

## EFFECT OF SALINITY LEVELS AND PLANT SPACING ON GROWTH AND FLOWERING BEHAVIOUR OF MARIGOLD

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### ABSTRACTS

A field experiment was carried out during rabi season of 2009-10 and 2010-11 at R.B.S.College research farm, Bichpuri, Agra to assess the effect of planting spacing and irrigation water salinity on behavior of African marigold (*Tagetes erecta* Linn) cv. 'Pusa Narangi'. Maximum plant height and secondary branches plant<sup>-1</sup> increased at closer spacing of 50cm x 40 cm; however, spread and diameter of plant, primary branches plant<sup>-1</sup> increased in wider spacing (50 cm x 50 cm). Opening of first flower was delayed in closer spacing, whereas duration of flowering and yield (0.42 kg plant<sup>-1</sup>) was observed in wide spacing (50 cm x 50 cm) but yield (205.19 q ha<sup>-1</sup>) was obtained in closer spacing (50cm x 40 cm). The use of saline water in irrigation increase salinity levels, reduced plant height; plant spread, and yields of flower (187.9 q ha<sup>-1</sup>) in Eciw 8 dSm<sup>-1</sup>.

**Key words:** Flower yield, salinity levels, flowering behavior, marigold, spacing.

### INTRODUCTION

Marigold (*Tagetes erecta*), an important commercial flower of India belongs to family Composite. It is very popular due to easy to grow and wider adaptability. Flowers are sold in the market as loose or for making garlands. Flowers are traditionally used as offering in temples, churches and are used in festivals, beautification and landscape. It is highly suitable for pot culture, bedding and window boxes. Closer planting of marigold increased number of plants but produces poor quality flowers and wider spacing decreases number of plants and flowers which are not economical, therefore, appropriate planting is needed. Mostly farmers grow the marigold in good quality water but this crop was successfully grown in saline water irrigation condition up to ECiw 8 dSm<sup>-1</sup>. Keeping in view the importance and uses of marigold and the role of spacing and salinity, the present experiment was conducted to assess the effect of spacing and salinity on vegetative growth, flowering behavior and yield of marigold.

### MATERIALS AND METHODS

An experiment was conducted during winter season of 2010 and 2011 at Management of salt affected soils and use of saline water in Agriculture Project (ICAR) R.B.S.College, Bichpuri, Agra in factorial randomized block design. There were six treatment combinations involving two spacing (50 cm x 40 cm and 50cm x 50 cm) and three water salinity levels at (BAW, 4 and 8 dSm<sup>-1</sup>). Experiment was conducted on variety "pusa narangi" of African marigold with three replications. Four week old seedlings were transplanted on 10 September 2010 and 2011 in 2.5m x 2.5m size plots. The experimental

soil was sandy loam in texture, low in organic carbon (3.2 g kg<sup>-1</sup>), available N (186 kg ha<sup>-1</sup>), available P (13.8 kg ha<sup>-1</sup>) and medium in available K (118 kg ha<sup>-1</sup>). The soil was slightly alkaline in reaction (pH 7.9). The recommended dose of 60 kg N, 40 kg P<sub>2</sub>O<sub>5</sub> and 40 kg K<sub>2</sub>O ha<sup>-1</sup> was applied through urea, diammonium phosphate and muriate of potash, respectively. The full dose of P and K and half dose of N were given at the time of preparing soil for transplanting the seedlings. The half dose of N was given in two split at 30 and 45 days as top dressing. The data were recorded on 50 days after sowing crop vegetative characteristics. The data were recorded on vegetative characters viz. plant height, spread of plant, diameter of main stem, number of branches per plant at final harvesting and flowering characters ( days taken for opening of first flower, length of flower stalk, diameter of flower, duration of flowering, number and weight of flower per plant and yield of flower on plot basis).

### RESULTS AND DISCUSSION

All the growth parameters were influenced significantly due to spacing (Table 1). The results revealed that maximum plant height (72.8cm) and number of secondary branches (11.2) were noted with (50cm x 40cm) spacing. This was due to fact that in closer spacing, plant tend to grow vertically for more light, air and space, hence plants were taller. These results are in close conformity with those of Ram *et al.*, (1998) and Srivastava *et al.*, (2002) in marigold. However, maximum spread (48.2), diameter of main stem (2.28) and number of primary branches (17.8) were recorded in wider spacing. This may be attributed to availability of space, nutrition and air.



plant (0.40 kg) and per hectare (207.2 q ha<sup>-1</sup>) was recorded maximum with T<sub>1</sub> (BAW) and at par with T<sub>2</sub> (Eciw 4). This was mainly due to development of plants and more number of branches bearing more number of flowers. Interaction effect between spacing and salinity levels was found non-significant.

#### Economics

The data presented in Table-2 clearly indicated that the maximum net return was taken in spacing (50 cm x 40 cm) as (Rs. 28,454) and minimum was row spacing (50cm x 50cm) Rs. 25,280. In case of water salinity no difference in best available water (Rs. 28,917) and Eciw 4 dSm<sup>-1</sup> (Rs. 28,828) but the net

income decrease in use of 8 Eciw dS m<sup>-1</sup> water for irrigation (Rs. 24,670) respectively.

It is concluded that the maximum plant height and secondary branches plant<sup>-1</sup> increased at spacing 50 cm x 40 cm; however, spread and diameter of plant, primary branches plant<sup>-1</sup> increased in wider row spacing 50 cm x 50 cm. Opening of first flower was delayed in closer row spacing, whereas duration of flowering and yield of flower increased with wider row spacing. The increased water salinity decreased all yield attributing characters, yield per plant and yield. Flower yield was maximized significantly when marigold was planted at closer row spacing alone with best available water.

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