ROTHAMSTED RESEARCH

Yields of the Field Experiments 1998

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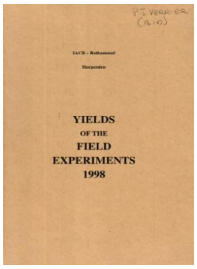

Crop Sequences

Rothamsted Research

Rothamsted Research (1999) *Crop Sequences ;* Yields Of The Field Experiments 1998, pp 52 - 115 **- DOI: https://doi.org/10.23637/ERADOC-1-52**

98/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 yield of continuous s. barley - Long Hoos V 3.

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

The 25th year, s. barley.

For previous years see 74-97/R/CS/140.

Design: Single replicate of 32 plots.

Whole plot dimensions: 4.06 x 4.57.

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

All combinations of:-

1. **WEEDKLLR** Weedkiller in autumn:

(NONE)	None
(GLYPHOS)	Glyphosate to barley stubble

2. **FUNGCIDE[1]** Fungicide in autumn:

(NONE)	None
(TRIADIM)	Triadimefon in autumn

3. **FUNGCIDE[2]** Fungicide in spring:

(NONE)	None
(BENOMYL)	Benomyl to the seedbed

4. **INSCTCDE** Insecticide:

(NONE)	None
(CHLORFEN)	Chlorfenvinphos to the seedbed

5. **NEMACIDE** Nematicide:

(NONE)	None
(ALDICARB)	Aldicarb to the seedbed

Experimental diary:

03-Dec-97 : B : Ploughed.
05-Feb-98 : B : Spring-tine cultivated.
11-Feb-98 : B : Spring-tine cultivated. Rotary harrowed, Alexis, undressed, drilled at 350 seeds per m^2.
19-Mar-98 : B : 34.5% N at 435 kg.
28-Apr-98 : B : Ally at 20 g with MSS Optica at 1.5 l in 200 l.

https://doi.org/10.23637/ERADOC-1-52

98/R/CS/140

Experimental diary:
13-Jul-98 : B : Hand rogued wild oats.
08-Aug-98 : B : Combine harvested.

GRAIN TONNES/HECTARE

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

FUNGCIDE[1]	(NONE)	(TRIADIM)	Mean
WEEDKLLR			
(NONE)	2.77	3.17	2.97
(GLYPHOS)	3.68	3.65	3.66
Mean	3.22	3.41	3.32

FUNGCIDE[2]	(NONE)	(BENOMYL)	Mean
WEEDKLLR			
(NONE)	2.83	3.11	2.97
(GLYPHOS)	3.76	3.56	3.66
Mean	3.30	3.34	3.32

FUNGCIDE[2]	(NONE)	(BENOMYL)	Mean
FUNGCIDE[1]			
(NONE)	3.21	3.23	3.22
(TRIADIM)	3.38	3.44	3.41
Mean	3.30	3.34	3.32

INSCTCDE	(NONE)	(CHLORFEN)	Mean
WEEDKLLR			
(NONE)	3.06	2.88	2.97
(GLYPHOS)	3.67	3.66	3.66
Mean	3.36	3.27	3.32

INSCTCDE	(NONE)	(CHLORFEN)	Mean
FUNGCIDE[1]			
(NONE)	3.32	3.12	3.22
(TRIADIM)	3.40	3.42	3.41
Mean	3.36	3.27	3.32

INSCTCDE	(NONE)	(CHLORFEN)	Mean
FUNGCIDE[2]			
(NONE)	3.38	3.22	3.30
(BENOMYL)	3.35	3.32	3.34
Mean	3.36	3.27	3.32

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GRAIN TONNES/HECTARE

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

NEMACIDE / WEEDKLLR	(NONE)	(ALDICARB)	Mean
(NONE)	3.03	2.91	2.97
(GLYPHOS)	3.80	3.53	3.66
Mean	3.42	3.22	3.32

NEMACIDE / FUNGCIDE[1]	(NONE)	(ALDICARB)	Mean
(NONE)	3.29	3.16	3.22
(TRIADIM)	3.55	3.27	3.41
Mean	3.42	3.22	3.32

NEMACIDE / FUNGCIDE[2]	(NONE)	(ALDICARB)	Mean
(NONE)	3.28	3.31	3.30
(BENOMYL)	3.55	3.12	3.34
Mean	3.42	3.22	3.32

NEMACIDE / INSCTCDE	(NONE)	(ALDICARB)	Mean
(NONE)	3.43	3.30	3.36
(CHLORFEN)	3.41	3.13	3.27
Mean	3.42	3.22	3.32

	FUNGCIDE[1]	(NONE)		(TRIADIM)	
WEEDKLLR	FUNGCIDE[2]	(NONE)	(BENOMYL)	(NONE)	(BENOMYL)
(NONE)		2.52	3.02	3.15	3.19
(GLYPHOS)		3.91	3.45	3.62	3.68

	FUNGCIDE[1]	(NONE)		(TRIADIM)	
WEEDKLLR	INSCTCDE	(NONE)	(CHLORFEN)	(NONE)	(CHLORFEN)
(NONE)		3.02	2.52	3.10	3.24
(GLYPHOS)		3.63	3.73	3.71	3.59

	FUNGCIDE[2]	(NONE)		(BENOMYL)	
WEEDKLLR	INSCTCDE	(NONE)	(CHLORFEN)	(NONE)	(CHLORFEN)
(NONE)		2.90	2.77	3.23	2.99
(GLYPHOS)		3.86	3.67	3.48	3.65

	FUNGCIDE[2]	(NONE)		(BENOMYL)	
FUNGCIDE[1]	INSCTCDE	(NONE)	(CHLORFEN)	(NONE)	(CHLORFEN)
(NONE)		3.33	3.10	3.32	3.15
(TRIADIM)		3.43	3.34	3.38	3.49

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98/R/CS/140

GRAIN TONNES/HECTARE

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

FUNGCIDE[1]		(NONE)		(TRIADIM)	
WEEDKLLR	NEMACIDE	(NONE)	(ALDICARB)	(NONE)	(ALDICARB)
(NONE)		2.69	2.84	3.37	2.97
(GLYPHOS)		3.88	3.48	3.72	3.58

FUNGCIDE[2]		(NONE)		(BENOMYL)	
WEEDKLLR	NEMACIDE	(NONE)	(ALDICARB)	(NONE)	(ALDICARB)
(NONE)		2.69	2.97	3.37	2.84
(GLYPHOS)		3.87	3.66	3.73	3.40

FUNGCIDE[2]		(NONE)		(BENOMYL)	
FUNGCIDE[1]	NEMACIDE	(NONE)	(ALDICARB)	(NONE)	(ALDICARB)
(NONE)		3.27	3.15	3.30	3.17
(TRIADIM)		3.29	3.48	3.80	3.07

INSCTCDE		(NONE)		(CHLORFEN)	
WEEDKLLR	NEMACIDE	(NONE)	(ALDICARB)	(NONE)	(ALDICARB)
(NONE)		3.15	2.97	2.91	2.84
(GLYPHOS)		3.70	3.63	3.90	3.42

INSCTCDE		(NONE)		(CHLORFEN)	
FUNGCIDE[1]	NEMACIDE	(NONE)	(ALDICARB)	(NONE)	(ALDICARB)
(NONE)		3.40	3.24	3.17	3.08
(TRIADIM)		3.45	3.36	3.64	3.19

INSCTCDE		(NONE)		(CHLORFEN)	
FUNGCIDE[2]	NEMACIDE	(NONE)	(ALDICARB)	(NONE)	(ALDICARB)
(NONE)		3.42	3.33	3.14	3.30
(BENOMYL)		3.43	3.28	3.67	2.97

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

Margins of two factor tables	0.264
Two factor tables	0.373
Three factor tables	0.527

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

Stratum	d.f.	s.e.	cv%
WP	6	0.745	22.5

GRAIN MEAN DM% 90.7

PLOT AREA HARVESTED 0.00105

https://doi.org/10.23637/ERADOC-1-52

98/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 14th year, w. wheat.

For previous years see 85-93,95-97/R/CS/302

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

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

Treatments: All combinations of:-

Whole plots

1. **FUNGCIDE**		Fungicide applied cumulatively 1985-93 and 1995-98:
	NONE	None
	CARB	Carbendazim at 0.25 kg
	PRO	Prochloraz at 0.40 kg (0.50 kg in 1993, 1995-1998)
	CARB+PRO	Carbendazim and prochloraz as above

Sub-plots

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

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

Experimental diary:

04-Oct-97 : B : Ploughed.
08-Oct-97 : B : Harrowed, rotary harrowed, Hereward, dressed Anchor, drilled at 380 seeds per m^2.
05-Dec-97 : B : Part: Unite A at 0.125 l with Unite B at 1.0 l and Adder at 1.0 l in 200 l.
13-Jan-98 : B : Completed: Unite A at 0.125 l with Unite B at 1.0 l and LI-700 at 1.0 l in 200 l.
16-Feb-98 : B : 34.5% N at 120 kg.

https://doi.org/10.23637/ERADOC-1-52

99/R/CS/302

Experimental diary:

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   16-Mar-98 : T : FUNGCIDE CARB+PRO: Barclay Eyetak at 1.1 l with Tripart
                   Defensor FL at 0.5 l in 200 l.
             : T : FUNGCIDE PRO: Barclay Eyetak at 1.1 l in 200 l.
             : T : FUNGCIDE CARB: Tripart Defensor FL at 0.5 l in 200 l.
   14-Apr-98 : B : 34.5% N at 460 kg.
   27-Apr-98 : T : FUNGCIDE PRO: Barclay Eyetak at 1.1 l in 200 l.
             : T : FUNGCIDE CARB: Campbell's Carbendazim 50 % Flowable at 0.5 l
                   in 200 l.
             : T : FUNGCIDE CARB+PRO: Barclay Eyetak at 1.1 l with Tripart
                   Defensor FL at 0.5 l in 200 l.
   28-Apr-98 : B : Ally at 20 g with Cheetah Super at 0.75 l, Starane 2 at 0.7 l
                   and Chiltern Cropoil at 1.0 l in 200 l.
   03-Jul-98 : B : Folicur at 0.3 l in 100 l.
   05-Aug-98 : B : Alpha Glyphogan at 3.0 l in 200 l.
   11-Aug-98 : B : Combine harvested.
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GRAIN TONNES/HECTARE

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

EYE INOC / FUNGCIDE	NATURAL	W 19R 1S	W 1R 19S	R 19R 1S	R 1R 19S	Mean
NONE	7.49	7.79	6.67	6.44	7.41	7.22
CARB	6.55	6.57	6.57	6.45	7.03	6.62
PRO	7.99	7.76	8.06	8.42	7.77	8.00
CARB+PRO	7.88	7.98	7.76	7.43	8.11	7.84
Mean	7.48	7.52	7.27	7.19	7.58	7.42

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

EYE INOC	FUNGCIDE* EYE INOC	
0.269	0.538	min.rep
0.233	0.446	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	0.538	7.3

GRAIN MEAN DM% 90.6 SUB-PLOT AREA HARVESTED 0.00138

https://doi.org/10.23637/ERADOC-1-52

98/R/CS/309 and 98/W/CS/309

LONG-TERM STRAW INCORPORATION

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

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

The 14th year, w. wheat.

