24-Aug-94 : **T** : **STRAW** NORMAL, 2 NORMAL, 4 NORMAL: Straw applied.
: **T** : **STRAW** NONE: Straw removed.
26-Aug-94 : B : Straw and stubble chopped.
08-Sep-94 : B : PK as (0:20:32) at 781 kg.

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95/R/CS/326 and 95/W/CS/326

Experimental diary:

Far Field I (W)

26-Sep-94 : B : Gramoxone 100 at 3.0 l in 200 l.
29-Sep-94 : B : Ploughed.
30-Sep-94 : B : Rotary harrowed, Soissons, dressed Beret 050FS, drilled at 350 seeds per m^2. Rolled.
02-Nov-94 : B : Avadex BW Granular at 22.5 kg.
02-Dec-94 : B : Stomp 400 at 3.3 l with Stefes IPU at 3.0 l in 200 l.
15-Mar-95 : B : 34.5% N at 116 kg.
28-Apr-95 : B : 34.5% N at 464 kg.
02-May-95 : B : Starane 2 at 1.0 l with Halo at 2.0 l in 200 l.
01-Jun-95 : B : Cyclone at 1.0 l in 300 l.
30-Jun-95 : B : Pirimicarb 50 DG at 280 g in 300 l.
02-Aug-95 : B : Combine harvested.

NOTES: Stubbles were sampled for dry matter in August 1994.
At Rothamsted soil was sampled in August 1994 for inorganic nitrogen, microbial biomass nitrogen and carbon, nitrogen mineralization and soil respiration measurements.
At Woburn soil was sampled in October 1994 for nitrogen measurements.
Straw and grain yields were measured.

95/R/CS/326 GREAT KNOTT III (R)

GRAIN TONNES/HECTARE

***** Tables of means *****

STRAW	
-	7.92
1	8.18
2	8.08
4	8.38
Mean	8.14

*** Standard errors of differences of means ***

STRAW
0.143

***** Stratum standard errors and coefficients of variation *****

Stratum	d.f.	s.e.	cv%
BLOCK.WP	9	0.203	2.5

GRAIN MEAN DM% 91.3

PLOT AREA HARVESTED 0.00311

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95/W/CS/326 FAR FIELD I (W)

GRAIN TONNES/HECTARE

***** Tables of means *****

STRAW	
-	6.99
1	6.85
2	6.75
4	7.22
Mean	6.95

*** Standard errors of differences of means ***

STRAW
0.359

***** Stratum standard errors and coefficients of variation *****

Stratum	d.f.	s.e.	cv%
BLOCK.WP	6	0.440	6.3

GRAIN MEAN DM% 91.9

PLOT AREA HARVESTED 0.00319

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95/W/CS/347

GREEN CROPS FOR SET-ASIDE

Object: To obtain information on the establishment and maintenance of sown crops and unsown vegetation in three-year and five-year set-aside. Effects on soil nitrate and leaching after ploughing are also studied - Woburn, Horsepool Lane Close II.

Sponsors: R.D. Prew, E.T.G. Bacon, D.P. Yeoman, M.V. Hewitt, J.F. Jenkyn, R.J. Gutteridge.

Design: 3 randomised blocks of 6 plots split into 2 x 2 criss-cross.

Whole plot dimensions: 6.5 x 26.0.

The sixth year, w. and s. sown wheat.

For previous years see 90-94/W/CS/347.

Treatments:

Test phase (first test crop after 5-year treatment phase)

Whole plots

1. **PREVCROP** Previous crops, cumulative 1990 to 1994:

(RY LF)	Ryegrass, cuttings left in situ
(RY+CL LF)	Ryegrass + clover, cuttings left in situ
(RY+CL RE)	Ryegrass + clover, cuttings removed
(RY+N RE)	Ryegrass given 100 kg N in spring, cuttings removed
(TU LF)	Tumbledown, natural regrowth, cuttings left in situ
(ARABLE)	Arable sequence w. wheat, w. wheat, w. oats, w. wheat, w. oats

Sub-plots (**WHEAT** split-plots, **N** criss-cross)

2. **WHEAT** Time of ploughing and drilling:

W	Winter
S	Spring

3. **N** Fertilizer nitrogen applied in spring:

NO	None
N OPT	Optimum

NOTES: (1) N OPT was given 40 kg N early (W in March, S in June) and the following rates later (W in April, S in July)

	(RY LF)	(RY+CL LF)	(RY+CL RE)	(RY+N RE)	(TU LF)	(ARABLE)
W	155	135	135	160	140	170
S	120	120	120	120	130	155

(2) The three blocks after 3-year set-aside were discontinued after the second test crop in 1994.

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95/W/CS/347

Experimental diary:

05-Oct-94 : **T** : **WHEAT** W: Ploughed.
07-Oct-94 : **T** : **WHEAT** W: Rolled. Rotary harrowed, Cadenza, dressed Rappor, drilled at 300 seeds per m^2.
01-Dec-94 : B : Stomp 400 at 3.3 l with Stefes IPU at 3.0 l in 200 l.
16-Mar-95 : **T** : **WHEAT** W: **N** N OPT: 27% N at 148 kg.
22-Mar-95 : **T** : **WHEAT** S: Ploughed.
30-Mar-95 : **T** : **WHEAT** S: Rotary harrowed.
31-Mar-95 : **T** : **WHEAT** S: Rotary harrowed, Cadenza, dressed Rappor, drilled at 500 seeds per m^2.
28-Apr-95 : **T** : **WHEAT** W, **N** N OPT: Nitrogen treatments applied as 27% N.
: **T** : **WHEAT** S: Rotary harrowed, Cadenza, dressed Cerevax, re-drilled at 500 seeds per m^2.
02-May-95 : **T** : **WHEAT** W: Halo at 2.0 l in 200 l.
25-May-95 : **T** : **WHEAT** S: Cadenza, dressed Rappor, re-drilled at 900 seeds per m^2.
26-May-95 : **T** : **PREVCROP** (RY+CL RE), (RY+N RE): Corrective P and K applied.
01-Jun-95 : **T** : **WHEAT** W: Cyclone at 1.0 l in 300 l.
15-Jun-95 : **T** : **WHEAT** S: Ally at 30 g in 300 l.
16-Jun-95 : **T** : **WHEAT** S, **N** N OPT: 27% N at 148 kg.
29-Jun-95 : B : Pirimicarb 50 DG at 280 g in 300 l.
19-Jul-95 : **T** : **WHEAT** S, **N** N OPT: Nitrogen treatments applied as 27% N.
05-Aug-95 : **T** : **WHEAT** W: Combine harvested.
22-Sep-95 : **T** : **WHEAT** S: Combine harvested.

NOTES: (1) The spring wheat was re-drilled twice following the failure of the first and second sowings, and yields were negligible and are not presented.
(2) Soil mineral nitrogen was measured in autumn and spring. Weeds were counted in November and July. Numbers of ears of wheat were estimated in July.

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95/W/CS/347 PLOTS 19-36

GRAIN TONNES/HECTARE

***** Tables of means *****

N	NO	N OPT	Mean
PREVCROP			
(RY LF)	1.70	6.74	4.22
(RY+CL LF)	4.03	8.29	6.16
(RY+CL RE)	3.72	7.17	5.45
(RY+N RE)	2.15	7.12	4.63
(TU LF)	1.44	7.64	4.54
(ARABLE)	1.72	7.24	4.48
Mean	2.46	7.37	4.91

*** Standard errors of differences of means ***

PREVCROP	N	PREVCROP N
0.707	0.304	0.884

Except when comparing means with the same level(s) of

PREVCROP	0.752
N	0.886

***** Stratum standard errors and coefficients of variation *****

Stratum	d.f.	s.e.	cv%
BLOCK.WP1.WP2	10	0.923	18.8

GRAIN MEAN DM% not measured

SUB-PLOT AREA HARVESTED 0.00235 or 0.00323

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95/R/CS/354

SOWING DATES AND TAKE-ALL

Object: To study the effects of sequences of sowing dates and volunteers on take-all (*Gaeumannomyces graminis*) and yield of winter wheat - Little Knott I.

Sponsor: R.J. Gutteridge.

The fifth year, w. wheat.

For previous years see 91-94/R/CS/354

Design: 4 randomised blocks of 5 plots.

Whole plot dimensions: 3.0 x 10.0.

Treatments:

SOW SEQ	Sequences of sowing date in 1991-1994 and level of volunteers in 1992-1994, all sown in mid-September 1994:
(E E E E)	Early in 1991, 1992, 1993 and 1994
(E L L L)	Early in 1991, late in 1992, 1993 and 1994
(E L+ L+ L+)	Early in 1991, late in 1992, 1993 and 1994, volunteers encouraged since 1992
(L E E E)	Late in 1991, early in 1992, 1993 and 1994
(L L* L* L*)	Late in 1991, 1992, 1993 and 1994, volunteers controlled since 1992

Experimental diary:

21-Aug-94 : B : Straw baled.
01-Sep-94 : B : Ploughed and furrow pressed.
12-Sep-94 : B : Rotary harrowed, Mercia, dressed Cerevax, drilled at 380 seeds per m^2.
13-Sep-94 : B : Rolled.
18-Nov-94 : B : Auger at 3.0 l with Stomp 400 at 2.5 l and Ripcord at 250 ml in 200 l.
13-Mar-95 : B : 34.5% N at 118 kg.
13-Apr-95 : B : 34.5% N at 463 kg.
02-Aug-95 : B : Combine harvested.

NOTE: Plant samples were taken in April and July for take-all assessment. Soil cores were taken after harvest to assess take-all infectivity.

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95/R/CS/354

GRAIN TONNES/HECTARE

***** Tables of means *****

SOW SEQ	
(E E E E)	3.85
(E L L L)	3.66
(E L+ L+ L+)	3.03
(L E E E)	3.18
(L L* L* L*)	3.53
Mean	3.45

*** Standard errors of differences of means ***

SOW SEQ
0.337

***** Stratum standard errors and coefficients of variation *****

Stratum	d.f.	s.e.	cv%
BLOCK.WP	12	0.477	13.8

GRAIN MEAN DM% 92.3

PLOT AREA HARVESTED 0.00228

https://doi.org/10.23637/ERADOC-1-50

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95/R/CS/355

RATES OF N AND MINERALIZATION

Object: To study the cumulative effects of rates of nitrogen fertilizer on soil mineralization capacity and yields of continuous winter wheat - Claycroft.

Sponsor: P.R. Poulton.

The fifth year, w. wheat.

For previous years see 91-94/R/CS/355.

Design: 3 randomised blocks of 7 plots.

Whole plot dimensions: 21.0 x 23.0.

Treatments:

N	Nitrogen fertilizer (kg N) as 34.5% N:
0	
50	
100	
150	
200	
250	
300	

Experimental diary:

20-Aug-94 : B : Straw chopped.
05-Sep-94 : B : PK as (0:20:32) at 1317 kg.
12-Sep-94 : B : Ploughed and furrow pressed.
28-Sep-94 : B : Rotary harrowed.
29-Sep-94 : B : Rotary harrowed, Mercia, dressed Rappor, drilled at 380 seeds per m^2.
30-Sep-94 : B : Draza at 5.5 kg.
07-Nov-94 : B : Avadex BW Granular at 22.5 kg.
23-Nov-94 : B : Alpha Isoproturon 500 at 5.0 l with Treflan at 2.0 l in 200 l.
11-Apr-95 : **T** : **N** 50, 100, 150, 200, 250, 300: Nitrogen treatments applied.
21-Apr-95 : B : Starane 2 at 0.75 l in 200 l.
15-Jun-95 : B : Halo at 2.0 l with Mallard 750 EC at 0.5 l in 300 l.
03-Aug-95 : B : Combine harvested.

NOTE: Crop samples were taken for chemical analysis.

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95/R/CS/355

GRAIN TONNES/HECTARE

***** Tables of means *****

N	
0	3.72
50	5.06
100	5.02
150	6.16
200	6.32
250	6.04
300	6.27
Mean	5.51

*** Standard errors of differences of means ***

N
0.433

***** Stratum standard errors and coefficients of variation *****

Stratum	d.f.	s.e.	cv%
BLOCK.WP	12	0.530	9.6

GRAIN MEAN DM% 91.4

PLOT AREA HARVESTED 0.00483

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95/R/CS/408

MISCANTHUS SINENSIS GIGANTEUS STUDY

Object: To quantify the biomass yield potential of *Miscanthus sinensis* Giganteus - Road Piece West.

Sponsor: D.G. Christian.

The third year, grass.

For previous year see 94/R/CS/408.

Design: 3 randomised blocks of 3 plots.

Whole plot dimensions: 10.0 x 10.0.

Treatments:

N	Nitrogen fertilizer cumulative to previous dressings, kg N:
-	None
N1	60
N2	120

Experimental diary:

15-May-95 : B : Muriate of potash at 281 kg.
: **T** : **N** N1, N2: 27% N applied.
30-Jan-96 : B : Cut.

NOTE: The crop was sampled periodically to measure leaf area, biomass and nutrient content. Shoot number and shoot height were measured monthly. Soil nitrogen was measured in April.

DRY MATTER TONNES/HECTARE

***** Tables of means *****

N	-	N1	N2	Mean
	11.48	9.84	11.02	10.78

*** Standard errors of differences of means ***

N
0.558

***** Stratum standard errors and coefficients of variation *****

Stratum	d.f.	s.e.	cv%
BLOCK.WP	4	0.683	6.3

MEAN DM% 44.05 PLOT AREA HARVESTED 0.00422

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95/R/CS/411

PANICUM STUDY

Object: To quantify the biomass yield potential of varieties of *Panicum* species - Road Piece West.

Sponsor: D.G. Christian.

The third year, grass.

For previous year see 94/R/CS/411

Design: 3 blocks of 7 x 2 plots.

Whole plot dimensions: 5.0 x 2.0.

Treatments:

1. **VARIETY**

CAVIN R	Cave in Rock
KANLOW	Kanlow
PATHFIND	Pathfinder
SUNBURST	Sunburst
FOREST B	Forest Burg
NEBR 28	NEBR 28
DAKOTAH	Dakotah

2. **N** Nitrogen fertilizer, kg N:

-	None
N1	60

Experimental diary:

02-May-95 : B : Duplosan New System CMPP at 2.5 l with Oxytril CM at 1.4 l in 200 l.
15-May-95 : **T** : **N** N1: 34.5% N at 174 kg.
22-Jun-95 : B : Duplosan New System CMPP at 2.5 l with Oxytril CM at 1.4 l in 200 l.
23-Oct-95 : **T** : **VARIETY** DAKOTAH: Cut.
14-Dec-95 : **T** : **VARIETY** FOREST B, SUNBURST: Cut.
04-Jan-96 : **T** : **VARIETY** NEBR 28, PATHFIND: Cut.
06-Feb-96 : **T** : **VARIETY** KANLOW: Cut.
08-Feb-96 : **T** : **VARIETY** CAVIN R: Cut.

NOTE: Soil nitrogen was measured in April. Height was measured and samples taken for biomass in September. Harvest samples were analysed for N,P and K.

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95/R/CS/411

DRY MATTER TONNES/HECTARE

***** Tables of means *****

NITROGEN	-	N1	Mean
VARIETY			
CAVIN R	8.11	8.03	8.07
KANLOW	7.10	5.34	6.22
PATHFIND	8.48	8.22	8.35
SUNBURST	6.98	8.05	7.51
FOREST B	7.35	8.72	8.04
NEBR 28	8.59	7.30	7.95
DAKOTAH	5.28	5.70	5.49
Mean	7.41	7.34	7.37

*** Standard errors of differences of means ***

VARIETY	NITROGEN	VARIETY NITROGEN
0.374	0.200	0.529

***** Stratum standard errors and coefficients of variation *****

Stratum	d.f.	s.e.	cv%
BLOCK.WP	26	0.647	8.8

MEAN DM% 57.3

PLOT AREA HARVESTED 0.00011

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95/R/CS/420

SET-ASIDE, CULTIVATION AND CROPS

Object: To measure the establishment, growth and yield of w. wheat and w. rape following a range of cultivations and herbicide applications after natural regeneration set-aside. To assess levels of soil nitrogen and weeds in the two crops and diseases in the wheat - Meadow.

Sponsors: E.T.G. Bacon, D.P. Yeoman, M.V. Hewitt, R.D. Prew, J.F. Jenkyn and R.J. Gutteridge.

The second year, w. wheat and w. rape.

Design: 4 randomised blocks of 5 x 2 plots split into 2 sub-plots.

Whole plot dimensions: 12.0 x 26.0.
Sub-plot dimensions: 10.0 x 12.0.

Treatments:

Whole plots

1. **SETDESTR**		Method and time of destruction of set-aside in 1994:
	(PG)	Ploughed in May, glyphosate pre-drilling
	(PC)	Ploughed in May, cultivated in June and July
	(MP)	Minimally cultivated in May, ploughed in August
	(HP)	Herbicide in May, ploughed in August
	(-P)	Ploughed in August

Sub-plots

2. **CROP**		Crop in 1995:
	R	Winter rape
	W	Winter wheat
3. **NITROGEN**		Fertilizer nitrogen in 1995 (kg N):
	-	None
	N	160

Experimental diary:

```
24-May-94 : T : SETDESTR (HP): Glyphogan at 4.0 l in 200 l.
27-May-94 : T : SETDESTR (PG), (PC), (MP), (-P): Topped.
03-Jun-94 : T : SETDESTR (MP): Heavy spring-tine cultivated to 10 cm.
          : T : SETDESTR (PG), (PC): Ploughed.
05-Jul-94 : T : SETDESTR (MP), (-P): Topped.
06-Jul-94 : T : SETDESTR (PC): Heavy spring-tine cultivated.
19-Jul-94 : B : PK as (0:20:32) at 1406 kg.
22-Jul-94 : T : SETDESTR (-P): Topped.
01-Aug-94 : T : SETDESTR (PC): Heavy spring-tine cultivated.
          : T : SETDESTR (MP), (HP), (-P): Topped.
12-Aug-94 : T : SETDESTR (MP), (HP), (-P): Ploughed.
```


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Experimental diary:

26-Aug-94 : **T** : **CROP** R: Cultivated by rotary grubber (one block only).
: **T** : **CROP** R: Spring-tine cultivated.
: **T** : **CROP** R: Rotary harrowed, Apex, dressed Lindex-Plus FS, drilled at 120 seeds per m^2.
27-Sep-94 : **T** : **SETDESTR** (PG), **CROP** W: Sting CT at 2.0 l in 200 l.
28-Sep-94 : **T** : **CROP** W: Spring-tine cultivated.
: **T** : **CROP** W: Rotary harrowed, Genesis, dressed Rappor, drilled at 380 seeds per m^2.
29-Sep-94 : B : Draza at 5.5 kg.
02-Nov-94 : **T** : **CROP** R: Butisan S at 2.5 l with Laser at 1.0 l and Atlas Adjuvant Oil at 2.4 l in 260 l.
21-Nov-94 : **T** : **CROP** W: Auger at 2.5 l with Stomp 400 at 2.5 l and Decis at 200 ml in 200 l.
07-Feb-95 : **T** : **CROP** W: Birlane 24 at 2.8 l in 200 l.
23-Feb-95 : **T** : **CROP** R, **NITROGEN** N: 34.5% N at 174 kg.
13-Mar-95 : **T** : **CROP** W, **NITROGEN** N: 34.5% N at 118 kg.
30-Mar-95 : **T** : **CROP** R, **NITROGEN** N: 34.5% N at 290 kg.
11-Apr-95 : **T** : **CROP** R: Barclay Eyetak at 1.1 l in 200 l.
12-Apr-95 : **T** : **CROP** W, **NITROGEN** N: 34.5% N at 348 kg.
03-May-95 : **T** : **CROP** W: Starane 2 at 0.75 l with Halo at 2.0 l in 200 l.
20-Jun-95 : **T** : **CROP** W: Silvacur at 1.0 l in 200 l.
12-Jul-95 : **T** : **CROP** R: Reglone at 3.0 l with Vassgro Spreader at 400 ml in 400 l.
18-Jul-95 : **T** : **CROP** R: Combine harvested.
02-Aug-95 : **T** : **CROP** W: Combine harvested.

