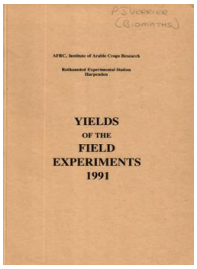
ROTHAMSTED RESEARCH

Yields of the Field Experiments 1991

Full Table of Content



Crop Sequences

Rothamsted Research

Rothamsted Research (1992) *Crop Sequences ;* Yields Of The Field Experiments 1991, pp 46 - 111 **- DOI: https://doi.org/10.23637/ERADOC-1-46**

91/R/CS/10 and 91/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.

Sponsors: S.P. McGrath, P.B. Barraclough, G.F.J. Milford.

The 30th year, w. oilseed rape.

For previous years see 'Details' 1967, 1973 and 74-90/R&W/CS/10.

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

Whole plot dimensions: 6.0 x 18.3.

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 P1, P2, P3, P4 = 25, 50, 75, 100 kg P as superphosphate

Sub plots

3. **SULPHUR** Sulphur (kg S, as calcium sulphate):

0
30

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 and 1990).
(2) Sulphur was applied as gypsum (17.5% S) on 13 Mar, 1991 (R), 21 Mar (W).
(3) Test manganese was applied cumulatively, 1987-90.

https://doi.org/10.23637/ERADOC-1-46

91/R/CS/10 and 91/W/CS/10

Basal applications:

Sawyers I (R): Manures: (25:0:16) at 200 kg. 'Nitram' at 640 kg. Magnesium at 0.13 kg as 'Vytel Liquid Magnesium' in 200 l. Manganese at 0.093 kg as 'Vytel Liquid Manganese' in 200 l. Weedkillers: Metazachlor at 0.75 kg in 200 l. Clopyralid at 0.10 kg in 200 l. Fungicide: Prochloraz at 0.50 kg in 200 l and on a second occasion at 0.40 kg in 200 l. Insecticide: Deltamethrin at 6.2 g in 200 l and at 12 g in 200 l on a second occasion. Desiccant: Diquat at 0.60 kg ion applied with wetting agent, 'Vassgro' at 0.52 l, in 520 l. Irrigation: 25 mm applied on two occasions.

Stackyard C (W): Manures: (25:0:16) at 200 kg. Magnesium at 0.13 kg as 'Vytel Liquid Magnesium' in 200 l. 'Nitram' at 580 kg. Manganese at 0.078 kg as 'Vytel Liquid Manganese' in 300 l. Weedkillers: Quizalofop-ethyl at 38 g with metazachlor at 0.75 kg applied with adjuvant 'Cropspray 11 E' at 2.0 l in 220 l. Fungicide: Prochloraz at 0.28 kg applied with the second insecticide in 200 l. Insecticide: Deltamethrin at 6.2 g in 220 l and on a second occasion at 12 g. Desiccant: Diquat at 0.60 kg ion applied with a wetting agent, 'Agral' at 0.40 l, in 400 l.

Seed: Libravo, dressed fenpropimorph, gamma-HCH, and thiram, at 6.0 kg (R & W).

Cultivations, etc.:-

Sawyers I (R): N and K applied: 23 Aug, 1990. Ploughed: 28 Aug. Rolled: 29 Aug. Rotary harrowed: 30 Aug. Rotary harrowed, seed sown, harrowed, rolled, metazachlor applied: 31 Aug. Irrigated: 21 and 27 Sept. Deltamethrin applied: 7 Nov. Prochloraz and Mg applied: 3 Dec. Clopyralid applied: 17 Dec. N applied: 4 Mar, 1991. Second deltamethrin applied: 12 Apr. Second prochloraz and Mn applied: 23 Apr. Desiccant with wetting agent applied: 30 July. Combine harvested: 7 Aug.

Stackyard C (W): Disced: 15 Aug, 1990. Subsoiled with tines 1.5 m apart, 0.4 m deep: 21 Aug. Ploughed and rolled: 22 Aug. N and K applied: 28 Aug. Rotary harrowed with crumbler attached, seed sown: 30 Aug. Weedkillers and adjuvant applied: 1 Nov. Deltamethrin applied: 15 Nov. Mg applied: 3 Dec. N applied: 15 Mar, 1991. Second deltamethrin applied with fungicide: 12 Apr. Mn applied: 9 May. Desiccant with wetting agent applied: 1 Aug. Combine harvested: 13 Aug.

https://doi.org/10.23637/ERADOC-1-46

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

GRAIN (AT 90% DRY MATTER) TONNES/HECTARE

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

P	O	P1	P2	P3	Mean
CHALK					
0	0.39	1.20	1.67	2.29	1.39
15	1.96	2.94	3.08	1.54	2.38
24.5	2.46	1.83	2.07	2.11	2.12
52.5	2.91	2.22	2.68	2.44	2.56
Mean	1.93	2.05	2.38	2.10	2.11

SULPHUR	0	30	Mean
CHALK			
0	1.38	1.39	1.39
15	2.52	2.25	2.38
24.5	2.06	2.17	2.12
52.5	2.33	2.80	2.56
Mean	2.07	2.15	2.11

SULPHUR	0	30	Mean
P			
O	1.99	1.87	1.93
P1	1.98	2.11	2.05
P2	2.15	2.61	2.38
P3	2.16	2.03	2.10
Mean	2.07	2.15	2.11

	SULPHUR	0	30
CHALK	**P**		
0	O	0.52	0.27
	P1	1.05	1.34
	P2	1.35	1.99
	P3	2.61	1.97
15	O	2.47	1.44
	P1	3.12	2.77
	P2	2.94	3.22
	P3	1.53	1.55
24.5	O	2.40	2.52
	P1	1.91	1.74
	P2	1.96	2.19
	P3	1.98	2.25
52.5	O	2.59	3.23
	P1	1.85	2.59
	P2	2.33	3.02
	P3	2.53	2.35

https://doi.org/10.23637/ERADOC-1-46

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

GRAIN (AT 90% DRY MATTER) TONNES/HECTARE

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

CHALK	P	SULPHUR	CHALK P
0.419	0.419	0.210	0.838

CHALK SULPHUR	P SULPHUR	CHALK P SULPHUR
0.514	0.514	1.027

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

CHALK	0.420
P	0.420
CHALK.P	0.839

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

Stratum	d.f.	s.e.	cv%
BLOCK.WP	15	0.838	39.7
BLOCK.WP.SP	16	0.839	39.8

GRAIN MEAN DM% 76.3

SUB PLOT AREA HARVESTED 0.00079

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

GRAIN (AT 90% DRY MATTER) TONNES/HECTARE

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

P / CHALK	0	P1	P2	P3	Mean
0	0.35	0.56	1.95	1.76	1.16
9	2.15	2.65	2.56	2.31	2.41
25.5	2.25	2.72	2.71	2.77	2.62
45.5	2.84	2.39	2.66	2.85	2.69
Mean	1.90	2.08	2.47	2.42	2.22

SULPHUR / CHALK	0	30	Mean
0	1.16	1.15	1.16
9	2.20	2.63	2.41
25.5	2.58	2.65	2.62
45.5	2.52	2.86	2.69
Mean	2.12	2.32	2.22

https://doi.org/10.23637/ERADOC-1-46

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

GRAIN (AT 90% DRY MATTER) TONNES/HECTARE

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

SULPHUR	0	30	Mean
P			
0	1.80	2.00	1.90
P1	1.95	2.21	2.08
P2	2.35	2.60	2.47
P3	2.36	2.48	2.42
Mean	2.12	2.32	2.22

CHALK	SULPHUR P	0	30
0	0	0.41	0.29
	P1	0.14	0.98
	P2	1.99	1.91
	P3	2.09	1.43
9	0	1.94	2.35
	P1	2.65	2.65
	P2	2.23	2.89
	P3	1.99	2.62
25.5	0	2.10	2.40
	P1	2.86	2.59
	P2	2.62	2.81
	P3	2.76	2.79
45.5	0	2.75	2.94
	P1	2.17	2.62
	P2	2.56	2.77
	P3	2.60	3.10

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

CHALK	P	SULPHUR	CHALK P
0.168	0.168	0.115	0.337

CHALK SULPHUR	P SULPHUR	CHALK P SULPHUR
0.234	0.234	0.469

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

CHALK	0.230		
P		0.230	
CHALK.P			0.461

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

Stratum	d.f.	s.e.	cv%
BLOCK.WP	15	0.337	15.2
BLOCK.WP.SP	16	0.461	20.8

GRAIN MEAN DM% 90.5

SUB PLOT AREA HARVESTED 0.00182

https://doi.org/10.23637/ERADOC-1-46

91/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 18th year, s. barley.

For previous years see 74-90/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 to 1990.
2.	**FUNGCIDE[1]**	Fungicide in autumn:
	NONE	None
	TRIADIM	Triadimefon at 0.25 kg in autumn 1981, 1982, 1984 to 1990, 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 28 Sept, 1990. Other treatments were applied on 8 Apr, 1991.

Basal applications: Manures: Muriate of potash at 520 kg. Magnesian limestone at 2.9 t. 'Nitram' at 440 kg. Weedkiller: Fluroxypyr at 0.15 kg in 200 l.

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

https://doi.org/10.23637/ERADOC-1-46

91/R/CS/140

Cultivations, etc.:- K applied: 14 Sept, 1990. Magnesian limestone applied: 4 Oct. Ploughed: 5 Dec. N applied, heavy spring-tine cultivated, rotary harrowed: 8 Apr, 1991. Seed sown, rolled: 9 Apr. Weedkiller applied: 16 June. Combine harvested: 21 Aug.

GRAIN TONNES/HECTARE

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

FUNGCIDE[1]	NONE	TRIADIM	Mean
WEEDKLLR			
NONE	6.07	6.07	6.07
GLYPHOS	6.11	6.09	6.10
Mean	6.09	6.08	6.08

FUNGCIDE[2]	NONE	BENOMYL	Mean
WEEDKLLR			
NONE	6.01	6.13	6.07
GLYPHOS	6.07	6.13	6.10
Mean	6.04	6.13	6.08

FUNGCIDE[2]	NONE	BENOMYL	Mean
FUNGCIDE[1]			
NONE	6.04	6.14	6.09
TRIADIM	6.04	6.12	6.08
Mean	6.04	6.13	6.08

INSCTCDE	NONE	CHLORFEN	Mean
WEEDKLLR			
NONE	5.97	6.17	6.07
GLYPHOS	5.95	6.25	6.10
Mean	5.96	6.21	6.08

INSCTCDE	NONE	CHLORFEN	Mean
FUNGCIDE[1]			
NONE	6.02	6.16	6.09
TRIADIM	5.90	6.26	6.08
Mean	5.96	6.21	6.08

INSCTCDE	NONE	CHLORFEN	Mean
FUNGCIDE[2]			
NONE	5.90	6.18	6.04
BENOMYL	6.02	6.24	6.13
Mean	5.96	6.21	6.08

NEMACIDE	NONE	ALDICARB	Mean
WEEDKLLR			
NONE	6.00	6.14	6.07
GLYPHOS	6.14	6.06	6.10
Mean	6.07	6.10	6.08

https://doi.org/10.23637/ERADOC-1-46

91/R/CS/140

GRAIN TONNES/HECTARE

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

NEMACIDE / **FUNGCIDE[1]**	NONE	ALDICARB	Mean
NONE	6.01	6.17	6.09
TRIADIM	6.13	6.03	6.08
Mean	6.07	6.10	6.08

NEMACIDE / **FUNGCIDE[2]**	NONE	ALDICARB	Mean
NONE	6.09	5.99	6.04
BENOMYL	6.05	6.21	6.13
Mean	6.07	6.10	6.08

NEMACIDE / **INSCTCDE**	NONE	ALDICARB	Mean
NONE	5.95	5.96	5.96
CHLORFEN	6.19	6.23	6.21
Mean	6.07	6.10	6.08

	FUNGCIDE[1]	NONE		TRIADIM	
WEEDKLLR	**FUNGCIDE[2]**	NONE	BENOMYL	NONE	BENOMYL
NONE		5.98	6.16	6.05	6.09
GLYPHOS		6.10	6.13	6.03	6.14

