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Yields of the Field Experiments 1982

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82/S/CS/1 Factors Affecting Yield - W. Wheat

Rothamsted Research

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82/S/CS/1

FACTORS AFFECTING YIELD

Object: To study the effects of a range of factors on the yield of w. wheat - Saxmundham.

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

The 17th year, w. wheat.

For previous years see 66/C/30(t), 67/C/23(t), 68/C/39, 69-81/S/CS/1.

Design: The experiment was on two sites, one after beans and one after wheat. On each site the design was a half replicate of 2 x 2 x 2 x 4 x 2 arranged as 8 whole plots split into 4 sub-plots. One extra sub-plot was included in each whole plot.

Whole plot dimensions: 8.53 x 18.3.

Treatments: On each site, combinations of:-

Whole plots

1. VARIETY	Varieties:
AVALON	
NORMAN	
2. AUT N	Nitrogen fertilizer to the seedbed in autumn on 13 Oct, 1981:
0	None
50	50 kg as (13:13:13)
3. PATHCONT	Pest and pathogen control:
NONE	None
FULL	Benomyl at 0.28 kg in 220 l on 1 Apr, 1982 Propiconazole at 0.12 kg with pirimicarb at 0.14 kg in 220 l on 26 May Carbendazim, maneb and tridemorph (as 'Cosmic' at 3.9 kg) with captafol at 1.1 kg and pirimicarb at 0.14 kg in 220 l on 30 June

Sub plots

4 N RATE	Total nitrogen fertilizer applied in spring (kg N) as 'Nitro-Chalk':

After wheat	After beans
130	70
160	100
190	130
220	160

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82/S/CS/1

5. N TIME — Times of applying spring nitrogen fertilizer:

SINGLE	All on 21 April, 1982
DIVIDED	40 kg N on 24 March, remainder on 21 April

plus whole plot treatments as above but given no spring nitrogen

NOTES: (1) AUT N 0 plots received 50 kg P_2O_5 and 50 kg K_2O as (0:20:20) to the seedbed.
(2) Muriate of potash was applied at 380 kg to stubble after beans, but not to stubble after wheat, on 2 Sept, 1981.

Basal applications: Weedkillers: Chlortoluron at 3.5 kg in 220 l. Mecoprop, bromoxynil and ioxynil (as 'Brittox' at 3.5 l) with 'Wheatclene' (1.3 kg of solid (metoxuron and simazine) plus 1.3 l of liquid (barban)) in 220 l.

Seed: Varieties sown at 380 seeds per m^2 .

Cultivations, etc.: Ploughed: 10 Sept, 1981. Seed sown: 13 Oct. Chlortoluron applied: 14 Oct. Mecoprop, bromoxynil and ioxynil with 'Wheatclene' applied: 1 Apr, 1982. Combine harvested: 11 Aug.

NOTE: Plots were sampled in autumn and spring for mineral N content of soil (to 90 cm depth) and for nitrate content of crop. N content of grain and N content of straw (except after wheat) were determined at harvest.

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82/S/CS/1 WHEAT AFTER WHEAT

GRAIN TONNES/HECTARE

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

SPRING NITROGEN APPLIED

AUT N	0	50	MEAN
VARIETY			
AVALON	5.19	6.19	5.69
NORMAN	7.87	8.28	8.07
MEAN	6.53	7.23	6.88

PATHCONT	NONE	FULL	MEAN
VARIETY			
AVALON	5.60	5.78	5.69
NORMAN	7.81	8.33	8.07
MEAN	6.70	7.06	6.88

PATHCONT	NONE	FULL	MEAN
AUT N			
0	6.23	6.82	6.53
50	7.18	7.29	7.23
MEAN	6.70	7.06	6.88

N TIME	SINGLE	DIVIDED	MEAN
VARIETY			
AVALON	5.47	5.91	5.69
NORMAN	7.89	8.25	8.07
MEAN	6.68	7.08	6.88

N TIME	SINGLE	DIVIDED	MEAN
AUT N			
0	6.23	6.82	6.53
50	7.13	7.34	7.23
MEAN	6.68	7.08	6.88

N TIME	SINGLE	DIVIDED	MEAN
PATHCONT			
NONE	6.60	6.81	6.70
FULL	6.76	7.35	7.06
MEAN	6.68	7.08	6.88

N RATE	130	160	190	220	MEAN
VARIETY					
AVALON	5.06	5.38	5.94	6.38	5.69
NORMAN	7.43	7.90	8.32	8.64	8.07
MEAN	6.24	6.64	7.13	7.51	6.88

