ROTHAMSTED RESEARCH

Yields of the Field Experiments 1992

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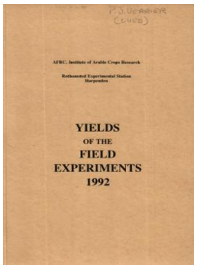

Crop Sequences

Rothamsted Research

Rothamsted Research (1993) *Crop Sequences ;* Yields Of The Field Experiments 1992, pp 50 - 101 **- DOI: https://doi.org/10.23637/ERADOC-1-47**

92/R/CS/10 and 92/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 31st year, w. oilseed rape.

For previous years see 'Details' 1967, 1973 and 74-91/R&W/CS/10.

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

Whole plot dimensions: 5.8 x 16.1 (R), 5.6 x 16.1 (W).

Treatments: All combinations of:-

Whole plots

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

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

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

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

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

Sub plots

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

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) Test manganese was applied cumulatively, 1987-90.

https://doi.org/10.23637/ERADOC-1-47

92/R/CS/10 and 92/W/CS/10

Experimental diary:

Sawyers I (R).

25-Aug-91 : B : Deep-tine cultivated with vibrating tines 60 cm apart, 45 cm deep.
26-Aug-91 : B : Ploughed, rolled.
04-Sep-91 : B : Rotary harrowed.
05-Sep-91 : B : Rotary harrowed, Libravo, dressed Hydraguard and Rovral WP, drilled at 6.1 kg, rolled.
06-Sep-91 : B : Butisan S at 2.5 l in 200 l.
24-Oct-91 : B : NK as (25:0:16) at 200 kg.
02-Dec-91 : B : Vytel Liquid Chelated Magnesium at 2.0 l in 200 l.
05-Mar-92 : **T** : **SULPHUR** 30: 30 kg S as gypsum.
05-Mar-92 : B : 34.5% N at 220 kg.
13-Apr-92 : B : Ploughed (crop failed).

Stackyard C (W).

03-Sep-91 : B : Ploughed.
06-Sep-91 : B : Rotary cultivated, Libravo, dressed Hydraguard and Rovral WP, drilled at 6.0 kg, rolled.
29-Oct-91 : B : NK as (25:0:16) at 200 kg.
15-Jan-92 : B : Benazalox at 1.25 kg in 200 l.
05-Mar-92 : **T** : **SULPHUR** 30: 30 kg S as gypsum.
06-Mar-92 : B : 34.5% N at 220 kg.
13-May-92 : B : Ploughed (crop failed).

NOTE: Owing to crop failure no yields were taken.

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92/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 19th year, s. barley.

For previous years see 74-91/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 1991.
2.	**FUNGCIDE[1]**	Fungicide in autumn:
	NONE	None
	TRIADIM	Triadimefon at 0.25 kg in autumn 1981, 1982, 1984 to 1991, 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

https://doi.org/10.23637/ERADOC-1-47

92/R/CS/140

Experimental diary:

```
   06-Nov-91 : T : WEEDKLLR GLYPHOS: Glyphosate at 1.5 kg in 220 l.
             : T : FUNGCIDE[1] TRIADIM: Triadimefon at 0.25 kg in
                   220 l.
   03-Jan-92 : B : Ploughed.
   06-Mar-92 : B : Spring-tine cultivated.
   11-Mar-92 : T : FUNGCIDE[2] BENOMYL: Benomyl at 4.0 kg.
             : T : INSCTCDE CHLORFEN: Chlorfenvinphos at 2.0 kg.
             : T : NEMACIDE ALDICARB: Aldicarb at 6.0 kg.
   13-Mar-92 : B : 34.5% N at 440 kg.
   17-Mar-92 : B : Spring-tine cultivated twice, rotary harrowed.  Alexis,
                   undressed, drilled at 150 kg.  Rolled.
   20-May-92 : B : Vindex at 1.0 l and Duplosan New System CMPP at 2.0 l in
                   200 l.
   06-Aug-92 : B : Combine harvested.
```

GRAIN TONNES/HECTARE

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

FUNGCIDE[1]	NONE	TRIADIM	Mean
WEEDKLLR			
NONE	4.93	5.02	4.97
GLYPHOS	5.26	5.29	5.27
Mean	5.09	5.16	5.12

FUNGCIDE[2]	NONE	BENOMYL	Mean
WEEDKLLR			
NONE	5.00	4.94	4.97
GLYPHOS	5.17	5.38	5.27
Mean	5.09	5.16	5.12

FUNGCIDE[2]	NONE	BENOMYL	Mean
FUNGCIDE[1]			
NONE	5.17	5.01	5.09
TRIADIM	5.00	5.31	5.16
Mean	5.09	5.16	5.12

INSCTCDE	NONE	CHLORFEN	Mean
WEEDKLLR			
NONE	5.00	4.94	4.97
GLYPHOS	5.30	5.25	5.27
Mean	5.15	5.09	5.12

INSCTCDE	NONE	CHLORFEN	Mean
FUNGCIDE[1]			
NONE	5.05	5.14	5.09
TRIADIM	5.26	5.05	5.16
Mean	5.15	5.09	5.12

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92/R/CS/140

GRAIN TONNES/HECTARE

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

INSCTCDE	NONE	CHLORFEN	Mean
FUNGCIDE[2]			
NONE	5.00	5.17	5.09
BENOMYL	5.31	5.02	5.16
Mean	5.15	5.09	5.12

NEMACIDE	NONE	ALDICARB	Mean
WEEDKLLR			
NONE	4.91	5.03	4.97
GLYPHOS	5.14	5.41	5.27
Mean	5.02	5.22	5.12

NEMACIDE	NONE	ALDICARB	Mean
FUNGCIDE[1]			
NONE	5.03	5.15	5.09
TRIADIM	5.02	5.29	5.16
Mean	5.02	5.22	5.12

NEMACIDE	NONE	ALDICARB	Mean
FUNGCIDE[2]			
NONE	4.98	5.19	5.09
BENOMYL	5.06	5.26	5.16
Mean	5.02	5.22	5.12

NEMACIDE	NONE	ALDICARB	Mean
INSCTCDE			
NONE	5.05	5.26	5.15
CHLORFEN	5.00	5.19	5.09
Mean	5.02	5.22	5.12

FUNGCIDE[1]	NONE		TRIADIM	
WEEDKLLR **FUNGCIDE[2]**	NONE	BENOMYL	NONE	BENOMYL
NONE	5.05	4.80	4.95	5.08
GLYPHOS	5.28	5.23	5.05	5.53

FUNGCIDE[1]	NONE		TRIADIM	
WEEDKLLR **INSCTCDE**	NONE	CHLORFEN	NONE	CHLORFEN
NONE	4.84	5.02	5.17	4.86
GLYPHOS	5.25	5.26	5.35	5.24

FUNGCIDE[2]	NONE		BENOMYL	
WEEDKLLR **INSCTCDE**	NONE	CHLORFEN	NONE	CHLORFEN
NONE	4.90	5.10	5.11	4.77
GLYPHOS	5.10	5.24	5.50	5.26

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GRAIN TONNES/HECTARE

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

	FUNGCIDE[2]	NONE		BENOMYL	
FUNGCIDE[1]	INSCTCDE	NONE	CHLORFEN	NONE	CHLORFEN
NONE		5.03	5.30	5.06	4.97
TRIADIM		4.97	5.04	5.55	5.06

	FUNGCIDE[1]	NONE		TRIADIM	
WEEDKLLR	NEMACIDE	NONE	ALDICARB	NONE	ALDICARB
NONE		4.86	4.99	4.95	5.08
GLYPHOS		5.20	5.31	5.08	5.51

	FUNGCIDE[2]	NONE		BENOMYL	
WEEDKLLR	NEMACIDE	NONE	ALDICARB	NONE	ALDICARB
NONE		4.95	5.05	4.86	5.02
GLYPHOS		5.02	5.32	5.26	5.50

	FUNGCIDE[2]	NONE		BENOMYL	
FUNGCIDE[1]	NEMACIDE	NONE	ALDICARB	NONE	ALDICARB
NONE		5.13	5.21	4.93	5.09
TRIADIM		4.84	5.17	5.19	5.42

	INSCTCDE	NONE		CHLORFEN	
WEEDKLLR	NEMACIDE	NONE	ALDICARB	NONE	ALDICARB
NONE		4.97	5.04	4.85	5.02
GLYPHOS		5.13	5.47	5.15	5.35

	INSCTCDE	NONE		CHLORFEN	
FUNGCIDE[1]	NEMACIDE	NONE	ALDICARB	NONE	ALDICARB
NONE		5.07	5.02	4.99	5.28
TRIADIM		5.02	5.50	5.01	5.09

	INSCTCDE	NONE		CHLORFEN	
FUNGCIDE[2]	NEMACIDE	NONE	ALDICARB	NONE	ALDICARB
NONE		4.76	5.24	5.21	5.13
BENOMYL		5.34	5.27	4.79	5.24

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

Margins of two factor tables	0.099
Two factor tables	0.140
Three factor tables	0.198

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

Stratum	d.f.	s.e.	cv%
WP	6	0.280	5.5

GRAIN MEAN DM% 86.9 PLOT AREA HARVESTED 0.00069

https://doi.org/10.23637/ERADOC-1-47

92/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 eighth year, w. wheat.