	FUNGCIDE[1]	NONE		TRIADIM	
WEEDKLLR	**INSCTCDE**	NONE	CHLORFEN	NONE	CHLORFEN
NONE		6.05	6.09	5.89	6.26
GLYPHOS		5.99	6.24	5.91	6.26

	FUNGCIDE[2]	NONE		BENOMYL	
WEEDKLLR	**INSCTCDE**	NONE	CHLORFEN	NONE	CHLORFEN
NONE		5.85	6.18	6.08	6.17
GLYPHOS		5.95	6.19	5.95	6.32

	FUNGCIDE[2]	NONE		BENOMYL	
FUNGCIDE[1]	**INSCTCDE**	NONE	CHLORFEN	NONE	CHLORFEN
NONE		6.02	6.06	6.02	6.27
TRIADIM		5.78	6.30	6.02	6.22

	FUNGCIDE[1]	NONE		TRIADIM	
WEEDKLLR	**NEMACIDE**	NONE	ALDICARB	NONE	ALDICARB
NONE		5.92	6.21	6.08	6.06
GLYPHOS		6.10	6.13	6.18	5.99

	FUNGCIDE[2]	NONE		BENOMYL	
WEEDKLLR	**NEMACIDE**	NONE	ALDICARB	NONE	ALDICARB
NONE		6.00	6.02	6.00	6.25
GLYPHOS		6.18	5.95	6.10	6.17

https://doi.org/10.23637/ERADOC-1-46

91/R/CS/140

GRAIN TONNES/HECTARE

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

	FUNGCIDE[2]	NONE		BENOMYL	
FUNGCIDE[1]	NEMACIDE	NONE	ALDICARB	NONE	ALDICARB
NONE		6.06	6.02	5.97	6.31
TRIADIM		6.13	5.95	6.13	6.10

	INSCTCDE	NONE		CHLORFEN	
WEEDKLLR	NEMACIDE	NONE	ALDICARB	NONE	ALDICARB
NONE		5.88	6.05	6.12	6.22
GLYPHOS		6.02	5.88	6.26	6.24

	INSCTCDE	NONE		CHLORFEN	
FUNGCIDE[1]	NEMACIDE	NONE	ALDICARB	NONE	ALDICARB
NONE		5.98	6.06	6.05	6.28
TRIADIM		5.93	5.87	6.33	6.19

	INSCTCDE	NONE		CHLORFEN	
FUNGCIDE[2]	NEMACIDE	NONE	ALDICARB	NONE	ALDICARB
NONE		5.93	5.87	6.25	6.11
BENOMYL		5.97	6.06	6.13	6.36

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

Margins of two factor tables	0.129
Two factor tables	0.182
Three factor tables	0.257

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

Stratum	d.f.	s.e.	cv%
WP	6	0.364	6.0

GRAIN MEAN DM% 88.8

PLOT AREA HARVESTED 0.00069

https://doi.org/10.23637/ERADOC-1-46

91/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 14th year, w. wheat.

For previous years see 78-90/R/CS/212.

Design: 3 randomised blocks of 8 plots.

Whole plot dimensions: 5.33 x 10.0.

Treatments:

PREVCROP Previous crops before w. wheat 1991:

	78	79	80	81	82	83	84	85	86	87	88	89	90
W13	W	W	W	W	W	W	W	W	W	W	W	W	W
BE2 W4	W	BE	W	W	BE	W	W	BE	BE	W	W	W	W
BE1 W4	W	W	W	W	W	W	W	W	BE	W	W	W	W
BE1 W6	BE	W	W	BE	W	W	BE	W	W	W	W	W	W
BE1 W7	W	W	BE	W	W	BE	W	W	W	W	W	W	W
BE1 W2	W	BE	W	W	BE	W	W	BE	W	W	BE	W	W
BE1 W1	W	W	BE	W	W	BE	W	W	BE	W	W	BE	W
BE1	BE	W	W	BE	W	W	BE	W	W	BE	W	W	BE

BE = s. beans, W = w. wheat

Basal applications: Manures: (0:16:36) at 980 kg. 'Nitram' at 410 kg. Weedkillers: Isoproturon at 1.3 kg and pendimethalin at 1.3 kg with the insecticide in 200 l. Glyphosate at 0.72 kg with a wetting agent, 'Frigate' at 1.0 l, in 200 l. Fungicides: Fenpropimorph at 0.38 kg in 200 l. Chlorothalonil at 0.49 kg and flutriafol at 0.078 kg with fenpropimorph at 0.38 kg in 200 l. Insecticide: Deltamethrin at 6.2 g.

Seed: Mercia, sown at 170 kg.

Cultivations, etc.:- PK applied: 3 Sept, 1990. Ploughed: 10 Sept. Cultivated by rotary grubber: 26 Sept. Rotary harrowed, seed sown: 27 Sept. Isoproturon, pendimethalin and the insecticide applied: 15 Nov. N applied: 3 Apr, 1991. Fenpropimorph alone applied: 10 May. Chlorothalonil, flutriafol and fenpropimorph applied: 20 June. Glyphosate with wetting agent applied: 13 Aug. Combine harvested: 20 Aug.

NOTE: Plant and soil samples were taken frequently during the season to assess take-all. Additional soil samples were taken to measure the suppressiveness of the soil to the take-all fungus.

https://doi.org/10.23637/ERADOC-1-46 *pp 11*

91/R/CS/212

GRAIN TONNES/HECTARE

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

PREVCROP	
W13	6.91
BE2 W4	6.97
BE1 W4	7.21
BE1 W6	7.08
BE1 W7	7.41
BE1 W2	6.83
BE1 W1	6.51
BE1	7.72
Mean	7.08

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

PREVCROP
0.191

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

Stratum	d.f.	s.e.	cv%
BLOCK.WP	14	0.234	3.3

GRAIN MEAN DM% 87.6

PLOT AREA HARVESTED 0.00216

https://doi.org/10.23637/ERADOC-1-46

91/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 seventh year, w. wheat.

For previous years see 85-90/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 1985-91:

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, 1990 and 12 Apr, 1991.
(2) The eyespot inoculum was colonised on oat seed and this was broadcast in October, 1984.

Basal applications: Manure: 'Nitram' at 120 kg and later at 460 kg. Weedkillers: Tri-allate at 2.2 kg. Diflufenican at 0.10 kg and isoproturon at 1.0 kg in 200 l. Glyphosate at 0.54 kg with a wetting agent, 'Team' at 1.0 l, in 200 l.

Seed: Mercia, sown at 170 kg.

Cultivations, etc.:- Straw burnt, heavy spring-tine cultivated: 22 Aug, 1990. Ploughed, furrow pressed: 24 Aug. Rotary harrowed, seed sown: 24 Sept. Tri-allate applied: 2 Nov. Diflufenican and isoproturon applied: 9 Nov. First N applied: 14 Mar, 1991. Second N applied: 8 Apr. Glyphosate with wetting agent applied: 12 Aug. Combine harvested: 22 Aug.

https://doi.org/10.23637/ERADOC-1-46 *pp 13*

91/R/CS/302

NOTE: Eyespot and sharp eyespot were assessed at fortnightly intervals from May - July on the **EYE INOC** NATURAL plots only.

GRAIN TONNES/HECTARE

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

EYE INOC / **FUNGCIDE**	NATURAL	W 19R 1S	W 1R 19S	R 19R 1S	R 1R 19S	Mean
NONE	5.32	5.14	5.12	5.01	4.90	5.14
CARB	5.37	5.20	4.99	5.19	4.90	5.17
PRO	5.54	5.51	5.12	5.40	5.84	5.49
CARB+PRO	5.61	5.72	5.44	5.44	5.51	5.55
Mean	5.46	5.39	5.17	5.26	5.29	5.34

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

EYE INOC	**FUNGCIDE*** **EYE INOC**	
0.082	0.164	min.rep
0.071	0.142	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	0.164	3.1

GRAIN MEAN DM% 84.5

SUB PLOT AREA HARVESTED 0.00138

https://doi.org/10.23637/ERADOC-1-46

91/R/CS/309 and 91/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, W. Powell, A.D. Todd.

Associate sponsor: D.S. Powlson.

The seventh year, w. wheat.

For previous years see 85-90/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	Cultivated to 10 cm depth
TN10PL20	Cultivated to 10 cm depth, ploughed to 20 cm
TN10TN20	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 22 Aug, 1990 (R), 6 Aug (W) and burnt, 22 Aug (R), 14 Aug (W).
(2) Discs were used to cultivate TN10PL20 plots to 10 cm depth on 24 Aug (R), and all plots except PLOUGH20 on 13 Aug and 24 Sept (W). TINE 10 plots were cultivated to 10 cm with a rotary grubber on 11 Oct (R only). A chisel plough was used to cultivate to 20 cm depth, on 10 Oct (R) and a deep-tine cultivator to 20 cm on 14 Aug (W).
(3) Ploughed plots were ploughed to 20 cm depth, on 28 Aug (R), 18 Sept (W), and rolled: 29 Aug (R), 21 Sept (W).

Basal applications:
Great Knott III (R): Manures: 'Nitram' at 120 kg, followed by 580 kg. (0:16:36) at 1040 kg. Weedkillers: Glyphosate at 0.27 kg in 200 l. Tri-allate at 2.2 kg. Isoproturon at 1.3 kg and pendimethalin at 1.3 kg in 200 l. Fungicides: Fenpropimorph at 0.38 kg in 200 l. Propiconazole at 0.25 kg in 200 l.

https://doi.org/10.23637/ERADOC-1-46 *pp 15*

91/R/CS/309 and 91/W/CS/309

Basal applications:

Far Field I (W): Manures: Magnesian limestone at 7.5 t. 'Nitram' at 120 kg followed by 580 kg. Weedkillers: Glyphosate at 0.27 kg in 220 l. Tri-allate at 1.7 kg in 220 l. Pendimethalin at 1.3 kg with isoproturon at 1.2 kg applied with the insecticide in 220 l. Fungicides: Fenpropimorph at 0.38 kg in 210 l, and on a second occasion with chlorothalonil at 0.49 kg and flutriafol at 78 g in 300 l. Insecticide: Deltamethrin at 5.0 g.

Seed: Haven, sown at 190 kg (R), 170 kg (W).

Cultivations, etc.:-

Great Knott III (R): Glyphosate applied: 8 Oct, 1990. Disced and rotary harrowed: 11 Oct. Seed sown, harrowed: 12 Oct. Rolled: 15 Oct. Tri-allate applied: 2 Nov. Isoproturon and pendimethalin applied: 15 Nov. N applied: 4 Mar, 1991 and 3 Apr. P and K applied: 12 Apr. Fenpropimorph applied: 24 Apr. Propiconazole applied: 11 June. Combine harvested: 21 Aug.

Far Field I (W): Magnesian limestone applied: 23 Aug, 1990. Glyphosate applied: 11 Sept. Tri-allate applied, rotary harrowed, seed sown: 2 Oct. Remaining weedkillers and insecticide applied: 27 Nov. N applied: 15 Mar, 1991 and 17 Apr. Fenpropimorph applied: 24 Apr. Fenpropimorph, chlorothalonil and flutriafol applied: 20 June. Combine harvested: 25 Aug.