NOTES: (1) Treatment **SETDESTR** (PG) - 'Glyphosate pre-drilling' was not applied to the plots going into rape.
(2) Straw was chopped in August 1993 at the start of the set-aside year.
(3) Soil and plant samples were taken in November and March for nitrogen content. Weed counts were made in November and March. Samples to assess root and stem base diseases in wheat were taken in April and June. Grain quality was assessed.

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95/R/CS/420

WINTER RAPE

GRAIN (AT 90% DRY MATTER) TONNES/HECTARE

***** Tables of means *****

NITROGEN	-	N	Mean
SETDESTR			
(PG)	3.67	4.31	3.99
(PC)	4.11	4.57	4.34
(MP)	3.48	4.65	4.06
(HP)	3.47	4.32	3.90
(-P)	2.73	4.22	3.48
Mean	3.49	4.42	3.95

*** Standard errors of differences of means ***

	SETDESTR	**NITROGEN**	**SETDESTR NITROGEN**
	0.168	0.116	0.249
Except when comparing means with the same level(s) of **SETDESTR**			0.259

***** Stratum standard errors and coefficients of variation *****

Stratum	d.f.	s.e.	cv%
BLOCK.WP	12	0.238	6.0
BLOCK.WP.SP	15	0.366	9.3

GRAIN MEAN DM% 87.6

SUB-PLOT AREA HARVESTED 0.00230

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95/R/CS/420

WINTER WHEAT

GRAIN TONNES/HECTARE

***** Tables of means *****

NITROGEN	-	N	Mean
SETDESTR			
(PG)	6.71	8.94	7.82
(PC)	6.02	8.75	7.39
(MP)	5.93	8.88	7.41
(HP)	5.72	8.66	7.19
(-P)	4.33	8.85	6.59
Mean	5.74	8.82	7.28

*** Standard errors of differences of means ***

	SETDESTR	**NITROGEN**	**SETDESTR NITROGEN**
	0.449	0.286	0.637
Except when comparing means with the same level(s) of **SETDESTR**			0.639

***** Stratum standard errors and coefficients of variation *****

Stratum	d.f.	s.e.	cv%
BLOCK.WP	12	0.635	8.7
BLOCK.WP.SP	15	0.904	12.4

GRAIN MEAN DM% 91.4

SUB-PLOT AREA HARVESTED 0.00230

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95/R/CS/429

WINTER RYE AS AN ENERGY CROP

Object: To measure the effects of different levels of nitrogen fertilizer on the biomass yield of w. rye - Road Piece West.

Sponsor: D.G. Christian.

The second year, w. rye.

For previous year see 94/R/CS/429.

Design: 3 randomised blocks of 5 plots.

Plot dimensions: 3.0 x 15.0.

Treatments:

NITROGEN	Nitrogen fertilizer (kg N), applied as 'Nitro-Chalk', cumulative to previous dressings:
-	None
N1	30
N2	60
N3	90
N4	120

Experimental diary:

30-Aug-94	B	Straw baled.
21-Sep-94	B	Harrowed to remove weeds, ploughed.
30-Sep-94	B	Rotary harrowed twice. Amando, dressed Baytan, drilled at 350 seeds per m^2.
	B	Draza at 5.5 kg.
02-Dec-94	B	Starane 2 at 0.75 l in 200 l.
04-Apr-95	**T**	**NITROGEN** N1, N2, N3, N4: 27% N at 111, 222, 333 and 444 kg respectively.
19-Apr-95	B	Tern 750 EC at 1.0 l in 200 l.
28-Apr-95	B	Starane 2 at 1.0 l with New 5C Cycocel at 2.5 l in 200 l.
19-Jun-95	B	Corbel at 1.0 l in 400 l.
09-Aug-95	B	Combine harvested.

NOTE: Crop samples were taken in April to determine nitrogen content, plant and tiller numbers before top dressing. Biomass and nitrogen content was measured at anthesis. Grain and straw were sampled at harvest for nitrogen content.

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95/R/CS/429

GRAIN TONNES/HECTARE

***** Tables of means *****

NITROGEN

-	3.22
N1	4.19
N2	4.76
N3	4.84
N4	4.49
Mean	4.30

*** Standard errors of differences of means ***

NITROGEN
0.411

***** Stratum standard errors and coefficients of variation *****

Stratum	d.f.	s.e.	cv%
BLOCK.WP	8	0.504	11.7

GRAIN MEAN DM% 89.5

PLOT AREA HARVESTED 0.00230

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95/W/CS/435

RYEGRASS, WHEAT VOLUNTEERS AND DISEASES

Object: To study how different populations of cereal volunteers and ryegrass sown as a cover crop affect the survival of cereal diseases - Woburn, School Field.

Sponsors: J.F. Jenkyn, R.J. Gutteridge.

Design: 4 randomised blocks of 10 x 2 plots.

Whole plot dimensions: 6.0 x 10.0.

Treatments:

1.	**CROP**	Crop, seed rate and soil inoculation:
	R	Ryegrass at 30 kg
	RW	Ryegrass at 30 kg + wheat at 50 seeds per m^2
	RI	Ryegrass at 30 kg+ soil inoculated with *Phialophora graminicola*
	RWI	Ryegrass at 30 kg + wheat at 50 seeds per m^2 + soil inoculated with *P. graminicola*
	M	Mustard at 300 seeds per m^2
	MW1	Mustard at 100 seeds per m^2 + wheat at 4 seeds per m^2
	MW2	Mustard at 100 seeds per m^2 + wheat at 9 seeds per m^2
	MW3	Mustard at 100 seeds per m^2 + wheat at 50 seeds per m^2
	MW4	Mustard at 100 seeds per m^2 + wheat at 200 seeds per m^2
	MW5	Mustard at 30 seeds per m^2 + wheat at 400 seeds per m^2
2.	**CULT**	Time of ploughing:
	PE	Early (12 May)
	PL	Late (17 Aug)

Experimental diary:

22-Aug-94 : B : Disced.
07-Sep-94 : B : Gramoxone 100 at 3.0 l in 200 l.
10-Sep-94 : B : Ploughed.
12-Sep-94 : B : Rolled.
13-Sep-94 : B : Rotary harrowed.
: **T** : Seeds sown and soil inoculated.
24-Nov-94 : **T** : **CROP** R and RI: Leyclene at 5.0 l in 220 l.
11-May-95 : B : Topped.
12-May-95 : **T** : **CULT** PE: Ploughed.
29-Jun-95 : **T** : **CULT** PL: Topped.
17-Aug-95 : **T** : **CULT** PL: Topped, ploughed.

NOTE: Mustard variety was Tilney, wheat, Soissons and ryegrass, Borvi, all undressed.

No yields were taken in 1995.

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95/R/CS/438

TAKE-ALL CONTROL

Object: To test seed treatments for the control of take-all in w. wheat - Long Hoos I/II.

Sponsors: G.L. Bateman, J.F. Jenkyn, R.J. Gutteridge.

The first year, w. wheat.

Design: 4 randomised blocks of 3 x 3 plots.

Whole plot dimensions: 3.0 x 10.0.

Treatments: All combinations of :-

1. **SEED TRT** Seed treatment:

UT	None
BY	Fuberidazole and triadimenol as 'Baytan'
NT	New treatment

NOTE: NT is under commercial development, composition undisclosed.

2. **N RATE** Rate and timing of nitrogen (kg N):

	Early	Later	Total
N1	-	120	120
N2	40	80	120
N3	40	160	200

Experimental diary:

26-Sep-94 : B : Ploughed and furrow pressed.
17-Oct-94 : B : Rotary harrowed, twice.
: **T** : **SEED TRT** UT: Rotary harrowed, Hussar, undressed, drilled at 380 seeds per m^2.
: **T** : **SEED TRT** BY: Rotary harrowed, Hussar, dressed Baytan, drilled at 380 seeds per m^2.
: **T** : **SEED TRT** NT: Rotary harrowed, Hussar, dressed N, drilled at 380 seeds per m^2.
21-Nov-94 : B : Draza at 5.5 kg.
24-Nov-94 : B : Alpha Isoproturon 500 at 3.0 l in 200 l.
: B : Stomp 400 at 3.3 l in 200 l.
27-Feb-95 : **T** : **N RATE** N2, N3: 34.5% N at 116 kg.
10-Apr-95 : **T** : **N RATE** N3: 34.5% N at 464 kg.
: **T** : **N RATE** N1: 34.5% N at 348 kg.
: **T** : **N RATE** N2: 34.5% N at 232 kg.
11-Apr-95 : B : Barclay Eyetak at 1.1 l in 200 l.
31-May-95 : B : Barclay Hurler at 1.0 l in 300 l.
09-Aug-95 : B : Combine harvested.

Previous crops: W. wheat 1993, s. wheat 1994.

NOTE: Samples to assess root and stem base diseases were taken in January, April and July.

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95/R/CS/438

GRAIN TONNES/HECTARE

***** Tables of means *****

N RATE / SEED TRT	N1	N2	N3	Mean
UT	6.13	6.76	7.96	6.95
BY	6.64	7.21	8.02	7.29
NT	7.12	7.54	8.68	7.78
Mean	6.63	7.17	8.22	7.34

*** Standard errors of differences of means ***

SEED TRT	N RATE	SEED TRT N RATE
0.161	0.161	0.279

***** Stratum standard errors and coefficients of variation *****

Stratum	d.f.	s.e.	cv%
BLOCK.WP	24	0.395	5.4

GRAIN MEAN DM% 89.4

PLOT AREA HARVESTED 0.00227

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95/W/CS/440

TAKE-ALL CONTROL

Object: To test the efficacy of seed treatments for the control of take-all (*Gaeumannomyces graminis*) at various rates of nitrogen fertilizer - Woburn, Stackyard III.

Sponsors: G.L. Bateman, J.F. Jenkyn, R.J. Gutteridge.

Design: 8 blocks of 3 plots split into 3 sub-plots.

Whole plot dimensions: 3.0 x 46.0.
Sub-plot dimensions: 3.0 x 15.0.

Treatments: All combinations of:-

Whole plots

1. **SEED TRT** Seed treatment:

UT	Untreated
BY	Fuberidazole + triadimenol
NT	New treatment

NOTE: NT is under commercial development, composition undisclosed.

Sub-plots

2. **N RATE** Nitrogen fertilizer (kg N) as 27% N:

	Early	Later
N1	0	80
N2	30	50
N3	30	130

Experimental diary:

08-Sep-94 : B : PK as (0:20:32) at 781 kg.
26-Sep-94 : B : Barclay Gallup at 4.0 l in 200 l.
06-Oct-94 : B : Ploughed.
17-Oct-94 : B : Rotary harrowed, Hussar drilled at 325 seeds per m^2, rolled.
28-Nov-94 : B : Panther at 2.0 l with Decis at 200 ml in 200 l.
06-Mar-95 : **T** : **N RATE** N2, N3: 27% N at 111 kg.
26-Apr-95 : **T** : **N RATE** N1: 27% N at 296 kg, N2 at 185 kg and N3 at 481 kg.
02-May-95 : B : Halo at 2.0 l in 200 l.
01-Jun-95 : B : Cyclone at 1.0 l with Mallard 750 EC at 0.3 l in 200 l.
29-Jun-95 : B : Pirimicarb 50 DG at 280 g in 300 l.
05-Aug-95 : B : Combine harvested.

NOTE: Plant establishment was assessed in autumn and spring. Plant samples were taken in November, April and June to assess take-all infection.

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95/W/CS/440

GRAIN TONNES/HECTARE

***** Tables of means *****

N RATE / **SEED TRT**	N1	N2	N3	Mean
UT	2.36	2.95	3.71	3.01
BY	2.29	3.22	3.25	2.92
NT	2.68	3.91	4.29	3.63
Mean	2.44	3.36	3.75	3.18

*** Standard errors of differences of means ***

SEED TRT	**N RATE**	**SEED TRT N RATE**
0.318	0.197	0.422

Except when comparing means with the same level(s) of **SEED TRT** 0.341

***** Stratum standard errors and coefficients of variation *****

Stratum	d.f.	s.e.	cv%
BLOCK.WP	14	0.636	20.0
BLOCK.WP.SP	42	0.682	21.4

GRAIN MEAN DM% 89.9

SUB-PLOT AREA HARVESTED 0.00326

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95/R/WW/1

WINTER WHEAT

PREDICTION OF WEED COMPETITION

Object: To predict the yield response of winter wheat to competition from three contrasting weed species - Stackyard.

Sponsors: J.W. Cussans, P.J.W. Lutman.

Design: 3 randomised blocks of 3 x 6 plots.

Whole plot dimensions: 3.0 x 8.0.

Treatments: All combinations of:-

1. **WEED SP** Weed species:

SM	*Stellaria media* (chickweed)
AM	*Alopecurus myosuroides* (black-grass)
GA	*Galium aparine* (cleavers)

2. **WEED DEN** Weed density, plants per m^2:

	SM	AM	GA
0	0	0	0
2	65	130	9
4	80	233	8
8	151	264	22
16	245	434	29
32	301	607	47

NOTE: Target weed densities, plants per m^2: SM, AM: 0, 40, 80, 160, 320 and 640, GA: 0, 3, 6, 12, 24 and 48.

Experimental diary:

02-Sep-94 : B : PK as (0:20:32) at 1317 kg.
07-Sep-94 : B : Ploughed and furrow pressed.
30-Sep-94 : B : Rotary harrowed.
: **T** : Weed seeds sown by hand.
: B : Rotary harrowed, Mercia, dressed Rappor, drilled at 275 seeds per m^2.
21-Nov-94 : B : Draza at 5.5 kg.
13-Jan-95 : **T** : **WEED SP** SM, GA (except **WEED DEN** 0): Cheetah R at 2.5 l in 220 l.
: **T** : **WEED DEN** 0: Stefes IPU at 3.0 l with Stomp 400 at 3.3 l in 220 l.
: **T** : **WEED SP** AM (except **WEED DEN** 0): Oxytril CM at 1.5 l with Starane 2 at 0.75 l in 220 l.
14-Mar-95 : B : 34.5% N at 118 kg.
21-Mar-95 : **T** : **WEED SP** GA (except **WEED DEN** 0): Isoproturon 500 at 3.0 l in 220 l.
: **T** : **WEED DEN** 0: Ally at 30 g with Cheetah R at 2.5 l and Starane 2 at 0.75 l in 220 l.
19-Apr-95 : B : 34.5% N at 463 kg.

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95/R/WW/1

Experimental diary:

05-May-95 : B : Calixin at 0.35 l with Halo at 2.0 l in 200 l.
20-Jun-95 : B : Silvacur at 1.0 l in 200 l.
04-Aug-95 : B : Hand harvested.

Previous crops: S. rape 1993, w. oats 1994.

NOTE: Weeds were counted in autumn and spring. Weeds and crop were sampled monthly for dry weight, green area and height, crop also had tillers and leaves per plant counted. Soil was sampled for nitrogen content in February. Flag leaf area and nutrient content were assessed in June. Black-grass seed produced was measured in June. Components of yield were assessed after harvest.

GRAIN TONNES/HECTARE

***** Tables of means *****

WEED DEN / WEED SP	0	2	4	8	16	32	Mean
SM	7.92	5.97	6.62	5.63	4.59	5.32	6.01
AM	8.37	3.48	2.90	3.20	2.49	2.65	3.85
GA	8.34	7.17	6.95	7.21	5.87	4.96	6.75
Mean	8.21	5.54	5.49	5.35	4.31	4.31	5.53

*** Standard errors of differences of means ***

WEED SP	WEED DEN	WEED SP WEED DEN
0.221	0.313	0.543

***** Stratum standard errors and coefficients of variation *****

Stratum	d.f.	s.e.	cv%
BLOCK.WP	34	0.664	12.0

GRAIN MEAN DM% 91.2

PLOT AREA HARVESTED 0.00020

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95/W/WW/1

WINTER WHEAT

VARIETY, SULPHUR AND NITROGEN

Object: To measure yield and quality response to sulphur fertilizer on two varieties of wheat - Woburn, Great Hill II/III.

Sponsors: S.P. McGrath, F. Zhao.

Design: 3 blocks of (2 x 6) + 6 plots

Plot dimensions: 3.0 x 10.0.

Treatments: All combinations of:-

1. **NITROGEN** Nitrogen fertilizer (kg N) as 27% N at GS 32 in addition to a basal dressing of 180 kg N:

N1	None
N2	50

2. **SULPHUR** Sulphur fertilizer (kg S) as gypsum (17.5% S) at GS 23:

S0	0
S1	20
S2	40
S3	60
S4	80
S5	100

plus 6 extra plots

3. **EXTRA** Variety, timing (growth stage (GS)) and rates of nitrogen fertilizer as urea (kg N), sulphur as ammonium sulphate or gypsum (kg S):

	Variety	N as urea	S as $(NH_4)SO_4$	S as gypsum	Timing (GS)	
EUS0	Hereward	50.0	0	0	65	
EUS1	Hereward	32.5	20	0	65	
EUS2	Hereward	17.0	40	0	65	
EUS3	Hereward	32.5	20	20	65	(gypsum at GS 23)
RNS0	Riband	0	0	0	-	
RNS2	Riband	0	0	40	23	

NOTE: All treatments were sown to variety Hereward, except RNS0 and RNS2 which were sown to Riband.

Experimental diary:

24-Sep-94 : B : Ploughed.
29-Sep-94 : B : Rolled.
30-Sep-94 : B : Rotary harrowed.

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95/W/WW/1

Experimental diary:

05-Oct-94 : **T** : Hereward and Riband, dressed Cerevax, drilled at 300 seeds m^2.
01-Dec-94 : B : Panther at 2.0 l with Fastac at 100 ml in 200 l.
09-Mar-95 : **T** : Sulphur treatments applied as gypsum.
09-Mar-95 : B : 27% N at 148 kg.
21-Apr-95 : B : 34.5% N at 406 kg.
28-Apr-95 : B : Halo at 2.0 l in 200 l.
04-May-95 : **T** : **NITROGEN** N2: 27% N at 185 kg.
02-Jun-95 : B : Cyclone at 1.0 l with Mallard at 0.5 l in 300 l.
30-Jun-95 : B : Pirimicarb 50 DG at 280 g in 300 l.
02-Jul-95 : **T** : **EXTRA** EUS0, EUS1, EUS2, EUS3: Half of ammonium sulphate and urea treatments applied.
10-Jul-95 : **T** : **EXTRA** EUS0, EUS1, EUS2, EUS3: Half of ammonium sulphate and urea treatments applied.
08-Aug-95 : B : Combine harvested.

NOTES: (1) Samples of grain and straw were taken for chemical analysis and grain was tested for baking quality. Sequential crop samples were taken from April to August to measure sulphur content. Soil was also sampled for sulphur content.
(2) One plot with treatment **EXTRA** EUS2 was badly damaged by rabbits. An estimated value was used in the analysis.

