ROTHAMSTED RESEARCH

Yields of the Field Experiments 1989

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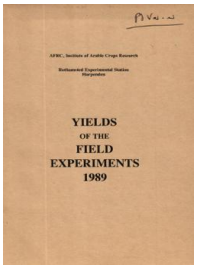

Crop Sequences

Rothamsted Research

Rothamsted Research (1990) *Crop Sequences ;* Yields Of The Field Experiments 1989, pp 66 - 111 **- DOI: https://doi.org/10.23637/ERADOC-1-40**

89/R/CS/10 and 89/W/CS/10

LONG TERM LIMING

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

Sponsor: S.P. McGrath, J.M. McEwen, D.P. Yeoman.

The 28th year, s. beans.

For previous years see 'Details' 1967, 1973 and 74-88/R&W/CS/10.

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

Whole plot dimensions: 6.40 x 18.3.

Treatments: All combinations of:-

Whole plots

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

R	W	Rothamsted total 1962-78	Rothamsted total 1982-87	Woburn total 1962-78	Woburn total 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 R & W	1981 R & W	1982 R & W	1983 R	1983 W	1988 R	1988 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 P1, P2, P3, P4 = 25, 50, 75, 100 kg P as superphosphate

Sub plots

3. **MANGNESE** — Manganese in 1989, cumulative to earlier applications:

0	None
MN	Manganese sprays

NOTES: (1) Until 1978 test P was applied cumulatively, rates varied with crop, K was also applied cumulatively, to P1 and P3 plots. Since 1981 K has been applied basally (none in 1986, 1987 and 1989).

(2) Manganese was applied at 0.19 kg Mn, as 'Vytel', in 200 l on 17 May, 1989 (R), in 220 l on 22 May (W) repeated at 0.10 kg Mn in 200 l on 13 June (R), in 220 l on 15 June (W).

https://doi.org/10.23637/ERADOC-1-40

89/R/CS/10 and 89/W/CS/10

Basal applications:

Sawyers I (R): Weedkillers: Simazine at 0.17 kg and trietazine at 1.2 kg in 200 l. Fungicides: Benomyl at 0.55 kg in 200 l. Fenpropimorph at 0.75 kg in 200 l. Insecticides: Deltamethrin at 7.5 g in 400 l applied on two occasions. Pirimicarb at 0.14 kg in 200 l.

Stackyard C (W): Weedkillers: Simazine at 0.14 kg and trietazine at 1.0 kg in 220 l. Alloxydim-sodium at 1.5 kg in 220 l. Fungicides: Fenpropimorph at 0.75 kg in 220 l. Benomyl at 0.55 kg applied with a wetting agent in 220 l. Insecticides: Deltamethrin at 6.2 g in 220 l and at 7.5 g in 220 l on a second occasion. Pirimicarb at 0.14 kg in 220 l.

Seed: Alfred, sown at 200 kg (R & W).

Cultivations, etc.:-

Sawyers I (R): Ploughed: 20 Dec, 1988. Heavy spring-tine cultivated, rotary harrowed: 29 Mar, 1989. Rotary harrowed, seed sown, harrowed, rolled: 30 Mar. Weedkiller applied: 31 Mar. Deltamethrin applied: 10 May and 31 May. Pirimicarb applied: 14 June. Benomyl and fenpropimorph applied: 14 July. Combine harvested: 14 Aug.

Stackyard C (W): Ploughed: 14 Dec, 1988. Spring-tine cultivated: 28 Mar, 1989. Rotary harrowed, seed sown: 31 Mar. Simazine and trietazine applied: 21 Apr. Deltamethrin applied: 22 May and 7 June. Alloxydim-sodium applied: 7 June. Pirimicarb applied: 22 June. Benomyl and fenpropimorph applied: 12 July. Combine harvested: 22 Aug.

NOTES: (1) Establishment counts were made and components of yield were measured at maturity.
(2) Soils were sampled for pH, P, K and Mg.
(3) Most CHALK 0 plots failed and yields of the rest of these plots were negligible. They have been omitted from the analysis.

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

GRAIN TONNES/HECTARE

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

P	0	P1	P2	P3	Mean
CHALK					
15	0.80	0.71	0.94	1.16	0.90
24.5	0.84	1.22	1.06	1.03	1.04
52.5	1.12	1.48	1.52	1.47	1.40
Mean	0.92	1.14	1.17	1.22	1.11

MANGNESE	O	MN	Mean
CHALK			
15	0.96	0.84	0.90
24.5	1.06	1.01	1.04
52.5	1.50	1.30	1.40
Mean	1.17	1.05	1.11

https://doi.org/10.23637/ERADOC-1-40

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

GRAIN TONNES/HECTARE

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

MANGNESE	O	MN	Mean
P			
0	0.95	0.89	0.92
P1	1.17	1.10	1.14
P2	1.29	1.05	1.17
P3	1.29	1.15	1.22
Mean	1.17	1.05	1.11

CHALK	MANGNESE P	O	MN
15	0	0.78	0.82
	P1	0.67	0.75
	P2	1.18	0.69
	P3	1.21	1.11
24.5	0	0.93	0.75
	P1	1.05	1.38
	P2	1.03	1.08
	P3	1.24	0.82
52.5	0	1.13	1.11
	P1	1.80	1.16
	P2	1.64	1.39
	P3	1.42	1.52

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

CHALK	P	MANGNESE	CHALK P
0.203	0.234	0.099	0.405

CHALK MANGNESE	P MANGNESE	CHALK P MANGNESE
0.236	0.273	0.472

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

CHALK	0.171
P	0.198
CHALK.P	0.342

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

Stratum	d.f.	s.e.	cv%
BLOCK.WP	11	0.405	36.5
BLOCK.WP.SP	12	0.342	30.8

GRAIN MEAN DM% 87.4

SUB PLOT AREA HARVESTED 0.00200

https://doi.org/10.23637/ERADOC-1-40

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

GRAIN TONNES/HECTARE

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

P	0	P1	P2	P3	Mean
CHALK					
9	0.68	0.58	0.34	0.85	0.61
25.5	1.17	0.50	1.01	1.33	1.00
45.5	1.17	1.44	1.21	1.38	1.30
Mean	1.01	0.84	0.85	1.19	0.97

MANGNESE	O	MN	Mean
CHALK			
9	0.59	0.64	0.61
25.5	0.97	1.04	1.00
45.5	1.21	1.39	1.30
Mean	0.92	1.02	0.97

MANGNESE	O	MN	Mean
P			
0	0.91	1.10	1.01
P1	0.84	0.84	0.84
P2	0.76	0.95	0.85
P3	1.19	1.19	1.19
Mean	0.92	1.02	0.97

	MANGNESE	O	MN
CHALK	**P**		
9	0	0.75	0.61
	P1	0.59	0.57
	P2	0.29	0.39
	P3	0.73	0.97
25.5	0	0.97	1.37
	P1	0.57	0.43
	P2	0.96	1.05
	P3	1.36	1.30
45.5	0	1.01	1.33
	P1	1.35	1.52
	P2	1.01	1.40
	P3	1.46	1.31

https://doi.org/10.23637/ERADOC-1-40

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

GRAIN TONNES/HECTARE

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

	CHALK	P	MANGNESE	CHALK P
	0.162	0.187	0.052	0.324

	CHALK MANGNESE	P MANGNESE	CHALK P MANGNESE
	0.174	0.201	0.348

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

CHALK	0.090
P	0.104
CHALK.P	0.180

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

Stratum	d.f.	s.e.	cv%
BLOCK.WP	11	0.324	33.3
BLOCK.WP.SP	12	0.180	18.5

GRAIN MEAN DM% 88.8

SUB PLOT AREA HARVESTED 0.00265

https://doi.org/10.23637/ERADOC-1-40

89/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 16th year, s. barley.

For previous years see 74-88/R/CS/140.

Design: Single replicate of 32 plots.

Whole plot dimensions: 4.06 x 4.57.

Treatments, applied cumulatively every year except as stated:

All combinations of:-

1.	**WEEDKLLR**	Weedkiller in autumn:
	NONE	None
	GLYPHOS	Glyphosate at 1.4 kg to barley stubble each autumn from 1979 to 1984, at 0.72 kg in 1985, at 0.54 kg in 1986, at 1.3 kg in 1987 and at 1.5 kg in 1988.
2.	**FUNGCIDE[1]**	Fungicide in autumn:
	NONE	None
	TRIADIM	Triadimefon at 0.25 kg in autumn 1981, 1982, 1984, 1985, 1986, 1987 and 1988, 0.28 kg in autumn 1983
3.	**FUNGCIDE[2]**	Fungicide in spring:
	NONE	None
	BENOMYL	Benomyl at 4 kg to seedbed
4.	**INSCTCDE**	Insecticide:
	NONE	None
	CHLORFEN	Chlorfenvinphos at 2 kg to the seedbed
5.	**NEMACIDE**	Nematicide:
	NONE	None
	ALDICARB	Aldicarb at 6 kg to the seedbed

NOTE: Glyphosate and triadimefon were applied in 220 l on 10 Oct, 1988 and 24 Oct respectively. Other treatments were applied on 31 Mar, 1989.