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

https://doi.org/10.23637/ERADOC-1-46

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

GRAIN TONNES/HECTARE

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

CULTIVTN / STRAW	TINE 10	TN10PL20	TN10TN20	PLOUGH20	Mean
BURNT	8.80	8.32	8.56	8.38	8.52
CHOPPED	7.15	8.52	8.73	8.65	8.26
Mean	7.70	8.46	8.67	8.56	8.35

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

STRAW	CULTIVTN	STRAW CULTIVTN	
		0.578	min.rep
0.250	0.334	0.501	max-min
		0.409	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	0.818	9.8

GRAIN MEAN DM% 88.7

PLOT AREA HARVESTED 0.00621

https://doi.org/10.23637/ERADOC-1-46

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

GRAIN TONNES/HECTARE

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

CULTIVTN / STRAW	TINE 10	TN10PL20	TN10TN20	PLOUGH20	Mean
BURNT	8.67	8.59	9.16	9.30	8.93
CHOPPED	7.76	8.29	7.82	8.72	8.15
Mean	8.07	8.39	8.27	8.91	8.41

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

STRAW	CULTIVTN	STRAW CULTIVTN	
		0.529	min.rep
0.229	0.305	0.458	max-min
		0.374	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	0.529	6.3

GRAIN MEAN DM% 85.1

PLOT AREA HARVESTED 0.00609

https://doi.org/10.23637/ERADOC-1-46

91/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, W. Powell, A.D. Todd.

The seventh year, w. wheat.

For previous years see 85-90/R/CS/311.

Design: Single replicate of 3 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 22 Aug, 1990
	BALED	Baled and removed on 21 Aug
	CHOPPED	Chopped on 22 Aug
2. **CULTTIME**		Time of cultivation, to 10 cm depth:
	EARLY	Cultivated by rotary grubber on 23 Aug, 1990
	LATER	Cultivated by rotary grubber on 14 Sept

Sub plots

3. **FUNGCIDE**		Fungicides:
	0	None
	FULL	Full programme:- Triadimefon at 0.12 kg and carbendazim at 0.25 kg in 200 l on 3 Dec, 1990 Prochloraz at 0.40 kg and carbendazim at 0.15 kg in 200 l on 12 Apr, 1991 Propiconazole at 0.12 kg with chlorothalonil at 0.50 kg in 200 l on 20 June
4. **INSCTCDE**		Insecticides:
	0	None
	CYP+PIR	Cypermethrin at 25 g in 200 l on 6 Nov, 1990 Pirimicarb at 0.14 kg in 200 l on 2 July, 1991
5. **MOLLCIDE**		Molluscicide:
	0	None
	METHCARB	Methiocarb at 0.22 kg on 11 Oct, 1990

NOTE: STRAW BURNT plots were disced the day after burning.

https://doi.org/10.23637/ERADOC-1-46

91/R/CS/311

Basal applications: Manures: 'Nitram' at 120 kg and later at 580 kg. Weedkillers: Glyphosate at 0.18 kg and later at 1.4 kg, both in 200 l. Tri-allate at 2.2 kg. Bifenox at 0.95 kg and chlorotoluron at 3.5 kg in 200 l.

Seed: Haven, sown at 190 kg.

Cultivations, etc.:- First glyphosate applied: 8 Oct, 1990. Rotary harrowed, seed sown: 10 Oct. Tri-allate applied: 2 Nov. Bifenox and chlorotoluron applied: 13 Nov. First N applied: 4 Mar, 1991. Second N applied: 5 Apr. Second glyphosate applied: 13 Aug. Combine harvested: 20 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	8.84	8.42	8.63
BALED	9.00	9.23	9.11
CHOPPED	8.78	8.23	8.51
Mean	8.87	8.63	8.75

FUNGCIDE	O	FULL	Mean
STRAW			
BURNT	7.71	9.55	8.63
BALED	8.39	9.84	9.11
CHOPPED	7.66	9.35	8.51
Mean	7.92	9.58	8.75

FUNGCIDE	O	FULL	Mean
CULTTIME			
EARLY	8.17	9.57	8.87
LATER	7.66	9.59	8.63
Mean	7.92	9.58	8.75

INSCTCDE	O	CYP+PIR	Mean
STRAW			
BURNT	8.44	8.82	8.63
BALED	9.05	9.18	9.11
CHOPPED	8.51	8.50	8.51
Mean	8.66	8.83	8.75

https://doi.org/10.23637/ERADOC-1-46

91/R/CS/311

GRAIN TONNES/HECTARE

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

INSCTCDE	O	CYP+PIR	Mean
CULTTIME			
EARLY	8.72	9.02	8.87
LATER	8.61	8.65	8.63
Mean	8.66	8.83	8.75

INSCTCDE	O	CYP+PIR	Mean
FUNGCIDE			
O	7.76	8.08	7.92
FULL	9.57	9.59	9.58
Mean	8.66	8.83	8.75

MOLLCIDE	O	METHCARB	Mean
STRAW			
BURNT	8.57	8.69	8.63
BALED	9.02	9.21	9.11
CHOPPED	8.53	8.48	8.51
Mean	8.71	8.79	8.75

MOLLCIDE	O	METHCARB	Mean
CULTTIME			
EARLY	8.84	8.91	8.87
LATER	8.58	8.68	8.63
Mean	8.71	8.79	8.75

MOLLCIDE	O	METHCARB	Mean
FUNGCIDE			
O	7.84	7.99	7.92
FULL	9.57	9.59	9.58
Mean	8.71	8.79	8.75

MOLLCIDE	O	METHCARB	Mean
INSCTCDE			
O	8.64	8.69	8.66
CYP+PIR	8.77	8.90	8.83
Mean	8.71	8.79	8.75

https://doi.org/10.23637/ERADOC-1-46

91/R/CS/311

GRAIN TONNES/HECTARE

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

			STRAW*
FUNGCIDE	INSCTCDE	MOLLCIDE	FUNGCIDE
0.111	0.111	0.111	0.192
CULTTIME*	STRAW*	CULTTIME*	FUNGCIDE
FUNGCIDE	INSCTCDE	INSCTCDE	INSCTCDE
0.156	0.192	0.156	0.156
STRAW*	CULTTIME*	FUNGCIDE	INSCTCDE
MOLLCIDE	MOLLCIDE	MOLLCIDE	MOLLCIDE
0.192	0.156	0.156	0.156

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

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

Stratum	d.f.	s.e.	cv%
WP.SP	27	0.383	4.4

GRAIN MEAN DM% 89.6

SUB PLOT AREA HARVESTED 0.00276

https://doi.org/10.23637/ERADOC-1-46

91/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 fourth year, w. barley, w. oats, w. triticale, w. wheat, s. barley.

For previous years see 88-90/R/CS/323

Design: 3 randomised blocks of 26 plots.

Whole plot dimensions: 3.0 x 10.0.

CROPSEQ	Crop sequences (1988, 1989, 1990 and 1991 respectively):
W W S S	W. wheat, w. wheat, s. barley, s. barley
B B B B	W. barley, w. barley, w. barley, w. barley
O B B B	W. oats, w. barley, w. barley, w. barley
B O B B	W. barley, w. oats, w. barley, w. barley
B B O B	W. barley, w. barley, w. oats, w. barley
S B S B	S. barley, w. barley, s. barley, w. barley
T T B B	W. triticale, w. triticale, w. barley, w. barley
T B T B	W. triticale, w. barley, w. triticale, w. barley
W B W B	W. wheat, w. barley, w. wheat, w. barley
W W B B	W. wheat, w. wheat, w. barley, w. barley
B B B O	W. barley, w. barley, w. barley, w. oats
T T T O	W. triticale, w. triticale, w. triticale, w. oats
W W W O	W. wheat, w. wheat, w. wheat, w. oats
T T T T	W. triticale, w. triticale, w. triticale, w. triticale
B B T T	W. barley, w. barley, w. triticale, w. triticale
O T T T	W. oats, w. triticale, w. triticale, w. triticale
T O T T	W. triticale, w. oats, w. triticale, w. triticale
T T O T	W. triticale, w. triticale, w. oats, w. triticale
W W T T	W. wheat, w. wheat, w. triticale, w. triticale
W T W T	W. wheat, w. triticale, w. wheat, w. triticale
W W W W	W. wheat, w. wheat, w. wheat w. wheat
B B W W	W. barley, w. barley, w. wheat, w. wheat
O W W W	W. oats, w. wheat, w. wheat, w. wheat
W O W W	W. wheat, w. oats, w. wheat, w. wheat
W W O W	W. wheat, w. wheat, w. oats, w. wheat
T T W W	W. triticale, w. triticale, w. wheat, w. wheat

Standard applications:

W. cereals: Manures: (0:16:36) at 300 kg. N at 30 kg to all w. cereals followed by N at 150 kg (w. barley), 170 kg (w. wheat), and 120 kg (w. oats and w. triticale), all as 'Nitram'. Weedkillers: Isoxaben at 76 g and methabenzthiazuron at 1.6 kg in 200 l. Fluroxypyr at 0.15 kg in 200 l. Fungicides: Carbendazim at 0.15 kg and prochloraz at 0.40 kg with tridemorph at 0.26 kg in 200 l.

https://doi.org/10.23637/ERADOC-1-46 *pp 23*

91/R/CS/323

Standard applications:
S. barley: Manures: (0:16:36) at 300 kg. N at 120 kg as 'Nitram'. Weedkiller: Metsulfuron-methyl at 6.0 g with fenpropimorph in 200 l. Fungicides: Carbendazim at 0.15 kg and prochloraz at 0.40 kg with tridemorph at 0.26 kg in 200 l. Fenpropimorph at 0.75 kg.

Seed: W. barley: Magie, sown at 130 kg.
W. oats: Image, sown at 130 kg.
W. triticale: Lasko, sown at 140 kg.
W. wheat: Mercia, sown at 170 kg.
S. barley: Klaxon, sown at 120 kg.

Cultivations, etc.:-
W. cereals: Ploughed, furrow pressed: 4 Sept, 1990. PK applied: 14 Sept. Rotary harrowed twice: 17 Sept. Rotary harrowed, seed sown: 19 Sept. Isoxaben and methabenzthiazuron applied: 20 Sept. First N applied: 4 Mar, 1991. Fluroxypyr applied: 12 Apr. Second N applied: 15 Apr. Fungicides applied: 23 Apr. Combine harvested: 12 Aug (w. barley), 20 Aug (w. wheat), 27 Aug (w. oats and w. triticale).
S. barley: Ploughed, furrow pressed: 4 Sept, 1990. PK applied: 14 Sept. Rotary harrowed twice: 17 Sept. N applied: 14 Mar, 1991. Rotary harrowed twice, seed sown: 15 Mar. Carbendazim, prochloraz and tridemorph applied: 23 Apr. Weedkiller with fenpropimorph applied: 11 June. Combine harvested: 15 Aug.

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

https://doi.org/10.23637/ERADOC-1-46

91/R/CS/323

GRAIN TONNES/HECTARE

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

CROPSEQ	
W W S S	5.40
B B B B	5.89
O B B B	7.22
B O B B	7.14
B B O B	7.36
S B S B	7.16
T T B B	6.63
T B T B	5.79
W B W B	6.54
W W B B	5.71
B B B O	5.98
T T T O	6.35
W W W O	5.08
T T T T	4.19
B B T T	4.51
O T T T	4.38
T O T T	3.93
T T O T	5.54
W W T T	4.21
W T W T	4.42
W W W W	5.65
B B W W	6.34
O W W W	7.38
W O W W	7.05
W W O W	7.05
T T W W	5.04
Mean	5.84

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

CROPSEQ
0.389

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

Stratum	d.f.	s.e.	cv%
BLOCK.WP	50	0.476	8.2

GRAIN MEAN DM% 84.9

PLOT AREA HARVESTED 0.00226

https://doi.org/10.23637/ERADOC-1-46

91/R/CS/326 and 91/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 fifth year, w. wheat.

For previous years see 87-90/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 per ha 85% DM), cumulative to previous annual dressings:

		R	W
NONE	None	-	-
NORMAL	Normal	3.9	3.0
2 NORMAL	Twice normal	7.8	6.0
4 NORMAL	Four times normal	15.6	12.0

NOTES: (1) Straw treatments were applied on 14 Aug, 1990 (R), 15 Aug (W) and chopped by trailed straw chopper and spread on 22 Aug (R), 19 Aug (W).
(2) At Rothamsted straw was incorporated by plough on 24 Aug. At Woburn it was disc cultivated to 10 cm on 24 Sept.

