



A Retrospect on Special Horticultural Practices in Fruit Crops

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Received: 09 Jul 2024; Received in revised form: 05 Aug 2024; Accepted: 11 Aug 2024; Available online: 17 Aug 2024

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Abstract— In fruit crops there are many practices and technologies to improve the quality of fruits. The pruning, girdling or ringing, smudging, thinning and bending are practices to affect the carbon nitrogen ratio in fruit crops. C:N ratio control by these practices. C:N ratio may change through these practices and improves the fruit quality and yield. In this review article we tried to discuss all these special horticultural practices which used to improve fruit quality, production, and plant vigour which leads to higher yield of crops.

Keywords— Pruning, Girdling, Bagging and Notching



INTRODUCTION

Special horticultural practices play key role in increasing production and quality of fruits. The major element is carbon and nitrogen which leads to play role in flowering. Girdling is the removal of the bark in circular manner of either branch or trunk of woody plants. Girdling stops the basipetal movement of assimilates through phloem which results in accumulation of carbohydrates above girdle which ultimately helps for induction of early and assured flowering. Urban *et al.* reported that girdling is one of the ways to improve the earliness and intensity of flowering in mango. Thinning helps to getting the good size and shape of fruit tree. Pruning or tip pruning is well known practice which helps to maintain the balance between carbon and nitrogen by removing the top shoots of the plants. In this practice we remove the auxin which helps to early flowering in the plant. (Aghav *et al.*, 2023). Smudging is an ancient method of inducing mango to flower. It is practiced in certain parts of the Philippines to obtain early flowering of 'Carabao' and 'Pico' mango. Ethylene has been identified as the active agent responsible for flowering during smudging (Dutcher, 1972). Bending of shoots improves the carbohydrate level in bended portion which leads to give more flowering and fruiting. The late flowering leads to

delayed fruit development and harvesting. The late harvested fruits fetch low market rates. It is often noticed that many of these new shoots do not produce flowers and hence the flowering is sparse which produce poor yield (Soudagar *et al.*, 2018). Treatment T₅ (girdling on the first fortnight of November and tip pruning) was best for the highest hermaphrodite flowers, maximum fruit set, and retention and also contributed to the highest yield with greater appreciation with respect to rate in the market (Aghav *et al.*, 2023)

Bending:

This is well known practice which is generally followed in guava and flower like rose. It may define as reduction in shoot growth and to enhance flowering and fruiting of plants. Bending frequently increases the polyphenol oxidase, tryptophane, lipid, catalase, proline and levels of peroxidase in bark, fruit and leaves, but decreased phenolics (Eassa *et al.*, 2012). Mamun *et al.*, 2012 found that significant variation have been seen as bending is used in guava to encourage off-season flowering. Bending encourages more fruiting and flowering, as well as get more returns and helps to regulate flowering by shoot bending (Mitra *et al.*, 2008).

Pruning:

In tropical fruit crops like mango, pruning is inescapable necessity to control the canopy size and to produce high quality fruits by facilitating good ventilation, more penetration of sunlight, simple application of plant protection chemicals and early in harvesting (Burondkar *et al.* (1997). The higher percentage of flowering due to pruning treatments was mainly attributed due to the availability of photosynthetic solar radiation to the leaves which enhanced flowering (Lal and Mishra, 2007). Shoot pruning reduces the auxin synthesis at the apex of the branches, directing the transport of assimilates and cytokinin's to the axillary buds of branches, creating favourable condition for flowering (Taiz and Zeiger, 2012). The trial concluded that special horticultural practices *viz.*, girdling, removal of new shoots (tip pruning), and smudging in mango cv. Ratna was beneficial for the early induction of flowering and early harvesting. Among all treatments, T₇ (removal of new shoots) was best for early induction of flowering and early harvesting. (Aghav *et al.*, 2023).

Girdling:

Girdling is the removal of the bark in the circular manner of either branch or trunk of woody plants. Girdling stops the basipetal movement of assimilates through phloem which results in the accumulation of carbohydrates above the girdle portion which ultimately helps for induction of early and assured flowering. The girdling is one of the ways to improve the earliness and intensity of flowering in mango (Urban *et al.*, 2009). Shinde *et al.* (2015) noticed the highest number of fruits per plant in T₁ (ringing during the first fortnight of May) in cv. Alphonso. Ibrahim *et al.* (2016) observed that girdling branches and limbs significantly affected the initial number of fruitlets per branch and fruit set percentage in Washington Navel Orange. Warang *et al.* (2019) recorded maximum fruit set (8.95 %) and maximum fruit retention (0.83 %) in girdling on first fortnight of the September and first fortnight of October and removal of new shoots in mango cv. Alphonso. Ghadage *et al.* (2017) girdling on 15th July produced significantly maximum yield (94.20 kg/plant) in mango cv. Alphonso.

