CHAPTER VI
SUMMERY and CONCLUSION

The present investigation entitled “Effect of plant growth regulators on flowering, yield and quality of sapota [Manilkara achras (Mill.) Forsberg] cv. Kalipatti” was carried out at Fruit Research Station, Lal Baugh, Department of Horticulture, Junagadh Agricultural University, Junagadh during the year 2015-16. The experiment was laid out in Randomized Block Design (RBD) with nine treatments and three replications. The plant growth regulators like, CCC, NAA, GA3 were sprayed and water spray was considered as control.

The effect of these treatments on flower, yield and quality of sapota fruit are summarized as below.

6.1 Flowering parameters

- Among the different plant growth regulators, significantly maximum number of buds per shoot (12.08) was noted in treatment T7 [CCC 450 ppm (FBD stage) + NAA 150 ppm (Pea stage) + GA3 50 ppm (Fruit development stage)], however, it was found at par with treatment T5 [CCC 450 ppm (FBD stage) + NAA 100 ppm (Pea stage) + GA3 50 ppm (Fruit development stage)] (11.52), T3 [CCC 350 ppm (FBD stage) + NAA 150 ppm (Pea stage) + GA3 50 ppm (Fruit development stage)] (11.10).

- Among the different plant growth regulators, significantly minimum number of buds drop per shoot (2.30) was noted in treatments T7 [CCC 450 ppm (FBD stage) + NAA 150 ppm (Pea stage) + GA3 50 ppm (Fruit development stage)], however, it was found at par with treatment T5 [CCC 450 ppm (FBD stage) + NAA 100 ppm (Pea stage) + GA3 50 ppm (Fruit development stage)] (2.37), T3 [CCC 350 ppm (FBD stage) + NAA 150 ppm (Pea stage) + GA3 50 ppm (Fruit development stage)] (2.40).

- Among the different plant growth regulators, significantly maximum number of flowers per shoot (9.78) was produced in treatment T7 [CCC 450 ppm (FBD stage) + NAA 150 ppm (Pea stage) + GA3 50 ppm (Fruit development stage)],
however, it was found at par with treatment T₅ [CCC 450 ppm (FBD stage) + NAA 100 ppm (Pea stage) + GA₃ 50 ppm (Fruit development stage)] (9.15).

- Among the different plant growth regulators, significantly maximum number of fruit set per shoot (4.42) was noted in treatments T₇ [CCC 450 ppm (FBD stage) + NAA 150 ppm (Pea stage) + GA₃ 50 ppm (Fruit development stage)], however, it was found at par with treatment T₅ [CCC 450 ppm (FBD stage) + NAA 100 ppm (Pea stage) + GA₃ 50 ppm (Fruit development stage)] (4.03).

- Among the different plant growth regulators significant minimum number of fruit drop per shoot (2.39) was noted in control.

- The different treatments recorded the non-significant results in terms of fruit set per shoot (%), fruit drop per shoot (%) and fruit retention per shoot (%).

6.2 Yield and yield attributing parameters

- Among the different plant growth regulators, significantly maximum number of fruits per tree (683.33) was recorded in treatments T₇ [CCC 450 ppm (FBD stage) + NAA 150 ppm (Pea stage) + GA₃ 50 ppm (Fruit development stage)], however, it was found at par with treatment T₅ [CCC 450 ppm (FBD stage) + NAA 100 ppm (Pea stage) + GA₃ 50 ppm (Fruit development stage)] (617.27), T₃ [CCC 350 ppm (FBD stage) + NAA 150 ppm (Pea stage) + GA₃ 50 ppm (Fruit development stage)] (603.33).

- In case of fruit weight (93.77 g), the result shows significantly maximum fruit weight in treatments T₇ [CCC 450 ppm (FBD stage) + NAA 150 ppm (Pea stage) + GA₃ 50 ppm (Fruit development stage)], however, it was found at par with treatment T₅ [CCC 450 ppm (FBD stage) + NAA 100 ppm (Pea stage) + GA₃ 50 ppm (Fruit development stage)] (90.90), T₃ [CCC 350 ppm (FBD stage) + NAA 150 ppm (Pea stage) + GA₃ 50 ppm (Fruit development stage)] (89.30).

- Among the different plant growth regulators, significantly maximum fruit length (6.62 cm) in observed in treatments T₇ [CCC 450 ppm (FBD stage) + NAA 150 ppm (Pea stage) + GA₃ 50 ppm (Fruit development stage)], however, it was found at par with treatment T₅ [CCC 450 ppm (FBD stage) + NAA 100 ppm (Pea stage) + GA₃ 50 ppm (Fruit development stage)] (6.22),
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T₃ [CCC 350 ppm (FBD stage) + NAA 150 ppm (Pea stage) + GA₃ 50 ppm (Fruit development stage)] (6.17).