For previous years see 85-91/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 1985-92:

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

NOTE: The eyespot inoculum was colonised on oat seed and this was broadcast in October, 1984.

Experimental diary:

28-Aug-91 : B : Straw chopped.
03-Sep-91 : B : PK as(0:16:36) at 1040 kg.
06-Sep-91 : B : Dolomite at 5.0 t.
24-Sep-91 : B : Ploughed, furrow pressed.
26-Sep-91 : B : Rotary harrowed. Mercia drilled at 160 kg, rolled.
16-Nov-91 : B : Pinnacle at 5.0 l in 200 l.
21-Nov-91 : **T** : **FUNGCIDE** CARB: Bavistin FL at 0.50 l in 200 l.
: **T** : **FUNGCIDE** PRO: Sportak 45 at 0.90 l in 200 l.
: **T** : **FUNGCIDE** CARB+PRO: Bavistin FL at 0.50 l in 200 l and Sportak 45 at 0.90 l in 200 l, applied separately.
27-Feb-92 : B : 34.5% N at 120 kg.

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92/R/CS/302

Experimental diary:

```
   06-Apr-92 : B : 34.5% N at 460 kg.
   20-Apr-92 : B : Harmony M at 0.06 kg and Starane 2 at 0.75 l in 200 l.
   05-May-92 : T : FUNGCIDE CARB: Bavistin FL at 0.50 l in 200 l.
             : T : FUNGCIDE PRO: Sportak 45 at 0.90 l in 200 l.
             : T : FUNGCIDE CARB+PRO: Bavistin FL at 0.50 l in 200 l and
                   Sportak 45 at 0.90 l in 200 l, applied separately.
   29-Jul-92 : B : Combine harvested.
```

NOTE: Eyespot and sharp eyespot were assessed on plants sampled in early July on the **EYE INOC** NATURAL plots. Isolates of the eyespot fungus were identified by type (W and R) and assessed for resistance to carbendazim and prochloraz.

GRAIN TONNES/HECTARE

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

EYE INOC / **FUNGCIDE**	NATURAL	W 19R 1S	W 1R 19S	R 19R 1S	R 1R 19S	Mean
NONE	5.86	5.91	5.91	6.18	5.45	5.86
CARB	5.52	5.91	5.63	5.38	5.64	5.60
PRO	6.02	5.98	5.96	5.93	6.59	6.09
CARB+PRO	7.16	6.99	6.81	6.83	6.79	6.95
Mean	6.14	6.20	6.08	6.08	6.12	6.13

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

EYE INOC	**FUNGCIDE*** **EYE INOC**	
0.167	0.335	min.rep
0.145	0.290	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	3	0.412	6.7
BLOCK.WP.SP	24	0.335	5.5

GRAIN MEAN DM% 88.8

SUB PLOT AREA HARVESTED 0.00138

https://doi.org/10.23637/ERADOC-1-47

92/R/CS/309 and 92/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, A.D. Todd, B.R. Kerry, D.G. Christian, E.T.G. Bacon, J.F. Jenkyn, R.J. Gutteridge, W. Powell.

Associate sponsor: D.S. Powlson.

The eighth year, w. rape.

For previous years see 85-91/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

Experimental diary:
Great Knott III (R):

28-Aug-91	T	**STRAW** CHOPPED: Straw chopped and spread.
30-Aug-91	T	**STRAW** BURNT: Straw burnt.
31-Aug-91	T	**STRAW** BURNT: Disced to 10 cm.
04-Sep-91	T	**CULTIVTN** TINE 10: Cultivated by rotary grubber to 10 cm.
	T	**CULTIVTN** TN10PL20: Cultivated by rotary grubber to 10 cm and ploughed to 20 cm.
	T	**CULTIVTN** TN10TN20: Cultivated by rotary grubber to 10 cm and chisel ploughed to 20 cm.
	T	**CULTIVTN** PLOUGH20: Ploughed to 20 cm.
05-Sep-91	B	Rotary harrowed, Falcon, dressed Lindex-Plus FS, drilled at 8.0 kg, rolled.
06-Sep-91	B	Butisan S at 2.5 l in 200 l.
13-Oct-91	B	Pilot at 0.15 l with Cropspray 11 E at 2.5 l in 200 l.
19-Feb-92	B	34.5% N at 220 kg.
25-Mar-92	B	34.5% N at 290 kg.

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92/R/CS/309 and 92/W/CS/309

Experimental diary:

Great Knott III (R):

09-Apr-92 : B : Sportak 45 at 1.1 l in 200 l.
15-Jul-92 : B : Reglone at 3.0 l with Farmon Blue at 0.26 l in 260 l.
22-Jul-92 : B : Combine harvested.

Far Field I (W):

25-Aug-91 : **T** : **STRAW** CHOPPED: Straw chopped and spread.
30-Aug-91 : **T** : **STRAW** BURNT : Straw burnt.
: **T** : **CULTIVTN** TINE 10: Heavy spring-tine cultivated to 10 cm.
: **T** : **CULTIVTN** TN10PL20: Heavy spring-tine cultivated to 10 cm and ploughed to 20 cm.
: **T** : **CULTIVTN** TN10TN20: Heavy spring-tine cultivated to 10 cm and again to 20 cm.
: **T** : **CULTIVTN** PLOUGH20: Ploughed to 20 cm.
02-Sep-91 : **T** : **CULTIVTN** TINE 10, TN10TN20: Disced to 10 cm.
02-Sep-91 : B : Rolled.
05-Sep-91 : B : Rotary harrowed, Falcon, dressed Lindex-Plus FS, drilled at 7.0 kg.
12-Oct-91 : B : Pilot at 0.15 l with Cropspray 11 E at 2.0 l in 200 l.
06-Jan-92 : B : PK as (0:16:36) at 740 kg.
15-Jan-92 : B : Benazolox at 1.0 kg in 200 l.
16-Jan-92 : B : PK as (0:16:36) at 300 kg.
21-Feb-92 : B : 34.5% N at 220 kg.
31-Mar-92 : B : 34.5% N at 290 kg.
03-May-92 : B : Sportak at 1.25 l in 200 l.
16-Jul-92 : B : Reglone at 3.0 l with Agral at 0.40 l in 400 l.
26-Jul-92 : B : Combine harvested.

NOTES: (1) From 1985 to 1991 effects were tested on w. wheat. In 1992 w. rape was grown in order to control grass weeds.
(2) Number of plants and dry weights were estimated in autumn and spring. Individual seed weight and oil content were measured at harvest.

https://doi.org/10.23637/ERADOC-1-47

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

GRAIN TONNES/HECTARE

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

CULTIVTN / STRAW	TINE 10	TN10PL20	TN10TN20	PLOUGH20	Mean
BURNT	3.86	3.72	3.78	3.64	3.75
CHOPPED	4.07	3.96	4.21	3.83	4.02
Mean	4.00	3.88	4.07	3.76	3.93

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

STRAW	CULTIVTN	STRAW CULTIVTN	
		0.189	min.rep
0.082	0.109	0.164	max-min
		0.134	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	0.267	6.8

GRAIN MEAN DM% 87.0

PLOT AREA HARVESTED 0.00644

https://doi.org/10.23637/ERADOC-1-47

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

GRAIN TONNES/HECTARE

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

CULTIVTN / STRAW	TINE 10	TN10PL20	TN10TN20	PLOUGH20	Mean
BURNT	2.55	2.21	2.75	2.75	2.56
CHOPPED	2.14	2.58	2.02	2.90	2.41
Mean	2.28	2.45	2.26	2.85	2.46

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

STRAW	CULTIVTN	STRAW CULTIVTN	
		0.579	min.rep
0.251	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	15	0.579	23.5

GRAIN MEAN DM% 87.5

PLOT AREA HARVESTED 0.00638

https://doi.org/10.23637/ERADOC-1-47

92/R/CS/311

EFFECTS OF SHALLOW STRAW INCORPORATION

Object: To study the effects of shallow straw incorporation on 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 eighth year, w. wheat.