For previous years see 85-97/R & W/CS/309.

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

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

Treatments: All combinations of:-

Whole plots

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

   BT1 BTTTTT
   BT1T2 CTTTTT
   BP2 BPPPPP
   BT1P2 CPPPPP
   CT1 CTTTTT
   CT1 CPTTPT
   CT1T2 CTPTTP
   CT1T2 CTTPTT
   CP2 CPPPPP
   CP2 CPTTPT
   CT1P2 CTPTTP
   CT1P2 CTTPTT

Sub-plots

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

   E Early
   L Late

https://doi.org/10.23637/ERADOC-1-52

97/R/CS/309 and 97/W/CS/309

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

Experimental diary:

Great Knott III (R):

19-Aug-97 : B : Straw chopped.
02-Sep-97 : **T** : **STRAWCUL** BTTTTT, BPPPPP: Straw burnt, ash incorporated with discs.
09-Sep-97 : B : PK as (0:20:32) at 1250 kg.
11-Sep-97 : B : Scythe LC at 4.0 l in 300 l.
07-Oct-97 : **T** : **STRAWCUL** BTTTTT, CTTTTT, CPTTPT, CTTPTT: Heavy spring-tine cultivated twice.
: **T** : **STRAWCUL** BPPPPP, CPPPPP, CTPTTP: Ploughed.
21-Oct-97 : B : Heavy spring-tine cultivated.
22-Oct-97 : **T** : **SOW DATE** E: Rotary harrowed, Hereward, dressed Anchor, drilled at 380 seeds per m^2.
12-Nov-97 : **T** : **SOW DATE** L: Rotary harrowed, Hereward, dressed Anchor, drilled at 380 seeds per m^2.
13-Jan-98 : B : Hawk at 2.5 l with Sprayprover at 1.0 l in 200 l.
13-Feb-98 : B : 34.5% N at 116 kg.
17-Mar-98 : B : Ally at 20 g with Alpha Briotril 24/16 at 0.5 l in 200 l.
27-Apr-98 : B : 34.5% N at 460 kg.
09-May-98 : B : Standon Tebuconazole at 0.7 l with Starane 2 at 0.5 l in 200 l.
28-May-98 : B : Opus at 0.7 l in 200 l.
04-Jun-98 : **T** : **SOW DATE** E **STRAWCUL** CTTTTT, CPTTPT and **SOW DATE** L **STRAWCUL** CTTTTT: Roundup at 3.0 l in 200 l.
12-Jun-98 : B : Bavistin DF at 0.5 kg with Folicur at 0.5 l in 100 l.
17-Aug-98 : **T** : Combine harvested.

Far Field I (W):

15-Aug-97 : **T** : **STRAWCUL** BTTTTT, CTTTTT, CPTTPT, CTTPTT: Straw chopped.
01-Sep-97 : **T** : **STRAWCUL** BTTTTT, BPPPPP: Straw burnt, ash incorporated with spring-tines.
05-Sep-97 : **T** : **STRAWCUL** BTTTTT, CTTTTT, CPTTPT, CTTPTT: Heavy spring-tine cultivated.
19-Sep-97 : **T** : **STRAWCUL** BPPPPP, CPPPPP, CTPTTP: Ploughed.
30-Sep-97 : B : Harvest at 3.0 l in 200 l.
01-Oct-97 : B : Rolled, rotary harrowed.
01-Oct-97 : **T** : **SOW DATE** E: Hereward, dressed Sibutol, drilled at 325 seeds per m^2.
21-Oct-97 : **T** : **SOW DATE** L: Hereward, dressed Sibutol, drilled at 350 seeds per m^2. Harrowed.
22-Oct-97 : B : Avadex BW Granular at 22.5 kg.
29-Jan-98 : B : Panther at 1.0 l with Atlas IPU at 1.0 l in 200 l.

https://doi.org/10.23637/ERADOC-1-52

98/R/CS/309 and 98/W/CS/309

Experimental diary:

Far Field I (W):

11-Feb-98 : B : 34.5% N at 145 kg.
19-Mar-98 : B : Mn and Cu as Phosyn Manganese at 2.0 l with Profol Copper at 0.25 l in 200 l.
30-Mar-98 : B : 34.5% N at 377 kg.
04-May-98 : B : Alto 100 SL at 0.6 l with Tripart Brevis at 2.0 l in 200 l.
21-May-98 : B : Ally at 20 g in 200 l.
31-May-98 : B : Opus at 0.8 l in 200 l.
12-Jun-98 : B : Folicur at 0.3 l with Bavistin DF at 0.3 kg in 200 l.
12-Aug-98 : B : Combine harvested.

NOTES: (1) At Rothamsted 24 plots were destroyed with herbicide because of brome infestation. All plots with **STRAWCUL** BT1T2 CTTTTT and CT1 CTTTTT were lost and were omitted from the analysis. All **SOW DATE** E for **STRAWCUL** CT1 CPTTPT and CP2 CPTTPT were lost. Estimated values were used in the analysis.

(2) Plant samples were taken in July to assess root and stem base diseases.

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

GRAIN TONNES/HECTARE

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

SOW DATE / **STRAWCUL**	E	L	Mean
BT1 BTTTTT	7.87	8.55	8.21
BP2 BPPPPP	8.08	8.51	8.29
BT1P2 CPPPPP	9.15	8.75	8.95
CT1 CPTTPT	7.63*	7.81	7.72
CT1T2 CTPTTP	9.04	8.65	8.84
CT1T2 CTTPTT	6.69	5.97	6.33
CP2 CPPPPP	8.70	8.70	8.70
CP2 CPTTPT	7.95*	8.12	8.04
CT1P2 CTPTTP	9.09	8.90	9.00
CT1P2 CTTPTT	4.38	6.41	5.40
Mean	7.86	8.04	7.95

* These means have been estimated since all values were lost. Treat these values with caution.

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

STRAWCUL	**SOW DATE**	**STRAWCUL SOW DATE**
0.464	0.169	0.598

Except when comparing means with the same level(s) of **STRAWCUL** 0.534

https://doi.org/10.23637/ERADOC-1-52

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

GRAIN TONNES/HECTARE

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

Stratum	d.f.	s.e.	cv%
BLOCK.WP	27	0.656	8.3
BLOCK.WP.SP	24	0.755	9.5

GRAIN MEAN DM% 87.1

SUB-PLOT AREA HARVESTED 0.00644

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

GRAIN TONNES/HECTARE

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

SOW DATE / **STRAWCUL**	E	L	Mean
BT1 BTTTTT	5.82	5.93	5.88
BT1T2 CTTTTT	3.11	5.66	4.39
BP2 BPPPPP	6.13	6.48	6.30
BT1P2 CPPPPP	5.52	5.57	5.55
CT1 CTTTTT	3.60	5.90	4.75
CT1 CPTTPT	4.42	6.45	5.44
CT1T2 CTPTTP	6.45	6.35	6.40
CT1T2 CTTPTT	5.81	6.96	6.38
CP2 CPPPPP	5.72	5.86	5.79
CP2 CPTTPT	5.76	6.73	6.25
CT1P2 CTPTTP	5.77	6.35	6.06
CT1P2 CTTPTT	4.80	6.00	5.40
Mean	5.24	6.19	5.72

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

STRAWCUL	**SOW DATE**	**STRAWCUL** **SOW DATE**
0.544	0.130	0.630

Except when comparing means with the same level(s) of
STRAWCUL 0.450

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

Stratum	d.f.	s.e.	cv%
BLOCK.WP	11	0.544	9.5
BLOCK.WP.SP	12	0.450	7.9

GRAIN MEAN DM% 89.0 SUB-PLOT AREA HARVESTED 0.00690

https://doi.org/10.23637/ERADOC-1-52

98/R/CS/311

EFFECTS OF SHALLOW STRAW INCORPORATION

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

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

The 14th year, w. wheat.

For previous years see 85-97/R/CS/311.

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

Whole plot dimensions: 4.5 x 12.0.

Treatments: Combinations of:-

Whole plots

1.	**STRAW**	Treatments to straw of previous wheat:
	BURNT	Burnt (duplicated)
	BALED	Baled and removed (duplicated)
	CHOPPED	Chopped and incorporated (duplicated)

Criss-cross with

2.	**CULTIVTN**	Autumn cultivations since 1993, previously all shallow cultivated:
	S P94	Shallow tine cultivated to 10 cm, (ploughed to 20 cm in autumn 1993)
	S P95	Shallow tine cultivated to 10 cm, (ploughed to 20 cm in autumn 1994)
	S P96	Shallow tine cultivated to 10 cm, (ploughed to 20 cm in autumn 1995)
	S P97	Shallow tine cultivated to 10 cm, (ploughed to 20 cm in autumn 1996)

Experimental diary:

11-Aug-97	**T**	**STRAW** BALED: Straw baled and removed.
	T	**STRAW** BURNT: Straw burnt and ash incorporated.
	T	**STRAW** CHOPPED: Straw chopped with trailed chopper.
12-Aug-97	B	Disced.
05-Sep-97	B	Scythe LC at 1.5 l with Vassgro Non Ionic at 1.0 l in 200 l.
11-Oct-97	B	Scythe LC at 3.0 l in 200 l.
14-Oct-97	B	Heavy spring-tine cultivated to 10 cm.
14-Oct-97	B	Rotary harrowed, Soissons, dressed Anchor, drilled at 400 seeds per m^2.
16-Oct-97	B	Draza at 5.5 kg.

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98/R/CS/311

Experimental diary:

13-Jan-98 : B : Hawk at 2.5 l with Sprayprover at 1.0 l in 200 l.
17-Feb-98 : B : 34.5% N at 120 kg.
16-Mar-98 : B : Ally at 20 g with MSS Optica at 1.0 l in 200 l.
28-Apr-98 : B : 34.5% N at 580 kg. Tripart Brevis at 1.5 l in 200 l.
29-May-98 : B : Folicur at 0.7 l in 200 l.
04-Jun-98 : **T** : **CULTIVTN** S P95: Roundup at 3.0 l in 200 l.
12-Jun-98 : B : Bavistin DF at 0.5 kg with Folicur at 0.5 l in 100 l.
08-Aug-98 : B : Combine harvested.

NOTES: (1) Plant samples were taken in July to assess root and stem base diseases.
(3) All **CULTIVTN** S P95 plots were destroyed with herbicide to reduce brome infestation in readiness for modifications to the experiment, these are omitted from the table of results.

GRAIN TONNES/HECTARE

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

CULTIVTN / **STRAW**	S P94	S P96	S P97	Mean
BURNT	8.66	8.19	8.50	8.45
BALED	6.04	6.05	7.59	6.56
CHOPPED	5.57	6.83	7.81	6.74
Mean	6.76	7.02	7.97	7.25

GRAIN MEAN DM% 87.8

SUB-PLOT AREA HARVESTED 0.00276

https://doi.org/10.23637/ERADOC-1-52

98/R/CS/323

CEREAL SEQUENCES AND TAKE-ALL

Object: To study the level of take-all (*Gaeumannomyces graminis*) in w. wheat grown after various cereal sequences and one year of set-aside - West Barnfield II.

