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98/R/CS/309 and 98/W/CS/309 Long Term Straw Incorporation - W. Wheat

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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

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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, CTPPTT: 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 m².
- 12-Nov-97 : T : **SOW DATE** L: Rotary harrowed, Hereward, dressed Anchor, drilled at 380 seeds per m².
- 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, CTPPTT: Straw chopped.
- 01-Sep-97 : T : **STRAWCUL** BTTTTT, BPPPPP: Straw burnt, ash incorporated with spring-tines.
- 05-Sep-97 : T : **STRAWCUL** BTTTTT, CTTTTT, CPTTPT, CTPPTT: 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 m².
- 21-Oct-97 : T : **SOW DATE** L: Hereward, dressed Sibutol, drilled at 350 seeds per m². 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.

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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	E	L	Mean
STRAWCUL			
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		0.534
STRAWCUL		

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	E	L	Mean
STRAWCUL			
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 CPTTTP	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 CPTTTP	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