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82/R/M/1 Soil Fumigation, Mycorrhiza and P - Mixed 1

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82/R/M/1

MIXED 1

SOIL FUMIGATION, MYCORRHIZA AND P

Object: To study the effects on w. wheat and w. barley of applications of mycorrhizal inoculum, methyl bromide and phosphate fertilizer - Delharding.

Sponsors: J.G. Buwalda, D.P. Stribley, P.B. Tinker.

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

Whole plot dimensions: 3.0 x 4.4.

Treatments: All combinations of:-

Whole plots

1. CROP Crops:

W BARLEY
W WHEAT

2. STERILNT Soil sterilant:

NONE None
METH BR Methyl bromide at 900 kg

3. P Rates of phosphate fertilizer (kg P), as superphosphate:

0
60

Sub plots

4. 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: N at 30 kg and a further application at 100 kg as 'Nitro-Chalk'. K at 50 kg, as muriate of potash. Weedkiller: Chlortoluron at 5.6 l in 280 l applied with the fungicide. Fungicide: Tridemorph at 0.53 kg.

Seed: W. barley: Igri, sown at 350 seeds per m².
W. wheat: Avalon, sown at 350 seeds per m².

Cultivations, etc.: - Deep-tine cultivated: 16 June, 1981. P, K and first N applied: 5 Aug. Seed sown: 29 Sept. Weedkiller with the fungicide applied: 27 Oct. Second N applied: 2 Mar, 1982. Harvested by hand: 17 Aug. Previous crops: Fallow 1980 and 1981.

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

GRAIN TONNES/HECTARE

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

STERILNT	NONE	METH BR	MEAN
CROP			
W BARLEY	6.46	5.25	5.85
W WHEAT	8.49	7.15	7.82
MEAN	7.47	6.20	6.84
P	0	60	MEAN
CROP			
W BARLEY	4.80	6.90	5.85
W WHEAT	7.21	8.44	7.82
MEAN	6.00	7.67	6.84
P	0	60	MEAN
STERILNT			
NONE	6.88	8.07	7.47
METH BR	5.12	7.28	6.20
MEAN	6.00	7.67	6.84
INOCULUM	NONE	G MOSSE	MEAN
CROP			
W BARLEY	5.38	6.32	5.85
W WHEAT	7.16	8.48	7.82
MEAN	6.27	7.40	6.84
INOCULUM	NONE	G MOSSE	MEAN
STERILNT			
NONE	7.05	7.90	7.47
METH BR	5.49	6.90	6.20
MEAN	6.27	7.40	6.84
INOCULUM	NONE	G MOSSE	MEAN
P			
0	5.37	6.63	6.00
60	7.17	8.17	7.67
MEAN	6.27	7.40	6.84
P	0	60	
CROP	STERILNT		
W BARLEY	NONE	5.83	7.08
	METH BR	3.77	6.73
W WHEAT	NONE	7.93	9.05
	METH BR	6.48	7.83

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GRAIN TONNES/HECTARE

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

	INOCULUM	NONE	G MOSSE
CROP	STERILNT		
W BARLEY	NONE	6.03	6.88
	METH BR	4.73	5.77
W WHEAT	NONE	8.07	8.92
	METH BR	6.26	8.04

	INOCULUM	NONE	G MOSSE
CROP	P		
W BARLEY	0	4.27	5.33
	60	6.49	7.32
W WHEAT	0	6.48	7.93
	60	7.85	9.03

	INOCULUM	NONE	G MOSSE
STERILNT	P		
NONE	0	6.40	7.36
	60	7.70	8.44
METH BR	0	4.34	5.90
	60	6.64	7.91

		INOCULUM	NONE	G MOSSE
CROP	STERILNT	P		
W BARLEY	NONE	0	5.28	6.39
		60	6.79	7.38
	METH BR	0	3.26	4.27
		60	6.19	7.26
W WHEAT	NONE	0	7.53	8.34
		60	8.60	9.50
	METH BR	0	5.43	7.53
		60	7.09	8.56

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

TABLE	CROP	STERILNT	P	INOCULUM
SED	0.176	0.176	0.176	0.134

TABLE	CROP STERILNT	CROP P	STERILNT P	CROP INOCULUM
SED	0.249	0.249	0.249	0.221
EXCEPT WHEN COMPARING MEANS WITH SAME LEVEL(S) OF: CROP				0.189

TABLE	STERILNT INOCULUM	P INOCULUM	CROP STERILNT P	CROP STERILNT INOCULUM
SED	0.221	0.221	0.352	0.313
EXCEPT WHEN COMPARING MEANS WITH SAME LEVEL(S) OF: STERILNT	0.189			
P		0.189		
CROP. STERILNT				0.268

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GRAIN TONNES/HECTARE

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

TABLE	CROP P INOCULUM	STERILNT P INOCULUM	CROP STERILNT P INOCULUM
SED	0.313	0.313	0.443
EXCEPT WHEN COMPARING MEANS WITH SAME LEVEL(S) OF:			
CROP.P	0.268		
STERILNT.P		0.268	
CROP.STERILNT.P			0.379

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

STRATUM	DF	SE	CV%
BLOCK.WP	14	0.432	6.3
BLOCK.WP.SP	16	0.464	6.8

SUB PLOT AREA HARVESTED 0.00020