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Research Article

# PLANT GROWTH REGULATORS AFFECTING GROWTH AND SEX EXPRESSION OF ROUND MELON (*Praecitrullus fistulosus) Cv.* Arka TINDA

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**Abstract-** The present investigation was carried out during summer season, 2016 at Horticulture Instructional Farm, S. D. Agricultural University, Sardarkrushinagar (Gujarat). Experiment was laid out in Randomized Block Design with ten treatments *viz.*, $T_1$ (Control), $T_2$ ($GA_3$ 10 ppm), $T_3$ ($GA_3$ 20 ppm), $T_4$ ($GA_3$ 30 ppm), $T_5$ (Ethrel 50 ppm), $T_6$ (Ethrel 100 ppm), $T_7$ (Ethrel 150 ppm), $T_8$ (Ethrel 25 ppm), $T_9$ (NAA 50 ppm) and $T_{10}$ (NAA 100 ppm). The results revealed that, the maximum length of main vine at 60 and 90 DAS (225.07 and 268.21 cm), respectively, and number of leaves per plant at 60 and 90 days after sowing (205.78 and 332.17) and produced the maximum number of male flower (228.56) were recorded with treatment ($T_4$) $GA_3$ 30 ppm. Treatment ($T_7$) Ethrel 150 ppm proved to be most effective for produced the minimum number of sub-vine at 60 and 90 DAS (7.78 and 9.22), lower node number at which first female flower appears (5.60), lower node number per plant at main vine (24.11), lower internodal length (9.56 cm), maximum total leaf area per plant (92.39 $cm^2$), number of female flower (45.78) and fruit set percent (66.18), numbers of fruits (28.78), fruit weight (68.00 g/fruit), fruit yield per plant (2.59 kg), fruit yield per plot (18.14 kg) and higher fruit yield per hectare (129.33 q/ha). The lowered sex ratio was recorded in treatment ($T_6$) Ethrel 100 ppm *i.e.* (1: 4.06).

**Keywords**- Sex expression, $GA_3$, Growth, Ethrel, NAA, Round melon, Yield.

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## Introduction

Round melon (*Praecitrullus fistulosus* or *Citrullus vulgaris var. fistulosus*) also known as round gourd, Indian squash, squash melon, or tinda is an important cucurbitaceous vegetable cultivated extensively in summer season, especially in North India. It is a member of the cucurbitaceous family and the origin is probably from north-western India, where wild types may still be found in the wild. Its immature fruits are cooked as vegetable.

In India, it is cultivated mainly in Punjab, Haryana, Uttar Pradesh and Rajasthan, etc in the dry season (February to end of April) or in the rainy season (mid-June to end of July). The Hindi name 'tinda' is commonly used in other parts of the world. In African continent, especially in East Africa, it is cultivated to meat out requirement of vegetable for the Asian population. In Ghana and Kenya it is grown for the export purpose to the United Kingdom. It is also cultivated on a small scale in United States of America. The sex expression in most of the cucurbitaceous crops, which have monoecious plants, is governed by genetical as well as environmental factors [1]. Tidejens (1928) reported that increased light intensity increases male: female ratio [2]. The modifying effects of the environment are through regulating the biosynthetic processes of various cell constituents, which might have direct bearing on the sex status of the plant.

A relationship between growth substances and sex expression probably exists in these plants. During flowering period, formation of pistillate organs is favoured by high auxin level in vicinity of differentiating primordial and of staminate organs by a low level [3]. Sex modification and a shift towards femaleness in sex expression by exogenous application of auxin, gibberellins, growth regulators, macro and micro nutrient also play important role which have been reported in cucumber [4] and in watermelon [5]. Certain growth regulating chemicals *viz.*, NAA, $GA_3$, TIBA, MH and Ethrel have been reported to influence sex suppression of male flower [6] in cucumber. The growth regulators suppress the number of male flower on lateral branches. Therefore, they increase the female flower production a lateral branches and thereby finally increase the yield. The present investigation was therefore undertaken to evaluate the potentiality of $GA_3$, Ethrel and NAA on influencing the growth, flowering and fruiting behavior of round melon.

