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Yields of the Field Experiments 1975

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75/ R&w/WW/1 - Varieties, N, Ccc & Fungicides - Winter Wheat

Rothamsted Research

Rothamsted Research (1976) 75/ R&w/WW/1 - Varieties, N, Ccc & Fungicides - Winter Wheat ; Yields Of The Field Experiments 1975, pp 283 - 288 - DOI: <https://doi.org/10.23637/ERADOC-1-141>

75/R/WW/1 and 75/W/WW/1

WINTER WHEAT

VARIETIES, N, CCC AND FUNGICIDE

Object: To study the yields and flour quality of a selection of the newer varieties of winter wheat and the effects of nitrogen, chlormequat and fungicides on land in rotation (pathogen free) and after several cereals (pathogen infected) - Rothamsted (R) Pastures (pathogen free) and Great Harpenden I (pathogen infected) and Woburn (W) Lansome III (pathogen free).

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

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

Whole plot dimensions: 4.27 x 27.1.

Treatments: All combinations of:-

Whole plots: 1. Varieties:

| | VARIETY |
|----------------|---------|
| Atou | AT |
| Bouquet | BO |
| Cappelle | CA |
| Flinor | FL |
| Maris Freeman | FR |
| Maris Fundin | FU |
| Maris Huntsman | HU |
| Maris Templar | TE |

Sub plots: 2. Nitrogen fertiliser (kg N):

| Pastures (RH) | Gt. Harpenden I (RD) and Lansome III (WH) | (RH) | (RD & WH) |
|-----------------------------------|--|-------|-----------|
| None | 63 in spring | 0 | 63 |
| 63 in spring | 126 in spring | 63 | 126 |
| 126 in spring | 189 in spring | 126 | 189 |
| 63 in spring + 63 at flowering | 126 in spring + 63 at flowering | 63+63 | 126+63 |

3. Chlormequat (kg):

| | |
|------|-----|
| None | 0.0 |
| 1.7 | 1.7 |

4. Fungicide in early May:

| | |
|-------------|----------|
| None | NONE |
| Carbendazim | CARBENDA |

5. Fungicides at flowering:

| | |
|---------------------------|----------|
| None | NONE |
| Carbendazim + tridemorphe | CARB/TRI |

NOTE: Treatment 4 was not applied on Lansome III (W).

75/R/WW/1 and 75/W/WW/1

Basal applications:

Manures:

Pastures (RH), and Great Harpenden I (RD): (0:20:20) at 310 kg, combine drilled.

Lansome III (WH): (0:20:20) at 290 kg, combine drilled.

Weedkillers:

Pastures (RH): Mecoprop at 1.7 kg plus bromoxynil at 0.14 kg with ioxynil at 0.21 kg and dichlorprop at 0.42 kg in 220 l.

Great Harpenden I (RD): MCPA, mecoprop and dicamba ('Banlene Plus' at 5.6 kg in 220 l).

Lansome III (WH): Ioxynil at 0.63 kg with mecoprop at 1.9 kg in 280 l.

Seed: Sown at 200 kg.

Cultivations, etc.:-

Great Harpenden I (RD): Ploughed: 22 Oct, 1974. Rotary harrowed: 5 Dec. Seed sown: 6 Dec. N applied: 18 Apr, 1975. Weedkiller applied: 12 May. Fungicide applied: 15 May. Chlormequat applied: 20 May. Late N, and fungicides applied: 18 June. Combine harvested: 19 Aug. Previous crops: Barley 1973, winter wheat 1974.

Pastures (RH): Chisel ploughed twice: 9-10 Dec, 1974. Rotary cultivated, seed sown: 20 Dec. N applied: 18 Apr, 1975. Weedkiller applied: 9 May. Fungicide applied: 15 May. Chlormequat applied: 20 May. Late N, and fungicides applied: 18 June. Combine harvested: 15 Aug. Previous crops: Beans 1973, potatoes 1974.

Lansome III (WH): Deep-tine cultivated twice: 31 Oct, 6 Nov, 1974. Spring-tine cultivated twice: 8 Nov, 25 Nov. Seed sown: 26 Nov. N applied: 11 Apr, 1975. Weedkiller applied: 9 May. Chlormequat applied: 22 May. Late N applied: 23 June. Fungicides applied: 1 July. Combine harvested: 15 Aug. Previous crops: Beans 1973, potatoes 1974.

