



CASE STUDY TECHNICAL SCOPE

# Impact of climate change on flowering induction in mangoes in the Northern Territory

March 2019

The Hub is working with the Northern Territory Government (Department of Primary Industry and Resources, DPIR), the Australian Mango Industry Association and NT Farmers Association to demonstrate the utility of climate change information for planning and management decisions in the Northern Territory mango industry. This document provides details of the technical scope for the case study.

Flowering induction in mangoes is dependent on minimum and maximum temperatures. Timing of flowering has implications for fruit set and so is commercially important. Understanding how temperatures will change in the future will support the mango industry to minimise risks and identify opportunities as they plan for the future.

## Mango cultivars

- Kensington Pride
- Honey Gold
- B74
- 3 x cultivars from the National Mango Breeding Program

## Regions of interest

Northern half of Northern Territory, as well as three specific growing regions (including Kununurra in Western Australia).<sup>1</sup>

## Relevant climate variables

Temperature thresholds<sup>2</sup>

- Days under 16°C, 18°C
- Days over 32°C, 35°C

## Time frame of interest

- 2030 – for current planting
- 2050 – for next planting
- 2070 and 2090 – for breeding program

## Time step

Monthly data for May, June, July and August (when flowering occurs) – i.e. number of days per month under/over thresholds.

## Observations

Historical trends in maximum and minimum temperature and the four temperature thresholds will be included for the region. BoM will provide climatology information associated with particular good/poor production events where possible.

## Emissions scenarios

The case study will use RCP4.5 and RCP8.5, as these are the scenarios that the temperature thresholds are available for.

## Projections

Climate change projections will be constructed as days over or under the identified thresholds.

## Data availability

DPIR will contribute mango physiology understanding from recent research.

BoM has observed maximum and minimum temperature data.

CSIRO has temperature threshold projections data.

## Data collection and analysis timeline

**28 Feb 2019:** Expert meeting

**1 Mar 2019:** Case study scoping meeting

**Mar–Aug 2019:** Climate team to collect and process observed data and climate model output

Mango team to conduct literature review, prepare gap analysis and analyse mango flowering data for the varieties in the case study

**Sep 2019 – Jan 2020:** Synthesis – drafting of technical report and peer review

**18–19 Feb 2020:** Synthesis workshop

**31 Mar 2020:** Publication of final report<sup>3</sup>

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## Notes

1. NT DPIR to provide bounding box (lat and long for each corner) for the three regions.

2. Temperature thresholds to be confirmed by DPIR by end April 2019.

3. Stakeholder engagement and communication activities and products are documented in the case study stakeholder communication and engagement plan.

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