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

The eleventh year, w. wheat.

For previous years see 88-96/R/CS/323.

Design: 3 randomised blocks of 26 plots.

Whole plot dimensions: 3.0 x 10.0.

Treatments:

CROPSEQ Crop sequences 1988 to 1995, all in wheat in 1996 and set-aside in 1997

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

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

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98/R/CS/323

Experimental diary:

28-Jul-97 : B : Disced.
10-Sep-97 : B : Scythe LC at 3.0 l in 300 l.
23-Sep-97 : B : Topped.
26-Sep-97 : B : Ploughed and furrow pressed.
01-Oct-97 : B : Rotary harrowed, Abbot, dressed Beret Gold, drilled at 380 seeds per m^2.
02-Oct-97 : B : Rolled.
12-Nov-97 : B : Stefes IPU 500 at 4.0 l with MSS Trifluralin 48 EC at 2.0 l and Cyperkill 10 at 250 ml in 200 l.
17-Feb-98 : B : 34.5% N at 120 kg.
27-Apr-98 : B : Opus at 0.6 l with Tripart Brevis at 2.25 l in 200 l.
28-Apr-98 : B : 34.5% N at 460 kg.
28-May-98 : B : Opus at 0.7 l in 200 l.
12-Jun-98 : B : Bavistin DF at 0.5 kg with Folicur at 0.5 l in 100 l.
17-Aug-98 : B : Combine harvested.

NOTE: Plant samples were taken in July to assess root and stem base diseases.

https://doi.org/10.23637/ERADOC-1-52

99/R/CS/323

GRAIN TONNES/HECTARE

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

CROPSEQ	
TTTTTTTT	11.23
OTTTOTTT	11.31
TOTTTOTT	11.40
TTOTTTOT	11.09
TTTOTTTO	11.17
WWWWWWWW	11.15
OWWWOWWW	11.38
WOWWWOWW	11.29
WWOWWWOW	11.28
WWWOWWWO	11.27
BBBBBBBB	11.07
OBBBOBBB	11.41
BOBBBOBB	11.19
BBOBBBOB	10.94
BBBOBBBO	11.43
WTWTWTWT	11.40
WBWBWBWB	11.30
TBTBTBTB	11.29
SBSBSBSB	10.98
WWTTTWWW	11.20
WWBBBWWW	11.58
TTBBBTTT	11.32
TTWWWTTT	11.26
BBWWWBBB	11.32
BBTTTBBB	11.14
WWSSSWWW	11.09
Mean	11.25

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

CROPSEQ
0.199

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

Stratum	d.f.	s.e.	cv%
BLOCK.WP	50	0.243	2.2

GRAIN MEAN DM% 87.6

PLOT AREA HARVESTED 0.00229

https://doi.org/10.23637/ERADOC-1-52

98/R/CS/326 and 98/W/CS/326

AMOUNTS OF STRAW

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

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

The 12th year, w. wheat.

For previous years see 87-97/R & W/CS/326.

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

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

Treatments:

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

		R	W
NONE	None	-	-
NORMAL	Normal	5.2	4.4
2 NORMAL	Twice normal	10.4	8.8
4 NORMAL	Four times normal	20.8	17.6

Experimental diary:
Great Knott III (R):

02-Sep-97 : **T** : **STRAW** NORMAL, 2 NORMAL, 4 NORMAL: Straw applied and chopped.
: **T** : **STRAW** NONE: Straw removed.
09-Sep-97 : B : PK as (0:20:32) at 1250 kg.
11-Sep-97 : B : Scythe LC at 3.0 l in 300 l.
08-Oct-97 : B : Ploughed.
22-Oct-97 : B : Rotary harrowed, Hereward, dressed Anchor, drilled at 380 seeds per m^2.
13-Jan-98 : B : Hawk at 2.5 l with Sprayprover at 1.0 l in 200 l.
13-Feb-98 : B : 34.5% N at 116 kg.
17-Mar-98 : B : Ally at 20 g with Alpha Briotril 24/16 at 0.5 l in 200 l.
27-Apr-98 : B : 34.5% N at 460 kg.
09-May-98 : B : Standon Tebuconazole at 0.7 l with Starane 2 at 0.5 l in 200 l.
28-May-98 : B : Opus at 0.7 l in 200 l.
12-Jun-98 : B : Bavistin DF at 0.5 kg with Folicur at 0.5 l in 100 l.
17-Aug-98 : B : Combine harvested.

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98/R/CS/326 and 98/W/CS/326

Far Field I (W):

02-Sep-97	**T**	**STRAW** NORMAL, 2 NORMAL, 4 NORMAL: Straw applied.
	T	**STRAW** NONE: Straw removed.
19-Sep-97	B	Ploughed.
01-Oct-97	B	Rolled, rotary harrowed, Hereward, dressed Sibutol, drilled, at 325 seeds per m^2.
22-Oct-97	B	Avadex BW Granular at 22.5 kg.
29-Jan-98	B	Panther at 1.0 l with Atlas IPU at 1.0 l in 200 l.
11-Feb-98	B	34.5% N at 145 kg.
19-Mar-98	B	Mn and Cu as Phosyn Manganese at 2.0 l with Profol Copper at 0.25 l in 200 l.
30-Mar-98	B	34.5% N at 377 kg.
04-May-98	B	Alto 100 SL at 0.6 l with Tripart Brevis at 2.0 l in 200 l.
21-May-98	B	Ally at 20 g in 200 l.
31-May-98	B	Opus at 0.8 l in 200 l.
12-Jun-98	B	Folicur at 0.3 l with Bavistin DF at 0.3 kg in 200 l.
12-Aug-98	B	Combine harvested.

NOTE: Samples of grain were analysed for thousand grain weight, hectolitre weight, Hagberg falling numbers and nitrogen content. Straw was sampled for nitrogen content.

https://doi.org/10.23637/ERADOC-1-52

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

GRAIN TONNES/HECTARE

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

STRAW	
NONE	8.61
NORMAL	8.71
2 NORMAL	8.75
4 NORMAL	9.13
Mean	8.80

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

STRAW
0.191

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

Stratum	d.f.	s.e.	cv%
BLOCK.WP	9	0.271	3.1

GRAIN MEAN DM% 86.6

STRAW TONNES/HECTARE

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

STRAW	
NONE	5.81
NORMAL	6.01
2 NORMAL	6.12
4 NORMAL	6.68
Mean	6.15

STRAW MEAN DM% 89.4

PLOT AREA HARVESTED 0.00310

https://doi.org/10.23637/ERADOC-1-52

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

GRAIN TONNES/HECTARE

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

	STRAW
NONE	7.70
NORMAL	7.65
2 NORMAL	7.88
4 NORMAL	7.73
Mean	7.74

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

STRAW
0.403

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

Stratum	d.f.	s.e.	cv%
BLOCK.WP	6	0.494	6.4

GRAIN MEAN DM% 89.0

STRAW TONNES/HECTARE

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

	STRAW
NONE	5.61
NORMAL	5.11
2 NORMAL	6.13
4 NORMAL	5.28
Mean	5.53

STRAW MEAN DM% 90.5

PLOT AREA HARVESTED 0.00333

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98/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 eighth year, w. wheat.

For previous years see 91-97/R/CS/355.

Design: 3 randomised blocks of 7 plots.

Whole plot dimensions: 21.0 x 23.0.

Treatments:

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

Experimental diary:

17-Aug-97 : B : PK as (0:20:32) at 1250 kg.
08-Oct-97 : B : Ploughed and furrow pressed.
19-Oct-97 : B : Rotary harrowed.
24-Oct-97 : B : Rotary harrowed, Mercia, dressed Sibutol, drilled at 380 seeds per m^2.
03-Nov-97 : B : Draza at 5.5 kg.
23-Jan-98 : B : Hawk at 2.5 l with Chiltern Cropoil at 1.0 l in 200 l.
17-Mar-98 : B : Ally at 20 g with Alpha Briotril 24/16 at 0.5 l in 200 l.
24-Mar-98 : **T** : **N** 50, 100, 150, 200, 250, 300: 34.5% N at 145, 290, 435, 580, 725 and 870 kg respectively.
08-May-98 : B : Standon Tebuconazole at 0.7 l with Starane 2 at 0.5 l in 200 l.
28-May-98 : B : Opus at 0.7 l in 200 l.
12-Jun-98 : B : Bavistin DF at 0.5 kg with Folicur at 0.5 l in 100 l.
19-Aug-98 : B : Combine harvested.

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

https://doi.org/10.23637/ERADOC-1-52

98/R/CS/355

GRAIN TONNES/HECTARE

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

N	
0	2.84
50	4.01
100	5.22
150	6.32
200	6.89
250	7.12
300	7.03
Mean	5.63

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

N
0.496

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

Stratum	d.f.	s.e.	cv%
BLOCK.WP	12	0.607	10.8

GRAIN MEAN DM% 86.7

PLOT AREA HARVESTED 0.00483

https://doi.org/10.23637/ERADOC-1-52

98/R/CS/408

MISCANTHUS SINENSIS GIGANTEUS STUDY

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

Sponsor: D.G. Christian.

The sixth year, grass.

For previous years see 94-97/R/CS/408.

Design: 3 randomised blocks of 3 plots.

Whole plot dimensions: 10.0 x 10.0.

Treatments:

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

Experimental diary:

08-May-98 : B : Dow Shield at 0.5 l in 220 l, spot treated thistles.
04-Jun-98 : **T** : **N** N1, N2: 34.5% N at 174 and 348 kg respectively.
16-Jun-98 : B : Muriate of potash at 286 kg.
01-Feb-99 : B : Hand harvested.

NOTE: Plants were measured regularly for stem height and density. Samples were taken regularly to measure dry matter and for chemical analysis.

DRY MATTER TONNES/HECTARE

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

N	-	N1	N2	Mean
	15.46	15.02	15.37	15.28

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

N
0.322

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

Stratum	d.f.	s.e.	cv%
BLOCK.WP	4	0.394	2.6

MEAN DM% 44.9 AVERAGE PLOT AREA HARVESTED 0.00444

https://doi.org/10.23637/ERADOC-1-52

98/R/CS/411

PANICUM STUDY

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

Sponsor: D.G. Christian.

The sixth year, grass.

For previous year see 94-97/R/CS/411

Design: 3 randomised blocks of 7 x 2 plots.

Whole plot dimensions: 5.0 x 2.0.

