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77/R/WW/1 Varieties, N and Fungicide - W. Wheat

Rothamsted Research

Rothamsted Research (1978) *77/R/WW/1 Varieties, N and Fungicide - W. Wheat* ; Yields Of The Field Experiments 1977, pp 312 - 316 - DOI: <https://doi.org/10.23637/ERADOC-1-29>

77/R/WW/1 and 77/W/WW/1

WINTER WHEAT

VARIETIES AND N

Object: To study the yields and flour quality of a selection of the newer varieties of winter wheat and the effects of nitrogen and aphicide on them on land in rotation (pathogen free) and after cereal (pathogen infected) - Rothamsted Webbs (pathogen free RH) and Great Knott I (pathogen infected RD), Woburn White Horse (pathogen free WH).

Sponsors: R. Moffitt, D.B. Slope.

Design: 4 randomised blocks of 9 plots split into 4 (except Webbs RH: 3 blocks only).

Whole plot dimensions: 4.27 x 27.1.

Treatments: All combinations of:-

Whole plots

1. VARIETY	Varieties:
AR	Armada
AT	Atou
CA	Cappelle
FL	Flanders
MF	Maris Fundin
MH	Maris Huntsman
MK	Maris Kinsman
SA	Sappo (spring wheat replacing a winter variety which failed)
SP	Sportsman

Sub plots

2. N	Nitrogen fertiliser (kg N):
(RH) (RD)&(WH)	Webbs (RH) Great Knott I (RD) & White Horse (WH)
0 63	0 63 in spring
63 126	63 in spring 126 in spring
126 189	126 in spring 189 in spring
63+63 126+63	63 in spring + 126 in spring + 63 at flowering 63 at flowering
3. INSECTICIDE	Insecticide (Great Knott I (RD) & White Horse (WH) only. Basal pirimicarb applied to Webbs (RH):
NONE	None
PIRIMICARB	Pirimicarb at 0.14 kg in 250 l on 14 July (Great Knott I (RD)) and at 0.14 kg in 270 l on 15 July (White Horse (WH))

Basal applications: Manures:

Webbs (RH) and Great Knott I (RD): (0:20:20) at 310 kg, combine drilled.

Great Knott I (RD) only: Chalk at 7.5 t.

White Horse (WH): (0:20:20) at 250 kg.

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Weedkillers:

Webbs (RH): Dicamba with mecoprop and MCPA ('Banlene Plus' at 4.9 l in 220 l).

Great Knott I (RD): Terbutryne and related triazines ('Prebane' at 4.5 kg in 220 l), ioxynil at 0.53 kg plus mecoprop at 1.6 kg in 220 l.

White Horse (WH): Ioxynil at 0.53 kg plus mecoprop at 1.6 kg in 220 l.

Insecticide:

Webbs (RH) only: Pirimicarb at 0.14 kg in 270 l.

Seed: Webbs (RH) and Great Knott I (RD): Varieties sown at 200 kg.

White Horse (WH): Varieties sown at 210 kg.

NOTE: The variety Hobbit established poorly on all three sites because old seed was used and was replaced in the spring by Sappo spring wheat sown at 200 kg.

Cultivations, etc.:-

Webbs (RH): Deep-tine cultivated three times: 19-23 Nov, 1976. Heavy spring-tine cultivated: 24 Nov. Rotary harrowed, seed sown, spring-tine cultivated: 25 Nov. Power harrowed SA treatments: 4 Apr, 1977. SA treatments sown: 5 Apr. Spring N applied: 18 Apr. Weedkillers applied: 11 May. Late N applied: 27 June. Insecticide applied: 14 July. Combine harvested: 9 Sept. Previous crops: Barley 1975, potatoes 1976.

Great Knott I (RD): Deep-tine cultivated: 24 Aug, 1976. Chalk applied: 1 Sept. Deep-tine cultivated: 20 Nov. Seed sown, spring-tine cultivated: 22 Nov. 'Prebane' applied: 26 Nov. Power harrowed SA treatments: 4 Apr, 1977. SA treatments sown: 5 Apr. Spring N applied: 18 Apr. Ioxynil plus mecoprop applied: 2 May. Late N applied: 27 June. Combine harvested: 10 Sept. Previous crops: Beans 1975, wheat 1976.

