

EFFECT OF SOURCE AND TIME OF N APPLICATION ON NO_3 MOVEMENT IN SOIL AND N UPTAKE BY MAIZE

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Maize variety "Izbulk" was used to establish the best source and time of application of nitrogen to avoid nitrate leaching, urea, calcium ammonium nitrate (CAN) and sulphur coated urea (SCU), each @ 150 kg N ha⁻¹ were applied. urea and CAN were applied, all at sowing, in 2 splits (half at sowing and half with 2nd irrigation) and 3 splits (1/3 at sowing, 1/3 with 2nd irrigation and 1/3 at tasselling) while SCU was applied only at sowing time. A constant measured normal level of irrigation water was applied. Grain yield was not affected significantly, however, average response i.e., kg grain/kg N application was maximum with urea applied all at sowing. Effect on N uptake was also at par, however, N recovery was maximum with urea application in 2 and 3 splits. $\text{NO}_3\text{-N}$ concentration, in general, decreased gradually in the soil profile at harvesting and was comparatively lower than before sowing $\text{NO}_3\text{-N}$ status. Number of splits were intended to increase $\text{NO}_3\text{-N}$, however, most of it was concentrated in 0-60 cm depth with all the sources. Urea and CAN, all at sowing, contributed less NO_3 in the profile while from CAN it was more. Overall, less NO_3 was observed from urea split application compared to CAN and SCU. This indicates more chances of NO_3 leaching from CAN and SCU.

INTRODUCTION

The applied nitrogen is subject to nitrification with nitrates as the end product. Nitrates being negatively charged are mobile nitrogen form in the nitrogen-balance sheet of soil (Haque and Ibrahim, 1965). It is generally accepted that nitrogen losses from soil in drainage water primarily consist of nitrates (Russell, 1961) which is a loss of costly input because the energy cost to produce a kilogram of nitrogen is much higher compared to that of phosphorus and potassium. This is primarily because the P and K are obtained from the mineral sources.

movement in comparison with soil samples taken after harvesting the crop. Each sample was composited from the respective depth of three sites in each plot. $\text{NO}_3\text{-N}$ in soil was estimated by phenol disulphonic acid method (Black 1965).

Maize variety "Izbulk" was sown on August 10, 1987. The row to row distance was 75 cm and that for plant to plant was 25 cm after thinning. Three sources of nitrogen i.e., urea, calcium ammonium nitrate (CAN) and sulphur coated urea (SCU) were applied each at the rate of 150 kg N ha⁻¹ (Table 1). The experiment was conducted in

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