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95/W/WW/1

GRAIN TONNES/HECTARE

***** Tables of means *****

SULPHUR / **NITROGEN**	S0	S1	S2	S3	S4	S5	Mean
N1	3.85	4.73	4.40	4.54	3.86	4.83	4.37
N2	3.59	4.43	4.71	4.55	3.97	5.03	4.38
Mean	3.72	4.58	4.56	4.55	3.92	4.93	4.38

EXTRA	EUS0	EUS1	EUS2	EUS3	RNS0	RNS2	Mean
	4.80	4.56	4.12	4.40	4.89	5.29	4.68

Grand mean 4.48

*** Standard errors of differences of means ***

SULPHUR	**NITROGEN**	**SULPHUR NITROGEN & EXTRA**
0.307	0.177	0.435

***** Stratum standard errors and coefficients of variation *****

Stratum	d.f.	s.e.	cv%
BLOCK.WP	33	0.532	11.9

GRAIN MEAN DM% 90.3

PLOT AREA HARVESTED 0.00176

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95/R/WW/2

WINTER WHEAT

WATER STRESS AND WEED COMPETITION

Object: To study the competitive effects of weeds in winter wheat, with and without irrigation - Stackyard.

Sponsors: J.W. Cussans, P.J.W. Lutman.

Design: 4 randomised blocks of 2 plots split into 4 sub-plots.

Whole plot dimensions: 8.0 x 30.0.
Sub-plot dimensions: 4.0 x 15.0.

Treatments:

1.	**IRRIGATN**	Irrigation:
	I	Irrigated
	0	None
2.	**WEED**	Weed species:
	-	None
	SM	*Stellaria media* (chickweed)
	AM	*Alopecurus myosuroides* (black-grass)
	GA	*Galium aparine* (cleavers)

Experimental diary:

02-Sep-94 : B : PK as (0:20:32) at 1317 kg.
07-Sep-94 : B : Ploughed and furrow pressed.
30-Sep-94 : B : Rotary harrowed.
04-Oct-94 : B : Spring-tine cultivated.
05-Oct-94 : B : Rotary harrowed.
: **T** : **WEED** SM, AM: Seed broadcast at 320 seeds per m^2.
: **T** : **WEED** GA: Seed broadcast at 24 seeds per m^2.
: B : Rotary harrowed, Mercia, dressed Cerevax, drilled at 380 seeds per m^2.
21-Nov-94 : B : Draza at 5.5 kg.
13-Jan-95 : **T** : **WEED** SM, GA: Cheetah R at 2.5 l in 220 l.
: **T** : **WEED** AM: Starane 2 at 0.75 l with Oxytril CM at 1.5 l in 220 l.
: **T** : **WEED** -: Stefes IPU at 3.0 l with Stomp 400 at 3.3 l in 220 l.
14-Mar-95 : B : 34.5% N at 118 kg.
21-Mar-95 : **T** : **WEED** GA: Isoproturon 500 at 3.0 l in 220 l.
: **T** : **WEED** -: Ally at 30 g with Starane 2 at 0.75 l and Topik at 125 ml in 220 l.
19-Apr-95 : B : 34.5% N at 463 kg.
28-Apr-95 : **T** : **IRRIGATN** I: Irrigated 25 mm.
05-May-95 : B : Calixin at 0.35 l with Halo at 2.0 l in 200 l.
15-May-95 : **T** : **IRRIGATN** I: Irrigated 25 mm.
02-Jun-95 : **T** : **IRRIGATN** I: Irrigated 25 mm.
20-Jun-95 : B : Silvacur at 1.0 l in 200 l.

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95/R/WW/2

Experimental diary:

20-Jun-95 : **T** : **IRRIGATN** I: Irrigated 15 mm.
21-Jun-95 : **T** : **IRRIGATN** I: Irrigated 20 mm.
29-Jun-95 : **T** : **IRRIGATN** I: Irrigated 25 mm.
06-Jul-95 : **T** : **IRRIGATN** I: Irrigated 25 mm.
13-Jul-95 : **T** : **IRRIGATN** I: Irrigated 25 mm.
20-Jul-95 : **T** : **IRRIGATN** I: Irrigated 25 mm.
05-Aug-95 : B : Roundup at 4.0 l in 200 l.
14-Aug-95 : B : Hand harvested.

Previous crops: S. rape 1993, w. oats 1994.

NOTE: Weed density was assessed in autumn and spring. Weeds and crop were sampled regularly and dry weight, green area, height and nutrient content were measured. Tillers and leaves were also counted in the crop. Soil was sampled for nitrogen content in February. Flag leaf area and nutrient content were assessed in June. Black-grass seed produced was measured in June. Components of yield were assessed after harvest.

GRAIN TONNES/HECTARE

***** Tables of means *****

WEED / **IRRIGATN**	-	SM	AM	GA	Mean
I	7.18	5.58	2.71	4.08	4.89
0	8.12	6.60	3.49	6.68	6.22
Mean	7.65	6.09	3.10	5.38	5.55

*** Standard errors of differences of means ***

IRRIGATN	**WEED**	**IRRIGATN WEED**
0.433	0.255	0.534

Except when comparing means with the same level(s) of **IRRIGATN** 0.361

***** Stratum standard errors and coefficients of variation *****

Stratum	d.f.	s.e.	cv%
BLOCK.WP.SP	18	0.511	9.2

GRAIN MEAN DM% 91.0

SUB-PLOT AREA HARVESTED 0.00020

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95/W/WW/2

WINTER WHEAT

PREDICTION OF WEED COMPETITION

Object: To predict the yield response of winter wheat in competition with three contrasting weed species - Woburn, Lansome III.

Sponsors: P.J.W. Lutman, J.W. Cussans.

Design: 3 blocks of 3 x 6 plots. Treatments balanced for blocks in two directions

Plot dimensions: 3.0 x 8.0.

Treatments: All combinations of:-

1. **WEED SP** Weed species:

SM	*Stellaria media* (chickweed)
AM	*Alopecurus myosuroides (black-grass)*
GA	*Galium aparine (cleavers)*

2. **WEED DEN** Average weed densities, plants per m^2:

SM	AM	GA
0	0	0
103	78	2
201	122	3
348	223	8
606	389	20
1091	921	31

NOTE: Target weed densities were: SM and AM: 0, 40, 80, 160, 320, 640 and GA: 0, 3, 6, 12, 24, and 48 respectively.

Experimental diary:

21-Sep-94 : B : Ploughed.
28-Sep-94 : B : Rotary harrowed.
29-Sep-94 : **T** : Weed seeds sown by hand.
30-Sep-94 : B : Mercia, dressed Rappor, drilled at 330 seeds per m^2.
14-Mar-95 : **T** : **WEED DEN** 0: Ally at 30 g with Cheetah Super at 2.5 l in 220 l.
: **T** : **WEED SP** AM: Ally at 30 g in 220 l.
: **T** : **WEED SP** GA: Stefes IPU at 4.2 l in 220 l.
15-Mar-95 : B : 34.5% N at 116 kg.
21-Apr-95 : B : 34.5% N at 464 kg.
02-May-95 : B : Halo at 2.0 l in 200 l.
02-Jun-95 : B : Cyclone at 1.0 l with Mallard 750 EC at 0.5 l in 300 l.
29-Jun-95 : B : Pirimicarb 50 DG at 280 g in 300 l.
04-Aug-95 : B : Hand harvested.

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95/W/WW/2

NOTE: Weeds were counted in autumn and spring. Weeds and crop were sampled in winter and monthly from March to harvest for dry weight, green area and height, crop also had tillers and leaves per plant counted. Soil was sampled for nitrogen content in February. Flag leaf area and nutrient content were assessed in June. Black-grass seed produced was measured in June. Components of yield were assessed after harvest.

GRAIN TONNES/HECTARE

***** Tables of means *****

WEED DEN / WEED SP	0	2	4	8	16	32	Mean
SM	5.31	3.42	2.66	2.49	3.34	3.13	3.39
AM	4.22	5.24	4.52	4.51	3.35	3.06	4.15
GA	5.07	4.39	4.89	4.72	5.15	4.41	4.77
Mean	4.87	4.35	4.02	3.91	3.95	3.53	4.11

*** Standard errors of differences of means ***

WEED SP	WEED DEN	WEED SP WEED DEN
0.243	0.344	0.595

***** Stratum standard errors and coefficients of variation *****

Stratum	d.f.	s.e.	cv%
BLOCK.WP	32	0.729	17.8

GRAIN MEAN DM% 85.2

PLOT AREA HARVESTED 0.00020

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95/R/WW/10

WINTER WHEAT

PLANT N INDICATORS

Object: To relate chlorophyll concentrations in individual leaves of w. wheat to nitrogen supply and crop yield - Little Hoos.

Sponsor: P.B. Barraclough.

Design: 4 randomised blocks of 11 plots.

Plot dimensions: 3.0 x 20.0.

Treatments:

N	Timing, rate and form of nitrogen fertilizer in spring (kg N):			
	G.S. 30	G.S. 31	G.S. 37	TOTAL
1	40	60	0	100
2	40	60	20	120
3	40	60	40	140
4	40	60	60	160
5	40	60	40*	140
6	40	60	80	180
7	40	60	-	160**
8	40	100	0	140
9	40	100	40	180
10	40	140	0	180
11	40	210	0	250

NOTES: * Treatment 5, nitrogen at G.S. (Growth Stage) 37 was applied as foliar urea (46% N).

** Treatment 7 received an extra 30 kg of N in early May, repeated in late May.

Experimental diary:

06-Sep-94 : B : PK as (0:20:32) at 1317 kg.
08-Sep-94 : B : Deep tine cultivated with vibrating tines 60 cm apart and 45 cm deep.
29-Sep-94 : B : Rolled. MSS Optica at 2.4 l in 200 l.
07-Oct-94 : B : Ploughed and furrow pressed.
21-Oct-94 : B : Spring-tine cultivated.
: B : Rotary harrowed, Mercia, dressed Rappor, drilled at 380 seeds per m^2.
24-Nov-94 : B : Alpha Isoproturon 500 at 3.0 l with Stomp 400 at 3.3 l in 200 l.
10-Mar-95 : B : 34.5% N at 118 kg.
07-Apr-95 : B : Tiger 90 at 35 kg.
20-Apr-95 : **T** : **N** 1, 2, 3, 4, 5, 6, 7: 34.5% N at 174 kg.
: **T** : **N** 8, 9: 34.5% N at 290 kg.
: **T** : **N** 10: 34.5% N at 405 kg.
: **T** : **N** 11: 34.5% N at 609 kg.
10-May-95 : B : Halo at 2.0 l in 200 l.

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95/R/WW/10

Experimental diary:

```
   11-May-95 : T : N 7: 34.5% N at 87 kg.
   15-May-95 : T : N 2: 34.5% N at 58 kg.
             : T : N 3 and 9: 34.5% N at 116 kg.
             : T : N 4: 34.5% N at 174 kg.
             : T : N 5: 46% N (foliar) at 87 kg.
             : T : N 6: 34.5% N at 232 kg.
   24-May-95 : T : N 7: 34.5% N at 87 kg.
   20-Jun-95 : B : Silvacur at 1.0 l in 200 l.
   03-Aug-95 : B : Combine harvested.
```

Previous crops: Potatoes 1993, s. beans 1994.

NOTES: (1) Tiger 90 is a sulphur fertilizer (90% S).
(2) The yield of one plot of treatment 8, was lost during harvesting. An estimated value was used in the analysis.
(3) Leaf chlorophyll was measured with a SPAD metre on 8 occasions between GS 24 and GS 77.

GRAIN TONNES/HECTARE

***** Tables of means *****

N	
1	8.62
2	9.22
3	9.43
4	9.47
5	9.43
6	9.48
7	9.53
8	9.86
9	9.71
10	10.10
11	9.61
Mean	9.50

*** Standard errors of differences of means ***

N
0.391

***** Stratum standard errors and coefficients of variation *****

Stratum	d.f.	s.e.	cv%
BLOCK.WP	29	0.553	5.8

GRAIN MEAN DM% 91.2

PLOT AREA HARVESTED 0.00345

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95/R/BW/2

WINTER BARLEY

RHYNCHOSPORIUM STUDY

Object: To characterise two geographically separated *Rhynchosporium* populations and to assess their susceptibility to fungicides. The experiment was repeated at Long Ashton Research Station, Bristol - Osier.

Sponsor: D.W. Holloman, Long Ashton Research Station.

Design: 2 randomised blocks of 4 plots.

Whole plot dimensions: 20.0 x 24.0.

Treatments:

FUNGCIDE	Fungicide:
-	None
CARB	Carbendazim
CARB+PRO	Carbendazim and propiconazole
PRO+TRI	Propiconazole and tridemorph

Experimental diary:

26-Jul-94 : B : Straw baled and removed.
05-Sep-94 : B : PK as (0:20:32) at 1317 kg.
09-Sep-94 : B : Ploughed and furrow pressed.
02-Nov-94 : B : Rotary harrowed, Chariot, dressed Rappor and Gamma-HCH, drilled at 350 seeds per m^2.
21-Mar-95 : B : 34.5% N at 118 kg.
03-Apr-95 : **T** : **FUNGCIDE** CARB: Carbate Flowable at 0.5 l in 200 l.
: **T** : **FUNGCIDE** CARB+PRO: Hispor 45 WP at 0.5 l in 200 l.
: **T** : **FUNGCIDE** PRO+TRI: Tilt Turbo 475 EC at 1.0 l in 200 l.
12-Apr-95 : B : 34.5% N at 300 kg.
21-Apr-95 : B : Ally at 30 g with Starane 2 at 0.75 l in 200 l.
28-Apr-95 : B : Terpal at 1.5 l with Vassgro Spreader at 300 ml in 300 l.
21-Jul-95 : B : Combine harvested.

Previous crops: Set-aside 1993, w. barley 1994.

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95/R/BW/2

GRAIN TONNES/HECTARE

***** Tables of means *****

FUNGCIDE	
-	5.64
CARB	5.46
CARB+PRO	6.23
PRO+TRI	6.30
Mean	5.91

GRAIN MEAN DM% 87.9

PLOT AREA HARVESTED 0.00460

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95/R/RAW/2

WINTER OILSEED RAPE

HIGH ERUCIC ACID RAPE

Object: To study the effects of disease on the yield and seed quality of high erucic acid rape - Delafield

Sponsors: K.J. Doughty, H.A. McCartney, P.J.W. Lutman.

Design: 4 blocks of 2 plots.

Whole plot dimensions: 3.0 x 17.0.

Treatments:

FUNGINOC	Inoculum or fungicide applied:
I	Inoculated with contaminated straw
F	Fungicide applied in November, April and June

Experimental diary:

07-Sep-94 : B : Heavy spring-tine cultivated, cultivated by rotary grubber, rotary harrowed, Askari, dressed Lindex-Plus FS, drilled at 120 seeds per m^2.
17-Oct-94 : B : Draza at 5.5 kg.
25-Oct-94 : **T** : **INOCFUNG** I: Straw inoculum applied at one bale per 51 m^2.
26-Oct-94 : B : Butisan S at 2.5 l and Laser at 1.0 l with Ashlade Adjuvant Oil at 2.4 l in 260 l.
02-Nov-94 : **T** : **FUNGINOC** F: Sportak 45 at 1.1 l in 200 l.
22-Feb-95 : B : 34.5% N at 174 kg.
11-Apr-95 : **T** : **FUNGINOC** F: Barclay Eyetak at 1.1 l in 200 l.
03-May-95 : B : Fastac at 200 ml in 200 l.
19-Jun-95 : **T** : **FUNGINOC** F: Rovral Flo at 3.0 l in 400 l.
24-Jul-95 : B : Stefes Diquat at 3.0 l with Vassgro Spreader at 0.30 l in 300 l.
28-Jul-95 : B : Combine harvested.

Previous crops: Linseed 1993 and 1994.

NOTES: (1) The crop failed on 2 plots, one of each treatment. The means presented are the means of the other 3 replicates.
(2) Seed was analysed for quality and ease of processing.

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95/R/RAW/2

GRAIN (AT 90% DRY MATTER) TONNES/HECTARE

***** Tables of means *****

FUNGINOC	
I	2.14
F	2.79
Mean	2.47

GRAIN MEAN DM% 83.1

PLOT AREA HARVESTED 0.00391

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95/R/RAW/5

WINTER OILSEED RAPE

FUNGICIDE TYPE AND TIMING

Object: To compare prophylactic and forecast fungicidal spray programmes for the control of diseases in oilseed rape - Highfield V.

Sponsors: B.D.L. Fitt, C.X. Hong, S. Mitchell.

Design: 3 randomised blocks of 16 plots.

Whole plot dimensions: 3.0 x 20.0.

Treatments:

FUNGCDE	Fungicide spraying strategy, fungicide type, rate and timing:	
NIL		None (triplicated)
S1	Standard	Tebuconazole, full rate, autumn
S2	Standard	Tebuconazole, full rate, spring
S12	Standard	Tebuconazole, half rate, autumn and spring
S3	Standard	Iprodione, full rate, summer
S13	Standard	Tebuconazole, full rate, autumn and iprodione, full rate, summer
S23	Standard	Tebuconazole, full rate, spring and iprodione, full rate, summer
S123	Standard	Tebuconazole, half rate, autumn and spring and iprodione full rate, summer
F1	Forecast	Tebuconazole, full rate, autumn (duplicated)
F2	Forecast	Tebuconazole, full rate, spring (duplicated)
F12	Forecast	Tebuconazole, half rate, autumn and spring (duplicated)

Experimental diary:

18-Jul-94 : B : PK as (0:20:32) at 1406 kg.
29-Jul-94 : B : Deep tine cultivated with vibrating tines 60 cm apart and 45 cm deep. Rolled.
03-Aug-94 : B : Ploughed and furrow pressed.
04-Aug-94 : B : Rolled.
23-Aug-94 : B : Spring-tine cultivated. Rotary harrowed, Envol, dressed Lindex-Plus FS, drilled at 120 seeds per m^2. Rolled.
23-Nov-94 : **T** : **FUNGCDE** S1, S13: Folicur at 1.0 l in 220 l.
: **T** : **FUNGCDE** S12, S123: Folicur at 0.5 l in 220 l.
19-Dec-94 : **T** : **FUNGCDE** F1: Folicur at 1.0 l in 220 l.
: **T** : **FUNGCDE** F12: Folicur at 0.5 l in 220 l.
23-Feb-95 : B : 34.5% N at 174 kg.
24-Feb-95 : **T** : **FUNGCDE** S1, S12, S13, S123: Folicur at 0.5 l in 220 l.
15-Mar-95 : B : 34.5% N at 348 kg.
30-Mar-95 : **T** : **FUNGCDE** S2, S23: Folicur at 1.0 l in 220 l.
: **T** : **FUNGCDE** S12, S123: Folicur at 0.5 l in 220 l.
19-Apr-95 : B : Fastac at 0.2 l in 200 l.
21-Apr-95 : **T** : **FUNGCDE** F2: Folicur at 1.0 l in 220 l.
: **T** : **FUNGCDE** F12: Folicur at 0.5 l in 220 l.

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95/R/RAW/5

Experimental diary:

01-Jun-95 : **T** : **FUNGCDE** S3, S13, S23, S123: Rovral Flo at 3.0 l in 200 l.
11-Jul-95 : B : Reglone at 3.0 l with Vassgro Spreader at 400 ml in 400 l.
17-Jul-95 : B : Combine harvested.

