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## Yields of the Field Experiments 1978

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### Annuals - Wheat

#### Rothamsted Research

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78/R/WW/1

WINTER WHEAT

VARIETIES AND N

Object: To study the yields and flour quality of a selection of the newer varieties of winter wheat and the effects of nitrogen on them on land in rotation (pathogen free) and after cereal (pathogen infected) - Great Harpenden I (pathogen free RH) and Little Hoos (pathogen infected RD).

Sponsors: R. Moffitt, R.J. Gutteridge.

Design: 4 randomised blocks of 9 plots split into 4 (RD) and 1 block of 9 plots split into 4 (RH).

Whole plot dimensions: 4.27 x 33.2 (RH)  
4.27 x 27.1 (RD)

Treatments: All combinations of:-

Whole plots

| 1. VARIETY | Varieties:     |
|------------|----------------|
| ARMADA     | Armada         |
| ATOU       | Atou           |
| FLANDERS   | Flanders       |
| HOBBIT     | Hobbit         |
| KADOR      | Kador          |
| MARDLER    | Mardler        |
| HUNTSMAN   | Maris Huntsman |
| KINSMAN    | Maris Kinsman  |
| SPORTSMAN  | Sportsman      |

Sub plots

| 2. N  | Nitrogen fertiliser (kg N): |                                   |                                    |
|-------|-----------------------------|-----------------------------------|------------------------------------|
| (RH)  | (RD)                        | Gt. Harpenden I (RH)              | Little Hoos (RD)                   |
| 0     | 63                          | 0                                 | 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 +<br>63 at flowering | 126 in spring +<br>63 at flowering |

- NOTES: (1) Three blocks were sown on Gt. Harpenden I (RH). Two were waterlogged during the winter and were abandoned.  
(2) An identical experiment was sown at Woburn but was abandoned after severe damage by birds during the winter.  
(3) Spring N was applied as 'Nitro-Chalk 25'. N at flowering was applied as a mixture of ammonium nitrate and urea applied in 530 l (the solution contained 6% N). The total dressing was divided equally between two occasions: 13 June and 5 July.

Basal applications: Manures: Gt. Harpenden I (RH) and Little Hoos (RD): (0:20:20) at 320 kg. Weedkillers: Gt. Harpenden I (RH): Mecoprop with bromoxynil and ioxynil ('Brittox' at 3.5 kg) in 220 l. Little Hoos (RD): Dicamba with mecoprop and MCPA ('Banlene Plus' at 4.9 kg) in 220 l.

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Seed: Both sites: Varieties sown at 200 kg except Sportsman which had a smaller germination percentage and was sown at 260 kg.

Cultivations, etc.:-

Gt. Harpenden I (RH): PK applied: 1 Nov, 1977. Heavy spring-tine cultivated: 5 Nov. Spring-tine cultivated twice: 8 Nov, 15 Nov. Seed sown, spring-tine cultivated: 16 Nov. Spring N applied: 25 Apr, 1978. Weedkillers applied: 11 May. Combine harvested: 13 Sept. Previous crops: Oats 1976, potatoes 1977.

Little Hoos (RD): Ploughed: 23 Sept, 1977. PK applied: 1 Nov. Heavy spring-tine cultivated: 5 Nov. Seed sown: 10 Nov. Spring N applied: 28 Apr, 1978. Weedkillers applied: 8 May. Combine harvested: 14 Sept. Previous crops: Beans 1976, wheat 1977.

NOTE: Samples were taken in July, on Little Hoos (RD) only, for estimates of eyespot (*Pseudocercospora herpotrichoides*) and 'take-all' (*Gaeumannomyces graminis*).

78/R/WW/1 GREAT HARPENDEN I (RH) PATHOGEN FREE

GRAIN TONNES/HECTARE

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

| N        | 0    | 63   | 126  | 63+63 | MEAN |
|----------|------|------|------|-------|------|
| VARIETY  |      |      |      |       |      |
| ARMADA   | 3.87 | 6.31 | 7.57 | 6.85  | 6.15 |
| ATOU     | 4.58 | 5.56 | 6.38 | 5.93  | 5.61 |
| FLANDERS | 3.64 | 5.62 | 6.81 | 6.40  | 5.62 |
| HOBBIT   | 3.82 | 5.94 | 7.91 | 6.81  | 6.12 |
| KADOR    | 4.23 | 6.13 | 7.57 | 5.37  | 5.82 |
| MARDLER  | 4.57 | 6.44 | 7.05 | 7.22  | 6.32 |
| HUNTSMAN | 3.88 | 5.58 | 6.73 | 6.32  | 5.63 |
| KINSMAN  | 3.23 | 5.12 | 6.44 | 5.95  | 5.19 |
| SPORTSMN | 4.24 | 6.35 | 7.11 | 6.53  | 6.06 |
| MEAN     | 4.01 | 5.89 | 7.06 | 6.38  | 5.84 |

GRAIN MEAN DM% 83.9

SUB PLOT AREA HARVESTED 0.00217

78/R/WW/1 LITTLE HOOS (RD) PATHOGEN INFECTED

GRAIN TONNES/HECTARE

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

| N        | 63   | 126  | 189  | 126+63 | MEAN |
|----------|------|------|------|--------|------|
| VARIETY  |      |      |      |        |      |
| ARMADA   | 5.28 | 6.96 | 7.19 | 7.05   | 6.62 |
| ATOU     | 5.34 | 6.45 | 6.69 | 6.62   | 6.28 |
| FLANDERS | 5.03 | 6.33 | 7.06 | 6.83   | 6.32 |
| HOBBIT   | 5.79 | 6.84 | 6.44 | 6.58   | 6.41 |
| KADOR    | 5.23 | 6.32 | 7.15 | 6.89   | 6.40 |
| MARDLER  | 5.77 | 6.69 | 6.73 | 7.18   | 6.59 |
| HUNTSMAN | 5.52 | 6.69 | 7.82 | 6.93   | 6.74 |
| KINSMAN  | 5.28 | 6.73 | 6.87 | 6.89   | 6.44 |
| SPORTSMN | 5.80 | 6.76 | 6.50 | 6.81   | 6.47 |
| MEAN     | 5.45 | 6.64 | 6.94 | 6.86   | 6.47 |

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

| TABLE                                                         | VARIETY | N     | VARIETY<br>N |
|---------------------------------------------------------------|---------|-------|--------------|
| SED                                                           | 0.162   | 0.081 | 0.265        |
| EXCEPT WHEN COMPARING MEANS WITH SAME LEVEL(S) OF:<br>VARIETY |         |       | 0.242        |

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

| STRATUM     | DF | SE    | CV% |
|-------------|----|-------|-----|
| BLOCK.WP    | 24 | 0.229 | 3.5 |
| BLOCK.WP.SP | 81 | 0.342 | 5.3 |

GRAIN MEAN DM% 79.4

SUB PLOT AREA HARVESTED 0.00172

78/R/WW/2 and 78/W/WW/2

# WINTER WHEAT

## AQUEOUS N AND NITRIFICATION INHIBITORS

Object: To study the effects of adding nitrification inhibitors to aqueous urea and aqueous ammonia on the yield and nitrogen uptake of winter wheat sown conventionally or direct drilled - Rothamsted (R), White Horse I and Woburn (W), Horsepool Lane Close West.

Sponsors: F.V. Widdowson, A. Penny, J. Ashworth.

Design: Single replicate of 40 plots, split semi-systematically into 2 for DRILLING (White Horse I (R)). 2 randomised blocks of 42 plots (Horsepool Lane Close West (W)).

Whole plot dimensions: White Horse I (R): 4.27 x 29.0.  
Horsepool Lane Close West (W): 4.27 x 9.14.

Treatments: All combinations of:-

### Whole plots

1. N FORM(1)                      Forms of aqueous nitrogen:  
  
    AMMONIA                      Aqueous ammonia 28% N  
    UREA                          Aqueous urea 18% N
2. N RATE                          Rate of nitrogen (kg N):  
  
    80  
    120
3. N TIME                          Times of applying aqueous nitrogen:  
  
    AUTUMN  
    SPRING
4. NIT INHB                      Nitrification inhibitors added to aqueous nitrogen:  
  
    NONE                          None  
    NITRAPYR                      Nitrapyrin  
    SOD TRI                          Sodium trithiocarbonate

plus extra treatments given additional forms of nitrogen fertiliser (kg N):

### N FORM(2)

|        |                                |
|--------|--------------------------------|
| 0      | 0                              |
| NC 70  | 70 as 'Nitro-Chalk' in spring  |
| NC 80  | 80 as 'Nitro-Chalk' in spring  |
| NC 90  | 90 as 'Nitro-Chalk' in spring  |
| NC 100 | 100 as 'Nitro-Chalk' in spring |
| NC 110 | 110 as 'Nitro-Chalk' in spring |
| NC 120 | 120 as 'Nitro-Chalk' in spring |
| NC 130 | 130 as 'Nitro-Chalk' in spring |

78/R/WW/2 & 78/W/WW/2

|          |                                                                                                        |
|----------|--------------------------------------------------------------------------------------------------------|
| A40INC80 | Aqueous ammonia (A) at 40 plus nitrapyrin (I) applied in autumn, 'Nitro-Chalk 25' (NC) at 80 in spring |
| A80INC40 | A at 80 plus I in autumn, NC at 40 in spring                                                           |
| A40TNC80 | A at 40 plus sodium trithiocarbonate (T) in autumn, NC at 80 in spring                                 |
| A80TNC40 | A at 80 plus T in autumn, NC at 40 in spring                                                           |
| U40INC80 | Aqueous urea (U) at 40 plus I in autumn, NC at 80 in spring                                            |
| U80INC40 | U at 80 plus I in autumn, NC at 40 in spring                                                           |
| U40TNC80 | U at 40 plus T in autumn, NC at 80 in spring                                                           |
| U80TNC40 | U at 80 plus T in autumn, NC at 40 in spring                                                           |

and at Horsepool Lane Close West (W) only, in aqueous form in spring:

|           |                                                       |
|-----------|-------------------------------------------------------|
| AS -- 120 | 120 as ammonium sulphate                              |
| AS IC 120 | 120 as ammonium sulphate plus I and carbon disulphide |

Sub plots (White Horse I (R) only)

5. DRILLING Cultivations and drilling:

|          |                                       |
|----------|---------------------------------------|
| CNVNTIAL | Cultivated and conventionally drilled |
| DIRECT   | Uncultivated, direct drilled          |

NOTES: (1) Nitrification inhibitor rates:

White Horse I (R): Aqueous N applied with nitrapyrin at 1.5 kg or with sodium trithiocarbonate at 40 kg in autumn and with nitrapyrin at 1.0 kg or with sodium trithiocarbonate at 17 kg in spring.

Horsepool Lane Close West (W): Aqueous N applied with nitrapyrin at 1.5 kg or with sodium trithiocarbonate at 40 kg in autumn and with nitrapyrin at 1.0 kg or with sodium trithiocarbonate at 20 kg. Aqueous ammonium sulphate applied with nitrapyrin at 1.0 kg plus carbon disulphide at 10 kg as an emulsion in spring.

(2) Aqueous nitrogen was applied by injectors with tines spaced 30 cm apart, 10 cm deep.

Basal applications:

White Horse I (R): Manures: (0:20:20) at 310 kg, combine drilled. Weedkillers: Difenzoquat at 0.99 kg with 1 l 'Agral' (a wetting agent) plus 2, 4-D at 0.98 kg in 220 l. Paraquat at 0.84 kg ion and 0.56 kg ion on successive occasions, both in 220 l. Growth regulator: Chlormequat at 1.4 kg in 220 l. Horsepool Lane Close West (W): Manures: (0:20:20) at 310 kg, combine drilled. Weedkiller: Mecoprop at 2.1 kg in 280 l. Growth regulator: Chlormequat at 1.7 kg in 280 l.

Seed: White Horse I (R) and Horsepool Lane Close West (W): Maris Huntsman, sown at 190 kg.

Cultivations, etc.:-

White Horse I (R): Stubble chopped: 21 Sept, 1977. Conventionally drilled plots only: Heavy spring-tine cultivated three times: 4 Oct. Paraquat applied twice: 11 Oct, 19 Oct. Aqueous N with inhibitors injected: 12 Oct. Conventionally drilled plots only: rotary harrowed 28 Oct, seed sown 29 Oct. Direct drilled plots only: seed sown 4 Nov. Aqueous N with inhibitors injected: 10 Apr, 1978. 'Nitro-Chalk' treatments applied: 27 Apr. Weedkillers applied: 11 May. Growth regulator applied: 17 May. Combine harvested: 29 Aug. Previous crops: Barley 1976, oats 1977.

