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76/R/CS/90 Cultivation for Cereals - Wheat

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76/R/CS/90

CULTIVATIONS FOR CEREALS

Object: To study the engineering aspects - power requirements, rate of work, revenue and costs - of different tillage systems for continuous wheat. Effects on weeds, soil pathogens and yields are also studied - Meadow.

Sponsors: D.E. Patterson (N.I.A.E.), R. Moffitt, R.D. Prew.

The fifth year, winter wheat.

For previous years see 72-75/R/CS/90.

Design: 3 randomised blocks of 10 plots.

Whole plot dimensions: 13.7 x 33.8.

Treatments

TILLAGE Tillage systems:-

- 1 Three passages of the tractor (three-pass system): Ploughed* 20 cm deep (8 inches): finger-tine harrowed: drilled.
- 2 Five-pass system: Tine cultivated* 15 cm deep (6 inches): tine cultivated 15 cm: finger-tine harrowed: drilled.
- 3 Two-pass system: Ploughed* 20 cm deep: finger-tine harrowed and drilled.
- 4 Two-pass system: Ploughed* 10 cm deep: finger-tine harrowed and drilled.
- 5 Three-pass system: Tine cultivated* (N.I.A.E.) 20 cm deep: disc harrowed: finger-tine harrowed and drilled.
- 6 Three-pass system: Tine cultivated* (N.I.A.E.) 10 cm deep: disc harrowed: finger-tine harrowed and drilled.
- 7 Two-pass system (stubble of 1975 crop burnt on 4 Sept): Tine cultivated* (N.I.A.E.) 10 cm deep: finger-tine harrowed and drilled.
- 8 Two-pass system: Sprayed with paraquat (0.56 kg ion in 220 l on 14 Oct): direct drilled.
- 9 Three-pass system: Rotary digger* (N.I.A.E.) cultivated: disc harrowed: finger-tine harrowed and drilled.
- 10 Two-pass system (stubble of 1975 crop burnt on 4 Sept): Rotary digger* (N.I.A.E.) cultivated: finger-tine harrowed and drilled.

NOTE: Rotary digger (N.I.A.E) - depth of working: rotor 10 cm, tines 20 cm.

* Cultivations done on 8 Oct, 1975. All other cultivations and drilling done on 15 Oct. A disc drill was used on all treatments except 8.

Basal applications: Manures: (10:24:24) at 310 kg, combine drilled. 'Nitro-Chalk' at 380 kg. Weedkillers: Dicamba with mecoprop and MCPA ('Banlene Plus' at 5.6 l in 220 l). Paraquat at 0.42 kg ion in 220 l. Difenzoquat at 1.0 kg in 220 l. Insecticide: Pirimicarb at 0.14 kg in 220 l.

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Seed: Atou, sown at 170 kg.

Cultivations, etc.:— Basal paraquat applied: 2 Oct, 1975. Seed sown: 15 Oct. N applied: 1 Apr, 1976. 'Banlene Plus' applied: 8 Apr. Difenzoquat applied: 28 Apr. Insecticide applied: 23 June. Combine harvested: 31 July.

NOTES: Observations and determinations were made as follows:—

- (1) Soil: Structure assessments, photographs for aggregate size, moisture determinations.
- (2) Implements: Depth and width of work, forward speed, wheel slip and power requirements.
- (3) Crop: Plant and tiller counts, numbers of ears and grains per ear, disease and pest assessments, aerial photographs.
- (4) On one of the blocks, plots of TILLAGE 6 and 9 were very severely infested with sterile brome grass (*Bromus sterilis*). This infestation is thought to have markedly lessened yields from these plots: the yields presented have not been adjusted.

GRAIN TONNES/HECTARE

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

TILLAGE	1	2	3	4	5	6	7	8	9	10	MEAN
	4.01	4.05	3.93	4.08	3.89	3.70	3.90	2.94	3.84	4.04	3.84

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

TABLE	TILLAGE
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SED	0.285

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

STRATUM	DF	SE	CV%
BLOCK.WP	18	0.349	9.1

GRAIN MEAN DM% 88.0

PLOT AREA HARVESTED 0.01031