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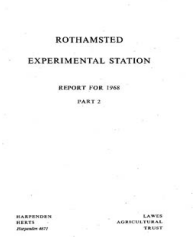
Rothamsted Experimental Station Report for 1968 - Part 2



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The Vesicular-arbuscular Mycorrhizal Fungi

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no consistent differences were found between Broadbalk and other fields. Non-rhizosphere soils were not studied, and this account describes results from Broadbalk only.

The 4th wheat crop after a one-year fallow on plot 3 (no manure) and plot 7 ($N_2PKNaMg$) was sampled at intervals from January to July. Table 9·6 lists the fungi identified. In addition to these spore-producing species, several sterile fungi were isolated, of which the most frequent has a fast-growing aerial mycelium, pinkish-fawn at first, but becoming dark-grey to black within four days. Twenty-four of the 32 rhizosphere fungi identified occurred on both plots. *Penicillium* spp., *Cladosporium* spp., *Geomyces vulgaris* and the *Mortierella*-type group were the most abundant species. On each of the 11 sampling dates these four groups constituted more than 33% of the total number of fungi and from May to July at least 65%. *Penicillium* spp. were most abundant at the earlier samplings, and *Cladosporium* became dominant later in the growing season.

Actinomycetes in Broadbalk soils. Actinomycetes in rhizosphere and non-rhizosphere soils from plot 7 were counted in May and June 1962, 1963 and 1964 using the dilution plate method (Table 9·7). The rhizosphere/non-rhizosphere ratios (R/S) were small in all 3 years, and the counts showed no evidence that actinomycetes were stimulated in the rhizosphere.

TABLE 9·7

Count of actinomycetes in rhizosphere and non-rhizosphere soils from Broadbalk plot 7 at a dilution of approx 1/40000, 1962–64

Year	Crop	Medium used	Date of sampling	Number actinomycetes millions per g dry soil: Rhizosphere (R)	Non rhizosphere (S)	R/S
1962	4th after fallow	Chitin[1]	16 May	0·67	0·59	1·14
			6 June	0·67	0·69	0·98
			28 June	0·96	0·90	1·07
1963	2nd after fallow	Chitin	8 May	1·25	2·13	0·59
			29 May	0·32	2·30	0·14
			26 June	0·85	0·85	1·00
1964	3rd after fallow	Soil extract agar[2]	26 May	1·71	1·73	0·99
			16 June	1·85	2·12	0·87

[1] Lingappa & Lockwood, 1962. [2] Flentje, 1956.

The Vesicular-arbuscular Mycorrhizal Fungi

By Barbara Mosse

Three plots on Broadbalk were surveyed for spores of *Endogone*, a mycorrhizal fungus, in 1961/2 and 1966 (Mosse & Bowen, 1968a, b), and four plots in 1968 (Hayman, unpublished). Each survey showed spores of four types, designated respectively as yellow vacuolate, laminate, bulbous reticulate and white reticulate, and that they occurred in different proportions in different plots. The unmanured plot contained more spores than the others

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and was especially rich in reticulate spores. Yellow vacuolate spores were most abundant in the FYM plot. Of the four types, laminate spores were fewest, whereas in the nearby field, Little Knott, they were the only ones found and were numerous in some plots, especially those not given nitrogen.

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