- NOTES: (1) Pastures (RH): Samples were taken for assessments of foliar diseases.
(2) Great Harpenden I (RD): Samples were taken for estimates of eyespot (*Cercospora herpotrichoides*) and take-all (*Gaeumannomyces graminis*).
(3) Grain samples were taken from all sites at harvest for assessments of flour quality.

75/R/WW/1 PASTURES (RH) PATHOGEN FREE

GRAIN TONNES/HECTARE

*** TABLES OF MEANS ***

| VARIETY N | AT | BO | CA | FL | FR | FU | HU | TE | MEAN |
|--------------|------|------|------|------|------|------|------|------|------|
| 0 | 5.57 | 5.36 | 5.03 | 4.94 | 6.15 | 4.90 | 5.76 | 5.32 | 5.38 |
| 63 | 7.42 | 7.38 | 7.16 | 6.84 | 7.27 | 7.01 | 7.68 | 7.74 | 7.31 |
| 126 | 8.01 | 7.88 | 7.58 | 7.69 | 8.01 | 7.77 | 8.10 | 8.11 | 7.89 |
| 63+63 | 8.34 | 8.14 | 7.95 | 7.62 | 7.73 | 8.22 | 7.89 | 8.36 | 8.03 |
| MEAN | 7.33 | 7.19 | 6.93 | 6.78 | 7.29 | 6.97 | 7.36 | 7.38 | 7.15 |

| VARIETY CCC | AT | BO | CA | FL | FR | FU | HU | TE | MEAN |
|----------------|------|------|------|------|------|------|------|------|------|
| 0.0 | 7.09 | 7.08 | 6.79 | 6.46 | 7.51 | 6.86 | 7.23 | 7.54 | 7.07 |
| 1.7 | 7.58 | 7.30 | 7.07 | 7.10 | 7.08 | 7.09 | 7.48 | 7.22 | 7.24 |
| MEAN | 7.33 | 7.19 | 6.93 | 6.78 | 7.29 | 6.97 | 7.36 | 7.38 | 7.15 |

| VARIETY FUNGICIDE(1) | AT | BO | CA | FL | FR | FU | HU | TE | MEAN |
|-------------------------|------|------|------|------|------|------|------|------|------|
| NONE | 7.39 | 7.04 | 7.03 | 6.50 | 7.30 | 6.87 | 7.45 | 7.37 | 7.12 |
| CARBENDA | 7.28 | 7.34 | 6.82 | 7.05 | 7.29 | 7.07 | 7.27 | 7.39 | 7.19 |
| MEAN | 7.33 | 7.19 | 6.93 | 6.78 | 7.29 | 6.97 | 7.36 | 7.38 | 7.15 |

| VARIETY FUNGICIDE(2) | AT | BO | CA | FL | FR | FU | HU | TE | MEAN |
|-------------------------|------|------|------|------|------|------|------|------|------|
| NONE | 7.33 | 7.16 | 6.86 | 6.66 | 6.85 | 6.97 | 7.39 | 7.17 | 7.05 |
| CARB/TRI | 7.34 | 7.22 | 6.99 | 6.89 | 7.73 | 6.98 | 7.33 | 7.59 | 7.26 |
| MEAN | 7.33 | 7.19 | 6.93 | 6.78 | 7.29 | 6.97 | 7.36 | 7.38 | 7.15 |

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

| TABLE | N | CCC | FUNGICIDE(1) | FUNGICIDE(2) |
|-------|-------|-------|--------------|--------------|
| SED | 0.148 | 0.105 | 0.105 | 0.105 |

| TABLE | VARIETY | N | VARIETY |
|--|---------|-------|---------|
| SED | 0.168 | 0.400 | |
| EXCEPT WHEN COMPARING MEANS WITH SAME LEVEL(S) OF: | | | |
| VARIETY | | 0.419 | |

| TABLE | CCC | FUNGICIDE(1) | FUNGICIDE(2) |
|--|---------|--------------|--------------|
| | VARIETY | VARIETY | VARIETY |
| SED | 0.268 | 0.268 | 0.268 |
| EXCEPT WHEN COMPARING MEANS WITH SAME LEVEL(S) OF: | | | |
| VARIETY | 0.297 | 0.297 | 0.297 |

