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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	METH BR	MEAN
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	METH BR	MEAN
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	60	MEAN
0	5.37	6.63	6.00
60	7.17	8.17	7.67
MEAN	6.27	7.40	6.84
CROP	P	0	60
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 *****

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

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

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

CROP	STERILNT	INOCULUM	NONE	G MOSSE
W BARLEY	NONE	P		
		0	5.28	6.39
	METH BR	60	6.79	7.38
		0	3.26	4.27
W WHEAT	NONE	60	6.19	7.26
		0	7.53	8.34
	METH BR	60	8.60	9.50
		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	CROP	STERILNT	CROP
	STERILNT	P	P	INOCULUM
SED	0.249	0.249	0.249	0.221
EXCEPT WHEN COMPARING MEANS WITH SAME LEVEL(S) OF:				
	CROP			0.189

TABLE	STERILNT	P	CROP	CROP
	INOCULUM	INOCULUM	STERILNT	STERILNT
			P	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