

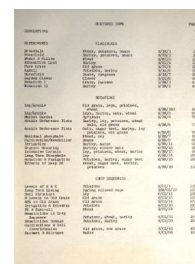
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76/R/WW/1 and 76/W/WW/1 Varieties, N, Ccc and Fungicides - W. Wheat

Rothamsted Research

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76/R/WW/1 and 76/W/WW/1

WINTER WHEAT

VARIETIES, N, CCC AND FUNGICIDES

Object: To study the yields and flour quality of a selection of the newer varieties of winter wheat and the effects of nitrogen, growth regulator, fungicides and aphicide on land in rotation (pathogen free) and after-cereal (pathogen infected) - Rothamsted Long Hoos I/II (pathogen free RH) and Long Hoos III (pathogen infected RD), Woburn Far-Field I (pathogen free WH).

Sponsors: R. Moffitt, J.F. Jenkyn, D.B. Slope.

Design: 4 randomised blocks of 8 plots split into 4 with confounding.

Whole plot dimensions: Long Hoos I/II (RH) & Long Hoos III (RD): 4.27 x 27.1
Far Field (WH): 4.27 x 25.9

Treatments: Combinations of:-

Whole plots

| | |
|------------|-----------------------|
| 1. VARIETY | Varieties: |
| AT | Atou |
| BO | Bouquet |
| CA | Cappelle |
| FL | Flinor (W only) |
| HO | Hobbit |
| FR | Maris Freeman |
| FU | Maris Fundin (R only) |
| HU | Maris Huntsman |
| ME | Mega |

Sub plots

- | | |
|----------------|---|
| 2. N | Nitrogen fertiliser (kg N): |
| (RH) (RD)&(WH) | Long Hoos I/II (RH) Long Hoos III (RD) & Far Field I (WH) |
| 0 63 | None 63 in spring |
| 63 126 | 63 in spring 126 in spring |
| 126 189 | 126 in spring 189 in spring |
| 63+63 126+63 | 63 in spring + 126 in spring + 63 at flowering 63 at flowering |
-
- | | |
|-------------|--|
| 3. GRWTHREG | Growth regulator, applied to (RH) & (RD) only: |
| NONE | None |
| CHLORMEQ | Chlormequat (CCC) at 2.02 kg in 430 l |
-
- | | |
|-----------------|---|
| 4. FUNGICIDE(1) | Fungicide to control eyespot, applied to (RD) only: |
| NONE | None |
| CARBENDA | Carbendazim at 0.2 kg in 430 l on 21 May |
-
- | | |
|-----------------|--|
| 5. FUNGICIDE(2) | Fungicide to control foliar diseases: |
| NONE | None |
| C+C+T | Carbendazim at 0.15 kg + captafol at 1.0 kg + tridemorph at 0.26 kg on 11 June |

76/R/WW/1 and 76/W/WW/1

6. APHICIDE Aphicide at flowering, applied to (RH) only:

NONE None
 PIRIMICA Pirimicarb at 0.14 kg on 17 June

NOTE: Chloromequat was applied to 3 blocks on Long Hoos I/II (RH) on 7 May; and to the remaining block and Long Hoos III (RD) on 14 May.

Basal applications: Manures:

Long Hoos I/II (RH) and Long Hoos III (RD): (0:20:20) at 310 kg, combine drilled.

Far Field I (WH): (0:20:20) at 260 kg, combine drilled.

Weedkillers:

Long Hoos I/II (RH): Dicamba with mecoprop and MCPA ('Banlene Plus' at 5.6 l in 220 l).

Long Hoos III (RD): Paraquat at 0.42 kg ion in 220 l. Dicamba with mecoprop and MCPA ('Banlene Plus' at 5.6 l in 220 l).

Far Field I (WH): Ioxynil at 0.63 kg plus mecoprop at 1.9 kg in 280 l.

Seed: Long Hoos I/II (RH) and Long Hoos III (RD): Varieties sown at 200 kg.
 Far Field I (WH): Varieties sown at 210 kg.

NOTE: The variety Bouquet was resown at 190 kg on Far Field I, because the first sowing was damaged by birds.

Cultivations, etc.:-

Long Hoos I/II (RH): Heavy spring-tine cultivated twice: 17 Oct, 1975.

Seed sown: 24 Oct. Spring N applied: 6 Apr, 1976. Weedkiller applied: 13 Apr. Late N applied: 3 June. Combine harvested: 2 Aug. Previous crops: Beans 1974, potatoes 1975.

Long Hoos III (RD): Paraquat applied: 7 Oct, 1975. Ploughed: 11 Oct.

Heavy spring-tine cultivated: 16 Oct. Rotary harrowed: 21 Oct. Seed sown: 24 Oct. Spring N applied: 5 Apr, 1976. 'Banlene Plus' applied: 13 Apr. Late N applied: 3 June. Combine harvested: 3 Aug. Previous crops: Winter oats 1974, winter wheat 1975.

