NITRIFICATION OF AMMONIATED PEAT AND OTHER NITROGEN CARRIERS

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Considerable interest has been exhibited during the last few years in possibilities of preparing fertilizers from humic materials derived from peat, lignite, and coal. The use of such materials has been recommended for the effects produced on the physical condition of soils in improving their moisture relations and aeration and in producing conditions favorable to greater bacterial activity in the soil.

Lieske (7, 8, 9) and Kissel (4, 5) have carried out extensive experiments tending to show the advantages of these materials. On the other hand, Lemmermann (6), while obtaining some favorable results in field trials from ammonium humate prepared from peat, believed the material could not be produced economically enough to warrant its commercial employment. Fuchs, Gargarin, and Kothny (2) made extensive water- and pot cultures with humates prepared from brown coal and obtained some specially promising results with some preparations on certain plants, while the same preparations were not so effective with other plants. Their results on the whole were not conclusive. Crowther and Brenchley (1) have carried out parallel pot, field, and nitrification tests of humates prepared from coal which showed close correlation with each other. They concluded that the ammonia in ammonium humate is about as effective as ammonium sulfate and there was some indication that humic material alone supplied a small amount of available nitrogen.

Possibilities for fertilizer use were indicated by Scholl and Davis (12) in the preparation of a somewhat similar material by the treatment of peat with anhydrous ammonia, thereby obtaining a product with an enhanced amount of nitrogen. Investigation of the value of ammoniated peat as fertilizer material has led to experiments in the conversion of the contained nitrogen into nitrate in the soil. It is generally conceded that the rapid formation of nitrate indicates the presence of a form of nitrogen readily available for plants. Other forms of nitrogen than nitrate may be utilized, but the rate of nitrification in the soil furnishes to some degree a comparison of the readily available nitrogen in nitrogen compounds.

TESTS PERFORMED

Nitrification tests were made in several series of experiments, the first over a period of 2 months, the second for 23 weeks, and the remaining for periods of 10 to 13 weeks. The materials used included ammonium sulfate, cottonseed meal,