## Materials and Methods

The experiment was laid out in Randomized Block Design with three replications during summer, 2016 on Horticulture Instructional Farm, S. D. Agricultural University, Sardarkrushinagar, Gujarat. The variety Arka Tinda were tested with ten treatments *viz.*, $T_1$ (Control), $T_2$ ($GA_3$ 10 ppm), $T_3$ ($GA_3$ 20 ppm), $T_4$ ($GA_3$ 30 ppm), $T_5$ (Ethrel 50 ppm), $T_6$ (Ethrel 100 ppm), $T_7$ (Ethrel 150 ppm), $T_8$ (Ethrel 25 ppm), $T_9$ (NAA 50 ppm) and $T_{10}$ (NAA 100 ppm). The seeds were sown at a spacing of 2 × 1 $m^2$ on 15th February. The applications of well decomposed farm yard manure @ 20 t/ha were applied for all the experimental plots uniformly as basal application. Nitrogen @ 100 kg/ha was applied in two equal split doses at basal dose and 30 days after sowing. Phosphorus @ 50 kg/ha and Potassium @ 50 kg/ha were applied as a basal dose. The nitrogen, phosphorus and potash were applied in form of organic manures (FYM, neem cake and poultry manure)

Standard cultural practices were followed during the entire crop period for all the experiment plots. The seedlings were sprayed with each chemical once at 2-true and 4th leaf stages. The data were recorded from five randomly selected tagged plants. All the recorded data were analyzed statistically following analysis techniques of Panse and Sukhatme (1985) [7].

## Results and Discussion

### Effect of $GA_3$, Ethrel and NAA on growth parameters:

### Length of main vine

The main vine at 60 and 90 days after sowing was recorded highest in treatment $T_4$ ($GA_3$ 30 ppm) *i.e.,* 225.97 cm and 268.21 cm. The main vine at 60 days after sowing was statistically at par with treatment $T_3$ ($GA_3$ 20 ppm), $T_8$ (NAA 25 ppm) *i.e.,* 209.33 cm and 205.33 cm. whereas was statistically at par with treatment $T_3$ ($GA_3$ 20 ppm), $T_2$ ($GA_3$ 10 ppm) and $T_7$ Ethrel (150 ppm) *i.e.,* 256.68 cm, 245.17 cm and 243.78 cm respectively. Treatment $T_1$ (Control) recorded minimum length of main vine *i.e.,* 218.33 cm. Treatment $T_1$ (Control) recorded shortest length of main vine at 60 and 90 days after sowing *i.e.,* 180.68 cm and 218.33 cm.

The beneficial effect of $GA_3$ at particular concentrations could be attributed to stimulatory action of $GA_3$ resulting in increased vine length [8]. Wittwar and Hillyer (1954) [9] reported that exogenous application of $GA_3$ adds up to the quantity of endogenous gibberellins like substances within the plant and cause extra stimulation of growth. This may be probable reason of increased vine length by $GA_3$ application in round melon. These results are in close accordance with those reported by Chaudhary *et al.* (2016) [10] in watermelon and Dixit *et al.* (2001) [11] in watermelon and Prasad *et al.* (2003) [12] in cucumber.

**Table-1** *Effect of $GA_3$, Ethrel and NAA on growth attributes of round melon cv. 'Arka Tinda'*

| Treatments | Length of main vine (cm) | | Number of sub-vine | | Number of leaves/plant | | Total leaf area ($cm^2$) | Node number at which first female flower appears | Average length of internode (cm) |
|---|---|---|---|---|---|---|---|---|---|
| | 60 DAS | 90 DAS | 60 DAS | 90 DAS | 60 DAS | 90 DAS | | | |
| $T_1$ (Control) | 180.68 | 218.33 | 5.11 | 6.56 | 141.67 | 227.97 | 71.22 | 7.87 | 11.00 |
| $T_2$ ($GA_3$ 10 ppm) | 196.33 | 245.17 | 5.00 | 6.67 | 165.00 | 282.13 | 71.95 | 5.87 | 11.67 |
| $T_3$ ($GA_3$ 20 ppm) | 209.33 | 256.68 | 5.33 | 6.11 | 180.44 | 314.87 | 73.52 | 6.47 | 11.00 |
| $T_4$ ($GA_3$ 30 ppm) | 225.97 | 268.21 | 5.89 | 6.56 | 205.78 | 332.17 | 74.33 | 7.47 | 11.89 |
| $T_5$ (Ethrel 50 ppm) | 200.18 | 235.41 | 7.11 | 7.67 | 187.67 | 278.67 | 79.49 | 6.00 | 11.44 |
| $T_6$ (Ethrel 100 ppm) | 194.50 | 237.50 | 7.11 | 7.67 | 191.00 | 290.57 | 88.85 | 5.67 | 10.78 |
| $T_7$ (Ethrel 150 ppm) | 199.66 | 243.78 | 7.78 | 9.22 | 196.22 | 272.13 | 92.39 | 5.60 | 9.56 |
| $T_8$ (NAA 25 ppm) | 205.23 | 223.67 | 5.67 | 6.44 | 149.78 | 281.87 | 74.70 | 7.37 | 11.89 |
| $T_9$ (NAA50 ppm) | 183.22 | 232.07 | 5.56 | 6.33 | 171.44 | 286.40 | 73.81 | 6.40 | 11.78 |
| $T_{10}$ (NAA 100 ppm) | 191.27 | 230.98 | 5.78 | 7.00 | 170.11 | 282.03 | 74.29 | 7.10 | 11.56 |
| S.Em. ± | 8.14 | 9.46 | 0.45 | 0.45 | 12.83 | 11.56 | 1.87 | 0.48 | 0.45 |
| C.D. at 5 % | 24.19 | 28.11 | 1.36 | 1.35 | 38.14 | 34.34 | 5.56 | 1.42 | 1.35 |