Basal applications: Manure: 'Nitram' at 320 kg. Weedkillers: Bentazone at 0.80 kg, dichlorprop at 1.1 kg and MCPA at 0.64 kg in 220 l.

Seed: Klaxon, seed not dressed, sown at 160 kg.

https://doi.org/10.23637/ERADOC-1-40

89/R/CS/140

Cultivations, etc.:- Ploughed: 25 Nov, 1988. N applied: 7 Mar, 1989. Spring-tine cultivated, seedbed treatments applied, rotary harrowed, seed sown, rolled: 31 Mar. Weedkillers applied: 9 May. Combine harvested: 15 Aug.

GRAIN TONNES/HECTARE

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

FUNGCIDE[1]	NONE	TRIADIM	Mean
WEEDKLLR			
NONE	3.81	3.93	3.87
GLYPHOS	3.94	3.92	3.93
Mean	3.88	3.93	3.90

FUNGCIDE[2]	NONE	BENOMYL	Mean
WEEDKLLR			
NONE	3.85	3.89	3.87
GLYPHOS	3.90	3.97	3.93
Mean	3.87	3.93	3.90

FUNGCIDE[2]	NONE	BENOMYL	Mean
FUNGCIDE[1]			
NONE	3.83	3.93	3.88
TRIADIM	3.92	3.93	3.93
Mean	3.87	3.93	3.90

INSCTCDE	NONE	CHLORFEN	Mean
WEEDKLLR			
NONE	3.74	3.99	3.87
GLYPHOS	3.89	3.98	3.93
Mean	3.81	3.99	3.90

INSCTCDE	NONE	CHLORFEN	Mean
FUNGCIDE[1]			
NONE	3.72	4.03	3.88
TRIADIM	3.91	3.95	3.93
Mean	3.81	3.99	3.90

INSCTCDE	NONE	CHLORFEN	Mean
FUNGCIDE[2]			
NONE	3.80	3.94	3.87
BENOMYL	3.83	4.03	3.93
Mean	3.81	3.99	3.90

NEMACIDE	NONE	ALDICARB	Mean
WEEDKLLR			
NONE	3.63	4.10	3.87
GLYPHOS	3.73	4.14	3.93
Mean	3.68	4.12	3.90

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GRAIN TONNES/HECTARE

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

NEMACIDE	NONE	ALDICARB	Mean
FUNGCIDE[1]			
NONE	3.61	4.14	3.88
TRIADIM	3.75	4.10	3.93
Mean	3.68	4.12	3.90

NEMACIDE	NONE	ALDICARB	Mean
FUNGCIDE[2]			
NONE	3.67	4.08	3.87
BENOMYL	3.69	4.17	3.93
Mean	3.68	4.12	3.90

NEMACIDE	NONE	ALDICARB	Mean
INSCTCDE			
NONE	3.58	4.05	3.81
CHLORFEN	3.78	4.20	3.99
Mean	3.68	4.12	3.90

	FUNGCIDE[2]	NONE	BENOMYL
WEEDKLLR	**FUNGCIDE[1]**		
NONE	NONE	3.83	3.79
	TRIADIM	3.87	3.98
GLYPHOS	NONE	3.82	4.06
	TRIADIM	3.97	3.88

	INSCTCDE	NONE	CHLORFEN
WEEDKLLR	**FUNGCIDE[1]**		
NONE	NONE	3.63	3.99
	TRIADIM	3.85	4.00
GLYPHOS	NONE	3.81	4.07
	TRIADIM	3.96	3.89

	INSCTCDE	NONE	CHLORFEN
WEEDKLLR	**FUNGCIDE[2]**		
NONE	NONE	3.74	3.96
	BENOMYL	3.75	4.02
GLYPHOS	NONE	3.87	3.92
	BENOMYL	3.90	4.04

	INSCTCDE	NONE	CHLORFEN
FUNGCIDE[1]	**FUNGCIDE[2]**		
NONE	NONE	3.71	3.94
	BENOMYL	3.73	4.12
TRIADIM	NONE	3.89	3.95
	BENOMYL	3.92	3.95

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89/R/CS/140

GRAIN TONNES/HECTARE

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

NEMACIDE		NONE	ALDICARB
WEEDKLLR	FUNGCIDE[1]		
NONE	NONE	3.67	3.95
	TRIADIM	3.60	4.25
GLYPHOS	NONE	3.56	4.33
	TRIADIM	3.89	3.96

NEMACIDE		NONE	ALDICARB
WEEDKLLR	FUNGCIDE[2]		
NONE	NONE	3.61	4.09
	BENOMYL	3.66	4.11
GLYPHOS	NONE	3.73	4.06
	BENOMYL	3.72	4.22

NEMACIDE		NONE	ALDICARB
FUNGCIDE[1]	FUNGCIDE[2]		
NONE	NONE	3.61	4.04
	BENOMYL	3.61	4.24
TRIADIM	NONE	3.73	4.11
	BENOMYL	3.76	4.10

NEMACIDE		NONE	ALDICARB
WEEDKLLR	INSCTCDE		
NONE	NONE	3.51	3.98
	CHLORFEN	3.76	4.22
GLYPHOS	NONE	3.66	4.11
	CHLORFEN	3.79	4.17

NEMACIDE		NONE	ALDICARB
FUNGCIDE[1]	INSCTCDE		
NONE	NONE	3.55	3.89
	CHLORFEN	3.67	4.39
TRIADIM	NONE	3.61	4.20
	CHLORFEN	3.88	4.01

NEMACIDE		NONE	ALDICARB
FUNGCIDE[2]	INSCTCDE		
NONE	NONE	3.47	4.14
	CHLORFEN	3.87	4.01
BENOMYL	NONE	3.69	3.96
	CHLORFEN	3.68	4.38

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

Margins of two factor tables	0.144
Two factor tables	0.204
Three factor tables	0.289

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

Stratum	d.f.	s.e.	cv%
WP	6	0.409	10.5

GRAIN MEAN DM% 84.6 PLOT AREA HARVESTED 0.00093

https://doi.org/10.23637/ERADOC-1-40

89/R/CS/212

SEASONAL EFFECTS OF TAKE-ALL

Object: To study the incidence of take-all (Gaeumannomyces graminis) in continuous w. wheat and in first, second and third w. wheats after a break - Great Harpenden I.

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

The 12th year, s. beans, w. wheat.

For previous years see 78-88/R/CS/212.

Design: 3 randomised blocks of 8 plots.

Whole plot dimensions: 5.33 x 10.7.

Treatments:

PREVCROP Previous crops before w. wheat 1989:

	78	79	80	81	82	83	84	85	86	87	88
W9 W W	W	W	W	W	W	W	W	W	W	W	W
W2 BE W	BE	W	W	BE	W	W	BE	W	W	BE	W
BE2 W W	W	BE	W	W	BE	W	W	BE	BE	W	W
BE1 W W	W	W	W	W	W	W	W	W	BE	W	W
W2 W W	BE	W	W	BE	W	W	BE	W	W	W	W
W3 W W	W	W	BE	W	W	BE	W	W	W	W	W
W1 W BE	W	BE	W	W	BE	W	W	BE	W	W	BE

BE = s. beans, W = w. wheat

NOTE: One additional crop sequence was in s. beans 1989, yields not taken.

Standard applications:

Both crops: Manures: (0:18:36) at 920 kg. Fungicides: Prochloraz at 0.40 kg and carbendazim at 0.15 kg in 200 l. Insecticide: Pirimicarb at 0.14 kg in 200 l.

W. wheat: Manure: 'Nitram' at 400 kg. Weedkillers: Chlortoluron at 3.5 kg in 200 l. Mecoprop at 2.2 kg, bromoxynil at 0.28 kg and ioxynil at 0.28 kg with isoproturon at 2.0 kg in 200 l.

S. beans: Insecticide: Deltamethrin at 7.5 g in 400 l.

Seed: W. wheat: Avalon, sown at 190 kg.
S. beans: Alfred, sown at 200 kg.

Cultivations, etc.:-

Both crops: PK applied: 16 Sept, 1988. Ploughed: 21 Sept. Fungicides applied: 10 May, 1989. Pirimicarb applied: 20 June.

W. wheat: Rotary harrowed, seed sown: 18 Oct, 1988. Chlortoluron applied: 21 Oct. N applied: 21 Apr, 1989. Remaining weedkillers applied: 5 May. Combine harvested: 9 Aug.

S. beans: Heavy spring-tine cultivated, rotary harrowed: 29 Mar, 1989. Seed sown: 30 Mar. Insecticide applied: 10 May. Combine harvested: 14 Aug.

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89/R/CS/212

NOTE: Plant and soil samples were taken on nine occasions during the season to assess take-all. Post-harvest soil samples were taken to measure the suppressiveness of the soil to take-all.

