Mango Flowering in Queensland

Flowering in the mango production regions of Queensland (QLD) occurs throughout winter and into spring. However, flowering that occurs in early winter may not successfully set fruit due to reduced pollen viability, slow fruit growth and frosts. The ideal flowering time is during late winter to spring, from July to September. During this time, minimum temperatures have begun to rise but remain within the range of inductive conditions (Figure 1). Harvest in QLD begins in northern areas at Bowen/Ayr in early November, then Dimbulah from late November and Mareeba in early December. Harvest then moves to central and southern QLD in late December and January.

Annual production cycle

The annual production cycle for mangoes in QLD is largely influenced by cooling winter weather conditions from June – August. At this time, dormant shoots are stimulated to initiate floral shoot growth by these cool temperatures. If temperatures remain low for long periods, this may slow floral induction or result in flowers which are small and deformed, with reduced pollen viability and limited fertilization success. If temperatures remain high, shoots may not be stimulated to produce floral shoot growth and instead produce vegetative shoot growth or mixed floral/vegetative shoots. Early fruit development can also be limited by cold temperatures.

In QLD, floral shoot growth is first seen at Bowen/Ayr in early July, due to these regions rapidly cooling minimum temperatures (Figure 1). Peak flowering is often 2-3 weeks earlier here than at Mareeba. At Bundaberg, winter temperatures are much cooler and this often delays floral shoot emergence until early August. The arrival of warm spring temperatures from September – November at Bowen/Ayr further accelerates the growth of developing fruit within this region, with the fruit harvest often 3-4 weeks earlier here than at Mareeba.

Climate drivers for flowering

The timing and intensity of flowering within each region varies between years in response to variable climate patterns. Unseasonably warm or cold winters can result in reduced flowering, poor fertilisation and subsequent lower fruit yields. Seasonal climatic variability between regions can delay or accelerate flowering and fruit development, resulting in a change of harvest timing within a region. This can occasionally lead to the overlapping of harvest times between regions, which can result in unusually high fruit volumes on the marketplace at the one time and often low prices for the farmer.

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Management practices for QLD

Key management practices that promote mango flower induction in QLD are:

1. Increase irrigation during inductive conditions (July-September) to encourage floral shoot growth.
2. Protect flowers from frosts: design orchards that avoid trapping cool air and irrigate during light frosts.
3. Foliar applications of boron and potassium nitrate at bud break may increase flower number and vigour.