**Table-2** *Effect of $GA_3$, Ethrel and NAA on flowering parameters of round melon cv. 'Arka Tinda'*

| Treatments | Days taken for appearance of first female flower | Number of female flowers | Number of male flowers | Sex ratio (female: male) | Percent fruit set |
|---|---|---|---|---|---|
| $T_1$ (Control) | 28.67 | 33.56 | 148.33 | 4.44 | 43.15 |
| $T_2$ ($GA_3$ 10 ppm) | 28.67 | 39.00 | 182.11 | 4.67 | 57.56 |
| $T_3$ ($GA_3$ 20 ppm) | 28.11 | 40.22 | 196.00 | 4.88 | 57.22 |
| $T_4$ ($GA_3$ 30 ppm) | 28.78 | 41.78 | 228.56 | 5.52 | 59.50 |
| $T_5$ (Ethrel 50 ppm) | 29.00 | 41.78 | 179.22 | 4.37 | 62.85 |
| $T_6$ (Ethrel 100 ppm) | 27.44 | 45.44 | 176.11 | 4.06 | 65.34 |
| $T_7$ (Ethrel 150 ppm) | 25.22 | 45.78 | 183.78 | 4.12 | 66.18 |
| $T_8$ (NAA 25 ppm) | 29.11 | 33.56 | 172.33 | 5.22 | 53.15 |
| $T_9$ (NAA50 ppm) | 29.22 | 37.44 | 181.11 | 4.87 | 64.99 |
| $T_{10}$ (NAA 100 ppm) | 29.56 | 36.00 | 186.44 | 5.21 | 55.18 |
| S.Em. ± | 1.12 | 2.50 | 9.02 | 0.25 | 4.45 |
| C.D. at 5 % | NS | 7.43 | 26.81 | 0.75 | 13.23 |

### Number of sub vine

The sub vine at 60 days after sowing was recorded highest in treatment $T_7$ (Ethrel 150 ppm) *i.e.,* 7.78 and 9.22, which was statistically at par with treatment $T_6$ (Ethrel 100 ppm), $T_5$ (Ethrel 50 ppm) *i.e.,* 7.11 and 7.11. There treatment $T_3$ ($GA_3$ 20 ppm) recorded lowest number of sub vine at 60 days after sowing *i.e.,* 5.00. Whereas Treatment $T_3$ ($GA_3$ 20 ppm) recorded minimum number of sub vine at 90 days after sowing *i.e.,* 6.11 other than all the treatments. This may be due to the effect of ethrel to enhance cell elongation and cell division. Dixit *et al.* (2001) in watermelon, Prasad *et al.* (2003) in cucumber and Arora and Partap (1988) [13] in pumpkin.