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Horsepool Lane Close West (W): Heavy spring-tine cultivated twice: 22 Sept, 1977. Aqueous N with inhibitors injected: 10 Oct. Heavy spring-tine cultivated, rotary cultivated: 19 Oct. Seed sown: 20 Oct. Weedkiller applied: 8 Apr, 1978. Aqueous N with inhibitors injected: 17 Apr. 'Nitro-Chalk' treatments applied: 27 Apr. Growth regulator applied: 18 May. Combine harvested: 4 Sept. Previous crops: Barley 1976, winter oats 1977.

- NOTES: (1) Soil samples were taken at monthly intervals, November to July for measurement of N in the injected bands. N was measured in a cross section of the band at Rothamsted only.  
(2) Plant top samples were taken at fortnightly intervals from April until G.S.10 and then ear samples for measurement of nitrate N at Rothamsted only.

78/R/WW/2 WHITE HORSE I(R)

GRAIN TONNES/HECTARE

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

| N FORM(1) | AMMONIA | UREA   | MEAN |
|-----------|---------|--------|------|
| NIT INHB  |         |        |      |
| NONE      | 5.24    | 5.37   | 5.30 |
| NITRAPYR  | 6.03    | 5.89   | 5.96 |
| SOD TRI   | 5.09    | 5.99   | 5.54 |
| MEAN      | 5.45    | 5.75   | 5.60 |
| N RATE    | 80      | 120    | MEAN |
| NIT INHB  |         |        |      |
| NONE      | 5.06    | 5.54   | 5.30 |
| NITRAPYR  | 5.47    | 6.45   | 5.96 |
| SOD TRI   | 5.06    | 6.03   | 5.54 |
| MEAN      | 5.20    | 6.01   | 5.60 |
| N RATE    | 80      | 120    | MEAN |
| N FORM(1) |         |        |      |
| AMMONIA   | 5.12    | 5.79   | 5.45 |
| UREA      | 5.27    | 6.23   | 5.75 |
| MEAN      | 5.20    | 6.01   | 5.60 |
| N TIME    | AUTUMN  | SPRING | MEAN |
| NIT INHB  |         |        |      |
| NONE      | 4.17    | 6.43   | 5.30 |
| NITRAPYR  | 5.39    | 6.54   | 5.96 |
| SOD TRI   | 4.79    | 6.30   | 5.54 |
| MEAN      | 4.78    | 6.42   | 5.60 |
| N TIME    | AUTUMN  | SPRING | MEAN |
| N FORM(1) |         |        |      |
| AMMONIA   | 4.61    | 6.30   | 5.45 |
| UREA      | 4.95    | 6.55   | 5.75 |
| MEAN      | 4.78    | 6.42   | 5.60 |

78/R/WW/2 WHITE HORSE I(R)

GRAIN TONNES/HECTARE

## \*\*\*\*\* TABLES OF MEANS \*\*\*\*\*

| N TIME<br>N RATE      | AUTUMN   | SPRING | MEAN |
|-----------------------|----------|--------|------|
| 80                    | 4.29     | 6.11   | 5.20 |
| 120                   | 5.27     | 6.74   | 6.01 |
| MEAN                  | 4.78     | 6.42   | 5.60 |
| DRILLING<br>NIT INHB  | CNVNTIAL | DIRECT | MEAN |
| NONE                  | 5.09     | 5.52   | 5.30 |
| NITRAPYR              | 5.86     | 6.06   | 5.96 |
| SOD TRI               | 5.35     | 5.74   | 5.54 |
| MEAN                  | 5.43     | 5.77   | 5.60 |
| DRILLING<br>N FORM(1) | CNVNTIAL | DIRECT | MEAN |
| AMMONIA               | 5.26     | 5.65   | 5.45 |
| UREA                  | 5.60     | 5.90   | 5.75 |
| MEAN                  | 5.43     | 5.77   | 5.60 |
| DRILLING<br>N RATE    | CNVNTIAL | DIRECT | MEAN |
| 80                    | 4.97     | 5.43   | 5.20 |
| 120                   | 5.90     | 6.12   | 6.01 |
| MEAN                  | 5.43     | 5.77   | 5.60 |
| DRILLING<br>N TIME    | CNVNTIAL | DIRECT | MEAN |
| AUTUMN                | 4.65     | 4.91   | 4.78 |
| SPRING                | 6.21     | 6.64   | 6.42 |
| MEAN                  | 5.43     | 5.77   | 5.60 |
| DRILLING<br>N FORM(2) | CNVNTIAL | DIRECT | MEAN |
| 0                     | 4.23     | 4.86   | 4.54 |
| NC 70                 | 5.75     | 5.15   | 5.45 |
| NC 80                 | 6.03     | 6.32   | 6.18 |
| NC 90                 | 6.26     | 6.22   | 6.24 |
| NC 100                | 6.86     | 7.00   | 6.93 |
| NC 110                | 6.88     | 6.09   | 6.49 |
| NC 120                | 6.90     | 6.86   | 6.88 |
| NC 130                | 6.97     | 6.86   | 6.92 |
| A40INC80              | 4.83     | 6.26   | 5.55 |
| A80INC40              | 6.40     | 6.91   | 6.66 |
| A40TNC80              | 6.26     | 6.69   | 6.47 |
| A80TNC40              | 5.51     | 5.91   | 5.71 |
| U40INC80              | 6.45     | 6.36   | 6.41 |
| U80INC40              | 6.01     | 6.54   | 6.27 |
| U40TNC80              | 5.96     | 6.72   | 6.34 |
| U80TNC40              | 6.21     | 5.94   | 6.07 |
| MEAN                  | 6.09     | 6.29   | 6.19 |

78/R/WW/2 WHITE HORSE I(R)

GRAIN TONNES/HECTARE

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

|                  |         |                |        |        |
|------------------|---------|----------------|--------|--------|
| N FORM(1)        | AMMONIA |                | UREA   |        |
| N RATE           | 80      | 120            | 80     | 120    |
| NIT INHB         |         |                |        |        |
| NONE             | 5.16    | 5.31           | 4.97   | 5.77   |
| NITRAPYR         | 5.45    | 6.62           | 5.50   | 6.28   |
| SOD TRI          | 4.76    | 5.42           | 5.35   | 6.63   |
| N FORM(1)        | AMMONIA |                | UREA   |        |
| N TIME           | AUTUMN  | SPRING         | AUTUMN | SPRING |
| NIT INHB         |         |                |        |        |
| NONE             | 4.28    | 6.19           | 4.06   | 6.68   |
| NITRAPYR         | 5.32    | 6.75           | 5.45   | 6.33   |
| SOD TRI          | 4.22    | 5.97           | 5.36   | 6.62   |
| N RATE           | 80      |                | 120    |        |
| N TIME           | AUTUMN  | SPRING         | AUTUMN | SPRING |
| NIT INHB         |         |                |        |        |
| NONE             | 3.95    | 6.17           | 4.39   | 6.70   |
| NITRAPYR         | 4.59    | 6.35           | 6.18   | 6.73   |
| SOD TRI          | 4.32    | 5.80           | 5.26   | 6.79   |
| N RATE           | 80      |                | 120    |        |
| N TIME           | AUTUMN  | SPRING         | AUTUMN | SPRING |
| N FORM(1)        |         |                |        |        |
| AMMONIA          | 4.26    | 5.99           | 4.96   | 6.62   |
| UREA             | 4.32    | 6.23           | 5.59   | 6.86   |
| N FORM(1)        | AMMONIA |                | UREA   |        |
| DRILLING CNVTIAL |         | DIRECT CNVTIAL |        | DIRECT |
| NIT INHB         |         |                |        |        |
| NONE             | 5.17    | 5.30           | 5.00   | 5.73   |
| NITRAPYR         | 5.72    | 6.34           | 6.00   | 5.78   |
| SOD TRI          | 4.89    | 5.30           | 5.81   | 6.17   |
| N RATE           | 80      |                | 120    |        |
| DRILLING CNVTIAL |         | DIRECT CNVTIAL |        | DIRECT |
| NIT INHB         |         |                |        |        |
| NONE             | 4.85    | 5.27           | 5.32   | 5.77   |
| NITRAPYR         | 5.26    | 5.69           | 6.46   | 6.44   |
| SOD TRI          | 4.78    | 5.33           | 5.91   | 6.14   |
| N RATE           | 80      |                | 120    |        |
| DRILLING CNVTIAL |         | DIRECT CNVTIAL |        | DIRECT |
| N FORM(1)        |         |                |        |        |
| AMMONIA          | 4.79    | 5.45           | 5.73   | 5.85   |
| UREA             | 5.14    | 5.41           | 6.07   | 6.39   |
| N TIME           | AUTUMN  |                | SPRING |        |
| DRILLING CNVTIAL |         | DIRECT CNVTIAL |        | DIRECT |
| NIT INHB         |         |                |        |        |
| NONE             | 4.04    | 4.30           | 6.13   | 6.73   |
| NITRAPYR         | 5.35    | 5.42           | 6.37   | 6.71   |
| SOD TRI          | 4.57    | 5.01           | 6.13   | 6.46   |

78/R/WW/2 WHITE HORSE I(R)

GRAIN TONNES/HECTARE

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

| N TIME<br>DRILLING<br>N FORM(1) | AUTUMN<br>CNVTIAL | SPRING |          |        |
|---------------------------------|-------------------|--------|----------|--------|
|                                 |                   | DIRECT | CNVNTIAL | DIRECT |
| AMMONIA                         | 4.35              | 4.86   | 6.17     | 6.43   |
| UREA                            | 4.95              | 4.96   | 6.25     | 6.84   |

  

| N TIME<br>DRILLING<br>N RATE | AUTUMN<br>CNVTIAL | SPRING |          |        |
|------------------------------|-------------------|--------|----------|--------|
|                              |                   | DIRECT | CNVNTIAL | DIRECT |
| 80                           | 4.05              | 4.53   | 5.88     | 6.33   |
| 120                          | 5.26              | 5.29   | 6.54     | 6.94   |

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

| TABLE | N FORM(2)<br>DRILLING |  | N FORM(1)<br>DRILLING | N RATE<br>DRILLING |
|-------|-----------------------|--|-----------------------|--------------------|
| SED   | 0.762*                |  | 0.220*                | 0.220*             |

  

| TABLE | N TIME<br>DRILLING | NIT INHB<br>DRILLING | N FORM(1)<br>N RATE<br>DRILLING | N FORM(1)<br>N TIME<br>DRILLING |
|-------|--------------------|----------------------|---------------------------------|---------------------------------|
| SED   | 0.220*             | 0.269*               | 0.311*                          | 0.311*                          |

  

| TABLE | N RATE<br>N TIME<br>DRILLING | N FORM(1)<br>NIT INHB<br>DRILLING | N RATE<br>NIT INHB<br>DRILLING | N TIME<br>NIT INHB<br>DRILLING |
|-------|------------------------------|-----------------------------------|--------------------------------|--------------------------------|
| SED   | 0.311*                       | 0.381*                            | 0.381*                         | 0.381*                         |

\* ONLY FOR COMPARING THE DIFFERENCE OF TWO EFFECTS OF DRILLING.  
THE SED OF SUCH A DIFFERENCE EQUALS 1.4142 TIMES THE SED SHOWN.