Treatments: All combinations of:-

1. **VARIETY**

CAVIN R	Cave in Rock
KANLOW	Kanlow
PATHFIND	Pathfinder
SUNBURST	Sunburst
FORESTB	Forestburg
NEBR 28	Nebraska 28
DACOTAH	Dacotah

2. **N** Nitrogen fertilizer, kg N cumulative to previous dressings:

-	None
N1	60

Experimental diary:

19-Feb-98 : B : Barclay Gallup at 4.0 l in 220 l.
08-May-98 : **T** : Dow Shield at 0.5 l in 220 l, spot treated thistles.
04-Jun-98 : B : Dow Shield at 1.0 l in 220 l.
05-Jun-98 : **T** : **N** N1: 34.5% N at 174 kg.
16-Jun-98 : B : Muriate of potash at 190 kg. Triple superphosphate at 230 kg.
25-Jan-99 : B : Hand harvested.

https://doi.org/10.23637/ERADOC-1-52

98/R/CS/411

DRY MATTER TONNES/HECTARE

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

	N	-	N1	Mean
VARIETY				
CAVIN R		13.61	11.33	12.47
KANLOW		12.27	12.78	12.53
PATHFIND		10.37	9.69	10.03
SUNBURST		10.35	9.54	9.95
FORESTB		10.36	8.77	9.57
NEBR 28		10.74	12.13	11.44
DACOTAH		8.01	9.36	8.69
Mean		10.82	10.52	10.67

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

VARIETY	**N**	**VARIETY** **N**
1.168	0.624	1.651

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

Stratum	d.f.	s.e.	cv%
BLOCK.WP	26	2.023	19.0

MEAN DM% 48.8

PLOT AREA HARVESTED 0.00047

https://doi.org/10.23637/ERADOC-1-52

98/W/CS/427

CONTAMINATED SLUDGE CAKE

Object: To test the effect of zinc, copper or cadmium enriched sewage sludges on soil microbial activity and agricultural productivity - Woburn, Butt Close West.

Sponsors: S.P. McGrath, A. Chaudri.

The fourth year, grass.

Design: 3 randomised blocks of 23 plots.

Whole plot dimensions: 6.0 x 8.0.

Treatments:

SLUDGE

T1	None (duplicated)
T2	Uncontaminated, digested low rate (quadruplicated)
T3	Uncontaminated, undigested low rate (duplicated)
T4	Zinc 150
T5	Zinc 250
T6	Zinc 350
T7	Zinc 450
T8	Copper 50
T9	Copper 100
T10	Copper 150
T11	Copper 200
T12	Cadmium 1
T13	Cadmium 2
T14	Cadmium 3
T15	Cadmium 4
T16	Uncontaminated, digested low rate + nitrogen (duplicated)
T17	Uncontaminated, undigested low rate + nitrogen (duplicated)
T18	Zinc 15 kg per annum
T19	Copper 7.5 kg per annum
T20	Cadmium 0.15 kg per annum

Experimental diary:

26-Jun-97 : **T** : Sludges applied as treatment.
29-Jul-97 : B : Mechanical spade cultivated.
03-Sep-97 : B : Rolled.
10-Sep-97 : B : Gallup at 6.0 l in 200 l.
18-Sep-97 : B : Rotary harrowed, Atalja Italian Ryegrass, drilled at 40 kg.
22-Sep-97 : B : Rolled.
31-Mar-98 : B : Muriate of potash at 120 kg. 34.5% N at 261 kg.
07-Apr-98 : **T** : **SLUDGE** T1, T19, T20: Triple superphosphate at 64 kg.
07-Apr-98 : **T** : **SLUDGE** T1, T16, T17, T18, T19, T20: 27% N at 222 kg.
09-May-98 : B : Legumex Extra at 7.0 l in 200 l.
02-Jul-98 : B : Cut.
09-Sep-98 : B : Cut, no yields

https://doi.org/10.23637/ERADOC-1-52

98/W/CS/427

NOTE: Soils were sampled in spring and the grass in summer for chemical analysis.

1ST CUT (2/7/98) DRY MATTER TONNES/HECTARE

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

SLUDGE

T1	4.90
T2	6.13
T3	6.22
T4	6.14
T5	6.41
T6	6.80
T7	6.69
T8	6.71
T9	5.95
T10	6.68
T11	6.18
T12	6.17
T13	7.00
T14	6.37
T15	6.03
T16	5.64
T17	5.78
T18	5.56
T19	5.24
T20	5.73
Mean	6.04

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

SLUDGE

0.596 min.rep
0.516 max-min
0.421 max.rep

SLUDGE

max.rep T1 v T2 or T16
max-min T1 or T2 or T16 v any of the remainder
min.rep Any of the remainder

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

Stratum	d.f.	s.e.	cv%
BLOCK.WP	47	0.730	12.1

1ST CUT MEAN DM% 20.2

PLOT AREA HARVESTED 0.00081

https://doi.org/10.23637/ERADOC-1-52

98/W/CS/428

METAL-AMENDED LIQUID SLUDGE

Object: To study the effects of zinc, copper and cadmium on soil microbial activity with low organic matter inputs - Woburn, Butt Close West.

Sponsor: S.P. McGrath, A. Chaudri.

The fourth year, grass.

Design: 3 randomised blocks of 13 plots.

Whole plot dimensions: 1.2 x 3.5.

Treatments:

SLUDGE

T21	None (duplicated)
T22	Uncontaminated (duplicated)
T23	Zinc, rate 1
T24	Zinc, rate 2
T25	Zinc, rate 3
T26	Copper, rate 1
T27	Copper, rate 2
T28	Copper, rate 3
T29	Cadmium, rate 1
T30	Cadmium, rate 2
T31	Cadmium, rate 3

Experimental diary:

10-Sep-97 : B : Gallup at 6.0 l in 200 l.
31-Oct-97 : **T** : Sludges applied as treatment.
31-Mar-98 : B : Muriate of potash at 120 kg. 34.5% N at 145 kg.
03-Apr-98 : **T** : **SLUDGE** T21: Triple superphosphate at 64 kg.
27% N at 370 kg.
08-May-98 : B : PDQ at 4.0 l in 200 l.
12-May-98 : B : Raked. Mixed ryegrass broadcast at 40 kg. Raked.
05-Oct-98 : B : Cut.

NOTE: Soils were sampled in spring and the grass in summer for chemical analysis.

https://doi.org/10.23637/ERADOC-1-52 *pp 28*

98/W/CS/428

1ST AND ONLY CUT (5/10/1998) DRY MATTER TONNES/HECTARE

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

SLUDGE	
T21	1.12
T22	2.63
T23	1.97
T24	2.61
T25	2.65
T26	2.47
T27	3.03
T28	3.00
T29	2.40
T30	2.10
T31	2.84
Mean	2.35

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

SLUDGE
0.470 min.rep
0.407 max-min
0.333 max.rep

	SLUDGE
max-min	T21 or T22 v any of the remainder
min.rep	Any of the remainder
max.rep	T21 v T22 only

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

Stratum	d.f.	s.e.	cv%
BLOCK.WP	26	0.576	24.5

1ST CUT MEAN DM% 14.0

PLOT AREA HARVESTED BETWEEN 0.00020 and 0.00024

https://doi.org/10.23637/ERADOC-1-52 *pp 29*

98/R/CS/429

WINTER RYE AS AN ENERGY CROP

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

Sponsor: D.G. Christian.

The fifth year, w. rye.

For previous years see 94-97/R/CS/429.

Design: 3 randomised blocks of 5 plots.

Plot dimensions: 3.0 x 15.0.

Treatments:

N	Nitrogen fertilizer (kg N), cumulative to previous dressings:
-	None
N1	30
N2	60
N3	90
N4	120

Experimental diary:

15-Aug-97 : B : Straw baled.
26-Aug-97 : B : Ploughed and rolled.
27-Aug-97 : B : PK as (0:20:32) at 1500 kg.
29-Aug-97 : B : Heavy spring-tine cultivated. Rotary harrowed. Amando, undressed, drilled at 350 seeds per m^2. Rolled.
29-Sep-97 : B : Swipe 560 EC at 3.5 l in 200 l.
17-Mar-98 : B : Alto 100 SL at 0.6 l in 200 l.
14-Apr-98 : **T** : **N** N1, N2, N3, N4: 34.5% N at 87, 174, 261, and 348 kg respectively.
08-May-98 : B : Folicur at 0.75 l in 200 l.
05-Aug-98 : B : Combine harvested.

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

https://doi.org/10.23637/ERADOC-1-52 *pp 30*

98/R/CS/429

GRAIN TONNES/HECTARE

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

	N
-	6.02
N1	6.01
N2	6.91
N3	6.41
N4	6.34
Mean	6.34

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

N
0.308

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

Stratum	d.f.	s.e.	cv%
BLOCK.WP	8	0.378	6.0

GRAIN MEAN DM% 81.9

STRAW TONNES/HECTARE

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

	N
-	5.81
N1	7.28
N2	6.48
N3	6.18
N4	6.79
Mean	6.51

STRAW MEAN DM% 92.5

PLOT AREA HARVESTED 0.00300

https://doi.org/10.23637/ERADOC-1-52

98/W/CS/435

RYEGRASS, WHEAT VOLUNTEERS AND DISEASE

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

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

The fourth year, w. wheat.

For previous years see 95-97/W/CS/435

Design: 4 randomised blocks of 10 x 2 plots.

Whole plot dimensions: 6.0 x 10.0.

Treatments:

1. **COV CROP**	Crop, seed rate and soil inoculation in 1995:	
	(R)	Ryegrass at 30 kg
	(RW)	Ryegrass at 30 kg + wheat at 50 seeds per m^2
	(RI)	Ryegrass at 30 kg + soil inoculated with *Phialophora graminicola*
	(RWI)	Ryegrass at 30 kg + wheat at 50 seeds per m^2 + soil inoculated with *P. graminicola*
	(M)	Mustard at 300 seeds per m^2
	(MW1)	Mustard at 100 seeds per m^2 + wheat at 4 seeds per m^2
	(MW2)	Mustard at 100 seeds per m^2 + wheat at 9 seeds per m^2
	(MW3)	Mustard at 100 seeds per m^2 + wheat at 50 seeds per m^2
	(MW4)	Mustard at 100 seeds per m^2 + wheat at 200 seeds per m^2
	(MW5)	Mustard at 30 seeds per m^2 + wheat at 400 seeds per m^2
2. **PLOUGH**	Time of ploughing in 1995:	
	(PE)	Early (12 May)
	(PL)	Late (17 Aug)

