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88/R/CS/311 Effects of Shallow Straw Incorporation - W. Wheat

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88/R/CS/311

EFFECTS OF SHALLOW STRAW INCORPORATION

Object: To study the effects of shallow straw incorporation on straw decomposition, toxin production, pests and diseases and on the establishment, growth and yield of winter wheat - West Barnfield I.

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The fourth year, w. wheat.

For previous years see 85-87/R/CS/311.

Design: Single replicate of 3 x a half replicate of 2 x 2 x 2 x 2 x 2.

Whole plot dimensions: 9.0 x 57.0.

Treatments: Combinations of:-

Whole plots

1. **STRAW** Treatments to straw of previous wheat:

| | |
|---------|---------------------------------------|
| BURNT | Burnt and then disced on 21 Aug, 1987 |
| BALED | Baled and removed on 20 Aug |
| CHOPPED | Chopped on 21 Aug |

2. **CULTTIME** Time of cultivation, to 10 cm depth:

| | |
|-------|--|
| EARLY | Cultivated by rotary grubber on 1 Sept, 1987 |
| LATER | Cultivated by rotary grubber on 16 Sept |

Sub plots

3. **AUT N** Autumn N as 'Nitram' applied just before cultivation:

| | |
|----|--|
| 0 | None |
| 50 | 50 kg N on 29 Aug, 1987 (CULTTIME EARLY), 16 Sept (CULTTIME LATER) |

4. **FUNGCIDE** Fungicides:

| | |
|------|--|
| 0 | None |
| FULL | Full programme:- Prochloraz at 0.40 kg and carbendazim at 0.15 kg in 200 l on 21 Apr, 1988 Propiconazole at 0.125 kg in 260 l on 25 May Propiconazole at 0.125 kg with carbendazim at 0.25 kg and maneb at 1.6 kg in 260 l on 20 June |

5. **INSCTCDE** Insecticides:

| | |
|---------|--|
| 0 | None |
| FON+PIR | Fonofos at 1.4 kg in 200 l on 21 Jan, 1988 and pirimicarb at 0.14 kg in 260 l on 20 June, 1988 |

88/R/CS/311

6. **MOLLCIDE** Residual effects of molluscicide applied for 1987 crop:

0 None
METHCARB Methiocarb at 0.22 kg in autumn 1986

Basal applications: Manures: 'Nitram' at 120 kg and later at 580 kg.
Weedkillers: Glyphosate at 0.27 kg in 200 l and later at 1.1 kg in 200 l. Tri-allate at 2.2 kg. Isoproturon at 2.1 kg in 200 l. Fluroxypyr at 0.20 kg in 200 l.

Seed: Mission, sown at 180 kg.

Cultivations, etc.:- First glyphosate applied: 30 Sept, 1987. Spring-tine cultivated, seed sown: 26 Oct. Tri-allate applied: 9 Dec. First N applied: 24 Feb, 1988. Isoproturon applied: 17 Mar. Second N applied: 22 Apr. Fluroxypyr applied: 6 May. Second glyphosate applied: 9 Aug. Combine harvested: 25 Aug.

NOTE: Growth was measured and incidence of pests and diseases was assessed at intervals during the season. Ears of volunteers were counted prior to harvest and components of yield were measured.

GRAIN TONNES/HECTARE

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

| CULTTIME | EARLY | LATER | Mean |
|-----------------|-------|----------|------|
| STRAW | | | |
| BURNT | 7.03 | 7.15 | 7.09 |
| BALED | 6.42 | 6.55 | 6.49 |
| CHOPPED | 5.79 | 6.44 | 6.12 |
| Mean | 6.41 | 6.71 | 6.56 |
| AUT N | 0 | 50 | Mean |
| STRAW | | | |
| BURNT | 7.11 | 7.07 | 7.09 |
| BALED | 6.31 | 6.66 | 6.49 |
| CHOPPED | 5.88 | 6.36 | 6.12 |
| Mean | 6.43 | 6.69 | 6.56 |
| AUT N | 0 | 50 | Mean |
| CULTTIME | | | |
| EARLY | 6.26 | 6.57 | 6.41 |
| LATER | 6.61 | 6.82 | 6.71 |
| Mean | 6.43 | 6.69 | 6.56 |
| MOLLCIDE | 0 | METHCARB | Mean |
| STRAW | | | |
| BURNT | 7.12 | 7.06 | 7.09 |
| BALED | 6.58 | 6.39 | 6.49 |
| CHOPPED | 5.97 | 6.26 | 6.12 |
| Mean | 6.56 | 6.57 | 6.56 |

