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RESEARCH PAPER

Response of bio-fertilizer *Azospirillum* on growth and yield of fenugreek *(Trigonella foenum graecum* L.) cv. RAJENDRA KANTI

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Abstract : The experiment was conducted at experimental field of department of Horticulture, Tirhut College of Agriculture, Dholi, Muzaffarpur, (Bihar) in *Rabi* season during 2007-2008 to 2009-2010. Combination of bio-fertilizer *Azospirillum* + inorganic nitrogen + FYM gave better performance as compared to alone application of bio-fertilizer *Azospirillum*, organic FYM inorganic nitrogen and other combination. The combination treatment (T_1) as soil application of inorganic N (100%) of RDF + *Azospirillum* @ 15 kg ha^{-1} + FYM @ 5 t ha^{-1} gave the maximum number of branches per plant (7.30), number of pods per plant (74.00) and yield per plot (1.18) or per hectare (2.62 t ha^{-1}) and increased the yield 91.24% over control and gave the maximum net profit Rs.45,100 ha^{-1} or benefit: cost (Rs.2.35) followed by treatment (T_2) as soil application of inorganic N (75%) of RDF + *Azospirillum* @ 15 kg ha^{-1} + FYM @ 5 t ha^{-1} *i.e.* number of branches per plant (7.00), number of pods per plant (69.67) and yield per plot (1.09 kg/4.8m^2) or yield per hectare (2.42 t ha^{-1}) and increased the yield 76.64 per cent over control and found the maximum net profit Rs.39,172.00 ha^{-1} or benefit: cost (Rs.2.17).

Key Words : FYM, *Azospirillum*, Inorganic nitrogen, Fenugreek, Economics

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INTRODUCTION

The spices fenugreek or Methi is known as minor spices, fenugreek is an important condiment occupying third place in area and fourth in production among all the minor spices grown in our country, it is a small seed with yellowish brown colour. It is rich in protein, carbohydrate, mineral, vitamins and yellowish brown seed. It is botanically known as (*Trigonella foenumgraecum* L.). Fenugreek belongs to family Leguminosae, subfamily papilionaceae and genus *Trigonella*. It has chromosome No. 2n = 2 x 8 = 16. It is an annual crop. The nodules found at the tip of side roots have nitrogen fixing bacteria which fix the nitrogen in the soil and thus add to the fertility of the soil. Saxena and Ahmed (1983), reported that fenugreek fixes about 283 kg nitrogen per hectare per year. The ability of the *Azospirillum* to proliferate in the rhizosphere of crop suggests its ability to improve the nutrient availability to the plants and can supplement the expensive inorganic and organic fertilizers. Therefore, the present study was under taken to investigate the impact of bio-fertilizers singly or in combination with different level of inorganic nitrogen and FYM on yield and yield parameters.

MATERIALS AND METHODS

The experiment was carried out from 2007-2008 to 2009-2010 at Department of Horticulture, Tirhut College of Agricultural, Dholi, Muzaffarpur (Rajendra Agricultural University, Bihar) during *Kharif* season (2007-2008 to 2009-2010). The experiment was laid out in randomized block design with three replications using variety Rajendra Kanti. There were ten treatments and three replications. The treatment details are given below.

T_1 : Inorganic N (100%) of RDF + *Azospirillum* (15kg ha^{-1})