Bagging:

Bagging prevents insect, pest especially fruit flies, from damaging the fruits. the bags provide physical protection from mechanical injuries (scars and scratches). Stover and Simmonds (1987) reported the use of polythene bags to enhance fruit maturity in banana. Sarker *et al.* (2009) described that the physical quality of bagged fruit was better than un-bagged fruit healthy fruit, which increased their market price. Fruit bagging has helped to reduce bird damage in various fruit (Kitagawa *et al.*, 1992).

Earthing Up:

It is important which provides support to the base of the plant and also gives chances for better formation of a better root system. Pineapple is only fruit crop where earthing up is mostly done Farid Hossain (2016) in this review of world pineapple production described that earthing up play better support to pineapple.

Notching:

Notching can be defined as the form of a slanting cut is given a little above the buds, removing a slice of bark. Notching is a simple, ancient trick that stimulates a branch to grow. Notching technique play vital role in enhancing lateral branching.

CONCLUSION

In this overview we concluded that special horticultural practices *viz.*, girdling, pruning, smudging, notching, earthing up, bending of shoots and bagging in horticultural crops (especially fruit crops) play important role in quality production and increasing yield of the fruits. This quality fruits fetches more prices in the market and to enhance socio-economic status of farmers.

REFERENCES

- [1] Aghav R.D., Haldankar P.M., Parulekar Y.R., Malshe K.V. and Dalvi V.V. 2023. Special horticultural practices for early induction of flowering in mango (*Mangifera indica* L.) cv. Ratna. *Journal of Eco-friendly Agriculture* **18**(1): 115-118.
- [2] Burondkar, M. M., R. T. Gunjate, M. B. Magdum, M. A. Govekar and G. M. Waghmare. 1997. Increasing productivity of mango orchards by pruning and application of paclobutrazol. *Acta Hort.* **455**: 367-374.
- [3] Dutcher, R.D. 1972. Induction of early flowering in 'Carabao' mango in the Philippines by smudging and ethephon application. *HortScience*, **7**: 343.
- [4] Ghadage, N.J., Patil, S.J., Khopade, R.Y., Shah, N.I. and Hiray, S.A. 2017. Effect of time and width of girdling on flowering and yield of mango (*Mangifera indica* L.) cv. Alphonso. *International Journal of Chemical Studies*, **5**: 1580-1583.
- [5] Hossain.MF1. World pineapple production: An overview. DOI: 10.18697/ajfand.76.15620.
- [6] Ibrahim M. M., Mohamed A. O., Mohamed A. H. and Omar A. A. 2016. Effect of some girdling treatments on fruiting behaviour and physio-chemical properties of Washington navel orange trees. *J. Agril. and Vet. Sci.* **9**: 58-65.
- [7] Kitagawa, H., Manabe, K. and Esguerra, E.B. (1992). Bagging of fruit on the tree to control disease. *Acta Horticulturae*, **321**: 871-875.
- [8] Lal, B. and Mishra, D. 2007. Effect of pruning on growth and bearing behaviour of mango cv. Chausa. *Indian Journal of Horticulture*, **64**: 268-70.

- [9] Mamun, A., M. H. Rahman and M. A. Rahim 2012. Effect of Shoot Bending and Fruit Thinning on Productivity of Guava. *J. Environ. Sci. and Natural Resources*, **5**(2): 167 – 172.
- [10] Mitra, S. K., Gurung, M. R. and Pathak, P. K. (2008). Sustainable guava production in West Bengal, *India. Acta Hort.* **773**, 179-182.
- [11] Sarker, D., Rahman, M. M. and Barman, J. C. (2009). Efficacy of different bagging materials for the control of mango fruit fly. *Bangladesh Journal of Agricultural Research*, **34**, 165–168.
- [12] Shinde, V.V., Dubale, J.J., Haldankar, P.M., Parulakar, Y.R. and Thorat, S.B. 2015. Effect of ringing on flowering and yield of mango *Mangifera indica* L. var Alphonso. *Asian Resonance*, **3**: 115-117.
- [13] Soudagar, T.P., Haldankar, P.M., Parulekar, Y.R., Dalvi, V.V. and Ghule, V.S. 2018. Study on effect of tip pruning on induction of flowering and harvesting in Alphonso mango. *Indian Journal of Horticulture*, **75**: 709-712.
- [14] Stover, R. H. and Simmonds, N.W. (1987). Bananas. 3rd Edition. Tropical Agriculture Series, Longman Scientific and Technical, Harlow, UK. 468 pp.
- [15] Taiz, L. and Zeiger, E. 2012. Fisiologia vegetal. 5. ed. Porto Alegre: Artmed.
- [16] Urban, L.M., Lechaudel, M. and Alphonsout, L. 2009. The effect of girdling on flowering and leaf net photosynthesis in mango cv. Cogshall. *Acta Horticulturae*, **820**: 251-258.
- [17] Warang, O.S., Haldankar, P.M., Parulekar, Y.R., Salvi, B.R., Chavan, S.A., Dalvi, N.V., Thorat, S.B. and Bhuvad, A.V. 2019. Non-chemical approaches for induction of appropriate flowering in mango cv. Alphonso. *Bulletin of Environment, Pharmacology and Life Sciences*, **8**: S58-S62.