Basal applications:
Great Knott III (R): Manures: 'Nitram' at 120 kg followed by 580 kg. (0:16:36) at 1040 kg. Weedkillers: Glyphosate at 0.27 kg in 200 l. Tri-allate at 2.2 kg. Isoproturon at 1.3 kg and pendimethalin at 1.3 kg in 200 l. Fungicides: Fenpropimorph at 0.38 kg in 200 l. Propiconazole at 0.25 kg in 200 l.
Far Field I (W): Manures: Magnesian limestone at 7.5 t. 'Nitram' at 120 kg followed by 580 kg. Weedkillers: Glyphosate at 0.27 kg in 220 l. Tri-allate at 1.7 kg in 220 l. Pendimethalin at 1.3 kg with isorpoturon at 1.2 kg applied with the insecticide in 220 l. Fungicides: Fenpropimorph at 0.38 kg in 210 l and on a second occasion with chlorothalonil at 0.49 kg and flutriafol at 78 g in 300 l. Insecticide: Deltamethrin at 5.0 g.

Seed: Haven, sown at 190 kg (R), 170 kg (W).

https://doi.org/10.23637/ERADOC-1-46 *pp 26*

91/R/CS/326 and 91/W/CS/326

Cultivations, etc.:-

Great Knott III (R): Ploughed and rolled: 24 Aug, 1990. Glyphosate applied: 8 Oct. Rotary harrowed, seed sown and harrowed: 12 Oct. Rolled: 15 Oct. Tri-allate applied: 2 Nov. Isoproturon and pendimethalin applied: 15 Nov. N applied: 4 Mar, 1991 and 3 Apr. P and K applied: 12 Apr. Fenpropimorph applied: 24 Apr. Propiconazole applied: 11 June. Combine harvested: 21 Aug.

Far Field I (W): Magnesian limestone applied: 23 Aug. Glyphosate applied: 11 Sept. Disced twice: 24 Sept. Tri-allate applied, rotary harrowed, seed sown: 2 Oct. Pendimethalin, isoproturon and deltamethrin applied: 27 Nov. N applied: 15 Mar, 1991 and 17 Apr. Fenpropimorph applied: 24 Apr. Fenpropimorph, chlorothalonil and flutriafol applied: 20 June. Combine harvested: 22 Aug.

NOTES: (1) Establishment counts were made in autumn. Shoot numbers and dry weights in spring, fertile ear numbers at anthesis and harvest index were measured.
(2) Foot and root rots were assessed in summer.

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

GRAIN TONNES/HECTARE

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

STRAW	
NONE	8.24
NORMAL	8.43
2 NORMAL	7.87
4 NORMAL	8.61
Mean	8.29

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

STRAW
0.416

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

Stratum	d.f.	s.e.	cv%
BLOCK.WP	9	0.588	7.1

GRAIN MEAN DM% 87.3

PLOT AREA HARVESTED 0.00307

https://doi.org/10.23637/ERADOC-1-46

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

GRAIN TONNES/HECTARE

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

	STRAW
NONE	7.59
NORMAL	7.84
2 NORMAL	6.89
4 NORMAL	7.99
Mean	7.58

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

STRAW
0.936

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

Stratum	d.f.	s.e.	cv%
BLOCK.WP	6	1.147	15.1

GRAIN MEAN DM% 86.1

PLOT AREA HARVESTED 0.00302

https://doi.org/10.23637/ERADOC-1-46

91/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 fourth year, lucerne.

For previous years see 88-90/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** Residues of carbofuran (kg) applied 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

NOTE: Carbofuran was applied to lucerne on 7 Apr, 1988 at sowing.

Basal applications: Manures: (0:16:36) at 510 kg. Weedkillers: 2,4-DB at 1.3 kg in 220 l. Paraquat at 0.40 kg ion in 220 l. Fluazifop-P-butyl at 0.19 kg in 220 l.

Cultivations, etc.:- P and K applied: 16 Nov, 1990. 2,4-DB applied: 14 Dec. Paraquat applied: 7 Mar, 1991. Fluazifop-P-butyl applied: 10 Apr. Cut: 20 May, 9 July, 12 Aug and 3 Oct.

https://doi.org/10.23637/ERADOC-1-46 *pp 29*

91/R/CS/327

1ST CUT (20/5/91) DRY MATTER TONNES/HECTARE

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

CARBRATE	(0.0)	(1.5)	Mean
VARIETY			
EUROPE	2.67	1.88	2.28
EUVA	4.48	3.59	4.04
VELA	1.02	1.07	1.04
VERTUS	5.80	5.11	5.45
Mean	3.49	2.91	3.20

ROWSPACE	15	30	Mean
VARIETY			
EUROPE	2.62	1.94	2.28
EUVA	4.34	3.73	4.04
VELA	1.23	0.86	1.04
VERTUS	5.92	4.99	5.45
Mean	3.53	2.88	3.20

ROWSPACE	15	30	Mean
CARBRATE			
(0.0)	3.76	3.23	3.49
(1.5)	3.30	2.53	2.91
Mean	3.53	2.88	3.20

ROWSPACE	15	30
VARIETY CARBRATE		
EUROPE (0.0)	3.07	2.28
EUROPE (1.5)	2.17	1.59
EUVA (0.0)	4.62	4.35
EUVA (1.5)	4.07	3.11
VELA (0.0)	1.19	0.86
VELA (1.5)	1.27	0.86
VERTUS (0.0)	6.16	5.44
VERTUS (1.5)	5.68	4.54

CA3 RO15	EUROPE	EUVA	VELA	VERTUS	Mean
	2.10	3.88	1.32	4.56	2.96

GRAND MEAN 3.16

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

CA3 RO15	VARIETY	CARBRATE	ROWSPACE
0.322	0.161	0.114	0.114

VARIETY CARBRATE	VARIETY ROWSPACE	CARBRATE ROWSPACE	VARIETY CARBRATE ROWSPACE
0.228	0.228	0.161	0.322

https://doi.org/10.23637/ERADOC-1-46

91/R/CS/327

1ST CUT (20/5/91) DRY MATTER TONNES/HECTARE

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

Stratum	d.f.	s.e.	cv%
BLOCK.WP	19	0.322	10.2

IST CUT MEAN DM% 15.7

2ND CUT (9/7/91) DRY MATTER TONNES/HECTARE

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

CARBRATE / **VARIETY**	(0.0)	(1.5)	Mean
EUROPE	3.68	3.79	3.74
EUVA	4.89	4.40	4.65
VELA	3.34	3.67	3.51
VERTUS	5.42	5.16	5.29
Mean	4.34	4.26	4.30

ROWSPACE / **VARIETY**	15	30	Mean
EUROPE	4.00	3.48	3.74
EUVA	4.93	4.37	4.65
VELA	3.88	3.13	3.51
VERTUS	5.48	5.10	5.29
Mean	4.57	4.02	4.30

ROWSPACE / **CARBRATE**	15	30	Mean
(0.0)	4.58	4.09	4.34
(1.5)	4.56	3.95	4.26
Mean	4.57	4.02	4.30

VARIETY	**ROWSPACE** / **CARBRATE**	15	30
EUROPE	(0.0)	3.89	3.48
	(1.5)	4.11	3.47
EUVA	(0.0)	5.11	4.68
	(1.5)	4.76	4.05
VELA	(0.0)	3.66	3.01
	(1.5)	4.09	3.25
VERTUS	(0.0)	5.67	5.18
	(1.5)	5.30	5.03

CA3 RO15	EUROPE	EUVA	VELA	VERTUS	Mean
	3.61	4.53	3.49	4.93	4.14

GRAND MEAN 4.27

https://doi.org/10.23637/ERADOC-1-46 *pp 31*

91/R/CS/327

2ND CUT (9/7/91) DRY MATTER TONNES/HECTARE

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

CA3 RO15	VARIETY	CARBRATE	ROWSPACE
0.311	0.155	0.110	0.110

VARIETY CARBRATE	VARIETY ROWSPACE	CARBRATE ROWSPACE	VARIETY CARBRATE ROWSPACE
0.220	0.220	0.155	0.311

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

Stratum	d.f.	s.e.	cv%
BLOCK.WP	19	0.311	7.3

2ND CUT MEAN DM% 17.4

3RD CUT (12/8/91) DRY MATTER TONNES/HECTARE

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

CARBRATE VARIETY	(0.0)	(1.5)	Mean
EUROPE	3.16	2.93	3.04
EUVA	3.79	3.56	3.67
VELA	2.34	2.59	2.46
VERTUS	4.14	4.03	4.08
Mean	3.36	3.28	3.32

ROWSPACE VARIETY	15	30	Mean
EUROPE	3.26	2.83	3.04
EUVA	3.66	3.69	3.67
VELA	2.72	2.20	2.46
VERTUS	4.25	3.92	4.08
Mean	3.47	3.16	3.32

ROWSPACE CARBRATE	15	30	Mean
(0.0)	3.48	3.24	3.36
(1.5)	3.47	3.08	3.28
Mean	3.47	3.16	3.32

https://doi.org/10.23637/ERADOC-1-46

91/R/CS/327

3RD CUT (12/8/91) DRY MATTER TONNES/HECTARE

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

VARIETY	ROWSPACE CARBRATE	15	30
EUROPE	(0.0)	3.42	2.90
	(1.5)	3.09	2.76
EUVA	(0.0)	3.63	3.95
	(1.5)	3.69	3.44
VELA	(0.0)	2.54	2.14
	(1.5)	2.91	2.27
VERTUS	(0.0)	4.31	3.97
	(1.5)	4.19	3.87

CA3 RO15	EUROPE	EUVA	VELA	VERTUS	Mean
	2.87	3.66	2.50	3.56	3.15

GRAND MEAN 3.28

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

CA3 RO15	VARIETY	CARBRATE	ROWSPACE
0.387	0.194	0.137	0.137

VARIETY CARBRATE	VARIETY ROWSPACE	CARBRATE ROWSPACE	VARIETY CARBRATE ROWSPACE
0.274	0.274	0.194	0.387

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

Stratum	d.f.	s.e.	cv%
BLOCK.WP	19	0.387	11.8

3RD CUT MEAN DM% 16.3

4TH CUT (3/10/91) DRY MATTER TONNES/HECTARE

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

CARBRATE VARIETY	(0.0)	(1.5)	Mean
EUROPE	1.79	1.62	1.70
EUVA	2.19	2.15	2.17
VELA	1.12	1.21	1.16
VERTUS	2.53	2.44	2.48
Mean	1.91	1.85	1.88

https://doi.org/10.23637/ERADOC-1-46

91/R/CS/327

4TH CUT (3/10/91) DRY MATTER TONNES/HECTARE

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

ROWSPACE	15	30	Mean
VARIETY			
EUROPE	1.91	1.49	1.70
EUVA	2.23	2.11	2.17
VELA	1.29	1.04	1.16
VERTUS	2.59	2.37	2.48
Mean	2.01	1.75	1.88

ROWSPACE	15	30	Mean
CARBRATE			
(0.0)	1.99	1.82	1.91
(1.5)	2.02	1.69	1.85
Mean	2.01	1.75	1.88

	ROWSPACE	15	30
VARIETY	CARBRATE		
EUROPE	(0.0)	2.06	1.51
	(1.5)	1.77	1.46
EUVA	(0.0)	2.13	2.26
	(1.5)	2.34	1.96
VELA	(0.0)	1.20	1.03
	(1.5)	1.37	1.05
VERTUS	(0.0)	2.59	2.47
	(1.5)	2.60	2.28