GRAIN TONNES/HECTARE

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

PREVCROP	
W9 W W	5.28
W2 BE W	5.83
BE2 W W	5.75
BE1 W W	5.90
W2 W W	5.25
W3 W W	6.02
W1 W BE	5.51
Mean	5.65

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

PREVCROP
0.441

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

Stratum	d.f.	s.e.	cv%
BLOCK.WP	12	0.541	9.6

GRAIN MEAN DM% 89.0

PLOT AREA HARVESTED 0.00289

https://doi.org/10.23637/ERADOC-1-40

89/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 fifth year, w. wheat.

For previous years see 85-88/R/CS/302.

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

Whole plot dimensions: 12.0 x 24.0.

Treatments: All combinations of:-

Whole plots

1. **FUNGCIDE** Fungicides applied cumulatively to 1985, 1986, 1987 and 1988 treatments:

NONE	None
CARB	Carbendazim at 0.25 kg
PRO	Prochloraz at 0.40 kg
CARB+PRO	Carbendazim at 0.15 kg + prochloraz at 0.40 kg

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

NOTES: (1) Fungicide treatments were applied in 200 l on 15 Nov, 1988 and 29 Mar, 1989.
(2) The eyespot inoculum was colonised on oat seed and this was broadcast in October, 1984.

Basal applications: Manures: (0:18:36) at 920 kg. 'Nitram' at 580 kg. Weedkillers: Glyphosate at 0.27 kg in 200 l. Chlortoluron at 3.5 kg in 200 l. Metsulfuron-methyl at 6.0 g in 400 l.

Seed: Avalon, sown at 190 kg.

Cultivations, etc.:- Rotary cultivated: 6 Sept, 1988. PK applied: 22 Sept. Glyphosate applied: 1 Oct. Heavy spring-tine cultivated: 14 Oct. Cultivated with rotary grubber, seed sown: 17 Oct. Chlortoluron applied: 21 Oct. N applied: 15 Apr, 1989. Metsulfuron-methyl applied: 3 May. Combine harvested: 3 Aug.
NOTE: Eyespot and sharp eyespot were assessed in July.

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89/R/CS/302

GRAIN TONNES/HECTARE

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

EYE INOC / FUNGCIDE	NATURAL	W 19R 1S	W 1R 19S	R 19R 1S	R 1R 19S	Mean
NONE	7.29	6.95	7.01	6.85	7.50	7.15
CARB	7.09	7.05	7.37	6.91	7.10	7.10
PRO	6.85	6.78	7.01	7.27	7.27	7.01
CARB+PRO	7.55	6.73	7.51	7.38	7.92	7.44
Mean	7.19	6.88	7.22	7.10	7.45	7.17

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

EYE INOC	FUNGCIDE* EYE INOC	
0.226	0.451	min.rep
0.195	0.391	max-min

	EYE INOC
max-min	NATURAL v any of the remainder
min.rep	any of the remainder

* Within the same level of FUNGCIDE only

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

Stratum	d.f.	s.e.	cv%
BLOCK.WP.SP	24	0.451	6.3

GRAIN MEAN DM% 85.9

SUB PLOT AREA HARVESTED 0.00138

https://doi.org/10.23637/ERADOC-1-40

89/R/CS/309 and 89/W/CS/309

LONG-TERM STRAW INCORPORATION

Object: To study the effects of mixing and depths of incorporation of straw on straw decomposition, soil nitrogen content, soil physical condition, pests, diseases and on the establishment, growth and yield of w. wheat - Rothamsted (R) Great Knott III and Woburn (W) Far Field I.

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

Associate sponsor: D.S. Powlson.

The fifth year, w. wheat.

For previous years see 85-88/R&W/CS/309.

Design: 4 randomised blocks of 12 plots (R).
2 randomised blocks of 12 plots (W).

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

Treatments, applied cumulatively in successive years: All combinations of:-

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

BURNT	Burnt
CHOPPED	Chopped and spread (duplicated)

2. **CULTIVTN** Cultivations:

TINE 10	Tine cultivated to 10 cm depth
TN10PL20	Tine cultivated to 10 cm depth, ploughed to 20 cm
TN10TN20	Tine cultivated to 10 cm depth and again to 20 cm
PLOUGH20	Ploughed to 20 cm depth

NOTES: (1) Straw was chopped by trailed straw chopper and spread on 5 Sept, 1988 (R), 7 Sept (W) and burnt, 6 Sept (R), 7 Sept (W).
(2) A heavy spring-tine cultivator was used to cultivate to 10 cm depth, on 14 Sept (R), 21 Sept (W). A chisel plough was used to cultivate to 20 cm depth, on 15 Sept (R) and a deep-tine cultivator to 20 cm on 21 Sept (W).
(3) Ploughed plots were ploughed to 20 cm depth on: 14 Sept (R), 30 Sept (W).

Basal applications:
Great Knott III (R): Manures: Magnesian limestone at 5.0 t (0:18:36) at 920 kg. 'Nitram' at 120 kg, followed by 580 kg. Weedkillers: Paraquat at 0.60 kg ion in 200 l. Isoproturon at 2.5 kg in 200 l. Metsulfuron-methyl at 6.0 g with fluroxypyr at 0.15 kg in 200 l. Fungicides: Chlorothalonil at 1.0 kg in 200 l. Propiconazole at 0.12 kg with tridemorph at 0.52 kg in 200 l.

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89/R/CS/309 and 89/W/CS/309

Basal applications:
Far Field I (W): Manures: (0:18:36) at 920 kg. 'Nitram' at 120 kg followed by 590 kg. Weedkillers: Paraquat at 0.80 kg ion in 220 l. Isoproturon at 1.5 kg in 220 l. Fungicides: Chlorothalonil at 1.0 kg in 220 l. Propiconazole at 0.12 kg with tridemorph at 0.52 kg in 220 l.

Seed: Rendezvous, sown at 180 kg.

Cultivations, etc.:-
Great Knott III (R): Magnesian limestone applied: 6 Sept, 1988. PK applied: 29 Sept. Paraquat applied: 18 Oct. Rotary harrowed, seed sown, harrowed: 19 Oct. Isoproturon applied: 29 Oct. N applied: 21 Feb, 1989 and 14 Apr. Metsulfuron-methyl and fluroxypyr applied: 15 Apr. Chlorothalonil applied: 19 May. Propiconazole and tridemorph applied: 20 June. Combine harvested: 5 Aug.
Far Field I (W): PK applied: 16 Sept, 1988. Subsoiled with tines 140 cm apart 56 cm deep: 20 Sept. Rolled: 3 Oct. Paraquat applied: 19 Oct. Spring-tine cultivated, seed sown, harrowed: 21 Oct. Isoproturon applied: 8 Dec. N applied: 8 Mar, 1989 and 28 Apr. Chlorothalonil applied: 23 May. Propiconazole and tridemorph applied: 22 June. Combine harvested: 4 Aug.

NOTES: (1) Establishment counts were made in autumn and total dry matter was measured in spring.
(2) Pests and fungal diseases were assessed at intervals during the season.
(3) Components of yield were measured and numbers of volunteer ears counted.

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

GRAIN TONNES/HECTARE

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

CULTIVTN / STRAW	TINE 10	TN10PL20	TN10TN20	PLOUGH20	Mean
BURNT	7.24	7.68	7.41	7.58	7.48
CHOPPED	6.73	7.33	7.10	7.45	7.16
Mean	6.90	7.45	7.20	7.49	7.26

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

STRAW	CULTIVTN	STRAW CULTIVTN	
		0.250	min.rep
0.108	0.144	0.216	max-min
		0.177	max.rep

	STRAW
min.rep	BURNT only
max-min	BURNT v CHOPPED
max.rep	CHOPPED only

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

Stratum	d.f.	s.e.	cv%
BLOCK.WP	37	0.353	4.9

GRAIN MEAN DM% 87.8

PLOT AREA HARVESTED 0.00621

https://doi.org/10.23637/ERADOC-1-40

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

GRAIN TONNES/HECTARE

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

CULTIVTN / STRAW	TINE 10	TN10PL20	TN10TN20	PLOUGH20	Mean
BURNT	7.46	6.77	7.41	7.24	7.22
CHOPPED	7.55	6.89	7.27	7.38	7.27
Mean	7.52	6.85	7.32	7.33	7.25

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

STRAW	CULTIVTN	STRAW CULTIVTN	
		0.403	min.rep
0.175	0.233	0.349	max-min
		0.285	max.rep

	STRAW
min.rep	BURNT only
max-min	BURNT v CHOPPED
max.rep	CHOPPED only

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

Stratum	d.f.	s.e.	cv%
BLOCK.WP	15	0.403	5.6

GRAIN MEAN DM% 87.3

PLOT AREA HARVESTED 0.00884

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89/R/CS/311

EFFECTS OF SHALLOW STRAW INCORPORATION

Object: To study the effects of shallow straw incorporation on straw decomposition, toxin production, pests and diseases and on the establishment, growth and yield of winter wheat - West Barnfield I.

