

## Impact of pruning time on bud and shoot development (maturity) in Honey Gold and Calypso mangoes in Katherine

### Objective

- Describe the relationship between low temperature and flower induction in two Katherine-grown mango cultivars;
- Quantify the duration of vegetative flushing and subsequent growth after tip pruning;
- Monitor fruit set and quality of fruits on trees treated with tip pruning.

### Background

- Floral induction in many mango occurs when bud break is synchronised with cool weather. The duration and amount of cool weather required appears to vary between cultivars. Bud development can be triggered by tip-pruning of branches (Davenport, 2006). The response to cool conditions in mango is detected in mature hard green leaves and transmitted to the growing shoot where flower development occurs. Tip-pruning not only stimulates, but can also eliminate immature flush that inhibit flowering.
- This project takes advantage of the progressively cooler weather in Katherine that occurs from April to July, to understand the effects of night temperatures on developing mango buds. This information can be used to target periods for growth to manipulate the fruiting times (early or late harvest), better management of fruit harvesting and packing, and in overall resulting in better productivity and profitability for mango farmers (Ramirez et al., 2010).

### Methods

- The experiment was undertaken on the cultivars “Honey Gold” at Piñata Farm and “Calypso” at Ooloo Farm, Katherine.
- 21 trees of each cultivar on KP rootstock were selected from 6 year-old trees. A randomised complete block with seven pruning times, to prune a total of 3 trees every 4 weeks on each pruning occasion.
- Terminal stems around the canopy were pruned at 10 cm above the last internode for each branch on each tree (Fig. 1).
- After pruning 20 shoots were randomly selected and tagged around the canopy on each tree (Figs. 1-2).
- One week after pruning, one axillary flush from the point of cutting was kept. Flush length for each of the 20 shoots was measured weekly.



Fig. 1: Different stages of bud development in cultivars Honey Gold and Calypso.

- Flowering time was recorded on 20 panicles from tagged branches in each treatment. Number of fruit and yield per selected panicle will be recorded at harvest.
- Measurements were taken throughout the dry season 2016 recording daily temperatures and relative humidity, coupled with shoot development variables such as pruning time, re-flushing time, flowering time, fruit set, final fruit set and harvesting time.



Fig. 2. Tip pruning and labelling of the selected trees.

## Early Results

- Climate data show Honey Gold received 305 hours below 20 °C over 13 weeks, while Calypso received 209 hours below 20 °C for the same period. Mean flush length was 135 mm for Calypso and 112 mm for Honey Gold by end of week 7. Flower induction should occur for both cultivars, as the first flushes have experienced sufficient time at temperatures below 20 °C.

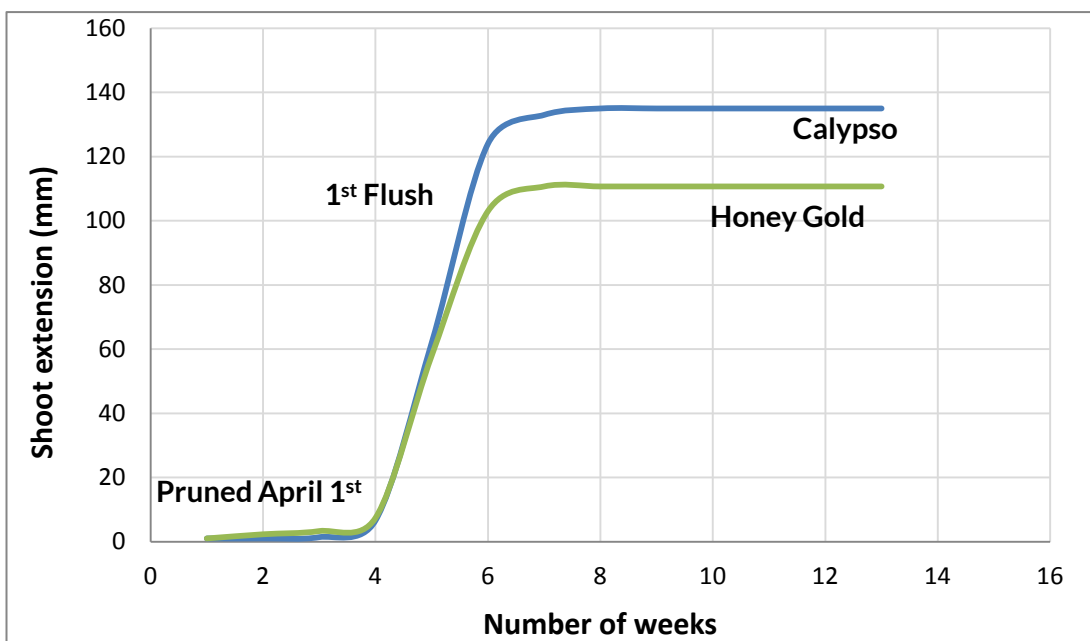


Fig 3. Growth of first flush in Honey Gold (green line) and Calypso (blue line) mangoes over 91 days.

## References

1. Davenport, T.L. (2009). Reproductive physiology. In: Litz, R.E. (Ed.), *The Mango: Botany Production and Uses*, 2nd edition. CAB International, Wallingford, UK, pp. 97–169.
2. Ramírez, F., Davenport, T.L. and Fischer, G. (2010). The number of leaves required for floral induction and translocation if the florigenic promoter in mango (*Mangifera indica* L.) in a tropical climate. *Scientia Horticulturae*, 123; 443–453.