

Flowering and Fruiting in Mangoes in the Top End with Paclobutrazol[^]

V. Kulkarni*, D. Hamilton and G. McMahon, Crops, Forestry and Horticulture, Darwin
* Formerly DPIFM

The profitability of growing mango is influenced by two key factors:

- Productivity, which consists of yield and quality.
- Supply and demand which rule market prices.

Top End mangoes are the earliest to reach domestic markets and therefore attract a premium price. However, as Queensland mangoes reach the market, prices fall steeply. Besides, the onset of the wet season increases the incidence of pests and diseases, which lower fruit quality. The manipulation of fruit maturity in favour of an early harvest would therefore be of great value to growers.

FLOWERING AND ITS MANIPULATION

Flower initiation is very important because it is the first step towards attaining fruit. Recent trials have clearly shown that while the extent (quantity) of flowering affects yields, time of flower emergence has a significant influence on time of fruit maturity. Early flowering clearly resulted in early fruit maturity.



Unfortunately, our commercial variety, Kensington Pride, does not flower regularly year after year. Flowering is also staggered, leading to considerable variation in fruit maturity. The induction of regular, profuse, early and uniform flowering will undoubtedly ensure higher yields and better returns to the grower.

THE EFFECTS OF PACLOBUTRAZOL

One method to manipulate flowering is to use the plant growth regulator, paclobutrazol. The post-harvest application of a small amount of paclobutrazol to the soil significantly promotes flowering and fruiting in the following year. Trials over the last two years have shown the following benefits from the treatment:

- A significant increase in flowering leading to increased yields.
- The early flowering considerably enhanced fruit maturity. Treated trees flowered three to four weeks early, which reduced the time to fruit maturity by at least two weeks.
- Visually, the fruit developed a better external colour.

SOME IMPORTANT CONSIDERATIONS IN THE USE OF PACLOBUTRAZOL

How does paclobutrazol act?

Available evidence strongly suggests that flower initiation depends on the presence of an unknown flower-promoting factor or factors synthesised in the leaves. At the same time, there are other factors in the shoots which work against the flowering factor or factors. It is believed that a group of plant hormones called gibberellins act as inhibitors to flowering. When paclobutrazol is applied to the soil, it moves up through the roots into the shoots and, due to its anti-gibberellin properties, blocks the synthesis of flowering inhibitors, thereby allowing the flower-promoting factor(s) to work.

How and when to apply paclobutrazol?

The application of paclobutrazol to soil as a drench around the tree trunk (collar drench) is the most effective method, as it ensures proper uptake by the tree. The required quantity is mixed in approximately one litre of water and poured onto the soil around the trunk in a circular band. In the Top End, the ideal time to apply paclobutrazol is from soon after harvest to early January. In dry conditions, a light irrigation is recommended after application. Foliar sprays have been ineffective.

At what age should trees be treated and when should treatment be repeated?

The size of trees at first application is important. This depends on the age of the trees and the spacing between them. Apart from promoting flowering, paclobutrazol also restricts tree vigour. Trees should therefore be allowed to develop a good canopy before treatment commences. In high tree density situations with closer spacing, it is recommended to apply paclobutrazol early when trees are about three years old. However, when trees are spaced farther apart, say 10 m, early application with paclobutrazol will reduce canopy size and the fruit bearing area. In such a situation, treatment can commence when trees are about five years old. **Tree size and canopy fill are important considerations.** Large trees, especially seedling trees, respond more slowly than young, bearing, grafted trees. The dosage required also varies between cultivars. Florida cultivars, such as Irwin, Glen and Tommy Atkins require a lower dosage than Kensington Pride.

At excessively high dosages, flower and shoot compaction can lead to increased infestation by caterpillars. If such compaction occurs, the dosage of repeat applications should be reduced. Two sprays of potassium nitrate at 4 g/L at ten-day intervals, commencing at signs of flower bud burst, were found to minimise panicle compaction. However, compaction is best prevented by using an optimum dosage. **If you are not sure about dosage and/or if your trees are ready for the treatment, seek expert advice.**

It is also important to note that tree size and not age is the key factor for determining dosage. Where there is considerable variation in tree size, dosage may have to be varied.

TREE HEALTH AND NUTRITION

Any treatment that leads to increased production should be supported by good management to maintain tree healthy. This includes nutrition, irrigation, control of pests and diseases, pruning and skirting. It is desirable to prune and skirt trees after harvest and before the treatment. Unhealthy and weak trees should not be treated with paclobutrazol.

^ Currently available trade names of paclobutrazol are Cultar® and Austar®

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