DISCUSSION
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The growth hormones influence characteristics and development of plant as an organism. By application of auxin, gibberellins and ethrel growth actions are altered artificially and hence is of innumerable use. In recent years plant growth substances are being increasing used as foliar spray to modify flowering and fruiting of plants. With this background, the research was undertaken to workout importance of NAA, GA₃ and Ethrel on mango.

A critical study of data shows the usefulness of plant growth regulators (i.e. NAA, GA₃ and Ethrel) in bringing marked changes in flowering, fruiting and physico chemical composition of mango fruits.

Effect of Growth Regulators on size of the panicle:

The response of different concentration of NAA, GA₃ and Ethrel was favourable in increasing the panicle length (Table 2). It is cerdent that tree with NAA treatment had highest length and width breadth. In general it is observed that when these
are active growth there is auxin production. Growing meristem and enlarging organs of vascular plants have seen to produce auxins. A close correlation between growth rate and auxin production has been shown as long as growth capacity persists. (LEOP LD 1960).

Almost universally very little amount of free auxin appeared in dormant meristematic tissues. Application of NAA directly increased the concentration of auxin which might have stimulated the panicle size in mango. Application of gibberellins has been reported to increase the endogenous auxin content (Phillips et al 1959) and Rajput and Singh 1983, Sainju et al (1988), Khan and Singh (1988). Growth response were proportional to increased auxin level.

The favourable response on the growth character of various fruit crop have been reported with the treatment of growth stimulating substances. These result are in conformity to Randhawa and Singh 1962.

EFFECT OF GROWTH REGULATORS ON THE FLOWERING BEHAVIOUR AND DURATION OF BLOSSOMING:

Duration of blossoming was most reduced by the application of different concentration of NAA. In the present investigation it was noted that NAA 300ppm concentration proved very effective in reducing the
flowering span, flowering was completed in 29.33 days and 30 days, the next effective treatment in this regard was, however, observed 200 ppm NAA in 30.00 days and 30.33 days. There was reduction of flowering span in there treatment by about 4 and 3 day respectively. The findings are in conformity with the respect of Singh (1977) who noted a reduction in the blossoming duration (37 days with 50 days for the control) under the influence of NAA, 2, 4-D and 2,4,5-T. Similar finding were reported by Singh and Rajput (1986), Tomer (1984) with GA3 also. Sainju et al (1988) with GA3 and, with Ethephon Ketechi and Williams (1969) and Nakata (1970) and Chacko et al (1972) and Chacko et al (1974). Pandey et al 1973, Casta and Filiti (1973). Rath and Das (1979), Nunez-elisea et al 1980 and Biswas et al 1982. Padmini et al (1985) also given the same result. Pandey and Nirwadkar (1984) Prasad and Ray (1987) Chen and Ku (1988). The observation made on the effect of growth regulators on flowering pattern exhibits maximum flowering with different concentration of GA3 as compared to other regulators. Similar finding were reported by Rajput and Singh (1983), Rawash et al (1983) and, also Muranishi (1968). Flowering was all increased with NAA at 100 ppm. Sen and Maiti 1965 and with Ethrel
treatment also increased the flowering Cocke and Randall (1968), Chacko et al. (1974), Rawash et al. (1983) and Bandhu (1986) and Cottin (1989). A marked reduction is in sex ratio in mango has been recorded with the application of various treatment of plant growth regulators. The application of 300 ppm NAA revealed lowest gap between hermaphrodite and male flowers similarly other applications of NAA, GA₃ and Ethrel, led to reduction in sex ratio. Possible reason for reduction in sex ratio may be explained on the basis of findings of Harrison (1957) the reported that auxin levels play an important part in flower development. Similar finding were observed with NAA by Harrison (1977), Prakash and Ram (1984), Chatoupadhaya and Jana (1988), Moti (1971) with NAA and GA₃ also given satisfactory result. Guttridge (1962), Marcelle & Sironval (1963) Griggs & Iwakiri (1961), Chacko (1968), Singh et al. (1969), Kachru et al. (1971), Rajput and Bist (1969). Etherel treatment also given better result in development of female organs. Pandey et al. (1973), Padmini et al. (1985), Edelstein et al. (1985) given same opinion. The pastulated that auxin concentration necessary for female organ development may be much higher that that observed for male organ development Singh et al. (1965), Mallik (1974) and Maiti (1973) found
increasing flowering as a reason for higher male female ratio. Gosh and Sen (1975) found lower male: female ratio in Papaya by use of NAA. Shawky et al (1978) reported that the application of GA₃ to mango cv. Taimour in mid-November increased the number of perfect flower in panicle and Singh (1983) and Bandhu (1986) Singh (1977) and Singh and Dhillon (1986) also reported increase in the number of hermaphrodite flower with the application of NAA in Dashehari cv. of mango. Chemical Ethrel also increasing the hermaphrodite flowers and also improved sex ratio. Pandey and Nirwadkar (1984) and Arora et al (1989) and Kaushal et al (1984).