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

The fifth year, w. wheat.

For previous years see 85-88/R/CS/311.

Design: Single replicate of 3 x a half replicate of 2 x 2 x 2 x 2 x 2.

Whole plot dimensions: 9.0 x 57.0.

Treatments: Combinations of:-

Whole plots

1. **STRAW**		Treatments to straw of previous wheat:
	BURNT	Burnt on 6 Sept, 1988
	BALED	Baled and removed on 30 Aug
	CHOPPED	Chopped on 6 Sept
2. **CULTTIME**		Time of cultivation, to 10 cm depth:
	EARLY	Cultivated by rotary grubber on 13 Sept, 1988
	LATER	Cultivated by rotary grubber on 29 Sept

Sub plots

3. **AUT N**		Autumn N as 'Nitram' applied just before cultivation:
	0	None
	50	50 kg N on 13 Sept, 1988 (CULTTIME EARLY), 29 Sept (CULTTIME LATER)
4. **FUNGCIDE**		Fungicides:
	O	None
	FULL	Full programme:- Prochloraz at 0.40 kg and carbendazim at 0.15 kg in 200 l on 15 Apr, 1989 Propiconazole at 0.125 kg in 200 l on 24 May Propiconazole at 0.125 kg with carbendazim at 0.25 kg and maneb at 1.6 kg in 200 l on 13 June
5. **INSCTCDE**		Insecticides:
	O	None
	FON+PIR	Fonofos at 1.4 kg in 200 l on 26 Jan, 1989 and pirimicarb at 0.14 kg in 200 l on 13 June

https://doi.org/10.23637/ERADOC-1-40

89/R/CS/311

6. **MOLLCIDE** Residual effects of molluscicide applied for 1987 crop:

0	None
METHCARB	Methiocarb at 0.22 kg in autumn 1986

Basal applications: Manures: Magnesian limestone at 5.0 t. (0:18:36) at 920 kg. 'Nitram' at 120 kg and later at 580 kg. Weedkillers: Paraquat at 0.60 kg ion in 200 l. Chlortoluron at 3.5 kg in 200 l. Metsulfuron-methyl at 6.0 g with fluroxypyr at 0.20 kg in 200 l.

Seed: Mission, sown at 160 kg.

Cultivations, etc.:- Magnesian limestone applied: 7 Sept, 1988. PK applied: 29 Sept. Paraquat applied: 18 Oct. Rotary harrowed, seed sown: 19 Oct. Chlortoluron applied: 22 Oct. First N applied: 23 Feb, 1989. Second N applied: 15 Apr. Metsulfuron-methyl with fluroxypyr applied: 26 Apr. Combine harvested: 8 Aug.

NOTE: Growth was measured and incidence of pests and diseases was assessed at intervals during the season. Ears of volunteers were counted prior to harvest and components of yield were measured.

GRAIN TONNES/HECTARE

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

CULTTIME	EARLY	LATER	Mean
STRAW			
BURNT	7.05	6.95	7.00
BALED	6.76	6.80	6.78
CHOPPED	6.65	6.82	6.74
Mean	6.82	6.86	6.84

AUT N	0	50	Mean
STRAW			
BURNT	7.28	6.72	7.00
BALED	6.88	6.68	6.78
CHOPPED	6.80	6.67	6.74
Mean	6.99	6.69	6.84

AUT N	0	50	Mean
CULTTIME			
EARLY	6.97	6.67	6.82
LATER	7.01	6.70	6.86
Mean	6.99	6.69	6.84

FUNGCIDE	O	FULL	Mean
STRAW			
BURNT	6.89	7.12	7.00
BALED	6.67	6.89	6.78
CHOPPED	6.44	7.03	6.74
Mean	6.67	7.01	6.84

https://doi.org/10.23637/ERADOC-1-40

89/R/CS/311

GRAIN TONNES/HECTARE

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

FUNGCIDE	O	FULL	Mean
CULTTIME			
EARLY	6.67	6.98	6.82
LATER	6.67	7.04	6.86
Mean	6.67	7.01	6.84

FUNGCIDE	O	FULL	Mean
AUT N			
0	6.80	7.17	6.99
50	6.53	6.85	6.69
Mean	6.67	7.01	6.84

INSCTCDE	O	FON+PIR	Mean
STRAW			
BURNT	6.87	7.14	7.00
BALED	6.59	6.97	6.78
CHOPPED	6.54	6.93	6.74
Mean	6.67	7.01	6.84

INSCTCDE	O	FON+PIR	Mean
CULTTIME			
EARLY	6.70	6.95	6.82
LATER	6.63	7.08	6.86
Mean	6.67	7.01	6.84

INSCTCDE	O	FON+PIR	Mean
AUT N			
0	6.78	7.20	6.99
50	6.55	6.83	6.69
Mean	6.67	7.01	6.84

INSCTCDE	O	FON+PIR	Mean
FUNGCIDE			
O	6.49	6.84	6.67
FULL	6.84	7.18	7.01
Mean	6.67	7.01	6.84

MOLLCIDE	O	METHCARB	Mean
STRAW			
BURNT	7.05	6.95	7.00
BALED	6.72	6.83	6.78
CHOPPED	6.84	6.63	6.74
Mean	6.87	6.81	6.84

https://doi.org/10.23637/ERADOC-1-40

89/R/CS/311

GRAIN TONNES/HECTARE

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

MOLLCIDE	O	METHCARB	Mean
CULTTIME			
EARLY	6.78	6.86	6.82
LATER	6.96	6.75	6.86
Mean	6.87	6.81	6.84

MOLLCIDE	O	METHCARB	Mean
AUT N			
0	7.00	6.97	6.99
50	6.74	6.64	6.69
Mean	6.87	6.81	6.84

MOLLCIDE	O	METHCARB	Mean
FUNGCIDE			
O	6.66	6.67	6.67
FULL	7.08	6.94	7.01
Mean	6.87	6.81	6.84

MOLLCIDE	O	METHCARB	Mean
INSCTCDE			
O	6.73	6.61	6.67
FON+PIR	7.02	7.01	7.01
Mean	6.87	6.81	6.84

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

AUT N	**FUNGCIDE**	**INSCTCDE**	**MOLLCIDE**
0.117	0.117	0.117	0.117

STRAW*	**CULTTIME***	**STRAW***	**CULTTIME***
AUT N	**AUT N**	**FUNGCIDE**	**FUNGCIDE**
0.203	0.166	0.203	0.166

AUT N	**STRAW***	**CULTTIME***	**AUT N**
FUNGCIDE	**INSCTCDE**	**INSCTCDE**	**INSCTCDE**
0.166	0.203	0.166	0.166

FUNGCIDE	**STRAW***	**CULTTIME***	**AUT N**
INSCTCDE	**MOLLCIDE**	**MOLLCIDE**	**MOLLCIDE**
0.166	0.203	0.166	0.166

FUNGCIDE	**INSCTCDE**
MOLLCIDE	**MOLLCIDE**
0.166	0.166

* Within the same level of **STRAW**, **CULTTIME** or **STRAW.CULTTIME** only

https://doi.org/10.23637/ERADOC-1-40

89/R/CS/311

GRAIN TONNES/HECTARE

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

Stratum	d.f.	s.e.	cv%
WP.SP	20	0.407	5.9

GRAIN MEAN DM% 89.9

SUB PLOT AREA HARVESTED 0.00276

https://doi.org/10.23637/ERADOC-1-40

89/R/CS/323

CEREAL SEQUENCES AND TAKE-ALL

Object: To study the effects on take-all (Gaeumannomyces graminis) and yield of including triticale in cereal sequences - West Barnfield II.

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

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

For previous year see 88/R/CS/323

Design: 3 randomised blocks of 26 plots.

Whole plot dimensions: 3.0 x 10.0.

CROPSEQ	Crop sequence (1988, 1989 respectively):
WB WB	W. barley, w. barley (5 plots per block)
WO WB	W. oats, w. barley
WT WB	W. triticale, w. barley
WW WB	W. wheat, w. barley
SB WB	S. barley, w. barley
WB WO	W. barley, w. oats
WT WO	W. triticale, w. oats
WW WO	W. wheat, w. oats
WO WT	W. oats, w. triticale
WT WT	W. triticale, w. triticale (5 plots per block)
WW WT	W. wheat, w. triticale
WO WW	W. oats, w. wheat
WW WW	W. wheat, w. wheat (6 plots per block)

Standard applications: Manures: (0:17:34) at 300 kg. N at 30 kg to all cereals followed by N at 170 kg (w. wheat), 150 kg (w. barley) and 120 kg (w. oats and w. triticale), all as 'Nitram'. Weedkillers: Glyphosate at 0.27 kg in 200 l. Methabenzthiazuron at 1.6 kg in 200 l. Metsulfuron-methyl at 6.0 g with fluroxypyr at 0.20 kg in 200 l. Fungicide: Tridemorph at 0.52 kg in 200 l.