Previous crops: S. beans 1993, set-aside 1994.

NOTE: Incidence of disease on leaves, stems and pods were assessed regularly. Meteorological data was recorded throughout the season.

GRAIN (AT 90% DRY MATTER) TONNES/HECTARE

***** Tables of means *****

FUNGCDE	
NIL	4.50
S1	5.12
S2	4.84
S12	5.16
S3	4.53
S13	5.15
S23	4.95
S123	5.14
F1	4.97
F2	4.85
F12	4.89
Mean	4.86

*** Standard errors of differences of means ***

FUNGCDE	
0.148	min.rep
0.121	max-min

	FUNGCDE
max-min	NIL v any of remainder
min.rep	Any of the remainder

***** Stratum standard errors and coefficients of variation *****

Stratum	d.f.	s.e.	cv%
BLOCK.WP	35	0.181	3.7

GRAIN MEAN DM% 83.0

SUB-PLOT AREA HARVESTED 0.00391

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95/R/RAW/7

WINTER OILSEED RAPE

W. RAPE DENSITY AND CHICKWEED

Object: To measure the effects of crop density, autumn nitrogen and the density of chickweed (*Stellaria media*) on the yield of w. rape - Highfield IV/Road Piece East.

Sponsor: P.J.W. Lutman.

Design: 3 randomised blocks of 4 x 2 x 2 plots.

Whole plot dimensions: 3.0 x 14.0.

Treatments: All combinations of:-

1. **CROP DEN** Target w. rape density, plants per m^2:

C1	25
C2	50
C4	100
C8	200

NOTES: (1) C1 rate was achieved by using 50% dead seed and drilling at the C2 rate.
(2) Owing to slug damage, a range of 13-222 plants per m^2 was established.

2. **WEED DEN** Chickweed density, average established plants per m^2:

W0	0
W1	262

3. **N** Nitrogen in autumn, kg N:

N0	0
N1	50

Experimental diary:

27-Jul-94 : B : Dolomite at 5.0 t.
01-Aug-94 : B : Ploughed and furrow pressed.
25-Aug-94 : B : Spring-tine cultivated.
: **T** : **N** N1: 34.5% N at 145 kg.
: **T** : **WEED DEN** W1: Chickweed broadcast.
: **T** : **CROP DEN** C1, C2, C4, C8: Rotary harrowed, Apex, dressed Lindex-Plus FS, drilled.
26-Aug-94 : B : Rolled.
20-Sep-94 : B : Draza at 5.5 kg.
02-Nov-94 : B : Fusilade 5 at 1.0 l with Vassgro Spreader at 260 ml in 260 l.
22-Feb-95 : B : 34.5% N at 174 kg.
21-Mar-95 : B : 34.5% N at 348 kg.
11-Apr-95 : B : Barclay Eyetak at 1.1 l in 200 l.

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95/R/RAW/7

Experimental diary:

19-Apr-95 : B : Fastac at 0.2 l in 200 l.
12-Jul-95 : B : Reglone at 3.0 l with Vassgro Spreader at 400 ml in 400 l.
17-Jul-95 : B : Combine harvested.

Previous crops: W. barley 1993, set-aside 1994.

NOTES: (1) Crop failed on six plots due to slugs with treatment combinations:

CROP DEN	C1	C2	C1	C4
WEED DEN	W0 (twice)	W0 (twice)	W0	W1
N	N0	N0	N1	N0

Estimated values were used in the analysis.

(2) Crop and weed density was assessed in September and October. Crop and weed growth was recorded in December, April, May and July.

GRAIN (AT 90% DRY MATTER) TONNES/HECTARE

***** Tables of means *****

WEED DEN	W0	W1	Mean
CROP DEN			
C1	3.84	2.90	3.37
C2	3.70	3.91	3.80
C4	4.29	4.02	4.16
C8	4.49	4.15	4.32
Mean	4.08	3.75	3.91

N	N0	N1	Mean
CROP DEN			
C1	2.98	3.76	3.37
C2	3.77	3.84	3.80
C4	3.95	4.36	4.16
C8	4.37	4.27	4.32
Mean	3.77	4.06	3.91

N	N0	N1	Mean
WEED DEN			
W0	3.92	4.24	4.08
W1	3.61	3.88	3.75
Mean	3.77	4.06	3.91

WEED DEN	W0		W1	
CROP DEN **N**	N0	N1	N0	N1
C1	3.79	3.89	2.18	3.63
C2	3.35	4.04	4.18	3.64
C4	4.08	4.50	3.81	4.23
C8	4.46	4.51	4.27	4.03

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95/R/RAW/7

*** Standard errors of differences of means ***

CROP DEN	WEED DEN	N	CROP DEN WEED DEN
0.145	0.103	0.103	0.206

CROP DEN N	WEED DEN N	CROP DEN WEED DEN N
0.206	0.145	0.291

***** Stratum standard errors and coefficients of variation *****

Stratum	d.f.	s.e.	cv%
BLOCK.WP	24	0.356	9.1

GRAIN MEAN DM% 82.4

PLOT AREA HARVESTED 0.00267

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95/R/RAW/8

WINTER OILSEED RAPE

VARIETIES AND DISEASES

Object: To study the effects of disease on growth, yield and seed quality of winter oilseed rape - Highfield IV/Road Piece E.

Sponsors: K.J. Doughty, H.A. McCartney.

Design: 4 blocks of 2 plots split into 2 sub-plots.

Whole plot dimensions: 6.0 x 10.0.

Treatments:

Whole plots

1. **INOCFUNG** Inoculation and fungicide:

I	Inoculated with diseased straw in autumn
F	Fungicide sprays in autumn, spring and summer

Sub-plots

2. **VARIETY**

CA	Capricorn
FA	Falcon

Experimental diary:

27-Jul-94 : B : Dolomite at 5.0 t.
01-Aug-94 : B : Ploughed and furrow pressed.
24-Aug-94 : B : Spring-tine cultivated.
: **T** : **VARIETY** CA: Rotary harrowed, Capricorn, dressed Lindex-Plus FS, drilled at 120 seeds per m^2.
: **T** : **VARIETY** FA: Rotary harrowed, Falcon, dressed Lindex-Plus FS, drilled at 120 seeds per m^2.
26-Aug-94 : B : Rolled.
20-Sep-94 : B : Draza at 5.5 kg.
24-Oct-94 : **T** : **INOCFUNG** I: Straw inoculum applied at 1 bale per 60 m^2.
02-Nov-94 : B : Butisan S at 2.5 l in 260 l.
: B : Fusilade 5 at 1.0 l with Vassgro Spreader at 260 ml in 260 l.
: **T** : **INOCFUNG** F: Sportak 45 at 1.1 l in 200 l.
22-Feb-95 : B : 34.5% N at 174 kg.
21-Mar-95 : B : 34.5% N at 348 kg.
11-Apr-95 : **T** : **INOCFUNG** F: Barclay Eyetak at 1.1 l in 200 l.
19-Jun-95 : **T** : **INOCFUNG** F: Rovral Flo at 3.0 l in 400 l.
24-Jul-95 : B : Stefes Diquat at 3.0 l with Vassgro Spreader at 300 ml in 300 l.
28-Jul-95 : B : Combine harvested.

Previous crops: W. barley 1993, set-aside 1994.

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95/R/RAW/8

NOTE: Seed was analysed for quality and ease of processing.

GRAIN (AT 90% DRY MATTER) TONNES/HECTARE

***** Tables of means *****

VARIETY / **INOCFUNG**	CA	FA	Mean
I	2.71	3.23	2.97
F	3.63	3.55	3.59
Mean	3.17	3.39	3.28

*** Standard errors of differences of means ***

	INOCFUNG	**VARIETY**	**INOCFUNG VARIETY**
	0.289	0.147	0.324
Except when comparing means with the same level(s) of **INOCFUNG**			0.207

***** Stratum standard errors and coefficients of variation *****

Stratum	d.f.	s.e.	cv%
BLOCK.WP.SP	6	0.293	8.9

GRAIN MEAN DM% 79.0

SUB PLOT AREA HARVESTED 0.00230

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95/W/RAS/1

SPRING OILSEED RAPE

SULPHUR FOR SPRING OILSEED RAPE

Object: To study the effects of rates of sulphur fertilizer on the yield and sulphur content of spring oilseed rape - Woburn, Lansome II.

Sponsors: S.P. McGrath, F. Zhao.

Design: 4 randomised blocks of 6 plots.

Whole plot dimensions: 3.0 x 15.0.

Treatments:

SULPHUR	Sulphur as potassium sulphate (kg S):
S0	0 (duplicated)
S1	10
S2	20
S4	40
S8	80

NOTE: Potassium chloride was applied to balance the potassium to supply 222 kg K_2O.

Experimental diary:

24-Mar-95 : B : Heavy spring-tine cultivated.
03-Apr-95 : **T** : Potassium chloride applied.
: **T** : Sulphur treatments applied.
: B : Rotary harrowed, Starlight, dressed Lindex-Plus FS, drilled at 150 seeds per m^2.
28-Apr-95 : B : 34.5% N at 290 kg.
02-Jun-95 : B : Fastac at 100 ml in 300 l.
30-Jun-95 : B : Fastac at 200 ml in 300 l.
25-Aug-95 : B : Combine harvested.

Previous crops: W. wheat 1993, s. barley 1994.

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95/W/RAS/1

GRAIN (AT 90% DRY MATTER) TONNES/HECTARE

***** Tables of means *****

SULPHUR

S0	0.60
S1	0.49
S2	0.41
S4	0.46
S8	0.51
Mean	0.51

*** Standard errors of differences of means ***

SULPHUR

0.066	min.rep
0.057	max-min

	SULPHUR
max-min	S0 v any of the remainder
min.rep	Any of the remainder

***** Stratum standard errors and coefficients of variation *****

Stratum	d.f.	s.e.	cv%
BLOCK.WP	16	0.093	18.1

GRAIN MEAN DM% 77.5

PLOT AREA HARVESTED 0.00286

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95/R/RAS/3

SPRING OILSEED RAPE

SULPHUR FOR SPRING OILSEED RAPE

Object: To test the response of spring oilseed rape to sulphur and magnesium fertilizers - Geescroft.

Sponsors: S.P. McGrath, F. Zhao.

Design: 4 randomised blocks of 12 plots.

Whole plot dimensions: 3.0 x 10.0.

Treatments:

SULMAG	Rates of sulphur or magnesium fertilizer, kg:
-	None (duplicated)
KS1	10 kg S as potassium sulphate to seedbed
KS2	20 kg S as potassium sulphate to seedbed
KS4	40 kg S as potassium sulphate to seedbed
KS8	80 kg S as potassium sulphate to seedbed
S2	20 kg S as elemental sulphur (Thiovit) to seedbed
S4	40 kg S as elemental sulphur (Thiovit) to seedbed
E2	20 kg S and 15.4 kg Mg as Epsom salts as a foliar spray
E4	40 kg S and 30.8 kg Mg as Epsom salts as a foliar spray
MG1	15.4 kg Mg as magnesium chloride
MG2	30.8 kg Mg as magnesium chloride

NOTES: (1) Muriate of potash was applied to balance the potassium in the potassium sulphate, so all plots received 222 kg K_2O.

(2) The Epsom salts and magnesium chloride treatments E2 and MG1 were applied in two doses repeated one week later. Treatments E4 and MG2 in four doses repeated one week later. Plants were allowed to dry between applications.

Experimental diary:

25-Nov-94 : B : Ploughed.
03-Apr-95 : **T** : **SULMAG** KS1, KS2, KS4, KS8, S2, S4: Seedbed treatments applied.
: B : Spring-tine cultivated, rotary harrowed, Starlight, dressed Lindex-Plus FS, drilled at 7.0 kg.
04-Apr-95 : B : Butisan S at 1.5 l in 200 l.
05-Apr-95 : B : 34.5% N at 145 kg.
02-May-95 : B : Decis at 300 ml in 200 l.
11-May-95 : B : Part irrigated 25 mm.
12-May-95 : B : Part irrigated 25 mm.
24-May-95 : B : 34.5% N at 156 kg.
31-May-95 : B : Dow Shield at 0.5 l in 200 l.
01-Jun-95 : B : Fastac at 200 ml in 300 l.
14-Jun-95 : B : Dow Shield at 1.0 l in 200 l.
15-Jun-95 : **T** : **SULMAG** E2, E4: Epsom salts applied with Vassgro Spreader at 56 ml in 750 l.

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95/R/RAS/3

Experimental diary:

```
   15-Jun-95 : T : SULMAG MG1, MG2: Magnesium chloride applied with Vassgro
                   Spreader at 56 ml in 750 l.
   22-Jun-95 : T : SULMAG E2, E4: Epsom salts applied with Vassgro Spreader
                   at 56 ml in 750 l.
             : T : SULMAG MG1, MG2: Magnesium chloride applied with Vassgro
                   Spreader at 56 ml in 750 l.
   10-Jul-95 : B : Fastac at 100 ml in 300 l.
   15-Aug-95 : B : Reglone at 3.0 l with Vassgro Spreader at 400 ml in
                   400 l.
   18-Aug-95 : B : Combine harvested.
```

Previous crops: S. wheat 1993, linseed 1994.

NOTE: The crop was sampled on three occasions to measure sulphur content.

GRAIN (AT 90% DRY MATTER) TONNES/HECTARE

***** Tables of means *****

SULMAG	
-	0.55
KS1	0.58
KS2	0.63
KS4	0.59
KS8	0.64
S2	0.72
S4	0.66
E2	0.54
E4	0.49
MG1	0.61
MG2	0.60
Mean	0.60

*** Standard errors of differences of means ***

SULMAG	
0.085	min.rep
0.073	max-min

	SULMAG
max-min	- v any of the remainder
min.rep	Any of the remainder

***** Stratum standard errors and coefficients of variation *****

Stratum	d.f.	s.e.	cv%
BLOCK.WP	34	0.120	20.1

GRAIN MEAN DM% 82.2 PLOT AREA HARVESTED 0.00184

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95/R/RAS/8

SPRING OILSEED RAPE

FUNGICIDE AND INOCULATION

Object: To determine the effects of disease on the yield and seed quality of spring oilseed rape - Geescroft.

Sponsor: K.J. Doughty.

Design: 4 replicates of 2 plots.

Whole plot dimensions: 3.0 x 14.0.

Treatments:

INOCFUNG	Diseases inoculated or fungicide applied:
I	Inoculated with a mycelial suspension of *Alternaria brassicae* in malt extract broth
F	Iprodione applied

Experimental diary:

25-Nov-94 : B : Ploughed.
03-Apr-95 : B : Spring-tine cultivated, rotary harrowed, Starlight, dressed Lindex-Plus FS, drilled at 180 seeds per m^2.
04-Apr-95 : B : Butisan S at 1.5 l in 200 l.
05-Apr-95 : B : 34.5% N at 145 kg.
02-May-95 : B : Decis at 300 ml in 200 l.
11-May-95 : B : Part irrigated 25 mm.
12-May-95 : B : Part irrigated 25 mm.
24-May-95 : B : 34.5% N at 156 kg.
31-May-95 : B : Dow Shield at 0.5 l in 200 l.
01-Jun-95 : B : Fastac at 200 ml in 300 l.
14-Jun-95 : B : Dow Shield at 1.0 l in 200 l.
29-Jun-95 : **T** : **INOCFUNG** F: Rovral Flo at 2.0 l in 200 l.
10-Jul-95 : B : Fastac at 100 ml in 300 l.
11-Jul-95 : **T** : **INOCFUNG** I: Inoculum applied.
18-Aug-95 : B : Combine harvested.

Previous crops: S. wheat 1993, linseed 1994.

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95/R/RAS/8

GRAIN (AT 90% DRY MATTER) TONNES/HECTARE

***** Tables of means *****

INOCFUNG

I	0.83
F	0.81
Mean	0.82

*** Standard errors of differences of means ***

INOCFUNG

0.057

***** Stratum standard errors and coefficients of variation *****

Stratum	d.f.	s.e.	cv%
WP	6	0.080	9.8

GRAIN MEAN DM% 81.7

PLOT AREA HARVESTED 0.00322

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95/R/BEW/1

WINTER BEANS

PHEROMONE-BAITED TRAP CROP

Object: To use pheromone-baited winter beans as a trap crop to attract spring migrant pea and bean weevils - Long Hoos I/II.

Sponsors: L.E. Smart, B.J. Pye.

Design: 5 x 5 quasi-complete Latin square.

Whole plot dimensions: 6.0 x 6.0.

Treatments:

PHEROMON	Pheromone and insecticide:
-	None
P	Pheromone
PI1	Pheromone with insecticide applied once
PI2	Pheromone with insecticide applied twice
PI3	Pheromone with insecticide applied thrice

Experimental diary:

26-Sep-94 : B : Ploughed and furrow pressed.
21-Oct-94 : B : Spring-tine cultivated, Punch, recleaned, drilled at 25 seeds per m^2.
07-Feb-95 : **T** : **PHEROMON** P, PI1, PI2, PI3: Pheromone applied.
04-Apr-95 : B : Bombardier at 2.0 l in 200 l.
06-Apr-95 : **T** : **PHEROMON** PI1, PI2, PI3: Decis at 300 ml in 200 l.
19-Apr-95 : **T** : **PHEROMON** PI2, PI3: Decis at 300 ml in 200 l.
05-May-95 : **T** : **PHEROMON** PI3: Decis at 300 ml in 200 l.
01-Aug-95 : B : Combine harvested.

Previous crops: W. wheat 1993, s. wheat 1994.

NOTES: (1) From April pheromones were applied from dispensers placed at the plot centres.
(2) Assessments of adult feeding damage were made between February and May.

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95/R/BEW/1

GRAIN TONNES/HECTARE

***** Tables of means *****

PHEROMON	
-	2.02
P	2.09
PI1	2.02
PI2	2.10
PI3	2.32
Mean	2.11

*** Standard errors of differences of means ***

PHEROMON
0.124

***** Stratum standard errors and coefficients of variation *****

Stratum	d.f.	s.e.	cv%
ROW.COL	12	0.196	9.3

GRAIN MEAN DM% 88.0

PLOT AREA HARVESTED 0.00276

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95/W/BES/1

SPRING BEANS

BEAN FLOWER COLOUR AND PHEROMONES

Object: To compare the incidence of *Sitona lineatus* in purple and white flowered beans with and without insecticide and pheromone - Woburn, Horsepool Lane Close I.

Sponsors: L.E. Smart, M.M. Blight.

Design: 6 x 6 quasi-complete Latin square.

Whole plot dimensions: 6.0 x 6.0.

Treatments:

1. **VARIETY**

A	Alfred
C	Caspar

2. **INSPHER** Insecticide or pheromone:

-	None
I	Insecticide (deltamethrin)
P	Pheromone

Experimental diary:

23-Mar-95	B	Heavy spring-tine cultivated.
30-Mar-95	B	Rotary harrowed.
	T	**VARIETY** A: Alfred drilled at 60 seeds per m^2.
	T	**VARIETY** C: Caspar drilled at 60 seeds per m^2.
06-Apr-95	B	Opogard 500 SC at 3.4 l in 200 l.
02-May-95	**T**	**INSPHER** I: Decis at 300 ml in 200 l.
15-May-95	**T**	**INSPHER** I: Decis at 300 ml in 200 l.
16-Aug-95	B	Combine harvested.

Previous crops: W. wheat 1993, w.rye 1994.

NOTES: (1) From late April, pheromone was released from a point source hung above the crop at the plot centre.

