ROTHAMSTED RESEARCH

Yields of the Field Experiments 1989

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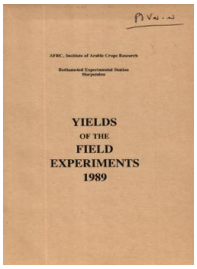

89/R/CS/309 and 89/W/CS/309 Long-term Straw Incorporation - W. Wheat

Rothamsted Research

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89/R/CS/309 and 89/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.

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The fifth year, w. wheat.

For previous years see 85-88/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	Tine cultivated to 10 cm depth
TN10PL20	Tine cultivated to 10 cm depth, ploughed to 20 cm
TN10TN20	Tine cultivated to 10 cm depth and again to 20 cm
PLOUGH20	Ploughed to 20 cm depth

NOTES: (1) Straw was chopped by trailed straw chopper and spread on 5 Sept, 1988 (R), 7 Sept (W) and burnt, 6 Sept (R), 7 Sept (W).
(2) A heavy spring-tine cultivator was used to cultivate to 10 cm depth, on 14 Sept (R), 21 Sept (W). A chisel plough was used to cultivate to 20 cm depth, on 15 Sept (R) and a deep-tine cultivator to 20 cm on 21 Sept (W).
(3) Ploughed plots were ploughed to 20 cm depth on: 14 Sept (R), 30 Sept (W).

Basal applications:
Great Knott III (R): Manures: Magnesian limestone at 5.0 t (0:18:36) at 920 kg. 'Nitram' at 120 kg, followed by 580 kg. Weedkillers: Paraquat at 0.60 kg ion in 200 l. Isoproturon at 2.5 kg in 200 l. Metsulfuron-methyl at 6.0 g with fluroxypyr at 0.15 kg in 200 l. Fungicides: Chlorothalonil at 1.0 kg in 200 l. Propiconazole at 0.12 kg with tridemorph at 0.52 kg in 200 l.

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Basal applications:
Far Field I (W): Manures: (0:18:36) at 920 kg. 'Nitram' at 120 kg followed by 590 kg. Weedkillers: Paraquat at 0.80 kg ion in 220 l. Isoproturon at 1.5 kg in 220 l. Fungicides: Chlorothalonil at 1.0 kg in 220 l. Propiconazole at 0.12 kg with tridemorph at 0.52 kg in 220 l.

Seed: Rendezvous, sown at 180 kg.

Cultivations, etc.:-
Great Knott III (R): Magnesian limestone applied: 6 Sept, 1988. PK applied: 29 Sept. Paraquat applied: 18 Oct. Rotary harrowed, seed sown, harrowed: 19 Oct. Isoproturon applied: 29 Oct. N applied: 21 Feb, 1989 and 14 Apr. Metsulfuron-methyl and fluroxypyr applied: 15 Apr. Chlorothalonil applied: 19 May. Propiconazole and tridemorph applied: 20 June. Combine harvested: 5 Aug.
Far Field I (W): PK applied: 16 Sept, 1988. Subsoiled with tines 140 cm apart 56 cm deep: 20 Sept. Rolled: 3 Oct. Paraquat applied: 19 Oct. Spring-tine cultivated, seed sown, harrowed: 21 Oct. Isoproturon applied: 8 Dec. N applied: 8 Mar, 1989 and 28 Apr. Chlorothalonil applied: 23 May. Propiconazole and tridemorph applied: 22 June. Combine harvested: 4 Aug.

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

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

GRAIN TONNES/HECTARE

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

CULTIVTN / STRAW	TINE 10	TN10PL20	TN10TN20	PLOUGH20	Mean
BURNT	7.24	7.68	7.41	7.58	7.48
CHOPPED	6.73	7.33	7.10	7.45	7.16
Mean	6.90	7.45	7.20	7.49	7.26

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

STRAW	CULTIVTN	STRAW CULTIVTN	
		0.250	min.rep
0.108	0.144	0.216	max-min
		0.177	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	0.353	4.9

GRAIN MEAN DM% 87.8

PLOT AREA HARVESTED 0.00621

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

GRAIN TONNES/HECTARE

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

CULTIVTN / STRAW	TINE 10	TN10PL20	TN10TN20	PLOUGH20	Mean
BURNT	7.46	6.77	7.41	7.24	7.22
CHOPPED	7.55	6.89	7.27	7.38	7.27
Mean	7.52	6.85	7.32	7.33	7.25

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

STRAW	CULTIVTN	STRAW CULTIVTN	
		0.403	min.rep
0.175	0.233	0.349	max-min
		0.285	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	0.403	5.6

GRAIN MEAN DM% 87.3

PLOT AREA HARVESTED 0.00884

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