For previous years see 85-91/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
	BALED	Baled and removed
	CHOPPED	Chopped
2. **CULTTIME**		Time of cultivation, to 10 cm depth:
	EARLY	As soon as possible after harvest
	LATER	At least 14 days after EARLY

Sub plots

3. **FUNGCIDE**		Fungicides:
	0	None
	FULL	Full programme:- Triadimefon and carbendazim in winter, prochloraz in spring plus propiconazole alone and with chlorothalonil in summer
4. **INSCTCDE**		Insecticides:
	0	None
	CYP+PIR	Cypermethrin in autumn and pirimicarb in summer
5. **MOLLCIDE**		Molluscicide:
	0	None
	METHCARB	Methiocarb after drilling

https://doi.org/10.23637/ERADOC-1-47

92/R/CS/311

Experimental Diary:

```
   22-Aug-91 : T : STRAW BALED: Straw baled and removed.
   27-Aug-91 : T : STRAW BURNT: Straw burnt.
             : T : STRAW CHOPPED: Straw chopped with trailed straw chopper.
   28-Aug-91 : T : STRAW BURNT: Disced.
             : T : CULTTIME EARLY: Cultivated by rotary grubber.
   23-Sep-91 : B : (0:16:36) at 1040 kg.
   11-Oct-91 : T : CULTTIME LATER: Cultivated by rotary grubber.
   12-Oct-91 : B : Rotary harrowed, Haven drilled at 220 kg, rolled.
   18-Oct-91 : T : MOLLCIDE METHCARB: Draza at 5.5 kg.
   12-Nov-91 : T : INSCTCDE CYP+PIR: Ripcord at 0.20 l in 200 l.
   27-Nov-91 : B : Stefes IPU at 2.5 l and Stomp 400 at 3.3 l in 200 l.
   14-Jan-92 : T : FUNGCIDE FULL: Bayleton BM at 1.0 kg in 200 l.
   25-Feb-92 : B : 34.5% N at 120 kg.
   14-Apr-92 : B : 34.5% N at 580 kg.
   15-May-92 : T : FUNGCIDE FULL: Sportak 45 at 0.90 l in 200 l.
   20-May-92 : B : Terpal at 2.0 l with Farmon Blue at 0.80 l in 200 l.
   04-Jun-92 : T : FUNGCIDE FULL: Radar at 0.50 l in 200 l.
   22-Jun-92 : T : FUNGCIDE FULL: Radar at 0.50 l and Chiltern
                   Chlorothalonil 500 at 1.0 l in 200 l.
             : T : INSCTCDE CYP+PIR: Aphox at 0.28 kg in 200 l.
   28-Jul-92 : B : Roundup at 4.0 l in 200 l.
   19-Aug-92 : B : Combine harvested.
```

NOTE: Growth was measured and incidence of diseases assessed at intervals during the season. Incidence of stem-borers was assessed in spring. 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	8.62	8.58	8.60
BALED	8.24	8.57	8.40
CHOPPED	8.23	8.56	8.39
Mean	8.36	8.57	8.47

FUNGCIDE	0	FULL	Mean
STRAW			
BURNT	7.79	9.40	8.60
BALED	7.54	9.26	8.40
CHOPPED	7.52	9.27	8.39
Mean	7.62	9.31	8.47

https://doi.org/10.23637/ERADOC-1-47

92/R/CS/311

GRAIN TONNES/HECTARE

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

FUNGCIDE	O	FULL	Mean
CULTTIME			
EARLY	7.53	9.20	8.36
LATER	7.71	9.42	8.57
Mean	7.62	9.31	8.47

INSCTCDE	O	CYP+PIR	Mean
STRAW			
BURNT	8.46	8.73	8.60
BALED	8.43	8.38	8.40
CHOPPED	8.39	8.40	8.39
Mean	8.43	8.50	8.47

INSCTCDE	O	CYP+PIR	Mean
CULTTIME			
EARLY	8.34	8.38	8.36
LATER	8.52	8.62	8.57
Mean	8.43	8.50	8.47

INSCTCDE	O	CYP+PIR	Mean
FUNGCIDE			
O	7.62	7.62	7.62
FULL	9.24	9.38	9.31
Mean	8.43	8.50	8.47

MOLLCIDE	O	METHCARB	Mean
STRAW			
BURNT	8.59	8.61	8.60
BALED	8.39	8.41	8.40
CHOPPED	8.43	8.35	8.39
Mean	8.47	8.46	8.47

MOLLCIDE	O	METHCARB	Mean
CULTTIME			
EARLY	8.37	8.36	8.36
LATER	8.58	8.56	8.57
Mean	8.47	8.46	8.47

MOLLCIDE	O	METHCARB	Mean
FUNGCIDE			
O	7.63	7.61	7.62
FULL	9.31	9.31	9.31
Mean	8.47	8.46	8.47

https://doi.org/10.23637/ERADOC-1-47

92/R/CS/311

GRAIN TONNES/HECTARE

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

MOLLCIDE	O	METHCARB	Mean
INSCTCDE			
O	8.50	8.36	8.43
CYP+PIR	8.45	8.55	8.50
Mean	8.47	8.46	8.47

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

FUNGCIDE	INSCTCDE	MOLLCIDE	STRAW* FUNGCIDE
0.084	0.084	0.084	0.145

CULTTIME* FUNGCIDE	STRAW INSCTCDE	CULTTIME INSCTCDE	FUNGCIDE INSCTCDE
0.119	0.145	0.119	0.119

STRAW* MOLLCIDE	CULTTIME* MOLLCIDE	FUNGCIDE MOLLCIDE	INSCTCDE MOLLCIDE
0.145	0.119	0.119	0.119

* 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	0.291	3.4

GRAIN MEAN DM% 87.0

SUB PLOT AREA HARVESTED 0.00276

https://doi.org/10.23637/ERADOC-1-47

92/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 fifth year, w. barley, w. oats, w. triticale, w. wheat, s. barley.

For previous years see 88-91/R/CS/323

Design: 3 randomised blocks of 26 plots.

Whole plot dimensions: 3.0 x 10.0.

CROPSEQ	Crop sequences (1988, 1989, 1990, 1991 and 1992 respectively):
W W S S S	W. wheat, w. wheat, s. barley, s. barley, s. barley
B B B B B	W. barley, w. barley, w. barley, w. barley, w. barley
O B B B O	W. oats, w. barley, w. barley, w. barley, w. oats
B O B B B	W. barley, w. oats, w. barley, w. barley, w. barley
B B O B B	W. barley, w. barley, w. oats, w. barley, w. barley
S B S B S	S. barley, w. barley, s. barley, w. barley, s. barley
T T B B B	W. triticale, w. triticale, w. barley, w. barley, w. barley
T B T B T	W. triticale, w. barley, w. triticale, w. barley, w. triticale
W B W B W	W. wheat, w. barley, w. wheat, w. barley, w. wheat
W W B B B	W. wheat, w. wheat, w. barley, w. barley, w. barley
B B B O B	W. barley, w. barley, w. barley, w. oats, w. barley
T T T O T	W. triticale, w. triticale, w. triticale, w. oats, w. triticale
W W W O W	W. wheat, w. wheat, w. wheat, w. oats, w. wheat
T T T T T	W. triticale, w. triticale, w. triticale, w. triticale, w. triticale
B B T T T	W. barley, w. barley, w. triticale, w. triticale, w. triticale
O T T T O	W. oats, w. triticale, w. triticale, w. triticale, w. oats
T O T T T	W. triticale, w. oats, w. triticale, w. triticale, w. triticale
T T O T T	W. triticale, w. triticale, w. oats, w. triticale, w. triticale
W W T T T	W. wheat, w. wheat, w. triticale, w. triticale, w. triticale
W T W T W	W. wheat, w. triticale, w. wheat, w. triticale, w. wheat
W W W W W	W. wheat, w. wheat, w. wheat w. wheat, w. wheat
B B W W W	W. barley, w. barley, w. wheat, w. wheat, w. wheat
O W W W O	W. oats, w. wheat, w. wheat, w. wheat, w. oats
W O W W W	W. wheat, w. oats, w. wheat, w. wheat, w. wheat
W W O W W	W. wheat, w. wheat, w. oats, w. wheat, w. wheat
T T W W W	W. triticale, w. triticale, w. wheat, w. wheat, w. wheat

https://doi.org/10.23637/ERADOC-1-47

92/R/CS/323

Experimental Diary:

05-Sep-91	B	Straw baled and removed.
12-Sep-91	B	Sting CT at 1.5 l in 200 l.
16-Sep-91	B	PK as (0:16:36) at 300 kg.
18-Sep-91	B	Ploughed and furrow pressed.
19-Sep-91	T	W. barley plots: Rotary harrowed, Magie drilled at 140 kg.
	T	W. oats plots: Rotary harrowed, Image drilled at 124 kg.
	T	W. triticale plots: Rotary harrowed, Cumulus drilled at 154 kg.
	T	W. wheat plots: Rotary harrowed, Mercia drilled at 161 kg.
20-Sep-91	B	Rolled.
20-Sep-91	T	W. barley, w. triticale and w. wheat plots: Stefes IPU at 2.5 l and Stomp 400 at 2.5 l in 200 l.
	T	W. oats plots: Glytex at 2.25 kg in 200 l.
25-Feb-92	T	W. barley, w. triticale, w.wheat and w.oats plots: 34.5% N at 87 kg.
05-Mar-92	T	S. barley plots: 34.5% N at 348 kg.
	T	S. barley plots: Rotary harrowed, Klaxon drilled at 136 kg.
14-Apr-92	T	W. triticale and w.oats plots: 34.5% N at 348 kg.
	T	W. barley plots: 34.5% N at 435 kg.
	T	W. wheat plots: 34.5% N at 493 kg.
03-May-92	B	Starane 2 at 1.0 l and Radar at 0.50 l in 260 l.
24-Jul-92	T	W. barley plots: Combine harvested.
30-Jul-92	T	W. wheat, w. triticale and s. barley plots: Combine harvested.
29-Aug-92	T	W. oats plots: Combine harvested.

