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

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85/R/CS/309 and 85/W/CS/309

LONG-TERM STRAW INCORPORATION

Object: To study the effects of different amounts 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 first year, w. wheat.

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: 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 27 Aug (R), 28 Aug (W). Burnt straw plots were shallow disced on 30 Aug. Straw was spread and burnt for both sites on 29 Aug, 1984.
- (2) A heavy spring-tine cultivator was used to cultivate to 10 cm depth, twice on 8 Sept (R), 29 Aug, 11 Sept (W). A chisel plough was used to cultivate to 20 cm depth, on 17 Sept (R) and a deep-tine cultivator to 20 cm on 11 Sept (W). All tine-cultivated plots on both sites were disced on 19 Sept.
- (3) Ploughed plots were ploughed to 20 cm depth on 31 Aug (W), 13, 14 Sept (R)

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Basal applications:

Great Knott III (R): Manures: N at 40 kg followed by 200 kg as 'Nitro-Chalk' (27.5% N). Weedkillers: Glyphosate at 1.4 kg in 200 l. Paraquat at 0.60 kg ion in 250 l. Isoproturon at 2.0 kg with clopyralid at 0.07 kg, bromoxynil octanoate at 0.34 kg and mecoprop at 2.5 kg applied with the prochloraz and carbendazim in 200 l. Fungicides: Prochloraz at 0.40 kg with carbendazim at 0.15 kg. Propiconazole, applied on two occasions, at 0.25 kg alone in 200 l on the first, at 0.12 kg with carbendazim and maneb (as 'Septal' at 2.5 kg) in 200 l on the second. Insecticide: Pirimicarb at 0.14 kg in 200 l. Desiccant: Glyphosate at 1.4 kg in 200 l.

Far Field I (W): Manures: N applied at 40 kg followed by 200 kg, as 'Nitro-Chalk' (27.5% N). Weedkillers: Paraquat at 0.30 kg ion on two occasions in 250 l. Mecoprop at 2.0 kg with bromoxynil at 0.25 kg and ioxynil at 0.25 kg in 250 l. Fungicides: Propiconazole on two occasions, at 0.25 kg and at 0.12 kg, with tridemorph at 0.19 kg on both occasions and with carbendazim and maneb (as 'Septal' at 2.5 kg) on the second, both in 250 l.

Seed: Great Knott III (R): Avalon, sown at 220 kg.

Far Field I (W): Avalon, sown at 170 kg.

Cultivations, etc.:-

Great Knott III (R): Glyphosate applied: 6 Aug, 1984. Paraquat applied: 2 Oct. Rotary harrowed, seed sown: 12 Oct. Spring-tine cultivated: 13 Oct. N applied: 6 Mar, 1985, 12 Apr. Weedkillers with fungicides applied: 9 Apr. Propiconazole applied: 3 June, with 'Septal': 2 July. Insecticide applied: 10 July. Desiccant applied: 21 Aug. Combine harvested: 30 Aug. Previous crops: Potatoes 1983, w. wheat 1984.

Far Field I (W): Paraquat applied: 19 Sept, 10 Oct, 1984. Rotary harrowed, seed sown: 11 Oct. N applied: 11 Mar, 1985, 18 Apr. Mecoprop with bromoxynil and ioxynil applied: 18 Apr. Propiconazole and tridemorph applied: 15 June. Propiconazole, tridemorph and 'Septal' applied: 2 July. Combine harvested: 7 Sept. Previous crops: Potatoes 1983, s. barley and w. wheat 1984.

- NOTES: (1) Establishment counts were made in the autumn and measurements were made of total dry matter in spring.
(2) Fungal diseases were assessed at intervals during the season.
(3) Components of yield were measured.

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

GRAIN TONNES/HECTARE

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

CULTIVTN STRAW	TINE 10	TN10PL20	TN10TN20	PLOUGH20	MEAN
BURNT	9.88	10.06	10.01	10.01	9.99
CHOPPED	9.76	9.93	9.69	9.88	9.81
MEAN	9.80	9.97	9.80	9.93	9.87

***** STANDARD ERRORS OF DIFFERENCES OF MEANS *****

TABLE	STRAW	CULTIVTN	STRAW CULTIVTN	
SED	0.049	0.065	0.113	MIN REP
			0.098	MAX-MIN
			0.080	MAX REP

STRAW
 MIN REP BURNT ONLY
 MAX-MIN BURNT V CHOPPED
 MAX REP CHOPPED ONLY

***** STRATUM STANDARD ERRORS AND COEFFICIENTS OF VARIATION *****

STRATUM	DF	SE	CV%
BLOCK.WP	37	0.160	1.6
GRAIN MEAN DM%	85.5		
PLOT AREA HARVESTED	0.00315		

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

GRAIN TONNES/HECTARE

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

CULTIVTN STRAW	TINE 10	TN10PL20	TN10TN20	PLOUGH20	MEAN
BURNT	9.69	9.40	9.49	9.35	9.49
CHOPPED	9.44	9.40	9.66	9.53	9.51
MEAN	9.53	9.40	9.60	9.47	9.50

***** STANDARD ERRORS OF DIFFERENCES OF MEANS *****

TABLE	STRAW	CULTIVTN	STRAW CULTIVTN	
SED	0.154	0.206	0.357	MIN REP
			0.309	MAX-MIN
			0.252	MAX REP

***** STRATUM STANDARD ERRORS AND COEFFICIENTS OF VARIATION *****

STRATUM	DF	SE	CV%
BLOCK.WP	15	0.357	3.8

GRAIN MEAN DM% 80.6

PLOT AREA HARVESTED 0.00442