CA3 RO15	EUROPE	EUVA	VELA	VERTUS	Mean
	1.58	2.23	1.29	2.38	1.87

GRAND MEAN 1.88

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

CA3 RO15	VARIETY	CARBRATE	ROWSPACE
0.174	0.087	0.062	0.062

VARIETY CARBRATE	VARIETY ROWSPACE	CARBRATE ROWSPACE	VARIETY CARBRATE ROWSPACE
0.123	0.123	0.087	0.174

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

Stratum	d.f.	s.e.	cv%
BLOCK.WP	19	0.174	9.3

4TH CUT MEAN DM% 20.8

https://doi.org/10.23637/ERADOC-1-46

91/R/CS/327

TOTAL OF 4 CUTS DRY MATTER TONNES/HECTARE

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

CARBRATE	(0.0)	(1.5)	Mean
VARIETY			
EUROPE	11.31	10.22	10.76
EUVA	15.35	13.71	14.53
VELA	7.81	8.54	8.18
VERTUS	17.89	16.74	17.32
Mean	13.09	12.30	12.70

ROWSPACE	15	30	Mean
VARIETY			
EUROPE	11.79	9.73	10.76
EUVA	15.17	13.90	14.53
VELA	9.12	7.24	8.18
VERTUS	18.24	16.39	17.32
Mean	13.58	11.81	12.70

ROWSPACE	15	30	Mean
CARBRATE			
(0.0)	13.81	12.38	13.09
(1.5)	13.35	11.25	12.30
Mean	13.58	11.81	12.70

ROWSPACE	15	30
VARIETY CARBRATE		
EUROPE (0.0)	12.44	10.18
EUROPE (1.5)	11.14	9.29
EUVA (0.0)	15.47	15.24
EUVA (1.5)	14.86	12.56
VELA (0.0)	8.59	7.04
VELA (1.5)	9.65	7.44
VERTUS (0.0)	18.73	17.05
VERTUS (1.5)	17.76	15.72

CA3 RO15	EUROPE	EUVA	VELA	VERTUS	Mean
	10.16	14.30	8.60	15.42	12.12

GRAND MEAN 12.58

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

CA3 RO15	VARIETY	CARBRATE	ROWSPACE
0.929	0.465	0.329	0.329

VARIETY CARBRATE	VARIETY ROWSPACE	CARBRATE ROWSPACE	VARIETY CARBRATE ROWSPACE
0.657	0.657	0.465	0.929

https://doi.org/10.23637/ERADOC-1-46

91/R/CS/327

TOTAL OF 4 CUTS DRY MATTER TONNES/HECTARE

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

Stratum	d.f.	s.e.	cv%
BLOCK.WP	19	0.929	7.4

TOTAL OF 4 CUTS MEAN DM% 17.5

PLOT AREA HARVESTED 0.00045

https://doi.org/10.23637/ERADOC-1-46

91/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 third year, w. wheat, w. oats.

For previous years see 89-90/R/CS/331

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 in the first year, none to w. wheat in 1990:
NONE O W	None (w. oats 1991, alternating with w. wheat)
NONE W O	None (w. wheat 1991, alternating with w. oats)
NONE W W	None (continuous w. wheat)
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.
(2) The sequence of cultivations in the first year was identical for all treatments: Plough to 23 cm, cultivate to level, traverse with fertilizer drill to 10 cm, rotary harrow to 10 cm and sow wheat with combine drill. In the second year the cultivations, all basal, were: Ploughed, rotary harrowed three times and seed sown. In the third year basal cultivations were: Ploughed on 10 Sept, 1990, rotary harrowed and seed sown, 26 Sept.
(3) The weedkillers applied to wheat were in error also applied to oats. No yields recorded.

Basal applications: Manures: (0:16:36) at 980 kg. 'Nitram' at 120 kg and later at 580 kg. Weedkillers: Isoproturon at 1.3 kg and pendimethalin at 1.3 kg with the insecticide in 200 l. Fungicides: Fenpropimorph at 0.38 kg in 200 l. Chlorothalonil at 0.49 kg and flutriafol at 0.08 kg with fenpropimorph at 0.38 kg in 200 l. Insecticide: Deltamethrin at 6.2 g.

Seed: W. wheat: Mercia, sown at 170 kg.
W. oats: Image, sown at 120 kg.

https://doi.org/10.23637/ERADOC-1-46 *pp 37*

91/R/CS/331

Cultivations, etc.:- PK applied: 3 Sept, 1990. Weedkillers with the insecticide applied: 15 Nov. N applied: 13 Mar, 1991 and later on 3 Apr. Fenpropimorph alone applied: 10 May. Fenpropimorph with chlorothalonil and flutriafol applied: 20 June. Combine harvested: 20 Aug (wheat), 27 Aug (oats).

NOTE: Plants were sampled 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.

GRAIN TONNES/HECTARE

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

INOCMETH	
NONE W O	8.21
NONE W W	7.85
I PRE PL	8.01
N PRE PL	8.05
I PRE SO	8.03
N PRE SO	7.91
I CD	7.93
N CD	8.20
Mean	8.02

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

INOCMETH
0.180

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

Stratum	d.f.	s.e.	cv%
BLOCK.WP	21	0.254	3.2

GRAIN MEAN DM% 87.7

PLOT AREA HARVESTED 0.00506

https://doi.org/10.23637/ERADOC-1-46

91/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 third year, w. wheat.

For previous years see 89-90/W/CS/336.

Design: 3 randomised blocks of 7 plots split into 7 sub plots.

Whole plot dimensions: 10.0 x 24.0.

Treatments: All combinations of:-

Whole plots

1. **LAND TRT[89]** Land treatment in 1989, after s. wheat 1988 (all treatments ploughed in autumn 1989 and 1990 before w. wheat in 1990 and 1991):

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

Sub plots

2. **N RES** Residues of nitrogen fertilizer to w. wheat in 1990 (kg N):

(0)
(37)
(56)
(73)
(92)
(110)
(128)

NOTE: An additional fallow sub plot was present, systematically arranged on one side of each whole plot.

https://doi.org/10.23637/ERADOC-1-46 *pp 39*

91/W/CS/336

Standard applications:

W. wheat: Manures: 'Nitram' at 580 kg. Weedkillers: Diclofop at 1.1 kg applied with the insecticide in 220 l. Diflufenican at 0.10 kg and isoproturon at 1.0 kg in 220 l. Fluroxypyr at 0.20 kg with bromoxynil at 0.34 kg and clopyralid at 0.07 kg in 200 l. Fungicides: Fenpropimorph at 0.38 kg in 210 l, and on a second occasion with chlorothalonil at 0.49 kg and flutriafol at 0.078 kg in 300 l. Insecticide: Deltamethrin at 5.0 g.

Fallow: Weedkiller: Linuron at 1.5 kg with paraquat at 0.6 kg ion in 210 l.

Seed: W. wheat: Mercia, sown at 150 kg.

Cultivations, etc.:-

W. wheat: Straw chopped on plots: 8 Aug, 1990. Ploughed: 14 Sept. Rotary harrowed with crumbler attached, seed sown: 26 Sept. Diclofop and insecticide applied: 27 Nov. Diflufenican and isoproturon applied: 5 Dec. Fluroxypyr, bromoxynil and clopyralid applied: 12 Apr, 1991. N applied: 17 Apr. Fenpropimorph applied: 24 Apr. Fenpropimorph, chlorothalonil and flutriafol applied: 20 June. Combine harvested: 20 Aug.

Fallow: Weedkiller applied: 20 May. Rotary cultivated: 15 July.

NOTE: Amounts of soil nitrogen were measured in autumn and spring on CA RA and WT plots. Assessments of plant cover were made in autumn. Plant samples were taken to assess diseases.

https://doi.org/10.23637/ERADOC-1-46

91/W/CS/336

GRAIN TONNES/HECTARE

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

N RES	(0)	(37)	(56)	(73)	(92)	(110)	(128)	Mean
LAND TRT[89]								
CA WW	6.30	5.54	6.21	5.61	5.72	5.58	5.72	5.81
CA RA	7.77	7.90	8.01	7.41	8.15	7.40	7.46	7.73
SA CA FA	6.44	6.53	7.00	6.58	6.85	7.43	7.43	6.89
CA CS	4.28	5.51	5.78	5.67	6.01	6.78	6.38	5.77
SA CS	4.27	5.48	5.03	5.44	6.26	6.29	6.13	5.56
WT	4.32	5.66	4.06	4.44	5.21	6.08	6.02	5.11
WT CS TS	4.60	5.13	5.68	6.16	5.57	6.09	6.11	5.62
Mean	5.43	5.96	5.97	5.90	6.25	6.52	6.46	6.07

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

LAND TRT[89]	**N RES LAND TRT[89]**	**N RES**
0.629	0.198	0.794

Except when comparing means with the same level(s) of
LAND TRT[89] 0.524

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

Stratum	d.f.	s.e.	cv%
BLOCK.WP	12	0.770	12.7
BLOCK.WP.SP	84	0.641	10.6

GRAIN MEAN DM% 87.8

SUB PLOT AREA HARVESTED 0.00199

https://doi.org/10.23637/ERADOC-1-46 *pp 41*

91/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. oilseed rape and the extent to which responses are affected by amounts of nitrogen fertilizer - Woburn, Butt Close II.

Sponsors: S.P. McGrath, G.F.J. Milford.

The third year, w. oilseed rape.

For previous years see 89-90/W/CS/339.

Design: 3 randomised blocks of 12 plots.

Whole plot dimensions: 4.0 x 8.0.

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 'Nitro-Chalk':

   0
   180
   230

NOTES: (1) Sulphur and nitrogen treatments were not cumulative to previous years but were re-randomized.
(2) Nitrogen treatments were applied in two stages; 40 kg N: 26 Feb, 1991 and the remainder: 5 Apr. Sulphur was applied on 26 Feb.

Basal applications: Manure: 'Nitram' at 145 kg. Weedkillers: Quizalofop-ethyl at 38 g with metazachlor at 0.75 kg and adjuvant 'Cropspray 11E' at 2.0 l in 220 l. Benazolin at 0.30 kg and clopyralid at 0.05 kg with insecticide in 220 l. Fungicides: Benomyl at 0.25 kg in 220 l. Prochloraz at 0.32 kg with insecticide in 200 l. Insecticide: Deltamethrin at 6.2 g on the first occasion and at 12 g on the second. Irrigation: 12 mm on each of two occasions.

Seed: Libravo, sown at 6.0 kg.

Cultivations, etc.:- Subsoiled: 28 Aug, 1990. Disced, ploughed and rolled: 29 Aug. Basal N applied, rotary harrowed, seed sown: 30 Aug. Irrigation applied: 19 and 20 Sept. Quizalofop-ethyl, metazachlor and adjuvant applied: 1 Nov. Benazolin, clopyralid and deltamethrin applied: 15 Nov. Benomyl applied: 17 Dec. Prochloraz and deltamethrin applied: 12 Apr, 1991. Combine harvested: 13 Aug.

https://doi.org/10.23637/ERADOC-1-46 *pp 42*

91/W/CS/339

GRAIN (AT 90% DRY MATTER) TONNES/HECTARE

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

S / N	0	10	20	40	Mean
0	0.44	0.44	0.30	0.40	0.39
180	1.90	2.69	2.14	2.31	2.26
230	1.12	1.74	2.73	2.72	2.08
Mean	1.15	1.62	1.72	1.81	1.58

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

N	S	N S
0.207	0.239	0.413

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

Stratum	d.f.	s.e.	cv%
BLOCK.WP	22	0.506	32.1

GRAIN MEAN DM% 85.8

STRAW (AT 90% DRY MATTER) TONNES/HECTARE

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

S / N	0	10	20	40	Mean
0	1.50	1.44	0.99	1.36	1.32
180	2.99	3.34	3.19	3.01	3.13
230	3.13	2.34	3.18	3.37	3.01
Mean	2.54	2.37	2.46	2.58	2.49

STRAW MEAN DM% 41.5

PLOT AREA HARVESTED 0.00084

https://doi.org/10.23637/ERADOC-1-46

91/W/CS/342

CATCH CROPS

Object: To compare a range of catch crops for their ability to take up N during the autumn, to measure rates of mineralization of N after incorporating them in spring and to measure their effects on the yield of a subsequent spring barley crop in the first year and on winter barley in the second - Woburn, Road Piece.