Experimental diary:

```
11-Sep-97 : B : Ploughed.  Rolled.
25-Sep-97 : B : Rotary harrowed.
26-Sep-97 : B : Rialto, dressed Sibutol, drilled at 350 seeds per m².
28-Sep-97 : B : Rolled.
25-Nov-97 : B : Stomp 400 SC at 2.0 l with Javelin Gold at 2.0 l and
                    Cyperkill 10 at 0.25 l in 200 l.
06-Feb-98 : B : Ashlade Nu Trace at 2.5 l in 200 l.
12-Feb-98 : B : 34.5% N at 145 kg.
25-Feb-98 : B : Vytel Manganese at 2.0 l in 200 l.
31-Mar-98 : B : 34.5% N at 377 kg
01-Apr-98 : B : Phosyn Manganese at 2.5 l with Profol Copper at 0.25 l
                    in 200 l.
27-Apr-98 : B : Alto 100 SL at 0.6 l with Tripart Brevis at 2.0 l,
                    Phosyn Manganese at 2.0 l and Profol Copper at 0.25 l.
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https://doi.org/10.23637/ERADOC-1-52 *pp 32*

98/W/CS/435

Experimental diary:

21-May-98 : B : Ally at 15 g with Cheetah Super at 0.5 l, Starane 2 at 0.5 l and Chiltern Cropoil at 1.0 l in 200 l.
31-May-98 : B : Opus at 0.8 l in 200 l.
12-Jun-98 : B : Folicur at 0.3 l with Bavistin DF at 0.3 kg in 200 l.
02-Aug-98 : B : Roundup Biactive at 4.0 l in 200 l.
14-Aug-98 : B : Combine harvested.

NOTE: Plant samples were taken in June to assess root and stem base diseases.

GRAIN TONNES/HECTARE

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

PLOUGH / COV CROP	(PE)	(PL)	Mean
(R)	8.01	8.30	8.15
(RW)	7.13	6.90	7.02
(RI)	7.57	7.30	7.44
(RWI)	7.16	7.39	7.28
(M)	6.90	7.24	7.07
(MW1)	7.29	7.33	7.31
(MW2)	7.00	7.30	7.15
(MW3)	6.59	7.37	6.98
(MW4)	6.70	7.68	7.19
(MW5)	7.86	7.12	7.49
Mean	7.22	7.39	7.31

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

COV CROP	PLOUGH	COV CROP PLOUGH
0.346	0.155	0.490

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

Stratum	d.f.	s.e.	cv%
BLOCK.WP	57	0.693	9.5

GRAIN MEAN DM% 88.1

PLOT AREA HARVESTED 0.00460

https://doi.org/10.23637/ERADOC-1-52

98/W/CS/439

METAL SALTS

Object: To study the effects of zinc, copper and cadmium as metal salts on soil microbial activity - Woburn, Butt Close West.

Sponsors: S.P. McGrath, A. Chaudri.

Design: 3 randomised blocks of 11 plots.

Whole plot dimensions: 1.2 x 3.5.

Treatments:

SALTS

A	None (duplicated)
ZN1	Zinc at rate 1
ZN2	Zinc at rate 2
ZN3	Zinc at rate 3
CU1	Copper at rate 1
CU2	Copper at rate 2
CU3	Copper at rate 3
CD1	Cadmium at rate 1
CD2	Cadmium at rate 2
CD3	Cadmium at rate 3

Experimental diary:

10-Sep-97 : B : Barclay Gallup at 6.0 l in 200 l.
31-Mar-98 : B : Muriate of potash at 120 kg. 34.5% N at 145 kg.
03-Apr-98 : B : Triple superphosphate at 64 kg. 27% N at 370 kg.
08-May-98 : B : PDQ at 4.0 l in 200 l.
12-May-98 : B : Raked. Mixed ryegrass broadcast at 40 kg. Raked.
05-Oct-98 : B : Cut.

NOTE: Soils were sampled in spring and the grass in summer for chemical analysis.

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98/W/CS/439

1ST AND ONLY CUT (5/10/98) DRY MATTER TONNES/HECTARE

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

SALTS	
A	1.12
ZN1	1.10
ZN2	1.35
ZN3	1.29
CU1	1.06
CU2	0.84
CU3	0.79
CD1	0.84
CD2	1.10
CD3	0.92
Mean	1.04

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

SALTS	
0.239	min.rep
0.207	max-min

	SALTS
max-min	A v any of the remainder
min.rep	Any of the remainder

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

Stratum	d.f.	s.e.	cv%
BLOCK.WP	21	0.293	28.0

1ST CUT MEAN DM% 15.6

PLOT AREA HARVESTED (MEAN) 0.00022

https://doi.org/10.23637/ERADOC-1-52

98/R/CS/442

PHALARIS LINES

Object: To assess the growth and yield of *Phalaris* lines for biofuel - Road Piece West.

Sponsor: D.G. Christian.

The fourth year.

For previous years see 96-97/R/CS/442.

Design: 6 randomised blocks of 15 plots.

Whole plot dimensions: 1.5 x 2.5.

Treatments:

LINES	*Phalaris* lines:
1	A
2	B
3	C
4	D
5	E
6	F
7	G
8	H
9	I
10	J
11	K
12	L
13	M
14	N
15	O

Experimental diary:

27-Apr-98 : B : MSS Optica at 2.0 l in 220 l.
08-May-98 : B : Spannit at 1.5 l in 220 l.
18-May-98 : B : 34.5% N at 291 kg.
22-May-98 : B : Starane 2 at 1.0 l in 220 l.
15-Jun-98 : B : Triple superphosphate at 140 kg.
16-Jun-98 : B : Muriate of potash at 190 kg.
27-Jul-98 : B : BASF Dimethoate 40 at 1.7 l in 200 l.
21-Dec-98 : **T** : Hand harvested three replicates.
03-Feb-99 : **T** : Hand harvested remaining three replicates.

NOTES: (1) Ground cover, stem height, date and duration of flowering were recorded. Incidence of pests and diseases were also recorded.
(2) **LINES** 3 and 4 failed to grow and have been omitted from the analysis.
(3) Yields presented come from the hand harvest on 03-Feb-99.

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98/R/CS/442

DRY MATTER TONNES/HECTARE

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

LINES	
1	7.45
2	7.43
5	7.30
6	5.37
7	8.80
8	8.56
9	6.27
10	6.58
11	6.17
12	5.54
13	6.96
14	8.19
15	6.55
Mean	7.01

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

LINES
1.249

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

Stratum	d.f.	s.e.	cv%
BLOCK.WP	24	1.529	21.8

MEAN DM% 73.1

PLOT AREA HARVESTED 0.00023

https://doi.org/10.23637/ERADOC-1-52

98/W/CS/446

RYEGRASS, WHEAT VOLUNTEERS AND DISEASES

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

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

For previous year see 96-97/W/CS/446.

The third year, w. wheat.

Design: 4 randomised blocks of 10 x 2 plots.

Whole plot dimensions: 6.0 x 10.0.

Treatments:

Whole plots

1. **COV CROP** — Crop, seed rate and soil inoculation in 1996:

(R)	Ryegrass at 30 kg
(RW)	Ryegrass at 30 kg + wheat at 50 seeds per m^2
(RI)	Ryegrass at 30 kg + soil inoculated with *Phialophora graminicola*
(RWI)	Ryegrass at 30 kg + wheat at 50 seeds per m^2 + soil inoculated with *P. graminicola*
(M)	Mustard at 300 seeds per m^2
(MW1)	Mustard at 100 seeds per m^2 + wheat at 4 seeds per m^2
(MW2)	Mustard at 100 seeds per m^2 + wheat at 9 seeds per m^2
(MW3)	Mustard at 100 seeds per m^2 + wheat at 50 seeds per m^2
(MW4)	Mustard at 100 seeds per m^2 + wheat at 200 seeds per m^2
(MW5)	Mustard at 30 seeds per m^2 + wheat at 400 seeds per m^2

2. **PLOUGH** — Time of ploughing in 1996:

(PE)	Early (17 May)
(PL)	Late (14 Aug)

Experimental diary:

12-Sep-97 : B : Ploughed.
16-Sep-97 : B : Rolled.
25-Sep-97 : B : Rotary harrowed, Hereward, dressed Sibutol, drilled at 350 seeds per m^2.
28-Sep-97 : B : Rolled.
25-Nov-97 : B : Stomp 400 SC at 2.0 l with Javelin Gold at 2.0 l and Cyperkill 10 at 0.25 l in 200 l.
06-Feb-98 : B : Ashlade Nu Trace at 2.5 l in 200 l.
12-Feb-98 : B : 34.5% N at 145 kg.
25-Feb-98 : B : Vytel Manganese at 2.0 l in 200 l.
31-Mar-98 : B : 34.5% N at 377 kg.

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Experimental diary:

01-Apr-98 : B : Phosyn Manganese at 2.5 l with Profol Copper at 0.25 l in 200 l.
27-Apr-98 : B : Alto 100 SL at 0.6 l with Tripart Brevis at 2.0 l, Phosyn Manganese at 2.0 l and Profol Copper at 0.25 l in 200 l.
21-May-98 : B : Ally at 15 g with Cheetah Super at 0.5 l, Starane 2 at 0.5 l and Chiltern Cropoil at 1.0 l in 200 l.
31-May-98 : B : Opus at 0.8 l in 200 l.
12-Jun-98 : B : Folicur at 0.3 l with Bavistin DF at 0.3 kg in 200 l.
02-Aug-98 : B : Roundup Biactive at 4.0 l in 200 l.
13-Aug-98 : B : Combine harvested.

NOTE: Plant samples were taken in April and June to assess root and stem base diseases.

GRAIN TONNES/HECTARE

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

CULT	(PE)	(PL)	Mean
CROP			
(R)	5.18	4.12	4.65
(RW)	3.77	4.85	4.31
(RI)	5.91	5.58	5.75
(RWI)	5.06	6.88	5.97
(M)	4.94	4.42	4.68
(MW1)	4.76	4.79	4.78
(MW2)	4.71	3.52	4.12
(MW3)	4.22	3.32	3.77
(MW4)	3.45	2.61	3.03
(MW5)	2.99	3.14	3.07
Mean	4.50	4.32	4.41

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

CROP	**CULT**	**CROP CULT**
0.690	0.308	0.975

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

Stratum	d.f.	s.e.	cv%
BLOCK.WP	57	1.379	31.3

GRAIN MEAN DM% 88.5

PLOT AREA HARVESTED 0.00460

https://doi.org/10.23637/ERADOC-1-52

98/R/CS/457

SET-ASIDE, CULTIVATIONS AND CROPS

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

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

The third year, w. wheat.

Design: 3 randomised blocks of 5 x 2 split into 2 sub-plots.

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

Treatments: All combinations of:-

1.	**SETDESTR**	Method and time of destruction of set-aside in 1996:
	(PG)	Ploughed in May, glyphosate pre-drilling
	(PC)	Ploughed in May, cultivated in June and July
	(MP)	Minimally cultivated in May, ploughed in August
	(HP)	Herbicide in May, ploughed in August
	(-P)	Ploughed in August
2.	**CROP**	Crop in 1997
	(R)	Winter rape
	(W)	Winter wheat

Sub-plots

3.	**NITROGEN**	Fertilizer nitrogen in 1997 (kg N):
	(-)	None
	(N)	160

Experimental diary:

22-Sep-97 : B : Ploughed.
25-Sep-97 : B : Rotary harrowed, Genesis, dressed Sibutol, drilled at 380 seeds per m^2.
26-Sep-97 : B : Rolled.
12-Nov-97 : B : Stefes IPU 500 at 2.0 l with Stomp 400 SC at 2.0 l and Cyperkill 10 at 250 ml in 200 l.
17-Feb-98 : B : 34.5% N at 120 kg.
17-Apr-98 : B : 34.5% N at 460 kg.
08-May-98 : B : Ally at 20 g with Pointer at 0.5 l in 200 l.
28-May-98 : B : Opus at 0.7 l in 200 l.
20-Aug-98 : B : Combine harvested.

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NOTE: Plant samples were taken in July to assess root and stem base diseases.

GRAIN TONNES/HECTARE

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

CROP	(R)	(W)	Mean
SETDESTR			
(PG)	9.62	5.19	7.40
(PC)	9.59	5.75	7.67
(MP)	7.74	5.52	6.63
(HP)	9.32	5.36	7.34
(-P)	8.95	4.94	6.95
Mean	9.04	5.35	7.20

N	(-)	(N)	Mean
SETDESTR			
(PG)	7.18	7.63	7.40
(PC)	8.08	7.25	7.67
(MP)	6.66	6.59	6.63
(HP)	7.64	7.04	7.34
(-P)	6.81	7.08	6.95
Mean	7.27	7.12	7.20

N	(-)	(N)	Mean
CROP			
(R)	8.95	9.13	9.04
(W)	5.60	5.10	5.35
Mean	7.27	7.12	7.20

CROP	(R)		(W)	
SETDESTR **N**	(-)	(N)	(-)	(N)
(PG)	9.54	9.69	4.81	5.56
(PC)	9.64	9.54	6.53	4.97
(MP)	7.24	8.24	6.09	4.95
(HP)	9.57	9.06	5.70	5.02
(-P)	8.77	9.14	4.86	5.01

https://doi.org/10.23637/ERADOC-1-52

98/R/CS/457

GRAIN TONNES/HECTARE

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

	SETDESTR	CROP	N	SETDESTR CROP
	0.542	0.343	0.186	0.766

	SETDESTR N	CROP N	SETDESTR CROP N
	0.616	0.390	0.872

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

SETDESTR	0.415
CROP	0.263
SETDESTR.CROP	0.587

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

Stratum	d.f.	s.e.	cv%
BLOCK.WP	18	0.939	13.0
BLOCK.WP.SP	20	0.719	10.0

GRAIN MEAN DM% 86.8

SUB-PLOT AREA HARVESTED 0.00230

https://doi.org/10.23637/ERADOC-1-52

98/R/CS/472

CEREALS AND SEED TREATMENTS

Object: To test seed treatment fungicides on root and stem base diseases of winter wheat and barley - Highfield IV/Road Piece East.

Sponsors: W.A.J.M. Dawson, G.L. Bateman, J.F. Jenkyn.

