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## Yields of the Field Experiments 1973

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### 73/R&bb/BS/1 - Growth & Yield on Contrasted Sites - Spring Barley

#### Rothamsted Research

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73/R/BS/1 and 73/BE/BS/1

SPRING BARLEY

GROWTH AND YIELD ON CONTRASTED SITES

**Object:** To try to account for yields and differences between yields of barley on sites at Rothamsted and Broom's Barn by studying crop growth rates, nutrient uptake, water use etc., at a wide range of nitrogen levels, with and without irrigation. Also to study the interaction between site differences and crops (see also 73/R and BB/WW/2) - Rothamsted (R), Long Hoos I and II, and Broom's Barn (BB), Dunholme Field.

**Sponsors:** P.J. Welbank, F.V. Widdowson.

**Design:** 3 randomised blocks of 2 plots, split into 6.

**Whole plot dimensions:**

Long Hoos I and II (R): 15.2 x 48.0. Sub plot area harvested: 0.00434.  
Dunholme Field (BB): 15.2 x 45.7. Sub plot area harvested: 0.00413.

**Treatments:** All combinations of:-

Whole plots: 1. Irrigation:

|                 | IRRIGN |
|-----------------|--------|
| None            | 0      |
| Full irrigation | I      |

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

|     | N   |
|-----|-----|
| 31  | 31  |
| 63  | 63  |
| 94  | 94  |
| 125 | 125 |
| 157 | 157 |
| 188 | 188 |

Total irrigation was 50.8 mm applied on 2 occasions (R) and 111.8 mm applied on 4 occasions (BB).

**Basal applications:**

Long Hoos (R): Manures: (0:20:20) at 360 kg combine drilled.

Weedkiller: MCPA, mecoprop and dicamba ('Tetralax Plus' at 7.0 l in 220 l). Fungicide: Tridemorph at 0.53 kg in 220 l.

NOTE: The site had a basal dressing of (0:20:20) at 1300 kg and Epsom salts at 900 kg in autumn 1971.

Dunholme Field (BB): Manures: (0:20:20) at 1300 kg. Epsom salts at 900 kg in autumn. (0:20:20) at 380 kg combine drilled. Weedkiller: MCPA, mecoprop and dicamba ('Banlene Plus' at 5.6 l in 220 l). Fungicide: Tridemorph 0.53 kg in 220 l.

**Seed:** Julia, dressed with ethirimol, sown at 160 kg (R) and 180 kg (BB).

73/R/BS/1 and 73/BB/BS/1

Cultivations, etc.:-

Long Hoos (R): Ploughed: 9 Nov, 1972. N applied, springtine cultivated and seed sown: 9 Mar, 1973. Weedkiller and fungicide applied: 11 May. Irrigated: 14 and 18 June. Combine harvested: 10 Aug. Previous crops: Beans 1971, winter wheat 1972.

Dunholme Field (BB): Basal PK and Epson salts applied: 6 Oct, 1972. Ploughed: 10 Nov. N applied: 8 Mar, 1973. Seed sown: 12 Mar. Weedkiller and fungicide applied: 14 May. Irrigated: 8, 14, 15 June and 5 July. Combine harvested: 9 Aug. Previous crops: Sugar beet 1971, winter wheat 1972.

NOTE: Crop samples were taken throughout the season. The percentage of N, P and K was measured in all samples. The number of tillers or ear-bearing stems was counted, and the leaf areas measured at each sampling. Mildew (*Erysiphe graminis*) assessments were made. 1000 grain weights were determined. Soil moisture content was estimated by neutron probe weekly.

Standard errors per sub plot. Grain: tonnes/hectare.  
Long Hoos I and II (R): 0.318 or 5.7% (20 d.f.)  
Dunholme Field (BB): 0.221 or 3.9% (20 d.f.)

73/R/BS/1 and 73/BB/BS/1

TABLES OF MEANS

LONG HOOS I AND II (R)

GRAIN: TONNES/HECTARE

|        | N    |      |      |      |      |      | Mean |
|--------|------|------|------|------|------|------|------|
|        | 31   | 63   | 94   | 125  | 157  | 188  |      |
| IRRIGN |      |      |      |      |      |      |      |
| O      | 4.39 | 5.28 | 5.96 | 6.06 | 6.11 | 5.97 | 5.63 |
| I      | 4.51 | 5.44 | 5.92 | 5.76 | 5.93 | 6.07 | 5.61 |
| Mean   | 4.45 | 5.36 | 5.94 | 5.91 | 6.02 | 6.02 | 5.62 |

STANDARD ERRORS OF DIFFERENCES

|   |       |         |
|---|-------|---------|
|   | N     | IRRIGN* |
|   | N     |         |
|   | 0.184 |         |
| * Within the same level<br>of IRRIGN only |       | 0.260   |
| Mean D.M. %                               | 84.8  |         |

STRAW: TONNES/HECTARE

|        |      |      |      |      |      |      |      |
|--------|------|------|------|------|------|------|------|
| IRRIGN |      |      |      |      |      |      |      |
| O      | 1.94 | 2.97 | 4.25 | 4.77 | 5.05 | 5.10 | 4.01 |
| I      | 2.65 | 3.28 | 4.15 | 5.15 | 4.94 | 5.28 | 4.24 |
| Mean   | 2.30 | 3.12 | 4.20 | 4.96 | 5.00 | 5.19 | 4.13 |

Mean D.M. % 95.1

73/R/BS/1 and 73/BB/BS/1

DUNHOLME FIELD (BB)

GRAIN: TONNES/HECTARE

|        | N    |      |      |      |      |      | Mean |
|--------|------|------|------|------|------|------|------|
|        | 31   | 63   | 94   | 125  | 157  | 188  |      |
| IRRIGN |      |      |      |      |      |      |      |
| O      | 5.89 | 6.01 | 5.24 | 5.20 | 5.43 | 5.39 | 5.52 |
| I      | 5.86 | 6.10 | 5.79 | 5.81 | 5.77 | 5.97 | 5.88 |
| Mean   | 5.87 | 6.05 | 5.51 | 5.50 | 5.60 | 5.68 | 5.70 |

STANDARD ERRORS OF DIFFERENCES

|   | N     | IRRIGN* |
|---|-------|---------|
|   |       | N       |
|   | 0.128 |         |
| * Within the same level<br>of IRRIGN only |       | 0.185   |

Mean D.M. % 81.4

STRAW: TONNES/HECTARE

|        |      |      |      |      |      |      |      |
|--------|------|------|------|------|------|------|------|
| IRRIGN |      |      |      |      |      |      |      |
| O      | 4.39 | 4.61 | 4.99 | 4.92 | 4.79 | 4.73 | 4.74 |
| I      | 4.71 | 6.02 | 6.18 | 5.76 | 6.06 | 5.73 | 5.74 |
| Mean   | 4.55 | 5.32 | 5.59 | 5.34 | 5.43 | 5.23 | 5.24 |

Mean D.M. % 64.4