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80/S/WW/1 Winter Wheat Factors Affecting Yield

Rothamsted Research

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80/S/WW/1

WINTER WHEAT

FACTORS AFFECTING YIELD

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

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

Design: Two blocks each a half replicate of 2 x 2 x 2 x 4 x 2 arranged as 8 whole plots split into 4.

Whole plot dimensions: 7.3 x 11.0.

Treatments: Combinations of:-

Blocks

1. PREVCROP Previous cropping in 1979:

BEANS
WHEAT

Whole plots

2. SOW DATE Dates of sowing:

26 SEPT 26 Sept, 1979
16 OCT 16 Oct

3. SDBED N Nitrogen fertiliser (kg N) to seedbed:

0
50

4. PATHCONT Pest and pathogen control:

NONE
FULL

Sub plots

5. S N RATE Nitrogen fertiliser (kg N) total in spring:

0
80
120
160

6. S N TIME Times of applying spring nitrogen fertiliser:

FEB+MAR 40 kg of total on 12 Feb, 1980, remainder on 31 Mar
MAR All on 31 Mar

NOTES: (1) SDBED N 50 was applied as (15:15:15). Plots not given this treatment received equivalent P & K as (0:20:20)

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(2) Full pest and pathogen control was:

Fungicides: Benomyl at 0.28 kg in 280 l on 10 Apr, 1980.
 Carbendazim with maneb and tridemorph (as 'Cosmic' at 3.9 kg) plus captafol at 1.1 kg in 280 l applied alone on 14 May and with dimethoate on 18 June. Carbendazim at 0.25 kg, maneb at 1.6 kg, captafol at 1.1 kg in 280 l applied with pirimicarb on 8 July.

Insecticides: Dimethoate at 0.34 l. Pirimicarb at 0.14 kg.

Basal applications: Weedkillers: Chlortoluron at 5.6 kg in 220 l. Ioxynil at 0.63 kg and mecoprop at 1.9 kg in 220 l.

Seed: Virtue, sown at 180 kg.

Cultivations, etc.: - Chlortoluron applied: 17 Oct, 1979. Ioxynil and mecoprop applied: 31 Mar, 1980. Combine harvested: 20 Aug.

NOTE: N content of grain was measured. Yields of straw were recorded only for PREVCROP BEANS.

GRAIN TONNES/HECTARE

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

SOW DATE	26 SEPT	16 OCT	MEAN
PREVCROP			
BEANS	8.29	8.29	8.29
WHEAT	7.71	7.50	7.60
MEAN	8.00	7.89	7.95
SDBED N	0	50	MEAN
PREVCROP			
BEANS	7.95	8.64	8.29
WHEAT	7.24	7.97	7.60
MEAN	7.59	8.30	7.95
SDBED N	0	50	MEAN
SOW DATE			
26 SEPT	7.63	8.38	8.00
16 OCT	7.56	8.23	7.89
MEAN	7.59	8.30	7.95
PATHCONT	NONE	FULL	MEAN
PREVCROP			
BEANS	7.84	8.74	8.29
WHEAT	6.99	8.21	7.60
MEAN	7.42	8.48	7.95
PATHCONT	NONE	FULL	MEAN
SOW DATE			
26 SEPT	7.46	8.55	8.00
16 OCT	7.38	8.41	7.89
MEAN	7.42	8.48	7.95

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GRAIN TONNES/HECTARE

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

PATHCONT	NONE	FULL	MEAN		
SDBED N					
0	7.20	7.98	7.59		
50	7.63	8.97	8.30		
MEAN	7.42	8.48	7.95		
S N RATE	0	80	120	160	MEAN
PREVCROP					
BEANS	6.13	8.51	8.96	9.57	8.29
WHEAT	5.23	7.70	8.48	9.01	7.60
MEAN	5.68	8.11	8.72	9.29	7.95
S N RATE	0	80	120	160	MEAN
SOW DATE					
26 SEPT	5.65	8.24	8.83	9.30	8.00
16 OCT	5.71	7.97	8.62	9.28	7.89
MEAN	5.68	8.11	8.72	9.29	7.95
S N RATE	0	80	120	160	MEAN
SDBED N					
0	5.08	7.69	8.35	9.26	7.59
50	6.28	8.52	9.10	9.32	8.30
MEAN	5.68	8.11	8.72	9.29	7.95
S N RATE	0	80	120	160	MEAN
PATHCONT					
NONE	5.23	7.52	8.25	8.68	7.42
FULL	6.13	8.69	9.19	9.90	8.48
MEAN	5.68	8.11	8.72	9.29	7.95
S N TIME	FEB+MAR	MAR	MEAN		
PREVCROP					
BEANS	8.22	8.37	8.29		
WHEAT	7.62	7.59	7.60		
MEAN	7.92	7.98	7.95		
S N TIME	FEB+MAR	MAR	MEAN		
SOW DATE					
26 SEPT	7.90	8.11	8.00		
16 OCT	7.94	7.85	7.89		
MEAN	7.92	7.98	7.95		