Key references

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Tables and Figures

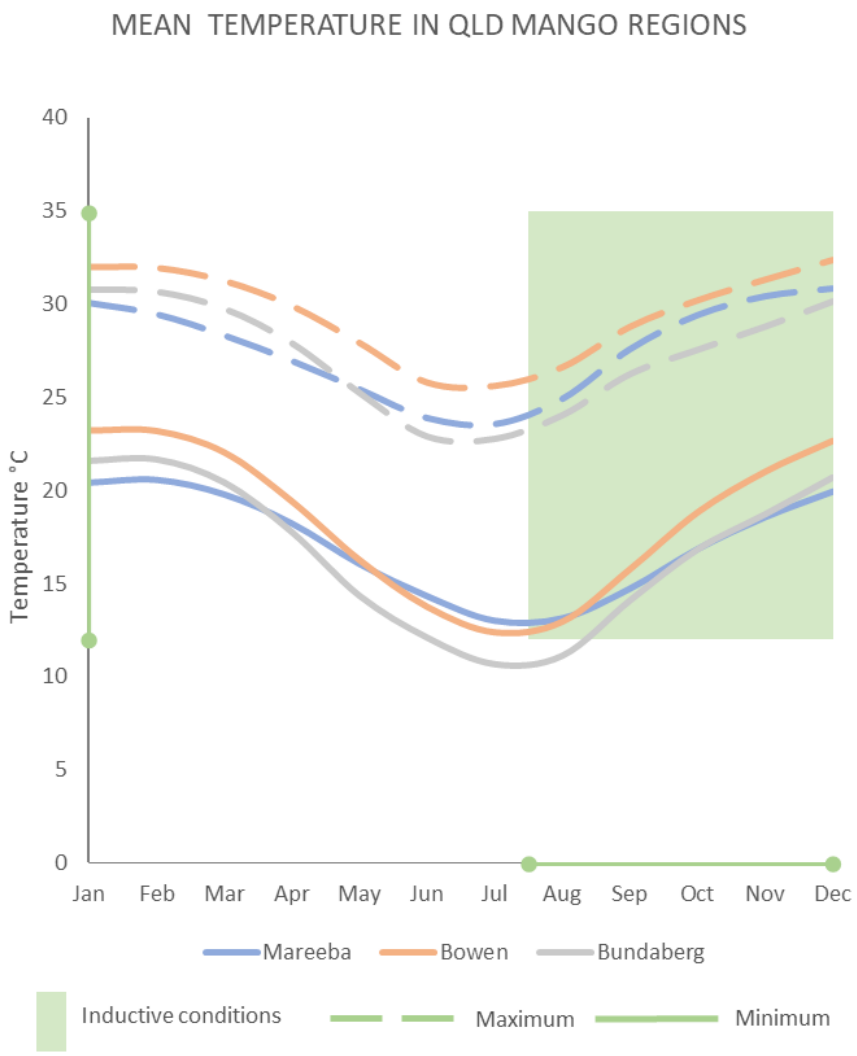

Figure 1. Mean minimum and maximum temperature for each month and floral inductive period of Mareeba, Bowen and Bundaberg mango production regions. Temperature data is monthly average maximum and minimum for the period of 1996 – 2019. Weather stations Ayr DPI Research Stn (Bowen), Walkamin Research Stn (Mareeba) and Bundaberg Aero (Bundaberg). Data source: Australian Government Bureau of Meterology (BOM) 2020.

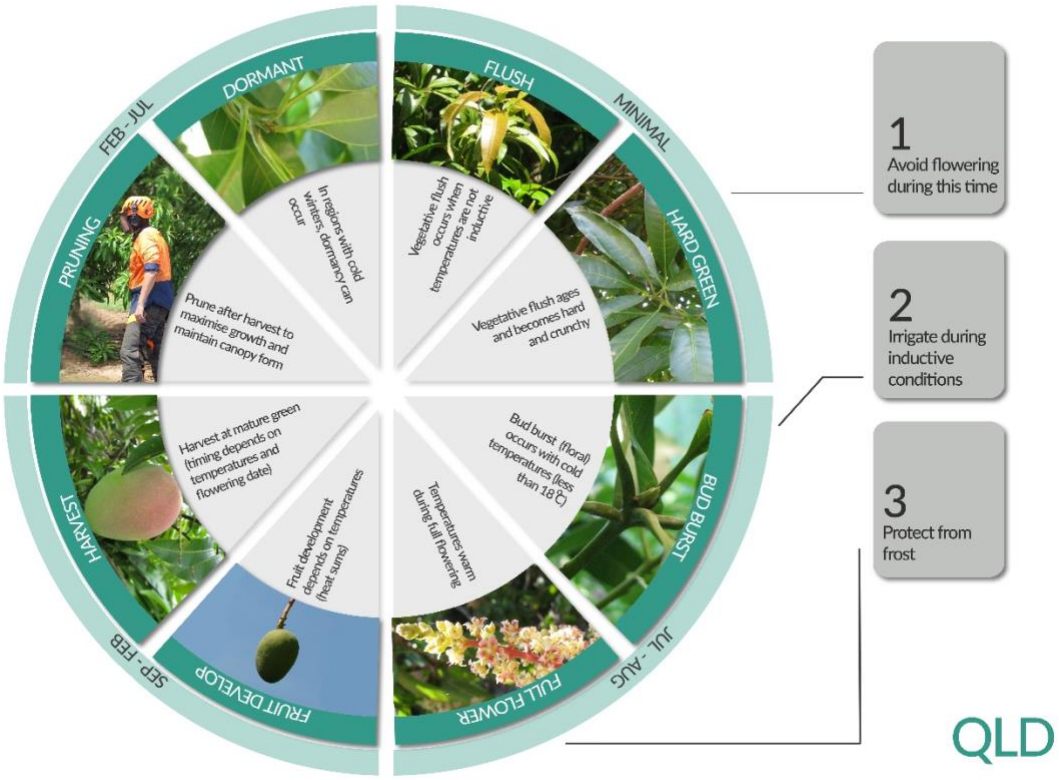

Figure 2. Annual flower management and phonological cycle for mango grown in the Queensland

Figure 3. Mango flowers