Far Field I: Deep-tine cultivated twice: 14 Oct, 20 Oct, 1975. Spring-tine cultivated, seed sown: 22 Oct. Plots sown to Bouquet spring-tine cultivated and resown: 8 Dec. Spring N applied: 1-5 Apr, 1976. Weedkiller applied: 21 Apr. Late N applied: 9 June. Combine harvested: 2 Aug. Previous crops: Beans 1974, potatoes 1975.

- NOTES: (1) Samples were taken in spring and summer, on Long Hoos III (RD) only, for estimates of eyespot (*Cercospora herpotrichoides*).
 (2) On Long Hoos III (RD) two plots with the following treatment combinations

| VARIETY | BO | BO |
|-------------|----------|----------|
| N | 126+63 | 126 |
| GRWTH REG | NONE | CHLORMEQ |
| FUNGCIDE(1) | CARBENDA | NONE |
| FUNGCIDE(2) | NONE | NONE |

were treated as missing because of a combine blockage at harvest. Estimated values were used in the analysis.

76/R/WW/1 LONG HOOS I/II (RH) PATHOGEN FREE

GRAIN TONNES/HECTARE

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

| VARIETY | AT | BO | CA | HD | FR | FU | HU | ME | MEAN |
|-------------|------|------|------|------|------|------|------|------|------|
| N | | | | | | | | | |
| 0 | 5.79 | 5.16 | 5.34 | 6.26 | 5.31 | 6.58 | 5.90 | 5.34 | 5.71 |
| 63 | 6.23 | 4.89 | 4.90 | 6.61 | 5.67 | 6.65 | 5.75 | 5.58 | 5.79 |
| 126 | 5.38 | 5.21 | 5.15 | 6.39 | 5.99 | 6.16 | 6.60 | 5.93 | 5.85 |
| 63+63 | 6.01 | 5.26 | 5.07 | 6.42 | 5.17 | 6.39 | 6.06 | 6.18 | 5.82 |
| GRWTHREG | | | | | | | | | |
| NONE | 5.78 | 5.40 | 4.98 | 6.37 | 5.61 | 6.60 | 6.15 | 5.69 | 5.82 |
| CHLORMEQ | 5.92 | 4.86 | 5.25 | 6.47 | 5.46 | 6.30 | 6.01 | 5.82 | 5.76 |
| FUNGCIDE(2) | | | | | | | | | |
| NONE | 5.89 | 5.15 | 5.22 | 6.76 | 5.82 | 6.51 | 6.11 | 6.00 | 5.93 |
| C+C+T | 5.81 | 5.11 | 5.00 | 6.08 | 5.26 | 6.38 | 6.05 | 5.52 | 5.65 |
| APHICIDE | | | | | | | | | |
| NONE | 5.68 | 5.03 | 5.05 | 6.21 | 5.65 | 6.35 | 5.91 | 5.82 | 5.71 |
| PIRIMICA | 6.02 | 5.23 | 5.18 | 6.64 | 5.42 | 6.55 | 6.25 | 5.69 | 5.87 |
| MEAN | 5.85 | 5.13 | 5.11 | 6.42 | 5.54 | 6.45 | 6.08 | 5.76 | 5.79 |

| TABLE | N | GRWTHREG | FUNGCIDE(2) | APHICIDE |
|-------|-------|----------|-------------|----------|
| SED | 0.168 | 0.119 | 0.119 | 0.119 |

| TABLE | VARIETY | N | GRWTHREG | FUNGCIDE(2) |
|--|---------|---------|----------|-------------|
| | | VARIETY | VARIETY | VARIETY |
| SED | 0.154 | 0.439 | 0.283 | 0.283 |
| EXCEPT WHEN COMPARING MEANS WITH SAME LEVEL(S) OF: | | | | |
| VARIETY | | 0.475 | 0.336 | 0.336 |

| TABLE | APHICIDE |
|--|----------|
| | VARIETY |
| SED | 0.283 |
| EXCEPT WHEN COMPARING MEANS WITH SAME LEVEL(S) OF: | |
| VARIETY | 0.336 |

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

| STRATUM | DF | SE | CV% |
|-------------|----|-------|------|
| BLOCK.WP | 17 | 0.218 | 3.8 |
| BLOCK.WP.SP | 40 | 0.672 | 11.6 |