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

Design: 4 randomised blocks of 8 x 2.

Plot dimensions: 3.0 x 10.0.

Treatments: All combinations of:-

1. **FUNGCIDE** Seed dressing:

	1997	1998
(-)-	None	None
(E)-	CR21528	None
(-)E	None	CR21529
(E)E	CR21528	CR21528
(B)-	CR21529	None
(-)B	None	CR21529
(B)B	CR21529	CR21529

2. **CROP**

WW	Winter wheat
BW	Winter barley

NOTE: Fungicides CR21528 and CR21529 are under commercial development, composition disclosed in confidence.

Experimental diary:

17-Sep-97 : B : Scythe LC at 3.0 l with Vassgro Non Ionic at 100 ml in 200 l.
18-Sep-97 : B : Topped.
24-Sep-97 : B : Ploughed and furrow pressed.
26-Sep-97 : **T** : **CROP** BW: Rotary harrowed, Pipkin, dressed as treatment, drilled at 350 seeds per m^2.
: **T** : **CROP** WW: Rotary harrowed, Brigadier, dressed as treatment, drilled at 380 seeds per m^2.
06-Jan-98 : B : Atlas Fieldgard at 2.6 l with Stomp 400 SC at 3.3 l in 200 l.
13-Feb-98 : B : 34.5% N at 116 kg. Grasp at 1.4 l with Isoguard at 2.0 l and Output at 0.75 l in 200 l.
25-Feb-98 : B : Manganese sulphate at 3.0 kg with Tern 750 EC at 0.75 l in 200 l.
31-Mar-98 : **T** : **CROP** BW: Campbell's Carbendazim 50% Flowable at 0.5 l in 220 l.
28-Apr-98 : B : 34.5% N at 400 kg.
08-May-98 : B : Ally at 20 g with Starane 2 at 0.5 l in 200 l.
14-May-98 : B : Carbate Flowable at 0.5 l with Opus at 1.0 l in 200 l.

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Experimental diary:
05-Jun-98 : B : Corbel at 1.0 l in 200 l.
20-Jul-98 : B : **CROP** BW: Combine harvested.
11-Aug-98 : B : **CROP** WW: Combine harvested.

NOTE: Plant samples were taken in January, March and June to assess root and stem base diseases.

GRAIN TONNES/HECTARE

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

CROP / **FUNGCIDE**	WW	BW	Mean
(-)-	7.59	7.40	7.50
(E)-	7.99	7.51	7.75
(-)E	9.14	7.33	8.23
(E)E	8.47	7.85	8.16
(B)-	8.00	7.90	7.95
(-)B	9.32	7.26	8.29
(B)B	8.74	7.43	8.08
Mean	8.36	7.51	7.93

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

FUNGCIDE	**CROP**	**FUNGCIDE** **CROP**	
0.296		0.419	min.rep
0.257	0.148	0.363	max-min
		0.296	max.rep

FUNGCIDE
max.rep - only
max-min - v any of the remainder
min.rep Any of the remainder

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

Stratum	d.f.	s.e.	cv%
BLOCK.WP	47	0.593	7.5

GRAIN MEAN DM% 88.5

PLOT AREA HARVESTED 0.00228

https://doi.org/10.23637/ERADOC-1-52

98/W/CS/474

EFFICIENCY OF S FERTILIZERS

Object: To measure the effect of different forms of sulphur on the yield of winter wheat and the following oilseed rape crop - Woburn, Lansome III.

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

The second year, w. rape.

Design: 4 randomised blocks of (4 x 2 + 1) split into 2 sub-plots.

Plot dimensions: 8.0 x 12.0.

Treatments: All combinations of:-

Whole plots

1. **FORM** — Form of sulphur to provide 30 kg S:

T+A	50% Stefes Tiger 90 and 50% ammonium sulphate
AS	Ammonium sulphate
T90	Stefes Tiger 90
NAS	Sodium thiosulphnate

2. **TIMING**

SB	To seedbed, pre-sowing
MAR	In March

EXTRA

-	None

Sub-plots

YEAR

97+98	Above treatments applied in 1997 and 1998
97	Above treatments applied in 1997 only

NOTE: The nitrogen was balanced on all plots to match that supplied by the ammonium sulphate treatment, this was 26.5 kg N to the seedbed and a spring dressing to provide a total of 180 kg N.

Experimental diary:

08-Sep-97 : B : Ploughed. Rotary harrowed.
09-Sep-97 : **T** : **FORM** T+A, AS, T90, NAS **TIMING** SB **YEAR** 97+98: Seedbed sulphur and balancing nitrogen applied.
: B : Apex, dressed Vitavax RS, drilled at 120 seeds per m^2.
24-Oct-97 : B : Butisan S at 1.5 l with Benazalox at 0.75 kg in 300 l.
17-Feb-98 : B : Folicur at 0.5 l in 200 l.

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Experimental diary:

16-Mar-98 : **T** : **FORM** T+A, AS, T90, NAS **TIMING** MAR **YEAR** 97+98:
Sulphur treatments applied and balancing nitrogen applied.
09-May-98 : B : Ronilan FL at 0.8 l with Fastac at 200 ml in 200 l.
16-Jul-98 : B : Alpha Glyphogan at 4.0 l in 200 l.
28-Jul-98 : B : Combine harvested.

NOTE: Soil was sampled in May and plants at harvest for chemical analysis.

GRAIN (AT 90% DRY MATTER) TONNES/HECTARE

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

TIMING	SB	MAR	Mean
FORM			
T+A	1.94	2.39	2.16
AS	1.96	2.45	2.20
T90	3.16	1.94	2.55
NAS	2.20	2.68	2.44
Mean	2.31	2.36	2.34

YEAR	97+98	97	Mean
FORM			
T+A	2.31	2.01	2.16
AS	2.24	2.17	2.20
T90	2.56	2.54	2.55
NAS	2.69	2.19	2.44
Mean	2.45	2.23	2.34

YEAR	97+98	97	Mean
TIMING			
SB	2.38	2.25	2.31
MAR	2.52	2.21	2.36
Mean	2.45	2.23	2.34

TIMING	SB		MAR	
YEAR	97+98	97	97+98	97
FORM				
T+A	2.02	1.85	2.60	2.17
AS	1.87	2.05	2.61	2.28
T90	3.13	3.19	1.99	1.89
NAS	2.51	1.89	2.87	2.49

EXTRA 2.06

Grand mean 2.31

https://doi.org/10.23637/ERADOC-1-52

98/W/CS/474

GRAIN (AT 90% DRY MATTER) TONNES/HECTARE

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

FORM	TIMING	YEAR	FORM TIMING
0.613	0.434	0.079	0.867

FORM YEAR	TIMING YEAR	FORM TIMING YEAR
0.623	0.441	0.881

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

FORM	0.157
TIMING	0.111
FORM.TIMING	0.222

SED for comparing **EXTRA** with any item in **FORM.TIMING.YEAR** table is 0.874

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

Stratum	d.f.	s.e.	cv%
BLOCK.WP	24	1.226	53.2
BLOCK.WP.SP	28	0.314	13.6

GRAIN MEAN DM% 85.5

SUB-PLOT AREA HARVESTED 0.00230

https://doi.org/10.23637/ERADOC-1-52

98/R/CS/476

FUNGICIDE SEQUENCES AND TAKE-ALL

Object: To determine the effects of a fungicidal seed treatment on take-all (*Gaeumannomyces graminis*) development in w. wheat - Long Hoos IV 4.

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

The second year, w. wheat.

For previous year see 97/R/CS/476.

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

Plot dimensions: 3.0 x 10.0.

Treatments: All combinations of:-

1. **FUNG97** Fungicidal seed dressing to the 1997 crop:

   (F97) Seed dressed
   (-97) None

2. **FUNG98** Fungicidal seed dressing to the 1998 crop:

   F98 Seed dressed
   -98 None

3. **FUNG99** Fungicidal seed dressing to the 1999 crop:

   F99 Seed dressed
   -99 None

NOTE: The seed dressing is under commercial development, composition disclosed in confidence.

Experimental diary:

20-Aug-97 : B : Straw baled.
30-Sep-97 : B : Ploughed, rolled. Spring-tine cultivated.
01-Oct-97 : B : Rotary harrowed, Hereward, dressed as treatment, drilled at 400 seeds per m^2.
13-Jan-98 : B : Atlas Fieldgard at 3.0 l with Stomp 400 SC at 2.5 l in 200 l.
19-Feb-98 : B : 34.5% N at 120 kg.
29-Apr-98 : B : 34.5% N at 460 kg.
13-Jul-98 : B : Hand rogued wild oats.
19-Aug-98 : B : Combine harvested.

NOTE: Plant samples were taken in December for leaf and root assessments, in March and June for root and stem base diseases. Soil samples were taken after harvest and used in bioassays to measure take-all infectivity.

https://doi.org/10.23637/ERADOC-1-52

98/R/CS/476

GRAIN TONNES/HECTARE

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

FUNG98 / **FUNG97**	F98	-98	Mean
(F97)	8.48	8.06	8.27
(-97)	7.99	7.50	7.74
Mean	8.24	7.78	8.01

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

FUNG97	**FUNG98**	**FUNG97** **FUNG98**
0.292	0.292	0.413

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

Stratum	d.f.	s.e.	cv%
BLOCK.WP	25	0.826	10.3

GRAIN MEAN DM% 84.9

PLOT AREA HARVESTED 0.00228

https://doi.org/10.23637/ERADOC-1-52

98/R/CS/477

CONTINUOUS MAIZE

Object: To monitor the fate of organic carbon in the soil organic matter - Hoosfield.

Sponsors: P.R. Poulton, J.L. Gaunt.

The second year, maize and s. barley.

Design: 3 randomised blocks of 6 plots.

Plot dimensions: 12.0 x 25.0.

Treatments:-

CROP	Crop and straw treatments:
BM	Spring barley, straw removed then maize after three years
BTM	Continuous spring barley, straw removed plus 10 t maize tops incorporated
B	Continuous spring barley, straw removed
M	Continuous maize, stubble incorporated
MB	Maize, stubble incorporated then s. barley after five years
MTB	Maize, stubble plus 10 t maize tops incorporated, then s. barley after five years

Experimental diary:

19-Sep-97 : **T** : **CROP** BTM, MTB: Chopped maize tops at 10 t.
15-Oct-97 : B : Muriate of potash at 180 kg and triple superphosphate at 170 kg.
16-Oct-97 : B : Ploughed.
18-Mar-98 : B : Roundup at 3.0 l in 200 l.
01-Apr-98 : B : Spring-tine cultivated.
: **T** : **CROP** BM, BTM, B: Rotary harrowed, Cooper, dressed Raxil S, drilled at 350 seeds per m^2.
29-Apr-98 : B : 34.5% N at 275 kg.
07-May-98 : **T** : **CROP** M, MB, MTB: Rotary harrowed, Hudson, dressed Mesurol, drilled at 11 seeds per m^2.
04-Jun-98 : **T** : **CROP** BM, BTM, B: MSS Optica at 2.0 l with Corbel at 0.3 l and Opus at 0.3 l in 200 l.
28-Jun-98 : **T** : Gesaprim 500 SC at 3.0 l with Chiltern Cropoil at 5.0 l in 200 l.
28-Aug-98 : **T** : **CROP** BM, BTM, B: Combine harvested.
16-Sep-98 : **T** : **CROP** M, MB, MTB: Hand harvested.

NOTE: Samples of whole crop maize and barley grain and straw were taken for chemical analysis.

https://doi.org/10.23637/ERADOC-1-52

98/R/CS/477 MAIZE

WHOLE CROP YIELD TONNES/HECTARE

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

CROP	
M	10.39
MB	10.71
MTB	10.16
Mean	10.42

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

CROP
0.568

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

Stratum	d.f.	s.e.	cv%
BLOCK.WP	4	0.695	6.7

CROP MEAN DM% 23.4

PLOT AREA HARVESTED 0.00108

S. BARLEY

GRAIN TONNES/HECTARE

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

CROP	
BM	5.17
BTM	4.90
B	4.80
Mean	4.95

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

CROP
0.188

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

Stratum	d.f.	s.e.	cv%
BLOCK.WP	4	0.230	4.6

GRAIN MEAN DM% 86.1

PLOT AREA HARVESTED 0.00575

https://doi.org/10.23637/ERADOC-1-52

98/W/CS/478

CONTINUOUS MAIZE

Object: To monitor the fate of organic carbon in the soil organic matter - Woburn, Stackyard A I.

Sponsors: P.R. Poulton, J. Gaunt.

The second year, maize and s. barley.

Design: 3 randomised blocks of 6 plots.

Plot dimensions: 9.0 x 25.0.

Treatments:

CROP	Crop and straw treatments:
BM	Spring barley, straw removed then maize after three years
BTM	Continuous spring barley plus 10 t maize tops incorporated.
B	Continuous spring barley, straw removed
M	Continuous maize, stubble incorporated
MB	Maize, stubble incorporated then s. barley after five years
MTB	Maize, stubble plus 10 t maize tops incorporated, then s. barley after five years

Experimental diary:

29-Sep-97 : **T** : **CROP** MTB, BTM: Chopped maize tops at 10 t.
: B : PK as (0:20:32) at 235 kg and (0:24:24) at 138 kg.
20-Oct-97 : B : Ploughed.