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

| STRATUM                     | DF | SE    | CV% |
|-----------------------------|----|-------|-----|
| WP.SP                       | 9  | 0.539 | 9.2 |
| GRAIN MEAN DM% 83.8         |    |       |     |
| PLOT AREA HARVESTED 0.00279 |    |       |     |

78/W/WW/2 HORSEPOOL LANE CLOSE (W)

GRAIN TONNES/HECTARE

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

|           |         |        |      |      |
|-----------|---------|--------|------|------|
| N FORM(1) | AMMONIA | UREA   | MEAN |      |
| NIT INHB  |         |        |      |      |
| NONE      | 6.24    | 6.25   | 6.24 |      |
| NITRAPYR  | 6.78    | 6.30   | 6.54 |      |
| SOD TRI   | 6.03    | 6.84   | 6.44 |      |
| MEAN      | 6.35    | 6.46   | 6.41 |      |
| N RATE    | 80      | 120    | MEAN |      |
| NIT INHB  |         |        |      |      |
| NONE      | 6.09    | 6.40   | 6.24 |      |
| NITRAPYR  | 5.98    | 7.10   | 6.54 |      |
| SOD TRI   | 5.51    | 7.37   | 6.44 |      |
| MEAN      | 5.86    | 6.96   | 6.41 |      |
| N RATE    | 80      | 120    | MEAN |      |
| N FORM(1) |         |        |      |      |
| AMMONIA   | 5.70    | 7.01   | 6.35 |      |
| UREA      | 6.02    | 6.91   | 6.46 |      |
| MEAN      | 5.86    | 6.96   | 6.41 |      |
| N TIME    | AUTUMN  | SPRING | MEAN |      |
| NIT INHB  |         |        |      |      |
| NONE      | 6.06    | 6.42   | 6.24 |      |
| NITRAPYR  | 6.26    | 6.83   | 6.54 |      |
| SOD TRI   | 6.16    | 6.71   | 6.44 |      |
| MEAN      | 6.16    | 6.66   | 6.41 |      |
| N TIME    | AUTUMN  | SPRING | MEAN |      |
| N FORM(1) |         |        |      |      |
| AMMONIA   | 6.32    | 6.38   | 6.35 |      |
| UREA      | 6.00    | 6.93   | 6.46 |      |
| MEAN      | 6.16    | 6.66   | 6.41 |      |
| N TIME    | AUTUMN  | SPRING | MEAN |      |
| N RATE    |         |        |      |      |
| 80        | 5.06    | 6.65   | 5.86 |      |
| 120       | 7.26    | 6.66   | 6.96 |      |
| MEAN      | 6.16    | 6.66   | 6.41 |      |
| N FORM(1) | AMMONIA | UREA   |      |      |
| N RATE    | 80      | 120    | 80   | 120  |
| NIT INHB  |         |        |      |      |
| NONE      | 5.80    | 6.68   | 6.38 | 6.12 |
| NITRAPYR  | 6.20    | 7.37   | 5.77 | 6.84 |
| SOD TRI   | 5.09    | 6.98   | 5.92 | 7.76 |

78/W/WW/2 HORSEPOOL LANE CLOSE (W)

GRAIN TONNES/HECTARE

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

|           |         |        |        |        |
|-----------|---------|--------|--------|--------|
| N FORM(1) | AMMONIA |        | UREA   |        |
| N TIME    | AUTUMN  | SPRING | AUTUMN | SPRING |
| NIT INHB  |         |        |        |        |
| NONE      | 6.47    | 6.01   | 5.66   | 6.84   |
| NITRAPYR  | 6.70    | 6.87   | 5.82   | 6.79   |
| SOD TRI   | 5.79    | 6.28   | 6.54   | 7.15   |

|          |        |        |        |        |
|----------|--------|--------|--------|--------|
| N RATE   | 80     |        | 120    |        |
| N TIME   | AUTUMN | SPRING | AUTUMN | SPRING |
| NIT INHB |        |        |        |        |
|          | 5.44   | 6.73   | 6.68   | 6.12   |
| NITRAPYR | 5.13   | 6.84   | 7.39   | 6.82   |
| SOD TRI  | 4.62   | 6.39   | 7.70   | 7.04   |

|           |        |        |        |        |
|-----------|--------|--------|--------|--------|
| N RATE    | 80     |        | 120    |        |
| N TIME    | AUTUMN | SPRING | AUTUMN | SPRING |
| N FORM(1) |        |        |        |        |
| AMMONIA   | 4.96   | 6.43   | 7.68   | 6.34   |
| UREA      | 5.17   | 6.88   | 6.84   | 6.98   |

|          |        |        |        |        |
|----------|--------|--------|--------|--------|
| N RATE   | 80     |        | 120    |        |
| N TIME   | AUTUMN | SPRING | AUTUMN | SPRING |
| NIT INHB |        |        |        |        |
| NIT INHB |        |        |        |        |
| NONE     | 5.42   | 6.18   | 7.52   | 5.84   |
| UREA     | 5.47   | 7.28   | 5.84   | 6.40   |
| NITRAPYR | 5.54   | 6.86   | 7.86   | 6.88   |
| UREA     | 4.71   | 6.83   | 6.92   | 6.76   |
| SOD TRI  | 3.92   | 6.25   | 7.65   | 6.30   |
| UREA     | 5.32   | 6.53   | 7.75   | 7.77   |

78/W/WW/2/HORSEPOOL LANE CLOSE (W)

GRAIN TONNES/HECTARE

## \*\*\*\*\* TABLES OF MEANS \*\*\*\*\*

|            |      |
|------------|------|
| N FORM(2)  |      |
| 0          | 4.14 |
| NC 70      | 6.96 |
| NC 80      | 6.23 |
| NC 90      | 6.73 |
| NC 100     | 6.94 |
| NC 110     | 7.17 |
| NC 120     | 6.60 |
| NC 130     | 7.00 |
| A40INC80   | 7.01 |
| A80INC40   | 6.68 |
| A40TNC80   | 7.35 |
| A80TNC40   | 6.71 |
| U40INC80   | 7.90 |
| U80INC40   | 7.31 |
| U40TNC80   | 6.70 |
| U80TNC40   | 7.27 |
| AS --120   | 7.69 |
| AS IC120   | 7.58 |
| MEAN       | 6.89 |
| GRAND MEAN | 6.41 |

## \*\*\*\*\* STANDARD ERRORS OF DIFFERENCES OF MEANS \*\*\*\*\*

| TABLE | N FORM(2)                       | NIT INHB                     | N FORM(1)                     | N RATE                                    |
|-------|---------------------------------|------------------------------|-------------------------------|-------------------------------------------|
| SED   | 0.867                           | 0.307                        | 0.250                         | 0.250                                     |
| TABLE | N TIME                          | NIT INHB<br>N FORM(1)        | NIT INHB<br>N RATE            | N FORM(1)<br>N RATE                       |
| SED   | 0.250                           | 0.434                        | 0.434                         | 0.354                                     |
| TABLE | NIT INHB<br>N TIME              | N FORM(1)<br>N TIME          | N RATE<br>N TIME              | NIT INHB<br>N FORM(1)<br>N RATE           |
| SED   | 0.434                           | 0.354                        | 0.354                         | 0.613                                     |
| TABLE | NIT INHB<br>N FORM(1)<br>N TIME | NIT INHB<br>N RATE<br>N TIME | N FORM(1)<br>N RATE<br>N TIME | NIT INHB<br>N FORM(1)<br>N RATE<br>N TIME |
| SED   | 0.613                           | 0.613                        | 0.501                         | 0.867                                     |

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

| STRATUM             | DF      | SE    | CV%  |
|---------------------|---------|-------|------|
| BLOCK.WP            | 41      | 0.867 | 13.1 |
| GRAIN MEAN DM%      | 81.1    |       |      |
| PLOT AREA HARVESTED | 0.00279 |       |      |

78/R/WW/4

# WINTER WHEAT

## PRECISION SOWING, IRRIGATION & N

Object: To study the effects of precision sowing, seed rates, irrigation and nitrogen fertiliser on the growth and yield of winter wheat - Gt. Field I & II.

Sponsors: G.N. Thorne, P.J. Welbank, F.V. Widdowson.

Design: Single replicate of 3 x 2 x 2 x 2 x 2 + 20 extra plots.

Whole plot dimensions: (1) ND, BND and HS: 4.27 x 15.2  
(2) ST: 4.88 x 15.2

Treatments: All combinations of:-

1. DRL SPAC      Drills and spacing between rows:  

|     |                                             |
|-----|---------------------------------------------|
| ST1 | Stanhay precision drill, rows 10.5 cm apart |
| ND1 | Nordsten drill, rows 10.5 cm apart          |
| ND2 | Nordsten drill, rows 21 cm apart            |
2. SEEDRATE      Seed rates:  

|    |                                                    |
|----|----------------------------------------------------|
| S1 | Half standard (188 seeds per square metre, 115 kg) |
| S2 | Standard (376 seeds per square metre, 230 kg)      |
3. IRRIGATN      Irrigation:  

|      |                                                                                                                                |
|------|--------------------------------------------------------------------------------------------------------------------------------|
| NONE | None                                                                                                                           |
| FULL | Irrigated (total 102.2 mm). Whenever the soil moisture deficit exceeded 25 mm, irrigation was applied to reduce this to 12 mm. |
4. EARLY N      Nitrogen fertiliser as 'Nitro-Chalk 25' on 28 April (kg N):  

|     |     |
|-----|-----|
| EN3 | 90  |
| EN5 | 150 |
5. LATE N      Nitrogen fertiliser as 'Nitro-Chalk 25' on 24 May (kg N):  

|     |    |
|-----|----|
| LNO | 0  |
| LN1 | 30 |

plus twenty additional plots:

|          |                                                                                                                                          |
|----------|------------------------------------------------------------------------------------------------------------------------------------------|
| EXTRA    | Sown with the Nordsten drill, rows 10.5 cm apart, standard seed rate, not irrigated, with eight nitrogen rates, applied in April (kg N): |
| ND1S2EN0 | 0                                                                                                                                        |
| ND1S2EN1 | 30                                                                                                                                       |
| ND1S2EN2 | 60                                                                                                                                       |
| ND1S2EN3 | 90                                                                                                                                       |
| ND1S2EN4 | 120                                                                                                                                      |
| ND1S2EN5 | 150                                                                                                                                      |
| ND1S2EN6 | 180                                                                                                                                      |
| ND1S2EN7 | 210                                                                                                                                      |

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Sown with Nordsten drill but with seed tubes disconnected to broadcast the seed, unirrigated, nitrogen applied on 28 April, all treatments duplicated:

|          |                                   |
|----------|-----------------------------------|
| BNDS1EN3 | Half standard seed rate, 90 kg N  |
| BNDS1EN5 | Half standard seed rate, 150 kg N |
| BNDS2EN3 | Standard seed rate, 90 kg N       |
| BNDS2EN5 | Standard seed rate, 150 kg N      |

Sown by hand at half standard seed rate in rows 10.5 cm apart, unirrigated, nitrogen applied on 28 April, all treatments duplicated:

|          |                                   |
|----------|-----------------------------------|
| HS1S1EN3 | Half standard seed rate, 90 kg N  |
| HS1S1EN5 | Half standard seed rate, 150 kg N |

NOTE: Irrigation treatments (mm water)

|              |      |
|--------------|------|
| 30 May, 1978 | 25.6 |
| 14 June      | 21.6 |
| 21 June      | 15.5 |
| 19 July      | 18.3 |
| 28 July      | 21.2 |

|       |       |
|-------|-------|
| Total | 102.2 |
|-------|-------|

Basal applications: Manures: (0:20:20) at 310 kg. Weedkillers: (1) Methabenz-thiazuron 2.0 kg in 280 l, (2) Dicamba with mecoprop and MCPA ('Banlene Plus' at 4.9 l in 220 l). Growth regulator: Chlormequat at 1.4 kg in 220 l. Fungicide: Triadimefon at 0.13 kg in 220 l.

Seed: Maris Huntsman.

Cultivations, etc.:— Ploughed: 20 Oct, 1977. Heavy spring-tine cultivated, PK applied: 24 Oct. Rotary harrowed: 25 Oct. Seed sown: 27 Oct. Weedkiller (1) applied: 4 Nov. Rolled: 6 April, 1978. Weedkiller (2) and growth regulator (mix) applied: 10 May. Fungicide applied: 14 June. Combine harvested: 4 Sept. Previous crops: Barley 1976, beans 1977.

NOTE: Emergence counts were made in December. Measurements were made of shoot numbers, dry weight of tops and ears, leaf area, and nitrogen content four times during the season. Weekly measurements were made of stem nitrate (between late April and mid July), of soil moisture (between mid April and August) and on two occasions measurements were made of light intensity at ground level.