### Number of leaves per plant

The number of leaves per plant at 60 and 90 days after sowing was recorded highest in treatment $T_4$ ($GA_3$ 30 ppm) *i.e.,* 205.78 and 332.17. The number of leaves per plant at 60 days after sowing was statistically at par with treatment $T_7$ (Ethrel 150 ppm), $T_6$ (Ethrel 100 ppm), $T_5$ (Ethrel 50 ppm), $T_3$ ($GA_3$ 20 ppm), $T_9$ (NAA 50 ppm) and $T_{10}$ (NAA 100 ppm) *i.e.,* (196.22), (191.00), (187.67), (180.44), (171.44) and (170.11), whereas number of leaves per plant at 90 days after sowing was statistically at par with treatment $T_3$ ($GA_3$ 20 ppm) *i.e.,* 314.87. Treatment $T_1$ (Control) recorded shortest number of leaves per plant at 60 and 90 days after sowing *i.e.,* 141.67 and 227.97. The increase in the number of leaves due to $GA_3$ might to be due to its additional availability of GA in seed which might have increased the level of amylase in the aleurone tissue of seed for better conversion of complex starch in to simple sugar for providing energy for growth [14]. Corroborative findings has also been reported by Chaudhary *et al.* (2016), Chovatia *et al.* (2010) [15] in bitter gourd and Dixit *et al.* (2001) in watermelon.

### Total leaf area/plant ($cm^2$)

The total leaf area/plant was recorded highest in treatment $T_7$ (Ethrel 150 ppm) *i.e.,* 92.39 $cm^2$ and it was statistically at par with treatment $T_6$ (Ethrel 100 ppm) *i.e.,* 88.85 $cm^2$. Treatment $T_1$ (Control) recorded lowest leaf/plant *i.e.,* 71.22 $cm^2$. These results are in agreement with the findings of Arora *et al.* (1989) [16] and Arora and Pratap (1988) in pumpkin [17].

### Node number at which first female flower appears

The minimum node number at which first female flower appears (5.60) was recorded in treatment $T_7$ (Ethrel 150 ppm) which was statistically at par with treatment $T_6$ (Ethrel 100 ppm), $T_2$ ($GA_3$ 10 ppm), $T_5$ (Ethrel 50 ppm) $T_9$ (NAA 50 ppm) and $T_3$ ($GA_3$ 20 ppm) *i.e.,* 5.67, 5.87, 6.0, 6.40 and 6.47 respectively. Treatment $T_1$ (control) recorded maximum node number at which first female flower appears *i.e.,* 7.87. The appearance of female flower at lowest node

observed in treatment $T_7$ (Ethrel 150 ppm). Probable reason of the initiation of female flowers at lower nodes might be the sex reversal due to growth substances in the lower staminate nodes. These results are conformity with those of Kakroo *et al.* (2005) [18] in bottle gourd, Patel (1997) [19] and Gopalkrishnan and Chaudhury (1978) in watermelon, Arora *et al.* (1987) in ridge gourd.

**Average length of internode (cm)**

The minimum average length of internode (9.56 cm) was recorded in treatment $T_7$ (Ethrel 150 ppm) and it was statistically at par with $T_6$ (Ethrel 100 ppm) *i.e.*, 10.78 cm. Treatment $T_4$ ($GA_3$ 30 ppm) recorded maximum average length of internode *i.e.,* 11.89. These results are close accordance with those findings of Sinha and Mandal (2000) [20] in cucumber.

**Table-3** *Effect of $GA_3$, Ethrel and NAA on yield and yield attributes of round melon cv. 'Arka Tinda'*

| Treatments | Days taken from fruit set to edible maturity | Number of fruit/plant | Fruit weight (kg) | Fruit yield/plant (kg) | Fruit yield/plot (kg) | Fruit yield/hectare (q) |
|---|---|---|---|---|---|---|
| $T_1$ (Control) | 14.22 | 17.78 | 47.22 | 2.16 | 12.15 | 108.23 |
| $T_2$ ($GA_3$ 10 ppm) | 12.33 | 22.44 | 47.67 | 2.20 | 13.18 | 109.99 |
| $T_3$ ($GA_3$ 20 ppm) | 12.78 | 21.33 | 55.33 | 2.22 | 13.99 | 110.94 |
| $T_4$ ($GA_3$ 30 ppm) | 13.00 | 24.22 | 60.11 | 2.30 | 14.83 | 115.00 |
| $T_5$ (Ethrel 50 ppm) | 13.67 | 25.22 | 52.67 | 2.37 | 14.26 | 118.33 |
| $T_6$ (Ethrel 100 ppm) | 13.56 | 28.22 | 66.56 | 2.49 | 15.58 | 124.67 |
| $T_7$ (Ethrel 150 ppm) | 11.56 | 28.78 | 68.00 | 2.59 | 18.14 | 129.33 |
| $T_8$ (NAA 25 ppm) | 13.11 | 20.22 | 53.22 | 2.17 | 14.77 | 108.64 |
| $T_9$ (NAA50 ppm) | 13.44 | 19.89 | 58.44 | 2.05 | 13.68 | 102.67 |
| $T_{10}$ (NAA 100 ppm) | 13.22 | 19.78 | 56.11 | 2.07 | 13.50 | 103.33 |
| S.Em. ± | 0.80 | 0.95 | 4.42 | 0.11 | 0.67 | 5.52 |
| C.D. at 5 % | NS | 2.84 | 13.14 | 0.32 | 2.00 | 16.42 |