88/R/CS/311

GRAIN TONNES/HECTARE

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

| MOLLCIDE | 0 | METHCARB | Mean |
|-----------------|------|----------|------|
| CULTTIME | | | |
| EARLY | 6.34 | 6.49 | 6.41 |
| LATER | 6.77 | 6.65 | 6.71 |
| Mean | 6.56 | 6.57 | 6.56 |

| MOLLCIDE | 0 | METHCARB | Mean |
|--------------|------|----------|------|
| AUT N | | | |
| 0 | 6.46 | 6.41 | 6.43 |
| 50 | 6.65 | 6.74 | 6.69 |
| Mean | 6.56 | 6.57 | 6.56 |

| FUNGCIDE | 0 | FULL | Mean |
|--------------|------|------|------|
| STRAW | | | |
| BURNT | 6.32 | 7.86 | 7.09 |
| BALED | 5.94 | 7.04 | 6.49 |
| CHOPPED | 5.46 | 6.77 | 6.12 |
| Mean | 5.91 | 7.22 | 6.56 |

| FUNGCIDE | 0 | FULL | Mean |
|-----------------|------|------|------|
| CULTTIME | | | |
| EARLY | 5.72 | 7.11 | 6.41 |
| LATER | 6.10 | 7.33 | 6.71 |
| Mean | 5.91 | 7.22 | 6.56 |

| FUNGCIDE | 0 | FULL | Mean |
|--------------|------|------|------|
| AUT N | | | |
| 0 | 5.77 | 7.10 | 6.43 |
| 50 | 6.05 | 7.34 | 6.69 |
| Mean | 5.91 | 7.22 | 6.56 |

| FUNGCIDE | 0 | FULL | Mean |
|-----------------|------|------|------|
| MOLLCIDE | | | |
| 0 | 5.84 | 7.28 | 6.56 |
| METHCARB | 5.98 | 7.16 | 6.57 |
| Mean | 5.91 | 7.22 | 6.56 |

| INSCTCDE | 0 | FON+PIR | Mean |
|--------------|------|---------|------|
| STRAW | | | |
| BURNT | 6.84 | 7.34 | 7.09 |
| BALED | 6.30 | 6.67 | 6.49 |
| CHOPPED | 5.84 | 6.40 | 6.12 |
| Mean | 6.32 | 6.80 | 6.56 |

88/R/CS/311

GRAIN TONNES/HECTARE

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

| INSCTCDE | O | FON+PIR | Mean |
|-----------------|------|---------|------|
| CULTTIME | | | |
| EARLY | 6.15 | 6.68 | 6.41 |
| LATER | 6.49 | 6.93 | 6.71 |
| Mean | 6.32 | 6.80 | 6.56 |

| INSCTCDE | O | FON+PIR | Mean |
|--------------|------|---------|------|
| AUT N | | | |
| 0 | 6.14 | 6.72 | 6.43 |
| 50 | 6.51 | 6.88 | 6.69 |
| Mean | 6.32 | 6.80 | 6.56 |

| INSCTCDE | O | FON+PIR | Mean |
|-----------------|------|---------|------|
| MOLLCIDE | | | |
| O | 6.30 | 6.82 | 6.56 |
| METHCARB | 6.35 | 6.79 | 6.57 |
| Mean | 6.32 | 6.80 | 6.56 |

| INSCTCDE | O | FON+PIR | Mean |
|-----------------|------|---------|------|
| FUNGCIDE | | | |
| O | 5.65 | 6.17 | 5.91 |
| FULL | 7.00 | 7.44 | 7.22 |
| Mean | 6.32 | 6.80 | 6.56 |

88/R/CS/311

GRAIN TONNES/HECTARE

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

| | | | |
|----------|-----------|-----------|-----------|
| AUT N | FUNGCIDE | INSCTCDE | MOLLCIDE |
| 0.110 | 0.110 | 0.110 | 0.110 |
| STRAW* | CULTTIME* | STRAW* | CULTTIME* |
| AUT N | AUT N | FUNGCIDE | FUNGCIDE |
| 0.191 | 0.156 | 0.191 | 0.156 |
| AUT N | STRAW* | CULTTIME* | AUT N |
| FUNGCIDE | INSCTCDE | INSCTCDE | INSCTCDE |
| 0.156 | 0.191 | 0.156 | 0.156 |
| FUNGCIDE | STRAW* | CULTTIME* | AUT N |
| INSCTCDE | MOLLCIDE | MOLLCIDE | MOLLCIDE |
| 0.156 | 0.191 | 0.156 | 0.156 |
| FUNGCIDE | INSCTCDE | | |
| MOLLCIDE | MOLLCIDE | | |
| 0.156 | 0.156 | | |

* Within the same level of STRAW, CULTTIME or STRAW.CULTTIME only

***** Stratum standard errors and coefficients of variation *****

| Stratum | d.f. | s.e. | cv% |
|---------|------|-------|-----|
| WP.SP | 20 | 0.383 | 5.8 |

GRAIN MEAN DM% 78.7

SUB PLOT AREA HARVESTED 0.00276