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GRAIN TONNES/HECTARE

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

|          |      |      |      |
|----------|------|------|------|
| SEEDRATE | S1   | S2   | MEAN |
| DRL SPAC |      |      |      |
| ST1      | 7.99 | 8.11 | 8.05 |
| ND1      | 8.00 | 8.33 | 8.17 |
| ND2      | 7.86 | 8.01 | 7.94 |
| MEAN     | 7.95 | 8.15 | 8.05 |
| IRRIGATN | NONE | FULL | MEAN |
| DRL SPAC |      |      |      |
| ST1      | 8.16 | 7.94 | 8.05 |
| ND1      | 8.27 | 8.06 | 8.17 |
| ND2      | 8.09 | 7.78 | 7.94 |
| MEAN     | 8.18 | 7.93 | 8.05 |
| IRRIGATN | NONE | FULL | MEAN |
| SEEDRATE |      |      |      |
| S1       | 8.00 | 7.91 | 7.95 |
| S2       | 8.35 | 7.94 | 8.15 |
| MEAN     | 8.18 | 7.93 | 8.05 |
| EARLY N  | EN3  | EN5  | MEAN |
| DRL SPAC |      |      |      |
| ST1      | 7.81 | 8.29 | 8.05 |
| ND1      | 7.96 | 8.38 | 8.17 |
| ND2      | 7.55 | 8.32 | 7.94 |
| MEAN     | 7.77 | 8.33 | 8.05 |
| EARLY N  | EN3  | EN5  | MEAN |
| SEEDRATE |      |      |      |
| S1       | 7.70 | 8.21 | 7.95 |
| S2       | 7.85 | 8.45 | 8.15 |
| MEAN     | 7.77 | 8.33 | 8.05 |
| EARLY N  | EN3  | EN5  | MEAN |
| IRRIGATN |      |      |      |
| NONE     | 7.88 | 8.47 | 8.18 |
| FULL     | 7.67 | 8.18 | 7.93 |
| MEAN     | 7.77 | 8.33 | 8.05 |
| LATE N   | LNO  | LN1  | MEAN |
| DRL SPAC |      |      |      |
| ST1      | 7.81 | 8.29 | 8.05 |
| ND1      | 8.03 | 8.30 | 8.17 |
| ND2      | 7.80 | 8.07 | 7.94 |
| MEAN     | 7.88 | 8.22 | 8.05 |

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GRAIN TONNES/HECTARE

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

|          |      |      |      |      |
|----------|------|------|------|------|
| LATE N   | LNO  | LN1  | MEAN |      |
| SEEDRATE |      |      |      |      |
| S1       | 7.80 | 8.10 | 7.95 |      |
| S2       | 7.95 | 8.34 | 8.15 |      |
| MEAN     | 7.88 | 8.22 | 8.05 |      |
| LATE N   | LNO  | LN1  | MEAN |      |
| IRRIGATN |      |      |      |      |
| NONE     | 7.99 | 8.36 | 8.18 |      |
| FULL     | 7.77 | 8.08 | 7.93 |      |
| MEAN     | 7.88 | 8.22 | 8.05 |      |
| LATE N   | LNO  | LN1  | MEAN |      |
| EARLY N  |      |      |      |      |
| EN3      | 7.52 | 8.03 | 7.77 |      |
| EN5      | 8.24 | 8.42 | 8.33 |      |
| MEAN     | 7.88 | 8.22 | 8.05 |      |
| SEEDRATE | S1   |      | S2   |      |
| IRRIGATN | NONE | FULL | NONE | FULL |
| DRL SPAC |      |      |      |      |
| ST1      | 8.19 | 7.80 | 8.13 | 8.09 |
| ND1      | 7.95 | 8.06 | 8.60 | 8.06 |
| ND2      | 7.85 | 7.87 | 8.33 | 7.68 |
| SEEDRATE | S1   |      | S2   |      |
| EARLY N  | EN3  | EN5  | EN3  | EN5  |
| DRL SPAC |      |      |      |      |
| ST1      | 7.82 | 8.17 | 7.80 | 8.41 |
| ND1      | 7.83 | 8.18 | 8.09 | 8.57 |
| ND2      | 7.45 | 8.27 | 7.65 | 8.37 |
| IRRIGATN | NONE |      | FULL |      |
| EARLY N  | EN3  | EN5  | EN3  | EN5  |
| DRL SPAC |      |      |      |      |
| ST1      | 7.78 | 8.54 | 7.84 | 8.04 |
| ND1      | 8.19 | 8.36 | 7.72 | 8.39 |
| ND2      | 7.66 | 8.53 | 7.45 | 8.11 |
| IRRIGATN | NONE |      | FULL |      |
| EARLY N  | EN3  | EN5  | EN3  | EN5  |
| SEEDRATE |      |      |      |      |
| S1       | 7.72 | 8.27 | 7.68 | 8.14 |
| S2       | 8.03 | 8.68 | 7.66 | 8.22 |
| SEEDRATE | S1   |      | S2   |      |
| LATE N   | LNO  | LN1  | LNO  | LN1  |
| DRL SPAC |      |      |      |      |
| ST1      | 7.71 | 8.27 | 7.90 | 8.31 |
| ND1      | 7.88 | 8.13 | 8.18 | 8.47 |
| ND2      | 7.82 | 7.91 | 7.78 | 8.24 |

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GRAIN TONNES/HECTARE

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

|          |      |      |      |      |
|----------|------|------|------|------|
| IRRIGATN | NONE |      | FULL |      |
| LATE N   | LNO  | LN1  | LNO  | LN1  |
| DRL SPAC |      |      |      |      |
| ST1      | 7.92 | 8.39 | 7.69 | 8.19 |
| ND1      | 8.11 | 8.43 | 7.95 | 8.17 |
| ND2      | 7.93 | 8.25 | 7.66 | 7.89 |
| IRRIGATN | NONE |      | FULL |      |
| LATE N   | LNO  | LN1  | LNO  | LN1  |
| SEEDRATE |      |      |      |      |
| S1       | 7.84 | 8.16 | 7.77 | 8.05 |
| S2       | 8.14 | 8.57 | 7.77 | 8.12 |
| EARLY N  | EN3  |      | EN5  |      |
| LATE N   | LNO  | LN1  | LNO  | LN1  |
| DRL SPAC |      |      |      |      |
| ST1      | 7.47 | 8.16 | 8.15 | 8.43 |
| ND1      | 7.83 | 8.08 | 8.23 | 8.52 |
| ND2      | 7.26 | 7.84 | 8.33 | 8.30 |
| EARLY N  | EN3  |      | EN5  |      |
| LATE N   | LNO  | LN1  | LNO  | LN1  |
| SEEDRATE |      |      |      |      |
| S1       | 7.51 | 7.89 | 8.09 | 8.32 |
| S2       | 7.52 | 8.17 | 8.38 | 8.52 |
| EARLY N  | EN3  |      | EN5  |      |
| LATE N   | LNO  | LN1  | LNO  | LN1  |
| IRRIGATN |      |      |      |      |
| NONE     | 7.57 | 8.19 | 8.41 | 8.54 |
| FULL     | 7.47 | 7.87 | 8.07 | 8.30 |
| EXTRA    |      |      |      |      |
| ND1S2EN0 | 5.75 |      |      |      |
| ND1S2EN1 | 6.20 |      |      |      |
| ND1S2EN2 | 6.09 |      |      |      |
| ND1S2EN3 | 7.41 |      |      |      |
| ND1S2EN4 | 7.85 |      |      |      |
| ND1S2EN5 | 8.30 |      |      |      |
| ND1S2EN6 | 8.59 |      |      |      |
| ND1S2EN7 | 8.71 |      |      |      |
| BNDS1EN3 | 8.05 |      |      |      |
| BNDS1EN5 | 8.84 |      |      |      |
| BNDS2EN3 | 8.05 |      |      |      |
| BNDS2EN5 | 8.78 |      |      |      |
| HS1S1EN3 | 7.52 |      |      |      |
| HS1S1EN5 | 8.62 |      |      |      |

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GRAIN TONNES/HECTARE

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

| TABLE | DRL SPAC                        | SEEDRATE                                        | IRRIGATN                        | EARLY N                          |
|-------|---------------------------------|-------------------------------------------------|---------------------------------|----------------------------------|
| SED   | 0.155                           | 0.127                                           | 0.127                           | 0.127                            |
| TABLE | LATE N                          | DRL SPAC<br>SEEDRATE                            | DRL SPAC<br>IRRIGATN            | SEEDRATE<br>IRRIGATN             |
| SED   | 0.127                           | 0.220                                           | 0.220                           | 0.179                            |
| TABLE | DRL SPAC<br>EARLY N             | SEEDRATE<br>EARLY N                             | IRRIGATN<br>EARLY N             | DRL SPAC<br>LATE N               |
| SED   | 0.220                           | 0.179                                           | 0.179                           | 0.220                            |
| TABLE | SEEDRATE<br>LATE N              | IRRIGATN<br>LATE N                              | EARLY N<br>LATE N               | DRL SPAC<br>SEEDRATE<br>IRRIGATN |
| SED   | 0.179                           | 0.179                                           | 0.179                           | 0.311                            |
| TABLE | DRL SPAC<br>SEEDRATE<br>EARLY N | DRL SPAC<br>IRRIGATN<br>EARLY N                 | SEEDRATE<br>IRRIGATN<br>EARLY N | DRL SPAC<br>SEEDRATE<br>LATE N   |
| SED   | 0.311                           | 0.311                                           | 0.254                           | 0.311                            |
| TABLE | DRL SPAC<br>IRRIGATN<br>LATE N  | SEEDRATE<br>IRRIGATN<br>LATE N                  | DRL SPAC<br>EARLY N<br>LATE N   | SEEDRATE<br>EARLY N<br>LATE N    |
| SED   | 0.311                           | 0.254                                           | 0.311                           | 0.254                            |
| TABLE | IRRIGATN<br>EARLY N<br>LATE N   | EXTRA                                           |                                 |                                  |
| SED   | 0.254                           | 0.621 MIN REP<br>0.538 MAX-MIN<br>0.439 MAX REP |                                 |                                  |

EXTRA  
 MAX REP BNDS1EN3,BNDS1EN5,BNDS2EN3,BNDS2EN5,  
 HS1S1EN3,HS1S1EN5  
 MAX-MIN THOSE IN MAX REP V ANY OF REMAINDER  
 MIN REP ANY OF REMAINDER

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

| STRATUM             | DF      | SE    | CV% |
|---------------------|---------|-------|-----|
| WP                  | 17      | 0.439 | 5.5 |
| MEAN DM%            | 83.2    |       |     |
| PLOT AREA HARVESTED | 0.00195 |       |     |

78/R/WW/5

# WINTER WHEAT

## SEED RATES AND DIVIDED N DRESSINGS

Object: To study the effects of seed rates, precision sowing, a growth regulator, foliar fungicide and rates and times of nitrogen fertiliser on the growth and yield of winter wheat - Gt. Field I.

Sponsors: J. McEwen, R. Moffitt.

Design: Single replicate of 3 x 2 x 2 x 6.

Whole plot dimensions: 3.25 x 7.62.

Treatments: All combinations of:-

1. DR SD RT                      Drills and seed rates:
 

|          |                                               |
|----------|-----------------------------------------------|
| NRDSTN 1 | Nordsten conventional drill, seed rate 120 kg |
| NRDSTN 2 | Nordsten conventional drill, seed rate 240 kg |
| STNHAY 1 | Stanhay precision drill, seed rate 120 kg     |
2. GRTH REG                      Growth regulator:
 

|          |                                   |
|----------|-----------------------------------|
| NONE     | None                              |
| CHLORMEQ | Chlormequat at 1.7 kg on 25 April |
3. FUNGICIDE                      Fungicide:
 

|         |                                                                                                                               |
|---------|-------------------------------------------------------------------------------------------------------------------------------|
| NONE    | None                                                                                                                          |
| T+C+M+S | Tridemorph at 0.45 kg + carbendazim at 0.21 kg + maneb at 1.33 kg + sulphur at 2.4 kg in 340 l on 12 June, 1978 and on 6 July |
4. N                                  Nitrogen fertiliser, times and rates (kg N as 'Nitro-Chalk 25'):
 

|       | 7 March | 17 April | 6 June |
|-------|---------|----------|--------|
| 1 3 1 | 25      | 75       | 25     |
| 1 4 1 | 25      | 100      | 25     |
| 0 4 0 | 0       | 100      | 0      |
| 0 5 0 | 0       | 125      | 0      |
| 0 6 0 | 0       | 150      | 0      |
| 0 4 1 | 0       | 100      | 25     |

Basal applications: Manures: (0:20:20) at 310 kg. Weedkillers: Dicamba with mecoprop and MCPA ('Banlene Plus' at 4.9 l in 220 l).

Seed: Maris Huntsman.

Cultivations, etc.: Ploughed: 20 Oct, 1977. Heavy spring-tine cultivated, PK applied: 24 Oct. Rotary harrowed: 25 Oct. Seed sown: 27 Oct. Rolled: 6 Apr, 1978. Weedkiller applied: 10 May. Combine harvested: 4 Sept. Previous crops: Barley 1976, beans 1977.

NOTES: (1) Establishment counts were made in February 1978.  
(2) Ear counts were made in August. 1000 grain weights were measured and grain was analysed for N percentage.