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-1-47

92/R/CS/323

GRAIN TONNES/HECTARE

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

CROPSEQ	
W W S S S	6.10
B B B B B	7.10
O B B B O	3.60
B O B B B	7.76
B B O B B	8.08
S B S B S	5.91
T T B B B	7.22
T B T B T	6.16
W B W B W	6.22
W W B B B	7.60
B B B O B	7.53
T T T O T	7.62
W W W O W	7.05
T T T T T	6.96
B B T T T	5.99
O T T T O	4.06
T O T T T	6.70
T T O T T	6.94
W W T T T	7.65
W T W T W	6.40
W W W W W	6.79
B B W W W	6.35
O W W W O	3.65
W O W W W	5.56
W W O W W	6.51
T T W W W	6.07
Mean	6.44

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

CROPSEQ
0.367

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

Stratum	d.f.	s.e.	cv%
BLOCK.WP	50	0.450	7.0

GRAIN MEAN DM% 85.4

PLOT AREA HARVESTED 0.00230

https://doi.org/10.23637/ERADOC-1-47

92/R/CS/326 and 92/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: R.D. Prew, D.G. Christian, J.F. Jenkyn, E.T.G. Bacon.

The sixth year, w. rape.

For previous years see 87-91/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	2.5	4.2
2 NORMAL	Twice normal	5.0	8.4
4 NORMAL	Four times normal	10.0	16.8

Experimental diary:

Great Knott III (R)

27-Aug-91 : **T** : **STRAW** NORMAL, 2 NORMAL and 4 NORMAL: Straw applied.
28-Aug-91 : B : Straw and stubble chopped.
04-Sep-91 : B : Ploughed.
05-Sep-91 : B : Rotary harrowed, Falcon, dressed Lindex-Plus FS, drilled at 8.0 kg. Rolled.
06-Sep-91 : B : Butisan S at 2.5 l in 200 l.
13-Oct-91 : B : Pilot at 0.15 l with Cropspray 11 E at 2.5 l in 200 l.
19-Feb-92 : B : 34.5% N at 220 kg.
25-Mar-92 : B : 34.5% N at 290 kg.
09-Apr-92 : B : Sportak 45 at 1.1 l in 200 l.
15-Jul-92 : B : Reglone at 3.0 l with Farmon Blue at 0.26 l in 260 l.
22-Jul-92 : B : Combine harvested.

Far Field I (W)

28-Aug-91 : **T** : **STRAW** NORMAL, 2 NORMAL and 4 NORMAL: Straw applied.
30-Aug-91 : B : Straw and stubble chopped.
02-Sep-91 : B : Disced four times to 10 cm. Rolled.
05-Sep-91 : B : Rotary harrowed, Falcon, dressed Lindex-Plus FS, drilled at 7.0 kg.
12-Oct-91 : B : Pilot at 0.15 l with Cropspray 11 E at 2.0 l in 200 l.
06-Jan-92 : B : PK as (0:16:36) at 740 kg.
15-Jan-92 : B : Benazalox at 1.0 kg in 200 l.
16-Jan-92 : B : PK as (0:16:36) at 300 kg.
21-Feb-92 : B : 34.5% N at 220 kg.

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92/R/CS/326 and 92/W/CS/326

Experimental diary:
Far Field I (W)
31-Mar-92 : B : 34.5% N at 290 kg.
01-Apr-92 : B : Lentagran 45 WP at 2.0 kg in 200 l.
03-May-92 : B : Sportak at 1.2 l in 200 l.
16-Jul-92 : B : Reglone at 3.0 l with Agral at 0.46 l in 400 l.
26-Jul-92 : B : Combine harvested.

NOTES: (1) From 1987 to 1991 effects were tested on w. wheat. In 1992 w. rape was grown in order to control grass weeds.
(2) Number of plants was estimated in autumn and spring. Dry weights were measured in spring. Individual seed weight and oil content were measured at harvest.

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

GRAIN TONNES/HECTARE

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

STRAW	
NONE	4.04
NORMAL	4.03
2 NORMAL	3.91
4 NORMAL	3.90
Mean	3.97

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

STRAW
0.108

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

Stratum	d.f.	s.e.	cv%
BLOCK.WP	9	0.153	3.9

GRAIN MEAN DM% 85.9

PLOT AREA HARVESTED 0.00307

https://doi.org/10.23637/ERADOC-1-47

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

GRAIN TONNES/HECTARE

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

	STRAW
NONE	3.29
NORMAL	3.32
2 NORMAL	3.11
4 NORMAL	3.46
Mean	3.29

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

STRAW
0.293

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

Stratum	d.f.	s.e.	cv%
BLOCK.WP	6	0.359	10.9

GRAIN MEAN DM% 85.9

PLOT AREA HARVESTED 0.00317

https://doi.org/10.23637/ERADOC-1-47

92/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 fourth year, w. wheat, w.oats.

For previous years see 89-91/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 (1989), none since:
NONE O W	None (w. oats 1992, alternating with w. wheat)
NONE W O	None (w. wheat 1992, 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 drilled with the seed
N CD	Non-infective inoculum combine drilled with the seed

Experimental diary:

17-Sep-91 : B : Ploughed and furrow pressed.
18-Sep-91 : **T** : **INOCMETH** NONE OW: Rotary harrowed, Image drilled at 120 kg.
: **T** : All treatments except **INOCMETH** NONE OW: Rotary harrowed. Mercia drilled at 160 kg.
18-Sep-91 : B : Rolled.
27-Nov-91 : B : Stefes IPU at 2.5 l and Stomp 400 at 3.3 l in 200 l.
02-Apr-92 : B : 34.5% N at 580 kg.
04-May-92 : B : Dorin at 1.0 l and Chiltern Olé at 1.0 l in 200 l.
23-Jun-92 : B : Mistral at 0.50 l and Radar at 0.50 l in 200 l.
29-Aug-92 : B : Combine harvested.

NOTE: Plant samples were taken on five occasions between March and July to assess take-all on roots. Take-all patches and lodging were assessed in July. Take-all inoculation was measured by bioassay of soil cores taken after harvest.

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92/R/CS/331

GRAIN TONNES/HECTARE

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

INOCMETH	
NONE W O	7.50
NONE W W	7.54
I PRE PL	7.56
N PRE PL	7.63
I PRE SO	7.35
N PRE SO	7.22
I CD	7.44
N CD	7.49
Mean	7.47

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

INOCMETH
0.281

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

Stratum	d.f.	s.e.	cv%
BLOCK.WP	21	0.397	5.3

GRAIN MEAN DM% 76.0

PLOT AREA HARVESTED 0.00506

https://doi.org/10.23637/ERADOC-1-47

92/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 third year, w. wheat.

For previous years see 90-91/W/CS/346.

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

Whole plot dimensions: 10.0 x 24.0.

Treatments: All combinations of:-

Whole plots

1. **LAND TRT[90]** 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 RES** Residues of nitrogen fertilizer (kg N) to w. wheat in 1991:

(0)
(80)
(120)
(160)
(200)
(240)
(280)

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

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92/W/CS/346

Experimental diary:

```
21-Sep-91 : B : Ploughed.
25-Sep-91 : B : Rolled.
02-Oct-91 : B : Rotary cultivated.
02-Oct-91 : T : On wheat plots Mercia drilled at 140 kg.
09-Mar-92 : T : 34.5% N at 116 kg to wheat plots.
01-Apr-92 : B : Duplosan New System CMPP at 2.0 l and Asset at 2.0 l in
                200 l.
23-Apr-92 : T : 34.5% N at 464 kg to wheat plots.
15-May-92 : T : Dorin at 1.0 l and Ally at 30 g in 300 l to wheat plots.
08-Jun-92 : T : Halo at 2.0 l in 200 l to wheat plots.
29-Aug-92 : T : Combine harvested.
```

NOTE: Soil N was measured in autumn and spring. Foliar diseases and foot and root rots were assessed in spring and summer.

GRAIN TONNES/HECTARE

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

N RES / LAND TRT[90]	(0)	(80)	(120)	(160)	(200)	(240)	(280)	Mean
CA WW	6.75	6.23	5.78	6.35	6.05	5.51	6.26	6.13
CA RA	7.25	6.92	6.09	6.36	5.06	6.34	5.56	6.23
SA CA FA	6.60	6.61	5.87	5.84	5.22	5.66	6.26	6.01
CA CS	6.19	6.37	6.45	5.64	5.46	6.11	5.38	5.94
SA CS	5.72	4.98	5.10	4.75	5.73	5.21	5.04	5.22
WT	6.18	4.97	5.84	5.37	4.89	5.15	4.67	5.29
WT CS TS	6.10	5.32	5.83	4.49	5.34	4.67	5.01	5.25
Mean	6.40	5.91	5.85	5.54	5.39	5.52	5.45	5.72

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

LAND TRT[90]	N RES	LAND TRT[90] N RES
0.526	0.259	0.823

Except when comparing means with the same level(s) of LAND TRT[90]: 0.684

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

Stratum	d.f.	s.e.	cv%
BLOCK.WP	12	0.644	11.3
BLOCK.WP.SP	84	0.838	14.6

GRAIN MEAN DM% 79.9

SUB PLOT AREA HARVESTED 0.00199

https://doi.org/10.23637/ERADOC-1-47

92/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 third year, w. oats, ryegrass, clover, tumbledown.

