

## Integrated nutrient management in Cabbage (*Brassica oleracea* var. *Capitata*) cv. PRIDE OF INDIA on growth and yield attributing parameters

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### ABSTRACT

A field experiment was conducted at Junagadh Agricultural University, Junagadh during *Rabi* season of the year 2006-2007 to study the effect of nitrogen, bio-fertilizer (*Azotobacter*) and FYM on cabbage cv. 'PRIDE OF INDIA' with respect to growth, yield attributing parameters and yield. The experiment consisting of eighteen treatment combinations, comprising of three nitrogen levels viz., control ( $N_1$ ), 100 kg/ha ( $N_2$ ), 150 kg/ha ( $N_3$ ), three bio-fertilizer (*Azotobacter*) levels viz., control ( $B_1$ ), 1.25 kg/ha ( $B_2$ ), 2.50 kg/ha ( $B_3$ ) and two FYM levels viz., control ( $O_1$ ), 10 t/ha ( $O_2$ ) were embedded in a Factorial Randomized Block Design with three replications. All growth and yield attributing characters and yield under study were significantly affected by nitrogen. Days to 50 % maturity, number unfolded leaves, number of days required for head formation, polar diameter, fresh weight of head, dry weight of head and yield were recorded maximum with application of nitrogen @ 150 kg/ha ( $N_3$ ). Though other characters, which decreased with higher dose of nitrogen were number of days required for head formation, stalk length, number of splitting head. Minimum number of days required for head formation, days to 50 % maturity, stalk length were observed in *Azotobacter* @ 2.50 kg/ha ( $B_3$ ). While, maximum number of unfolded leaves, polar diameter, fresh weight of head, dry weight of head and yield per plot were recorded in *Azotobacter* @ 2.50 kg/ha ( $B_3$ ). The highest number of splitting head, number unfolded leaves, polar diameter, fresh weight of head, dry weight of head and yield per plot were noticed in FYM @ 10 t/ha ( $O_2$ ). Significantly minimum number of days required for head formation, days to 50 % maturity, Stalk length, number of days required for head formation were observed in FYM @ 10 t/ha ( $O_2$ ). The interaction effect of nitrogen x Bio-fertilizer (N x B), Nitrogen x FYM (N x O), Bio-fertilizer x FYM (B x O) and Nitrogen x Bio-fertilizer x FYM (N x B x O) for the various characters studied was non significant.

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Cabbage (*Brassica oleracea* var. *capitata*) is extensively cultivated in India, China, Bangladesh and Burma in the world. In India, cabbage is an important cole crop mainly cultivated in Gujarat, Uttar Pradesh, Orissa, Bihar, West Bengal, Assam, Maharashtra and Karnataka. Cabbage status in respect of area and production in India including Gujarat is far below the average. The area under this crop grown in India is 2.8 lakh ha. with annual production of 60 lakh tons. Cabbage is one of the important vegetable crops grown in Gujarat state occupying an area of about 14.34 thousand ha. and production of 2.39 lakh tones. (Anon., 2005). Chemical fertilizers and FYM play a pivotal role in vegetable production. Nutrient supply system is considered as one of the basic factor. It has been established beyond doubt that there is a positive correlation between fertilizer use and crop productivity. Farmers are using excessive chemical fertilizers leads to decline in organic carbon.

The excessive use of chemical fertilizers spoils the structure and texture of the soil. Therefore, use of chemical fertilizer alone may not keep pace with time in maintenance of soil health for sustaining the productivity. *Azotobacter* is one of the most important non-symbiotic N-fixing microorganisms. Application of *Azotobacter* would reduce the dependence on inorganic and organic source of nitrogen. The experiment was laid out to study the effect of various levels of nitrogen, *Azotobacter* and FYM with its interaction effects to find out the best combination of different treatments to achieve maximum economic returns on growth, yield and quality of cabbage.

### MATERIALS AND METHODS

The study was carried out at Instructional Farm, College of Agriculture, Junagadh Agricultural University, Junagadh during *Rabi* 2006-07. FYM was applied and well mixed with the soil of respective plots before the