ROTHAMSTED RESEARCH

Yields of the Field Experiments 1981

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81/R/CS/265 Soil Fumigation, Mycorrhiza and P - S. Wheat

Rothamsted Research

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81/R/CS/265

SOIL FUMIGATION, MYCORRHIZA AND P

Object: To study the effects on s. wheat of applications of mycorrhizal inoculum, methyl bromide and rates of phosphate fertiliser - Delharding.

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The first year, s. wheat.

Design: 3 randomised blocks of 8 plots split into 2.

Whole plot dimensions: 4.4 x 3.0.

Treatments: All combinations of:-

Whole plots

1. STERILNT — Soil sterilant:

   NONE — None
   METH BR — Methyl bromide at 980 kg

2. P — Rates of phosphate fertiliser (kg P), as superphosphate:

   0
   15
   30
   60

Sub plots

3. INOCULUM — Mycorrhizal inoculum:

   NONE — None
   G MOSSE — Glomus mosseae

NOTE: Inoculum was prepared by growing leeks in pots of soil infected with the mycorrhiza. After 20 weeks growth, soil and roots in the pots were chopped and applied to the seed furrows at 3.5 t per ha. Uninoculated plots received soil and roots at the same rate from pots growing uninfected leeks.

Basal applications: Manures: Dolomitic limestone at 12.5 t. Chalk at 3.0 t N at 125 kg as 'Nitro-Chalk', K at 50 kg as muriate of potash, Mg at 100 kg as Epsom salts. Weedkillers: Ioxynil at 0.42 l and mecoprop at 1.26 l in 250 l, applied with the fungicide. Fungicide: Tridemorph at 0.53 kg.

Seed: Highbury, sown at 350 seeds per m^2 (about 170 kg).

Cultivations, etc.:- Dolomitic limestone applied: 15 Sept, 1980. Epsom salts applied: 13 Jan, 1981. Basal chalk, N, and K and test P applied: 18 Mar. Methyl bromide applied: 13 Apr. Inoculum applied, seed sown: 23 Apr. Weedkillers applied: 7 June. Harvested by hand: 9 Sept.

NOTE: Plots were sampled five times during the season to assess mycorrhizal infection, and twice to measure P content of the leaves and soil.

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81/R/CS/265
GRAIN TONNES/HECTARE
***** TABLES OF MEANS *****

P	0	15	30	60	MEAN
STERILNT					
NONE	2.70	3.86	4.31	5.07	3.98
METH BR	2.70	3.62	4.23	4.90	3.86
MEAN	2.70	3.74	4.27	4.98	3.92

INOCULUM	NONE	G MOSSE	MEAN
STERILNT			
NONE	3.86	4.11	3.98
METH BR	3.39	4.33	3.86
MEAN	3.62	4.22	3.92

INOCULUM	NONE	G MOSSE	MEAN
P			
0	2.31	3.09	2.70
15	3.45	4.03	3.74
30	4.00	4.54	4.27
60	4.73	5.23	4.98
MEAN	3.62	4.22	3.92

	INOCULUM	NONE	G MOSSE
STERILNT	P		
NONE	0	2.42	2.99
	15	3.84	3.89
	30	4.16	4.45
	60	5.01	5.12
METH BR	0	2.21	3.19
	15	3.07	4.16
	30	3.83	4.64
	60	4.45	5.34

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

TABLE	STERILNT	P	INOCULUM	STERILNT P
SED	0.201	0.285	0.075	0.403

TABLE	STERILNT INOCULUM	P INOCULUM	STERILNT P INOCULUM
SED	0.215	0.304	0.429

EXCEPT WHEN COMPARING MEANS WITH SAME LEVEL(S) OF:

STERILNT	0.106
P	0.149
STERILNT.P	0.211

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

STRATUM	DF	SE	CV%
BLOCK.STERILNT.P	14	0.493	12.6
BLOCK.STERILNT.P.INOCULUM	16	0.258	6.6

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STRAW TONNES/HECTARE

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

P	0	15	30	60	MEAN
STERILNT					
NONE	3.38	4.40	5.01	5.67	4.61
METH BR	4.47	5.31	5.83	5.80	5.35
MEAN	3.93	4.85	5.42	5.73	4.98

INOCULUM	NONE	G MOSSE	MEAN
STERILNT			
NONE	4.41	4.82	4.61
METH BR	4.95	5.76	5.35
MEAN	4.68	5.29	4.98

INOCULUM	NONE	G MOSSE	MEAN
P			
0	3.44	4.41	3.93
15	4.49	5.22	4.85
30	5.11	5.73	5.42
60	5.67	5.80	5.73
MEAN	4.68	5.29	4.98

INOCULUM	NONE	G MOSSE
STERILNT	P	
NONE	0	3.02	3.74
	15	4.30	4.50
	30	4.84	5.18
	60	5.48	5.86
METH BR	0	3.87	5.08
	15	4.68	5.94
	30	5.39	6.28
	60	5.86	5.73

NO DRY MATTER PERCENTAGES - CROP WEIGHED DRY

SUB PLOT AREA HARVESTED 0.00020

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