SEED: W. barley: Magie, sown at 150 kg.
W. oats: Image, sown at 190 kg.
W. triticale: Cumulus, sown at 180 kg.
W. wheat: Mercia, sown at 180 kg.

Cultivations, etc.:- Rotary cultivated: 5 Sept, 1988. Glyphosate applied: 1 Oct. PK applied: 11 Oct. Heavy spring-tine cultivated: 17 Oct. Rotary harrowed, seed sown: 24 Oct. Methabenzthiazuron applied: 29 Oct. First N applied: 23 Feb, 1989. Second N applied: 14 Apr. Metsulfuron-methyl with fluroxypyr applied: 26 Apr. Fungicide applied: 19 May. Combine harvested: 21 July (w. barley), 25 July (w. oats), 4 Aug (w. wheat) and 7 Aug (w. triticale).

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

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89/R/CS/323

W. WHEAT, W.BARLEY, W. TRITICALE, W. OATS

GRAIN TONNES/HECTARE

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

CROPSEQ	
WB WB	7.65
WO WB	8.16
WT WB	7.70
WW WB	8.10
SB WB	8.03
WB WO	8.02
WT WO	7.54
WW WO	7.54
WO WT	7.44
WT WT	7.52
WW WT	8.00
WO WW	8.41
WW WW	8.22
Mean	7.85

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

CROPSEQ	
0.276	min.rep
0.211	max-min

	CROPSEQ
max-min	WB WB 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	63	0.338	4.3

GRAIN MEAN DM% 89.0

PLOT AREA HARVESTED 0.00274

https://doi.org/10.23637/ERADOC-1-40

89/R/CS/326 and 89/W/CS/326

AMOUNTS OF STRAW

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

Sponsors: D.G. Christian, J.F. Jenkyn, E.T.G. Bacon, R.D. Prew.

The third year, w. wheat.

For previous years see 87-88/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 seedbed (t ha 85% DM), cumulative to previous annual dressings:

		R	W
NONE	None	-	-
NORMAL	Normal	3.3	5.8
2 NORMAL	Twice normal	6.6	11.6
4 NORMAL	Four times normal	13.2	23.2

NOTES: (1) Straw treatments were applied on 2 Sept (R), 5 Sept (W) and chopped by trailed straw chopper and spread on 5 Sept, 1988 (R), 7 Sept (W).
(2) At Rothamsted straw was incorporated by 'I.E.R. Mixaplough' on 14 Sept. At Woburn it was heavy-tine cultivated in to 10 cm twice on 21 Sept, spring-tined with crumbler attached on 21 Oct.

Basal applications:
Great Knott III (R): Manures: Magnesian limestone at 5.0 t. (0:18:36) at 920 kg. 'Nitram' at 120 kg followed by 580 kg. Weedkillers: Paraquat at 0.60 kg ion in 200 l. Isoproturon at 2.5 kg in 200 l. Metsulfuron-methyl at 6.0 g with fluroxypyr at 0.15 kg in 200 l. Fungicides: Chlorothalonil at 1.0 kg in 200 l. Propiconazole at 0.12 kg with tridemorph at 0.52 kg in 200 l.
Far Field I (W): Manures: (0:18:36) at 920 kg. 'Nitram' at 120 kg followed by 590 kg. Weedkillers: Glyphosate at 1.1 kg in 220 l. Paraquat at 0.80 kg ion in 220 l. Isoproturon at 1.5 kg in 220 l. Fungicides: Chlorothalonil at 1.0 kg in 220 l. Propiconazole at 0.12 kg with tridemorph at 0.52 kg in 220 l.

Seed: Rendezvous, sown at 180 kg.

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89/R/CS/326 and 89/W/CS/326

Cultivations, etc.:-

Great Knott III (R): Magnesian limestone applied: 6 Sept, 1988. Ploughed: 14 Sept. PK applied: 29 Sept. Paraquat applied: 18 Oct. Rotary harrowed, seed sown, harrowed: 19 Oct. Isoproturon applied: 29 Oct. N applied: 21 Feb, 1989 and 14 Apr. Metsulfuron-methyl and fluroxypyr applied: 15 Apr. Chlorothalonil applied: 19 May. Propiconazole and tridemorph applied: 20 June. Combine harvested: 5 Aug.

Far Field I (W): PK applied: 16 Sept, 1988. Subsoiled with tines 140 cm apart, 40 cm deep: 20 Sept. Rolled: 3 Oct. Paraquat applied: 19 Oct. Spring-tine cultivated with crumbler attached, seed sown, harrowed: 21 Oct. Isoproturon applied: 8 Dec. N applied: 8 Mar, 1989 and 28 Apr. Chlorothalonil applied: 23 May. Propiconazole and tridemorph applied: 22 June. Combine harvested: 4 Aug.

NOTES: (1) Establishment counts were made in autumn. Shoot numbers and dry weight at growth stage 30, dry weight and fertile ear numbers after anthesis and harvest index were measured.

(2) Foliar diseases and foot and root rots were assessed in summer.

https://doi.org/10.23637/ERADOC-1-40

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

GRAIN TONNES/HECTARE

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

	STRAW
NONE	7.42
NORMAL	7.33
2 NORMAL	7.39
4 NORMAL	7.24
Mean	7.35

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

STRAW
0.193

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

Stratum	d.f.	s.e.	cv%
BLOCK.WP	9	0.273	3.7

GRAIN MEAN DM% 87.0

PLOT AREA HARVESTED 0.00299

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

GRAIN TONNES/HECTARE

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

	STRAW
NONE	7.72
NORMAL	7.43
2 NORMAL	7.45
4 NORMAL	7.60
Mean	7.55

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

STRAW
0.337

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

Stratum	d.f.	s.e.	cv%
BLOCK.WP	6	0.413	5.5

GRAIN MEAN DM% 86.9

PLOT AREA HARVESTED 0.00434

https://doi.org/10.23637/ERADOC-1-40 *pp 28*

89/R/CS/327

CONTROL OF STEM NEMATODE

Object: To study the effects of rates of carbofuran and row spacings on the incidence of stem nematode (Ditylenchus dipsaci) and yield of four varieties of lucerne - Long Hoos IV 3.

Sponsor: A.G. Whitehead.

The second year, lucerne.

For previous year see 88/R/CS/327.

Design: 2 randomised blocks of 20 plots.

Whole plot dimensions: 1.22 x 8.84.

Treatments: All combinations of:-

1. **VARIETY** Varieties:

   EUROPE
   EUVA
   VELA
   VERTUS

2. **CARBRATE** Rates of carbofuran (kg) in first year only:

   0.0
   1.5

3. **ROWSPACE** Spacings between rows (cm):

   15 15 (6 inches)
   30 30 (12 inches)

plus four extra treatments:

CA3 RO15 Varieties, given 3 kg carbofuran, on 15 cm row spacing, in first year only:

EUROPE
EUVA
VELA
VERTUS

NOTES: (1) Carbofuran was applied to lucerne on 7 Apr, 1988 at sowing.
(2) Two additional blocks were sown in autumn 1988 but they failed to establish. These blocks were sown to Progreta peas on 20 Apr, 1989, no treatments, no yields, to maintain the population of D. dipsaci.

Basal applications: Manures: (0:18:36) at 500 kg. Weedkiller: 2,4-DB at 2.1 kg in 220 l.

Cultivations, etc.:- Weedkiller applied: 11 Nov, 1988. PK applied: 16 Nov. Cut: 25 May, 1989, 25 July and 2 Oct.

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89/R/CS/327

1ST CUT (25/5/89) DRY MATTER TONNES/HECTARE

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

CARBRATE	0.0	1.5	Mean
VARIETY			
EUROPE	1.88	5.02	3.45
EUVA	2.32	5.31	3.81
VELA	1.78	4.27	3.02
VERTUS	3.80	5.33	4.56
Mean	2.44	4.98	3.71

ROWSPACE	15	30	Mean
VARIETY			
EUROPE	3.64	3.26	3.45
EUVA	3.90	3.72	3.81
VELA	3.05	3.00	3.02
VERTUS	5.05	4.08	4.56
Mean	3.91	3.51	3.71

ROWSPACE	15	30	Mean
CARBRATE			
0.0	2.73	2.15	2.44
1.5	5.09	4.87	4.98
Mean	3.91	3.51	3.71

	ROWSPACE	15	30
VARIETY	CARBRATE		
EUROPE	0.0	2.05	1.71
	1.5	5.23	4.81
EUVA	0.0	2.59	2.05
	1.5	5.22	5.39
VELA	0.0	2.19	1.37
	1.5	3.91	4.63
VERTUS	0.0	4.12	3.48
	1.5	5.98	4.67