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GRAIN TONNES/HECTARE

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

S N TIME	FEB+MAR	MAR	MEAN
SDBED N			
0	7.53	7.65	7.59
50	8.30	8.31	8.30
MEAN	7.92	7.98	7.95

S N TIME	FEB+MAR	MAR	MEAN
PATHCONT			
NONE	7.40	7.44	7.42
FULL	8.44	8.52	8.48
MEAN	7.92	7.98	7.95

S N TIME	FEB+MAR	MAR	MEAN
S N RATE			
0	5.68	5.68	5.68
80	8.06	8.15	8.11
120	8.61	8.83	8.72
160	9.32	9.25	9.29
MEAN	7.92	7.98	7.95

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

TABLE	SOW DATE	SDBED N	PATHCONT	
SED	0.083	0.083	0.083	
TABLE	S N RATE	S N TIME	PREVCROP* SOW DATE	PREVCROP* SDBED N
SED	0.112	0.079	0.117	0.117
TABLE	SOW DATE SDBED N	PREVCROP* PATHCONT	SOW DATE PATHCONT	SDBED N PATHCONT
SED	0.117	0.117	0.117	0.117
TABLE	PREVCROP* S N RATE	SOW DATE S N RATE	SDBED N S N RATE	PATHCONT S N RATE
SED	0.159	0.161	0.161	0.161
EXCEPT WHEN COMPARING MEANS WITH SAME LEVEL(S) OF:				
PREVCROP	0.159			
SOW DATE		0.159		
SDBED N			0.159	
PATHCONT				0.159

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GRAIN TONNES/HECTARE

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

TABLE	PREVCROP* S N TIME	SOW DATE S N TIME	SDBED N S N TIME	PATHCONT S N TIME
SED	0.112	0.115	0.115	0.115
EXCEPT WHEN COMPARING MEANS WITH SAME LEVEL(S) OF:				
SOW DATE		0.112		
SDBED N			0.112	
PATHCONT				0.112

TABLE	S N RATE S N TIME
SED	0.159
EXCEPT WHEN COMPARING MEANS WITH SAME LEVEL(S) OF:	
S N RATE	0.161

* WITHIN THE SAME LEVEL OF PREVCROP ONLY

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

STRATUM	DF	SE	CV%
BLOCK.WP	4	0.165	2.1
BLOCK.WP.SP	26	0.318	4.0

GRAIN MEAN DM% 85.1

STRAW DRY MATTER TONNES/HECTARE

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

SDBED N	0	50	MEAN
SOW DATE			
26 SEPT	3.57	3.86	3.71
16 OCT	3.66	3.27	3.46
MEAN	3.61	3.57	3.59
PATHCONT	NONE	FULL	MEAN
SOW DATE			
26 SEPT	3.54	3.89	3.71
16 OCT	3.79	3.13	3.46
MEAN	3.66	3.51	3.59
PATHCONT	NONE	FULL	MEAN
SDBED N			
0	3.69	3.53	3.61
50	3.64	3.50	3.57
MEAN	3.66	3.51	3.59

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STRAW DRY MATTER TONNES/HECTARE

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

S N RATE	0	80	120	160	MEAN
SOW DATE					
26 SEPT	2.01	4.17	4.52	4.16	3.71
16 OCT	2.19	3.24	3.92	4.50	3.46
MEAN	2.10	3.70	4.22	4.33	3.59

S N RATE	0	80	120	160	MEAN
SDBED N					
0	1.99	3.72	4.31	4.43	3.61
50	2.21	3.69	4.14	4.23	3.57
MEAN	2.10	3.70	4.22	4.33	3.59

S N RATE	0	80	120	160	MEAN
PATHCONT					
NONE	2.57	3.71	4.20	4.19	3.66
FULL	1.64	3.70	4.24	4.47	3.51
MEAN	2.10	3.70	4.22	4.33	3.59

S N TIME	FEB+MAR	MAR	MEAN
SOW DATE			
26 SEPT	3.62	3.81	3.71
16 OCT	3.38	3.55	3.46
MEAN	3.50	3.68	3.59

S N TIME	FEB+MAR	MAR	MEAN
SDBED N			
0	3.52	3.70	3.61
50	3.48	3.66	3.57
MEAN	3.50	3.68	3.59

S N TIME	FEB+MAR	MAR	MEAN
PATHCONT			
NONE	3.57	3.76	3.66
FULL	3.42	3.60	3.51
MEAN	3.50	3.68	3.59

S N TIME	FEB+MAR	MAR	MEAN
S N RATE			
0	2.18	2.02	2.10
80	3.66	3.75	3.70
120	4.09	4.35	4.22
160	4.06	4.59	4.33
MEAN	3.50	3.68	3.59

STRAW MEAN DM% 75.6

SUB PLOT AREA HARVESTED 0.00111