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72/R/WW/6 and 72/BB/WW/6 Winter Wheat Growth and Yield on Contrasted Sites

Rothamsted Research

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72/R/WW/6 and 72/BB/WW/6

WINTER WHEAT

GROWTH AND YIELD ON CONTRASTED SITES

Object: To try to account for yields and differences between yields of wheat 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 72/R&BB/B/1) - Rothamsted (R), Long Hoos I and II and Broom's Barn (BB), Hackthorn 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 47.8. Sub plot area harvested: 0.00434.
Hackthorn Field (BB): 15.2 x 45.7. Sub plot area harvested: 0.00413.

Treatments: All combinations of:-

Whole plots: 1. Irrigation (I): None (O), full irrigation (C).

Sub plots: 2. Nitrogen: 31, 63, 94, 125, 157, 188 kg N as
'Nitro-Chalk'.

Total irrigation was 86.4 mm, applied on 4 occasions (R) and 126 mm, on 5 occasions (BB).

Basal applications (both fields):

1260 kg (0:20:20) plus 900 kg Epsom salts in seedbed. 250 kg
(10:24:24) combine drilled. Weedkiller: MCPA, mecoprop and dicamba
(*'Banlene Plus'* at 5.6 l in 220 l). Fungicide: Tridemorph at 0.53
kg in 280 l.

Seed: Cappelle, dressed with dieldrin, sown at 200 kg.

Cultivations, etc.:

Long Hoos I and II (R): Basal PK and Epsom salts applied:

24 Sept, 1971. Ploughed: 5 Oct. Seed combine drilled:

25 Oct. N applied: 19 Apr, 1972. Weedkiller applied:

26 Apr. Fungicide applied: 12 May. Irrigated: 2, 13 and

29 June and 14 July. Combine harvested: 31 Aug. Previous

crops: Spring wheat 1970, spring beans 1971.

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Hackthorn Field (BB): Deep-tine cultivated: 23 Sept, 1971.
Epsom salts applied: 12 Oct. Basal PK applied: 15 Oct.
Seed combine drilled: 25 Oct. Weedkiller applied: 17 Apr.
N applied: 19 Apr, 1972. Fungicide applied: 16 May.
Irrigated: 2, 13, 29 and 30 June and 18 July. Combine
harvested: 24 Aug. Previous crops: Sugar beet 1970,
beans 1971.

Standard errors per sub plot. Grain, tonnes/hectare:
Long Hoos I and II (R): 0.272 or 3.6% (20 d.f.)
Hackthorn Field (BB): 0.432 or 7.0% (20 d.f.)

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TABLES OF MEANS

LONG HDOS I & II (R)

N: KG/HA

	31	63	97	125	157	188	Mean
I	GRAIN: TONNES/HECTARE						
D	8.04	8.24	7.86	7.68	7.50	6.25	7.59
C	7.84	7.99	8.02	7.59	7.48	6.72	7.61
Mean	7.94	8.11	7.94	7.64	7.49	6.48	7.60

STANDARD ERRORS OF DIFFERENCES

N	I* N
0.157	0.222

* Within the same level of I

I	STRAW: TONNES/HECTARE						
D	6.90	7.09	7.53	7.92	8.62	8.35	7.74
C	6.37	7.77	7.82	8.56	8.72	8.57	7.97
Mean	6.63	7.43	7.68	8.24	8.67	8.46	7.85

Mean D.M. %: Grain: 80.9
Straw: 80.9

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HACKTHORN FIELD (BB)

N: KG/HA

	31	63	94	125	157	188	Mean
I	GRAIN: TONNES/HECTARE						
O	5.46	6.05	6.37	5.89	6.06	5.85	5.94
C	6.09	6.67	6.71	6.64	6.48	6.14	6.45
Mean	5.77	6.36	6.54	6.26	6.27	5.99	6.20

STANDARD ERRORS OF DIFFERENCES

N	I* N
0.250	0.353

* Within the same level of I

I	STRAW: TONNES/HECTARE						
O	6.53	7.20	7.63	7.23	7.89	7.56	7.34
C	6.18	7.16	7.42	7.66	7.88	7.64	7.32
Mean	6.35	7.18	7.52	7.45	7.88	7.60	7.33

Mean D.M. %: Grain: 85.2
Straw: 60.0