

EFFECT OF COMBINED APPLICATION OF NITROGEN FERTILIZER AND STRAW ON BARLEY UNDER SODPODZOLIC SANDY SOIL

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ABSTRACT

A micro field experiment was conducted on barley under sod-podzolic Sandy Soil, using N^{15} labelled $(NH_4)_2SO_4$ and N^{15} labelled straw to study their influence on yield, residual N and coefficient use of N from straw by barley plants. Incorporation of straw decreased the productivity particularly in PK treatment and available N. Uptake of soil N by the plants ranged between 59 to 85 percent. It was observed that 16 to 40 percent N was used from straw in the year of its application and increased with increase in humus contents and decreased with increased dose of straw. Incorporation of straw decreased the utilization of fertilizer N and increased its fixation in the soil. Losses of fertilizer N ranged between 13 to 38 percent.

INTRODUCTION

It is not possible to obtain optimum crop yields without conserving and improving soil fertility. Addition of fresh organic matter helps in enhancing soil fertility. (Chaney and Swift, 1984; Strong *et al.*, 1987). Use of commercial N fertilizer also results in significant crop yield increases. However, the plants use only upto 50% of the applied fertilizer N (Jybdkerm 1970; Hauck, 1971) because losses of fertilizer N have been reported from 10 to 50% from the soil plant system in different ways (Kundler, 1970; Hauck, 1971, 1981; Germon and Couton, 1987; Priebe and Blackmer, 1989; Sharma, 1990). The rising cost of N fertilizers and potentially adverse environmental effects associated with their use emphasize the need for efficient use of fertilizer N for conserving the soil fertility in poor soils.

In spite of versatile positive influence of straw as fertilizer, it has two important negative consequences when incorporated into the soil. Firstly it immobilizes the mobile form of N and causes a reduction in crop yields. Secondly, it forms organic compounds which are toxic for crops because of initial stage of decomposition (Patrick, 1971; Cannell, 1984; Prasad, 1986).

The objective of this study was to observe the effect of different doses of nitrogenous fertilizer in combination with straw on the yield of barley crop, determination