75/R/WW/1 GT HARPENDEN I (RD) PATHOGEN INFECTED

GRAIN TONNES/HECTARE

*** TABLES OF MEANS ***

| VARIETY | AT | BO | CA | FL | FR | FU | HU | TE | MEAN |
|---------|------|------|------|------|------|------|------|------|------|
| N | | | | | | | | | |
| 63 | 5.01 | 5.30 | 4.39 | 3.83 | 4.76 | 3.92 | 4.63 | 4.99 | 4.60 |
| 126 | 6.36 | 6.07 | 5.77 | 5.35 | 5.83 | 6.20 | 6.01 | 6.59 | 6.02 |
| 189 | 5.72 | 5.70 | 5.50 | 6.12 | 5.67 | 6.02 | 6.40 | 6.50 | 5.95 |
| 126+63 | 6.28 | 5.94 | 5.78 | 6.19 | 6.62 | 5.53 | 6.25 | 6.94 | 6.19 |
| MEAN | 5.84 | 5.75 | 5.36 | 5.37 | 5.72 | 5.42 | 5.82 | 6.26 | 5.69 |

| VARIETY | AT | BO | CA | FL | FR | FU | HU | TE | MEAN |
|---------|------|------|------|------|------|------|------|------|------|
| CCC | | | | | | | | | |
| 0.0 | 6.22 | 5.71 | 5.27 | 5.42 | 5.87 | 5.63 | 5.79 | 6.20 | 5.76 |
| 1.7 | 5.46 | 5.80 | 5.45 | 5.33 | 5.57 | 5.21 | 5.85 | 6.32 | 5.62 |
| MEAN | 5.84 | 5.75 | 5.36 | 5.37 | 5.72 | 5.42 | 5.82 | 6.26 | 5.69 |

| VARIETY | AT | BO | CA | FL | FR | FU | HU | TE | MEAN |
|-------------|------|------|------|------|------|------|------|------|------|
| FUNGCIDE(1) | | | | | | | | | |
| NONE | 5.79 | 5.70 | 5.45 | 5.36 | 5.95 | 5.13 | 5.89 | 6.13 | 5.67 |
| CARBENDA | 5.89 | 5.81 | 5.27 | 5.39 | 5.49 | 5.70 | 5.75 | 6.38 | 5.71 |
| MEAN | 5.84 | 5.75 | 5.36 | 5.37 | 5.72 | 5.42 | 5.82 | 6.26 | 5.69 |

| VARIETY | AT | BO | CA | FL | FR | FU | HU | TE | MEAN |
|-------------|------|------|------|------|------|------|------|------|------|
| FUNGCIDE(2) | | | | | | | | | |
| NONE | 5.64 | 5.88 | 5.23 | 5.41 | 5.67 | 5.48 | 5.88 | 6.24 | 5.68 |
| CARB/TRI | 6.04 | 5.63 | 5.49 | 5.34 | 5.77 | 5.35 | 5.76 | 6.28 | 5.71 |
| MEAN | 5.84 | 5.75 | 5.36 | 5.37 | 5.72 | 5.42 | 5.82 | 6.26 | 5.69 |

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

| TABLE | N | CCC | FUNGCIDE(1) | FUNGCIDE(2) |
|-------|-------|-------|-------------|-------------|
| SED | 0.140 | 0.099 | 0.099 | 0.099 |

| TABLE | VARIETY | N | VARIETY |
|--|---------|-------|---------|
| SED | 0.217 | 0.406 | |
| EXCEPT WHEN COMPARING MEANS WITH SAME LEVEL(S) OF: | | | |
| VARIETY | | 0.396 | |

| TABLE | CCC | FUNGCIDE(1) | FUNGCIDE(2) |
|--|---------|-------------|-------------|
| | VARIETY | VARIETY | VARIETY |
| SED | 0.294 | 0.294 | 0.294 |
| EXCEPT WHEN COMPARING MEANS WITH SAME LEVEL(S) OF: | | | |
| VARIETY | 0.280 | 0.280 | 0.280 |