White Horse (WH): Heavy spring-tine cultivated twice: 8-9 Nov, 1976. Spring-tine cultivated, seed sown: 10 Nov. Spring-tine cultivated with crumbler attached SA treatments, SA treatments sown: 31 Mar, 1977. Spring N applied: 15 Apr. Weedkiller applied: 10 May. Late N applied: 29 June. Combine harvested: 8 Sept. Previous crops: Beans 1975, potatoes 1976.

NOTE: Samples were taken in April and July, on Great Knott I (RD) only, for estimates of eyespot (*Cercospora herpotrichoides*) and 'take-all' (*Gaeumannomyces graminis*).

77/R/WW/1 WEBBS (RH) PATHOGEN FREE

GRAIN TONNES/HECTARE

VARIETY	AR	AT	CA	FL	MF	MH	MK	SA	SP	MEAN
N										
0	2.98	3.23	3.46	2.73	2.60	3.05	3.10	2.48	3.22	2.98
63	4.89	5.32	4.70	5.29	4.93	4.58	4.85	3.60	5.61	4.86
126	6.33	6.49	5.87	6.32	6.26	5.87	6.40	3.69	7.14	6.04
63+63	5.49	5.60	4.79	5.22	5.31	4.76	5.02	4.77	5.98	5.22
MEAN	4.92	5.16	4.70	4.89	4.77	4.57	4.84	3.64	5.49	4.78

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

TABLE	VARIETY	N	VARIETY
			N

SED	0.172	0.102	0.316
EXCEPT WHEN COMPARING MEANS WITH SAME LEVEL(S) OF:			
VARIETY			0.307

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

STRATUM	DF	SE	CV%
BLOCK.WP	16	0.211	4.4
BLOCK.WP.SP	54	0.376	7.9

GRAIN MEAN DM% 79.5

SUB PLOT AREA HARVESTED 0.00173

77/R/WW/1 GREAT KNOTT I (RD) PATHOGEN INFECTED

GRAIN TONNES/HECTARE

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

VARIETY N	AR	AT	CA	FL	MF	MH	MK	SA	SP	MEAN
63	4.39	4.36	3.72	4.56	4.26	5.27	4.85	3.80	4.06	4.36
126	5.27	6.10	5.24	5.45	5.39	4.90	6.71	3.67	5.65	5.38
189	5.33	6.19	5.26	6.12	5.93	6.04	7.61	3.33	5.53	5.70
126+63	6.65	6.33	5.40	5.76	5.75	5.52	5.30	3.42	6.47	5.62
MEAN	5.41	5.75	4.91	5.47	5.33	5.43	6.12	3.55	5.43	5.27

VARIETY INSCTCDE	AR	AT	CA	FL	MF	MH	MK	SA	SP	MEAN
NONE	5.30	5.73	4.79	5.37	5.27	5.53	6.10	3.28	5.49	5.21
PIRIMICA	5.52	5.76	5.02	5.58	5.40	5.33	6.13	3.83	5.36	5.32
MEAN	5.41	5.75	4.91	5.47	5.33	5.43	6.12	3.55	5.43	5.27

N	VARIETY INSCTCDE	AR	AT	CA	FL	MF	MH	MK	SA	SP
63	NONE	5.09	5.05	4.12	5.22	4.39	5.55	4.70	3.51	3.41
	PIRIMICA	3.68	3.66	3.32	3.90	4.12	5.00	5.00	4.09	4.72
126	NONE	5.40	6.07	4.51	4.53	5.21	4.82	7.14	3.38	6.26
	PIRIMICA	5.14	6.13	5.98	6.38	5.56	4.97	6.29	3.95	5.03
189	NONE	4.79	5.84	4.59	6.28	6.07	6.29	7.00	3.20	7.19
	PIRIMICA	5.86	6.54	5.93	5.96	5.80	5.79	8.23	3.45	3.87
126+63	NONE	5.90	5.97	5.94	5.46	5.40	5.47	5.58	3.03	5.11
	PIRIMICA	7.39	6.70	4.86	6.06	6.11	5.57	5.02	3.82	7.82