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82/S/CS/1 WHEAT AFTER WHEAT

GRAIN TONNES/HECTARE

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

SPRING NITROGEN APPLIED

N RATE	130	160	190	220	MEAN
AUT N					
0	5.94	6.36	6.69	7.11	6.53
50	6.55	6.91	7.56	7.92	7.23
MEAN	6.24	6.64	7.13	7.51	6.88

N RATE	130	160	190	220	MEAN
PATHCONT					
NONE	6.04	6.47	6.95	7.37	6.70
FULL	6.45	6.80	7.31	7.66	7.06
MEAN	6.24	6.64	7.13	7.51	6.88

N RATE	130	160	190	220	MEAN
N TIME					
SINGLE	6.01	6.40	6.97	7.35	6.68
DIVIDED	6.48	6.87	7.29	7.68	7.08
MEAN	6.24	6.64	7.13	7.51	6.88

NO SPRING NITROGEN

AUT N	0	50	MEAN
VARIETY			
AVALON	1.14	2.08	1.61
NORMAN	2.68	3.64	3.16
MEAN	1.91	2.86	2.39

PATHCONT	NONE	FULL	MEAN
VARIETY			
AVALON	1.59	1.63	1.61
NORMAN	3.05	3.27	3.16
MEAN	2.32	2.45	2.39

PATHCONT	NONE	FULL	MEAN
AUT N			
0	1.71	2.12	1.91
50	2.93	2.79	2.86
MEAN	2.32	2.45	2.39

GRAND MEAN 5.98

GRAIN MEAN DM% 87.5

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82/S/CS/1 WHEAT AFTER BEANS

GRAIN TONNES/HECTARE

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

SPRING NITROGEN APPLIED

AUT N	0	50	MEAN
VARIETY			
AVALON	9.44	10.01	9.73
NORMAN	10.08	10.12	10.10
MEAN	9.76	10.06	9.91

PATHCONT	NONE	FULL	MEAN
VARIETY			
AVALON	9.42	10.03	9.73
NORMAN	9.64	10.56	10.10
MEAN	9.53	10.29	9.91

PATHCONT	NONE	FULL	MEAN
AUT N			
0	9.48	10.04	9.76
50	9.58	10.54	10.06
MEAN	9.53	10.29	9.91

N TIME	SINGLE	DIVIDED	MEAN
VARIETY			
AVALON	9.63	9.83	9.73
NORMAN	10.08	10.12	10.10
MEAN	9.85	9.97	9.91

N TIME	SINGLE	DIVIDED	MEAN
AUT N			
0	9.69	9.83	9.76
50	10.01	10.11	10.06
MEAN	9.85	9.97	9.91

N TIME	SINGLE	DIVIDED	MEAN
PATHCONT			
NONE	9.48	9.58	9.53
FULL	10.23	10.36	10.29
MEAN	9.85	9.97	9.91

N RATE	70	100	130	160	MEAN
VARIETY					
AVALON	9.24	9.55	10.07	10.05	9.73
NORMAN	9.54	10.13	10.38	10.34	10.10
MEAN	9.39	9.84	10.22	10.19	9.91

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82/S/CS/1 WHEAT AFTER BEANS

GRAIN TONNES/HECTARE

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

SPRING NITROGEN APPLIED

N RATE	70	100	130	160	MEAN
AUT N					
0	9.20	9.77	10.00	10.08	9.76
50	9.58	9.91	10.45	10.30	10.06
MEAN	9.39	9.84	10.22	10.19	9.91

N RATE	70	100	130	160	MEAN
PATHCONT					
NONE	9.20	9.41	9.89	9.62	9.53
FULL	9.58	10.26	10.56	10.77	10.29
MEAN	9.39	9.84	10.22	10.19	9.91

