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Effect of different gibberllic acid (GA_3) concentrations on growth, flowering and yield of African marigold

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ABSTRACT

A field experiment was conducted at Horticultural Instructional Farm, Department of Horticulture, College of Agriculture, Junagadh during winter season 2005-06 with a view to study the effect of different gibberillic acid concentrations treatment on growth, flowering and yield of African marigold cultivars. All the vegetative growth characters were highly influenced by GA_3 at 300 ppm. This treatment recorded maximum plant height at first flower initiation (57.37 cm) and full bloom (63.83cm), plant spread at flower initiation (49.66 cm^2) and full bloom stage (53.95 cm^2) and fresh weight of plant (375.85g). The highest flower diameter (6.39 cm) and maximum vase life (7.46 days) of cut flower were also recorded. While maximum number of branches (13.62) per plant and maximum flowering span (64.17 days) was observed in treatment with 200 ppm GA_3. However, 100 ppm GA_3 recorded maximum number of flowers per plant (86.43), weight of flowers (248.67g) per plant and flower yield (79.56 q/ha) in GA_3 at 300 ppm

Key words : Gibberllic acid, Growth, Flowering yield and African marigold

Appreciation of flowers transcends the boundaries of race, religion and countries and Symbolizes of man's communication with nature. In India, the estimated area under lower crops is 1.06 lakh hectares with 7.35 lakh Metric tonnes production of loose flowers and 2565 million numbers of cut flowers (Jain *et al*., 2003). The major flower growing states are Maharashtra, Rajasthan, Uttar Pradesh, Delhi and Haryana etc. The estimated area under Gujarat state is about 6956 hectare with production of 41811 meteric tonnes loose flowers and 2325 lakh cut flowers (Dhaduk *et al*., 2006). *Tagetes erecta*, the African marigold is hardy, about 90 cm tall, erect and branched. Leaves are pinnately divided and leaflets are lanceolate and serrated. Flowers are single to fully double and large sized globular heads. The florets are either Z-lipped or quilled, flower colour varies from yellow, lemon-yellow, golden yellow to orange including white colour. Marigold is mostly grown for cut flowers or loose flowers for making garlands, *venies*, bouquets, buttons, garnishing and worship or grown as flowering plant in garden display. The globular shaped flowers with long stalks are used for cut flower purpose, besides it's aesthetic value, the roots of some species contain nematicidal properties. The plant parts are also contained insecticidal and fungicidal properties. Plants are also important from herbal medicinal point of view. Marigold flowers are also used in soap making, perfumery and cosmetic Industries. Now a days the use of growth regulators play an important role by increasing, reducing or modifying the physiological process within plant and which ultimately affects the growth, flowering and yield. Gibberellins fall in growth promoter group of plant hormones. The most drastic effect of gibberellin is the transformation of dwarf plants in to tall ones by increasing in stem elongation (Phinney, 1956). Very little scientific research work has been done on this aspect in Gujarat state and particularly in Junagadh district of South Saurashtra Agroclimatic region. Therefore, present experiment was undertaken in order to study the effect of plant spacing and GA_3 on growth, flowering and yield of African marigold cultivars *viz*., Local Orange, Pusa Narangi and Pusa Basanti

MATERIALS AND METHODS

The experiment was laid out in a Factorial Randomized Block Design with three replications. The experimental material comprised of three cultivars of African marigold and four gibberellic acid (GA_3) concentrations (0, 100, 200 and 300 ppm) constituting twelve treatment combinations. Two varieties *viz*., Pusa Narangi and Pusa Bansanti were colleted from IARI New Delhi and third variety Local Orange was procured from local source. The raised beds were prepared after mixing the well rotten farm yard manure. The seeds were sown on 22nd September, 2005 at a distance of 10 cm between the rows and 2 to 3 cm within the row. Five weeks old seedlings were used for transplanting. Transplanting was done at a spacing of 45 cm between two rows and 60 cm between two plants. Three different concentrations *viz*.,