CA3 RO15	EUROPE	EUVA	VELA	VERTUS	Mean
	6.08	5.90	5.64	5.80	5.86

GRAND MEAN 4.14

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

CA3 RO15	VARIETY	CARBRATE	ROWSPACE
0.363	0.181	0.128	0.128

VARIETY CARBRATE	VARIETY ROWSPACE	CARBRATE ROWSPACE	VARIETY CARBRATE ROWSPACE
0.256	0.256	0.181	0.363

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89/R/CS/327

1ST CUT (25/5/89) DRY MATTER TONNES/HECTARE

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

Stratum	d.f.	s.e.	cv%
BLOCK.WP	19	0.363	8.8

1ST CUT MEAN DM% 16.5

2ND CUT (25/7/89) DRY MATTER TONNES/HECTARE

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

CARBRATE	0.0	1.5	Mean
VARIETY			
EUROPE	3.87	5.40	4.63
EUVA	4.89	6.31	5.60
VELA	3.04	3.80	3.42
VERTUS	5.45	6.07	5.76
Mean	4.31	5.39	4.85

ROWSPACE	15	30	Mean
VARIETY			
EUROPE	4.93	4.33	4.63
EUVA	6.05	5.15	5.60
VELA	3.24	3.61	3.42
VERTUS	6.26	5.27	5.76
Mean	5.12	4.59	4.85

ROWSPACE	15	30	Mean
CARBRATE			
0.0	4.70	3.93	4.31
1.5	5.54	5.25	5.39
Mean	5.12	4.59	4.85

ROWSPACE	15	30
VARIETY	**CARBRATE**	
EUROPE	0.0	3.62	4.11
	1.5	6.24	4.55
EUVA	0.0	6.14	3.64
	1.5	5.96	6.65
VELA	0.0	2.96	3.13
	1.5	3.51	4.09
VERTUS	0.0	6.07	4.83
	1.5	6.44	5.70

CA3 RO15	EUROPE	EUVA	VELA	VERTUS	Mean
	7.72	6.11	5.81	6.13	6.44

GRAND MEAN 5.17

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89/R/CS/327

2ND CUT (25/7/89) DRY MATTER TONNES/HECTARE

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

CA3 RO15	VARIETY	CARBRATE	ROWSPACE
0.908	0.454	0.321	0.321

VARIETY CARBRATE	VARIETY ROWSPACE	CARBRATE ROWSPACE	VARIETY CARBRATE ROWSPACE
0.642	0.642	0.454	0.908

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

Stratum	d.f.	s.e.	cv%
BLOCK.WP	19	0.908	17.6

2ND CUT MEAN DM% 29.3

3RD CUT (2/10/89) DRY MATTER TONNES/HECTARE

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

CARBRATE	0.0	1.5	Mean
VARIETY			
EUROPE	1.41	1.63	1.52
EUVA	1.79	2.16	1.97
VELA	0.78	0.68	0.73
VERTUS	1.26	1.86	1.56
Mean	1.31	1.58	1.44

ROWSPACE	15	30	Mean
VARIETY			
EUROPE	1.96	1.08	1.52
EUVA	2.17	1.78	1.97
VELA	0.60	0.86	0.73
VERTUS	1.64	1.47	1.56
Mean	1.59	1.30	1.44

ROWSPACE	15	30	Mean
CARBRATE			
0.0	1.49	1.13	1.31
1.5	1.69	1.47	1.58
Mean	1.59	1.30	1.44

https://doi.org/10.23637/ERADOC-1-40

89/R/CS/327

3RD CUT (2/10/89) DRY MATTER TONNES/HECTARE

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

VARIETY	ROWSPACE / CARBRATE	15	30
EUROPE	0.0	1.35	1.47
	1.5	2.56	0.70
EUVA	0.0	2.71	0.87
	1.5	1.63	2.69
VELA	0.0	0.48	1.09
	1.5	0.72	0.63
VERTUS	0.0	1.44	1.08
	1.5	1.84	1.87

CA3 RO15	EUROPE	EUVA	VELA	VERTUS	Mean
	2.94	2.86	1.73	1.58	2.28

GRAND MEAN 1.61

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

CA3 RO15	VARIETY	CARBRATE	ROWSPACE
0.710	0.355	0.251	0.251

VARIETY CARBRATE	VARIETY ROWSPACE	CARBRATE ROWSPACE	VARIETY CARBRATE ROWSPACE
0.502	0.502	0.355	0.710

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

Stratum	d.f.	s.e.	cv%
BLOCK.WP	19	0.710	44.1

3RD CUT MEAN DM% 27.3

TOTAL OF 3 CUTS DRY MATTER TONNES/HECTARE

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

CARBRATE / VARIETY	0.0	1.5	Mean
EUROPE	7.15	12.04	9.60
EUVA	9.00	13.77	11.38
VELA	5.60	8.75	7.18
VERTUS	10.51	13.25	11.88
Mean	8.07	11.95	10.01

https://doi.org/10.23637/ERADOC-1-40

89/R/CS/327

TOTAL OF 3 CUTS DRY MATTER TONNES/HECTRE

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

ROWSPACE	15	30	Mean
VARIETY			
EUROPE	10.52	8.67	9.60
EUVA	12.12	10.64	11.38
VELA	6.88	7.47	7.18
VERTUS	12.95	10.81	11.88
Mean	10.62	9.40	10.01

ROWSPACE	15	30	Mean
CARBRATE			
0.0	8.93	7.21	8.07
1.5	12.31	11.59	11.95
Mean	10.62	9.40	10.01

	ROWSPACE	15	30
VARIETY	CARBRATE		
EUROPE	0.0	7.02	7.29
	1.5	14.03	10.06
EUVA	0.0	11.43	6.56
	1.5	12.81	14.73
VELA	0.0	5.62	5.59
	1.5	8.15	9.35
VERTUS	0.0	11.63	9.39
	1.5	14.27	12.24

CA3 RO15	EUROPE	EUVA	VELA	VERTUS	Mean
	16.74	14.88	13.17	13.51	14.57

GRAND MEAN 10.92

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

CA3 RO15	VARIETY	CARBRATE	ROWSPACE
1.748	0.874	0.618	0.618

VARIETY CARBRATE	VARIETY ROWSPACE	CARBRATE ROWSPACE	VARIETY CARBRATE ROWSPACE
1.236	1.236	0.874	1.748

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

Stratum	d.f.	s.e.	cv%
BLOCK.WP	19	1.748	16.0

TOTAL OF 3 CUTS MEAN DM% 24.4

PLOT AREA HARVESTED ROW SPACE 30CM 0.00045
ALL OTHER PLOTS 0.00039

https://doi.org/10.23637/ERADOC-1-40

89/R/CS/331

TAKE-ALL INOCULATION

Object: To compare a range of methods of artificially inoculating take-all (Gaeumannomyces graminis) and to relate amounts of disease established to the yield and grain quality of w. wheat - Great Harpenden I.

Sponsors: D. Hornby, G.L. Bateman, R.J. Gutteridge.

The first year, w. wheat.

Design: 4 randomised blocks of 9 plots.

Whole plot dimensions: 3.0 x 22.0.

Treatments:

INOCMETH	Methods of inoculating take-all to w. wheat:
NONE	None (duplicated)
I PRE PL	Infective inoculum applied to soil surface pre-ploughing
N PRE PL	Non-infective inoculum applied to soil surface pre-ploughing
I PRE SO	Infective inoculum applied by fertilizer drill to 10 cm depth before rotary harrowing and sowing wheat
N PRE SO	Non-infective inoculum applied as above
I CD	Infective inoculum combine drilled with the seed
N CD	Non-infective inoculum combine drilled with the seed

NOTES: (1) Inoculum was prepared on autoclaved oat seed sown at 212 kg.
(2) The sequence of cultivations was identical for all treatments: Plough to 23 cm on 5 Oct, 1988, cultivate to level on 22 Oct, traverse with fertilizer drill to 10 cm on 26 Oct, rotary harrow to 10 cm and sow wheat with combine drill on 27 Oct.
(3) An additional treatment, required for comparisons in future years, was sown with w. oats.

Basal applications: Manures: (0:18:36) at 920 kg. 'Nitram' at 580 kg. Weedkillers: Paraquat at 0.60 kg ion in 200 l. Methabenzthiazuron at 1.6 kg in 200 l. Mecoprop at 2.2 kg, bromoxynil at 0.28 kg and ioxynil at 0.28 kg in 200 l. Fungicides: Prochloraz at 0.40 kg and carbendazim at 0.15 kg in 200 l.

Seed: W. wheat: Mercia, sown at 190 kg.
W. oats: Image, sown at 190 kg.

Cultivations, etc.:- Rotary cultivated: 19 Aug, 1988. PK applied: 16 Sept. Paraquat applied: 19 Sept. Methabenzthiazuron applied: 3 Nov. N applied: 18 Apr, 1989. Mecoprop, bromoxynil and ioxynil applied: 4 May. Fungicides applied: 10 May. Combine harvested: 4 Aug (w. wheat), 17 Aug (w. oats). Previous crops: W. beans 1987, w. oats 1988.

NOTE: Plant samples were taken on six occasions between mid-March and mid-July to assess take-all. Quality assessments were made on the grain. Soil cores were taken after harvest to assess take-all infectivity, before and after cultivations.