GRAIN MEAN DM% 88.5

SUB PLOT AREA HARVESTED 0.00173

76/R/WW/1 LONG HOOS III (RD) PATHOGEN INFECTED

GRAIN TONNES/HECTARE

| VARIETY | AT | BO | CA | HD | FR | FU | HU | ME | MEAN |
|-------------|------|------|------|------|------|------|------|------|------|
| N | | | | | | | | | |
| 63 | 3.40 | 2.60 | 3.35 | 4.41 | 3.22 | 3.70 | 3.76 | 3.28 | 3.46 |
| 126 | 3.85 | 3.34 | 4.01 | 4.43 | 3.76 | 4.01 | 3.80 | 4.04 | 3.90 |
| 189 | 4.39 | 3.36 | 3.94 | 4.96 | 4.26 | 4.73 | 5.04 | 4.41 | 4.39 |
| 126+63 | 4.11 | 3.75 | 3.75 | 4.10 | 4.07 | 3.54 | 4.17 | 3.95 | 3.93 |
| GRWTHREG | | | | | | | | | |
| NONE | 3.91 | 3.18 | 3.92 | 4.34 | 3.62 | 4.13 | 4.22 | 3.85 | 3.90 |
| CHLORMEQ | 3.96 | 3.35 | 3.60 | 4.60 | 4.04 | 3.86 | 4.16 | 3.99 | 3.94 |
| FUNGCIDE(1) | | | | | | | | | |
| NONE | 3.98 | 3.11 | 3.75 | 4.45 | 4.09 | 3.92 | 4.12 | 3.82 | 3.91 |
| CARBENDA | 3.89 | 3.41 | 3.77 | 4.50 | 3.56 | 4.07 | 4.27 | 4.02 | 3.94 |
| FUNGCIDE(2) | | | | | | | | | |
| NONE | 3.93 | 3.29 | 3.64 | 4.59 | 3.86 | 4.07 | 4.15 | 3.84 | 3.92 |
| C+C+T | 3.94 | 3.24 | 3.88 | 4.36 | 3.79 | 3.92 | 4.23 | 4.00 | 3.92 |
| MEAN | 3.94 | 3.26 | 3.76 | 4.47 | 3.83 | 3.99 | 4.19 | 3.92 | 3.92 |

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

| TABLE | N | GRWTHREG | FUNGCIDE(1) | FUNGCIDE(2) |
|-------|-------|----------|-------------|-------------|
| SED | 0.124 | 0.088 | 0.088 | 0.088 |

| TABLE | VARIETY | N | GRWTHREG | FUNGCIDE(1) |
|--|---------|---------|----------|-------------|
| | | VARIETY | VARIETY | VARIETY |
| SED | 0.233 | 0.382 | 0.291 | 0.291 |
| EXCEPT WHEN COMPARING MEANS WITH SAME LEVEL(S) OF: | | | | |
| VARIETY | | 0.350 | 0.248 | 0.248 |

| TABLE | FUNGCIDE(2) |
|--|-------------|
| | VARIETY |
| SED | 0.291 |
| EXCEPT WHEN COMPARING MEANS WITH SAME LEVEL(S) OF: | |
| VARIETY | 0.248 |

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

| STRATUM | DF | SE | CV% |
|-------------|----|-------|------|
| BLOCK.WP | 17 | 0.329 | 8.4 |
| BLOCK.WP.SP | 38 | 0.496 | 12.6 |

GRAIN MEAN DM% 87.7

SUB PLOT AREA HARVESTED 0.00171

76/W/WW/1 FAR FIELD 1 (WH) PATHOGEN FREE

GRAIN TONNES/HECTARE

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

| VARIETY | AT | BO | CA | FL | HD | FR | HU | ME | MEAN |
|--------------|------|------|------|------|------|------|------|------|------|
| N | | | | | | | | | |
| 63 | 3.07 | 2.08 | 2.82 | 3.69 | 3.58 | 3.13 | 4.00 | 2.69 | 3.13 |
| 126 | 2.78 | 1.96 | 2.73 | 3.28 | 3.26 | 3.03 | 3.66 | 2.75 | 2.93 |
| 189 | 2.84 | 2.02 | 2.67 | 3.02 | 3.23 | 3.12 | 3.54 | 2.85 | 2.91 |
| 126+63 | 3.03 | 2.19 | 2.72 | 3.35 | 3.19 | 2.89 | 3.88 | 3.02 | 3.03 |
| FUNGICIDE(2) | | | | | | | | | |
| NONE | 2.99 | 2.10 | 2.70 | 3.47 | 3.38 | 2.98 | 3.78 | 2.83 | 3.03 |
| C+C+T | 2.86 | 2.02 | 2.77 | 3.19 | 3.25 | 3.10 | 3.75 | 2.83 | 2.97 |
| MEAN | 2.93 | 2.06 | 2.74 | 3.33 | 3.31 | 3.04 | 3.77 | 2.83 | 3.00 |

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

| TABLE | N FUNGICIDE(2) | VARIETY |
|-------|----------------|---------|
| SED | 0.071 | 0.378 |

| TABLE | N FUNGICIDE(2) | |
|--|----------------|---------|
| | VARIETY | VARIETY |
| SED | 0.416 | 0.391 |
| EXCEPT WHEN COMPARING MEANS WITH SAME LEVEL(S) OF: | | |
| VARIETY | 0.202 | 0.143 |

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

| STRATUM | DF | SE | CV% |
|-------------|----|-------|------|
| BLOCK.WP | 14 | 0.534 | 17.8 |
| BLOCK.WP.SP | 48 | 0.285 | 9.5 |

GRAIN MEAN DM% 88.8

SUB PLOT AREA HARVESTED 0.00165