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GRAIN TONNES/HECTARE

## \*\*\*\*\* TABLES OF MEANS \*\*\*\*\*

|          |               |          |       |         |       |       |      |
|----------|---------------|----------|-------|---------|-------|-------|------|
| GRTH REG | NONE CHLORMEQ |          | MEAN  |         |       |       |      |
| DR SD RT |               |          |       |         |       |       |      |
| NRDSTN 1 | 8.81          | 9.39     | 9.10  |         |       |       |      |
| NRDSTN 2 | 8.90          | 9.16     | 9.03  |         |       |       |      |
| STNHAY 1 | 8.96          | 9.07     | 9.02  |         |       |       |      |
| MEAN     | 8.89          | 9.21     | 9.05  |         |       |       |      |
| FUNGIDE  | NONE          | T+C+M+S  | MEAN  |         |       |       |      |
| DR SD RT |               |          |       |         |       |       |      |
| NRDSTN 1 | 9.08          | 9.12     | 9.10  |         |       |       |      |
| NRDSTN 2 | 8.99          | 9.08     | 9.03  |         |       |       |      |
| STNHAY 1 | 8.87          | 9.16     | 9.02  |         |       |       |      |
| MEAN     | 8.98          | 9.12     | 9.05  |         |       |       |      |
| FUNGIDE  | NONE          | T+C+M+S  | MEAN  |         |       |       |      |
| GRTH REG |               |          |       |         |       |       |      |
| NONE     | 8.79          | 9.00     | 8.89  |         |       |       |      |
| CHLORMEQ | 9.17          | 9.25     | 9.21  |         |       |       |      |
| MEAN     | 8.98          | 9.12     | 9.05  |         |       |       |      |
| N        | 1 3 1         | 1 4 1    | 0 4 0 | 0 5 0   | 0 6 0 | 0 4 1 | MEAN |
| DR SD RT |               |          |       |         |       |       |      |
| NRDSTN 1 | 9.35          | 9.65     | 8.06  | 9.23    | 9.35  | 8.96  | 9.10 |
| NRDSTN 2 | 9.06          | 9.56     | 8.45  | 8.98    | 9.01  | 9.14  | 9.03 |
| STNHAY 1 | 8.81          | 9.26     | 8.60  | 8.97    | 9.07  | 9.39  | 9.02 |
| MEAN     | 9.07          | 9.49     | 8.37  | 9.06    | 9.14  | 9.16  | 9.05 |
| N        | 1 3 1         | 1 4 1    | 0 4 0 | 0 5 0   | 0 6 0 | 0 4 1 | MEAN |
| GRTH REG |               |          |       |         |       |       |      |
| NONE     | 8.97          | 9.10     | 8.15  | 8.84    | 9.13  | 9.16  | 8.89 |
| CHLORMEQ | 9.18          | 9.88     | 8.59  | 9.28    | 9.15  | 9.16  | 9.21 |
| MEAN     | 9.07          | 9.49     | 8.37  | 9.06    | 9.14  | 9.16  | 9.05 |
| N        | 1 3 1         | 1 4 1    | 0 4 0 | 0 5 0   | 0 6 0 | 0 4 1 | MEAN |
| FUNGIDE  |               |          |       |         |       |       |      |
| NONE     | 9.05          | 9.48     | 8.39  | 8.95    | 9.08  | 8.92  | 8.98 |
| T+C+M+S  | 9.10          | 9.50     | 8.36  | 9.17    | 9.20  | 9.40  | 9.12 |
| MEAN     | 9.07          | 9.49     | 8.37  | 9.06    | 9.14  | 9.16  | 9.05 |
| GRTH REG | NONE          | CHLORMEQ |       |         |       |       |      |
| FUNGIDE  | NONE          | T+C+M+S  | NONE  | T+C+M+S |       |       |      |
| DR SD RT |               |          |       |         |       |       |      |
| NRDSTN 1 | 8.71          | 8.91     | 9.46  | 9.32    |       |       |      |
| NRDSTN 2 | 8.83          | 8.98     | 9.15  | 9.18    |       |       |      |
| STNHAY 1 | 8.82          | 9.09     | 8.91  | 9.23    |       |       |      |

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GRAIN TONNES/HECTARE

## \*\*\*\*\* TABLES OF MEANS \*\*\*\*\*

|                   | N | 1 3 1 | 1 4 1 | 0 4 0 | 0 5 0 | 0 6 0 | 0 4 1 |
|-------------------|---|-------|-------|-------|-------|-------|-------|
| DR SD RT GRTH REG |   |       |       |       |       |       |       |
| NRDSTN 1 NONE     |   | 9.13  | 9.41  | 7.51  | 8.69  | 9.33  | 8.79  |
| CHLORMEQ          |   | 9.58  | 9.88  | 8.61  | 9.76  | 9.36  | 9.13  |
| NRDSTN 2 NONE     |   | 8.91  | 8.97  | 8.19  | 9.00  | 8.90  | 9.45  |
| CHLORMEQ          |   | 9.21  | 10.15 | 8.72  | 8.96  | 9.12  | 8.82  |
| STNHAY 1 NONE     |   | 8.87  | 8.91  | 8.75  | 8.82  | 9.16  | 9.24  |
| CHLORMEQ          |   | 8.75  | 9.61  | 8.44  | 9.13  | 8.97  | 9.54  |

|                   | N | 1 3 1 | 1 4 1 | 0 4 0 | 0 5 0 | 0 6 0 | 0 4 1 |
|-------------------|---|-------|-------|-------|-------|-------|-------|
| DR SD RT FUNGCIDE |   |       |       |       |       |       |       |
| NRDSTN 1 NONE     |   | 9.20  | 9.72  | 8.16  | 9.20  | 9.33  | 8.89  |
| T+C+M+S           |   | 9.50  | 9.58  | 7.96  | 9.26  | 9.37  | 9.03  |
| NRDSTN 2 NONE     |   | 9.20  | 9.57  | 8.41  | 8.65  | 9.10  | 8.98  |
| T+C+M+S           |   | 8.92  | 9.56  | 8.49  | 9.31  | 8.92  | 9.30  |
| STNHAY 1 NONE     |   | 8.75  | 9.15  | 8.59  | 9.01  | 8.81  | 8.90  |
| T+C+M+S           |   | 8.87  | 9.36  | 8.61  | 8.93  | 9.32  | 9.89  |

|                   | N | 1 3 1 | 1 4 1 | 0 4 0 | 0 5 0 | 0 6 0 | 0 4 1 |
|-------------------|---|-------|-------|-------|-------|-------|-------|
| GRTH REG FUNGCIDE |   |       |       |       |       |       |       |
| NONE NONE         |   | 8.93  | 9.01  | 8.22  | 8.54  | 9.05  | 8.96  |
| T+C+M+S           |   | 9.00  | 9.18  | 8.08  | 9.14  | 9.21  | 9.36  |
| CHLORMEQ NONE     |   | 9.17  | 9.94  | 8.56  | 9.37  | 9.11  | 8.88  |
| T+C+M+S           |   | 9.19  | 9.82  | 8.63  | 9.19  | 9.19  | 9.45  |

## \*\*\*\*\* STANDARD ERRORS OF DIFFERENCES OF MEANS \*\*\*\*\*

| TABLE | DR SD RT | GRTH REG | FUNGCIDE | N     |
|-------|----------|----------|----------|-------|
| SED   | 0.084    | 0.069    | 0.069    | 0.119 |

| TABLE | DR SD RT<br>GRTH REG | DR SD RT<br>FUNGCIDE | GRTH REG<br>FUNGCIDE | DR SD RT<br>N |
|-------|----------------------|----------------------|----------------------|---------------|
| SED   | 0.119                | 0.119                | 0.098                | 0.207         |

| TABLE | GRTH REG<br>N | FUNGCIDE<br>N | DR SD RT<br>GRTH REG<br>FUNGCIDE | DR SD RT<br>GRTH REG<br>N |
|-------|---------------|---------------|----------------------------------|---------------------------|
| SED   | 0.169         | 0.169         | 0.169                            | 0.293                     |

| TABLE | DR SD RT<br>FUNGCIDE<br>N | GRTH REG<br>FUNGCIDE<br>N |
|-------|---------------------------|---------------------------|
| SED   | 0.293                     | 0.239                     |

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

| STRATUM             | DF      | SE    | CV% |
|---------------------|---------|-------|-----|
| WP                  | 10      | 0.293 | 3.2 |
| GRAIN MEAN DM%      | 82.0    |       |     |
| PLOT AREA HARVESTED | 0.00163 |       |     |

78/R/WW/6

# WINTER WHEAT

## FUNGICIDES AND GRAIN MICROFLORA

Object: To study the effects of a range of fungicides applied at a range of times on the yield, quality and grain microflora of winter wheat - Geescroft.

Sponsor: R.A. Hill.

Design: 2 randomised blocks of 3 x 2 x 2 x 2.

Whole plot dimensions: 4.27 x 13.1.

Treatments: All combinations of:

### 1. FUNGICIDE Broad spectrum fungicides:

|          |                                           |
|----------|-------------------------------------------|
| CAPTAFOL | Captafol at 0.57 kg                       |
| CARB+MAN | Carbendazim at 0.10 kg + maneb at 0.65 kg |
| BENOMYL  | Benomyl at 0.45 kg                        |

### 2. APP TIME Application times of broad spectrum fungicides:

|       | 4 July 1978 | 12 July | 24 July |
|-------|-------------|---------|---------|
| NONE  | None        | None    | None    |
| E     | Sprayed     | None    | None    |
| M     | None        | Sprayed | None    |
| L     | None        | None    | Sprayed |
| E+M   | Sprayed     | Sprayed | None    |
| E+L   | Sprayed     | None    | Sprayed |
| M+L   | None        | Sprayed | Sprayed |
| E+M+L | Sprayed     | Sprayed | Sprayed |

NOTE: Treatment sprays were applied in 340 l.

Basal applications: Manures: (0:20:20) at 310 kg, combine drilled. 'Nitra-shell 34' at 300 kg. Weedkillers: Mecoprop, bromoxynil and ioxynil ('Brittox' at 3.5 l in 220 l).

Seed: Maris Freeman, sown at 190 kg.

Cultivations, etc.: Ploughed: 7 Oct, 1977. Rotary harrowed, seed sown: 14 Oct. N applied: 24 Apr, 1978. Weedkiller applied: 9 May. Combine harvested: 6 Sept. Previous crops: Barley 1976, beans 1977.

NOTES: (1) Grain microflora were assessed at 7-10 day intervals after heading on unsprayed plots, after each application of fungicide on treated plots and on all plots just before harvest.  
(2) Thousand grain weights, germination of harvested produce and bread making quality were assessed.

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GRAIN TONNES/HECTARE

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

| APP TIME  | E    | M    | L    | E+M  | E+L  | M+L  | E+M+L | MEAN |
|-----------|------|------|------|------|------|------|-------|------|
| FUNGICIDE |      |      |      |      |      |      |       |      |
| CAPTAFOL  | 7.34 | 7.20 | 7.67 | 7.30 | 7.38 | 7.51 | 7.07  | 7.35 |
| CARB+MAN  | 7.22 | 7.69 | 7.08 | 7.20 | 7.39 | 7.61 | 7.31  | 7.36 |
| BENOMYL   | 7.27 | 7.11 | 7.08 | 7.43 | 7.28 | 7.23 | 7.83  | 7.32 |
| MEAN      | 7.28 | 7.33 | 7.28 | 7.31 | 7.35 | 7.45 | 7.40  | 7.34 |

APP TIME NONE 7.12

GRAND MEAN 7.32

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

| TABLE | FUNGICIDE | APP TIME | FUNGICIDE<br>APP TIME |
|-------|-----------|----------|-----------------------|
| SED   | 0.151     | 0.231    | 0.400                 |

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

| STRATUM  | DF | SE    | CV% |
|----------|----|-------|-----|
| BLOCK.WP | 25 | 0.400 | 5.5 |

GRAIN MEAN DM% 81.8

PLOT AREA HARVESTED 0.00260

78/R/WW/7

WINTER WHEAT

SOWING DATES AND INSECTICIDES

Object: To study the effects of dates of sowing and times of applying insecticides on the incidence of cereal aphids, barley yellow dwarf virus (BYDV) and on the yield of winter wheat - Claycroft.

Sponsor: R.T. Plumb.

Design: 3 randomised blocks of 12 plots.

Whole plot dimensions: 6.40 x 18.3.

