THE HUMINIFACTION OF HIGH-MOOR PEAT

I. CHANGES IN ION-EXCHANGE CAPACITY AND NITROGEN CONTENTS OF THE ORGANIC MATTER IN HIGH-MOOR PEAT

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INTRODUCTION

The black high-moor peat occurring in the Netherlands, and being used in the experiments described here, has for the most part originated from Spagnum. From an agricultural point of view it has certain undesirable properties; it has a low pH, usually below 4, and also its colloidal properties are unsatisfactory. Once having been dried it is very difficult if not impossible to rewet; in the fresh, wet condition it is greasy. In general, therefore, it is an unattractive material for soil improvement.

By relatively simple means, however, most of these disadvantages can be virtually eliminated. The high acidity and the lack of mineral nutrients required for plant growth and the development of microorganisms can be eliminated by adding the necessary inorganic substances. The colloidal properties can be greatly improved by freesing. Thus, after the wet peat (water content at least 83 per cent) has been exposed to frost in winter, rewetting after drying is possible, and the wet substance is no longer greasy.

After such improvements the black peat can now be used, and it is in fact used in the Netherlands in increasing quantities, as garden peat ("tuinturf"). In this publication the term "garden peat" has been used for black highmoor peat, which had been exposed to frost; this is the untreated material that has been used throughout the experiments. It will be clear that the adjustment of the pH depends on the type of plants to be grown and also on the type of soil to which the peat is applied. Mineral fertilizers such as phosphates, potassium, and nitrogen compounds and oligo-elements such
as are required by the plants in cultivation can be added to ensure good growth.

Although the garden peat now appears to have qualities which render it a useful material for agricultural purposes, it is still not a high-quality medium for vegetable and microbial growth. It cannot be described as a "ripe" or "mild" humus, though it may be transformed to such when it is added to the soil. The main purpose of our experiments was how to accelerate this process.

Nevertheless, as shown in Fig. 1, treatment of garden peat with fertilizers and adjustment of the pH results in a marked improvement in its properties as a microbial medium. In the upper two

![Fig. 1. Upper two dishes inoculated with 0.2 mg of untreated garden peat. Lower two dishes inoculated with 0.02 mg of garden peat treated with mineral fertilizers.](image-url)