



Investigating the molecular mechanisms behind flowering in *Mangifera indica*

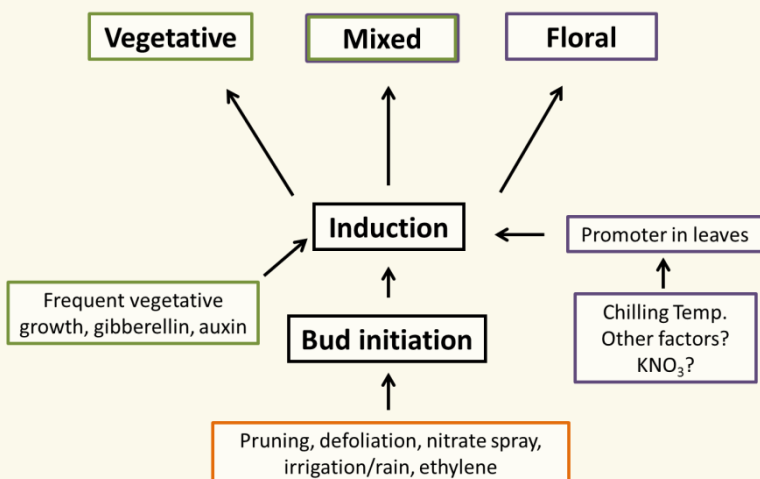
Background

In mango dormant buds must be initiated before floral induction can occur. Initiation can be the result of a number of factors; including, irrigation after periods of drought, pruning and application of nitrogen fertiliser. Floral induction in mango is caused by low temperatures (<20°C), the low temperatures are perceived by the mature leaves and a signal is sent via the phloem to the bud. If buds are in the early stages of initiated and inductive conditions are present, floral shoots will occur (Davenport, 2009).

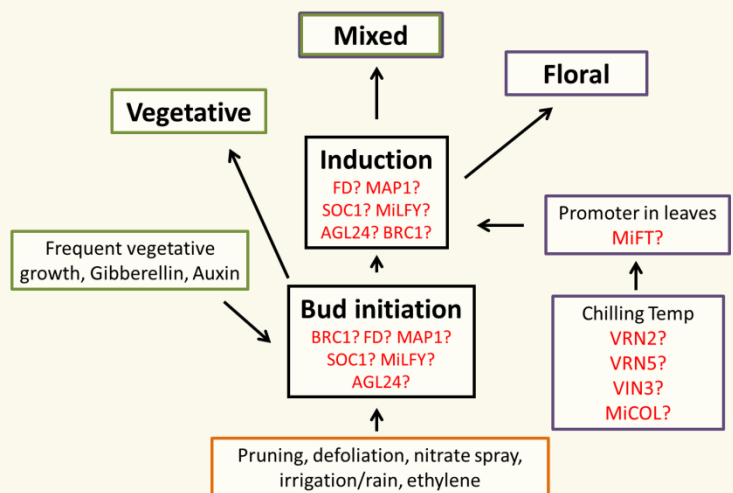
Some molecular work has been done in mango to identify flowering genes and so far, FT, CO, LFY and AP1 homologs have been identified (Nakagawa et al., 2012, Hu et al., 2003, Davenport et al., 2006a, Luo et al., 2009, de los Santos-Villalobos et al., 2012). At present the MiFT genes is the strongest candidate for the genetic precursor of the mango FP, it's expression increases in response to cooling, the increased expression occurs in mature green leaves and the signal appears to be transported to the buds to stimulate expression of MAP1-1 (Nakagawa et al., 2012).

Despite the recent advances in the research into mango flowering there is still much more to be done. Only a small handful of homologs of a vast number of Arabidopsis flowering genes have been identified, and only in a few cultivars of no significance to the Australian market and little research into expression patterns has been conducted on these new found genes.

