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79/R/CS/240 Effects of Mycorrhiza on Response to P - Potatoes, Leeks

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79/R/CS/240

EFFECTS OF MYCORRHIZA ON RESPONSE TO P

Object: To study the effects of two methods of inoculating mycorrhiza on the response of potatoes and leeks to a range of rates of phosphate fertiliser - Delharding.

Sponsors: D.P. Stribley, P.B. Tinker.

The first year early potatoes followed by leeks.

Design: Single replicate of 28 plots.

Whole plot dimensions: 2.84 x 3.35.

Treatments: All combinations of:-

- | | |
|-------------|--|
| 1. MYCO INF | Methods of mycorrhizal infection: |
| NONE | None |
| CULTURE | Live culture of a yellow vacuolate mycorrhizal endophyte |
| INF SOIL | Soil from a site known to have mycorrhizal infection |
| 2. P | Rates of phosphate fertiliser (kg P) as superphosphate: |
| 0 | |
| 20 | |
| 40 | |
| 60 | |
| 80 | |
| 100 | |
| 120 | |
| 140 | |

Above treatments were applied to potatoes planted 30 cm (12 in.) apart in rows spaced 71 cm (28 in.) apart.

Four extra treatments were included, applied to potatoes planted 15 cm (6 in.) apart in rows 71 cm apart:

XTR CLOS

IOP0	No inoculum, no phosphate
IOP40	No inoculum, 40 kg P
ISOILP0	Mycorrhizal infected soil, no phosphate
ISOILP40	Mycorrhizal infected soil, 40 kg P

NOTES: (1) Inoculum for CULTURE was coarse sand containing 240 spores of *Glomus mosseae* per kg applied at 250 g per tuber. Inoculum for INF SOIL was soil containing 670 spores per kg of bulbous reticulate mycorrhiza (*Gigaspora* sp.) applied at 500 g per tuber.

(2) Leeks were not lifted by 31 Dec, 1979 and will be reported on in 'Yields' 1980.

(3) No yields were taken for XTR CLOS plots.

Basal applications: Manures: Chalk at 7.5 t. Muriate of potash at 580 kg. (25:0:16) at 720 kg. Kieserite at 340 kg.

79/R/CS/240

Seed: Ulster Sceptre.

Cultivations, etc.:— Chalk applied: 4 Apr, 1979. K, NK and Mg applied: 23 Apr.
Test P applied: 27 Apr. Spring-tine cultivated three times: 9 May, 10 May,
14 May. Rotary harrowed, rotary ridged: 14 May. Potatoes planted: 15 May.
Lifted: 8 Aug. Previous crops: Winter wheat 1977, fallow 1978.

NOTE: Plots were sampled several times to assess mycorrhizal infection, P content
of leaves and of soil.

TOTAL TUBERS TONNES/HECTARE

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

P	0	20	40	60	80	100	120	140	MEAN
MYCO INF									
NONE	5.2	10.2	14.9	12.9	14.5	12.7	18.5	13.8	12.8
CULTURE	5.4	8.6	12.5	13.5	16.5	14.5	13.1	11.5	12.0
INF SOIL	15.2	11.5	14.8	21.7	21.9	21.0	15.2	14.6	17.0
MEAN	8.6	10.1	14.1	16.0	17.6	16.1	15.6	13.3	13.9

PLOT AREA HARVESTED 0.00026