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**Short Communication:**

# INFLUENCE OF INTEGRATED NITROGEN MANAGEMENT ON YIELD AND NUTRIENT UPTAKE OF MAIZE

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Maize (*Zea mays* L.) is one of the most versatile emerging crop growth has wider adaptability under varied agro-climatic conditions and successful cultivation in diverse seasons and ecologies for various purposes. Maize is originated in Mexico in Central America. Its introduction in India probably occurred in the beginning of the seventeenth century, during the early days of the East India Company (Singh, 1999).

Maize is heavy feeder of nutrient and due to proper nutrient management is one of the most important practices to increase production. It gives good response to nutrient and nutrient application practices has showed significant indication in increasing the plant height, dry matter accumulation, cob diameter, cob length, number of grain cob$^{-1}$, test weight, grain yield and straw yield.The combine use of chemical fertilizer with FYM and vermicompost is essential to make optimum use of each type of fertilizer and to achieve balance nutrient management for crop growth on various parameters and also increase in the total uptake of NPK.

Crops generally requires adequate quantity of major nutrients especially nitrogen during most of the crop growth period. The availability of nitrogen in soils is the key factor to determine the growth and yield of crop. The mineralisable N in the soil play a dominant role in the nutrition of crops. Incorporation of organic materials with fertilizers is known to stimulate the mineralization fractions (Shinde and Subbaiah,1969).Considering the above facts present investigation was undertaken to study the influence of integrated nitrogen management on, yield and nutrient uptake of maize.

A field experiment was conducted at Agronomy farm, College of Agriculture, Nagpur during *kharif* season of 2015-16.The experiment was laid out in randomized block design with three replications.The treatments consisted of $T_1$-100% N through urea, $T_2$-100 % N through neem coated urea,$T_3$- 75% N through urea + 25% N through FYM,$T_4$-75% N through urea + 25% N through vermicompost,$T_5$-75% N through urea + 2% spray of urea (at flowering and grain filling stage),$T_6$-75% N through urea + 25% N through neem coated urea,$T_7$-50% N through urea + 50% N through neem coated urea,$T_8$-50% N through urea+25% N through FYM + 25% N through neem coated urea,$T_9$-50% N through urea + 25% N through vermicompost + 25% N through neem coated urea. The soil of experimental plot was clayey in texture, low in available nitrogen (250.63 kg ha$^{-1}$), medium in phosphorus (20.32 kg ha$^{-1}$) and organic carbon (0.52 %) and very high in available potash (414.42 kg ha$^{-1}$) and slightly alkaline in reaction (pH 7.60).

The crop variety PKVM- Shatak was used with gross plot size of 5.4 m ×4.8 m and net plot size of 4.8 m × 3.4 m. As per the treatment, the quantity of FYM, vermicompost and fertilizer required plot$^{-1}$ was calculated. FYM, vermicompost were applied before sowing. Nitrogen was applied as per treatments in three splits i.e.$^1/_2$ at sowing,$^1/_4$ at 30 DAS and $^1/_4$ at 50 DAS. Full dose of phosphorus, potassium were applied at sowing. Five plants of maize from each net plot were selected randomly, labeled properly. Grains and stovers were taken and analyzed for nitrogen as per the Alkaline permanganate method (Subbiah and Asija, 1956) to determine nitrogen uptake by maize crop.

The data pertaining to various treatments studied viz., yield, nitrogen content (%) and nitrogen uptake kg ha$^{-1}$as influenced by various treatments are presented in table 1.Yield, nitrogen content and nitrogen uptake were significantly more in100% N through neem coated urea ($T_2$) followed by 50% N through urea + 50% N through neem coated urea ($T_7$) and 75% N through urea + 25% N through neem coated urea ($T_6$) and 100% N through urea ($T_1$) .This might be due to more availability of N, P and K in soil due to mobilization from sources. Neem coated urea reduced the leaching and volatilization losses and also inhibit the nitrification process resulting increase in the availability and mobilization of nutrient from source. Tanwar (2014) reported that application 100% RDN through neem coated urea (4 ml neem oil 100$^{-1}$ g urea) recorded significantly increased both grain (69.10 q ha$^{-1}$) and stover yield(80.17 q ha$^{-1}$) of maize and higher value of N (1.57% and 0.57% stover and grain concentration respectively) over other treatments. Usha Rani *et al.*(2013) studied that the uptake of NPK and the fertilizer use efficiency were maximum with the application of 50% N through urea along with neem cake followed by castor cake in both plant and ratoon crops.

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**Table 1. Effect of integrated nitrogen management on yield and nutrient uptake of maize**

| Treatments | Yield (q ha$^{-1}$) | | Nitrogen content (%) | | Nitrogen uptake (kg ha$^{-1}$) | | |
|---|---|---|---|---|---|---|---|
| | Grain | Straw | Grain | Straw | Grain | Straw | Total |
| $T_1$- 100% N through urea | 49.52 | 72.29 | 1.51 | 0.53 | 74.77 | 38.31 | 113.08 |
| $T_2$- 100% N through neem coated urea | 54.15 | 81.25 | 1.57 | 0.57 | 85.01 | 46.31 | 131.32 |
| $T_3$- 75% N through urea+25% N through FYM | 43.62 | 58.65 | 1.11 | 0.42 | 48.41 | 24.63 | 73.04 |
| $T_4$- 75% N through urea+25% N through vermicompost | 45.85 | 60.50 | 1.24 | 0.43 | 56.85 | 26.01 | 82.86 |
| $T_5$- 75% N through urea+2% spray of urea (at flowering and grain filling stage) | 48.10 | 68.30 | 1.41 | 0.49 | 67.82 | 33.46 | 101.28 |
| $T_6$- 75% N through urea+25% N through neem coated urea. | 50.78 | 74.64 | 1.54 | 0.54 | 78.20 | 40.30 | 118.50 |
| $T_7$- 50% N through urea+50% N through neem coated urea. | 51.40 | 76.07 | 1.55 | 0.55 | 79.67 | 41.83 | 121.50 |
| $T_8$- 50% N through urea+25% N through FYM+25% N through neem coated urea | 46.50 | 65.10 | 1.33 | 0.45 | 61.84 | 29.29 | 91.13 |
| $T_9$-50% N through urea+25% N through FYM+25% N through neem coated urea | 47.22 | 64.21 | 1.38 | 0.47 | 65.16 | 30.17 | 95.33 |
| S E (m) $\pm$ | 2.08 | 4.06 | - | - | 4.14 | 2.67 | - |
| C D at 5% | 6.24 | 12.18 | - | - | 12.42 | 8.01 | - |
| GM | 48.37 | 68.40 | 1.40 | 0.49 | 68.63 | 34.47 | 103.11 |

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