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Studies on impact of bio-fertilizers and GA₃ on growth and flower yield of marigold (*Tagetes erecta* L.) cv. ORANGE DOUBLE

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Abstract : Marigold is grown for loose flowers, making garlands, decoration during pooja and several religious functions besides its use in landscape gardening. The present investigation was carried out to know the effect of bio-fertilizers and GA₃ on growth and flower yield of marigold. The treatment T₁₄ (*Azospirillum* @ 5 kg ha⁻¹ + PSB @ 5 kg ha⁻¹ + GA₃ @ 200 ppm) recorded more plant height, maximum stem girth, more dry matter production in stem, leaf and flower than other treatments. The same treatment T₁₄ also recorded significantly more diameter of flower, number of flowers per plant, yield per plot (6.45 kg) and yield per ha (9.83 t) than control.

Key words : Bio-fertilizers, GA₃, Growth parameters, Yield attributes, Marigold

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Marigold, which is also known as “*Tagetes*” is one of the commercially exploited flower crops that belong to the family Asteraceae and genus *Tagetes*. In India, marigold is cultivated on an area of 20,825 hectares with a production of more than 2 lakhs tonnes. In Karnataka, it is grown over an area of 6,985 ha with an annual production of 66,497 tonnes which shares 24 per cent of area out of the total flower production area in Karnataka (Anonymous, 2009). The use of only fertilizers is also not sufficient to increase the flower yield as applied fertilizers containing major nutrients especially N may be lost through leaching or evaporation and P may be fixed in the soil in complex form and thus both N and P availability are in lesser quantity to the crop which may be insufficient for the plant to show its maximum potentiality for producing higher yield. In order to improve deficient status of N and P in soil, the use of bio-fertilizers like *Azospirillum* which fixes atmospheric nitrogen in the soil and phosphate solubilising bacteria (PSB) which releases P from fixed complex forms in the soil and thus maintaining the nutrient reserve of the soil which is helpful for getting higher yield of flower. The use of bio-fertilizers also reduces inorganic

fertilizers to an extent of 25 per cent. Keeping these points in view, an investigation was undertaken to find out the possibilities of increasing flower yield and seed yield through the use of bio-fertilizers and GA₃ under North Eastern dry zone of Karnataka. The bio-fertilizers were inoculated to the seedlings by dipping the seedlings at the time of transplanting as per the treatments. The GA₃ sprayed twice (30 and 60 DAT) as per the treatments.

RESEARCH METHODS

The field experiment was laid out in RBD design with three replications in red soil during the year 2010-2011 at MARS Raichur. Totally 15 treatments were formed by bio-fertilizers and GA₃. The variety Orange Double was used for the studies. The size of the net plot size of 2.4 x 2.7 m was obtained after removing one ring line. 30 days old seedlings were used for transplanting. Although the observations on growth and yield parameters were recorded at 50, 100 and 150 days after transplanting, only the final observations on these parameters are presented here. Flower yield was recorded weekly after