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

TABLE	VARIETY	N	INSCTCDE	VARIETY N
SED	0.335	0.203	0.144	0.625
EXCEPT WHEN COMPARING MEANS WITH SAME LEVEL(S) OF:				
VARIETY				0.609

TABLE	VARIETY INSCTCDE	VARIETY N INSCTCDE
SED	0.452	0.973
EXCEPT WHEN COMPARING MEANS WITH SAME LEVEL(S) OF:		
VARIETY	0.431	0.963

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

STRATUM	DF	SE	CV%
BLOCK.WP	8	0.473	9.0
BLOCK.WP.SP	45	0.861	16.4

GRAIN MEAN DM% 81.2

SUB PLOT AREA HARVESTED 0.00172

77/W/WW/1 WHITE HORSE (WH) PATHOGEN FREE

GRAIN TONNES/HECTARE

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

VARIETY	AR	AT	CA	FL	MF	MH	MK	SA	SP	MEAN
N										
63	4.22	4.13	3.80	3.10	3.26	3.51	4.25	4.10	5.00	3.93
126	4.59	4.45	3.67	4.03	3.93	4.16	4.99	3.42	4.94	4.24
189	4.42	3.70	3.57	3.67	3.05	3.76	4.28	2.72	4.29	3.72
126+63	4.43	4.36	3.89	3.45	3.56	4.25	4.20	3.39	5.10	4.07
MEAN	4.42	4.16	3.73	3.56	3.45	3.92	4.43	3.41	4.83	3.99

VARIETY	AR	AT	CA	FL	MF	MH	MK	SA	SP	MEAN
INSCTCDE										
NONE	4.34	4.04	3.61	3.41	3.40	3.89	4.20	3.35	4.74	3.89
PIRIMICA	4.49	4.28	3.86	3.71	3.50	3.95	4.66	3.47	4.92	4.10
MEAN	4.42	4.16	3.73	3.56	3.45	3.92	4.43	3.41	4.83	3.99

N	VARIETY	AR	AT	CA	FL	MF	MH	MK	SA	SP
	INSCTCDE									
63	NONE	4.28	4.07	4.02	2.99	3.80	3.51	3.90	4.04	5.13
	PIRIMICA	4.16	4.19	3.58	3.21	2.71	3.52	4.59	4.16	4.87
126	NONE	4.40	4.29	3.30	3.91	3.82	3.73	4.70	3.38	4.67
	PIRIMICA	4.79	4.62	4.05	4.14	4.03	4.59	5.29	3.47	5.20
189	NONE	4.50	3.78	3.32	3.74	2.79	3.53	4.16	2.83	3.67
	PIRIMICA	4.34	3.62	3.82	3.61	3.32	3.98	4.41	2.61	4.91
126+63	NONE	4.17	4.03	3.79	3.00	3.18	4.77	4.05	3.13	5.48
	PIRIMICA	4.68	4.69	3.99	3.90	3.93	3.73	4.34	3.66	4.72

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

TABLE	VARIETY	N	INSCTCDE	VARIETY
				N
SED	0.166	0.098	0.069	0.304
EXCEPT WHEN COMPARING MEANS WITH SAME LEVEL(S) OF:				
VARIETY				0.293

TABLE	VARIETY	VARIETY
	INSCTCDE	N
		INSCTCDE
SED	0.222	0.471
EXCEPT WHEN COMPARING MEANS WITH SAME LEVEL(S) OF:		
VARIETY	0.208	0.464

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

STRATUM	DF	SE	CV%
ELOCK.WP	8	0.235	5.9
BLOCK.WP.SP	45	0.415	10.4

GRAIN MEAN DM% 83.5

SUB PLOT AREA HARVESTED 0.00173