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81/R/CS/254 Soil Fumigation, Mycorrhiza and P - W. Barley

Rothamsted Research

Rothamsted Research (1982) *81/R/CS/254 Soil Fumigation, Mycorrhiza and P - W. Barley* ; Yields Of The Field Experiments 1981, pp 195 - 197 - DOI: <https://doi.org/10.23637/ERADOC-1-35>

81/R/CS/254

SOIL FUMIGATION, MYCORRHIZA AND P

Object: To study the residual effects on w. barley of applications of mycorrhizal inoculum, methyl bromide and rates of phosphate fertiliser to s. wheat in 1980 - Delharding.

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

The second year, w. barley.

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

Whole plot dimensions: 2.2 x 4.4.

Treatments: All combinations of:-

Whole plots

1. STERILNT(80) Soil sterilant in 1980:
 NONE None
 METH BR Methyl bromide at 980 kg
2. P(80) Rates of phosphate fertiliser (kg P), as superphosphate in 1980:
 0
 15
 30
 60

Sub plots

3. INOCULUM(80) Mycorrhizal inoculum in 1980:
 NONE None
 G MOSSE Glomus mosseae

- NOTES: (1) Treatments were applied to s. wheat in 1980, grain yields were not taken.
(2) 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 broadcast over the plots at 3.5 t. Uninoculated plots received soil and roots at the same rate from pots growing uninfected leeks.
(3) Irrigation was applied as 25 mm water on 19 May, 1980.

Standard applications:

- S. wheat (1980): Manures: Dolomitic limestone at 12.5 t. N at 125 kg as 'Nitro-Chalk', K at 50 kg as muriate of potash, Mg at 100 kg as kieserite.
W. barley (1981): Manures: N at 30 kg as 'Nitro-Chalk' and K at 19 kg as muriate of potash to the seed bed. N at 100 kg as 'Nitro-Chalk' in spring. Weedkillers: Paraquat at 1.1 kg ion on the first occasion, at 0.7 kg ion on the second. Isoproturon at 2.5 l in 280 l applied with the fungicide. Fungicide: Tridemorph at 0.53 kg.

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Seed: S. wheat (1980): Highbury, sown at 350 seeds per m² (about 170 kg).
 W. barley (1981): Igri, with no seed dressing, sown at 160 kg.

Cultivations, etc.:-

S. wheat: Basal N, K and Mg applied, treatment P applied: 8 Apr, 1980.
 Dolomitic limestone applied: 9 Apr. Methyl bromide applied: 21 Apr.
 Inoculum applied: 29 Apr. Seed sown: 8 May. Harvested by hand:
 14 Aug. Previous crops: Fallow 1978 and 1979.
 W. barley: Paraquat applied: 11 Sept, 1980 and 26 Sept. Seedbed N, K
 applied: 18 Sept. Disc harrowed: 26 Sept. Seed sown: 2 Oct.
 Isoproturon applied: 27 Nov. Spring N applied: 1 Apr, 1981.
 Harvested by hand: 22 June.

NOTES: (1) Plots were sampled five times during the season to assess
 mycorrhizal infection, and twice to measure P content of the
 leaves and soil.
 (2) Grain yields were not taken, crop was harvested green on
 22 June.

TOTAL DRY MATTER TONNES/HECTARE

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

P(80)	0	15	30	60	MEAN
STERILNT(80)					
NONE	4.87	6.07	6.94	6.96	6.21
METH BR	4.81	5.97	5.93	7.13	5.96
MEAN	4.84	6.02	6.44	7.05	6.08
INOCULUM(80)	NONE	G MOSSE	MEAN		
STERILNT(80)					
NONE	5.98	6.44	6.21		
METH BR	5.10	6.82	5.96		
MEAN	5.54	6.63	6.08		
INOCULUM(80)	NONE	G MOSSE	MEAN		
P(80)					
0	4.14	5.53	4.84		
15	5.08	6.96	6.02		
30	6.29	6.58	6.44		
60	6.65	7.44	7.05		
MEAN	5.54	6.63	6.08		
STERILNT(80)	INOCULUM(80)	NONE	G MOSSE		
NONE	P(80)				
	0	4.51	5.23		
	15	5.63	6.51		
	30	6.69	7.19		
	60	7.10	6.83		
METH BR	0	3.77	5.84		
	15	4.52	7.42		
	30	5.89	5.98		
	60	6.21	8.04		

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TOTAL DRY MATTER TONNES/HECTARE

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

TABLE	STERILNT(80)	P(80)	INOCULUM(80)	STERILNT(80) P(80)
SED	0.311	0.440	0.238	0.623

TABLE	STERILNT(80) INOCULUM(80)	P(80) INOCULUM(80)	STERILNT(80) P(80) INOCULUM(80)
SED	0.392	0.555	0.784

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

STERILNT(80)	0.337		
P(80)		0.477	
STERILNT(80).P			0.675

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

STRATUM	DF	SE	CV%
BLOCK.WP	14	0.763	12.5
BLOCK.WP.SP	16	0.826	13.6

GRAIN MEAN DM% 34.2

SUB PLOT AREA HARVESTED 0.00010