Sponsors: D.G. Christian, D.S. Powlson.

The second year, w. barley.

For first year see 90/W/CS/342.

Design: 3 randomised blocks of 11 plots split into 2 sub plots criss-cross.

Whole plot dimensions: 8.0 x 10.0.

Treatments: All combinations of:-

Whole plots

1. **CROP RES**		Catch crops and subsequent crops in 1990, all w. barley in 1991:
		Sown 1989, ploughed in March 1990 and s. barley sown:
	AL CL SB	Alsike clover
	FA CU SB	Fallow, cultivated to keep soil bare
	FA UC SB	Fallow, uncultivated, weeds and volunteers allowed to grow
	FO RA SB	Forage rape
	PH TA SB	Phacelia tanacetifolia
	RY GR SB	Ryegrass
	RYE SB	Rye
	WH MU SB	White mustard
	WM+RY SB	White mustard + rye
	WW SB	Winter wheat
		Sown 1989, taken to normal maturity:
	W WHEAT	Winter wheat

Sub plots

2.	**N RES**	Nitrogen fertilizer (kg N) in 1990:
	(0)	
	(50)	

Basal applications: Manure: 'Nitram' at 116 kg followed by 232 kg. Weedkillers: Diflufenican at 0.10 kg and isoproturon at 1.0 kg applied with the insecticide in 220 l. Fungicides: Triadimefon at 0.12 kg with tridemorph at 0.26 kg in 210 l. Propiconazole at 0.12 kg in 300 l. Insecticide: Deltamethrin at 5.0 g.

Seed: Magie sown at 140 kg.

https://doi.org/10.23637/ERADOC-1-46 *pp 44*

91/W/CS/342

Cultivations, etc.:- Straw chopped on plots: 18 Aug, 1990. Disced: 19 Aug. Ploughed and rolled: 7 Sept. Rotary harrowed with crumbler attached, seed sown: 21 Sept. Weedkiller and insecticide applied: 8 Nov. N applied: 19 Mar, 1991 and 16 Apr. Triadimefon and tridemorph applied: 23 Apr. Propiconazole applied: 21 May. Combine harvested: 6 Aug.

GRAIN TONNES/HECTARE

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

N RES	(0)	(50)	Mean
CROP RES			
AL CL SB	8.79	8.76	8.77
FA CU SB	8.05	7.76	7.91
FA UC SB	8.60	7.73	8.16
FO RA SB	7.95	8.59	8.27
PH TA SB	8.09	8.15	8.12
RY GR SB	8.30	8.36	8.33
RYE SB	8.64	8.16	8.40
WH MU SB	8.20	8.23	8.22
WM+RY SB	8.12	7.81	7.97
WW SB	8.88	7.96	8.42
W WHEAT	7.89	8.38	8.13
Mean	8.32	8.17	8.25

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

CROP RES	N RES	CROP RES N RES
0.433	0.120	0.516

Except when comparing means with the same level(s) of
CROP RES 0.397

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

Stratum	d.f.	s.e.	cv%
BLOCK.WP	20	0.531	6.4
BLOCK.WP.SP	22	0.487	5.9

GRAIN MEAN DM% 84.0

https://doi.org/10.23637/ERADOC-1-46

91/W/CS/342

STRAW TONNES/HECTARE

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

N RES	(0)	(50)	Mean
CROP RES			
AL CL SB	4.17	4.25	4.21
FA CU SB	3.42	3.18	3.30
FA UC SB	4.30	3.17	3.74
FO RA SB	3.73	4.24	3.98
PH TA SB	4.62	4.06	4.34
RY GR SB	3.89	4.42	4.16
RYE SB	3.36	3.82	3.59
WH MU SB	4.09	3.72	3.91
WM+RY SB	3.77	4.11	3.94
WW SB	3.96	3.95	3.96
W WHEAT	3.94	4.06	4.00
Mean	3.93	3.91	3.92

STRAW MEAN DM% 89.3

SUB PLOT AREA HARVESTED 0.00100

https://doi.org/10.23637/ERADOC-1-46

91/W/CS/346

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, White Horse.

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, M.D. Helps.

The second year, w. wheat.

For first year see 90/W/CS/346.

Design: 3 randomised blocks of 7 plots split into 7 sub plots.

Whole plot dimensions: 10.0 x 24.0.

Treatments: All combinations of:-

Whole plots

1. **LAND TRT**		Land treatment in 1990, after w. wheat 1989 (all treatments ploughed autumn 1990 before w. wheat):
	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

Sub plots

2.	**N**	Nitrogen fertilizer (kg N) as 'Nitro-chalk':
	0	
	80	
	120	
	160	
	200	
	240	
	280	

NOTES: (1) An additional fallow sub plot was present, systematically arranged on one side of each whole plot.
(2) Some variation occured in the method of N application. Statistical correction did not improve the response curve and the yield data are given as recorded.

https://doi.org/10.23637/ERADOC-1-46 **pp 47**

91/W/CS/346

Standard applications: W. wheat: Weedkillers: Mecoprop at 1.6 kg with the insecticide in 220 l. Fluroxypyr at 0.20 kg with bromoxynil at 0.34 kg and clopyralid at 0.07 kg in 200 l. Fungicides: Fenpropimorph at 0.38 kg in 210 l, and on a second occasion with chlorothalonil at 0.49 kg and flutriafol at 0.078 kg in 300 l. Insecticide: Deltamethrin at 5.0 g.

Seed: W. wheat: Mercia, sown at 150 kg.

Cultivations, etc.:-
W. wheat: Ploughed: 13 Sept, 1990. Rotary harrow with crumbler attached, seed sown: 25 Sept. Mecoprop and insecticide applied: 30 Nov. N treatments applied: 3 Apr, 1991. Fluroxypyr, bromoxynil and clopyralid applied: 12 Apr. Fenpropimorph applied: 24 Apr. Fenpropimorph, chlorothalonil and flutriafol applied: 20 June. Combine harvested: 21 Aug.
Fallow: Ploughed: 13 Sept, 1990. Rotary cultivated: 20 May, 1991 and 15 July.

NOTE: Amounts of soil nitrogen and plant dry matter were measured in autumn and spring. Assessments of plant cover were made in autumn, spring and summer. Plant samples were taken to assess diseases.

GRAIN TONNES/HECTARE

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

N	0	80	120	160	200	240	280	Mean
LAND TRT								
CA WW	1.82	3.43	6.68	6.25	6.26	6.99	7.42	5.55
CA RA	2.04	4.80	6.64	7.63	8.96	8.98	8.89	6.85
SA CA FA	4.27	6.35	7.46	8.08	8.70	9.08	9.19	7.59
CA CS	6.11	7.45	8.02	8.24	8.51	8.61	8.67	7.94
SA CS	5.74	7.01	8.13	9.28	8.86	9.37	9.10	8.21
WT	4.69	7.37	8.51	8.70	8.81	9.12	9.39	8.08
WT CS TS	3.43	6.78	7.48	7.53	8.68	8.40	8.96	7.32
Mean	4.01	6.17	7.56	7.96	8.40	8.65	8.80	7.36

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

	LAND TRT	N	LAND TRT N
	0.472	0.290	0.852
Except when comparing means with the same level(s) of LAND TRT			0.766

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

Stratum	d.f.	s.e.	cv%
BLOCK.WP	12	0.579	7.9
BLOCK.WP.SP	84	0.939	12.7

GRAIN MEAN DM% 87.1

SUB PLOT AREA HARVESTED 0.00199

https://doi.org/10.23637/ERADOC-1-46

91/W/CS/347

GREEN CROPS FOR SET-ASIDE

Object: To obtain information on the establishment and maintenance of sown crops and unsown vegetation in a long term, up to five-year, set-aside area given no chemical inputs. Effects on soil nitrate and leaching after ploughing are also studied - Woburn, Horsepool Lane Close II.

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

Design: 6 randomised blocks of 6 plots.

Whole plot dimensions: 6.5 x 26.0.

The second year, w. wheat, ryegrass, clover.

For previous year see 90/W/CS/347.

Treatments in 1990 and 1991:

CROPS	Crops:
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
W WHEAT	Winter wheat

NOTE: Yields were taken from the w. wheat and from the ley plots from which cuttings were removed.

Standard applications:

All crops except w. wheat and tumbledown: Manures: P_2O_5 at 25 kg to RY+CL RE and at 39 kg to RY+N RE as 'Triple superphosphate'. K_2O at 122 kg to RY+CL RE and at 223 kg to RY+N RE as 'Muriate of potash'. N at 100 kg as 'Nitram' to RY+N RE plots only.

W. wheat: Manures: N at 40 kg and on a second occasion at 160 kg as 'Nitram'. Fungicides: Fenpropimorph at 0.38 kg in 210 l and on a second occasion with chlorothalonil at 0.49 kg and flutriafol at 0.078 kg in 300 l.

Seed: W. wheat: Mercia sown at 150 kg.
Ryegrass and clover sown in 1989.

Cultivations, etc.:-

All crops except w. wheat and tumbledown: P and K applied to RY+CL RE and RY+N RE plots: 20 Feb, 1991. N applied to RY+N RE plots: 18 Mar. RY LF and RY+CL LF plots topped: 30 May, 15 July and 18 Sept. RY+CL RE and RY+N RE plots cut and produce removed: 3 June, 17 July and 16 Sept.

Tumbledown plots: Topped: 7 Nov, 1990, 30 May, 1991, 15 July and 18 Sept.

W. wheat plots: Ploughed: 21 Sept, 1990. Rotary harrowed, seed sown, rolled: 25 Sept. N applied: 18 Mar, 1991 and 17 Apr. Fenpropimorph applied: 24 Apr. Remaining fungicides applied: 20 June. Combine harvested: 20 Aug.

https://doi.org/10.23637/ERADOC-1-46

91/W/CS/347

NOTE: Assessments were made of soil nitrogen in autumn 1990 and spring 1991, and plant numbers and plant cover in spring and autumn 1991.

GRASS

1ST CUT (3/6/91) DRY MATTER TONNES/HECTARE

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

CROPS	RY+CL RE	RY+N RE	Mean
	1.38	5.66	3.52

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

CROPS
0.236

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

Stratum	d.f.	s.e.	cv%
BLOCK.WP	5	0.408	11.6

1ST CUT MEAN DM% 24.6

2ND CUT (17/7/91) DRY MATTER TONNES/HECTARE

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

CROPS	RY+CL RE	RY+N RE	Mean
	1.84	2.39	2.12

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

CROPS
0.229

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

Stratum	d.f.	s.e.	cv%
BLOCK.WP	5	0.396	18.7

2ND CUT MEAN DM% 34.8

https://doi.org/10.23637/ERADOC-1-46

91/W/CS/347

3RD CUT (16/9/91) DRY MATTER TONNES/HECTARE

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

CROPS	RY+CL RE	RY+N RE	Mean
	0.48	0.47	0.47

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

CROPS
0.146

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

Stratum	d.f.	s.e.	cv%
BLOCK.WP	5	0.252	53.3

3RD CUT MEAN DM% 35.8

TOTAL OF 3 CUTS DRY MATTER TONNES/HECTARE

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

CROPS	RY+CL RE	RY+N RE	Mean
	3.70	8.52	6.11

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

CROPS
0.430

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

Stratum	d.f.	s.e.	cv%
BLOCK.WP	5	0.746	12.2

TOTAL OF 3 CUTS MEAN DM% 31.7

PLOT AREA HARVESTED 0.00264

WHEAT

GRAIN TONNES/HECTARE 9.254

GRAIN MEAN DM% 86.3

PLOT AREA HARVESTED 0.00546

https://doi.org/10.23637/ERADOC-1-46 *pp 51*

91/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.

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

The first year, w. wheat.

Design: 4 randomised blocks of 5 plots.

Whole plots dimensions: 3.0 x 10.0.