Treatments: All combinations of:-

1. SOW DATE                      Dates of sowing:

|        |                 |
|--------|-----------------|
| 6 OCT  | 6 October, 1977 |
| 4 NOV  | 4 November      |
| 25 NOV | 25 November     |

2. INSECTICIDE(1)              Phorate granules to seedbed:

|         |                 |
|---------|-----------------|
| NONE    | None            |
| PHORATE | Phorate at 5 kg |

3. INSECTICIDE(2)              Menazon spray:

|         |                                                      |
|---------|------------------------------------------------------|
| NONE    | None                                                 |
| MENAZON | Menazon (0.7 l 'Saphi-Col' in 220 l on 7 July, 1978) |

Basal applications: Manures: (0:20:20) at 310 kg, combine drilled, 'Nitra-Shell 34' at 350 kg. Weedkillers: Dicamba plus mecoprop and MCPA ('Banlene Plus' at 4.9 l in 220 l).

Seed: Flanders, sown at 190 kg.

Cultivations, etc.: Ploughed: 4 Oct, 1977. Rotary harrowed all plots, treatments applied to SOW DATE 6 OCT and these plots only rotary harrowed 5 Oct and sown: 6 Oct. Treatments applied to SOW DATE 4 NOV and these plots only power harrowed and sown: 4 Nov. Treatments applied to SOW DATE 25 NOV and these plots only rotary harrowed and sown: 25 Nov. N applied: 8 May, 1978. Weedkillers applied: 9 May. Combine harvested: 13 Sept. Previous crops: Fallow 1976, beans 1977.

NOTE: Plant emergence, aphid and virus counts were made during the season, tiller counts before harvest and grains per ear at harvest.

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GRAIN TONNES/HECTARE

## \*\*\*\*\* TABLES OF MEANS \*\*\*\*\*

| INSCTCDE(1) | NONE | PHORATE | MEAN |
|-------------|------|---------|------|
| SOW DATE    |      |         |      |
| 6 OCT       | 6.94 | 7.65    | 7.29 |
| 4 NOV       | 7.66 | 7.91    | 7.79 |
| 25 NOV      | 6.53 | 6.55    | 6.54 |
| MEAN        | 7.04 | 7.37    | 7.21 |

| INSCTCDE(2) | NONE | MENAZON | MEAN |
|-------------|------|---------|------|
| SOW DATE    |      |         |      |
| 6 OCT       | 7.41 | 7.17    | 7.29 |
| 4 NOV       | 7.54 | 8.03    | 7.79 |
| 25 NOV      | 6.60 | 6.49    | 6.54 |
| MEAN        | 7.19 | 7.23    | 7.21 |

| INSCTCDE(2) | NONE | MENAZON | MEAN |
|-------------|------|---------|------|
| INSCTCDE(1) |      |         |      |
| NONE        | 6.99 | 7.10    | 7.04 |
| PHORATE     | 7.39 | 7.36    | 7.37 |
| MEAN        | 7.19 | 7.23    | 7.21 |

| INSCTCDE(1) | NONE |         | PHORATE |         |
|-------------|------|---------|---------|---------|
| INSCTCDE(2) | NONE | MENAZON | NONE    | MENAZON |
| SOW DATE    |      |         |         |         |
| 6 OCT       | 7.04 | 6.83    | 7.79    | 7.51    |
| 4 NOV       | 7.29 | 8.03    | 7.80    | 8.03    |
| 25 NOV      | 6.63 | 6.44    | 6.57    | 6.54    |

## \*\*\*\*\* STANDARD ERRORS OF DIFFERENCES OF MEANS \*\*\*\*\*

| TABLE | SOW DATE | INSCTCDE(1) | INSCTCDE(2) | SOW DATE<br>INSCTCDE(1) |
|-------|----------|-------------|-------------|-------------------------|
| SED   | 0.221    | 0.180       | 0.180       | 0.312                   |

| TABLE | SOW DATE    | INSCTCDE(1) | SOW DATE                   |
|-------|-------------|-------------|----------------------------|
|       | INSCTCDE(2) | INSCTCDE(2) | INSCTCDE(1)<br>INSCTCDE(2) |
| SED   | 0.312       | 0.255       | 0.441                      |

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

| STRATUM  | DF | SE    | CV% |
|----------|----|-------|-----|
| BLOCK.WP | 22 | 0.540 | 7.5 |

GRAIN MEAN DM% 84.5

PLOT AREA HARVESTED 0.00260

78/R/WW/8

WINTER WHEAT

RATES & TIMES OF APPLYING N

Object: To study the effects of applying a range of nitrogen rates before and after ear initiation on the growth and yield of winter wheat - Gt. Field I.

Sponsors: G.N. Thorne, P.J. Taylor, P.J. Welbank.

Design: 4 randomised blocks of 8 plots.

Whole plot dimensions: 4.27 x 13.1.

Treatments: All combinations of:-

1. N DATE                      Dates of applying nitrogen fertiliser:  
    6 MARCH                      6 March, before ear initiation  
    17 APRIL                      17 April, after ear initiation
2. N RATE                      Rates of applying nitrogen fertiliser (kg N as 'Nitro-Chalk 25'):  
    0  
    60  
    120  
    180

Basal applications: Manures: (0:20:20) at 310 kg. Weedkillers: Dicamba with mecoprop and MCPA ('Banlene Plus' at 4.9 l in 220 l). Fungicide: Triadimefon at 0.13 kg in 220 l.

Seed: Maris Huntsman, sown at 190 kg.

Cultivations, etc.: Ploughed: 20 Oct, 1977. Heavy spring-tine cultivated and PK applied: 24 Oct. Rotary harrowed: 25 Oct. Seed sown: 26 Oct. Weedkiller applied: 10 May, 1978. Fungicide applied: 15 June. Combine harvested: 4 Sept. Previous crops: Barley 1976, beans 1977.

NOTE: Shoots were counted, apical development observed and lodging scored. Measurements of dry weights of tops and ears, leaf areas, nitrogen contents and shoot lengths were made during the season.

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GRAIN TONNES/HECTARE

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

| N RATE   | 0    | 60   | 120  | 180  | MEAN |
|----------|------|------|------|------|------|
| N DATE   |      |      |      |      |      |
| 6 MARCH  |      | 6.12 | 7.34 | 7.54 | 7.00 |
| 17 APRIL |      | 6.34 | 7.43 | 8.13 | 7.30 |
| MEAN     | 4.31 | 6.23 | 7.38 | 7.83 | 6.44 |

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

| TABLE | N DATE | N RATE | N DATE<br>N RATE |
|-------|--------|--------|------------------|
| SED   | 0.140  | 0.172  | 0.243<br>0.210*  |

\* FOR COMPARING WITH N RATE 0

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

| STRATUM  | DF | SE    | CV% |
|----------|----|-------|-----|
| BLOCK.WP | 22 | 0.343 | 5.3 |

GRAIN MEAN DM% 82.3

PLOT AREA HARVESTED 0.00260

78/R/WW/9

WINTER WHEAT

PARASITES AND PREDATORS OF INSECT PESTS

Object: To study the effects of two insecticides, applied separately and together, on the parasites and predators and on the yield of winter wheat - Stackyard.

Sponsors: R. Bardner, J.R. Lofty, K.E. Fletcher.

Design: 3 randomised blocks of 4 plots.

Whole plot dimensions: 12.8 x 18.3.

Treatments:

| INSTCDE | Insecticides:                                                                  |
|---------|--------------------------------------------------------------------------------|
| NONE    | None                                                                           |
| FON     | Fonofos at 0.5 kg as 10% granules to the seedbed on 28 Oct, 1977               |
| CHL     | Chlorpyrifos at 1.17 kg as a foliar spray in 1100 l on 17 Apr, 1978 and 5 June |
| FON+CHL | Fonofos + chlorpyrifos at above rates and times                                |

Basal applications: Manures: (10:24:24) at 250 kg, combine drilled. 'Nitro-Chalk 26' at 430 kg. Weedkillers: Isoproturon at 2.2 kg plus mecoprop at 2.5 kg in 220 l.

Seed: Flanders, sown at 190 kg.

Cultivations, etc.: Ploughed: 24 Oct, 1977. Rotary harrowed: 26 Oct. Rotary harrowed after applying fonofos: 28 Oct. Seed sown: 1 Nov. N applied: 8 May, 1978. Weedkillers applied: 11 May. Combine harvested: 12 Sept. Previous crops: Fallow 1976, wheat 1977.

NOTE: Soil samples for pests and predators were taken six times during the season. Plant samples for stem borers were taken twice. Pitfall traps, emergence traps and sticky traps were examined weekly. Aphids and thrips were assessed during the season.

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GRAIN TONNES/HECTARE

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

| INSCTCDE | NONE | FON  | CHL  | FON+CHL | MEAN |
|----------|------|------|------|---------|------|
|          | 4.88 | 5.14 | 5.45 | 5.63    | 5.27 |

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

| TABLE | INSCTCDE |
|-------|----------|
| SED   | 0.389    |

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

| STRATUM  | DF | SE    | CV% |
|----------|----|-------|-----|
| BLOCK.WP | 6  | 0.476 | 9.0 |

GRAIN MEAN DM% 85.0

PLOT AREA HARVESTED 0.00520

78/S/WW/1

# WINTER WHEAT

## RATES AND TIMES OF N AND FUNGICIDE

Object: To study the effects of fungicides and rates and times of nitrogen fertiliser on the incidence of foliar diseases and on yield of winter wheat - Saxmundham.

Sponsors: F.V. Widdowson, A. Penny.

Design: Half replicate of  $4 \times 2^4$  plus 8 extra plots.

Whole plot dimensions: 6.40 x 2.74.

Treatments: Combinations of:

1. N AUTUMN                      Nitrogen fertiliser in autumn (19 Oct, 1977):
  - 0                                  None
  - IBDU 1                         Isobutylidene diurea at 50 kg N
2. N SPRING                     Nitrogen fertiliser in spring (14 Mar, 1978):
  - 0                                  None
  - NC 1                             'Nitro-Chalk' 25% N at 50 kg N
  - NC 2                             'Nitro-Chalk' 25% N at 100 kg N
  - NC 3                             'Nitro-Chalk' 25% N at 150 kg N
3. N SUMMER                    Nitrogen fertiliser in summer:
  - 0                                  None
  - AG 1                             'Agsol 26% N' at 50 kg N. Foliar spray, half on 7 June, half on 21 June
4. FUNGICIDE(1)                Fungicide:
  - 0                                  None
  - BN+CA+MA                    Benomyl on 18 May, carbendazim + maneb on 7 June and 6 July
5. FUNGICIDE(2)                Fungicide:
  - 0                                  None
  - BENODANI                     Benodanil on 21 June and on 6 July

plus four extra treatments (duplicated), all given FUNGICIDE(1) and FUNGICIDE(2):

### EXTRA

- NCA1NCD2                    'Nitro-Chalk' in autumn at 50 kg N, 'Nitro-Chalk' in spring/summer at 100 kg N dressing divided 1/5 at G.S.3, 3/5 at G.S.5, 1/5 at G.S.8.
- NCA1NCD3                    As previous treatment but spring/summer dressing at 150 kg N
- IBA1NCD2                    Isobutylidene diurea in autumn at 50 kg N, 'Nitro-Chalk' in spring/summer at 100 kg N dressing divided as above
- IBA1NCD3                    As previous treatment but spring/summer dressing at 150 kg N

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NOTES: (1) EXTRA nitrogen treatments were applied on the following dates:  
G.S.3 14 Mar, G.S.5 20 Apr, G.S.8 18 May.

(2) 'FUNGICIDE(1)' Benomyl was applied at 0.28 kg in 280 l and  
carbendazim at 0.25 kg plus maneb at 1.6 kg in 280 l.

(3) 'FUNGICIDE(2)' Benodanil was applied at 1.1 kg in 280 l.

Basal applications: Manures: Muriate of potash at 250 kg. (0:20:20) at 250 kg.

Weedkillers: Isoproturon at 1.8 kg in 450 l. Ioxynil at 0.53 kg with  
mecoprop at 1.9 kg in 280 l applied with the fungicide and growth regulator  
(see below). Fungicide: Tridemorph at 0.53 kg. Insecticide: Pirimicarb at  
0.14 kg in 280 l. Growth regulator: Chlormequat at 1.7 kg.

Seed: Maris Huntsman, sown at 200 kg.

Cultivations, etc.:— Muriate of potash applied: 21 Sept, 1977. Ploughed: 24  
Sept. Harrowed and rolled three times: 12 Oct. PK applied, seed sown,  
isoproturon applied: 19 Oct. Ioxynil, mecoprop, tridemorph and chlormequat  
applied: 18 May, 1978. Pirimicarb applied: 3 Aug. Combine harvested:  
23 Aug.