24-Mar-98 : B : Rotary harrowed.
24-Mar-98 : **T** : **CROP** BM, BTM, B: Copper, dressed Raxil S, drilled at 375 seeds per m^2.
13-May-98 : B : 34.5% N at 278 kg.
14-May-98 : **T** : **CROP** M, MB, MTB: Rotary harrowed, Hudson, dressed Thiram and Methiocare, drilled at 10.9 seeds per m^2.
20-May-98 : **T** : **CROP** BM, BTM, B: Asset at 2.0 l with Astix at 1.0 l in 200 l. Opus at 0.2 l in 200 l.
14-Aug-98 : **T** : **CROP** BM, BTM, B: Combine harvested.
15-Sep-98 : **T** : **CROP** M, MB, MTB: Hand harvested.

NOTE: Samples of whole crop maize and barley grain and straw were taken for chemical analysis.

https://doi.org/10.23637/ERADOC-1-52

98/W/CS/478 MAIZE

WHOLE CROP YIELD TONNES/HECTARE

***** TABLES OF MEANS *****

CROP	
M	9.49
MB	10.49
MTB	10.95
Mean	10.31

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

CROP
0.470

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

Stratum	d.f.	s.e.	cv%
BLOCK.WP	4	0.576	5.6

CROP MEAN DM% 29.7

PLOT AREA HARVESTED 0.00108

BARLEY

GRAIN TONNES/HECTARE

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

CROP	
BM	1.51
BTM	2.18
B	1.65
Mean	1.78

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

CROP
0.455

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

Stratum	d.f.	s.e.	cv%
BLOCK.WP	4	0.557	31.4

GRAIN MEAN DM% 86.7 PLOT AREA HARVESTED 0.00575

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98/R/CS/480

MISCANTHUS GENOTYPES

Object: To compare growth, yield, winter survival and quality for combustion and fibre uses of a range of miscanthus genotypes - Long Hoos III 4.

Sponsors: D.G. Christian.

The second year, grasses.

Design: 3 randomised blocks of 15 plots.

Plot dimensions: 5.0 x 5.0.

Treatments:-

GENOTYPE

1	Giganteus/M1 Lasei 1
2	Giganteus/M53 LLP53
3	Giganteus/M56 Haga 56
4	Giganteus/M63 Greif 63
5	Sacchariflorus/M11 Materec 11
6	Sinensis H/M7 Gofal 7
7	Sinensis H/M42 Berbo 42
8	Sinensis H/M43 RH43
9	Sinensis H/M78 Jesel 78
10	Sinensis H/M81 RH81
11	Sinensis /88-110
12	Sinensis /88-111
13	Sinensis /90-5
14	Sinensis /90-6
15	Sinensis /SW 217

Experimental diary:

16-May-97 : B : 34.5% N at 174 kg. Triple superphosphate at 213 kg. Muriate of potash at 292 kg. Heavy spring-tine cultivated.
19-May-97 : B : Rotary cultivated. Transplanted genotypes.
20-May-97 : B : Irrigated 20 mm.
28-May-97 : B : Irrigated 20 mm.
03-Jun-97 : B : Irrigated 20 mm.
20-Aug-97 : B : Irrigated 12.5 mm.
17-Feb-98 : B : Hand harvested.
18-Feb-98 : **T** : Replanted missing plants by hand.
18-Mar-98 : B : Gramoxone 100 at 2.0 l with Luxon Non-ionic Wetter at 100 ml in 200 l.
08-May-98 : B : Dow Shield at 0.5 l in 220 l, spot treat thistles.
15-Jun-98 : B : Triple superphosphate at 213 kg. 34.5% N at 174 kg.
16-Jun-98 : B : Muriate of potash at 190 kg.
17-Jul-98 : B : Hand weeded.
16-Feb-99 : B : Hand harvested.

https://doi.org/10.23637/ERADOC-1-52

98/R/CS/480

NOTE: Winter survival was assessed. Regular measurements of plant height and shoot numbers were made. The onset of senescence was recorded. Plant samples were taken at harvest to assess above and below ground biomass and for chemical analysis.

DRY MATTER TONNES/HECTARE

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

GENOTYPE	
1	1.78
2	3.35
3	3.53
4	2.74
5	1.23
6	3.62
7	4.13
8	0.95
9	4.83
10	3.91
11	1.19
12	0.90
13	1.61
14	0.50
15	1.22
Mean	2.36

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

GENOTYPE
0.421

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

Stratum	d.f.	s.e.	cv%
BLOCK.WP	28	0.515	21.8

MEAN DM% 64.0

PLOT AREA HARVESTED 0.00105

https://doi.org/10.23637/ERADOC-1-52

98/W/CS/482

DIAGNOSIS OF S DEFICIENCY

Object: To develop reliable diagnostic methods for the prediction of sulphur deficiency - Woburn, Butt Close I.

Sponsors: F.J. Zhao, M.M.A. Blake-Kalff, S.P. McGrath.

The first year, w. wheat.

Design: 4 randomised blocks of 6 plots.

Plot dimensions: 3.0 x 12.0.

Treatments:-

SULPHUR	Kg of sulphur:
S0	None
S1	5
S2	10
S3	20
S4	40
S5	80

Experimental diary:

16-Sep-97 : B : Ploughed. Rolled.
14-Oct-97 : **T** : **SULPHUR** S1, S2, S3, S4, S5: Gypsum applied at 29, 57, 114, 229 and 457 kg respectively.
: B : Rotary harrowed. Riband, dressed Sibutol, drilled at 385 seeds m^2.
29-Jan-98 : B : Panther at 1.0 l with Atlas IPU at 1.0 l in 200 l.
12-Feb-98 : B : 34.5% N at 145 kg.
31-Mar-98 : B : 34.5% N at 377 kg.
04-May-98 : B : Alto 100 SL at 0.6 l in 200 l.
31-May-98 : B : Opus at 0.8 l in 200 l.
12-Jun-98 : B : Folicur at 0.3 l with Bavistin DF at 0.3 kg in 200 l.
02-Aug-98 : B : Roundup Biactive at 3.0 l in 200 l.
13-Aug-98 : B : Combine harvested.

NOTES: (1) Plant samples were taken in April, May and June and analysed for glutathione and sulphur content. At harvest grain and straw were analysed for sulphur content.
(2) Because of rabbit damage the yield of one plot with **SULPHUR** S2 was lost. An estimated value was used in the analysis.

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98/W/CS/482

GRAIN TONNES/HECTARE

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

SULPHUR

S0	5.32
S1	6.75
S2	6.13
S3	5.47
S4	6.13
S5	6.32
Mean	6.02

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

SULPHUR
0.541

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

Stratum	d.f.	s.e.	cv%
BLOCK.WP	14	0.766	12.7

GRAIN MEAN DM% 87.8

PLOT AREA HARVESTED 0.00276

https://doi.org/10.23637/ERADOC-1-52

98/R/CS/483

SEVERE TAKE-ALL IN WHEAT

Object: To create severe take-all (*Gaeumannomyces graminis*) in winter wheat by applying inoculum artificially to spring wheat and then test seed dressings on w. wheat - Summerdells I.

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

The second year, w. wheat.

For previous year see 97/R/CS/483

Design: 4 randomised blocks of 2 x 7 plots.

Plot dimensions: 3.0 x 10.0.

Treatments:-

All combinations of:

1.	**INOCULTN**	Inoculum applied in 1997:
	-	None
	TA	Take-all inoculum
2.	**SEED TRT**	Seed dressing in 1998:
	-	None
	R1	CR 21529 at 200 ml per 100 kg
	R2	CR 21529 at 300 ml per 100 kg
	R3	CR 21529 at 450 ml per 100 kg
	NR1	CR 21529 (Non-P) at 200 ml per 100 kg
	NR3	CR 21529 (Non-P) at 450 ml per 100 kg
	B	Baytan Flowable at 200 ml per 100 kg

NOTE: Treatments CR 21529 and CR 21529 (Non-P) are under commercial development, composition disclosed in confidence.

Experimental diary:

10-Sep-97 : B : PK as (0:20:32) at 1250 kg.
01-Oct-97 : B : Heavy spring-tine cultivated twice.
01-Oct-97 : **T** : Rotary harrowed, Hereward, dressed as treatment, drilled at 400 seeds per m^2.
03-Oct-97 : B : Rolled.
16-Oct-97 : B : Draza at 5.5 kg.
13-Jan-98 : B : Unite A at 0.125 l with Unite B at 1.0 l and LI-700 at 1.0 l in 200 l.
17-Feb-98 : B : 34.5% N at 120 kg.
29-Apr-98 : B : 34.5% N at 460 kg.
18-Aug-98 : B : Combine harvested.

NOTE: Plant populations, growth and take-all were assessed in March. Take-all and stem base diseases were assessed in June.

https://doi.org/10.23637/ERADOC-1-52

98/R/CS/483

GRAIN TONNES/HECTARE

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

INOCULTN	-	TA	Mean
SEED TRT			
-	5.78	5.82	5.80
R1	6.03	6.25	6.14
R2	6.14	6.58	6.36
R3	5.59	6.67	6.13
NR1	6.75	5.68	6.21
NR3	6.22	6.70	6.46
B	5.68	6.29	5.99
Mean	6.03	6.28	6.16

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

INOCULTN	SEED TRT	INOCULTN SEED TRT
0.227	0.425	0.601

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

Stratum	d.f.	s.e.	cv%
BLOCK.WP	39	0.850	13.8

GRAIN MEAN DM% 88.0

PLOT AREA HARVESTED 0.00228

https://doi.org/10.23637/ERADOC-1-52

98/R/CS/484

STEM BASE DISEASES AND FUNGICIDES

Object: To evaluate sampling methods and molecular diagnostics for assessing risk of stem-base diseases and the effects of fungicides - Great Harpenden I.

Sponsors: G.L. Bateman, L.W. Morgan.

The first year, w. wheat.

Design: 4 randomised blocks of 4 x 5 plots.

Plot dimensions: 3.0 x 10.0.

Treatments:-

1. **CULTIVAR**

L	Lynx
B	Brigadier
M	Mercia
S	Soissons

2. **FUNGCIDE**

-	None
P	Prochloraz
C	Cyprodinil
A	Azoxystrobin
F	Flusilazole

Experimental diary:

02-Sep-97 : B : Alpha Glyphogan at 5.0 l in 200 l.
27-Sep-97 : B : Ploughed and furrow pressed.
10-Oct-97 : **T** : **CULTIVAR** B: Rotary harrowed, Brigadier, undressed, drilled at 380 seeds per m^2.
: **T** : **CULTIVAR** L: Rotary harrowed, Lynx, undressed, drilled at 380 seeds per m^2.
: **T** : **CULTIVAR** M: Rotary harrowed, Mercia, undressed, drilled at 380 seeds per m^2.
: **T** : **CULTIVAR** S: Rotary harrowed, Soissons, undressed drilled at 400 seeds per m^2.
28-Jan-98 : B : Isoguard at 2.0 l with Panther at 0.25 l and Stomp 400 SC at 2.5 l in 200 l.
17-Feb-98 : B : 34.5% N at 120 kg.
23-Mar-98 : B : Eagle at 40 g in 200 l.
07-Apr-98 : **T** : **FUNGCIDE** A: Amistar at 1.0 l in 220 l.
: **T** : **FUNGCIDE** C: Unix at 1.0 kg in 220 l.
: **T** : **FUNGCIDE** F: DUK9703 at 1.5 l in 220 l.
: **T** : **FUNGCIDE** P: Sportak 45 HF at 0.89 l in 220 l.
27-Apr-98 : B : 34.5% N at 460 kg.
12-May-98 : B : Opus at 1.0 l in 200 l.
05-Jun-98 : B : Corbel at 1.0 l in 200 l.
10-Aug-98 : B : Combine harvested.

https://doi.org/10.23637/ERADOC-1-52

98/R/CS/484

NOTES: (1) Plant samples were taken in February, April, May and July to assess and identify stem base diseases.
(2) Two plots of **CULTIVAR** B and one of **CULTIVAR** M were sown to Hereward due to a shortage of seed. These have been treated as missing values in the analysis.

GRAIN TONNES/HECTARE

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

FUNGCIDE / **CULTIVAR**	-	P	C	A	F	Mean
L	9.13	9.73	9.44	10.69	8.84	9.56
B	9.61	9.83	9.52	9.81	9.80	9.72
M	8.68	8.97	8.07	9.43	8.86	8.80
S	8.44	8.78	9.32	10.16	9.34	9.21
Mean	8.96	9.33	9.09	10.02	9.21	9.32

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

CULTIVAR	**FUNGCIDE**	**CULTIVAR FUNGCIDE**
0.247	0.276	0.552

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

Stratum	d.f.	s.e.	cv%
BLOCK.WP	54	0.780	8.4

GRAIN MEAN DM% 89.7

PLOT AREA HARVESTED 0.00230

https://doi.org/10.23637/ERADOC-1-52

98/W/CS/491

EFFICIENCY OF S FERTILIZERS

Object: To measure the effect of different forms of sulphur on yields of wheat and a subsequent rape crop - Woburn, Stackyard III.

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

The first year, w. wheat.

Design: 4 randomised blocks of 4 x 2 + 1.

Plot dimensions: 4.0 x 12.0.

Treatments:-

1. **S FORM** Form of sulphur:

T+A	Tiger 90 and ammonium sulphate
AS	Ammonium sulphate
T90	Tiger 90
NAS	Sodium thiosulphate

2. **APP TIME** Time of application:

SB	To the seedbed
MAR	17-Mar-98

EXTRA

-	None

NOTE: Nitrogen fertilizer was applied to balance the nitrogen supplied by ammonium sulphate, this was 26 kg to the seedbed and to give a total of 180 kg N in March.

Experimental diary:

```
29-Sep-97 : B : Ploughed.
01-Oct-97 : B : Rolled.
02-Oct-97 : B : Rotary harrowed.
03-Oct-97 : T : APP TIME SB: Sulphur treatments applied to give 30 kg S.
          : T : Balancing nitrogen applied as 27% N.
03-Oct-97 : B : Riband, dressed Sibutol, drilled at 385 seeds per m².
13-Nov-97 : B : Stomp 400 SC at 2.0 l with Isoproturon 500 at 1.0 l and
                Cyperkill 10 at 0.25 in 200 l.
17-Mar-98 : T : APP TIME MAR: Sulphur treatments applied to give 30 kg S.
          : T : Balancing nitrogen applied as 27% N.
04-May-98 : B : Alto 100 SL at 0.6 l in 200 l.  Tripart Brevis at 1.5 l
                in 200 l.
31-May-98 : B : Opus at 0.8 l in 200 l.
12-Jun-98 : B : Folicur at 0.3 l with Bavistin DF at 0.3 kg in 200 l.
13-Aug-98 : B : Combine harvested.
```

Previous crops: W. rye 1996, potatoes 1997.

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98/W/CS/491

NOTE: Soils were sampled in October and August and analysed for sulphur.
Plants were sampled in April, July and August for sulphur and nitrogen.

GRAIN TONNES/HECTARE

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

APP TIME / S FORM	SB	MAR	Mean
T+A	9.41	8.98	9.19
AS	9.37	9.38	9.37
T90	9.11	9.15	9.13
NAS	9.19	9.30	9.24
Mean	9.27	9.20	9.24
EXTRA	9.37		

GRAND MEAN 9.25

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

S FORM	APP TIME	S FORM APP TIME & EXTRA
0.177	0.125	0.250

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

Stratum	d.f.	s.e.	cv%
BLOCK.WP	24	0.353	3.8

GRAIN MEAN DM% 87.9

PLOT AREA HARVESTED 0.00230

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98/R/CS/494

TAKE-ALL, PHIALOPHORA AND SEED TREATMENTS

Object: To test the effects in the field of a fungal antagonist of take-all (*Gaeumannomyces graminis*) and determine its interaction with a take-all-selective fungicide - Stackyard.

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

The first year, s. wheat.

Design: 4 randomised blocks of 18 plots.

Plot dimensions: 3.0 x 10.0.

Treatments: Combinations of:-

1. **TRT1998** Treatment to 1998 crop:

-8	None
P8	*Phialophora* inoculum to seedbed
T8	Take-all inoculum to seedbed

2. **TRT1999** Treatment to 1999 crop:

-9	None
P9	*Phialophora* inoculum to seedbed
T9	Take-all inoculum to seedbed

3. **TRT2000** Treatment to 2000 crop:

-0	None
P0	*Phialophora* inoculum to seedbed
S0	Seed treatment fungicide
PS0	*Phialophora* and seed treatment

Experimental diary:

31-Oct-97 : B : Ploughed.
30-Jan-98 : B : Barclay Gallup at 2.0 l with Chiltern Cropoil at 1.0 l in 200 l.
12-Feb-98 : B : Parable at 2.0 l with Scythe LC at 0.5 l and Luxon Non-Ionic Wetter at 0.1 l in 200 l.
16-Mar-98 : B : Heavy spring-tine cultivated.
17-Mar-98 : B : Spring-tine cultivated.
18-Mar-98 : **T** : **TRT1998** P8: Inoculum applied at 20 g per m^2. Rotary harrowed.
: **T** : **TRT1998** T8: Inoculum applied at 20 g per m^2. Rotary harrowed.
: B : Rotary harrowed, Axona, undressed, drilled at 400 seeds per m^2.
29-Apr-98 : B : 34.5% N at 380 kg.
05-May-98 : B : Ally at 30 g with MSS Optica at 2.0 l in 200 l.
04-Jun-98 : B : Corbel at 0.3 l with Opus at 0.3 l in 200 l.
12-Jun-98 : B : Topik at 125 ml with Chiltern Cropoil at 1.0 l in 200 l.

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Experimental diary:
28-Jun-98 : B : Bavistin DF at 0.3 kg with Radar at 0.25 l in 200 l.
02-Sep-98 : B : Combine harvested.

NOTE: Plant samples were taken in July to assess take-all and root colonisation by *Phialophora*.

GRAIN TONNES/HECTARE

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

TRT1998

-8	7.02
P8	6.83
T8	5.81
Mean	6.63

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

TRT1998

0.099	min.rep
0.089	max-min

	TRT1998
min.rep	P8 v T8
max-min	-8 v P8 or T8

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

Stratum	d.f.	s.e.	cv%
BLOCK.WP	66	0.313	4.7

GRAIN MEAN DM% 82.0

PLOT AREA HARVESTED 0.00229

https://doi.org/10.23637/ERADOC-1-52