(2) Assessments were made of weevil larval numbers in root nodules at the end of May and of damage to leaves by adult weevils in April and May.

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95/W/BES/1

GRAIN TONNES/HECTARE

***** Tables of means *****

INSPHER	-	I	P	Mean
VARIETY				
A	2.62	2.36	2.49	2.49
C	2.24	2.11	2.40	2.25
Mean	2.43	2.23	2.45	2.37

*** Standard errors of differences of means ***

VARIETY	INSPHER	VARIETY INSPHER
0.057	0.070	0.099

***** Stratum standard errors and coefficients of variation *****

Stratum	d.f.	s.e.	cv%
ROW.COL	20	0.172	7.3

GRAIN MEAN DM% 86.9

PLOT AREA HARVESTED 0.00264

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95/R/BES/4

SPRING BEANS

WEED COMPETITION AND SPRING BEANS

Object: To study the effects of three weeds, oats (*Avena sativa*), charlock (*Sinapsis arvensis*) and chickweed (*Stellaria media*), on the growth and yield of spring beans - Webbs.

Sponsor: P.J.W. Lutman.

Design: 3 randomised blocks of 20 plots.

Whole plot dimensions: 3.0 x 10.0.

Treatments:

WEED	Weed species and density, average number of established plants per m^2:
O1	Oats, 18.2
O2	Oats, 44.8
O3	Oats, 85.3
O4	Oats, 167.7
CE1	Charlock, 0
CE2	Charlock, 0
CE3	Charlock, 22.7
CE4	Charlock, 32.3
CL1	Charlock, 0
CL2	Charlock, 0
CL3	Charlock, 18.9
CL4	Charlock, 37.8
CW1	Chickweed, 39.3
CW2	Chickweed, 68.8
CW3	Chickweed, 152.1
CW4	Chickweed, 309.6
-	None (quadrupled)

NOTES: (1) Weeds sown same day as the beans, except CL1-CL4 sown 13 days later.

(2) Oats were cv. Dula dressed Rappor Plus.

(3) Target weed densities, plants per m^2:

Oats		Charlock				Chickweed	
O1	40	CE1	50	CL1	50	CW1	100
O2	120	CE2	100	CL2	100	CW2	200
O3	240	CE3	200	CL3	200	CW3	400
O4	480	CE4	400	C14	400	CW4	800

Target sowing date of CL1-CL4 was 10 days after beans.

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95/R/BES/4

Experimental diary:

15-Aug-94 : B : Straw baled and removed.
06-Sep-94 : B : PK as (0:20:32) at 1317 kg.
11-Nov-94 : B : Stubble topped.
21-Nov-94 : B : Ploughed.
21-Mar-95 : B : Spring-tine cultivated.
23-Mar-95 : **T** : **WEED** O1, O2, O3, O4, CE1, CE2, CE3, CE4, CW1, CW2, CW3, CW4: Weed seeds broadcast.
: B : Rotary harrowed, Alfred, undressed, drilled at 50 seeds per m^2.
05-Apr-95 : **T** : **WEED** CL1, CL2, CL3, CL4: Charlock seed broadcast.
02-May-95 : B : Decis at 300 ml in 200 l.
06-Jul-95 : B : Bravo 500 at 3.0 l with Pirimicarb 50 DG at 280 g in 220 l.
29-Aug-95 : B : Combine harvested.

NOTES: (1) Weeds failed to establish for **WEED** CE1, CE2, CL1 and CL2 and have been omitted from the analysis.
(2) Weed populations were assessed during April and May. Samples of weeds and crop were taken on seven occasions from May to August to measure relative rates of growth. Visual and photographic assessments of ground cover were made during May and June.

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95/R/BES/4

GRAIN TONNES/HECTARE

***** Tables of means *****

WEED	
O1	2.46
O2	2.04
O3	1.92
O4	1.04
CE3	2.84
CE4	2.33
CL3	3.17
CL4	2.58
CW1	3.11
CW2	2.56
CW3	3.23
CW4	2.75
-	3.09
Mean	2.65

*** Standard errors of differences of means ***

WEED	
0.417	min.rep
0.208	max.rep

WEED	
max-min	- v any of the remainder
min.rep	Any of the remainder

***** Stratum standard errors and coefficients of variation *****

Stratum	d.f.	s.e.	cv%
BLOCK.WP	33	0.511	19.3

GRAIN MEAN DM% not measured

PLOT AREA HARVESTED 0.00020

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95/R/LP/1

LUPINS

LUPIN VARIETIES

Object: To assess the overwinter survival, crop structure, yield potential and maturity date of nine lines of autumn-sown determinate lupins - Highfield VI.

Sponsors: G.F.J. Milford, H.J. Stevenson.

Design: 4 randomised blocks of 10 plots.

Plot dimensions: 2.88 x 6.0.

Treatments:

LINES	Lines and growth regulator:
A	DTN 01
B	DTN 02
C	DTN 11
D	DTN 12
E	DTN 13
F	DTN 16
G	DTN 19
H	DTN 20
70	CH304/70
70R	CH304/70 with growth regulator in spring

Experimental diary:

29-Jul-94 : B : Deep tine cultivated with vibrating tines 60 cm apart and 45 cm deep. Rolled.
04-Aug-94 : B : Ploughed and furrow pressed. Rolled.
02-Sep-94 : B : Rotary harrowed twice.
: **T** : **LINES**: Lines drilled at 40 seeds per m^2.
06-Sep-94 : B : Opogard 500 SC at 2.8 l in 220 l.
12-Sep-94 : B : Draza at 5.5 kg.
30-Nov-94 : B : Falcon at 1.0 l in 200 l.
15-Dec-94 : B : Farmon PDQ at 15.0 l in 900 l, inter-row sprayed using dribble bar.
06-Feb-95 : B : Hand weeding started.
14-Feb-95 : B : Hand weeding finished.
13-Mar-95 : B : Atlas Simazine at 2.0 l in 200 l.
04-Apr-95 : **T** : **LINES** 70R: Cultar at 826 ml in 220 l.
19-Apr-95 : B : Atlas Dimethoate 40 at 850 ml in 200 l.
23-May-95 : B : Atlas Dimethoate 40 at 850 ml in 200 l.
20-Jun-95 : B : Corbel at 0.5 l with Tilt Turbo 475 EC at 1.0 l in 200 l.
30-Jun-95 : B : Atlas Dimethoate 40 at 850 ml in 200 l.
17-Aug-95 : B : Combine harvested.

Previous crops: W. wheat 1993, set-aside 1994.

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95/R/LP/1

NOTES: (1) The yield of one plot was lost during harvesting with treatment: **LINES** A. An estimated value was used in the analysis.
(2) Plant populations were assessed monthly September to April. Plant heights were measured in February and June. Final main stem leaf numbers, date of first floret opening and maximum floret numbers were recorded. Branch and leaf numbers were counted in July. Components of yield were assessed.

GRAIN TONNES/HECTARE

***** Tables of means *****

LINES	
A	1.70
B	2.49
C	2.04
D	1.59
E	1.87
F	2.09
G	1.91
H	2.16
70	2.00
70R	1.81
Mean	1.96

*** Standard errors of differences of means ***

LINES
0.325

***** Stratum standard errors and coefficients of variation *****

Stratum	d.f.	s.e.	cv%
BLOCK.WP	26	0.460	23.4

GRAIN MEAN DM% 89.8

PLOT AREA HARVESTED 0.00072

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95/R/LP/2

LUPINS

LINES AND SOWING DATES

Object: To test the effects of sowing date on the plant architecture and yield of two lines of lupins sown in autumn and spring - Highfield VI.

Sponsors: G.F.J. Milford, I. Shield.

Design: 4 randomised blocks of 3 x 2 plots.

Plot dimensions: 2.88 x 6.0.

Treatments: All combinations of:-

1. **LINES**

70	CH304/70
73	CH304/73

2. **SOW DATE** Date of sowing:

E	Early September, 1994
M	Late September
L	Middle of March, 1995

Experimental diary:

29-Jul-94 : B : Deep tine cultivated with vibrating tines 60 cm apart and 45 cm deep. Rolled.
04-Aug-94 : B : Ploughed and furrow pressed, rolled.
05-Sep-94 : **T** : **SOW DATE** E: Rotary harrowed, lines drilled at 40 seeds per m^2.
06-Sep-94 : **T** : **SOW DATE** E: Opogard 500 SC at 2.8 l in 220 l.
12-Sep-94 : B : Draza at 5.5 kg.
22-Sep-94 : **T** : **SOW DATE** M: Rotary harrowed, lines drilled at 40 seeds per m^2.
26-Sep-94 : **T** : **SOW DATE** M: Opogard 500 SC at 2.8 l in 200 l.
30-Nov-94 : B : Falcon at 1.0 l in 200 l.
16-Dec-94 : **T** : **SOW DATE** E, M: Farmon PDQ at 15.0 l in 900 l, inter-row sprayed using dribble bar.
03-Feb-95 : **T** : **SOW DATE** E, M: Hand weeded.
09-Mar-95 : **T** : **SOW DATE** L: Sting CT at 4.0 l in 220 l.
13-Mar-95 : **T** : **SOW DATE** E, M: Atlas Simazine at 2.0 l in 220 l.
14-Mar-95 : **T** : **SOW DATE** L: Heavy spring-tine cultivated, rotary harrowed, lines drilled at 40 seeds per m^2.
14-Mar-95 : **T** : **SOW DATE** L: Opogard 500 SC at 2.8 l in 220 l.
11-Apr-95 : **T** : **SOW DATE** E, M: Cultar at 0.75 l in 220 l.
19-Apr-95 : B : Atlas Dimethoate 40 at 850 ml in 200 l.
23-May-95 : B : Atlas Dimethoate 40 at 850 ml in 200 l.
16-Jun-95 : **T** : **SOW DATE** L: Fusilade 5 at 2.0 l in 220 l.
20-Jun-95 : B : Corbel at 0.5 l with Tilt Turbo 475 EC at 1.0 l in 200 l.
30-Jun-95 : B : Atlas Dimethoate 40 at 850 ml in 200 l.
17-Aug-95 : **T** : **SOW DATE** E, M: Combine harvested.

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95/R/LP/2

NOTES: (1) **SOW DATE** L did not produce harvestable grain.
(2) Plant numbers were assessed in autumn, winter, spring and at harvest. Plant components were assessed at flowering. Components of yield were measured after harvest.

Previous crops: W. wheat 1993, set-aside 1994.

GRAIN TONNES/HECTARE

***** Tables of means *****

SOW DATE / **LINES**	E	M	Mean
70	1.73	2.21	1.97
73	2.74	2.99	2.87
Mean	2.23	2.60	2.42

*** Standard errors of differences of means ***

LINES	**SOW DATE**	**LINES** **SOW DATE**
0.142	0.142	0.201

***** Stratum standard errors and coefficients of variation *****

Stratum	d.f.	s.e.	cv%
BLOCK.WP	9	0.284	11.7

GRAIN MEAN DM% 90.3

PLOT AREA HARVESTED 0.00072

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95/W/LP/2

LUPINS

ESTABLISHMENT STUDY ON HEAVY SOIL

Object: To identify seedbed conditions for the establishment and survival of autumn-sown lupins - Woburn, Long Mead.

Sponsor: I. Shield.

Design: 3 blocks of 8 plots.

Whole plot dimensions: 6.0 x 9.0.

Treatments:

ESTABL	Seedbed type, cultivations and method of sowing:
1	Medium-coarse seedbed, unconsolidated, precision drilled 5 cm deep
2	Medium-coarse seedbed, unconsolidated, tine-drilled 5 cm deep
3	As 2, then rolled
4	Fine seedbed, consolidated, tine-drilled 5 cm deep, rolled
5	Medium-coarse seedbed, unconsolidated, tine-drilled 7.5 cm deep
6	Direct drilled 5 cm deep, seed mixed with slug pellets
7	Minimal cultivations, seed broadcast with slug pellets, cultivated to 5 cm
8	Seed broadcast, ploughed to 10 cm, levelled

Experimental diary:

08-Sep-94 : **T** : **ESTABL** 1, 2, 3, 4, 5, 7 and 8: Sub-soiled.
12-Sep-94 : **T** : **ESTABL** 1, 2, 3, 4, 5: Ploughed.
: **T** : **ESTABL** 1: Precision drilled 5 cm deep.
: **T** : **ESTABL** 2, 3: Tine drilled 5 cm deep.
: **T** : **ESTABL** 4: Flat rolled, rotary harrowed, tine-drilled 5 cm deep.
: **T** : **ESTABL** 3, 4: Cambridge rolled.
: **T** : **ESTABL** 5: Precision drilled 7.5 cm deep.
: **T** : **ESTABL** 6: Direct drilled 5 cm deep with Draza at 5.5 kg.
: **T** : **ESTABL** 7: Seed broadcast with Draza at 5.5 kg. Rotary harrowed to 5 cm.
: **T** : **ESTABL** 8: Seed broadcast, ploughed 10 cm deep, rotary harrowed to level.
18-Sep-94 : B : Opogard 500 SC at 2.3 l with Gramoxone 100 at 3.0 l in 200 l.
02-Nov-94 : B : Laser at 1.0 l with adjuvant oil at 2.4 l in 300 l.
19-Apr-95 : B : Cultar at 0.75 l in 300 l.
28-Apr-95 : B : Atlas Simazine at 2.0 l in 300 l.
03-May-95 : B : Danadim Dimethoate 40 at 0.85 l with Vassgro Spreader at 0.3 l in 300 l.
30-Jun-95 : B : Danadim Dimethoate 40 at 850 ml in 300 l.
24-Aug-95 : B : Combine harvested.

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95/W/LP/2

NOTES: (1) Seed was CH304/70, dressed Germipro UFB, sown at 40 seeds per m^2.
(2) The crop on treatment 8 failed and has been omitted from the analysis.

Previous crops: Set-aside 1993, w. wheat 1994.

NOTE: Plants were counted monthly from sowing to April. Dry matter was measured in December. Leaf and branch numbers were counted post-flowering. Components of yield were measured, oil and protein content of grain was assessed on **ESTABL** 1 only.

GRAIN TONNES/HECTARE

***** Tables of means *****

ESTABL	
1	1.02
2	1.20
3	1.41
4	1.35
5	0.98
6	0.64
7	1.07
Mean	1.10

*** Standard errors of differences of means ***

ESTABL
0.214

***** Stratum standard errors and coefficients of variation *****

Stratum	d.f.	s.e.	cv%
BLOCK.WP	12	0.263	24.0

GRAIN MEAN DM% 88.9

PLOT AREA HARVESTED 0.00135

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95/R/LP/3

LUPINS

SOWING DATES, PESTS AND DISEASES

Object: To study overwinter losses of autumn-sown lupins - Highfield VI.

Sponsors: G.L. Bateman, A.W. Ferguson, G.F.J. Milford, I. Shield, S. Nabb.

Design: 2 randomised blocks of 2 x 2 x 2 x 3 plots.

Whole plot dimensions: 2.88 x 10.0.

Treatments: All combinations of:-

1. **SOW DATE** Date of sowing:

   E Early (late August)
   L Late (middle of September)

2. **INS SEED** Insecticide seed treatment:

   D- None
   DI Insecticide (furothiocarb)

3. **FNG SEED** Fungicide seed treatment:

   DO None
   DF Fungicide (iprodione and carbendazim)

4. **AUT FUNG** Autumn fungicide:

   F- None
   FP Prochloraz
   FD Difenoconazol

Experimental diary:

29-Jul-94 : B : Deep tine cultivated with vibrating tines 60 cm apart and 45 cm deep, rolled.
04-Aug-94 : B : Ploughed and furrow pressed, rolled.
30-Aug-94 : **T** : **SOW DATE** E: Rotary harrowed, CH304/70 drilled at 40 seeds per m^2.
31-Aug-94 : **T** : **SOW DATE** E: Opogard 500 SC at 2.8 l in 220 l.
12-Sep-94 : B : Draza at 5.5 kg.
22-Sep-94 : **T** : **SOW DATE** L: Rotary harrowed, CH 304/70 drilled at 40 seeds per m^2.
26-Sep-94 : **T** : **SOW DATE** L: Opogard 500 SC at 2.8 l in 200 l.

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96/R/LP/3

Experimental diary:

```
   21-Nov-94 : T : AUT FUNG FP: Sportak 45 at 1.1 l in 220 l.
             : T : AUT FUNG FD: Plover at 0.3 l in 220 l.
   30-Nov-94 : B : Falcon at 1.0 l in 200 l.
   16-Dec-94 : B : Farmon PDQ at 15.0 l in 900 l, inter-row sprayed using
                   dribble bar.
   16-Jan-95 : B : Hand weeding started.
   17-Feb-95 : B : Hand weeding finished.
   13-Mar-95 : B : Atlas Simazine at 2.0 l in 200 l.
   12-Apr-95 : B : Cultar at 0.75 l in 200 l.
   19-Apr-95 : B : Atlas Dimethoate 40 at 850 ml in 200 l.
   23-May-95 : B : Atlas Dimethoate 40 at 850 ml in 200 l.
   20-Jun-95 : B : Corbel at 0.5 l with Tilt Turbo 475 EC at 1.0 l in
                   200 l.
   30-Jun-95 : B : Atlas Dimethoate 40 at 850 ml in 200 l.
   16-Aug-95 : B : Combine harvested.
```

Previous crops: W. wheat 1993, set-aside 1994.

NOTE: Samples were taken in September and October 1994 to assess pest and disease damage. Plant counts and visual assessments of damage were made at intervals.

GRAIN TONNES/HECTARE

***** Tables of means *****

INS SEED / **SOW DATE**	D-	DI	Mean
E	1.62	1.87	1.75
L	2.15	2.28	2.22
Mean	1.89	2.07	1.98

FNG SEED / **SOW DATE**	DO	DF	Mean
E	1.75	1.75	1.75
L	2.25	2.18	2.22
Mean	2.00	1.96	1.98

FNG SEED / **INS SEED**	DO	DF	Mean
D-	1.93	1.84	1.89
DI	2.06	2.09	2.07
Mean	2.00	1.96	1.98

AUT FUNG / **SOW DATE**	F-	FP	FD	Mean
E	1.69	1.98	1.57	1.75
L	2.28	2.38	1.99	2.22
Mean	1.98	2.18	1.78	1.98

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96/R/LP/3

GRAIN TONNES/HECTARE

***** Tables of means *****

AUT FUNG INS SEED	F-	FP	FD	Mean
D-	1.91	1.99	1.76	1.89
DI	2.05	2.37	1.79	2.07
Mean	1.98	2.18	1.78	1.98

AUT FUNG FNG SEED	F-	FP	FD	Mean
DO	1.99	2.20	1.80	2.00
DF	1.98	2.16	1.76	1.96
Mean	1.98	2.18	1.78	1.98

SOW DATE	FNG SEED INS SEED	DO	DF
E	D-	1.64	1.61
	DI	1.85	1.89
L	D-	2.23	2.07
	DI	2.26	2.29

SOW DATE	AUT FUNG INS SEED	F-	FP	FD
E	D-	1.54	1.75	1.58
	DI	1.85	2.21	1.55
L	D-	2.29	2.22	1.94
	DI	2.26	2.53	2.04

SOW DATE	AUT FUNG FNG SEED	F-	FP	FD
E	DO	1.71	1.99	1.53
	DF	1.67	1.98	1.60
L	DO	2.26	2.42	2.06
	DF	2.29	2.34	1.92

INS SEED	AUT FUNG FNG SEED	F-	FP	FD
D-	DO	1.86	2.09	1.85
	DF	1.96	1.89	1.67
DI	DO	2.12	2.32	1.74
	DF	1.99	2.43	1.85

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96/R/LP/3

GRAIN TONNES/HECTARE

***** Tables of means *****

SOW DATE	INS SEED	AUT FUNG FNG SEED	F-	FP	FD
E	D-	DO	1.44	1.77	1.70
		DF	1.64	1.73	1.46
	DI	DO	1.99	2.20	1.36
		DF	1.70	2.23	1.74
L	D-	DO	2.29	2.41	2.00
		DF	2.29	2.04	1.89
	DI	DO	2.24	2.44	2.11
		DF	2.29	2.63	1.96

*** Standard errors of differences of means ***

SOW DATE	INS SEED	FNG SEED	AUT FUNG
0.107	0.107	0.107	0.130

SOW DATE INS SEED	SOW DATE FNG SEED	INS SEED FNG SEED	SOW DATE AUT FUNG
0.151	0.151	0.151	0.184

INS SEED AUT FUNG	FNG SEED AUT FUNG	SOW DATE INS SEED FNG SEED	SOW DATE INS SEED AUT FUNG
0.184	0.184	0.213	0.261

SOW DATE FNG SEED AUT FUNG	INS SEED FNG SEED AUT FUNG	SOW DATE INS SEED FNG SEED AUT FUNG
0.261	0.261	0.369

***** Stratum standard errors and coefficients of variation *****

Stratum	d.f.	s.e.	cv%
BLOCK.WP	23	0.369	18.6

GRAIN MEAN DM% 90.4

PLOT AREA HARVESTED 0.00144

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95/R/LP/5

LUPINS

AUTUMN HERBICIDES

Object: To test autumn-applied herbicides at various rates on the survival of weeds and autumn-sown lupins - Highfield VI.