For previous years see 90-91/W/CS/347.

Treatments:

CROPS	Crops, cumulative since 1990:
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 OATS	Winter oats

NOTES: (1) Yields were taken from the w. oats and from the ley plots, from which cuttings were removed.
(2) Ryegrass and clover were sown in 1989.

Experimental diary:

18-Sep-91 : **T** : **CROPS** W OATS: Ploughed.
21-Sep-91 : **T** : **CROPS** W OATS: Rolled.
25-Sep-91 : **T** : **CROPS** W OATS: Rotary cultivated, Image drilled at 152 kg rolled.
20-Mar-92 : **T** : **CROPS** RY+CL RE: 21 kg P_2O_5 and 84 kg K_2O to balance PK in crop removed last year.
RY+N RE: 53 kg P_2O_5 and 264 kg K_2O to balance PK in crop removed last year.
10-Apr-92 : **T** : **CROPS** W OATS: 34.5% N at 290 kg.
15-May-92 : **T** : **CROPS** W OATS: Dorin at 1.0 l and Ally at 30 g in 300 l.
27-May-92 : **T** : **CROPS** RY LF, RY+CL LF, RY+CL RE and RY+N RE: Cut.
28-May-92 : **T** : **CROPS** TU LF: Cut.
02-Jun-92 : **T** : **CROPS** RY+CL RE and RY+N RE: Cuttings removed.
15-Jul-92 : **T** : **CROPS** RY LF, RY+CL LF, RY+CL RE, RY+N RE and TU LF: Cut.
15-Jul-92 : **T** : **CROPS** RY+CL RE and RY+N RE: Cuttings removed.
31-Jul-92 : **T** : **CROPS** W OATS: Combine harvested.
15-Sep-92 : **T** : **CROPS** RY LF, RY+CL LF, RY+CL RE and RY+N RE: Cut.
16-Sep-92 : **T** : **CROPS** TU LF: Cut.
16-Sep-92 : **T** : **CROPS** RY+CL RE and RY+N RE: Cuttings removed.

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92/W/CS/347

NOTE: Soil nitrogen was measured in autumn 1991 and spring 1992. Ground cover, plant numbers, plant height and growth stages were estimated in spring and autumn 1992. Soil seedbank samples were taken in autumn 1992.

GRASS

1ST CUT (27/5/92) DRY MATTER TONNES/HECTARE

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

CROPS	RY+CL RE	RY+N RE	Mean
	1.44	4.27	2.85

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

CROPS
0.280

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

Stratum	d.f.	s.e.	cv%
BLOCK.WP	5	0.484	17.0

1ST CUT MEAN DM% 23.3

2ND CUT (15/7/92) DRY MATTER TONNES/HECTARE

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

CROPS	RY+CL RE	RY+N RE	Mean
	1.22	0.37	0.79

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

CROPS
0.116

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

Stratum	d.f.	s.e.	cv%
BLOCK.WP	5	0.201	25.3

2ND CUT MEAN DM% 23.3

https://doi.org/10.23637/ERADOC-1-47

92/W/CS/347

GRASS

3RD CUT (15/9/92) DRY MATTER TONNES/HECTARE

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

CROPS	RY+CL RE	RY+N RE	Mean
	2.02	0.75	1.38

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

CROPS
0.170

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

Stratum	d.f.	s.e.	cv%
BLOCK.WP	5	0.295	21.3

3RD CUT MEAN DM% 27.4

TOTAL OF 3 CUTS DRY MATTER TONNES/HECTARE

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

CROPS	RY+CL RE	RY+N RE	Mean
	4.67	5.38	5.03

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

CROPS
0.478

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

Stratum	d.f.	s.e.	cv%
BLOCK.WP	5	0.828	16.5

TOTAL OF 3 CUTS MEAN DM% 24.7

PLOT AREA HARVESTED 0.00264

W. OATS

GRAIN TONNES/HECTARE 4.65

GRAIN MEAN DM% 86.5

PLOT AREA HARVESTED 0.00572

https://doi.org/10.23637/ERADOC-1-47

92/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 second year, w. wheat.

For first year see 91/R/CS/354

Design: 4 randomised blocks of 5 plots.

Whole plot dimensions: 3.0 x 10.0.

Treatments:

SOW SEQ	Sequences of sowing date in 1991 and 1992, and level of volunteers in 1992:
ERL ERL	Early in 1991 and 1992
ERL LATE	Early in 1991 and late in 1992
ERL LT V	Early in 1991 and late in 1992, when volunteers encouraged
LATE ERL	Late in 1991 and early in 1992
LT LT NV	Late in 1991 and late in 1992, when volunteers controlled

NOTE: On ERL LT V volunteers simulated by sowing 50 kg wheat seed after cultivations on 12 Sept.

Experimental diary:

30-Aug-91 : B : Straw baled.
07-Sep-91 : B : Ploughed and furrow pressed.
11-Sep-91 : B : Rotary harrowed.
12-Sep-91 : **T** : **SOW SEQ** ERL ERL and LATE ERL: Rotary harrowed, Mercia drilled at 161 kg.
12-Sep-91 : B : Rolled.
08-Oct-91 : **T** : **SOW SEQ** LT LT NV: Sting CT at 2.0 l in 200 l.
14-Oct-91 : **T** : **SOW SEQ** ERL LATE, ERL LT V and LT LT NV: Rotary harrowed, Mercia drilled at 161 kg.
15-Oct-91 : B : Rolled.
16-Nov-91 : B : Stefes IPU at 1.0 l, Stomp 400 at 2.5 l and Decis at 0.20 l in 200 l.
06-Mar-92 : B : 34.5% N at 120 kg.
02-Apr-92 : B : 34.5% N at 460 kg.
20-May-92 : B : Dorin at 1.0 l and Chiltern Olé at 1.5 l in 200 l.
23-Jun-92 : B : Mistral at 0.50 l and Radar at 0.50 l in 200 l.
03-Aug-92 : B : Combine harvested.

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-1-47 *pp 31*

92/R/CS/354

GRAIN TONNES/HECTARE

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

SOW SEQ	
ERL ERL	7.31
ERL LATE	7.02
ERL LT V	7.21
LATE ERL	7.62
LT LT NV	6.95
Mean	7.22

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

SOW SEQ
0.289

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

Stratum	d.f.	s.e.	cv%
BLOCK.WP	12	0.409	5.7

GRAIN MEAN DM% 86.6

PLOT AREA HARVESTED 0.00226

https://doi.org/10.23637/ERADOC-1-47

92/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 second year, w. wheat.

For first year see 91/R/CS/355.

Design: 3 randomised blocks of 7 plots.

Whole plot dimensions: 21.0 x 23.0.

Treatments:

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

Experimental diary:

27-Aug-91 : B : Straw chopped.
03-Sep-91 : B : PK as (0:16:36) at 1040 kg.
02-Oct-91 : B : Ploughed and furrow pressed.
04-Oct-91 : B : Disced.
07-Oct-91 : B : Disced.
08-Oct-91 : B : Rotary harrowed.
09-Oct-91 : B : Rotary harrowed, Mercia drilled at 160 kg.
11-Oct-91 : B : Rolled.
27-Nov-91 : B : Tripart Ludorum at 3.0 l and Stomp 400 at 3.3 l in 200 l.
13-Apr-92 : **T** : **N** 50: 34.5% N at 145 kg.
: **T** : **N** 100: 34.5% N at 290 kg.
: **T** : **N** 150: 34.5% N at 435 kg.
: **T** : **N** 200: 34.5% N at 580 kg.
: **T** : **N** 250: 34.5% N at 725 kg.
: **T** : **N** 300: 34.5% N at 870 kg.
19-May-92 : B : Starane 2 at 1.0 l and Dorin at 1.0 l in 200 l.
23-Jun-92 : B : Mistral at 0.50 l and Radar at 0.50 l in 200 l.
26-Aug-92 : B : Combine harvested.

NOTE: Samples were taken before combine harvest to measure straw and stubble yields. Grain, straw and stubble samples were taken for chemical analysis.

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92/R/CS/355

GRAIN TONNES/HECTARE

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

N	
0	3.40
50	4.80
100	5.76
150	6.77
200	6.69
250	6.67
300	6.48
Mean	5.79

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

N
0.368

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

Stratum	d.f.	s.e.	cv%
BLOCK.WP	12	0.451	7.8

GRAIN MEAN DM% 78.6

PLOT AREA HARVESTED 0.00483

https://doi.org/10.23637/ERADOC-1-47 *pp 34*

92/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 second year, w. wheat.

For first year see 91/W/CS/356.

Design: 3 randomised blocks of 7 plots split into 8.

Whole plot dimensions: 10.0 x 24.0.

Treatments: All combinations of:-

Whole plot

1. **LAND TRT[91]** Land treatment in 1991, after w. wheat 1990 (all treatments ploughed autumn 1991 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

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

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92/W/CS/356

Experimental diary.