Effect of Plant growth regulators on the fruiting behaviour:

The treatment of plant growth regulators gave favourable result in fruiting character as shown in Table 6, and 7. The treatment obviously increased fruit set and fruit retention. Increased fruit set per panicle may be due to the production of higher number of hermaphrodite flowers per panicle. Besides presence of large amount of auxins after pollination and the fact that synthetic auxin is itself responsible for fruit set
(Leopold, 1960). Auxin content in mango during the first 2-3 weeks after pollination is low and the ability of mango fruits to mobilize food material is poor due to low auxin level which results in fruit drop. As the fruit develops the amount of auxin rises rapidly which is helpful in mobilization of food material. (Chalko et al. 1972). Several other workers given this opinion that NAA increasing fruit set per penicle, Arawinda Kshah et al. (1979), Sarkar et al. (1984), Babu and Lavania 1985, Zang et al. (1988), Singh and Chadha (1990) & Keskar (1986). Auxin and gibberllins effectively increase fruit set in ' Bartleth" pear (Griggs and Iwakisi 1961), in Fig. (Crane, 1965) in mango (Rao 1961 and Arora and Singh 1964), Hassion (1988), Subhadrabandhu (1986), Pain and Saha (1974), Rana (1974), Ranjeet Kumar et al. (1975), Gracia Marting & Gracia papi (1979), Babu et al. (1984), Babu and Lavania (1985), Kulkarni and Rameshwar (1978), Cottin (1989) with GA\textsubscript{3} in different fruit crops. Etherel treatment also increasing in fruit setting in different fruit crop. Edgerton & Greene Halgh (1969), Rawash et al. (1983), Zang et al. (1988), Curry and Willianas (1989). The increased pollengermination and pollen tube growth might be another possible region for higher fruit set. Dhuria and Randhawa (1963) with GA\textsubscript{3} in sweet lime.
All these three plant growth regulators led to lower rate of fruit drop. The fruit drop takes place principally as a result of weakening and ultimate rupturing of the middle lamella, possibly through inhibition of enzymes which render pectins. Whether conditions such as wind velocity and temperature too are responsible for fruit drop. Reduction in percent fruit drop also favour the hypothesis of Luckwill (1963) who established a relationship between auxins and fruit drop in apple. Higher fruit set and lesser fruit drop led to increase in fruit retention. This result is in conformity with finding of several other workers, (Singh, 1977), Rowash et al (1983) and Rajput and Singh (1983), Prasad and Pathak (1972), Maurya and Singh (1979), Singh and Ram (1983), Prakash and Ram (1986), Beghel et al (1987), Johnson and Sharma (1987), Sharma and Dhillon (1987), Thakur et al (1990), Sharma and Awasthi (1990), Sharma and Dhillon (1987), Turnbull (1989) with NA, GA3 & Pandey et al (1980) with etherel. Who observed similar trend in fruit set and fruit retention in mango as influenced by other growth regulators. Fruit drop was also reduced by different plant both regulator this result is in conformity with finding of several other worker; Chundawat et al (1975) Rathore (1975),
Effect of growth regulators on physico-chemical composition of mango fruit:

Foliar application of growth substances i.e. NAA, GA₃ and Ethrel improved the length, diameter and weight of the fruit as shown in Table 8. Increase in fruit size may be attributed mainly to cell enlargement. Increase in size automatically led to increase in weight (Table 12 & 13). This result is in conformity with Chadha and Singh (1963), Das and Reddy (1974), Tiwari and Moti (1977), Pandey et al (1983), Mishra and Singh (1984), Babylatha and Aravinda Kash (1984), Singh and Phogat (1984), Sarkar (1984), Babu and Lavana (1985), Sharma and Dhillion (1986), Johnson and Sharma (1987), Chandra (1987), Khader (1988), Wang and Shiesh (1990). The weight of
pulp, peel, stone remained significantly more than that of control. Pulp stone ratio similarly was better than that of control, with NAA being most effective in all the three concentrations. Increase in size of fruit may be attributed to accumulation of metabolites and photosynthetics. (Leopold 1960). Medlicott and Thompson (1985), Sharma and Dhillion (1984), Baghel et al (1987). Mshéva (1987). given some opinion.

The improved quality of fruit can be attributed to foliar application of growth regulators leading to cell elongation, extension accompanied by considerable increase in sugar content. This result is in conformity with finding of Rao and Rao (1961), Rao (1970), Jun hoari and Lyons (1970), Prasad and Pathak (1972), Nura and Das (1974), Sharma et al. (1975), Murya and Singh (1979) and Singh and Phogat (1984), Sarkar (1984), Babu et al. (1984), Keskar et al. (1986), Johnson and Sharma (1967), Sharma and Dhillon (1987), Ograkh Singh (1988). Foregoing discussion highlights the importance of growth regulators (NAA, GA\textsubscript{3} and Ethrel) treatment as foliar spray for modifying flowering and fruiting behaviour in mango. Treatment of growth regulators also brought a bout improvement in physico-chemical composition of fruit.