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GRAIN TONNES/HECTARE

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

|            |      |          |      |      |      |
|------------|------|----------|------|------|------|
| N SPRING   | 0    | NC 1     | NC 2 | NC 3 | MEAN |
| N AUTUMN   |      |          |      |      |      |
| 0          | 2.83 | 5.20     | 6.37 | 6.88 | 5.32 |
| IBDU 1     | 3.98 | 5.90     | 6.67 | 7.01 | 5.89 |
| MEAN       | 3.40 | 5.55     | 6.52 | 6.94 | 5.60 |
| N SUMMER   | 0    | AG 1     | MEAN |      |      |
| N AUTUMN   |      |          |      |      |      |
| 0          | 5.00 | 5.63     | 5.32 |      |      |
| IBDU 1     | 5.74 | 6.04     | 5.89 |      |      |
| MEAN       | 5.37 | 5.84     | 5.60 |      |      |
| N SUMMER   | 0    | AG 1     | MEAN |      |      |
| N SPRING   |      |          |      |      |      |
| 0          | 3.06 | 3.75     | 3.40 |      |      |
| NC 1       | 5.18 | 5.93     | 5.55 |      |      |
| NC 2       | 6.45 | 6.58     | 6.52 |      |      |
| NC 3       | 6.79 | 7.09     | 6.94 |      |      |
| MEAN       | 5.37 | 5.84     | 5.60 |      |      |
| FUNGIDE(1) | 0    | BN+CA+MA | MEAN |      |      |
| N AUTUMN   |      |          |      |      |      |
| 0          | 5.23 | 5.41     | 5.32 |      |      |
| IBDU 1     | 5.80 | 5.98     | 5.89 |      |      |
| MEAN       | 5.51 | 5.69     | 5.60 |      |      |
| FUNGIDE(1) | 0    | BN+CA+MA | MEAN |      |      |
| N SPRING   |      |          |      |      |      |
| 0          | 3.27 | 3.54     | 3.40 |      |      |
| NC 1       | 5.61 | 5.50     | 5.55 |      |      |
| NC 2       | 6.40 | 6.63     | 6.52 |      |      |
| NC 3       | 6.77 | 7.11     | 6.94 |      |      |
| MEAN       | 5.51 | 5.69     | 5.60 |      |      |
| FUNGIDE(1) | 0    | BN+CA+MA | MEAN |      |      |
| N SUMMER   |      |          |      |      |      |
| 0          | 5.25 | 5.49     | 5.37 |      |      |
| AG 1       | 5.78 | 5.90     | 5.84 |      |      |
| MEAN       | 5.51 | 5.69     | 5.60 |      |      |
| FUNGIDE(2) | 0    | BENODANI | MEAN |      |      |
| N AUTUMN   |      |          |      |      |      |
| 0          | 5.36 | 5.27     | 5.32 |      |      |
| IBDU 1     | 5.97 | 5.81     | 5.89 |      |      |
| MEAN       | 5.67 | 5.54     | 5.60 |      |      |

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GRAIN TONNES/HECTARE

## \*\*\*\*\* TABLES OF MEANS \*\*\*\*\*

| FUNGCIDE(2) | 0    | BENODANI | MEAN |
|-------------|------|----------|------|
| N SPRING    |      |          |      |
| 0           | 3.34 | 3.47     | 3.40 |
| NC 1        | 5.63 | 5.48     | 5.55 |
| NC 2        | 6.56 | 6.48     | 6.52 |
| NC 3        | 7.14 | 6.75     | 6.94 |
| MEAN        | 5.67 | 5.54     | 5.60 |

| FUNGCIDE(2) | 0    | BENODANI | MEAN |
|-------------|------|----------|------|
| N SUMMER    |      |          |      |
| 0           | 5.32 | 5.42     | 5.37 |
| AG 1        | 6.01 | 5.67     | 5.84 |
| MEAN        | 5.67 | 5.54     | 5.60 |

| FUNGCIDE(2) | 0    | BENODANI | MEAN |
|-------------|------|----------|------|
| FUNGCIDE(1) |      |          |      |
| 0           | 5.64 | 5.39     | 5.51 |
| BN+CA+MA    | 5.69 | 5.70     | 5.69 |
| MEAN        | 5.67 | 5.54     | 5.60 |

| EXTRA | NCA1NCD2 | NCA1NCD3 | IBA1NCD2 | IBA1NCD3 | MEAN |
|-------|----------|----------|----------|----------|------|
|       | 7.27     | 7.69     | 6.64     | 7.52     | 7.28 |

## \*\*\*\*\* STANDARD ERRORS OF DIFFERENCES OF MEANS \*\*\*\*\*

| TABLE | N AUTUMN | N SPRING | N SUMMER | FUNGCIDE(1) |
|-------|----------|----------|----------|-------------|
| SED   | 0.093    | 0.132    | 0.093    | 0.093       |

| TABLE | FUNGCIDE(2) | EXTRA | N AUTUMN<br>N SUMMER | N SPRING<br>N SUMMER |
|-------|-------------|-------|----------------------|----------------------|
| SED   | 0.093       | 0.263 | 0.132                | 0.186                |

| TABLE | N AUTUMN<br>FUNGCIDE(1) | N SPRING<br>FUNGCIDE(1) | N SUMMER<br>FUNGCIDE(1) | N AUTUMN<br>FUNGCIDE(2) |
|-------|-------------------------|-------------------------|-------------------------|-------------------------|
| SED   | 0.132                   | 0.186                   | 0.132                   | 0.132                   |

| TABLE | N SPRING<br>FUNGCIDE(2) | N SUMMER<br>FUNGCIDE(2) | FUNGCIDE(1)<br>FUNGCIDE(2) | N AUTUMN<br>N SPRING |
|-------|-------------------------|-------------------------|----------------------------|----------------------|
| SED   | 0.186                   | 0.132                   | 0.132                      | 0.186                |

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

| STRATUM | DF | SE    | CV% |
|---------|----|-------|-----|
| WP      | 10 | 0.263 | 4.4 |

GRAIN MEAN DM% 79.8

PLOT AREA HARVESTED 0.00098

78/R/WS/1

SPRING WHEAT

### BACTERIAL INOCULATION

Object: To study the effects of applying a bacterial inoculant and additives on the growth and yield of spring wheat in the presence and absence of straw applied in winter - Hoosfield.

Sponsors: M.E. Brown, J.F. Witty.

Design: Single replicate of 2 x 3 split into 2 x 4.

Whole plot dimensions: 4.27 x 7.62.

Treatments: All combinations of:-

Whole plots

1. STRAW                      Straw (t) applied in winter, chopped on site and ploughed in on 14 Dec, 1977:

0.0  
7.5

2. SEEDBD N                  Nitrogen fertiliser (kg N) (as 'Nitro-chalk 26') applied to seedbed on 17 May, 1978:

30  
90  
150

Sub plots

3. WINTER N                  Nitrogen fertiliser (kg N) (as 'Nitro-chalk 25') applied just before straw on 13 Dec, 1977:

0  
30

4. INOCULNT                  Inoculants sprayed on chopped straw:

|       |                                                             |
|-------|-------------------------------------------------------------|
| 0     | None                                                        |
| B+W+C | Bacterial inoculant plus fermented whey plus cobalt lactate |
| W+C   | Fermented whey plus cobalt lactate                          |
| C     | Cobalt lactate                                              |

NOTE: Rates of application of INOCULNT were:

- (1) Bacteria at 0.019 kg of a culture containing *Actinomyces thermophilus*, *Azotobacter chroococcum*, *Cellvibrio*, *Cytophaga* and *Bacillus subtilis*.
  - (2) Whey 6.67 kg.
  - (3) Cobalt lactate (0.22 kg 'Symbooster').
- Materials were applied in 240 l.

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Basal applications: Manures: (0:20:20) at 310 kg, combine drilled. Weedkillers: Dicamba with mecoprop and MCPA ('Banlene Plus' at 4.9 l) in 220 l.

Seed: Sicco, sown at 190 kg.

Cultivations, etc.:— Ploughed: 16 Dec, 1977. Rotary harrowed, seed sown: 15 Mar, 1978. Weedkillers applied: 26 May. Combine harvested: 16 Sept. Previous crops: Sugar beet 1976, barley 1977.

NOTE: Germination counts were made in May and the total dry weight of plants was measured in May and June.

# GRAIN TONNES/HECTARE

## \*\*\*\*\* TABLES OF MEANS \*\*\*\*\*

|          |      |      |      |      |
|----------|------|------|------|------|
| SEEDBD N | 30   | 90   | 150  | MEAN |
| STRAW    |      |      |      |      |
| 0.0      | 2.30 | 2.98 | 3.85 | 3.04 |
| 7.5      | 1.60 | 2.22 | 3.07 | 2.29 |
| MEAN     | 1.95 | 2.60 | 3.46 | 2.67 |
| WINTER N | 0    | 30   | MEAN |      |
| STRAW    |      |      |      |      |
| 0.0      | 2.80 | 3.29 | 3.04 |      |
| 7.5      | 2.10 | 2.49 | 2.29 |      |
| MEAN     | 2.45 | 2.89 | 2.67 |      |
| WINTER N | 0    | 30   | MEAN |      |
| SEEDBD N |      |      |      |      |
| 30       | 1.80 | 2.10 | 1.95 |      |
| 90       | 2.34 | 2.85 | 2.60 |      |
| 150      | 3.21 | 3.71 | 3.46 |      |
| MEAN     | 2.45 | 2.89 | 2.67 |      |

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GRAIN TONNES/HECTARE

## \*\*\*\*\* TABLES OF MEANS \*\*\*\*\*

| INOCULNT | 0    | B+W+C | W+C  | C    | MEAN |
|----------|------|-------|------|------|------|
| STRAW    |      |       |      |      |      |
| 0.0      | 3.09 | 3.01  | 2.95 | 3.12 | 3.04 |
| 7.5      | 2.39 | 2.37  | 2.24 | 2.17 | 2.29 |
| MEAN     | 2.74 | 2.69  | 2.59 | 2.65 | 2.67 |

| INOCULNT | 0    | B+W+C | W+C  | C    | MEAN |
|----------|------|-------|------|------|------|
| SEEDBD N |      |       |      |      |      |
| 30       | 1.99 | 1.99  | 1.99 | 1.82 | 1.95 |
| 90       | 2.81 | 2.48  | 2.51 | 2.59 | 2.60 |
| 150      | 3.43 | 3.61  | 3.26 | 3.53 | 3.46 |
| MEAN     | 2.74 | 2.69  | 2.59 | 2.65 | 2.67 |

| INOCULNT | 0    | B+W+C | W+C  | C    | MEAN |
|----------|------|-------|------|------|------|
| WINTER N |      |       |      |      |      |
| 0        | 2.61 | 2.51  | 2.27 | 2.41 | 2.45 |
| 30       | 2.87 | 2.88  | 2.92 | 2.89 | 2.89 |
| MEAN     | 2.74 | 2.69  | 2.59 | 2.65 | 2.67 |

| STRAW | WINTER N | 0    | 30   |
|-------|----------|------|------|
| 0.0   | SEEDBD N |      |      |
|       | 30       | 2.07 | 2.53 |
|       | 90       | 2.76 | 3.20 |
|       | 150      | 3.57 | 4.12 |
| 7.5   | 30       | 1.52 | 1.67 |
|       | 90       | 1.93 | 2.50 |
|       | 150      | 2.84 | 3.30 |

| STRAW | INOCULNT | 0    | B+W+C | W+C  | C    |
|-------|----------|------|-------|------|------|
| 0.0   | SEEDBD N |      |       |      |      |
|       | 30       | 2.19 | 2.45  | 2.24 | 2.32 |
|       | 90       | 3.23 | 2.77  | 2.81 | 3.11 |
|       | 150      | 3.86 | 3.82  | 3.79 | 3.93 |
| 7.5   | 30       | 1.79 | 1.53  | 1.75 | 1.31 |
|       | 90       | 2.39 | 2.20  | 2.22 | 2.06 |
|       | 150      | 3.00 | 3.40  | 2.74 | 3.13 |

| STRAW | INOCULNT | 0    | B+W+C | W+C  | C    |
|-------|----------|------|-------|------|------|
| 0.0   | WINTER N |      |       |      |      |
|       | 0        | 2.82 | 2.84  | 2.56 | 2.99 |
|       | 30       | 3.36 | 3.19  | 3.33 | 3.26 |
| 7.5   | 0        | 2.41 | 2.18  | 1.97 | 1.83 |
|       | 30       | 2.38 | 2.57  | 2.50 | 2.51 |

| SEEDBD N | INOCULNT | 0    | B+W+C | W+C  | C    |
|----------|----------|------|-------|------|------|
| 30       | WINTER N |      |       |      |      |
|          | 0        | 2.03 | 1.94  | 1.49 | 1.71 |
|          | 30       | 1.95 | 2.04  | 2.50 | 1.92 |
| 90       | 0        | 2.60 | 2.07  | 2.33 | 2.37 |
|          | 30       | 3.01 | 2.90  | 2.70 | 2.81 |
| 150      | 0        | 3.20 | 3.51  | 2.98 | 3.13 |
|          | 30       | 3.66 | 3.71  | 3.55 | 3.93 |