W. wheat:

18-Sep-91	: B :	Ploughed.
25-Sep-91	: T :	Rolled.
02-Oct-91	: T :	Rotary cultivated, Mercia drilled at 140 kg.
18-Mar-92	: T :	Folimat at 1.12 l in 200 l.
01-Apr-92	: T :	Duplosan New System CMPP at 2.0 l and Asset at 2.0 l in 200 l.
09-Apr-92	: T :	N 80, 120, 160, 200, 240 and 280: Applied as 27% N.
15-May-92	: T :	Dorin at 1.0 l and Ally at 0.03 kg in 300 l.
08-Jun-92	: T :	Halo at 2.0 l in 200 l.
29-Jul-92	: T :	Barclay Gallup at 2.0 l with Team at 0.30 l in 300 l.
01-Sep-92	: T :	Combine harvested.

Fallow:

18-Sep-91	: B :	Ploughed.
25-Apr-92	: T :	Rotary cultivated.

NOTE: Amounts of soil nitrogen and plant dry matter were measured in autumn and spring. Assessment of plant cover was made in spring. Diseases were assessed in spring and summer.

GRAIN TONNES/HECTARE

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

N	0	80	120	160	200	240	280	Mean
LAND TRT[91]								
CA WW	5.37	6.65	6.24	6.25	6.21	7.27	6.46	6.35
CA RA	4.26	6.53	6.86	6.91	7.29	7.42	7.47	6.68
SA CA FA	5.08	6.19	7.35	7.31	7.39	6.35	6.76	6.63
CA CS	7.62	7.56	7.61	7.08	7.30	6.58	6.46	7.17
SA CS	6.45	7.90	7.50	7.64	7.27	7.75	7.14	7.38
WT	5.88	7.16	6.74	7.35	7.43	7.69	7.70	7.13
WT CS TS	7.56	7.18	7.39	7.30	6.62	6.34	5.16	6.79
Mean	6.03	7.02	7.10	7.12	7.07	7.06	6.74	6.88

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

LAND TRT[91]	N	LAND TRT[91] N
0.262	0.273	0.718

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

LAND TRT[91]	
	0.722

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

Stratum	d.f.	s.e.	cv%
BLOCK.WP	12	0.321	4.7
BLOCK.WP.SP	84	0.884	12.9

GRAIN MEAN DM% 83.0 SUB PLOT AREA HARVESTED 0.00199

https://doi.org/10.23637/ERADOC-1-47

92/W/CS/357

COVER CROPS

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

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

The second year, w. barley.

For first year see 91/W/CS/357.

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. **CROP RES** — Cover crops, sown 1990, re-sown to s. barley 1991:

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 RES** — Nitrogen fertilizer (kg N) in 1991:

(0)
(50)

plus three extra treatments:

1. **EXTRA**

CULT FAL	Cultivated fallow sown to s. barley in 1991
TUMBDOWN	Tumbledown fallow, no weed control until sown to s. barley in 1991
W BARLEY	W. barley sown in 1990, taken to maturity in 1991

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92/W/CS/357

Sub plots

2. **N EXTRA** Nitrogen fertilizer, (kg N) in 1991:

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

Experimental diary:
11-Sep-91 : B : Ploughed and rolled.
25-Sep-91 : B : Rotary cultivated, Puffin drilled at 120 kg. Rolled.
31-Jan-92 : B : Stomp 400 at 2.5 l and Stefes IPU at 1.0 l in 200 l.
10-Mar-92 : B : 34.5% N at 116 kg.
01-Apr-92 : B : Bayleton at 0.50 kg and Ringer at 0.35 l in 200 l.
02-Apr-92 : B : 34.5% N at 348 kg.
03-May-92 : B : Bayleton at 0.50 kg and Ringer at 0.50 kg in 300 l.
24-Jul-92 : B : Combine harvested.

GRAIN TONNES/HECTARE

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

CC SOWDT	24 AUG	24 SEPT	Mean
CROP RES			
FO RA SB	5.32	5.47	5.39
PH TA SB	6.00	5.12	5.56
RY GR SB	5.74	5.65	5.70
RYE SB	5.40	6.20	5.80
WH MU SB	5.36	5.92	5.64
WM+RY SB	6.05	6.11	6.08
Mean	5.65	5.75	5.70

N RES	(0)	(50)	Mean
CROP RES			
FO RA SB	5.51	5.28	5.39
PH TA SB	5.50	5.61	5.56
RY GR SB	5.92	5.48	5.70
RYE SB	6.02	5.59	5.80
WH MU SB	5.53	5.75	5.64
WM+RY SB	6.30	5.86	6.08
Mean	5.80	5.60	5.70

N RES	(0)	(50)	Mean
CC SOWDT			
24 AUG	5.69	5.60	5.65
24 SEPT	5.90	5.59	5.75
Mean	5.80	5.60	5.70

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92/W/CS/357
GRAIN TONNES/HECTARE

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

CROP RES	N RES / CC SOWDT	(0)	(50)
FO RA SB	24 AUG	5.31	5.34
	24 SEPT	5.71	5.22
PH TA SB	24 AUG	5.96	6.04
	24 SEPT	5.04	5.19
RY GR SB	24 AUG	5.74	5.74
	24 SEPT	6.09	5.21
RYE SB	24 AUG	5.69	5.11
	24 SEPT	6.35	6.06
WH MU SB	24 AUG	5.19	5.53
	24 SEPT	5.87	5.98
WM+RY SB	24 AUG	6.26	5.84
	24 SEPT	6.35	5.88

N EXTRA / EXTRA	(0)	(APPLIED)	Mean
CULT FAL	5.21	5.31	5.26
TUMBDOWN	6.02	5.65	5.84
Mean	5.61	5.48	5.55

GRAND MEAN 5.68

WINTER BARLEY

N EXTRA	(0)	(APPLIED)	Mean
	5.80	5.30	5.55

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

CROP RES	CC SOWDT	N RES	CROP RES CC SOWDT
0.347	0.200	0.083	0.491

CROP RES N RES	CC SOWDT N RES	CROP RES CC SOWDT N RES	N EXTRA
0.376	0.217	0.531	0.203

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

CROP RES	0.203	
CC SOWDT		0.117
CROP RES.CC SOWDT		0.288

EXTRA	N EXTRA EXTRA
0.491	0.531

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

EXTRA	0.288

NOTE: Do not use SED for comparisons involving Winter Barley means.

https://doi.org/10.23637/ERADOC-1-47

92/W/CS/357

GRAIN TONNES/HECTARE

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

Stratum	d.f.	s.e.	cv%
BLOCK.WP	26	0.601	10.6
BLOCK.WP.SP	28	0.352	6.2

GRAIN MEAN DM% 88.3

STRAW TONNES/HECTARE

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

CC SOWDT	24 AUG	24 SEPT	Mean
CROP RES			
FO RA SB	2.32	2.51	2.42
PH TA SB	2.97	2.06	2.51
RY GR SB	2.20	2.43	2.31
RYE SB	2.57	2.72	2.65
WH MU SB	2.10	2.76	2.43
WM+RY SB	2.50	2.87	2.68
Mean	2.44	2.56	2.50

N RES	(0)	(50)	Mean
CROP RES			
FO RA SB	2.51	2.32	2.42
PH TA SB	2.38	2.64	2.51
RY GR SB	2.49	2.13	2.31
RYE SB	2.50	2.79	2.65
WH MU SB	2.49	2.37	2.43
WM+RY SB	2.73	2.64	2.68
Mean	2.52	2.48	2.50

N RES	(0)	(50)	Mean
CC SOWDT			
24 AUG	2.45	2.43	2.44
24 SEPT	2.58	2.53	2.56
Mean	2.52	2.48	2.50

https://doi.org/10.23637/ERADOC-1-47

92/W/CS/357

STRAW TONNES/HECTARE

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

CROP RES	N RES CC SOWDT	(0)	(50)
FO RA SB	24 AUG	2.61	2.04
	24 SEPT	2.42	2.60
PH TA SB	24 AUG	2.85	3.08
	24 SEPT	1.92	2.20
RY GR SB	24 AUG	2.09	2.31
	24 SEPT	2.89	1.96
RYE SB	24 AUG	2.55	2.59
	24 SEPT	2.45	3.00
WH MU SB	24 AUG	2.17	2.02
	24 SEPT	2.81	2.71
WM+RY SB	24 AUG	2.44	2.56
	24 SEPT	3.01	2.72

N EXTRA	(0)	(APPLIED)	Mean
EXTRA			
CULT FAL	2.44	2.70	2.57
TUMBDOWN	2.99	2.77	2.88
Mean	2.72	2.74	2.73

GRAND MEAN 2.53

WINTER BARLEY

N EXTRA	(0)	(APPLIED)	Mean
	2.54	2.00	2.27

STRAW MEAN DM% 93.6

PLOT AREA HARVESTED 0.00264

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92/W/CS/375

TAKE-ALL EPIDEMICS

Object: To determine whether severe take-all (Gaeumannomyces graminis) can be caused by artificial inoculum in winter wheat and to determine the distribution of such infection within the crop - Woburn, Butt Close I.