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89/R/CS/331

GRAIN TONNES/HECTARE

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

INOCMETH	
NONE	7.11
I PRE PL	6.96
N PRE PL	7.11
I PRE SO	6.88
N PRE SO	7.35
I CD	6.58
N CD	7.12
Mean	7.03

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

INOCMETH	
0.168	min.rep
0.145	max-min

	INOCMETH
max-min	NONE 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	22	0.237	3.4

GRAIN MEAN DM% 87.1

PLOT AREA HARVESTED 0.00506

https://doi.org/10.23637/ERADOC-1-40

89/R/CS/333

COMPARISON OF COMBINABLE CROPS

Object: To compare yields and other attributes of a range of combinable crops and to study their effects on a following crop of w. wheat - Long Hoos VI/VII 1.

Sponsors: J. McEwen, D.P. Yeoman, R.J. Darby, M.V. Hewitt.

The second year, w. wheat.

For previous year see 88/R/CS/333.

Design: 3 randomised blocks of 12 plots split into 2.

Whole plot dimensions: 2.5 x 8.0.

Treatments: All combinations of:-

Whole plots

1. **PREVCROP** Crops in 1988:

W BEANS	W. beans, Vicia faba
W OATS	W. oats
W PEAS	W. peas, Pisum sativum
W RAPE	W. oilseed rape
W WHEAT	W. wheat
S BEANS	S. beans, Vicia faba
S LUPINS	S. lupins, Lupinus albus
S PEAS	S. peas, Pisum sativum
SNFLOWER	Sunflowers
FALLOW/C	Fallow, cultivated
FALLOW/P	Fallow, paraquat applied on four occasions
RYEGRASS	One-year ryegrass, cut and produce returned

Sub plots

2. **SPRING N** Nitrogen fertilizer applied on 18 Apr, 1989:

0	None
N	N applied, amount depending on quantity in crop and soil in spring.

NOTE: Amounts of N applied (kg N) as 'Nitro-Chalk' were:

After **PREVCROP**		
	FALLOW/C	170
	W PEAS, S BEANS, S PEAS	180
	FALLOW/P	190
	W BEANS, W RAPE	200
	S LUPINS	210
	SUNFLOWERS	220
	W WHEAT, RYEGRASS	230
	W OATS	240

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89/R/CS/333

Standard applications: Weedkillers: Paraquat at 0.60 kg ion in 220 l except after lupins. Isoproturon at 2.5 kg with mecoprop at 1.5 kg in 220 l except after lupins. Isoproturon at 2.5 kg with mecoprop at 0.42 kg in 220 l after lupins only. Isoproturon at 2.5 kg with mecoprop at 1.7 kg with cyanazine at 0.46 kg and clopyralid at 0.08 kg in 220 l to all plots. Difenzoquat at 0.99 kg applied with a wetting agent ('Agral' at 1.0 l) in 220 l. Fungicides: Propiconazole at 0.12 kg in 220 l. Carbendazim at 0.15 kg, maneb at 1.6 kg and tridemorph at 0.38 kg in 220 l. Molluscicide: Metaldehyde at 0.60 kg.

Seed: W. wheat: Mercia, sown at 200 kg.

Cultivations, etc.:- Paraquat applied except after lupins: 9 Sept, 1988. Deep-tine cultivated, except after lupins: 12 Sept. Rotary cultivated and seed sown except after lupins: 19 Sept. After lupin plots spring-tine cultivated, seed sown: 4 Oct. Isoproturon and mecoprop applied except after lupins: 19 Oct, and after lupins: 31 Oct and again to all plots with cyanazine and clopyralid: 6 Jan, 1989. Difenzoquat applied: 8 Feb. Propiconazole applied: 8 Mar. Metaldehyde applied: 15 Mar. Carbendazim, maneb and tridemorph applied: 26 Apr. Combine harvested: 28 July.

NOTE: Because the grain was spilt before weighing, the yield of one plot was lost, with treatment S BEANS N. An estimated value was used in the analysis.

https://doi.org/10.23637/ERADOC-1-40

89/R/CS/333

GRAIN TONNES/HECTARE

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

SPRING N	O	N	Mean
PREVCROP			
W BEANS	6.75	9.63	8.19
W OATS	3.82	8.81	6.31
W PEAS	6.82	9.17	7.99
W RAPE	6.61	9.24	7.92
W WHEAT	2.51	7.20	4.85
S BEANS	7.47	9.80	8.64
S LUPINS	6.66	9.42	8.04
S PEAS	6.96	9.51	8.24
SNFLOWER	4.86	9.14	7.00
FALLOW/C	8.10	9.70	8.90
FALLOW/P	7.43	9.75	8.59
RYEGRASS	3.68	7.55	5.62
Mean	5.97	9.08	7.52

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

PREVCROP	SPRING N	PREVCROP SPRING N
0.380	0.157	0.541

Except when comparing means with the same level(s) of
PREVCROP 0.545

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

Stratum	d.f.	s.e.	cv%
BLOCK.WP	22	0.465	6.2
BLOCK.WP.SP	23	0.667	8.9

GRAIN MEAN DM% 88.0

SUB PLOT AREA HARVESTED 0.00055

https://doi.org/10.23637/ERADOC-1-40

89/W/CS/336

SET-ASIDE STUDY

Object: To compare different treatments of land temporarily withdrawn from arable cropping and to study their effects on nitrate leaching and on subsequent wheat crops - Woburn Horsepool.

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

Associate sponsors: D.L.O. Smith, I. Shield.

The first year, w. wheat, forage rape, ryegrass and trefoil.

Design: 3 randomised blocks of 7 plots.

Whole plot dimensions: 10.0 x 24.0.

Treatments:

LAND TRT	Land treatment, after s. wheat 1988:
CA WW	Cultivated in autumn, sown to w. wheat
CA RA	Cultivated in autumn, sown to ryegrass in autumn, topped in spring
SA CA FA	Straw chopped and spread in autumn, cultivated in autumn, sown to forage rape in autumn, topped in spring
CA CS	Cultivated in autumn, cultivated in spring
SA CS	Straw chopped and spread in autumn, cultivated in spring
WT	Weeds topped
WT CS TS	Weeds topped, cultivated in spring, trefoil sown in spring, topped

NOTE: Yields were taken from CA WW only.

Standard applications, seed and cultivations, etc.:-

CA WW: S. wheat straw baled and carted: 8 Sept, 1988. Ploughed: 12 Sept. Rotary harrowed: 13 Sept. Rotary harrowed, seed sown: 4 Oct. N applied at 180 kg as 'Nitram': 21 Apr, 1989. Weedkillers: Bromoxynil at 0.34 kg and clopyralid at 0.07 kg with mecoprop at 2.5 kg in 220 l applied: 3 May. Fungicides: Propiconazole at 0.12 kg in 220 l applied: 12 June. Combine harvested: 8 Aug.

CA RA: S. wheat straw baled and carted: 8 Sept, 1988. Ploughed: 12 Sept. Rotary harrowed, Italian ryegrass sown at 30 kg, harrowed: 13 Sept. Topped: 4 May, 1989 and 27 June.

SA CA FA: S. wheat straw chopped: 9 Sept, 1988. Ploughed: 12 Sept. Rotary harrowed, Giant forage rape sown at 8.0 kg, harrowed: 13 Sept. Topped: 4 May, 1989 and 27 June.

CA CS: S. wheat straw baled and carted: 8 Sept, 1988. Ploughed: 12 Sept. Spring-tine cultivated: 29 Mar, 1989. Shallow cultivated with thistle bar: 26 June.

SA CS: S. wheat straw chopped: 9 Sept, 1988. Cultivated with sweep tines 7 cm deep: 3 May, 1989 and 12 June.

WT: S. wheat straw baled and carted: 8 Sept, 1988. Topped: 4 May, 1989 and 27 June.

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89/W/CS/336

Standard applications, seed and cultivations, etc.:-
WT CS TS: S. wheat straw baled and carted: 8 Sept, 1988. Weeds topped, ploughed: 29 Mar, 1989. Rotary harrowed with crumbler attached, rolled, spike harrowed with crumbler attached, trefoil, inoculated Rhizobium, sown at 10 kg, rolled: 15 May.
Previous crops: Potatoes 1987, s. wheat 1988.

NOTE: Assessments of soil N, dry matter and plant cover were made in autumn, spring and summer.

GRAIN TONNES/HECTARE

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

LAND TRT	CA WW
	2.86

MEAN DM% 88.8

PLOT AREA HARVESTED 0.00732

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89/R/CS/337

PREVIOUS CROPS AND N

Object: To study the effects of a range of crops on the nitrogen requirements, quality and yield of a subsequent w. barley crop - Webbs.

Sponsors: D.G. Christian, N.L. Carreck.

The first year, w. barley, w. oats, w. beans, s. oilseed rape, potatoes.

Design: 3 randomised blocks of 5 plots.

