TRANSFORMATION OF NITROGEN IN RICE SOIL
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INTRODUCTION

The changes which nitrogen compounds undergo in soils which are adapted to most farm crops have been rather exhaustively studied. It has been fairly conclusively established that most agricultural plants, with the exception of legumes, obtain the nitrogen required for growth from the soil in the form of nitrates. Some evidence has been presented showing that plants may, and perhaps often do, take up some nitrogen as ammonia. It has also been demonstrated that plants can use nitrogen in the form of soluble amino compounds.

The assimilation of nitrogen by rice has received less attention than in the case of dry land plants due, no doubt, to the fact that the rice crop is not widely adapted in this country, and to the further fact that nitrogen studies in submerged soils offer a difficult problem. Such work as has been done along this line has led to the general belief that rice plants assimilate nitrogen as ammonia much more readily than as nitrate, and that ammonium salts are superior to nitrate salts as nitrogenous fertilizers for rice soils.

The need for more experimental evidence on the problem of nitrogen transformation in submerged soils led the writers to undertake the work reported here. The experiment was designed to give some evidence on (a) the extent of assimilation of nitrates and of ammonia by the plant, (b) the relative value of green manure, sodium nitrate, and ammonium sulfate as fertilizing material for rice soil, and (c) the changes which nitrogen in these three carriers undergoes in such soil.

PLAN OF EXPERIMENT

The present investigation was limited to pot culture in the greenhouse. In this experiment it was planned to maintain an environment favorable to the plant. Soil classified as Clarksville silt loam was taken from the University farm and used in this experiment. Rice had not been grown on this soil before. Corn had been grown on the land the previous year, and the nitrate and organic matter content of the soil was low. This soil was supplemented with nitro-

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