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RESEARCH ARTICLE

Influence of irrigation regimes and nitrogen levels on root density, nutrient uptake and grain yield of August sown hybrid maize (*Zea mays* L.)

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SUMMARY

A field experiment was conducted at Punjab Agricultural University Ludhiana, during late *Kharif* 2009-10 to study the effect of different irrigation regimes (IW/CPE ratio 0.50, 0.75, 1.00 and 1.25) and nitrogen rates (100, 125, 150 and 175 kg N ha^{-1}) on root growth, nutrient uptake and yield of August sown hybrid maize. The irrigation regimes $I_{1.25}$ (3 irrigations) and $I_{1.00}$ (3 irrigations) produced the grain yield of 83.1 and 81.2 q ha^{-1}, respectively, which was significantly higher than the grain yield observed under $I_{0.75}$ (2 irrigations) and $I_{0.50}$ (1 irrigation). Root density was higher in surface soil layers *i.e.*, 0-15 and 15-30 cm soil profile under adequate irrigation regimes ($I_{1.25}$ and $I_{1.00}$) which was statistically at par with each other but reverse trend was observed in deeper layers where root density was higher under deficit irrigation regimes. Nutrient uptake by maize *i.e.* N, P and K was also higher at higher irrigation regimes. Among nitrogen rates, N_{150} and N_{175} being statistically at par with each other gave significantly higher grain yield over N_{125} and N_{100}. Similar trend was observed for root density in different soil layers. Total N, P and K uptake was also higher at N_{175} which was significantly higher than other nitrogen levels in case of total N and P uptake whereas it was statistically at par with N_{150} in case of total K uptake.

Key Words : August sown hybrid maize, Irrigation regimes, Nitrogen levels, Root density, Nutrient uptake

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