Whole plot dimensions: 21.0 x 20.0.

Treatments:

CROP	Crops:
W BARLEY	W. barley
W BEANS	W. beans
W OATS	W. oats
W RAPE	W. oilseed rape
POTATOES	Potatoes

NOTE: Winter oilseed rape failed and was replaced by s. oilseed rape, yields not taken.

Standard applications:

All crops: Manures: (0:18:36) at 920 kg.
W. barley: Manure: 'Nitram' at 360 kg. Weedkiller: Isoproturon at 2.5 kg in 200 l. Fungicide: Propiconazole at 0.12 kg in 200 l.
W. beans: Weedkillers: Simazine at 0.17 kg and trietazine at 1.2 kg in 200 l. Insecticide: Deltamethrin at 7.5 g in 400 l.
W. oats: Manure: 'Nitram' at 290 kg. Weedkiller: Methabenzthiazuron at 1.6 kg in 200 l.
W. oilseed rape (failed): Manure: 'Nitram' at 220 kg (to two of three plots only). Weedkiller: Propyzamide at 0.70 kg in 200 l.
S. oilseed rape: Manure: 'Nitram' at 220 kg (to two plots given N to w.oilseed rape) and 440 kg to remaining plot. Weedkiller: Propachlor at 4.3 kg in 450 l.
Potatoes: Manure: 'Nitram' at 640 kg. Weedkiller: Metribuzin at 1.0 kg in 300 l. Fungicides: Mancozeb at 1.4 kg in 200 l on three occasions and at 1.0 kg in 200 l on a fourth occasion.

Seed: W. barley: Halcyon, sown at 150 kg.
W. beans: Bourdon, dressed with thiabendazole and thiram, sown at 240 kg.
W. oats: Image, sown at 190 kg.
W. oilseed rape: Ariana, dressed gamma HCH, thiram and fenpropimorph, sown at 8 kg.
S. oilseed rape: Topaz, dressed gamma HCH, thiram and fenpropimorph, sown at 8 kg.
Potatoes: Desiree.

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Cultivations, etc.:-

All crops: Heavy spring-tine cultivated: 30 Aug, 1988. PK applied: 9 Sept.

W. barley: Rotary harrowed, seed sown: 18 Oct, 1988. Weedkiller applied: 16 Nov. N applied: 30 Mar, 1989. Fungicide applied: 16 May. Combine harvested: 21 July.

W. beans: Rotary harrowed, seed sown: 18 Oct, 1988. Weedkillers applied: 4 Nov. Insecticide applied: 10 May. Combine harvested: 14 Aug.

W. oats: Rotary harrowed, seed sown: 18 Oct, 1988. Weedkiller applied: 29 Oct. N applied: 18 Apr, 1989. Combine harvested: 25 July.

W. oilseed rape: Seed sown: 9 Sept, 1988. Weedkiller applied: 4 Nov. N applied (to two plots): 23 Feb, 1989. Crop destroyed by cultivating with rotary grubber: 15 Apr.

S. oilseed rape: N applied: 20 Apr, 1989. Rotary harrowed twice, seed sown: 21 Apr. Weedkiller applied: 1 June. Cut with forage harvester: 29 Aug.

Potatoes: Ploughed: 19 Oct, 1988. N applied: 20 Apr, 1989. Rotary harrowed: 24 Apr. Planted: 3 May. Rotary ridged: 26 May. Metribuzin applied: 31 May. Mancozeb applied: 3 July, 17 July, 28 July, 14 Aug. Haulm mechanically destroyed: 21 Aug. Lifted: 8 Sept.

Previous crops: W. oilseed rape 1987, w. wheat 1988.

NOTES: (1) Soil samples were taken from rape plots in April 1989, to determine N content.

(2) Crop samples were taken from each crop in August, just before harvest, to determine total dry matter yield and N content.

https://doi.org/10.23637/ERADOC-1-40

89/R/CS/337

GRAIN TONNES/HECTARE

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

	CROP
W BARLEY	6.85
W BEANS	5.38
W OATS	6.73
Mean	6.32

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

CROP
0.743

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

Stratum	d.f.	s.e.	cv%
BLOCK.WP	4	0.910	14.4

GRAIN MEAN DM% 87.3

PLOT AREA HARVESTED 0.00230

POTATOES

TOTAL TUBERS TONNES/HECTARE

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

CROP	POTATOES
	26.4

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89/R/CS/338

CONTROL OF VOLUNTEERS

Object: To study the residual effects in w. oats of a range of methods of volunteer control in w. wheat in the preceding year - Summerdells II.

Sponsors: R. Moffitt, D.G. Christian.

The second year, w. oats.

For previous year see 88/R/WW/12.

Design: 3 replicates of 6 x 3 criss-cross.

Column plot dimensions: 6.0 x 23.0.

Treatments: All combinations of:-

1. **PRIMCULT** Primary cultivations in previous year:

NONE	None until just before sowing
DYNDRIVE	'Bomford Dynadrive'
DISC	Disc
PLOUGH	Plough
ROTAVATE	Rotary cultivate
TINE	Tine

2. **PRSOWCON** Pre-sowing volunteer control in previous year:

GLYPHOS	Glyphosate
PARAQUAT	Paraquat
ROT HARR	Rotary harrow

NOTES: (1) In 1987, disc and tine treatments were cultivated twice, the others once.
(2) All plots were disced twice and rotary harrowed on 7 Nov, 1987. All were ploughed on 11 Oct, 1988 and rotary harrowed on 28 Oct.
(3) The 'Bomford Dynadrive' has a frame similar to a rotary cultivator but it has two rotating shafts containing flat, slightly twisted, spade shaped tines. The front shaft drives the rear, it is fitted with twice the number of blades and rotates at about one third the speed of the rear shaft.

Basal applications: Manure: 'Nitram' at 360 kg. Weedkiller: Methabenzthiazuron at 1.6 kg in 200 l. Fungicide: Fenpropimorph at 0.75 kg with the growth regulator and wetting agent in 200 l. Growth regulator: Chlormequat chloride at 1.6 kg with a wetting agent ('Enhance' at 0.036 l).

Seed: Image, sown at 190 kg.

Cultivations, etc.:- Seed sown: 28 Oct, 1988. Weedkiller applied: 29 Oct. N applied: 16 Apr, 1989. Fungicide with growth regulator and wetting agent applied: 16 May. Combine harvested: 23 July. Previous crops: W. barley 1987, w. wheat 1988.

NOTE: Volunteers were assessed at crop anthesis. Since volunteers were absent, yields were not taken.

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89/W/CS/339

SULPHUR AND NITROGEN

Object: To study the effects of differing amounts of sulphur on rates of sulphur uptake and on the yield of w. wheat and the extent to which responses are affected by amounts of nitrogen fertilizer - Woburn Butt Close II.

Sponsor: S.P. McGrath.

The first year, w. wheat.

Design: 3 randomised blocks of 12 plots.

Whole plot dimensions: 4.0 x 10.0.

Treatments: All combinations of:-

1. **S** Rates of sulphur (kg S) as calcium sulphate:

   0
   10
   20
   40

2. **N** Rates of nitrogen (kg N) as 'Nitram':

   0
   180
   230

Basal applications: Weedkillers: Paraquat at 0.80 kg ion in 220 l. Isoproturon at 1.5 kg in 220 l. Insecticide: Fonofos at 1.4 kg in 220 l. Fungicides: Carbendazim at 0.15 kg and prochloraz at 0.40 kg in 220 l. Propiconazole at 0.12 kg in 220 l.

Seed: Mercia, sown at 150 kg.

Cultivations, etc.:- Ploughed: 7 July, 1988. Paraquat applied: 19 Oct. Spring-tine cultivated, seed sown, harrowed: 21 Oct. Isoproturon applied: 8 Dec. Insecticide applied: 30 Jan, 1989. N and S treatments applied: 19 Apr. Carbendazim and prochloraz applied: 17 May. Propiconazole applied: 12 June. Combine harvested: 8 Aug. Previous crops: W. wheat 1987, fallow 1988.

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89/W/CS/339

GRAIN TONNES/HECTARE

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

S N	0	10	20	40	Mean
0	2.94	2.20	2.29	1.87	2.32
180	4.64	4.51	4.77	3.84	4.44
230	4.47	5.26	4.13	4.45	4.58
Mean	4.02	3.99	3.73	3.38	3.78

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

S	N	S N
0.331	0.287	0.573

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

Stratum	d.f.	s.e.	cv%
BLOCK.WP	22	0.702	18.6

GRAIN MEAN DM% 88.6

STRAW TONNES/HECTARE

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

S N	0	10	20	40	Mean
0	1.37	1.04	0.95	1.06	1.10
180	3.99	3.38	3.48	3.47	3.58
230	3.53	3.71	3.67	4.05	3.74
Mean	2.96	2.71	2.70	2.86	2.81

STRAW MEAN DM% 90.6

PLOT AREA HARVESTED 0.00165

https://doi.org/10.23637/ERADOC-1-40