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76/R/CS/24 P K and Take-all - Continuous - Wheat

Rothamsted Research

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76/R/CS/24

PK AND TAKE-ALL

Object: To study the effects of different amounts of phosphate and potassium fertiliser on the yields and incidence of take-all (*Gaeumannomyces graminis*) in continuous wheat - West Barnfield II.

Sponsors: G.E.G. Mattingly, D.B. Slope.

The ninth year, continuous winter wheat (after continuous barley 1968-1973).

For previous years see 68/C/16(t), 69/R/CS/24, 70/R/CS/24(t) and 71-75/R/CS/24.

Design: 4 randomised blocks of 10 plots, split into 2.

Whole plot dimensions: 5.33 x 20.1.

Treatments: All combinations of:-

Whole plots

1. P Phosphate (kg P) as superphosphate:

0	None
15 A	15 annually
60 A	60 annually
90 S	90 six-yearly, last applied autumn 1973
360 S	360 six-yearly, last applied autumn 1973

2. K Potassium (kg K) annually as muriate of potash:

30	30
120	120

Sub plots

3. N RESID Residues of nitrogen fertiliser, applied annually 1970-1973 (kg N):

37.5	37.5
75.0	75.0
113	113
150	150

Basal applications: Manures: 'Nitro-Chalk' at 500 kg. Weedkillers: Glyphosate at 1.7 kg in 220 l. Ioxynil at 0.53 with mecoprop at 1.6 kg in 220 l in spring.

Seed: Cappelle, sown at 200 kg.

Cultivations, etc.:- Glyphosate applied: 26 Sept, 1975. Ploughed: 14 Oct. Heavy spring-tine cultivated: 16 Oct. P and K applied: 3 Nov. Power harrowed and sown: 4 Nov. N applied: 5 Apr, 1976. Spring weedkiller applied: 22 Apr. Combine harvested: 30 July.

NOTE: Incidence of take-all was measured in July.

76/R/CS/24

GRAIN TONNES/HECTARE

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

N RESID	37.5	75.0	113	150	MEAN	
K20						
30	2.33	2.43	2.47	2.43	2.41	
120	3.31	2.94	3.33	3.02	3.15	
MEAN	2.82	2.68	2.90	2.73	2.78	
P205	0	15 A	60 A	90 S	360 S	MEAN
K20						
30	2.17	2.30	2.60	2.50	2.50	2.41
120	2.57	3.19	3.39	3.24	3.36	3.15
MEAN	2.37	2.75	3.00	2.87	2.93	2.78
P205	0	15 A	60 A	90 S	360 S	MEAN
N RESID						
37.5	2.54	2.79	2.98	2.94	2.85	2.82
75.0	2.03	2.75	3.00	2.82	2.81	2.68
113	2.69	2.85	2.89	2.94	3.13	2.90
150	2.21	2.60	3.11	2.77	2.93	2.73
MEAN	2.37	2.75	3.00	2.87	2.93	2.78
	P205	0	15 A	60 A	90 S	360 S
K20	N RESID					
30	37.5	2.17	2.17	2.64	2.41	2.25
	75.0	2.15	2.33	2.42	2.66	2.57
	113	2.25	2.39	2.50	2.49	2.73
	150	2.11	2.32	2.82	2.43	2.46
120	37.5	2.90	3.41	3.33	3.46	3.45
	75.0	1.92	3.17	3.57	2.99	3.06
	113	3.13	3.30	3.29	3.39	3.53
	150	2.32	2.88	3.40	3.11	3.40

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

TABLE	K20	N RESID	P205	K20 N RESID
SED	0.057	0.081	0.091	0.116
TABLE	K20 P205	N RESID P205	K20 N RESID P205	
SED	0.129	0.182	0.270	

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

STRATUM	DF	SE	CV%
BLOCK.WP+BLOCK.WP.SP	37	0.257	9.2
GRAIN MEAN DM%	88.2		

76/R/CS/24

STRAW TONNES/HECTARE

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

N RESID	37.5	75.0	113	150	MEAN	
K20						
30	2.42	2.32	2.49	2.45	2.42	
120	3.51	3.08	3.51	3.15	3.31	
MEAN	2.96	2.70	3.00	2.80	2.86	
P205	0	15 A	60 A	90 S	360 S	MEAN
K20						
30	2.06	2.27	2.73	2.61	2.42	2.42
120	2.33	3.22	3.83	3.40	3.76	3.31
MEAN	2.20	2.74	3.28	3.01	3.09	2.86
P205	0	15 A	60 A	90 S	360 S	MEAN
N RESID						
37.5	2.60	2.78	3.31	3.15	2.98	2.96
75.0	1.88	2.76	3.17	2.79	2.88	2.70
113	2.39	2.93	3.11	3.21	3.34	3.00
150	1.93	2.50	3.53	2.87	3.16	2.80
MEAN	2.20	2.74	3.28	3.01	3.09	2.86
P205	0	15 A	60 A	90 S	360 S	
K20						
30	37.5	2.21	2.17	2.88	2.61	2.22
	75.0	2.08	2.20	2.30	2.59	2.41
	113	1.99	2.51	2.59	2.70	2.64
	150	1.97	2.19	3.14	2.53	2.39
120	37.5	2.99	3.39	3.73	3.69	3.74
	75.0	1.68	3.32	4.04	2.99	3.35
	113	2.79	3.35	3.63	3.72	4.03
	150	1.88	2.81	3.92	3.21	3.92

STRAW MEAN DM% 93.5

SUB PLOT AREA HARVESTED 0.00270