**Effect of $GA_3$, Ethrel and NAA on flowering parameters:**

**Days taken for appearance of first female flower after sowing**

The minimum days taken for appearance of first female flower after sowing (25.22) was recorded in treatment $T_7$ (Ethrel 150 ppm). Treatment $T_{10}$ (NAA 100 ppm) recorded maximum days taken for appearance of first female flower after sowing *i.e.,* 29.56. These results are in agreement with the findings of Arora *et al.* (1989) and Arora and Pratap (1988) in pumpkin.

**Number of female flower/plant**

Treatment $T_7$ (Ethrel 150 ppm) recorded maximum number of female flower/vine *i.e.,* 45.78 which was statistically at par with $T_6$ (Ethrel 100 ppm), $T_5$ (Ethrel 50 ppm), $T_4$ ($GA_3$ 30 ppm), $T_3$ ($GA_3$ 20 ppm), $T_2$ ($GA_3$ 10 ppm) *i.e.,* 45.74, 41.78, 41.78, 40.22 and 39.00 respectively. The minimum number of female flowers/vine recorded with treatment $T_1$ (control) and $T_8$ (NAA 25 ppm) *i.e.,* 33.56 and 33.56. In the present investigation Ethrel 150 produce more number of female flowers might be due to ethrel decreased vine length and resulted in production of more primary branches on which female flowers appeared in large number. These results are conformity with the results of Sinha and Mandal (2000) in cucumber and Gopalkrishnan and Chaudhury (1978) in watermelon.

**Number of male flower/plant**

The treatment $T_4$ ($GA_3$ 30 ppm) recorded maximum number of male flowers/vine *i.e.,* 228.56. The minimum number of male flowers/vine recorded in treatment $T_1$ (control) *i.e.,* 148.33. Khan and Chaudhary (2006) [21] concluded that particularly effect of $GA_3$ on flowering was partially restored by phytohormone. Similar response of $GA_3$ on number of male flower has been reported Chaudhary *et al.* (2016) and Gopalkrishnan and Chaudhary (1978) in watermelon, Singh *et al.* (1975) [22] in summer squash.

**Male: female flower (sex ratio)**

The lowest sex ratio (male: female) was recorded with treatment of $T_6$ (Ethrel 100 ppm) *i.e.,* 4.06 through it was statistically at par with treatment $T_7$ (Ethrel 150 ppm), $T_5$ (Ethrel 50 ppm), $T_1$ (control) and $T_2$ ($GA_3$ 10 ppm) *i.e.,* 4.12, 4.37, 4.44 and 4.67 respectively. The maximum sex ratio (male: female) recorded in treatment $T_4$ ($GA_3$ 30 ppm) *i.e.,* 5.52. Gopalkrishnan and Chaudhury (1978), the lower the node number of the first female flower, the lower is the male : female ratio, it was evident that in the present studies the vine treated with Ethrel 100-150 ppm the first female flower appeared at the lowest node and the male : female flower ratio was also lowest. These results are in agreement with the findings of Kakroo *et al.* (2005) in bottle gourd, Arora *et al.* (1989) and Arora and Pratap (1988) in pumpkin.

**Percent fruit set**

The maximum percent of fruit set (66.18) was recorded in treatment $T_7$ (Ethrel 150 ppm). Which was statistically at par with treatments $T_6$ (Ethrel 100 ppm), $T_9$ (NAA 50 ppm), $T_5$ (Ethrel 50 ppm), $T_4$ ($GA_3$ 30 ppm), $T_2$ ($GA_3$ 10 ppm), $T_3$ ($GA_3$ 20 ppm), $T_{10}$ (NAA 100 ppm) and $T_8$ (NAA 25 ppm) *i.e.,* 65.34, 64.99, 62.85, 59.50, 57.56, 57.22, 55.18 and 53.15. Treatment $T_1$ (control) recorded minimum percent fruit set *i.e.,* 43.15. These results are in close accordance with the findings of Kakroo *et al.* (2005) in bottle gourd, Arora *et al.* (1989) in pumpkin.

