Effect of biofertilizers (*Azotobacter* and *Azospirillum*) alone and in combination with reduced levels of nitrogen on quality of cauliflower cv. SNOWBALL – 16

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Accepted : *February, 2007*

ABSTRACT

An experiment was conducted during *Rabi* season of 2004-05 involving three levels of nitrogen. (O, 100% and 75% nitrogen) with four levels of biofertilizers (no inoculation, *Azospirillum, Azotobacter* and *Azotobacter + Azospirillum*). Out of the twelve treatment combinations, the best was 75% nitrogen (120 kg ha^{-1}) + *Azotobacter + Azospirillum* which showed significant increase in ascorbic acid content in curds (87 mg 100g^{-1}), protein content in curds (18.62%), total nitrogen content in plant (2.98%) and compactness of curds (97.39%). Thus there is nitrogen economy of 25% in getting maximum quality of cauliflower curds.

Key words : *Azotobacter*, *Azospirillum*, Nitrogen, Quality, Cauliflower.

Cauliflower (*Brassica oleracea* Var. botrytis L.) is one of the most important winter vegetables among the cole crops. It is having great demand on account of its delicious taste due to abortive floral parts which are freshly and closely crowded, are used for culinary purposes either alone or mixed with potato. To obtain maximum yield in vegetable crops, farmers are repeatedly using chemical fertilizers. As a consequences of continuous use of chemical fertilizers, farmers are facing the problem of soil deterioration. Therefore, the current trend is of organic farming using organic fertilizers like biofertilizers of microbial origin with limited use of chemical fertilizers. Application of *Azospirillum* and *Azotobacter* inoculants in vegetable crops has been of much significance because they not only fix atmospheric nitrogen but also produce growth promoting and antifungal substances. (Sharma *et al.*, 1986). Hence keeping in view these facts, the present investigation was undertaken to explore the effect of *Azotobacter* and *Azospirillum* with reduced levels of nitrogen on quality of cauliflower.

MATERIALS AND METHODS

The experiment was conducted at main farm, Department of Horticulture, Marathwada Agricultural University, Parbhani in Factorial Randomized Block Design with twelve treatment combinations having three replications. There were three levels of nitrogen i.e. 0, 100% and 75% nitrogen (symbolized as N_0, N_1 and N_2,

respectively) and four levels of biofertilizers i.e. no inoculation, *Azospirillum, Azotobacter* and *Azotobacter + Azospirillum* (symbolized as B_0, B_1, B_2 and B_3, respectively). The soil of experimental plot has pH 7.9. Seeds were sown on fine raised beds with seed rate of 500 g ha^{-1}. Spraying of insecticide, weeding, and watering were done on raised bed. Also ploughing, harrowings and manuring were done on experimental field. Ridges and furrows were opened at the spacing of 60 cm. Before transplanting, seedlings were dipped in slurry of biofertilizers for 10 miniutes. Uniform and healthy one month old seedlings of cauliflower Cv. Snowball-16 were transplanted in November with spacing of 60 cm x 45 cm. The plot had a gross area of 3.0 m x 2.7 m and net area of 2.4 m x 1.8 m. Fertilizer dose applied was 160 kg N + 80 kg P_2O_5 + 80 kg K_2O ha^{-1}. Half dose of nitrogen according to treatment level i.e. 100 % and 75 % nitrogen in the recommended dose. Remaining half dose of nitrogen was given one month after transplanting i.e. at earthing up FYM @ 10 tonnes ha^{-1} was applied at field preparation. Observations on quality were recorded. Ascorbic acid content of curd was estimated by using 2, 6 dichlorophenol indophenol visual titration method (A.O.A.C., 1990). Nitrogen content from plant sample was determined by Microkjeldhal's method (A.O.A.C., 1975). Protein content in cauliflower curd was calculated from nitrogen content of curd multiplied by factor 6.25. Compactness of curd was determined by formula Z = C/W3 x 100, given by Pearson where Z is an index of compactness, C is the net weight of curd and W is the average of lateral and polar diameter of curd.