75/W/W/1 LANSOME III (W) PATHOGEN FREE

GRAIN TONNES/HECTARE

*** TABLES OF MEANS ***

| VARIETY | AT | BO | CA | FL | FR | FU | HU | TE | MEAN |
|---------|------|------|------|------|------|------|------|------|------|
| N | | | | | | | | | |
| 63 | 3.37 | 3.71 | 3.60 | 3.26 | 3.69 | 2.66 | 3.34 | 3.95 | 3.45 |
| 126 | 3.82 | 4.42 | 4.06 | 4.33 | 4.68 | 3.19 | 4.11 | 4.33 | 4.12 |
| 189 | 4.16 | 4.19 | 4.01 | 4.59 | 3.86 | 3.25 | 3.86 | 4.33 | 4.03 |
| 126+63 | 4.14 | 4.34 | 4.11 | 4.44 | 4.06 | 2.78 | 4.05 | 4.56 | 4.06 |
| MEAN | 3.87 | 4.17 | 3.95 | 4.16 | 4.07 | 2.97 | 3.84 | 4.29 | 3.91 |

| VARIETY | AT | BO | CA | FL | FR | FU | HU | TE | MEAN |
|---------|------|------|------|------|------|------|------|------|------|
| CCC | | | | | | | | | |
| 0.0 | 3.90 | 4.08 | 3.96 | 4.21 | 4.16 | 3.22 | 3.68 | 4.44 | 3.96 |
| 0.7 | 3.84 | 4.26 | 3.93 | 4.10 | 3.99 | 2.71 | 4.00 | 4.15 | 3.87 |
| MEAN | 3.87 | 4.17 | 3.95 | 4.16 | 4.07 | 2.97 | 3.84 | 4.29 | 3.91 |

| VARIETY | AT | BO | CA | FL | FR | FU | HU | TE | MEAN |
|-------------|------|------|------|------|------|------|------|------|------|
| FUNGCIDE(2) | | | | | | | | | |
| NONE | 4.05 | 4.13 | 3.75 | 3.94 | 4.04 | 2.98 | 3.86 | 4.03 | 3.85 |
| CARB/TRI | 3.69 | 4.20 | 4.14 | 4.37 | 4.11 | 2.96 | 3.82 | 4.56 | 3.98 |
| MEAN | 3.87 | 4.17 | 3.95 | 4.16 | 4.07 | 2.97 | 3.84 | 4.29 | 3.91 |

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

| TABLE | N | CCC FUNGCIDE(2) | VARIETY |
|-------|-------|-----------------|---------|
| SED | 0.100 | 0.071 | 0.071 |

| TABLE | N | CCC | FUNGCIDE(2) |
|-------|---------|---------|-------------|
| | VARIETY | VARIETY | VARIETY |
| SED | 0.414 | 0.362 | 0.362 |

EXCEPT WHEN COMPARING MEANS WITH SAME LEVEL(S) OF:
 VARIETY 0.283 0.200 0.200

75/R/WW/1 PASTURES (RH) PATHOGEN FREE

GRAIN TONNES/HECTARE

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

| STRATUM | DF | SE | CV% |
|-------------|----|-------|-----|
| BLOCK.WP | 17 | 0.237 | 3.3 |
| BLOCK.WP.SP | 40 | 0.593 | 8.3 |

GRAIN MEAN DM% 86.0

SUB PLOT AREA HARVESTED 0.00173

75/R/WW/1 GT HARPENDEN I (RD) PATHOGEN INFECTED

GRAIN TONNES/HECTARE

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

| STRATUM | DF | SE | CV% |
|-------------|----|-------|-----|
| BLOCK.WP | 17 | 0.306 | 5.4 |
| BLOCK.WP.SP | 40 | 0.561 | 9.8 |

GRAIN MEAN DM% 88.4

SUB PLOT AREA HARVESTED 0.00001

75/W/WW/1 LANSOME III (W) PATHOGEN FREE

GRAIN TONNES/HECTARE

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

| STRATUM | DF | SE | CV% |
|-------------|----|-------|------|
| BLOCK.WP | 6 | 0.472 | 12.1 |
| BLOCK.WP.SP | 14 | 0.401 | 10.2 |

GRAIN MEAN DM% 86.1

SUB PLOT AREA HARVESTED 0.00173