- In case of fruit width (5.59 cm) the result shows significantly maximum fruit width in treatments T₇ [CCC 450 ppm (FBD stage) + NAA 150 ppm (Pea stage) + GA₃ 50 ppm (Fruit development stage)], however, it was found at par with treatment T₅ [CCC 450 ppm (FBD stage) + NAA 100 ppm (Pea stage) + GA₃ 50 ppm (Fruit development stage)] (5.13), T₃ [CCC 350 ppm (FBD stage) + NAA 150 ppm (Pea stage) + GA₃ 50 ppm (Fruit development stage)] (5.11).

- Among the different plant growth regulators, significantly maximum fruit circumference (20.10 cm) was recorded with spraying of treatments T₇ [CCC 450 ppm (FBD stage) + NAA 150 ppm (Pea stage) + GA₃ 50 ppm (Fruit development stage)], however, it was found at par with treatment T₅ [CCC 450 ppm (FBD stage) + NAA 100 ppm (Pea stage) + GA₃ 50 ppm (Fruit development stage)] (19.15), T₃ [CCC 350 ppm (FBD stage) + NAA 150 ppm (Pea stage) + GA₃ 50 ppm (Fruit development stage)] (19.13).

- In case of fruit volume (69.30 cm³) the result shows significantly maximum fruit volume in treatments T₇ [CCC 450 ppm (FBD stage) + NAA 150 ppm (Pea stage) + GA₃ 50 ppm (Fruit development stage)], however, it was found at par with treatment T₅ [CCC 450 ppm (FBD stage) + NAA 100 ppm (Pea stage) + GA₃ 50 ppm (Fruit development stage)] (68.18), T₃ [CCC 350 ppm (FBD stage) + NAA 150 ppm (Pea stage) + GA₃ 50 ppm (Fruit development stage)] (67.92).

- The different treatments recorded the non-significant results in fruit maturity days.

- Among the different plant growth regulators, significantly maximum (63.91 kg plant⁻¹) fruit yield was recorded with spraying of treatment T₇ [CCC 450 ppm (FBD stage) + NAA 150 ppm (Pea stage) + GA₃ 50 ppm (Fruit development stage)], however, it was found at par with treatment T₅ [CCC 450 ppm (FBD stage) + NAA 100 ppm (Pea stage) + GA₃ 50 ppm (Fruit development stage)] (55.18), T₃ [CCC 350 ppm (FBD stage) + NAA 150 ppm (Pea stage) + GA₃ 50 ppm (Fruit development stage)] (54.94).

- Among the different plant growth regulators, significantly maximum (6.39 tonnes ha⁻¹) fruit yield was recorded with spraying of treatment T₇ [CCC 450
ppm (FBD stage) + NAA 150 ppm (Pea stage) + GA\textsubscript{3} 50 ppm (Fruit development stage)], however, it was found at par with treatment T\textsubscript{5} [CCC 450 ppm (FBD stage) + NAA 100 ppm (Pea stage) + GA\textsubscript{3} 50 ppm (Fruit development stage)] (5.52), T\textsubscript{3} [CCC 350 ppm (FBD stage) + NAA 150 ppm (Pea stage) + GA\textsubscript{3} 50 ppm (Fruit development stage)] (5.49).

- The different treatments recorded the non-significant results in number of seed per fruit and seed weight (g).

6.3 Quality parameters

- The different treatments recorded the non-significant results for T.S.S. (\textsuperscript{0}Brix), reducing sugar (%), total sugar (%) and non-reducing sugar (%).

6.4 Economics

- An application of CCC 450 ppm (FBD stage) + NAA 150 ppm (Pea stage) + GA\textsubscript{3} 50 ppm (Fruit development stage) (T\textsubscript{7}) gave higher gross realization (95850 Rs. ha\textsuperscript{-1}) and net realization (44081 Rs. ha\textsuperscript{-1}). This treatment also recorded higher CBR (1:1.85), which was followed by treatment T\textsubscript{3} [CCC 350 ppm (FBD stage) + NAA 150 ppm (Pea stage) + GA\textsubscript{3} 50 ppm (Fruit development stage)] (1:1.63).

CONCLUSION

From the foregoing discussion, it can be concluded that spraying of CCC 450 ppm (FBD stage) + NAA 150 ppm (Pea stage) + GA\textsubscript{3} 50 ppm (Fruit development stage) significantly influenced the flowering, yield and yield attributing parameters viz., number of bud per shoot, number of bud drop per shoot, number of flower per shoot, number of fruit set per shoot, number of fruit per tree, average fruit weight, fruit length, fruit width, fruit circumference, fruit volume and fruit yield (kg tree\textsuperscript{-1} and tonne ha\textsuperscript{-1}).

Hence, it is recommended to spray CCC 450 ppm (FBD stage \textit{i.e.}, 1\textsuperscript{st} week of July) + NAA 150 ppm (Pea stage \textit{i.e.}, 2\textsuperscript{nd} week of September) + GA\textsubscript{3} 50 ppm (Fruit development stage \textit{i.e.}, 3\textsuperscript{rd} week of October) for higher yield, net return and CBR of sapota cv. Kalipatti.