Sponsor: I. Shield.

Design: 3 randomised blocks of 4 x 4 plots.

Plot dimensions: 3.0 x 9.0.

Treatments: All combinations of:-

1. **HERBCIDE** Herbicide and time of application:

ST	Pendimethalin pre-emergence
OK	Terbuthylazine with terbutryn pre-emergence, propyzamide post-emergence
SI	Simazine pre-emergence
O	Terbuthylazine with terbutryn pre-emergence

2. **RATE** Rate of herbicide application:

½N	Half normal
N	Normal
2N	Twice normal
4N	Four times normal

Experimental diary:

29-Jul-94 : B : Deep tine cultivated with vibrating tines 60 cm apart 45 cm deep, rolled.
04-Aug-94 : B : Ploughed and furrow pressed, rolled.
05-Sep-94 : B : Rotary harrowed, CH304/70 dressed Germipro UFB, drilled at 40 seeds per m^2.
07-Sep-94 : **T** : **HERBCIDE** OK, O **RATE** ½N, N, 2N, 4N: Opogard 500 SC at 1.4, 2.8, 5.6, 11.2 l in 220 l respectively.
: **T** : **HERBCIDE** SI **RATE** ½N, N, 2N, 4N: Atlas Simazine at 0.5, 1.0, 2.0, 4.0 l in 220 l respectively.
: **T** : **HERBCIDE** ST **RATE** ½N, N, 2N, 4N: Stomp 400 at 2.5, 5.0, 10.0, 20.0 l in 220 l respectively.
12-Sep-94 : B : Draza at 5.5 kg.
21-Nov-94 : **T** : **HERBCIDE** OK **RATE** ½N, N, 2N, 4N: Kerb Flo at 2.1 l in 220 l.
30-Nov-94 : B : Falcon at 1.0 l in 200 l.
14-Mar-95 : B : Logran 20 WG at 37.5 g in 200 l.
12-Apr-95 : B : Cultar at 0.75 l in 200 l.
19-Apr-95 : B : Atlas Dimethoate 40 at 850 ml in 200 l.
23-May-95 : B : Atlas Dimethoate 40 at 850 ml in 200 l.
20-Jun-95 : B : Corbel at 0.5 l with Tilt Turbo 475 EC at 1.0 l in 200 l.
30-Jun-95 : B : Atlas Dimethoate 40 at 850 ml in 200 l.
17-Aug-95 : B : Combine harvested.

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95/R/LP/5

Previous crops: W. wheat 1993, set-aside 1994.

NOTE: Plant density was assessed in autumn, winter and spring. Dry matter was measured in winter and spring, weed cover was assessed in January.

GRAIN TONNES/HECTARE

***** Tables of means *****

RATE / HERBCIDE	½N	N	2N	4N	Mean
ST	1.90	1.81	1.93	1.39	1.76
OK	2.04	1.84	1.83	1.63	1.83
SI	1.54	1.89	1.90	1.91	1.81
O	1.50	1.58	1.75	1.91	1.69
Mean	1.74	1.78	1.85	1.71	1.77

*** Standard errors of differences of means ***

HERBCIDE	RATE	HERBCIDE RATE
0.097	0.097	0.194

***** Stratum standard errors and coefficients of variation *****

Stratum	d.f.	s.e.	cv%
BLOCK.WP	30	0.238	13.4

GRAIN MEAN DM% 91.1

PLOT AREA HARVESTED 0.00205

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95/R/LP/6

LUPINS

SPRING HERBICIDES

Object: To test herbicides applied in the spring at various rates on the survival of weeds and autumn-sown lupins - Highfield VI.

Sponsor: I. Shield.

Design: 3 randomised blocks of (5 X 4) + 2 plots.

Plot dimensions: 3.0 x 9.0.

Treatments: All combinations of:-

1. **HERBCIDE** Herbicide type:

AZ	Aziprotryne
DI	RPEXP 30930A
PE	Pendimethalin
SI	Simazine
TR	Triasulfuron

NOTE: RPEXP 30930A is an experimental product containing diflufenican, exact composition is not disclosed.

2. **HERBRATE** Herbicide rate:

½N	Half normal
N	Normal
2N	Twice normal
4N	Four times normal

plus 2 extra plots

3. **EXTRA** Herbicide at normal rate:

AM	Amidosulfuron
PY	Pyridate

Experimental diary:

29-Jul-94 : B : Deep tine cultivated with vibrating tines 60 cm apart and 45 cm deep. Rolled.
04-Aug-94 : B : Ploughed and furrow pressed. Rolled.
05-Sep-94 : B : Rotary harrowed. CH304/70 drilled at 40 seeds per m^2.
06-Sep-94 : B : Opogard 500 SC at 2.8 l in 200 l.
12-Sep-94 : B : Draza at 5.5 kg.
30-Nov-94 : B : Falcon at 1.0 l in 200 l.
13-Mar-95 : **T** : **HERBCIDE** SI, **HERBRATE** ½N, N, 4N: Atlas Simazine at 1.15, 2.3, 4.6, 9.2 l in 220 l respectively.
: **T** : **HERBCIDE** PE, **HERBRATE** ½N, N, 2N, 4N: Stomp 400 at 2.5, 5.0, 10.0, 20.0 l in 220 l respectively.
04-Apr-95 : **T** : **EXTRA** AM: Eagle at 40 g in 220 l.
: **T** : **EXTRA** PY: Lentagran WP at 2.0 kg in 220 l.

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95/R/LP/6

Experimental diary:

04-Apr-95 : **T** : **HERBCIDE** AZ, **HERBRATE** ½N, N, 2N, 4N: Brasoran 50 WP at 2.0, 4.0, 8.0, 16.0 kg in 220 l respectively.
04-Apr-95 : **T** : **HERBCIDE** DI, **HERBRATE** ½N, N, 2N, 4N: RPEXP 30930A at 0.5, 1.0, 2.0, 4.0 l in 220 l respectively.
: **T** : **HERBCIDE** TR, **HERBRATE** ½N, N, 2N, 4N: Lo-gran 20 WG at 18.75, 37.5, 75.0, 150 g in 220 l respectively.
12-Apr-95 : B : Cultar at 0.75 l in 200 l.
19-Apr-95 : B : Atlas Dimethoate 40 at 850 ml in 200 l.
23-May-95 : B : Atlas Dimethoate 40 at 850 ml in 200 l.
20-Jun-95 : B : Corbel at 0.5 l with Tilt Turbo 475 EC at 1.0 l in 200 l.
30-Jun-95 : B : Atlas Dimethoate 40 at 850 ml in 200 l.
17-Aug-95 : B : Combine harvested.

Previous crops: W. wheat 1993, set-aside 1994.

NOTES: (1) Yields failed on all **EXTRA** AM plots because the herbicide killed the crop. This treatment was omitted from the analysis.
(2) Plant counts were made in March and June, dry weight, fresh weight was recorded in May. Oil content and thousand grain weights were measured after harvest.

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95/R/LP/6

GRAIN TONNES/HECTARE

***** Tables of means *****

HERBRATE / HERBCIDE	½N	N	2N	4N	Mean
AZ	1.50	1.25	1.52	1.34	1.40
DI	1.44	1.27	1.37	1.41	1.37
PE	1.71	1.55	1.58	1.83	1.67
SI	1.43	1.54	1.57	1.60	1.53
TR	1.42	1.38	1.10	1.07	1.24
Mean	1.50	1.40	1.43	1.45	1.44

EXTRA	PY
	1.41

Grand mean 1.44

*** Standard errors of differences of means ***

HERBCIDE	HERBRATE	HERBCIDE HERBRATE & EXTRA
0.105	0.094	0.209

***** Stratum standard errors and coefficients of variation *****

Stratum	d.f.	s.e.	cv%
BLOCK.WP	40	0.257	17.8

GRAIN MEAN DM% 91.1

PLOT AREA HARVESTED 0.00205

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95/R/LP/7

LUPINS

GROWTH REGULATOR STUDY

Object: To assess the effectiveness of growth regulators in shortening and strengthening autumn-sown lupins at risk of lodging - Highfield VI.

Sponsors: I. Shield, G.F.J. Milford, J. Leach.

Design: 3 randomised blocks of 5 plots.

Plot dimensions: 3.0 x 9.0.

Treatments:

GROW REG	Growth regulator:
-	None
TR	Triapenthanol
PA	Paclobutrazol
AD	Chlormequat
FO	Tebuconazole

Experimental diary:

29-Jul-94 : B : Deep tine cultivated with vibrating tines 60 cm apart and 45 cm deep. Rolled.
04-Aug-94 : B : Ploughed and furrow pressed. Rolled.
05-Sep-94 : B : Rotary harrowed. CH304/70, dressed Germipro UFB, drilled at 40 seeds per m^2.
06-Sep-94 : B : Opogard 500 SC at 2.8 l in 200 l.
12-Sep-94 : B : Draza at 5.5 kg.
30-Nov-94 : B : Falcon at 1.0 l in 200 l.
20-Dec-94 : B : Farmon PDQ at 15.0 l in 900 l, inter-row sprayed using dribble bar.
03-Feb-95 : B : Hand weeded.
13-Mar-95 : B : Atlas Simazine at 2.0 l in 200 l.
04-Apr-95 : **T** : **GROW REG** PA: Cultar at 826 g in 220 l.
: **T** : **GROW REG** TR: Triapenthanol at 700 g in 220 l.
: **T** : **GROW REG** AD: Adjust at 3.0 l in 220 l.
: **T** : **GROW REG** FO: Folicur at 1.0 l in 220 l.
19-Apr-95 : B : Atlas Dimethoate 40 at 850 ml in 200 l.
23-May-95 : B : Atlas Dimethoate 40 at 850 ml in 200 l.
20-Jun-95 : B : Corbel at 0.5 l with Tilt Turbo 475 EC at 1.0 l in 200 l.
30-Jun-95 : B : Atlas Dimethoate 40 at 850 ml in 200 l.
18-Aug-95 : B : Combine harvested.

Previous crops: W. wheat 1993, set-aside 1994.

NOTE: Plant numbers were assessed in April, May and at harvest. Plant height was measured fortnightly during stem extension. Dry matter of plant components and leaf area index were measured in July. Components of yield were measured at harvest.

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95/R/LP/7

GRAIN TONNES/HECTARE

***** Tables of means *****

GROW	REG
-	1.77
TR	1.35
PA	1.39
AD	1.10
FO	1.27
Mean	1.38

*** Standard errors of differences of means ***

GROW	REG
	0.212

***** Stratum standard errors and coefficients of variation *****

Stratum	d.f.	s.e.	cv%
BLOCK.WP	8	0.260	18.9

GRAIN MEAN DM% 91.1

PLOT AREA HARVESTED 0.00101

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95/R/LP/8

LUPINS

CONTROL OF INSECT PESTS

Object: To assess the effect of insect controls on the growth and yield of autumn-sown lupins - Highfield VI.

Sponsors: A.W. Ferguson, I. Shield.

Design: 3 randomised blocks of 8 plots.

Plot dimensions: 3.0 x 9.0.

Treatments:

INSCTCDE	Insecticide applied as seed treatment or spray:
_	None
S	Seed treatment (furathiocarb)
SD	Seed treatment (furathiocarb), deltamethrin in winter and spring
SA	Seed treatment (furathiocarb), pirimicarb as required
SAA	Seed treatment (furathiocarb), pirimicarb with wetting agent, as required
SAS	Seed treatment (furathiocarb), pirimicarb with sticker, as required
SH	Seed treatment (furathiocarb), dimethoate pre-flowering and as required
F	Seed treatment (furathiocarb), deltamethrin, pirimicarb with wetting agent and dimethoate as required

Experimental diary:

29-Jul-94 : B : Deep tine cultivated with vibrating tines 60 cm apart and 45 cm deep. Rolled.
04-Aug-94 : B : Ploughed and furrow pressed. Rolled.
05-Sep-94 : B : Rotary harrowed. CH 304/70 drilled at 40 seeds per m^2.
06-Sep-94 : B : Opogard 500 SC at 2.8 l in 200 l.
12-Sep-94 : B : Draza at 5.5 kg.
21-Nov-94 : **T** : **INSCTCDE** SD, F: Decis at 300 ml in 220 l.
30-Nov-94 : B : Falcon at 1.0 l in 200 l.
13-Mar-95 : B : Atlas Simazine at 2.0 l in 200 l.
04-Apr-95 : **T** : **INSCTCDE** SD, F: Decis at 300 ml in 220 l.
12-Apr-95 : B : Cultar at 0.75 l in 200 l.
28-Apr-95 : **T** : **INSCTCDE** SA: Pirimicarb 50 DG at 280 g in 220 l.
: **T** : **INSCTCDE** SH, F: Atlas Dimethoate 40 at 850 ml in 220 l.
: **T** : **INSCTCDE** SAS: Pirimicarb 50 DG at 280 g with Intracrop BLA at 220 ml in 200 l.
: **T** : **INSCTCDE** SAA: Pirimicarb 50 DG at 280 g with Vassgro Spreader at 55 ml in 220 l.
31-May-95 : **T** : **INSCTCDE** SA: Pirimicarb 50 DG at 280 g in 220 l.
: **T** : **INSCTCDE** SAS: Pirimicarb 50 DG at 280 g with Intracrop BLA at 220 ml in 220 l.

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96/R/LP/8

Experimental diary:
31-May-95 : **T** : **INSCTCDE** SAA, F: Pirimicarb 50 DG at 280 g with Vassgro Spreader at 55 ml in 220 l.
20-Jun-95 : B : Corbel at 0.5 l with Tilt Turbo 475 EC at 1.0 l in 200 l.
18-Aug-95 : B : Combine harvested.

Previous crops: W. wheat 1993, set-aside 1994.

NOTE: Plant samples were taken before and after each insecticide treatment to assess damage by bean seed fly and infestation of lupin aphid. Establishment counts were made in October 1994.

GRAIN TONNES/HECTARE

***** Tables of means *****

INSCTCDE	
_	0.85
S	0.96
SD	0.91
SA	1.54
SAA	1.68
SAS	1.57
SH	0.38
F	1.59
Mean	1.19

*** Standard errors of differences of means ***

INSCTCDE
0.288

***** Stratum standard errors and coefficients of variation *****

Stratum	d.f.	s.e.	cv%
BLOCK.WP	14	0.352	29.7

GRAIN MEAN DM% 90.7

PLOT AREA HARVESTED 0.00130

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95/R/LP/9

LUPINS

CANOPY STRUCTURE AND YIELD

Object: To assess the effects of canopy structure and leaf and pod photosynthesis on the dry matter production and yield of two lupin lines - Highfield VI.

Sponsors: J.E. Leach, T. Scott.

Design: 4 randomised blocks of 2 plots (duplicated).

Plot dimensions: 2.88 x 10.0.

Treatments:

VARIETY

70	CH304/70
73	CH304/73

Experimental diary:

29-Jul-94 : B : Deep tine cultivated with vibrating tines 60 cm apart and 45 cm deep. Rolled.
04-Aug-94 : B : Ploughed and furrow pressed. Rolled.
05-Sep-94 : **T** : **VARIETY** 70, 73: Rotary harrowed, varieties drilled at 40 seeds per m^2.
06-Sep-94 : B : Opogard 500 SC at 2.8 l in 220 l.
12-Sep-94 : B : Draza at 5.5 kg.
30-Nov-94 : B : Falcon at 1.0 l in 200 l.
16-Dec-94 : B : Farmon PDQ at 15.0 l in 900 l, inter-row sprayed using dribble bar.
19-Jan-95 : B : Hand weeded.
30-Jan-95 : B : Hand weeded.
13-Mar-95 : B : Atlas Simazine at 2.0 l in 200 l.
12-Apr-95 : B : Cultar at 0.75 l in 200 l.
23-May-95 : B : Atlas Dimethoate 40 at 850 ml in 200 l.
20-Jun-95 : B : Corbel at 0.5 l with Tilt Turbo 475 EC at 1.0 l in 200 l.
30-Jun-95 : B : Atlas Dimethoate 40 at 850 ml in 200 l.
17-Aug-95 : B : Hand harvested.

Previous crops: W. wheat 1993, set-aside 1994.

NOTE: Radiation interception was measured weekly from spring to the start of maturity. Dry matter, photosynthesis and canopy structure was measured fortnightly from spring till harvest.

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95/R/LP/9

GRAIN TONNES/HECTARE

***** Tables of means *****

VARIETY	70	73	Mean
	1.58	3.21	2.39

*** Standard errors of differences of means ***

VARIETY
0.455

***** Stratum standard errors and coefficients of variation *****

Stratum	d.f.	s.e.	cv%
BLOCK.WP	11	0.910	38.0

GRAIN MEAN DM% not measured

PLOT AREA HARVESTED 0.00011

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95/R/LP/13

LUPINS

SPRING-SOWN WINTER LUPINS

Object: To assess the growth of two winter cultivars and one spring cultivar, sown in spring at three sowing dates, and the use of a desiccant to accelerate maturity - Sawyers 1 E.

Sponsors: G.F.J. Milford, H. Stevenson, I. Shield.

Design: 3 randomised blocks of 3 x 2 x 2 + 1 (duplicated) plots.

Whole plot dimensions: 3.0 x 9.0.

Treatments: All combinations of:-

1. **VARIETY**

70	CH304/70
73	CH304/73
MIN	Minori

NOTE: 70 was sown at 240 kg, 73 at 160 kg and MIN at 220 kg, to give 80 seeds per m^2.

