

## Effect of irrigation schedules and integrated nutrient management on yield and nutrient uptake by *rabi* maize (*Zea mays* L.)

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Accepted : August, 2008

### SUMMARY

An experiment on *rabi* maize constituting two irrigation schedules *viz.*, irrigation scheduled at 0.75 IW/CPE ratio and irrigation scheduled at CGS along with five integrated nutrient management practices *viz.*, application of 100% RDF only, 100% RDF + 5 t FYM/ha, 100% RDF + 10 t FYM/ha, 75% RDF + 7.5 t FYM/ha and 50% RDF + 10 t FYM/ha was conducted at Instructional Farm, Department of Agronomy, MAD, Parbhani during winter seasons of 2004-05 and 2005-06. The results showed that irrigation scheduled at 0.75 IW/CPE ratio recorded significantly higher grain yield of maize over scheduling of irrigation at critical growth stages. Moreover, application of 100% RDF + 10t FYM/ha was at par with application of 100% RDF + 5 t FYM/ha and both of them recorded significantly higher grain yield than other integrated nutrient management practices. As regards to nutrient uptake by maize, scheduling of irrigation at 0.75 IW/CPE ratio recorded highest uptake of N over scheduling of irrigation at CGS. It also recorded numerically higher value of uptake of P and K by maize over scheduling of irrigation at CGS but did not reach to the level of significance. The uptake of N and P were increased with, increase in dose of RDF along with quantity of FYM application. However, the K content in maize and its uptake was not influenced significantly by integrated nutrient management practices.

**Key words :** *Rabi* maize, Scheduling of irrigation, Integrated nutrient management.

**M**aize (*Zea mays* L.) is an ideal crop owing to its quick growing habit, high yielding ability, palatability and nutritiousness. It can be grown in any season and is one of the most important cereal crop of the world agricultural economy both as food for human and feed for animals.

Maize is very efficient utilizer of solar energy and has immense potential for higher yield. Each climatic zone has its own characteristics and as such different hybrids, composites and local varieties maturing in 60 to 150 days are being grown (Jain *et al.*, 1981). It can be feed to cattle at any stage, as there is no problem of poisoning to cattle with HCN or oxalic acid in plant unlike sorghum and therefore, it is called as 'Queen of cereals and King of fodder'. The father of green revolution renowned Nobel Laureate Dr. Norman E. Borlaug, has mentioned maize as the crop of future. In future maize can play vital role in ensuring food security as well as nutritional security by use of quality protein maize for the country as well as world as a whole.

In Maharashtra, maize is principally a rainy season

crop but the climatic variability and eco-physiological limitations are the major constraints to achieve potential yield of maize in traditional rainfed *khari* season in the state. Recent studies conclusively proved that maize is a potential winter season crop having three times higher yield potential than *khari* crop (Desai and Deore, 1980, Nayak *et al.*, 1987). Water and nutrient is the key factor to increase the productivity of this crop. As it is scarce during winter, it's efficient utilization is necessary. However, information regarding irrigation scheduling and use of integrated sources of nutrients is meagre, hence the present experiment was conducted.

### MATERIALS AND METHODS

The experiment was conducted during winter (*rabi*) seasons of 2004-05 and 2005-06 at Parbhani. The trial was laid out in a split plot design with 4 replications. Two irrigation schedules were tried in main plots and five integrated nutrient management practices *viz.*, application of 100% RDF, 100% RDF + 5 t FYM/ha, 100% RDF + 10 t FYM/ha, 75% RDF + 7.5 t FYM/ha and 50% RDF + 10 t FYM/ha were in sub plots. The soil of the experimental plot was medium black, slightly alkaline in reaction (pH 8.24), low in available nitrogen, medium in available phosphorus and rich in potassium. The Monsanto's maize hybrid Kargil was sown in 46th meteorological week. The complete dose of FYM along with half dose of nitrogen and full dose of phosphorus and potassium was applied before sowing and remaining

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