Internat. J. Plant Sci. Vol.2 No.2 July 2007 : 197-201

Response of maize (*Zea mays* L.) to seed treatment of micronutrients supplemented *Azospirillum* biofertilizer

M.G. MUDENOOR[1]*, GEETA GOUDAR[2] AND V.P. SAVALGI[2]
[1] Department of Environmental Sciences, University of Agricultural Sciences, DHARWAD (KARNATAKA) INDIA
[2] Department of Agricultural Microbiology, University of Agricultural Sciences, DHARWAD (KARNATAKA) INDIA
(Accepted :June, 2007)

SUMMARY
A pot culture experiment was conducted to study the effect of seed treatment of micronutrient supplemented *Azospirillum* biofertilizer strains (ACD-20 and ACD-L_4) on dry matter production, N content and yield of maize in vertisols of Karnataka. The results obtained from the study indicated that, significantly higher shoot and root dry matter, endorhizosphere population, grain yield of Maize were recorded with the seed treatment of *Azospirillum* biofertilizers supplemented with micronutrients (@ 100 ppm individually (Zn, Fe and Mo) and in combination (Zn+Mo, Fe+Mo and Zn+Fe+Mo) as against inoculated and uninoculated control. Significantly higher endorhizosphere population of *Azospirillum* was observed in the treatment receiving *Azospirillum* + Zn + Mo + Fe over inoculated and uninoculated control. Upon seed inoculation of *A. brasilense* ACD-20 significant variation in grain yield was noticed from 12.20g per plant in un-inoculated control (UIC) to 13.17 g per plant in inoculated control. With the enrichment of biofertilizers with micronutrients significantly higher grain yield of 23.35 (*A. brasilense* + Zn + Mo + Fe) and 22.90 (*A. brasilense* + Zn + Mo) was recorded in case of inoculation ACD-20. While inoculation of micronutrient enriched *A. brasilense* ACD L_4 maximum grain yield of 25.85 and 25.10 g per plant was recorded in the treatment receiving *A. brasilense* + Zn + Mo + Fe and *A. brasilense* + Zn + Mo, respectively. Thus it can be concluded that, micronutrients are playing an important role in increasing the nitrogen economy of cereals in general and maize in specific by way of higher atmospheric nitrogen fixation with enrichment of micronutrients.

Key words: Maize, Biofertilizers, *Azospirillum*, Associative symbiotic N fixers and micronutrients etc.

In recent years, biofertilizers have been emerged as supplement to mineral fertilizers and hold a promise to improve the yields of crops. The biofertilizers are found to have positive contribution to soil fertility, resulting in an increase in crop yield without causing any type of environmental, water and soil hazards. Out of many microorganisms which were identified and included in the list of biofertilizers, *Azospirillum* has been recognized to play a unique role in nitrogen economy of many crops like cereals and grasses (Chunchunkumar *et al*., 1998). As early as 1925, Beijerinck reported this bacterium as *Spirillum lipoferum*. Later on Tarrand renamed the organism as *Azospirillum* (Azote means nitrogen) due to nitrogen fixing capacity and classified all the stains of *Azospirillum* into two groups; *Azospirillum brasilense* and *A. lipoferum* (Tarrand *et al*., 1978).

Use of *Azospirillum* as seed inoculant, economy of 20-30 kg N per ha equivalent could be achieved. Micronutrients play an important role in growth and development of the plant and its deficiency is the major cause for lower yields in several crop plants. The micronutrients are also required for activity of microorganism, especially for the root associated beneficial bacteria like *Azospirillum* that are used as microbial inoculants for increasing nitrogen fixation and crop productivity. In view of this, attempts were made to study the effect of micronutrient-enriched biofertilizers on crop growth and yield using maize as test crop.

MATERIALS AND METHODS

A pot culture experiment was conducted to know the effect of seed treatment of micronutrient enriched *Azospirillum* biofertilizer strains on growth, dry matter production and yield of maize at Department of Agricultural Microbiology, UAS, Dharwad during 2002-03. The details of the material used and the experimental techniques adopted during the course of investigation are described. The fertilizer dose recommended for the crop was 150:75:37.5 N:P:K kg per ha and FYM 10 t per ha. Nitrogen was applied in the form of urea in three split doses, 35 per cent of nitrogen, as urea was applied as basal dose and remaining as top dressing at 25 and 50 days after sowing (DAS). FYM and other major nutrients viz., phosphorus as single supper phosphate and potassium

* Author for correspondence.