Treatments:

SOW DATE	Sowing dates:
17 SEP	17 September, 1990 (triplicated)
11 OCT	11 October (duplicated)

Basal applications: Manure: (0:16:36) at 980 kg. 'Nitram' at 580 kg. Weedkillers: Isoproturon at 1.3 kg and pendimethalin at 1.3 kg with the insecticide in 200 l. Difenzoquat at 1.0 kg with a wetting agent, 'Vassgro' at 1.0 l, in 200 l. Fungicides: Fenpropimorph at 0.38 kg in 200 l. Chlorothalonil at 0.49 kg and flutriafol at 78 g in 200 l. Insecticide: Deltamethrin at 5.0 g.

Seed: Mercia, sown at 170 kg.

Cultivations, etc.:- PK applied: 22 Aug, 1990. Ploughed: 30 Aug. Rotary harrowed all plots, **SOW DATE** 17 SEP rotary harrowed again and seed sown: 17 Sept. **SOW DATE** 11 OCT rotary harrowed, seed sown: 11 Oct. Isoproturon, pendimethalin and the insecticide applied: 21 Nov. Difenzoquat with wetting agent applied: 13 Mar, 1991. N applied: 28 Mar. Fenpropimorph applied: 9 May. Chlorothalonil and flutriafol applied: 20 June. Combine harvested: 20 Aug. Previous crops: W. wheat 1989, w. oats 1990.

NOTE: Plants were sampled in April and July to assess take-all. Soil cores were taken after harvest to assess take-all infectivity.

https://doi.org/10.23637/ERADOC-1-46 *pp 52*

91/R/CS/354

GRAIN TONNES/HECTARE

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

SOW DATE	
17 SEP	9.39
11 OCT	9.45
Mean	9.41

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

SOW DATE
0.086

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

Stratum	d.f.	s.e.	cv%
BLOCK.WP	15	0.187	2.0

GRAIN MEAN DM% 86.7

PLOT AREA HARVESTED 0.00230

https://doi.org/10.23637/ERADOC-1-46

91/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 first year, w. wheat.

Design: 3 randomised blocks of 7 plots.

Whole plot dimensions: 21.0 x 23.0.

Treatments:

N	Nitrogen fertilizer (kg N) as 'Nitram':
0	
50	
100	
150	
200	
250	
300	

Basal applications: Manure: Magnesian limestone at 5.0 t. Weedkillers: Bifenox at 0.95 kg and chlortoluron at 3.5 kg with the insecticide in 200 l. Fungicides: Fenpropimorph at 0.38 kg in 200 l. Fenpropimorph at 0.38 kg with chlorothalonil at 0.49 kg and flutriafol at 0.078 kg in 200 l. Insecticide: Deltamethrin at 6.2 g.

Seed: Mercia, sown at 170 kg.

Cultivations, etc.:- Magnesian limestone applied: 22 Aug, 1990. Deep tine cultivated with vibrating tines 60 cm apart and 45 cm deep: 19 Sept. Ploughed: 27 Sept. Disced: 28 Sept. Disced, rotary harrowed, seed sown: 9 Oct. Weedkillers with the insecticide applied: 23 Nov. N treatments applied: 9 Apr, 1991. Fenpropimorph alone applied: 10 May. Fenpropimorph with chlorothalonil and flutriafol applied: 20 June. Combine harvested: 21 Aug. Previous crops: W. wheat 1989 and 1990.

NOTE: Quadrat samples were taken before harvest to estimate straw and stubble yield.

https://doi.org/10.23637/ERADOC-1-46

91/R/CS/355

GRAIN TONNES/HECTARE

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

N	
0	4.38
50	6.30
100	7.43
150	7.64
200	8.00
250	8.21
300	7.98
Mean	7.13

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

N
0.395

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

Stratum	d.f.	s.e.	cv%
BLOCK.WP	12	0.484	6.8

GRAIN MEAN DM% 87.5

PLOT AREA HARVESTED 0.00483

https://doi.org/10.23637/ERADOC-1-46

91/W/CS/356

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 Lane Close I.

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, M.D. Helps.

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

Design: 3 randomised blocks of 7 plots.

Whole plot dimensions: 10.0 x 24.0.

Treatments:

LAND TRT	Land treatment after w. wheat 1990:
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: W. wheat straw baled and carted: 16 Aug, 1990. Ploughed: 23 Aug. Rolled: 24 Aug. Rotary harrowed, Mercia wheat sown at 150 kg: 25 Sept. Manures: N applied as 'Nitram' at 40 kg: 18 Mar, 1991 and at 160 kg: 17 Apr. Fungicides: Fenpropimorph at 0.38 kg in 210 l: 24 Apr and again with chlorothalonil at 0.49 kg and flutriafol at 0.078 kg in 300 l: 20 June. Combine harvested: 20 Aug.

CA RA: W. wheat straw baled and carted: 16 Aug, 1990. Ploughed: 23 Aug. Rolled: 24 Aug. Rotary harrowed, Italian ryegrass seed sown at 25 kg, rolled: 6 Sept. Topped: 25 Apr, 1991, 19 June, 15 July and 11 Sept.

SA CA FA: W. wheat straw chopped: 19 Aug, 1990. Ploughed: 23 Aug. Rolled: 24 Aug. Rotary harrowed, Giant forage rape seed sown at 10 kg, rolled: 6 Sept. Topped: 25 Apr, 1991, 19 June, 15 July and 11 Sept.

CA CS: W. wheat straw baled and carted: 16 Aug, 1990. Ploughed: 23 Aug. Rolled: 24 Aug. Weedkiller: Glyphosate applied at 0.72 kg: 23 Jan, 1991. Rotary cultivated: 17 June and 15 July.

SA CS: W. wheat straw chopped: 19 Aug. Shallow-tine cultivated: 17 May, 1991 and 15 July.

https://doi.org/10.23637/ERADOC-1-46 *pp 56*

91/W/CS/356

Standard applications, seed and cultivations, etc.:-
WT: W. wheat straw baled and carted: 16 Aug, 1990. Topped: 25 Apr, 1991, 19 June, 15 July and 11 Sept.
WT CS TS: W. wheat straw baled and carted: 16 Aug, 1990. Topped: 25 Apr, 1991. Ploughed, rotary cultivated, Virgo Pajayere trefoil seed, inoculated with Rhizobium, sown at 10 kg, rolled: 9 May. Weeds topped: 15 July. Topped: 11 Sept.
Previous crops: W. oats 1989, w. wheat 1990.

NOTE: Soil nitrogen, plant dry matter and plant cover were assessed in autumn, spring and summer.

GRAIN TONNES/HECTARE (CA WW PLOT ONLY) 9.26

MEAN DM% 86.5

PLOT AREA HARVESTED 0.00501

https://doi.org/10.23637/ERADOC-1-46

91/W/CS/357

COVER CROPS

Object: To compare a range of cover crops for their ability to take up N during the autumn, to measure rates of mineralization of N after incorporating them in spring and to measure their effects on the yield of a subsequent spring barley crop - Woburn, Lansome III.

Sponsors: D.G. Christian, D.S. Powlson.

The first year, forage rape, phacelia, ryegrass, rye, mustard, w. and s. barley.

Design: 3 randomised blocks of 15 plots split into 2 sub plots.

Whole plot dimensions: 6.0 x 25.0.

Treatments: All combinations of:-

Whole plots

1. **CROPS** — Cover crops, sown 1990, ploughed on 13 Mar, 1991, sown to s. barley: 14 Mar:

FO RA SB	Forage rape
PH TA SB	Phacelia tanacetifolia
RY GR SB	Perennial ryegrass
RYE SB	Rye
WH MU SB	White mustard
WM+RY SB	White mustard + rye

2. **CC SOWDT** — Sowing dates of cover crops:

24 AUG	24 August, 1990
24 SEPT	24 September

Sub plots

3. **N** — Nitrogen fertilizer on 14 Mar, 1991 (kg N) as 'Nitro-Chalk':

0
50

plus three extra treatments:

1. **EXTRA**

CULT FAL	Cultivated fallow until sown to s. barley on 14 Mar, 1991
TUMBDOWN	Tumbledown fallow, no weed control until sown to s. barley, on 14 Mar, 1991
W BARLEY	W. barley sown 25 September, 1990, taken to maturity

https://doi.org/10.23637/ERADOC-1-46

91/W/CS/357

Sub plots

2. **N EXTRA** Nitrogen fertilizer on 14 Mar, 1991 (kg N) as 'Nitro-Chalk':

O
APPLIED 50 (CULT FAL and TUMBDOWN) or 100 (W BARLEY)

NOTE: The tumbledown fallow was given 50 kg of seed from the previous wheat crop to ensure volunteers.

Basal applications: Manure: Magnesian limestone at 7.5 t.

Standard applications:
CULT FAL plots only: Weedkiller: Paraquat at 0.60 kg ion in 250 l.
W BARLEY plots only: Manures: N treatments applied on two occasions, each at 50 kg. Weedkillers: Diflufenican at 0.10 kg and isoproturon at 1.0 kg applied with insecticide in 220 l. Fungicide: Propiconazole at 0.12 kg in 300 l. Insecticide: Deltamethrin at 5.0 g.
S. barley only: Weedkiller: Metsulfuron-methyl at 6.0 g with fungicide in 200 l. Fungicide: Tridemorph at 0.26 kg.

Seed: Forage rape: Giant, sown at 30 kg.
Phacelia tanacetifolia: sown at 30 kg.
Perrenial ryegrass: Contessa, sown at 25 kg.
Rye: Halo, sown at 180 kg.
White mustard: sown at 30 kg.
White mustard + rye: sown at 15 kg and 90 kg respectively.
W. barley: Puffin, sown at 140 kg.
S. barley: Alexis, sown at 160 kg

Cultivations, etc.:-
All plots: Deep-tine cultivated with tines 1.5 m apart and 0.4 m deep: 18 Aug, 1990. Disced: 19 Aug. Magnesian limestone applied, rotary cultivated: 23 Aug.
24 AUG plots only: Rotary harrowed with crumbler attached, seed sown, rotary harrowed, rolled: 24 Aug.
24 SEPT plots only: Rotary harrowed with crumbler attached, and rolled: 24 Aug. Seed sown, rotary harrowed: 24 Sept.
CULT FAL plots only: Disced: 23 Oct. Weedkiller applied: 26 Feb, 1991.
All plots except W BARLEY: Ploughed: 13 Mar. N treatments applied, rotary cultivated, s. barley seed sown: 14 Mar. Weedkiller and fungicide applied: 24 May. Combine harvested: 15 Aug.
W BARLEY plots only: Rotary harrowed with crumbler attached, w. barley seed sown: 25 Sept, 1990. Weedkillers and insecticide applied: 29 Nov. N treatments applied: 14 Mar and 22 Apr, 1991. Fungicide applied: 21 May. Combine harvested: 6 Aug.

