

Quality characters affected by integrated nutrient management in cabbage (*Brassica oleracea* var. *Capitata*) cv. PRIDE OF INDIA

J.K. ROHIT, M.V. RAMDEVPUTRA, D.R. KANZARIA, N.H. DEVMURARI, A.M. BUTANI AND D.K. KAKADE

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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 and yield attributing parameters and yield. The experiment consisting of eighteen treatment combinations, comprising of three nitrogen levels viz., control (N₁), 100 kg/ha (N₂), 150 kg/ha (N₃), three bio-fertilizer (*Azotobacter*) levels viz., control (B₁), 1.25 kg/ha (B₂), 2.50 kg/ha (B₃) and two FYM levels viz., control (O₁), 10 t/ha (O₂) were embedded in a Factorial Randomized Block Design with three replications. Significantly the highest total soluble solid content (6.40 %), reducing sugar (2.88 %), ascorbic acid content (96.00 mg/100g), protein content (2.66 g/100g), N uptake (194.72 kg/ha), P uptake (97.23 kg/ha) and K uptake (151.07 kg/ha) were recorded with the application of nitrogen @ 150 kg/ha (N₃). Though, non-reducing sugar (1.12%) decreased with the higher dose of nitrogen. Significantly the highest total soluble solid content (6.15 %), reducing sugar (2.44 %), ascorbic acid content (96.00 mg/100g), protein content (2.64 g/100g), N uptake (185 kg/ha), P uptake (88.36 kg/ha) and K uptake (142.86 kg/ha) was noticed in application of *Azotobacter* @ 2.50 kg/ha (B₃). The maximum total soluble solid content (5.99 %), reducing sugar (2.35 %), ascorbic acid content (95.15 mg/100g), protein content (2.51 g/100g), N uptake (181.04 kg/ha), P uptake (79.17 kg/ha) and K uptake (138.43 kg/ha) were recorded in FYM @ 10 t/ha (O₂), as compared to control (O₁). Non-reducing sugar (1.53 %) was recorded minimum in FYM @ 10 t/ha (O₂). 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.

See end of the article for authors' affiliations

Correspondence to :

D.K. KAKADE

National Research Centre
for Groundnut,
JUNAGADH (GUJARAT)
INDIA

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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. (Anonymous, 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 transplanting of the seedlings. The crop was fertilized by application of whole dose of phosphorus and potash and