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Rothamsted- the Classical Experiments

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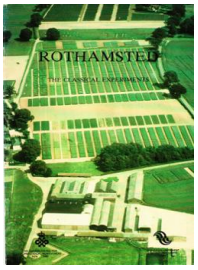

Barnfield

Rothamsted Research

Rothamsted Research (1984) *Barnfield ;* Rothamsted- The Classical Experiments, pp 25 - 25 **- DOI: https://doi.org/10.23637/ERADOC-1-190**

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previously acid plots and occasional plants of many other broad-leaved weeds also occur. Increasing the pH to 6 on sub-plots 9b, 11/1b and 11/2b has halved the amount of meadow foxtail but increased tall oat grass, especially on 11/1b.

(The botanical notes above were written in 1976 by Joan Thurston who has since retired.)

The distributions in the soil of nodule bacteria (*Rhizobium* spp.) for clover, *Lathyrus* and *Lotus* correspond closely to the distributions of their hosts in the different plots; neither medicks nor their nodule bacteria occur. Acid sub-plots contain no nodule bacteria and liming increases numbers. On limed sub-plots, N fertilizer has neither diminished the numbers nor altered the symbiotic effectiveness of the clover nodule bacteria.

BARNFIELD

Although less well-known than the other Classicals this was the first, having treatments applied in spring 1843 for a crop of turnips several months before the start of Broadbalk. However, the treatments and the cropping, although mainly roots, varied until 1876 when a period of continuous cropping with mangolds was started which lasted until 1959 (sugar beet were also grown from 1946).

As on Hoosfield Barley the treatments were applied in strips crossing at right angles. North–south strips tested minerals and FYM, including a test of FYM + PK, and these were crossed by strips comparing no nitrogen fertilizer with forms of nitrogen supplying 96 kg N ha^{-1}. Before 1968 this was the only Classical in which N was applied with both FYM and FYM + PK fertilizer.

Because yields of the continuous roots were declining, perhaps because of increasing amounts of cyst nematodes (*Heterodera schachtii*), the cropping has been progressively modified since 1959 and has included a range of arable crops with an increased range of N dressings and grass. Since 1977 the strip which had never received nitrogen fertilizer has been kept in fallow and since 1975 the remainder has been in grass.

A feature of the continuous roots and of recent arable crops has been the superiority of yields from plots given FYM even when a wide range of N dressings has been tested with the minerals. This may be because the extra organic matter has improved soil structure with greater effect on this field which is one of the most difficult to cultivate well. Yields of grass have also been larger on FYM-treated soils although FYM has not been applied since sowing the grass. This may be because more of the N applied to grass on fertilizer-treated soils is being used to increase soil organic matter. Accordingly a range of nitrogen dressings (75, 100, 125, 150 kg N per cut) has been tested on the grass since 1983.

AGDELL

This was the only Classical in which crops were grown in rotation. From 1848 to 1951 three different manurial combinations (none, PKNaMg and NPKNaMg plus rape cake/castor meal) were applied to the root crops of two four-course rotations. The rotations differed only in their third course – roots, barley, fallow or legume, wheat. There were only six plots and only one course of the rotation was present each year. The roots were turnips or swedes, the legume

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