2. **SOW DATE** Dates of sowing:

E	13 March
M	27 March

3. **DESICANT** Desiccant:

-	None
D	Glyphosate

plus extra treatment

MIN LATE **VARIETY** MIN, sown 10 April (duplicated)

Experimental diary:

13-Jan-95 : B : Roundup at 4.0 l in 200 l.
07-Feb-95 : B : Ploughed.
13-Mar-95 : **T** : **SOW DATE** E: Rotary harrowed, varieties drilled, Stomp 400 at 5.0 l in 220 l.
27-Mar-95 : **T** : **SOW DATE** M: Rotary harrowed, varieties drilled,
30-Mar-95 : **T** : **SOW DATE** M: Stomp 400 at 5.0 l in 220 l.
10-Apr-95 : **T** : **DESI LAT** -, D: Rotary harrowed, varieties drilled, Stomp 400 at 5.0 l in 220 l.
31-May-95 : B : Fusilade 5 at 2 l with Vassgro Spreader at 200 ml in 200 l.
21-Jul-95 : B : Corbel at 1.0 l in 300 l.
09-Aug-95 : **T** : **SOW DATE** E, **VARIETY** MIN, **DESICANT** D: Roundup at 2.0 l in 220 l.
22-Aug-95 : **T** : **SOW DATE** E, **VARIETY** MIN: Hand harvested (one block).

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95/R/LP/13

Experimental diary:

30-Aug-95 : **T** : **SOW DATE** M, **VARIETY** MIN, **DESICANT** D: Roundup at 2.0 l in 220 l.
04-Sep-95 : **T** : **SOW DATE** E, **VARIETY** MIN: Hand harvested (two blocks).
05-Sep-95 : **T** : **SOW DATE** E, **VARIETY** 70, 73, **DESICANT** D: Roundup at 2.0 l in 220 l.
21-Sep-95 : **T** : **SOW DATE** M, **VARIETY** MIN, **MIN LATE**: Hand harvested.
25-Sep-95 : **T** : **SOW DATE** E, **VARIETY** 70, 73: Combine harvested.
: **T** : **SOW DATE** M, **VARIETY** 70, 73, **DESICANT** D: Roundup at 2.0 l in 220 l.
11-Oct-95 : **T** : **SOW DATE** M, **VARIETY** 70, 73: Combine harvested.

Previous crops: S. wheat 1993, w. wheat 1994.

NOTES: (1) Late sowings of **VARIETY** 70, 73 were not harvested due to poor growth and are omitted from the tables.
(2) Plants were counted at establishment and harvest. Leaf production was measured pre-vernalization, leaf and branch numbers were assessed after flowering. Photosynthesis was measured during pod development. Components of yield were measured, oil and protein content of grain were assessed.

GRAIN TONNES/HECTARE

***** Tables of means *****

SOW DATE / **VARIETY**	E	M	Mean
70	1.31	0.77	1.04
73	1.08	0.70	0.89
MIN	1.71	1.17	1.44
Mean	1.37	0.88	1.12

DESICANT / **VARIETY**	-	D	Mean
70	1.09	0.98	1.04
73	0.88	0.91	0.89
MIN	1.47	1.41	1.44
Mean	1.15	1.10	1.12

DESICANT / **SOW DATE**	-	D	Mean
E	1.34	1.40	1.37
M	0.96	0.80	0.88
Mean	1.15	1.10	1.12

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95/R/LP/13

GRAIN TONNES/HECTARE

***** Tables of means *****

DESICANT		-	D
VARIETY	**SOW DATE**		
70	E	1.39	1.24
	M	0.80	0.73
73	E	1.06	1.11
	M	0.69	0.70
MIN	E	1.57	1.84
	M	1.37	0.97

MIN LATE
0.82

Grand mean 1.08

*** Standard errors of differences of means ***

VARIETY	**SOW DATE**	**DESICANT**	**VARIETY SOW DATE**
0.082	0.067	0.067	0.116

VARIETY DESICANT	**SOW DATE DESICANT**	**VARIETY SOW DATE DESICANT**
0.116	0.094	0.164

SED for comparing **MIN LATE** with any item in **VARIETY**, **SOW DATE**, **DESICANT** table is 0.142

***** Stratum standard errors and coefficients of variation *****

Stratum	d.f.	s.e.	cv%
BLOCK.WP	27	0.200	18.5

GRAIN MEAN DM% 84.8

PLOT AREA HARVESTED 0.00318 **VARIETY** MIN
PLOT AREA HARVESTED 0.00165 OTHER TREATMENTS

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95/R/LN/1

LINSEED

WEED TYPES IN LINSEED

Object: To study the effects of three weed species on the growth and yield of linseed - Hoosfield Old 4-course.

Sponsor: P.J.W. Lutman.

Design: 3 blocks of 15 plots.

Plot dimensions: 3.0 x 10.0.

Treatments:

SPECDEN	Weed species and density (average number of established plants per m^2):
0	None (triplicated)
C1	Cultivated oats (*Avena sativa* cv. Dula), 10.7
C2	Cultivated oats, 30.7
C3	Cultivated oats, 86.1
C4	Cultivated oats, 174.0
K1	Knotgrass (*Polygonum aviculare*), 20.3
K2	Knotgrass, 47.2
K3	Knotgrass, 74.4
K4	Knotgrass, 145.0
F1	Fat hen (*Chenopodium album*), 0
F2	Fat hen, 0
F3	Fat hen, 0
F4	Fat hen, 23.3

NOTES: (1) Target weed sowing rates and densities were as follows:
Cultivated oats (seeds per m^2): C1 20, C2 60, C3 180 and C4 360.
Knotgrass (plants per m^2): K1 20, K2 80, K3 180 and K4 320.
Fat hen (plants per m^2): F1 40, F2 80, F3 160 and F4 320.
(2) Weeds on plots with treatments F1, F2, F3 failed to establish. These plots have been omitted from the analysis.

Experimental diary:

```
06-Sep-94 : B : PK as (0:20:32) at 1317 kg.
07-Sep-94 : B : Dolomite at 5.0 t.
16-Dec-94 : B : Ploughed.
19-Apr-95 : B : Heavy spring-tine cultivated.  Rotary harrowed.
20-Apr-95 : T : SPECDEN C1, C2, C3, C4: Dula, dressed Rappor, drilled.
          : T : SPECDEN K1, K2, K3, K4: Knotgrass broadcast.
          : T : SPECDEN F1, F2, F3, F4: Fat hen broadcast.
          : B : Rotary harrowed, Antares, dressed Prelude 20 LF, drilled
                at 700 seeds per m².
```


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95/R/LN/1

Experimental diary:

```
   21-Apr-95 : B : Rolled.
   04-May-95 : B : Part irrigated, 25 mm.
   05-May-95 : B : Part irrigated, 25 mm.
   10-May-95 : B : Decis at 200 ml in 300 l.
   11-May-95 : B : 34.5% N at 232 kg.
   15-Aug-95 : B : Standon Diquat at 3.0 l with Vassgro Spreader at 400 ml
                   in 400 l.
   22-Aug-95 : B : Hand harvested.
```

Previous crops: W. oats 1993, w. wheat 1994.

NOTE: Crop and weed densities were assessed in May. Crop and weeds were sampled in June and August to measure dry matter.

GRAIN (AT 90% DRY MATTER) TONNES/HECTARE

***** Tables of means *****

SPECDEN	
0	1.11
C1	0.91
C2	0.59
C3	0.29
C4	0.18
K1	0.89
K2	0.77
K3	0.61
K4	0.58
F4	0.98
Mean	0.76

*** Standard errors of differences of means ***

SPECDEN	
0.125	min.rep
0.102	max-min

	SPECDEN
max-min	0 v any of the remainder
min.rep	Any of the remainder

***** Stratum standard errors and coefficients of variation *****

Stratum	d.f.	s.e.	cv%
BLOCK.WP	24	0.154	20.1

GRAIN MEAN DM% not measured

PLOT AREA HARVESTED 0.00020

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95/R/LN/2

LINSEED

WEED COMPETITION IN LINSEED

Object: To study the effects of two weed species on each other and on the growth and yield of linseed - New Zealand.

Sponsors: R.C. Van Acker, P.J.W. Lutman.

Design: 2 randomised blocks of (5 x 5) + 5 plots.

Plot dimensions: 3.0 x 10.

Treatments: All combinations of:-

1. **BARLEY** — Average number of barley plants established per m^2:

B0	0
B1	16
B2	33
B3	61
B4	181

2. **CHK WEED** — Average number of chickweed plants established per m^2:

C0	0
C1	52
C2	103
C3	241
C4	395

plus 5 extra treatments

3. **EXTRA** — Average number of barley or chickweed plants established per m^2:

	Barley	Chickweed
-	0	0
EB1	97	0
EB2	200	0
EC1	0	358
EC2	0	528

NOTE: Weed sowing rates and target densities were as follows:

Seeds per m^2		Plants per m^2	
B1	25	C1	100
B2	50	C2	200
B3	100	C3	400
B4	300	C4	800
EB1	200	EC1	600
EB2	400	EC2	1200

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95/R/LN/2

Experimental diary:

09-Dec-94	: B	:	Farmyard manure at 25 t.
21-Dec-94	: B	:	Ploughed.
14-Mar-95	: B	:	Gramoxone 100 at 4.0 l in 200 l.
20-Apr-95	: B	:	Spring-tine cultivated.
21-Apr-95	: **T**	:	**BARLEY** B1, B2, B3, B4, **EXTRA** EB1, EB2: Alexis, dressed Cerevax Extra, broadcast by machine.
	: **T**	:	**CHKWEED** C1, C2, C3, C4, **EXTRA** EC1, EC2: Chickweed seeds broadcast by hand.
	: B	:	Rotary harrowed, Antares, dressed Prelude 20LF, drilled at 700 seeds per m^2.
03-May-95	: B	:	Irrigated 25 mm.
05-May-95	: B	:	Decis at 300 ml in 300 l.
16-May-95	: B	:	Irrigated 5 mm.
24-May-95	: B	:	34.5% N at 232 kg.
15-Aug-95	: B	:	Standon Diquat at 3.0 l with Vassgro Spreader at 400 ml in 400 l.
16-Aug-95	: B	:	Hand harvested.

NOTE: Leaf area indices of barley, chickweed and linseed were measured on two occasions during the growing season. Percentage ground cover was assessed by visual and photographic methods on two occasions early in the growing season. Weed seed yield, and crop components of yield, were measured before harvest.

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95/R/LN/2

GRAIN (AT 90% DRY MATTER) TONNES/HECTARE

***** Tables of means *****

CHK WEED BARLEY	C0	C1	C2	C3	C4	Mean
B0	1.31	1.22	1.19	0.93	0.45	1.02
B1	1.05	0.90	0.75	0.57	0.39	0.73
B2	0.73	0.68	0.81	0.54	0.47	0.65
B3	0.54	0.59	0.49	0.39	0.28	0.46
B4	0.23	0.23	0.13	0.14	0.17	0.18
Mean	0.77	0.72	0.67	0.51	0.35	0.61

EXTRA	-	EB1	EB2	EC1	EC2	Mean
	1.41	0.15	0.16	0.45	0.42	0.52

Grand mean 0.59

*** Standard errors of differences of means ***

BARLEY	CHK WEED	BARLEY CHK WEED & EXTRA
0.048	0.048	0.107

***** Stratum standard errors and coefficients of variation *****

Stratum	d.f.	s.e.	cv%
BLOCK.WP	29	0.107	18.1

GRAIN MEAN DM% not measured

PLOT AREA HARVESTED 0.00010

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95/R/LN/3

LINSEED

LEAF BROWNING SYMPTOMS

Object: To distinguish pathogens responsible for leaf browning in linseed, and to measure their response to fungicide - New Zealand.

Sponsors: B.D.L. Fitt, S. Mitchell.

Design: 5 randomised blocks of 3 plots.

Plot dimensions: 3.0 x 15.0.

Treatments:

FUNGICIDE	Fungicide:
-	None
A	Iprodione
B	Benomyl

Experimental diary:

09-Dec-94 : B : Farmyard manure at 25 t.
21-Dec-94 : B : Ploughed.
14-Mar-95 : B : Gramoxone 100 at 4.0 l in 200 l.
20-Apr-95 : B : Spring-tine cultivated, rotary harrowed, Antares, dressed Prelude 20 LF, drilled at 700 seeds per m^2.
05-May-95 : B : Decis at 300 ml in 300 l.
10-May-95 : B : Irrigated 12.5 mm.
11-May-95 : B : Irrigated 12.5 mm.
24-May-95 : B : 34.5% N at 232 kg.
15-Jun-95 : B : Lorate 20 DF at 30 g in 300 l.
05-Jul-95 : **T** : **FUNGICIDE** A: Rovral Flo at 2.0 l in 220 l.
: **T** : **FUNGICIDE** B: Benlate Fungicide at 1.1 kg in 220 l.
24-Jul-95 : **T** : **FUNGICIDE** A: Rovral Flo at 2.0 l in 220 l.
: **T** : **FUNGICIDE** B: Benlate Fungicide at 1.1 kg in 220 l.
15-Aug-95 : B : Standon Diquat at 3.0 l with Vassgro Spreader at 400 ml in 400 l.
04-Sep-95 : B : Combine harvested.

Previous crops: S. wheat 1993, linseed 1994.

NOTE: Regular samples were taken to assess the incidence of disease. Concentrations of airborne spores were recorded with a Burkard spore sampler.

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95/R/LN/3

GRAIN (AT 90% DRY MATTER) TONNES/HECTARE

***** Tables of means *****

FUNGCIDE

-	1.63
A	1.68
B	1.78
Mean	1.69

*** Standard errors of differences of means ***

FUNGCIDE

0.052

***** Stratum standard errors and coefficients of variation *****

Stratum	d.f.	s.e.	cv%
BLOCK.WP	8	0.082	4.8

GRAIN MEAN DM% 90.5

PLOT AREA HARVESTED 0.00294

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95/W/P/1

POTATOES

DOUBLE CROPPING AND NEMATODES

Object: To assess the population dynamics of *Globodera pallida* in double cropped potatoes - Woburn, Mill Dam Close III.

Sponsors: K. Evans, P.D. Halford.

Design: 4 randomised blocks of 6 plots.

Whole plot dimensions: 3.0 x 10.0.

Treatments:

1. **NEMACIDE[1]** Nematicide applied to first double crop:

-	None
OX	Oxamyl

2. **NEMACIDE[2]** Nematicide applied to second double crop:

-	None
OX	Oxamyl

plus 2 extra plots

3. **NEMMAIN** Nematicide applied to main crop:

-	None
OX	Oxamyl

Experimental diary:

08-Sep-94 : B : PK as (0:20:32) at 781 kg.
21-Sep-94 : B : Ploughed.
20-Mar-95 : **T** : **NEMACIDE[1]** OX: Vydate at 40 kg.
: **T** : Double crop: 34.5% N at 522 kg. PK as (0:24:24) at 1000 kg. Rotary cultivated.
21-Mar-95 : **T** : Double crop: Maris Bard, dressed Rizolex, planted.
23-Mar-95 : B : Campbell's Linuron 45% Flowable at 1.9 l with Gramoxone 100 at 4.0 l in 400 l.
24-Mar-95 : **T** : Double crop: Covered with polythene.
01-May-95 : **T** : **NEMMAIN** OX: Vydate at 40 kg.
: **T** : Main crop: 34.5% N at 522 kg. PK as (0:24:24) at 1000 kg. Rotary cultivated, Estima, dressed Rizolex, planted.
16-May-95 : B : Irrigated 3 mm.
19-May-95 : B : Irrigated 3 mm.
26-May-95 : **T** : Double crop: Polythene removed.
07-Jun-95 : B : Irrigated 5 mm.
20-Jun-95 : **T** : Double crop: Hand weeded.
05-Jul-95 : B : Ashlade Maneb Flowable at 2.5 l in 300 l.
10-Jul-95 : B : Irrigated 25 mm.
17-Jul-95 : **T** : Double crop: Potatoes lifted.

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95/W/P/1

Experimental diary:

18-Jul-95	**T**	**NEMACIDE[2]** OX: Vydate at 40 kg.
	T	Double crop: PK as (0:24:24) at 1000 kg, 27% N at 667 kg, rotary cultivated.
19-Jul-95	**T**	Double crop: Rotary cultivated, Estima, dressed Rizolex, planted.
21-Jul-95	B	Irrigated 20 mm.
24-Jul-95	B	Ashlade Maneb Flowable at 2.5 l in 400 l.
25-Jul-95	B	Irrigated 12.5 mm.
11-Aug-95	B	Irrigated 12.5 mm.
12-Aug-95	B	Ashlade Maneb Flowable at 2.5 l in 400 l.
15-Aug-95	B	Irrigated 12.5 mm.
16-Aug-95	B	Irrigated 12.5 mm.
22-Aug-95	**T**	Main crop: Potatoes lifted.
23-Aug-95	**T**	Double crop: Harvest at 4.0 l in 300 l sprayed between rows.
01-Sep-95	**T**	Double crop: Irrigated 12.5 mm.
13-Sep-95	**T**	Double crop: Super-Tin 4L at 560 ml in 300 l.
11-Oct-95	**T**	Double crop: Super-Tin 4L at 560 ml in 300 l.
24-Oct-95	**T**	Double crop: Potatoes lifted.

Previous crops: Potatoes 1993, s. barley 1994.

NOTE: Soil samples were taken at intervals through the growing season for nematode counts. Samples of roots and tops were taken to measure vegative production and nematode infestation.

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95/W/P/1

TOTAL TUBERS TONNES/HECTARE

***** Tables of means *****

NEMACIDE[2]	-	OX	Mean
NEMACIDE[1]			
-	15.4	23.5	19.5
OX	28.5	29.6	29.0
Mean	22.0	26.5	24.2

NEMMAIN	
-	20.0
OX	28.9
Mean	24.4

GRAND MEAN 24.3

*** Standard errors of differences of means ***

NEMACIDE[1]	**NEMACIDE[2]**	**NEMACIDE[1] NEMACIDE[2] & NEMMAIN**
1.80	1.80	2.54

***** Stratum standard errors and coefficients of variation *****

Stratum	d.f.	s.e.	cv%
BLOCK.WP	15	3.59	14.8

PLOT AREA HARVESTED 0.00150

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95/W/P/2

POTATOES

DOUBLE CROPPING AND NEMATODES

Object: To assess the population dynamics of *Globodera rostochiensis* in double cropped potatoes - Woburn, Lansome III.

Sponsors: K. Evans, P.D. Halford.

Design: 4 randomised blocks of 6 plots.

Whole plot dimensions: 3.0 x 12.0.