**Effect of $GA_3$, Ethrel and NAA on yield parameters:**

**Days taken from fruit set to edible maturity**

The minimum days taken for fruit set to edible maturity (11.56) was recorded in treatment $T_7$ (Ethrel 150 ppm). Treatment $T_1$ (control) recorded maximum fruit set to edible maturity *i.e.,* 14.22. The similar beneficial effect of growth substances were reported by Kakroo *et al.* (2005) in bottle gourd, Arora *et al.* (1989) in pumpkin.

**Number of fruits/plant**

Treatment $T_7$ (Ethrel 150 ppm) recorded maximum numbers of fruits *i.e.,* 28.78 and which was statistically at par with treatment $T_6$ (Ethrel 100 ppm) *i.e.,* 28.22. The minimum numbers of fruits was recorded with treatment $T_1$ (control) *i.e.,* 17.78. This may due to the fact that ethrel suppressed the number of male flowers and promoted number of female flowers there by increased number of fruits and ultimately produced the more yield. Similar results were observed by Kakroo *et al.* (2005) in bottle gourd and Arora *et al.* (1989) in pumpkin.

**Fruit weight (g)**

The maximum fruit weight (68.00 g) was recorded in treatment $T_7$ (Ethrel 150 ppm) which was statistically at par with treatment $T_6$ (Ethrel 100 ppm), $T_4$ ($GA_3$ 30 ppm), $T_9$ (NAA 50 ppm) and $T_{10}$ (NAA 100 ppm) and $T_3$ ($GA_3$ 20 ppm) *i.e.,* (66.56 g), (60.11 g), (58.44 g), (56.11 g) and (55.33 g) respectively. The minimum fruit weight recorded with treatment $T_1$ (Control) *i.e.,* (47.22 g). These results are in agreement with the findings of Kakroo *et al.* (2005) in bottle gourd and Arora and Pratap (1988) in pumpkin.

**Fruit yield/plant (kg)**

The maximum fruit yield/plant (2.59 kg) was recorded in treatment $T_7$ (Ethrel 150 ppm) which was statistically at par with treatment $T_6$ (Ethrel 100 ppm), $T_5$ (Ethrel 50 ppm) and $T_4$ ($GA_3$ 30 ppm) *i.e.,* (2.49 kg), (2.37 kg) and (2.30 kg) respectively. The minimum fruit yield/plant recorded with treatment $T_9$ (NAA 50 ppm) *i.e.,* (2.05 kg). These results are in agreement with the findings of Kakroo *et al.* (2005) in

bottle gourd and Arora and Pratap (1988) in pumpkin.

**Fruit yield/plot (kg) and hectare (q)**

The highest fruit yield/plot (18.14 kg) and hectare (129.33 q) were recorded in treatment $T_7$ (Ethrel 150 ppm) though fruit yield/hectare was statistically at par with treatment $T_6$ (Ethrel 100 ppm), $T_6$ (Ethrel 100 ppm) and $T_4$ ($GA_3$ 30 ppm) *i.e.,* (124.67 q), (118.33 q) and (115.00 q) respectively. The lowest fruit yield/hectare recorded with treatment $T_9$ (NAA 50 ppm) *i.e.,* (102.67 q). Whereas minimum fruit yield/plot recorded with treatment $T_1$ (control) *i.e.,* (12.15 kg). The probable reason for increased fruit yield due to ethrel treatment was suppressed the number of male flowers and promoted number of female flowers there by increased number of fruits and ultimately produced the more yield. These results are in agreement with the findings of Kakroo *et al.* (2005) in bottle gourd and Arora and Pratap (1988) in pumpkin.

**Conclusion**

In light of the results obtained from present investigation, it could be concluded that the better growth, early flowering, minimum sex ratio and highest fruit yield could be achieved by the spray of ethrel 150 ppm at 2-4 leaf stages Round melon *cv.* 'Arka Tinda' under the North Gujarat Agro-climatic conditions.

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