NOTE: Because of rabbit damage the yields of three plots were lost, with treatment combinations:-

CROPS	FO RA SB	RYE SB	RY GR SB
CC SOWDT	24 SEPT	24 SEPT	24 AUG
N	0	0	0

Estimated values were used in the analysis.

https://doi.org/10.23637/ERADOC-1-46

91/W/CS/357

GRAIN TONNES/HECTARE

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

SPRING BARLEY

CC SOWDT	24 AUG	24 SEPT	Mean
CROPS			
FO RA SB	4.38	5.78	5.08
PH TA SB	4.05	4.14	4.09
RY GR SB	4.00	4.12	4.06
RYE SB	3.73	4.89	4.31
WH MU SB	4.65	3.89	4.27
WM+RY SB	4.73	5.66	5.20
Mean	4.26	4.75	4.50

N	0	50	Mean
CROPS			
FO RA SB	4.63	5.53	5.08
PH TA SB	2.85	5.34	4.09
RY GR SB	4.49	3.62	4.06
RYE SB	3.92	4.70	4.31
WH MU SB	3.50	5.04	4.27
WM+RY SB	4.80	5.59	5.20
Mean	4.03	4.97	4.50

N	0	50	Mean
CC SOWDT			
24 AUG	3.76	4.75	4.26
24 SEPT	4.30	5.19	4.75
Mean	4.03	4.97	4.50

	N	0	50
CROPS	**CC SOWDT**		
FO RA SB	24 AUG	3.76	5.01
	24 SEPT	5.51	6.05
PH TA SB	24 AUG	2.66	5.44
	24 SEPT	3.04	5.23
RY GR SB	24 AUG	5.27	2.72
	24 SEPT	3.72	4.52
RYE SB	24 AUG	2.77	4.69
	24 SEPT	5.07	4.71
WH MU SB	24 AUG	3.95	5.35
	24 SEPT	3.06	4.72
WM+RY SB	24 AUG	4.18	5.28
	24 SEPT	5.42	5.90

N EXTRA	0	APPLIED	Mean
EXTRA			
CULT FAL	2.85	4.88	3.87
TUMBDOWN	5.06	5.06	5.06
Mean	3.96	4.97	4.46

GRAND MEAN 4.50

https://doi.org/10.23637/ERADOC-1-46

91/W/CS/357

GRAIN TONNES/HECTARE

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

WINTER BARLEY

N EXTRA	0	APPLIED	Mean
	4.58	5.97	5.27

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

CROPS	**CC SOWDT**	**N**	**CROPS CC SOWDT**
0.664	0.384	0.350	0.940

CROPS N	**CC SOWDT N**	**CROPS CC SOWDT N**	**N EXTRA**
0.899	0.519	1.272	0.857

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

CROPS	0.857		
CC SOWDT		0.495	
CROPS.CC SOWDT			**1.212**

EXTRA	**N EXTRA**	**EXTRA**
0.940	1.272	

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

EXTRA	1.212

NOTE: do not use SED for comparisons involving Winter Barley means

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

Stratum	d.f.	s.e.	cv%
BLOCK.WP	26	1.15	25.6
BLOCK.WP.SP	25	1.48	33.0

GRAIN MEAN DM% 83.8

STRAW TONNES/HECTARE

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

SPRING BARLEY

CC SOWDT CROPS	24 AUG	24 SEPT	Mean
FO RA SB	1.94	2.60	2.27
PH TA SB	2.27	1.70	1.99
RY GR SB	1.65	1.70	1.67
RYE SB	1.49	2.04	1.76
WH MU SB	1.97	2.18	2.07
WM+RY SB	1.83	2.37	2.10
Mean	1.86	2.10	1.98

https://doi.org/10.23637/ERADOC-1-46

91/W/CS/357

STRAW TONNES/HECTARE

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

N	0	50	Mean
CROPS			
FO RA SB	2.09	2.45	2.27
PH TA SB	1.15	2.83	1.99
RY GR SB	1.90	1.45	1.67
RYE SB	1.54	1.99	1.76
WH MU SB	1.68	2.46	2.07
WM+RY SB	1.88	2.32	2.10
Mean	1.71	2.25	1.98

N	0	50	Mean
CC SOWDT			
24 AUG	1.57	2.15	1.86
24 SEPT	1.84	2.35	2.10
Mean	1.71	2.25	1.98

N		0	50
CROPS	**CC SOWDT**		
FO RA SB	24 AUG	1.68	2.20
	24 SEPT	2.51	2.69
PH TA SB	24 AUG	1.28	3.26
	24 SEPT	1.01	2.40
RY GR SB	24 AUG	2.34	0.95
	24 SEPT	1.46	1.94
RYE SB	24 AUG	0.91	2.06
	24 SEPT	2.17	1.91
WH MU SB	24 AUG	1.67	2.27
	24 SEPT	1.69	2.66
WM+RY SB	24 AUG	1.52	2.14
	24 SEPT	2.23	2.51

N EXTRA	0	APPLIED	Mean
EXTRA			
CULT FAL	0.90	2.04	1.47
TUMBDOWN	2.94	2.05	2.50
Mean	1.92	2.05	1.98

GRAND MEAN 1.98

WINTER BARLEY

N EXTRA	O	APPLIED	Mean
	2.77	3.17	2.97

STRAW MEAN DM% 89.3

PLOT AREA HARVESTED 0.00252

https://doi.org/10.23637/ERADOC-1-46

91/R/CS/361

CONTROL OF STEM NEMATODE

Object: To study the effects of rates of carbofuran on the control of stem nematode (Ditylenchus dipsaci) and on the yield of two varieties of lucerne of different susceptibility - Long Hoos IV 3.

Sponsors: A.G. Whitehead, A.J.F. Nichols.

The first year, lucerne.

Design: 3 randomised blocks of 8 plots.

Whole plot dimensions: 1.2 x 8.8.

Treatments: All combinations of:-

1. **CARBRATE** Rates of carbofuran (kg), applied to seed furrow at sowing: 21 Aug, 1990.

   0.00
   0.60
   1.20
   2.30

2. **VARIETY** Varieties and stem nematode susceptibility:

EUROPE	Europe - susceptible
EUVER	Euver - partially resistant

Basal applications: Weedkillers: 2,4-DB at 1.3 kg in 220 l. Paraquat at 0.40 kg ion in 220 l. Fluazifop-P-butyl at 0.19 kg in 220 l. Irrigation: 5 mm on seven occasions, total 35 mm.

Cultivations, etc.:- Ploughed and rolled: 20 Aug, 1990. Seed sown, cultivated by rotary grubber: 22 Aug. Irrigated: 28, 30 Aug, 3, 10, 13, 20 and 26 Sept. 2,4-DB applied: 14 Dec. Paraquat applied: 7 Mar, 1991. Fluazifop-P-butyl applied: 10 Apr. Cut: 10 July, 13 Aug and 3 Oct. Previous crops: S. peas 1989, w. wheat 1990.

https://doi.org/10.23637/ERADOC-1-46 *pp 63*

91/R/CS/361

1ST CUT (10/7/91) DRY MATTER TONNES/HECTARE

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

CARBRATE VARIETY	0.00	0.60	1.20	2.30	Mean
EUROPE	1.19	2.88	2.85	3.54	2.61
EUVER	3.47	3.22	4.36	4.28	3.83
Mean	2.33	3.05	3.61	3.91	3.22

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

VARIETY	CARBRATE	VARIETY CARBRATE
0.267	0.377	0.533

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

Stratum	d.f.	s.e.	cv%
BLOCK.WP	14	0.653	20.3

1ST CUT MEAN DM% 21.0

2ND CUT (13/8/91) DRY MATTER TONNES/HECTARE

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

CARBRATE VARIETY	0.00	0.60	1.20	2.30	Mean
EUROPE	1.44	1.88	2.29	3.04	2.16
EUVER	2.87	3.15	3.28	3.50	3.20
Mean	2.16	2.51	2.79	3.27	2.68

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

VARIETY	CARBRATE	VARIETY CARBRATE
0.178	0.252	0.356

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

Stratum	d.f.	s.e.	cv%
BLOCK.WP	14	0.437	16.3

2ND CUT MEAN DM% 17.7

https://doi.org/10.23637/ERADOC-1-46

91/R/CS/361

3RD CUT (3/10/91) DRY MATTER TONNES/HECTARE

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

CARBRATE VARIETY	0.00	0.60	1.20	2.30	Mean
EUROPE	1.23	1.40	1.53	1.69	1.46
EUVER	1.99	1.96	2.06	1.86	1.97
Mean	1.61	1.68	1.80	1.77	1.71

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

VARIETY	CARBRATE	VARIETY CARBRATE
0.064	0.091	0.129

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

Stratum	d.f.	s.e.	cv%
BLOCK.WP	14	0.158	9.2

3RD CUT MEAN DM% 20.0

TOTAL OF 3 CUTS DRY MATTER TONNES/HECTARE

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

CARBRATE VARIETY	0.00	0.60	1.20	2.30	Mean
EUROPE	3.86	6.15	6.68	8.27	6.24
EUVER	8.33	8.33	9.70	9.64	9.00
Mean	6.09	7.24	8.19	8.95	7.62

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

VARIETY	CARBRATE	VARIETY CARBRATE
0.472	0.667	0.943

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

Stratum	d.f.	s.e.	cv%
BLOCK.WP	14	1.155	15.2

TOTAL OF 3 CUTS MEAN DM% 19.6

PLOT AREA HARVESTED 0.00045

https://doi.org/10.23637/ERADOC-1-46 *pp 65*

91/W/CS/371

CHEMICAL CONTROL OF GLOBODERA PALLIDA

Object: To determine the residual effects of nematicides applied to control G. pallida in 1990 - Woburn, Lansome/Mill Dam Close III.

Sponsors: A.G. Whitehead, A.J.F. Nichols.

Design: 3 randomised blocks of 2 plots split into 6 sub plots.

The second year, potatoes.

For previous year see 90/W/P/2.

Whole plot dimensions: 6.0 x 13.3.

Treatments: All combinations of:-

1. **IRRIG RS** Residues of irrigation applied in 1990:

   NONE
   252 MM

Sub plots

2. **CHEM RES** Residues of chemicals applied in 1990:

NONE	None
OXAMYL	Oxamyl at 5.6 kg
OX CARBO	Oxamyl at 5.6 kg + carbofuran at 5.6 kg
OX ETHOP	Oxamyl at 5.6 kg + ethoprophos at 5.6 kg
OX FORMA	Oxamyl at 5.6 kg + formalin at 1170 kg
OX SODME	Oxamyl at 5.6 kg + sodium metavanadate at 36 kg

Basal applications: Manures: (13:13:20) at 1.6 t. Weedkillers: Linuron at 1.5 kg with paraquat at 0.4 kg ion in 210 l. Fungicides: Maneb at 1.2 kg and zinc oxide at 28 g with a wetting agent, 'Bond' at 200 ml, in 200 l, and on a second occasion at 0.96 kg, 22 g and 200 ml respectively in 300 l. Mancozeb at 0.82 kg with insecticide: pirimicarb at 0.14 kg and wetting agent, 'Bond' at 200 ml, in 300 l on two occasions. Desiccant: Glufosinate-ammonium at 0.45 kg in 200 l.

Variety: Sante.

Cultivations, etc.:- Ploughed: 12 Mar, 1991. N, P and K applied, spiked rotary cultivated, seed sown: 9 Apr. Rotary ridged, weedkillers applied: 26 Apr. Hand weeded 12, 13 June and 12 to 18 July. Rotary ridged: 13 June. Maneb, zinc oxide and wetting agent applied: 4 and 31 July. Mancozeb, pirimicarb and wetting agent applied: 20 July and 12 Aug. Desiccant applied: 27 Aug. Potatoes lifted: 5 Sept.

https://doi.org/10.23637/ERADOC-1-46 *pp 66*

91/W/CS/371

TOTAL TUBERS TONNES/HECTARE

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

IRRIG RS	NONE	252 MM	Mean
CHEM RES			
NONE	25.8	9.4	17.6
OXAMYL	26.8	20.7	23.7
OX CARBO	28.2	24.1	26.1
OX ETHOP	29.0	25.5	27.3
OX FORMA	32.3	22.9	27.6
OX SODME	31.0	23.2	27.1
Mean	28.9	21.0	24.9

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

CHEM RES	**IRRIG RS*** **CHEM RES**
2.36	3.34

* within the same level of **IRRIG RS** only

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

Stratum	d.f.	s.e.	cv%
BLOCK.WP.SP	20	4.09	16.4

PERCENTAGE WARE 3.81 CM (1.5 INCH) RIDDLE

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

IRRIG RS	NONE	252 MM	Mean
CHEM RES			
NONE	66.6	39.2	52.9
OXAMYL	77.4	71.4	74.4
OX CARBO	77.3	73.4	75.3
OX ETHOP	79.1	73.4	76.3
OX FORMA	80.7	63.1	71.9
OX SODME	75.0	72.5	73.8
Mean	76.0	65.5	70.8

SUB PLOT AREA HARVESTED 0.00057

https://doi.org/10.23637/ERADOC-1-46