Current Flowering Model



Possible Flowering Model



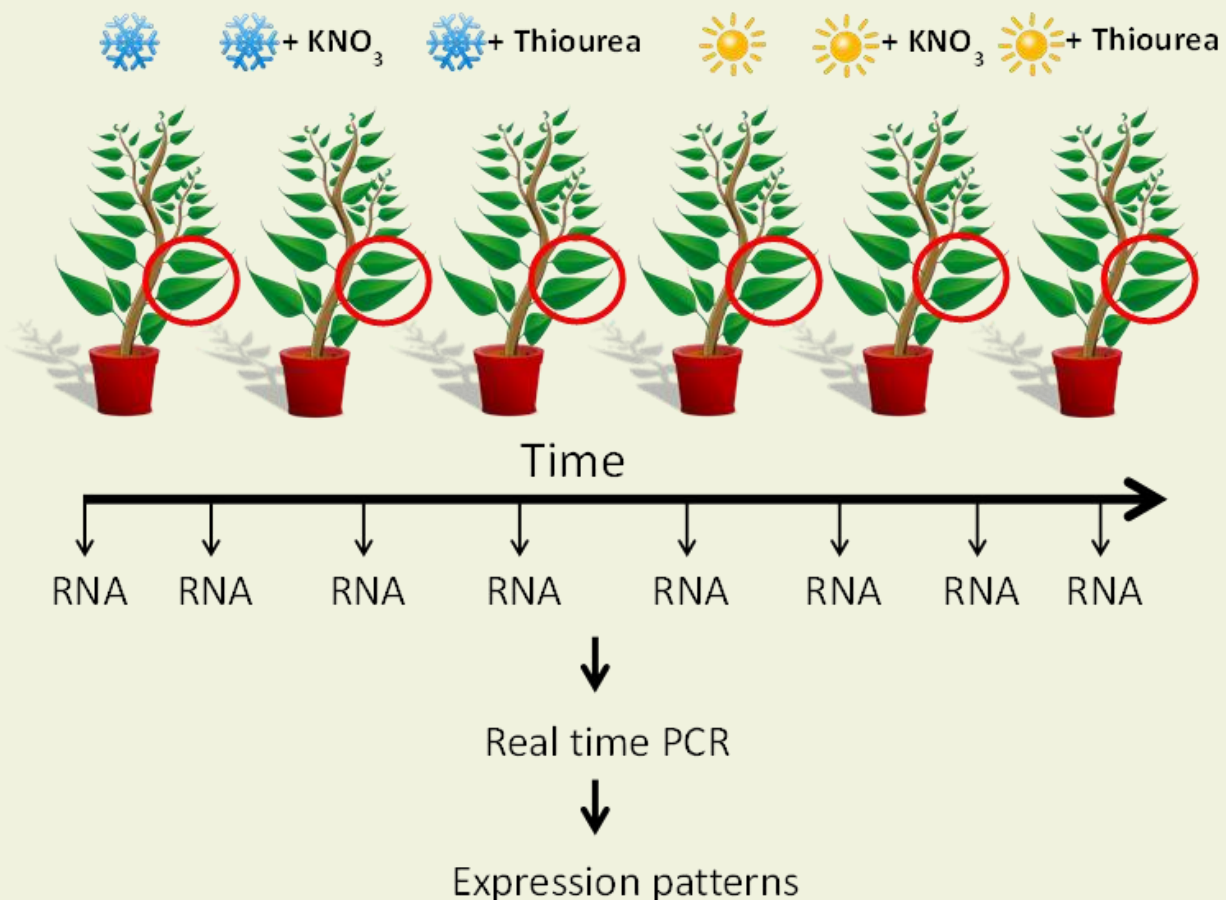


Research Questions

My research will combine physiological studies with molecular research to develop the current mango flowering model to better understand the mango flowering pathway.

1. How do flowering gene homologs in mango contribute to flowering?
2. Is FT a floral stimulus in mango?
3. Is flowering a qualitative or quantitative response?
4. In mango, is the FT protein short lived after production?

Temperature and Chemical Experiment



Davenport, T. (2009). "5 Reproductive Physiology." The mango: Botany, production and uses: 97.
 Davenport, T., et al. (2006). Isolation of genes potentially regulating mango flowering. Proceedings of the 33rd Annual Meeting of the Plant Growth Regulation Society of America. Quebec City.
 de los Santos-Villalobos, S., et al. (2012). "Primers to amplify flowering locus T (FT) transcript in mango (*Mangifera indica*) and their potential use in other angiosperms."
 Hu, G., et al. (2003). "Isolation and sequence analysis of LEAFY homologous gene from mango." Subtropical Plant Science 33(2): 1-4.
 Luo, C., et al. (2009). "Cloning and bioinformatic analysis of the AP1 homolog gene from mango." Genomics and Applied Biology 28(5): 851-858.
 Nakagawa, M., et al. (2012). "Isolation and expression analysis of FLOWERING LOCUS T-like and gibberellin metabolism genes in biennial-bearing mango trees." Scientia Horticulturae 139: 108-117.