Sponsors: G. L. Bateman, D. Hornby.

The first year, w. wheat

Design: 3 randomised blocks of 6 x 2, plus 2 extra plots.

Whole plot dimensions: 6.0 x 2.50.

Treatments: All combinations of:-

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

E	Early
L	Late (4 weeks later)

2. **INOCULTN** Weight (kg) of inoculated oat seed applied by combine drill in autumn and spring:

	Autumn (E)	Autumn (L)	Spring
0	Nil	Nil	-
1	Nil	200	-
2	200	200	-
3	400	200	-
30	400	200	Nil
3S	400	200	500

plus 2 extra plots, systematically arranged with treatments 0 and 2:

NOTE: INOCULTN 0, 1, 30: Nil occurs where empty drill drawn across plots.

Experimental diary:

19-Sep-91 : B : Sub-soiled and ploughed.
23-Sep-91 : B : Rotary harrowed.
: **T** : **INOCULTN** 0 and 1: Empty drill drawn across plots.
INOCULTN 2, 3, 30 and 3S: Inoculated oat seed applied by combine drill.
: **T** : **SOW DATE** E: Mercia, undressed, drilled at 180 kg.
14-Oct-91 : **T** : **SOW DATE** L: Rotary harrowed.
: **T** : **INOCULTN** 0: Empty drill drawn across plots.
INOCULTN 1, 2, 3, 30 and 3S: Inoculated oat seed applied by combine drill.
: **T** : **SOW DATE** L: Mercia, undressed, drilled at 180 kg.
06-Jan-92 : B : PK as (0:16:36) at 740 kg.
31-Jan-92 : B : Stomp 400 at 2.5 l and Stefes IPU at 1.0 l in 200 l.
10-Mar-92 : B : 34.5% N at 116 kg.
25-Mar-92 : **T** : **INOCULTN** 30: Empty drill drawn across plots.
INOCULTN 3S: Inoculated oat seed applied by combine drill.

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92/W/CS/375

Experimental diary:
22-Apr-92 : B : 34.5% N at 464 kg.
09-Jun-92 : B : Impact Excel at 2.0 l in 200 l.
29-Aug-92 : B : Combine harvested.

Previous crops: Potatoes 1990, navy beans 1991.

NOTE: Plant samples were taken for take-all assessment in autumn, spring and summer. Extra plots were sampled throughout the growing season to measure take-all and plant growth in relation to growth stage.

GRAIN TONNES/HECTARE

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

INOCULTN	0	1	2	3	30	3S	Mean
SOW DATE							
E	4.27	2.77	2.81	2.50	1.38	2.61	2.72
L	3.75	2.40	2.08	1.04	1.24	1.63	2.03
Mean	4.01	2.59	2.45	1.77	1.31	2.12	2.37

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

SOW DATE	**INOCULTN**	**SOW DATE INOCULTN**
0.342	0.592	0.837

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

Stratum	d.f.	s.e.	cv%
BLOCK.WP	22	1.025	43.2

GRAIN MEAN DM% 81.7

PLOT AREA HARVESTED 0.00132

https://doi.org/10.23637/ERADOC-1-47

92/R/CS/380

COVER CROPS AND 15N

Object: To assess how effectively cover crops take up nitrogen and to assess how much of that nitrogen is subsequently available to the following crop - Webbs.

Sponsors: P.R. Poulton, D.G. Christian, A.J. Macdonald.

The first year, forage rape, rye, tumbledown, w. and s. barley.

Design: 3 blocks of 5 plots split into 2.

Whole plot dimensions: 6.0 x 12.0.

Treatments: All combinations of:-

Whole plots

1. **LAND TRT** Cover crops, sown in autumn, tumbledown and fallow. All plots ploughed in spring and sown to s. barley:

FO RA SB	Forage rape
RYE SB	Rye
TUMDN SB	Tumbledown
FALLOWSB	Fallow

Sub plots

2. **N** Nitrogen fertilizer (kg N) to s. barley:

0
75

plus one extra treatment

Whole plot

1. **EXTRA**

W BARLEY	W. barley sown in autumn, taken to maturity

Sub plot

2. **N EXTRA** Nitrogen fertilizer (kg N) to w. barley:

0
150

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

https://doi.org/10.23637/ERADOC-1-47

92/R/CS/380

Experimental diary:

15-Aug-91	: B	:	Straw baled.
21-Aug-91	: B	:	Dolomite at 5.0 t.
	: **T**	:	**LAND TRT** FO RA SB, RYE SB, TUMDN SB: Shallow cultivated twice with Bomford Dynadrive.
	: **T**	:	**LAND TRT** FO RA SB: Giant broadcast at 30 kg.
	: **T**	:	**LAND TRT** RYE SB: Halo broadcast at 180 kg.
	: **T**	:	**LAND TRT** TUMDN SB: S. barley (cv. Alexis) broadcast at 50 kg.
	: **T**	:	**LAND TRT** FO RA SB, RYE SB, TUMDN SB: Harrowed and rolled.
12-Sep-91	: **T**	:	**LAND TRT** FO RA SB: Fusilade 5 at 1.0 l with Vassgro Spreader at 0.22 l in 220 l.
13-Sep-91	: **T**	:	**EXTRA** W BARLEY: Ploughed.
	: **T**	:	**EXTRA** W BARLEY: Rotary harrowed twice.
			EXTRA W BARLEY: Rotary harrowed, Magie drilled at 144 kg, rolled.
19-Sep-91	: **T**	:	**LAND TRT** FALLOWSB: Ploughed and heavy spring-tine cultivated.
25-Sep-91	: **T**	:	**LAND TRT** FALLOWSB: Rolled.
14-Nov-91	: **T**	:	**LAND TRT** FO RA SB: Pilot at 0.075 l with Actipron at 2.0 l in 220 l.
03-Dec-91	: **T**	:	**LAND TRT** FALLOWSB: Gramoxone 100 at 3.0 l in 220 l.
	: **T**	:	**EXTRA** W BARLEY: Stefes IPU at 2.5 l and Stomp 400 at 3.3 l in 220 l.
03-Mar-92	: **T**	:	**LAND TRT** FO RA SB, RYE SB, TUMDN SB, FALLOWSB: Ploughed.
06-Mar-92	: **T**	:	**LAND TRT** FO RA SB, RYE SB, TUMDN SB, FALLOWSB: Rotary harrowed. Alexis, dressed Baytan, drilled at 146 kg.
09-Mar-92	: B	:	Rolled
24-Apr-92	: **T**	:	**N** 75: 27% N at 278 kg.
	: **T**	:	**N EXTRA** 150: as 27% N at 556 kg.
22-May-92	: **T**	:	**LAND TRT** FO RA SB, RYE SB, TUMDN SB, FALLOWSB: Duplosan New System CMPP at 2.0 l, Vindex at 1.0 l and Calixin at 0.70 l in 220 l.
30-Jul-92	: B	:	Hand harvested.

Previous crops: W. barley 1990, s. barley 1991.

NOTE: Main plots were labelled with 15N in autumn 1991. Recovery of 15N by each level of **LAND TRT**, **EXTRA** W BARLEY and the subsequent s. barley was measured.

https://doi.org/10.23637/ERADOC-1-47

92/R/CS/380

S. BARLEY

GRAIN TONNES/HECTARE

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

N	0	75	Mean
LAND TRT			
FO RA SB	4.02	4.85	4.44
RYE SB	2.92	4.36	3.64
TUMDN SB	2.73	4.73	3.73
FALLOWSB	5.17	5.72	5.45
Mean	3.71	4.91	4.31

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

	LAND TRT	N	LAND TRT N
	0.239	0.288	0.472
Except when comparing means with the same level(s) of LAND TRT			0.576

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

Stratum	d.f.	s.e.	cv%
BLOCK.WP	6	0.293	6.8
BLOCK.WP.SP	8	0.705	16.3

EXTRA W BARLEY

N EXTRA	0	150	Mean
	3.79	6.05	4.92

GRAIN MEAN DM% 37.2

PLOT AREA HARVESTED 0.00008

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92/W/CS/381

N UPTAKE AND COVER CROPS

Object: To assess how effectively cover crops take up nitrogen and assess how much of that nitrogen is subsequently available to the following crop - Woburn, Road Piece.

Sponsor: D.G. Christian.

The first year, forage rape, rye and linseed.

Design: 3 blocks of 5 plots plus a single replicate of 3 extra plots, split into 2.

Whole plot dimensions: 9.0 x 12.0.

