

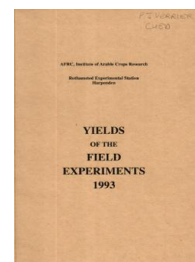
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93/R/CS/309 and 93/W/CS/309 Long-term Straw Incorporation - W. Wheat

Rothamsted Research

Rothamsted Research (1994) *93/R/CS/309 and 93/W/CS/309 Long-term Straw Incorporation - W. Wheat* ; Yields Of The Field Experiments 1993, pp 63 - 66 - DOI:
<https://doi.org/10.23637/ERADOC-1-48>

93/R/CS/309 and 93/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 ninth year, w. wheat.

For previous years see 85-92/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

NOTE: In 1993 treatments were applied to straw from previous w. rape.

Experimental diary:

Great Knott III (R):

- 24-Jul-92 : T : **STRAW BURNT**: Straw baled and removed.
 : T : **STRAW CHOPPED**: Straw chopped and spread.
- 18-Aug-92 : B : Gramoxone 100 at 2.0 l with Farmon Blue at 0.10 l in 200 l.
- 12-Oct-92 : T : **CULTIVTN TN10TN20**: Heavy spring-tine cultivated to 10 cm and chisel ploughed to 20 cm.
 : T : **CULTIVTN TN10PL20**: Heavy spring-tine cultivated to 10 cm and ploughed to 20 cm.
 : T : **CULTIVTN TINE 10**: Heavy spring-tine cultivated to 10cm.
 : T : **CULTIVTN PLOUGH20**: Ploughed to 20 cm.
- 16-Oct-92 : B : Rotary harrowed, Soissons, dressed Cerevax, drilled at 400 seeds per square metre.

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Experimental diary:

Great Knott III (R):

22-Oct-92 : B : Draza at 5.5 kg.
 13-Nov-92 : B : Avadex BW Granular at 22.5 kg.
 24-Nov-92 : B : Draza at 5.5 kg.
 24-Feb-93 : B : Panther at 2.0 l in 200 l.
 08-Mar-93 : B : 34.5% N at 120 kg.
 15-Apr-93 : B : Halo at 2.0 l and Tripart Brevis at 2.25 l in 200 l.
 16-Apr-93 : B : 34.5% N at 460 kg.
 22-Jun-93 : B : Corbel at 0.50 l and Radar at 0.50 l in 200 l.
 19-Aug-93 : B : Combine harvested.

Far Field I (W):

27-Jul-92 : T : **STRAW CHOPPED**: Straw chopped and spread.
 28-Jul-92 : T : **STRAW BURNT**: Straw baled and removed.
 11-Aug-92 : B : Stubble topped, subsoiled to 45 cm with tines 1.5 m apart.
 29-Sep-92 : B : Roundup at 4.0 l in 200 l.
 05-Oct-92 : T : **CULTIVTN TINE 10**: Heavy spring-tine cultivated to 10 cm.
 : T : **CULTIVTN TN10TN20**: Heavy spring-tine cultivated to 10 cm, deep-tine cultivated to 20 cm
 07-Oct-92 : T : **CULTIVTN TINE 10, TN10TN20**: Discd twice to 10cm.
 : T : **CULTIVTN PLOUGH20**: Ploughed to 20 cm.
 09-Oct-92 : B : Rotary harrowed, Soissons, dressed Cerevax, drilled at 350 seeds per square metre.
 : B : Avadex BW at 4.2 l in 200 l.
 12-Oct-92 : B : Pre-Empt at 5.0 l and Scythe at 3.0 l in 200 l.
 16-Oct-92 : B : Draza at 5.5 kg.
 16-Mar-93 : B : 34.5% N at 120 kg.
 15-Apr-93 : B : Starane 2 at 1.0 l with New 5C Cycocel at 2.5 l in 200 l.
 30-Apr-93 : B : 34.5% N at 460 kg.
 18-May-93 : B : Halo at 2.0 l and Mistral at 0.25 l in 200 l.
 22-Jun-93 : B : Ashlade Mancozeb FL at 3.0 l and Corbel at 0.5 l in 200 l.
 14-Aug-93 : B : Combine harvested.

- NOTES:** (1) At Rothamsted and Woburn on the **STRAW BURNT** plots previous w. rape straw proved difficult to burn and was subsequently removed.
- (2) Because of excessive weeds the yield from one plot at Rothamsted was lost with treatment **STRAW CHOPPED**, **CULTIVTN TINE 10**. An estimated value was used in the analysis. Plot cut 17-May-93 and cuttings removed; topped 17-June-93 and roundup at 5.0 l in 200 l applied 02-Jul-93.
- (3) Establishment counts were made in autumn and shoot numbers and total dry matter were measured in spring. Components of yield were measured and numbers of volunteer ears counted. Fungal diseases were measured at intervals during the season.

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

GRAIN TONNES/HECTARE

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

CULTIVTN	TINE 10	TN10PL20	TN10TN20	PLOUGH20	Mean
STRAW					
BURNT	9.54	9.65	10.04	9.64	9.72
CHOPPED	9.26	8.82	8.88	8.62	8.90
Mean	9.35	9.09	9.27	8.96	9.17

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

STRAW	CULTIVTN	STRAW	CULTIVTN
		0.918	min.rep
0.398	0.530	0.795	max-min
		0.649	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	36	1.298	14.2

GRAIN MEAN DM% 86.4

PLOT AREA HARVESTED 0.00588

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

GRAIN TONNES/HECTARE

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

CULTIVTN	TINE 10	TN10PL20	TN10TN20	PLOUGH20	Mean
STRAW					
BURNT	7.80	8.32	8.98	8.61	8.43
CHOPPED	5.82	8.96	5.67	8.98	7.36
Mean	6.48	8.75	6.77	8.85	7.71

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

STRAW	CULTIVTN	STRAW CULTIVTN
0.578	0.771	1.335 min.rep
		1.156 max-min
		0.944 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	1.335	17.3

GRAIN MEAN DM% 83.5

PLOT AREA HARVESTED 0.00636