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71/R/WW/6 and 71/BB/WW/6 Growth and Yield on Contrasted Sites - W. Wheat

Rothamsted Research

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71/R/WW/6 and 71/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 71/R & BB/B/1) - Rothamsted (R) Great Knott II and Broom's Barn (BB) Flint Ridge Field.

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

Whole plot dimensions:-

Great Knott II (R): 13.7 x 48. Sub plot area harvested: 0.00390.
Flint Ridge Field (BB): 15.2 x 45.7. Sub plot area harvested:
0.00413.

Treatments: All combinations of:-

Whole plots: 1. Irrigation: None (O), full irrigation (I).
Sub plots: 2. Nitrogen: 31, 63, 94, 125, 157, 188 kg N as
'Nitro-Chalk'.

Total irrigation was 61.0 mm applied on four occasions (R) and
76.7 mm applied on four occasions (BB).

Basal applications:

Great Knott II (R): 1260 kg (0:20:20) plus 900 kg Epsom salts in
seedbed. 380 kg (8:20:16) combine drilled.

Flint Ridge Field (BB): In seedbed, as above. 392 kg (8:20:16)
combine drilled.

Weedkiller (both fields):- 2,4-D at 0.56 kg plus dichlorprop at
2.24 kg in 225 l.

Fungicide (both fields): - Tridemorph at 0.47 kg in 427 l.

Cultivations, etc.:-

Great Knott II (R): Deep-tine cultivated on 2 occasions: 6 Oct
and 7 Oct, 1970. Basal PK and Epsom salts applied: 12 Oct.
Seed combine drilled at 202 kg: 13 Oct. Weedkiller applied:
14 Apr, 1971. N applied: 16 Apr. Fungicide applied: 12 May.

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Irrigated: 14 May - 5.08 mm, 19 May - 5.08 mm, 20 May - 25.4 mm,
7 June - 25.4 mm. Combine harvested: 27 Aug. Variety: Cappelle.
Previous crops: Fallow 1969, potatoes 1970.
Flint Ridge Field (BB): Ploughed: 1 Sept, 1970. Rotary cultivated:
19 Sept. Epsom salts applied: 7 Oct. Basal PK applied, seed
combine drilled at 202 kg: 12 Oct. N applied: 19 Apr, 1971.
Weedkiller applied: 28 Apr. Fungicide applied: 10 May. Irrigated:
11 May - 3.8 mm, 14 May - 25.4 mm, 21 May - 26.7 mm, 26 May -
20.8 mm. Combine harvested: 25 Aug. Variety: Cappelle.
Previous crop: 1 year ley for hay 1970.

NOTE: At Rothamsted straw was gathered by pick-up baler. At Broom's Barn
straw was collected on a sheet behind the combine.

Standard errors per plot.

Grain, tonnes/hectare: Great Knott III (R): Sub plot: 0.335 or 4.8%
(20 d.f.)

Flint Ridge Field (BB): Sub plot: 0.454 or 7.6%
(20 d.f.)

7L/R/WW/6 and 7L/EB/WW/6

SUMMARY OF RESULTS

GREAT KNOTT II (R)

N: KG/HA

	31	63	97	125	157	188	Mean
GRAIN: TONNES/HECTARE							
(±0.193)*							
O	7.40	7.22	7.54	6.73	6.36	5.98	6.87
I	6.98	7.36	7.24	6.91	6.60	6.45	6.92
Mean (±0.137)	7.19	7.29	7.39	6.82	6.48	6.21	6.90

* For use in horizontal and interaction comparisons only

STRAW: TONNES/HECTARE

O	6.50	7.10	6.76	7.23	7.37	6.54	6.92
I	6.58	7.17	7.19	7.33	8.23	7.44	7.32
Mean	6.54	7.13	6.98	7.28	7.80	6.99	7.12

Mean D.M. %: Grain: 80.9
Straw: 83.9

71/R/WW/6 and 71/BB/WW/6

FLINT RIDGE FIELD (BB)

N: KG/HA

	31	63	94	125	157	188	Mean
GRAIN: TONNES/HECTARE (±0.262)*							
O	4.61	5.56	5.64	6.06	6.35	6.36	5.76
I	5.13	5.74	6.40	6.80	6.88	6.36	6.22
Mean (±0.185)	4.87	5.65	6.02	6.43	6.61	6.36	5.99

* For use in horizontal and interaction comparisons only

STRAW: TONNES/HECTARE

O	4.42	5.64	5.51	6.04	6.39	6.35	5.73
I	5.27	6.08	6.57	7.76	7.35	7.76	6.80
Mean	4.85	5.86	6.04	6.90	6.87	7.05	6.26

Mean D.M. %: Grain: 82.6
Straw: 77.4