Treatments: All combinations of:-

Whole plots

1. **LANDTRT** Land treatments over winter, ploughed and conventionally drilled to linseed in spring:

FO RA LN	Forage rape
RYE LN	Rye
TUMDN LN	Tumbledown plus w. barley
FALLW LN	Fallow
STUBL LN	Stubble

Sub plots

2. **N** Nitrogen fertilizer (kg N) in spring to linseed:

0
75

plus three extra unreplicated treatments, direct drilled to linseed in spring and split for N:

1. **EXTRA**

EX FR LN	Forage rape
EX RY LN	Rye
EX TD LN	Tumbledown plus w. barley

NOTE: W. barley seed from previous crop was drilled into TUMDN LN plots to ensure volunteers.

https://doi.org/10.23637/ERADOC-1-47

92/W/CS/381

Experimental diary:

19-Aug-91	: **T** :	**LANDTRT** FO RA LN, RYE LN and TUMDN LN and **EXTRA**: Disc harrowed to 5 cm depth.
	: **T** :	**LANDTRT** FO RA LN and **EXTRA** EX FR LN: Ember drilled at 30 kg.
	: **T** :	**LANDTRT** TUMDN LN and **EXTRA** EX TD LN: Magie drilled at 50 kg.
	: **T** :	**LANDTRT** RYE LN and **EXTRA** EX RY LN: Amando drilled at 180 kg.
20-Aug-91	: **T** :	**LANDTRT** FO RA LN, RYE LN, TUMDN LN and **EXTRA**: Harrowed and rolled.
12-Sep-91	: **T** :	**LANDTRT** FO RA LN and FALLW LN and **EXTRA** EX FR LN: Pilot at 0.15 l in 200 l.
08-Oct-91	: **T** :	**LANDTRT** FALLW LN: Ploughed.
01-Apr-92	: **T** :	**EXTRA**: Gramoxone 100 at 4.0 l in 200 l.
13-Apr-92	: **T** :	**EXTRA**: Antares, dressed Prelude 20LF, direct drilled at 52 kg.
	: **T** :	**LANDTRT**: FO RA LN, RYE LN, TUMBDN LN, STUBL LN: Ploughed.
14-Apr-92	: **T** :	**LANDTRT**: Rotary cultivated with crumbler attached. Antares, dressed Prelude 20LF, drilled at 52 kg.
22-Apr-92	: B :	Harrowed lightly.
18-May-92	: **T** :	**N**: 75. Applied as 27% N.
08-Jun-92	: B :	Ally at 0.03 kg in 200 l.
29-Aug-92	: B :	Reglone at 3.0 l with Vassgro Spreader at 0.30 l in 300 l.
29-Sep-92	: B :	Combine harvested.

Previous crops: 1990 s. barley, 1991 w. barley.

NOTE: Plant samples of cover crops were taken for growth analysis in autumn and spring. Linseed was sampled for growth analysis and disease incidence.

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92/W/CS/381

GRAIN (AT 90% DRY MATTER) TONNES/HECTARE

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

N	0	75	Mean
LANDTRT			
FO RA LN	0.77	1.12	0.94
RYE LN	0.77	1.34	1.06
TUMDN LN	0.54	1.08	0.81
FALLW LN	0.70	1.15	0.92
STUBL LN	0.89	1.23	1.06
Mean	0.73	1.18	0.96

N	0	75	Mean
EXTRA			
EX FR LN	0.70	1.51	1.10
EX RY LN	0.81	1.47	1.14
EX TD LN	0.91	1.17	1.04
Mean	0.80	1.38	1.09

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

LANDTRT	**N**	**LANDTRT N**
0.166	0.078	0.207

Except when comparing means with the same level(s) of **LANDTRT** 0.175

NOTE: Do not use SED for comparisons involving **EXTRA**

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

Stratum	d.f.	s.e.	cv%
BLOCK.WP	8	0.204	21.2
BLOCK.WP.SP	10	0.214	22.4

GRAIN MEAN DM% 85.9

SUB PLOT AREA HARVESTED 0.00082

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92/W/CS/388

SULPHUR AND NITROGEN

Object: To test the crop response to sulphur and whether nitrogen affects this response - Woburn, Butt Close W.

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

The first year, w. rape.

Design: 3 blocks of 3 x 4 plots.

Plot dimensions: 4.0 x 10.0.

Treatments: All combinations of:-

1. **S** Sulphur (kg S) in spring as calcium sulphate:

S0	0
S1	10
S2	20
S4	40

2. **N** Nitrogen (kg N) in spring as 27% N:

N0	0
N1	180
N2	230

NOTES: (1) Nitrogen treatments were applied in two split applications.
(2) Because of poor growth nitrogen was applied at 50 kg N to the N0 plots on 23 Apr, 1992.
(3) Sulphur was applied as gypsum (17.5% S).

Experimental diary:

27-Aug-91 : B : Ploughed,
04-Sep-91 : B : Rolled, rotary harrowed, Falcon drilled at 7.0 kg.
07-Sep-91 : B : Rolled.
29-Oct-91 : B : 27% N at 145 kg.
06-Jan-92 : B : PK as (0:16:36) at 740 kg.
15-Jan-92 : B : Benazalox at 1.25 kg in 200 l.
13-Feb-92 : **T** : **N** N1 and N2: 27% N at 185 kg.
S S1, S2 and S4: Gypsum applied.
01-Apr-92 : **T** : **N** N1 and N2: 27% N at 481 kg and 667 kg respectively.
23-Apr-92 : **T** : **N** N0: 27% N at 185 kg.
20-Jul-92 : B : Reglone at 3.0 l with Agral at 0.40 l in 400 l.
26-Jul-92 : B : Combine harvested.

Previous crops: W. wheat 1990 and 1991.

NOTE: Soil samples were taken for chemical analysis in autumn, late winter and spring. Plant samples were taken in winter, spring and summer for chemical analysis of crop components.

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92/W/CS/388

GRAIN (AT 90% DRY MATTER) TONNES/HECTARE

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

N S	N0	N1	N2	Mean
S0	0.56	0.89	1.03	0.83
S1	0.77	1.29	1.40	1.15
S2	0.52	1.52	1.45	1.17
S3	0.55	1.55	1.70	1.27
Mean	0.60	1.31	1.40	1.10

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

S	N	S N
0.113	0.098	0.195

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

Stratum	d.f.	s.e.	cv%
BLOCK.WP	22	0.239	21.6

GRAIN MEAN DM% 77.2

STRAW (AT 90% DRY MATTER) TONNES/HECTARE

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

N S	N0	N1	N2	Mean
S0	1.16	1.46	1.46	1.36
S1	1.07	1.64	2.29	1.66
S2	2.06	2.32	1.93	2.10
S3	1.04	2.17	2.07	1.76
Mean	1.33	1.90	1.93	1.72

STRAW MEAN DM% 71.1

PLOT AREA HARVESTED 0.00132

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92/R/CS/392

ALTERNARIA & FUNGICIDES

Object: To study the epidemiology and changes in the population of Alternaria linicola under different fungicide treatments - Long Hoos IV 4.

Sponsors: I. Vloutoglou, B.D.L. Fitt.

The first year, linseed.

Design: 5 randomised blocks of 4 plots.

Whole plot dimensions: 3.0 x 10.0.

Treatments:

FUNGCIDE	Fungicides:
NONE	None
IPRODION	Iprodione
CHLORTHL	Chlorothalonil
PROCHLOR	Prochloraz

Experimental diary:

14-Apr-92 : B : Heavy spring-tine cultivated.
21-Apr-92 : B : Rotary harrowed.
21-Apr-92 : B : Rotary harrowed. Antares, undressed, drilled at 50 kg.
23-Apr-92 : B : Rolled.
13-May-92 : B : 34.5% N at 220 kg.
02-Jun-92 : B : Basagran at 2.0 l and Vindex at 1.0 l in 200 l.
18-Jun-92 : B : Irrigation: 8 mm applied.
24-Jun-92 : **T** : **FUNGCIDE** IPRODION: Rovral Flo at 1.0 l in 220 l.
: **T** : **FUNGCIDE** CHLORTHL: Chiltern Chlorothalonil 500 at 0.50 l in 220 l.
: **T** : **FUNGCIDE** PROCHLOR: Sportak 45 at 0.35 l in 220 l.
26-Jun-92 : B : Irrigation: 12mm applied.
29-Jun-92 : B : Irrigation: 12mm applied.
08-Jul-92 : **T** : **FUNGCIDE**: All applications as 24-Jun-92.
22-Jul-92 : **T** : **FUNGCIDE**: All applications as 24-Jun-92.
28-Jul-92 : B : Irrigation: 12mm applied.
06-Aug-92 : **T** : **FUNGCIDE**: All applications as 24-Jun-92.
19-Aug-92 : **T** : **FUNGCIDE**: All applications as 24-Jun-92.
10-Sep-92 : **T** : **FUNGCIDE**: All applications as 24-Jun-92.
16-Sep-92 : B : Roundup at 3.0 l in 200 l.
17-Sep-92 : B : Combine harvested.

Previous crops: W. wheat 1990, linseed 1991.

NOTE: Plant samples were taken at fortnightly intervals from mid-June until mid-September for assessment of infection by Alternaria linicola.

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92/R/CS/392

GRAIN (AT 90% DRY MATTER) TONNES/HECTARE

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

FUNGCIDE	
NONE	0.96
IPRODION	0.93
CHLORTHL	1.06
PROCHLOR	1.18
Mean	1.03

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

FUNGCIDE
0.086

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

Stratum	d.f.	s.e.	cv%
BLOCK.WP	12	0.136	13.2

GRAIN MEAN DM% 86.0

PLOT AREA HARVESTED 0.00230

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