Treatments:

1. **NEMACIDE[1]** Nematicide applied to first double crop:

-	None
OX	Oxamyl

2. **NEMACIDE[2]** Nematicide applied to second double crop:

-	None
OX	Oxamyl

plus 2 extra plots

3. **NEMMAIN** Nematicide applied to main crop:

-	None
OX	Oxamyl

Experimental diary:

```
08-Sep-94 : B : PK as (0:20:32) at 781 kg
21-Sep-94 : B : Ploughed
21-Mar-95 : T : NEMACIDE[1] OX: Vydate at 40 kg.
          : T : Double crop: 34.5% N at 522 kg. PK as (0:24:24) at
                1000 kg.  Rotary cultivated, Maris Bard, dressed
                Rizolex, planted.
23-Mar-95 : B : Campbell's Linuron 45% Flowable at 1.9 l with Gramoxone
                at 4.0 l in 400 l.
24-Mar-95 : T : Double crop: Covered with polythene.
01-May-95 : T : NEMMAIN OX: Vydate at 40 kg.
          : T : Main crop: 34.5% N at 522 kg.  PK as (0:24:24) at
                1000 kg.  Rotary cultivated, Estima, dressed Rizolex,
                planted.
26-May-95 : T : Double crop: Polythene removed .
08-Jun-95 : T : Double crop: Gramoxone 100 at 4.0 l in 200 l sprayed
                between rows.
20-Jun-95 : T : Double crop: Hand weeded.
05-Jul-95 : B : Ashlade Maneb Flowable at 2.5 l in 300 l.
11-Jul-95 : B : Irrigated 12.5 mm.
12-Jul-95 : B : Irrigated 12.5 mm.
17-Jul-95 : T : Double crop: Potatoes lifted.
```


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95/W/P/2

Experimental diary:

18-Jul-95	**T**	**NEMACIDE[2]** OX: Vydate at 40 kg.
	T	Double crop: PK as (0:24:24) at 1000 kg, 27% N at 667 kg. Rotary cultivated.
19-Jul-95	**T**	Double crop: Rotary cultivated, Estima, dressed Rizolex, planted.
21-Jul-95	B	Irrigated 20 mm.
24-Jul-95	B	Ashlade Maneb Flowable at 2.5 l in 400 l.
25-Jul-95	B	Irrigated 12.5 mm.
11-Aug-95	B	Irrigated 12.5 mm.
12-Aug-95	B	Ashlade Maneb Flowable at 2.5 l in 400 l.
14-Aug-95	B	Irrigated 12.5 mm.
17-Aug-95	B	Irrigated 12.5 mm.
23-Aug-95	**T**	Main crop: Potatoes lifted.
	T	Double crop: Harvest at 4.0 l in 300 l sprayed between rows.
31-Aug-95	**T**	Double crop: Irrigated 12.5 mm.
13-Sep-95	**T**	Double crop: Super-Tin 4L at 560 ml in 300 l.
11-Oct-95	**T**	Double crop: Super-Tin 4L at 560 ml in 300 l.
25-Oct-95	**T**	Double crop: Potatoes lifted.

Previous crops: Potatoes 1993, S. barley 1994.

NOTE: Soil samples were taken at intervals through the growing season for nematode counts. Plant samples of roots and tops were taken to measure vegative production and nematode infestation.

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95/W/P/2

TOTAL TUBERS TONNES/HECTARE

***** Tables of means *****

NEMACIDE[2]	-	OX	Mean
NEMACIDE[1]			
-	14.0	20.1	17.0
OX	21.9	23.8	22.9
Mean	18.0	21.9	20.0

NEMMAIN	
-	14.0
OX	24.1
Mean	19.1

GRAND MEAN 19.7

*** Standard errors of differences of means ***

NEMACIDE[1]	**NEMACIDE[2]**	**NEMACIDE[1] NEMACIDE[2] & NEMMAIN**
1.89	1.89	2.67

***** Stratum standard errors and coefficients of variation *****

Stratum	d.f.	s.e.	cv%
BLOCK.WP	15	3.78	19.2

PLOT AREA HARVESTED 0.00150

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95/R/P/4

POTATOES

PATHOGENIC FUNGI

Object: To study the effects of three potato pathogenic fungi, individually and in combination, on the growth and yield of two cultivars - Great Harpenden II.

Sponsor: P.J. Read.

Design: 3 randomised blocks of 2 x 8 plots.

Whole plot dimensions: 1.5 x 9.5.

Treatments: All combinations of:-

1. **CULTIVAR**

E	Estima
M	Maris Piper

2. **DISEASE** Inoculated with fungal cultures of:

H	None (healthy)
CC	*Colletotrichum coccodes*
VD	*Verticillium dahliae*
RS	*Rhizoctonia solani*
C+V	*C. coccodes* and *V. dahliae*
C+R	*C. coccodes* and *R. solani*
V+R	*V. dahliae* and *R. solani*
CVR	*C. coccodes*, *V. dahliae* and *R. solani*

Experimental diary:

07-Nov-94 : B : Ploughed.
29-Mar-95 : B : Heavy spring-tine cultivated.
13-Apr-95 : B : Heavy spring-tine cultivated.
18-Apr-95 : B : NPK as (12:20:20) at 1750 kg.
19-Apr-95 : B : Rotary harrowed.
20-Apr-95 : B : Ridged.
21-Apr-95 : B : Potatoes planted.
04-May-95 : B : Ridged.
23-May-95 : B : Campbell's Linuron 45% Flowable at 5.0 l with Gramoxone 100 at 3.0 l in 300 l.
20-Jun-95 : B : Ashlade Maneb Flowable at 2.75 l in 200 l.
30-Jun-95 : B : Ashlade Maneb Flowable at 2.75 l in 200 l.
19-Jul-95 : B : Ashlade Maneb Flowable at 2.75 l in 300 l.
01-Aug-95 : B : Ashlade Maneb Flowable at 2.75 l in 300 l.
14-Aug-95 : B : Super-Tin 4L at 560 ml with Intracrop BLA at 200 ml in 200 l.
30-Aug-95 : B : Super-Tin 4L at 560 ml with Intracrop BLA at 200 ml in 200 l.
13-Sep-95 : B : Super-Tin 4L at 560 ml with Harvest at 3.0 l in 400 l.
29-Sep-95 : B : Pulverised potato tops.
16-Oct-95 : B : Potatoes lifted.

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95/R/P/4

Previous crops: S. wheat 1993, w. barley 1994.

NOTE: In June plant height and the number of stems per plant were recorded. At the beginning of July and August samples were taken and disease assessed on stem-bases, roots and tubers; total yields and size of tubers recorded. Disease was assessed and tubers were graded by size and weighed after harvest.

TOTAL TUBERS TONNES/HECTARE

***** Tables of means *****

CULTIVAR / DISEASE	E	M	Mean
H	29.9	31.4	30.6
CC	27.8	27.6	27.7
VD	23.3	28.9	26.1
RS	21.0	27.5	24.2
C+V	27.2	27.5	27.3
C+R	25.9	25.0	25.5
V+R	22.7	24.7	23.7
CVR	25.1	27.3	26.2
Mean	25.4	27.5	26.4

*** Standard errors of differences of means ***

CULTIVAR	DISEASE	CULTIVAR DISEASE
1.06	2.11	2.99

***** Stratum standard errors and coefficients of variation *****

Stratum	d.f.	s.e.	cv%
BLOCK.WP	30	3.66	13.9

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95/R/P/4

PERCENTAGE WARE 5 CM RIDDLE

***** Tables of means *****

CULTIVAR / DISEASE	E	M	Mean
H	59.7	47.9	53.8
CC	59.2	48.9	54.0
VD	53.2	48.3	50.7
RS	63.9	63.4	63.6
C+V	56.9	49.0	53.0
C+R	65.2	56.8	61.0
V+R	62.3	62.2	62.3
CVR	65.0	57.0	61.0
Mean	60.7	54.2	57.4

PLOT AREA HARVESTED 0.00086

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95/W/M/1

MIXED 1

METHODS OF COVER CROP ESTABLISHMENT

Object: To examine the effectiveness of a range of methods of establishing cover crops and to measure the yield of a subsequent crop of linseed - Woburn, Great Hill Bottom I.

Sponsor: D.G. Christian.

Design: 3 randomised blocks of (2 x 4) + 1 plots, split into 2 sub-plots.

Whole plot dimensions: 6.0 x 12.0.
Sub-plot dimensions: 6.0 x 4.5.

Treatments: All combinations of:-

Whole plots

1. **COV CROP**	Cover crops:	
	BW	Winter barley
	FR	Forage rape
2. **SOWING**	Method and timing of sowing:	
	BC	Broadcast into standing crop seven days before harvest
	DC	Disced, broadcast and rolled, three days after harvest
	RC	Rotary cultivated, broadcast and rolled three days after harvest
	DD	Direct drilled two days after harvest

Sub-plot

3. **N**	Nitrogen, kg N:	
	N1	None
	N2	75

plus one extra treatment

Whole plot

1. **EXTRA**		
	ST	Stubble from previous wheat crop

Sub-plot

2. **N EXTRA**	Nitrogen, kg N:	
	N1	None
	N2	75

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95/W/M/1

Experimental diary:

```
08-Aug-94 : T : SOWING BC, COV CROP BW: Puffin broadcast at 180 kg.
          : T : SOWING BC, COV CROP FR: Ember broadcast at 30 kg.
15-Aug-94 : B : Wheat combine harvested, straw chopped.
18-Aug-94 : T : SOWING DC: Disced.
          : T : SOWING RC: Rotary cultivated.
          : T : SOWING DC, RC, DD, COV CROP BW: Puffin sown at 180 kg.
          : T : SOWING DC, RC, DD, COV CROP FR: Ember sown at 30 kg.
          : T : SOWING DC, RC, COV CROP BW, FR: Rolled.
07-Sep-94 : B : Draza at 5.5 kg.
24-Nov-94 : T : COV CROP FR: Draza at 5.5 kg.
08-Apr-95 : B : Ploughed and rolled.
11-Apr-95 : B : Rotary harrowed, Antares, dressed Prelude 20LF, at 600
                seeds per m².
13-Apr-95 : B : Rolled.
05-May-95 : T : N N2, N EXTRA N2: 27% N at 278 kg.
02-Jun-95 : B : Ally at 30 g in 200 l.
          : B : Fastac at 0.10 l in 300 l.
22-Sep-95 : B : Combine harvested.
```

Previous crops: S. rape 1993, w. wheat 1994.

NOTE: Dry matter, plant numbers and nitrogen content in the cover crops were measured in autumn. Dry matter and nitrogen content was also measured in spring. At harvest dry matter, nitrogen content, harvest index, oil content and thousand grain weights were measured in the linseed.

GRAIN (AT 90% DRY MATTER) TONNES/HECTARE

***** Tables of means *****

COV CROP	BW	FR	Mean
SOWING			
BC	0.50	0.49	0.50
DC	0.57	0.59	0.58
RC	0.54	0.53	0.53
DD	0.54	0.54	0.54
Mean	0.54	0.54	0.54

N	N1	N2	Mean
SOWING			
BC	0.45	0.55	0.50
DC	0.48	0.69	0.58
RC	0.43	0.63	0.53
DD	0.44	0.64	0.54
Mean	0.45	0.63	0.54

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95/W/M/1

GRAIN (AT 90% DRY MATTER) TONNES/HECTARE

***** Tables of means *****

N	N1	N2	Mean
COV CROP			
BW	0.45	0.63	0.54
FR	0.45	0.62	0.54
Mean	0.45	0.63	0.54

N	N1	N2
SOWING	**COV CROP**	
BC	BW	0.43	0.57
	FR	0.46	0.53
DC	BW	0.49	0.65
	FR	0.46	0.72
RC	BW	0.41	0.67
	FR	0.46	0.59
DD	BW	0.46	0.63
	FR	0.43	0.65

N EXTRA	N1	N2	Mean
	0.33	0.76	0.55

Grand mean 0.54

*** Standard errors of differences of means ***

SOWING	**COV CROP**	**N**	**SOWING COV CROP**
0.080	0.057	0.031	0.114

SOWING N	**COV CROP N**	**SOWING COV CROP N & N EXTRA**
0.092	0.065	0.130

Except when comparing means with the same level(s) of

SOWING	0.063		
COV CROP		0.044	
SOWING.COV CROP			0.089

***** Stratum standard errors and coefficients of variation *****

Stratum	d.f.	s.e.	cv%
BLOCK.WP	16	0.139	25.8
BLOCK.WP.SP	18	0.109	20.1

GRAIN MEAN DM% 87.9

SUB-PLOT AREA HARVESTED 0.00099

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METEOROLOGICAL RECORDS 1995 - ROTHAMSTED

(Departure from 30-year means in brackets)

MONTH	Total sunshine: hours	Mean temperature: °C Air(1)	Dew point	In ground under grass 30cm	100cm
JAN	61 (+9)	4.4 (+1.3)	2.2	5.4	7.4
FEB	77 (+12)	6.3 (+3.0)	4.1	6.4	7.1
MAR	197 (+91)	5.3 (+0.0)	2.0	5.9	6.7
APR	186 (+48)	9.0 (+1.4)	5.0	9.2	8.1
MAY	237 (+50)	11.5 (+0.6)	7.9	11.7	9.9
JUNE	189 (-2)	13.8 (-0.1)	9.3	13.9	11.8
JULY	252 (+63)	18.8 (+3.0)	13.8	17.2	14.2
AUG	280 (+102)	19.1 (+3.2)	12.7	18.2	16.1
SEPT	139 (-1)	13.5 (-0.1)	11.3	15.1	15.3
OCT	134 (+30)	13.0 (+2.6)	10.9	13.5	13.9
NOV	70 (+5)	7.5 (+1.6)	6.2	9.6	11.5
DEC	32 (-14)	2.0 (-2.0)	1.0	6.0	8.9
YEAR*	1853 (+391)	10.3 (+1.2)	7.2	11.0	10.9

MONTH	Ground frosts (2)	Total rainfall:mm 12.7cm (5 in) gauge	Rain days (3)	Drainage through 50.8cm (20 in) soil:mm	Wind km per hour (4)
JAN	18	128 (+63)	21	106	12.4
FEB	9	84 (+36)	22	63	12.2
MAR	20	55 (-2)	15	30	10.1
APR	8	11 (-42)	6	0	7.8
MAY	11	28 (-25)	8	0	6.4
JUNE	0	28 (-29)	11	2	7.0
JULY	0	19 (-28)	9	0	5.3
AUG	0	2 (-51)	2	0	6.5
SEPT	2	108 (+53)	22	33	5.8
OCT	7	31 (-35)	10	9	4.2
NOV	11	50 (-15)	14	31	4.9
DEC	17	93 (+24)	20	80	6.2
YEAR*	103	636 (-52)	160	352	7.4

30-year means are for the period 1961-90

(1) Mean of maximum and minimum

(2) Number of nights grass min. was below 0.0°C

(3) Number of days rainfall was 0.2 mm or more

(4) At 2 metres above ground level

*Mean or total

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METEOROLOGICAL RECORDS 1995 - WOBURN

(Departure from 30-year means in brackets)

Mean temperature: °C

MONTH	Total sunshine: hours	Air(1)	Dew point	In ground under grass 30 cm	In ground under grass 100 cm	Ground frosts (2)	Total rainfall: mm 12.7 cm (5in) gauge	Rain days (3)	Wind km per hour (4)
JAN	50 (+1)	4.4 (+1.0)	1.7	4.7	7.3	16	103 (+51)	18	11.7
FEB	64 (+5)	6.3 (+2.9)	3.5	6.2	7.1	6	65 (+25)	21	13.0
MAR	190 (+87)	5.4 (-0.2)	1.5	5.8	6.7	21	53 (+1)	16	10.8
APR	169 (+40)	9.1 (+1.5)	4.6	9.8	8.4	9	19 (-32)	9	7.0
MAY	227 (+48)	11.4 (+0.5)	6.9	13.1	10.3	8	29 (-25)	7	5.8
JUNE	174 (-10)	13.9 (-0.1)	8.7	15.4	12.3	0	16 (-39)	7	6.0
JULY	240 (+60)	18.7 (+2.7)	13.4	19.7	15.0	0	37 (-13)	9	6.2
AUG	266 (+97)	18.7 (+3.0)	12.1	21.0	17.0	0	2 (-56)	3	5.1
SEPT	123 (-13)	13.1 (-0.5)	10.9	15.3	15.8	2	148 (+97)	19	6.0
OCT	135 (+35)	13.2 (+2.7)	10.4	13.3	14.1	5	29 (-27)	9	6.2
NOV	66 (+5)	7.4 (+1.1)	5.9	8.5	11.4	11	65 (+9)	13	5.3
DEC	29 (-14)	1.5 (-2.7)	0.5	4.6	8.5	21	85 (+27)	18	4.7
YEAR*	1732(+539)	10.3 (+1.0)	6.7	11.5	11.1	99	650 (+18)	149	7.3

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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 (yd²)	= 0·8361 m²
1 acre (ac) (=4840 yd²)	= 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) (t)
1 pint	= 0·5682 litre (l)
1 gallon (gal) (=8 pints)	= 4·546 litres
1 fluid ounce = 1/20 pint	= 0·02841 litre = 28·41 ml
1 cubic foot	= 28·32 litres

To convert	*Multiply by*
oz ac^{-1} to g ha^{-1}	70·06
lb ac^{-1} to kg ha^{-1}	1·121
cwt ac^{-1} to kg ha^{-1}	125·5
cwt ac^{-1} to t ha^{-1}	0·1255
ton ac^{-1} to kg ha^{-1}	2511
ton ac^{-1} to t ha^{-1}	2·511
gal ac^{-1} to l ha^{-1}	11·233

The following factors are accurate to about 2 parts in 100:

1 lb ac^{-1} = 1·1 kg ha^{-1}
1 gal ac^{-1} = 11 litres ha^{-1}
1 ton ac^{-1} = 2·5 t ha^{-1}

In general reading of the text there will be no great inaccuracy in regarding:

1 lb = 0·5 kg
1 lb ac^{-1} = 1 kg ha^{-1}

Temperatures

To convert °F into °C subtract 32 and multiply by $\frac{5}{9}$ (0.556)
To convert °C into °F multiply by $\frac{9}{5}$ (1·8) and add 32

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CONVERSION FACTORS

Factors for the Conversion of Metric to Imperial Units

1 centimetre (cm)	=	0·3937 inch (in.) = 0·03281 ft
1 metre (m)	=	1·094 yards (yd)
1 square metre (m^2)	=	1·196 square yards (yd^2)
1 hectare (ha)	=	2·471 acres (ac)
1 gram (g)	=	0·03527 ounce (oz)
1 kilogram (kg)	=	2·205 pounds (lb)
1 kg	=	0·01968 hundredweight (cwt) = 0·0009842 ton
1 metric ton (tonne) (t)	=	0·9842 ton
1 litre	=	1·760 pints = 0·2200 gallon (gal)

1 litre = 1000 millilitres (ml) = 35·20 fluid ounces = 0·03531 cubic foot (ft^3)

To convert	*Multiply by*
g ha^{-1} to oz ac^{-1}	0·01427
kg ha^{-1} to lb ac^{-1}	0·8921
kg ha^{-1} to cwt ac^{-1}	0·007966
t ha^{-1} to cwt ac^{-1}	7·966
kg ha^{-1} to tons ac^{-1}	0·0003983
t ha^{-1} to tons ac^{-1}	0·3983
l ha^{-1} to gal ac^{-1}	0·08902

Plant nutrients

Plant nutrients are best stated in terms of amounts of the elements (P, K, Na, Ca, Mg, S); the old 'oxide' terminology (P_2O_5, K_2O, Na_2O, CaO, MgO, SO_3) is still used in work involving fertilisers and liming since Regulations require statements of P_2O_5, K_2O, etc.

For quick conversions

(accurate to within 2%) the following factors may be used:

$2\frac{1}{3} \times P = P_2O_5$	$\frac{3}{7} \times P_2O_5 = P$
$1\frac{1}{5} \times K = K_2O$	$\frac{5}{6} \times K_2O = K$
$1\frac{2}{5} \times Ca = CaO$	$\frac{7}{10} \times CaO = Ca$
$1\frac{2}{3} \times Mg = MgO$	$\frac{3}{5} \times MgO = Mg$

For accurate conversions:

To convert	*Multiply by*	*To convert*	*Multiply by*
P_2O_5 to P	0·4364	P to P_2O_5	2·2915
K_2O to K	0·8301	K to K_2O	1·2047
CaO to Ca	0·7146	Ca to CaO	1·3994
MgO to Mg	0·6031	Mg to MgO	1·6581

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