N RATE	70	100	130	160	MEAN
N TIME					
SINGLE	9.32	9.89	10.06	10.15	9.85
DIVIDED	9.46	9.79	10.39	10.24	9.97
MEAN	9.39	9.84	10.22	10.19	9.91

NO SPRING NITROGEN

AUT N	0	50	MEAN
VARIETY			
AVALON	6.81	7.95	7.38
NORMAN	7.39	8.75	8.07
MEAN	7.10	8.35	7.72

PATHCONT	NONE	FULL	MEAN
VARIETY			
AVALON	7.30	7.45	7.38
NORMAN	7.77	8.38	8.07
MEAN	7.54	7.91	7.72

PATHCONT	NONE	FULL	MEAN
AUT N			
0	6.95	7.25	7.10
50	8.12	8.58	8.35
MEAN	7.54	7.91	7.72

GRAND MEAN 9.47

GRAIN MEAN DM% 87.5

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82/S/CS/1 WHEAT AFTER BEANS

STRAW TONNES/HECTARE

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

SPRING NITROGEN APPLIED

AUT N	0	50	MEAN
VARIETY			
AVALON	3.85	4.56	4.21
NORMAN	4.38	5.00	4.69
MEAN	4.11	4.78	4.45

PATHCONT	NONE	FULL	MEAN
VARIETY			
AVALON	4.21	4.20	4.21
NORMAN	4.51	4.86	4.69
MEAN	4.36	4.53	4.45

PATHCONT	NONE	FULL	MEAN
AUT N			
0	3.94	4.28	4.11
50	4.78	4.77	4.78
MEAN	4.36	4.53	4.45

N TIME	SINGLE	DIVIDED	MEAN
VARIETY			
AVALON	3.96	4.46	4.21
NORMAN	4.47	4.90	4.69
MEAN	4.21	4.68	4.45

N TIME	SINGLE	DIVIDED	MEAN
AUT N			
0	3.81	4.41	4.11
50	4.61	4.95	4.78
MEAN	4.21	4.68	4.45

N TIME	SINGLE	DIVIDED	MEAN
PATHCONT			
NONE	4.19	4.54	4.36
FULL	4.24	4.82	4.53
MEAN	4.21	4.68	4.45

N RATE	70	100	130	160	MEAN
VARIETY					
AVALON	3.92	3.99	4.42	4.49	4.21
NORMAN	4.62	4.74	4.58	4.80	4.69
MEAN	4.27	4.37	4.50	4.65	4.45

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82/S/CS/1 WHEAT AFTER BEANS

STRAW TONNES/HECTARE

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

SPRING NITROGEN APPLIED

N RATE	70	100	130	160	MEAN
AUT N					
0	3.90	4.26	3.94	4.35	4.11
50	4.64	4.48	5.06	4.94	4.78
MEAN	4.27	4.37	4.50	4.65	4.45

N RATE	70	100	130	160	MEAN
PATHCONT					
NONE	4.14	4.23	4.47	4.61	4.36
FULL	4.40	4.50	4.53	4.68	4.53
MEAN	4.27	4.37	4.50	4.65	4.45

N RATE	70	100	130	160	MEAN
N TIME					
SINGLE	4.07	4.22	4.18	4.38	4.21
DIVIDED	4.47	4.51	4.82	4.91	4.68
MEAN	4.27	4.37	4.50	4.65	4.45

NO SPRING NITROGEN

AUT N	0	50	MEAN
VARIETY			
AVALON	3.23	3.93	3.58
NORMAN	3.33	4.21	3.77
MEAN	3.28	4.07	3.67

PATHCONT	NONE	FULL	MEAN
VARIETY			
AVALON	3.67	3.49	3.58
NORMAN	3.43	4.11	3.77
MEAN	3.55	3.80	3.67

PATHCONT	NONE	FULL	MEAN
AUT N			
0	3.06	3.49	3.28
50	4.03	4.10	4.07
MEAN	3.55	3.80	3.67

GRAND MEAN 4.29

STRAW MEAN DM% 83.8

SUBPLOT AREA HARVESTED 0.00126

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