

Manipulation of mango flowering

Introduction

Mangoes are the most valuable horticultural industry for the Northern Territory. Cool night temperatures trigger mango flowering. Last year (2016) the cool weather took a lot longer to reach us than it normally does in the dry season and resulted in a late mango season (Table 1). These warm starts to the dry season could be correlated with poor productions seasons (Figure 1). The 2016 delay in cool weather allowed us to look at initiating flowering in mangoes using growth promoting foliar sprays, with our main goal being, to increase the profitability for mango growers in the NT.

Table 1: Number of days with minimum temperature below 15 °C from January-July, Darwin region.

Years	2001	2002	2003	2004	2005	2006	2007	2008	2009	2011	2012	2013	2014	2015	2016
Days	3	13	2	8	2	11	16	12	8	17	19	5	13	11	0

Methods

Two randomised and blocked experiments were conducted along two separate rows of Kensington Pride mango trees in an orchard in Berry Springs. The first row examined 8 different growth inhibitor treatments to stop premature vegetative growth. The second row examined 6 treatments of growth promoters that targeted initiate bud break and early flowering.

For the growth inhibitor trial, every treated tree in the trial row was scored for overall growth percentages on a weekly basis after the second and final spray (Figure 2).

For the growth promoter trial, individual branches on both sides of the treated trees were tagged and scored on a weekly basis over a period of two months after the initial spray. These scores were summed together in their respective treatments to gain an overall view of the growth of the tree due to the treatment used (Figure 3).

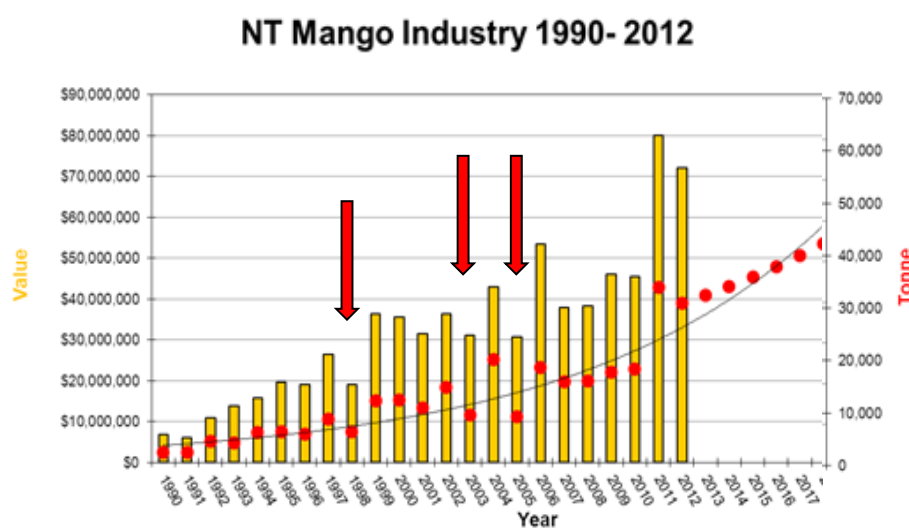


Figure 1: NT Mango Production 1990-2012, red arrows show the similarly warm dry seasons highlighted in Table 1.

Discussion

We have explored options for chemically inducing flowering. The 2016 research indicates that foliar sprays have only worked on certain parts of the trees. In the rows planted North-South the most exposed parts of the canopy did not respond, the western and south eastern. Flowering between the trees was the strongest.

This may indicate that there is a high temperature inhibition as well as a low temperature requirement for flowering. The conventional use of KNO_3 were almost ineffective in triggering flowering during these periods of high night temperatures. The time to react to the responsive chemical treatments is rapid for plants with growth occurring after 1 week and flowers within 2-3 weeks.

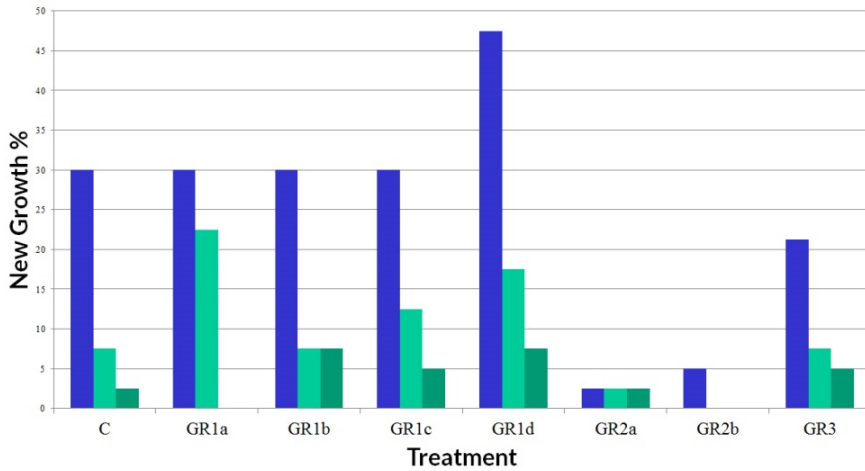
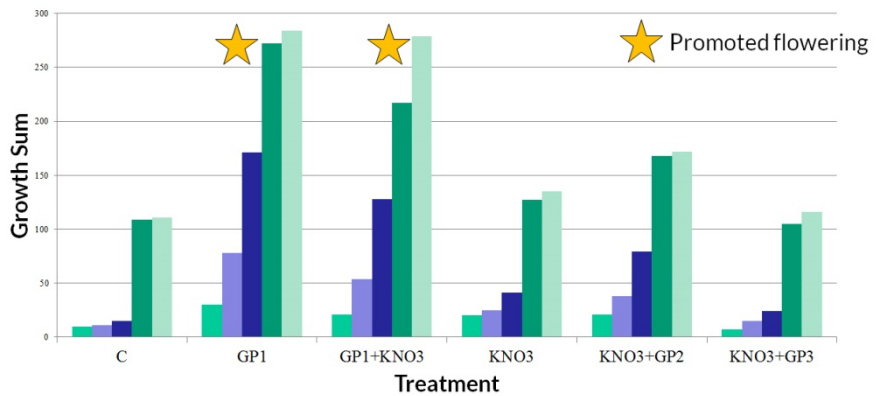


Figure 2: Growth Inhibitor Results 1 week after final spray.

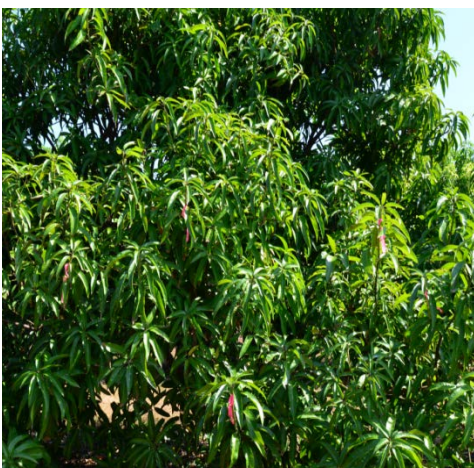
Fig 3. Growth promoter weekly results.



Conclusion

These results demonstrate that when specific floral promoters are used, they are able to initiate flower growth at temperatures when mango trees would not normally flower. With further research this could open the opportunity for mango production to occur from June all the way through to December.

Fig 4: Control vs Growth Promoters



Lack of response to KNO_3



Flowering response to GP - see fig 3 stars