

NITRATE LEACHING IN SOIL INFLUENCED BY TIME AND SOURCE OF
NITROGEN APPLICATION TO MAIZE

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ABSTRACT

A field experiment was conducted on maize to evaluate the nitrogen losses from urea and calcium ammonium nitrate (CAN), each @ 150 kg N ha⁻¹ applied all at sowing, 1/2 at sowing + 1/2 with 2nd irrigation (28 days after sowing) and 1/3 at sowing + 1/3 with 2nd irrigation + 1/3 at tasseling (70 days after sowing). Prior to sowing and after harvesting the crop, soil samples were collected from each plot at 0-30, 30-60, 60-90, 90-120 and 120-150 cm depths to follow nitrate movement in soil profile. NO₃-N concentration was higher in plots which received all urea and CAN at sowing. It was followed by two splits and three splits of either urea or CAN in descending order.

INTRODUCTION

Application of N is inevitable to overcome its deficiency in our present day agricultural crop production. However, a considerable fraction (40-50%) of the applied N is lost through volatilization, denitrification and leaching as nitrates (Gill, 1978). Nitrate-N moves in soil to almost a depth of 300 cm (Bracken and Greaves, 1941). Leaching of nitrates beyond the active root-zone is one of the major constraints which decreases the

urea and calcium ammonium nitrate (CAN) were applied each @ 0 and 150 kg N ha⁻¹ with the following treatments.

- T₁ = Control
- T₂ = Urea, all at sowing
- T₃ = Urea, 1/2 at sowing + 1/2 with second irrigation
- T₄ = Urea, 1/3 at sowing + 1/3 with second irrigation + 1/3 at tasseling
- T₅ = CAN, all at sowing
- T₆ = CAN, 1/2 at sowing + 1/2 with second irrigation
- T₇ = CAN, 1/3 at sowing + 1/3 with second irrigation + 1/3 at tasseling

The basal dose of P₂O₅ and K₂O were applied @ 75 and 50 kg ha⁻¹ as single superphosphate and sulphate of potash, respectively to all the plots. Six irrigations each of approximately 7 cm were applied upto the maturity of crop. Nitrate leaching in the experimental plots was followed by collecting soil samples at various depths after harvesting the crop. The soil samples were analysed for various physical and chemical characteristics according to the standard procedures described by Richards (1954). NO₃-N was estimated by using phenoldisulphonic acid method