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GRAIN TONNES/HECTARE

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

| TABLE | STRAW                 | SEEDBD N             | WINTER N                       | INOCULNT                       |
|-------|-----------------------|----------------------|--------------------------------|--------------------------------|
| SED   | **                    | **                   | 0.089                          | 0.126                          |
| TABLE | STRAW<br>SEEDBD N     | STRAW*<br>WINTER N   | SEEDBD N*<br>WINTER N          | STRAW*<br>INOCULNT             |
| SED   | **                    | 0.126                | 0.154                          | 0.178                          |
| TABLE | SEEDBD N*<br>INOCULNT | WINTER N<br>INOCULNT | STRAW*<br>SEEDBD N<br>WINTER N | STRAW*<br>SEEDBD N<br>INOCULNT |
|       | 0.218                 | 0.178                | 0.218                          | 0.308                          |

| TABLE | STRAW*<br>WINTER N<br>INOCULNT | SEEDBD N*<br>WINTER N<br>INOCULNT |
|-------|--------------------------------|-----------------------------------|
| SED   | 0.251                          | 0.308                             |

\* WITHIN SAME LEVEL OF STRAW, SEEDBD N OR STRAW SEEDBD N  
 \*\* NO STANDARD ERROR AVAILABLE

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

| STRATUM | DF | SE    | CV%  |
|---------|----|-------|------|
| WP.SP   | 6  | 0.308 | 11.5 |

GRAIN MEAN DM% 80.8

PLOT AREA HARVESTED 0.00217

78/R/WS/2

SPRING WHEAT

INTEGRATED PEST CONTROL

Object: To study the effects of chemical and biological pest control treatments on the incidence of pests and on yield of spring wheat - Stackyard.

Sponsors: G. Dean, R. Bardner, C.A. Edwards, A. Dewar, J.W. Stephenson, N. Wilding, K.E. Fletcher, J.R. Lofty.

Design: 3 randomised blocks of 4 plots.

Whole plot dimensions: 19.2 x 19.2.

Treatments:

|          |                                                                                                                                                                    |
|----------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| TREATMNT | Chemical and biological treatments:                                                                                                                                |
| NONE     | None (duplicated)                                                                                                                                                  |
| BIOLOGIC | Metarrhizium fungus applied as $4 \times 10^{13}$ spores per hectare on rice grains applied at 800 kg on 17 May                                                    |
| MULTCHEM | Multiple chemical treatments: Chlorpyrifos at 2 kg on 17 March. Metaldehyde at 31.4 kg on 30 March. Omethoate at 0.2 kg on 2 June. Pirimicarb at 0.14 kg on 4 July |

NOTE: It was intended to add to BIOLOGIC the release of aphids infected with Entomophthora. Natural aphids were few and this treatment was not applied. A planned additional treatment of aphicide only was also not applied for the same reason.

Basal applications: Manures: (20:14:14) at 440 kg, combine drilled. Weedkillers: Dicamba with mecoprop and MCPA ('Banlene Plus' at 4.9 l) in 220 l.

Seed: Sicco, seed not dressed, sown at 190 kg.

Cultivations, etc.:— Ploughed: 22 Nov, 1977. Spring-tine cultivated twice: 13 Mar, 1978. Seed sown: 15 Mar. Weedkiller applied: 18 May. Combine harvested: 15 Sept. Previous crops: Beans 1976, wheat 1977.

78/R/WS/2

GRAIN TONNES/HECTARE

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

|          |      |          |           |      |
|----------|------|----------|-----------|------|
| TREATMNT | NONE | BIOLOGIC | MULTICHEM | MEAN |
|          | 5.43 | 5.44     | 5.85      | 5.54 |

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

|       |               |
|-------|---------------|
| TABLE | TREATMNT      |
| REP   | UNEQUAL       |
| SED   | 0.146 MIN REP |
|       | 0.127 MAX-MIN |

TREATMENT  
 MAX-MIN NONE V ANY OF REMAINDER  
 MIN REP ANY OF REMAINDER

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

|          |    |       |     |
|----------|----|-------|-----|
| STRATUM  | DF | SE    | CV% |
| BLOCK.WP | 7  | 0.179 | 3.2 |

GRAIN MEAN DM% 80.8

PLOT AREA HARVESTED 0.00410

78/R/WS/3

SPRING WHEAT

FUNGICIDES AND GRAIN MICROFLORA

Object: To study the effects of a range of fungicides applied at a range of times on the yield, quality and grain microflora of spring wheat - Summerdells I.

Sponsor: R.A. Hill.

Design: 2 randomised blocks of 3 x 2 x 2 x 2.

Whole plot dimensions: 4.27 x 13.1.

Treatments: All combinations of:-

|              |                                                 |         |         |
|--------------|-------------------------------------------------|---------|---------|
| 1. FUNGICIDE | Broad spectrum fungicides:                      |         |         |
| CAPTAFOL     | Captafol at 1.4 kg                              |         |         |
| CARB+MAN     | Carbendazim at 0.25 kg + maneb at 1.6 kg        |         |         |
| BENOMYL      | Benomyl at 1.1 kg                               |         |         |
| 2. APP TIME  | Application times of broad spectrum fungicides: |         |         |
|              | 10 July                                         | 20 July | 11 Aug  |
| NONE         | None                                            | None    | None    |
| E            | Sprayed                                         | None    | None    |
| M            | None                                            | Sprayed | None    |
| L            | None                                            | None    | Sprayed |
| E+M          | Sprayed                                         | Sprayed | None    |
| E+L          | Sprayed                                         | None    | Sprayed |
| M+L          | None                                            | Sprayed | Sprayed |
| E+M+L        | Sprayed                                         | Sprayed | Sprayed |

NOTE: Treatment sprays were applied in 340 l.

Basal applications: Manures: (20:14:14) at 440 kg, combine drilled. Weedkiller: Mecoprop at 2.5 kg in 220 l.

Seed: Timmo, sown at 190 kg.

Cultivations, etc.: - Chisel ploughed twice: 8 and 10 Nov, 1977. Spring-tine cultivated twice and seed sown: 13 Mar, 1978. Weedkiller applied: 22 May. Combine harvested: 15 Sept. Previous crops: Winter oats 1976, potatoes 1977.

NOTE: Grain microflora were assessed weekly after heading. Thousand grain weights were measured, and grain was assessed for germination, vigour and breadmaking quality.

78/R/WS/3

GRAIN TONNES/HECTARE

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

| APP TIME<br>FUNGICIDE | E    | M    | L    | E+M  | E+L  | M+L  | E+M+L | MEAN |
|-----------------------|------|------|------|------|------|------|-------|------|
| CAPTAFOL              | 6.50 | 6.75 | 6.18 | 6.35 | 6.82 | 6.55 | 6.80  | 6.57 |
| CARB+MAN              | 6.86 | 6.50 | 6.38 | 6.71 | 6.55 | 6.82 | 6.86  | 6.67 |
| BENOMYL               | 6.38 | 6.50 | 6.25 | 6.53 | 6.48 | 6.62 | 6.71  | 6.50 |
| MEAN                  | 6.58 | 6.59 | 6.27 | 6.53 | 6.62 | 6.66 | 6.79  | 6.58 |

APP TIME NONE 6.31

GRAND MEAN 6.54

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

| TABLE | FUNGICIDE | APP TIME | FUNGICIDE<br>APP TIME |
|-------|-----------|----------|-----------------------|
| SED   | 0.098     | 0.150    | 0.259                 |

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

| STRATUM  | DF | SE    | CV% |
|----------|----|-------|-----|
| BLOCK.WP | 25 | 0.259 | 4.0 |

GRAIN MEAN DM% 80.5

PLOT AREA HARVESTED 0.00195

78/R/WS/4

SPRING WHEAT

IRRIGATION, LODGING, CCC AND MICROFLORA

Object: To study the effects of irrigation, artificial lodging and a growth regulator on grain microflora and yield - Long Hoos IV 4.

Sponsor: R.A. Hill.

Design: 4 randomised blocks of 2 plots split into 4.

Whole plot dimensions: 8.53 x 9.75.

Treatments: All combinations of:-

Whole plots

1. IRRIGATN                      Irrigation:

|      |               |
|------|---------------|
| NONE | None          |
| FULL | Full (108 mm) |

Sub plots

2. LODGING                      Lodging:

|        |                            |
|--------|----------------------------|
| NONE   | None, supported by netting |
| LODGED | Lodged, under netting      |

3. GRWTHREG                      Growth regulator:

|          |                                                        |
|----------|--------------------------------------------------------|
| NONE     | None                                                   |
| CHLORMEQ | Chlormequat (CCC) at 1.1 kg in 340 l on 19 June, 1978. |

NOTES: (1) Lodging treatment was applied on 1 Aug, 1978.

(2) Irrigation was applied at 9 mm on each dry day between 11 Aug and harvest (11, 16, 17, 18, 21, 23, 24, 25 and 29 August and 5, 8 and 11 Sept).

Basal applications: Manures (0:14:28) at 720 kg. 'Nitro-chalk 25' at 500 kg combine drilled. Weedkillers: Mecoprop, bromoxynil and ioxynil ('Brittox' at 2.5 l in 340 l).

Seed: Timmo, sown at 180 kg.

Cultivations, etc.: PK applied: 30 Sept, 1977. Ploughed: 6 Oct. Power harrowed: 31 Mar, 1978. Seed sown: 5 Apr. Weedkillers applied: 11 May. Combine harvested: 19 Sept.

NOTE: Grain microflora were assessed weekly after lodging and at harvest. 1000 grain weights were taken and grain assessed for mycotoxins, germination percentage and seedling vigour.

78/R/WS/4

GRAIN TONNES/HECTARE

## \*\*\*\*\* TABLES OF MEANS \*\*\*\*\*

|          |      |          |      |      |
|----------|------|----------|------|------|
| LODGING  | NONE | LODGED   | MEAN |      |
| IRRIGATN |      |          |      |      |
| NONE     | 5.15 | 2.47     | 3.81 |      |
| FULL     | 4.80 | 1.69     | 3.24 |      |
| MEAN     | 4.97 | 2.08     | 3.53 |      |
| GRWTHREG | NONE | CHLORMEQ | MEAN |      |
| IRRIGATN |      |          |      |      |
| NONE     | 3.81 | 3.81     | 3.81 |      |
| FULL     | 3.06 | 3.43     | 3.24 |      |
| MEAN     | 3.43 | 3.62     | 3.53 |      |
| GRWTHREG | NONE | CHLORMEQ | MEAN |      |
| LODGING  |      |          |      |      |
| NONE     | 4.77 | 5.17     | 4.97 |      |
| LODGED   | 2.10 | 2.07     | 2.08 |      |
| MEAN     | 3.43 | 3.62     | 3.53 |      |
| LODGING  | NONE | LODGED   |      |      |
| GRWTHREG | NONE | CHLORMEQ |      |      |
| IRRIGATN |      |          |      |      |
| NONE     | 5.02 | 5.29     | 2.60 | 2.34 |
| FULL     | 4.53 | 5.06     | 1.59 | 1.79 |

## \*\*\*\*\* STANDARD ERRORS OF DIFFERENCES OF MEANS \*\*\*\*\*

|       |                       |                     |                                  |
|-------|-----------------------|---------------------|----------------------------------|
| TABLE | LODGING               | GRWTHREG            | IRRIGATN*<br>LODGING             |
| SED   | 0.119                 | 0.119               | 0.168                            |
| TABLE | IRRIGATN*<br>GRWTHREG | LODGING<br>GRWTHREG | IRRIGATN*<br>LODGING<br>GRWTHREG |
| SED   | 0.168                 | 0.168               | 0.238                            |

\* WITHIN SAME LEVEL OF IRRIGATN ONLY

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

|             |    |       |     |
|-------------|----|-------|-----|
| STRATUM     | DF | SE    | CV% |
| BLOCK.WP.SP | 18 | 0.336 | 9.5 |

GRAIN MEAN DM% 84.4

SUB PLOT AREA HARVESTED 0.00087