

Effect of biofertilizers and their combinations with nitrogen fertilizer on growth, yield and quality of rose (*Rosa damascene* L.)

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ABSTRACT

An experiment was carried out to study the effect of biofertilizers and their combination with nitrogen fertilizer on growth, yield and quality of rose (*Rosa damascene* L.) at Anand during the year 2007-08. The treatments comprised of three levels of nitrogen (0, 25, 50 g/plant) with *Azotobacter* (1ml/plant) and *Azospirillum* (1 ml/plant) alone as well as their combinations and compared with control (RD). The application of 50 g N /plant + *Azotobacter* and *Azospirillum* each @ 1ml/plant (T₉) produced significantly maximum plant height, number of branches, plant spread, stem diameter, diameter of flower, number of petals, weight of individual flower and yield of flowers as compared to control. The treatment of 25 g N/plant + *Azotobacter* and *Azospirillum* each @ 1ml/plant (T₈) produced maximum leaf area and initiation of first flower than control and remained at par with treatment 50 g N/plant + *Azotobacter* and *Azospirillum* each @ 1ml/plant (T₉) While, 0 g N/plant + *Azospirillum* 1ml/plant (T₄) produced maximum shelf life of flower. The treatment T₉ also recorded the highest net realization (2, 99,139 Rs./ha) and cost benefit ratio (1:4.55).

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Rose being cultivated from ancient times and maintained its position as the Queen of flowers. Rose gained popularity amongst gardeners and flower dealers on account of its easy culture and wide spectrum of attractive colours, shape, size and good keeping quality. Flower is symbolized as purity, peace, passion, love and beauty. Due to their aesthetic, economic and social values, their demand is increasing tremendously. In India, it is one of the most commonly grown loose flower and extensively used in religious and social functions. Nitrogen is one of the most important elements as well as expensive input in agricultural production. Biofertilizers are microbial inoculants of selective microorganisms like bacteria, algae, fungi already existing in nature. They may help in improving soil fertility by way of accelerating biological nitrogen fixation from atmosphere, solubilization of the insoluble nutrients already present in soil, decomposing plant residues, stimulating plant growth and production. *Azotobacter* is one of the most important non-symbiotic nitrogen fixing microorganisms. *Azospirillum* bacteria are found in association with the root system of many horticultural crops. It is associated with symbiosis where the bacterial cells are found colonizing the root cortical cells of the intercellular spaces in the cortex. These bacteria grow better under reduced oxygen levels. Hence, the present investigation with reduce dose of nitrogen with different combinations of biofertilizers on rose was taken up.

MATERIALS AND METHODS

An experiment was conducted to study the effect of biofertilizers and their combination with nitrogen fertilizer on growth, yield and quality of Rose (*Rosa damascene* L.) during the year 2007-08 in Department of Horticulture, B.A. College of Agriculture, Anand Agricultural University, Anand. Five month old plants of rose having uniform growth and vigour were selected for the study, which were planted at 1.5 x 0.9 m spacing. The soil of the experimental site was sandy loam, locally known as "Goradu". The soil was well drained and it responded well to irrigation and manuring, and was reasonably suitable for Deshi red rose cultivation. The treatments consisted of three levels of nitrogen (0, 25 and 50 g/plant) with *Azotobacter* and *Azospirillum* each @ 1 ml/plant and their combinations along with control viz., T₁: 0gN/plant + *Azotobacter* 1ml/plant, T₂: 25g N /plant + *Azotobacter* 1ml /plant, T₃: 50g N plant + *Azotobacter* 1ml /plant, T₄: 0g N /plant + *Azospirillum* 1 ml /plant, T₅: 25g N /plant + *Azospirillum* 1ml /plant, T₆: 50g N /plant + *Azospirillum* 1ml /plant, T₇: 0g N /plant + *Azotobacter* 1 ml /plant + *Azospirillum* 1 ml /plant, T₈: 25g N /plant + *Azotobacter* 1 ml /plant + *Azospirillum* 1 ml /plant, T₉: 50g N /plant + *Azotobacter* 1 ml /plant + *Azospirillum* 1 ml /plant, T₁₀: Control (RDF 50:50:0g NPK /plant). Biofertilizers i.e. *Azotobacter*, *Azospirillum* and combination of *Azotobacter* and *Azospirillum* were