HORTICULTURE

VULNERABILITY RATING

(Low—High)

PROGNOSIS

With changes to temperature, rainfall, growing degree days, and frost risk, horticultural enterprises are set to expand into new territory across the region. However, as a result of increased rainfall intensity, longer periods of drought and reduced chill hours throughout the region, growers will need to focus on a range of adaptations to continue to be viable.

THE FUTURE OF HORTICULTURE IN THE CRADLE COAST REGION

The entire Cradle Coast NRM region is projected to have an increase in temperature of 2.6 to 3.3°C, which is similar to the rest of the state[1]. Temperature changes in the region could have implications for the key growth stages of many crops, impacting on the abilities of horticulturists to continue growing their current produce. Vegetable and viticulture crops are very temperature sensitive with restricted optimum growing times[2,3].

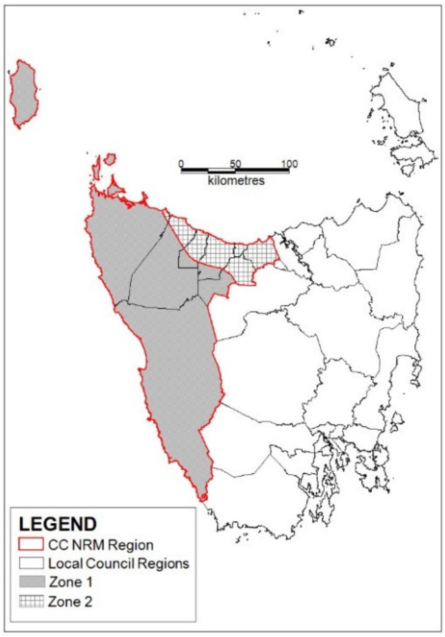

Figure 1. Cradle Coast Region depicting Zones 1 & 2.

Horticulture in the region occurs in zone 2 where change in rainfall is expected to increase up to 20% in winter and spring and decrease by 10-20% during summer and autumn. These changes in rainfall are expected to generate more intense downpours along with longer dry periods[1] which could have impacts on the horticultural industry. For example the increase in rain during summer could cause crop loss due to fruit splitting and increased risk of rots and moulds[4]. This increase in rainfall intensity is also likely to increase the risk of soil erosion for several enterprises.

Frost can be detrimental to many horticultural crops, especially during key phases. During the critical growth stages, hard frosts, which occur below -2°C, are more detrimental to the crop than light frosts, which occur at less than 2°C. Frost incidence is expected to decrease under

[1] Holz et al., 2010
[2] Rogers and Montagu 2013
[3] Webb et al., 2006
[4] Tasmania Climate Change Office, 2014

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the Climate Futures A2 scenario for the region, although damaging spring frosts may still occur[1] (Figure 2).

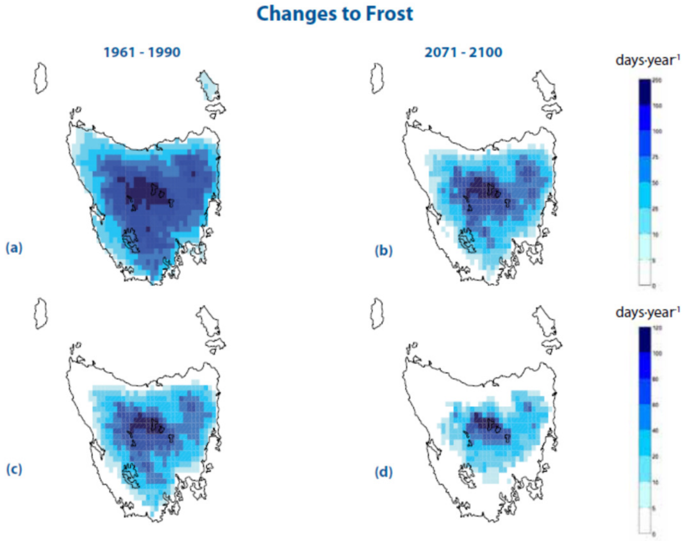

Figure 2. Frost incidence under the A2 emissions scenario. (a) and (b) days with less than 2°C per year (c) and (d) days with less than 0°C per year. Source: Holz et al 2010.

Another major contributing factor to crop growth is the number of growing degree days (GDD). Growing degree days, also referred to as growing degree units, is a measure of the heat required to grow and ripen crops[1]. Under climate change the number of GDDs is projected to increase across the region (Figure 3).

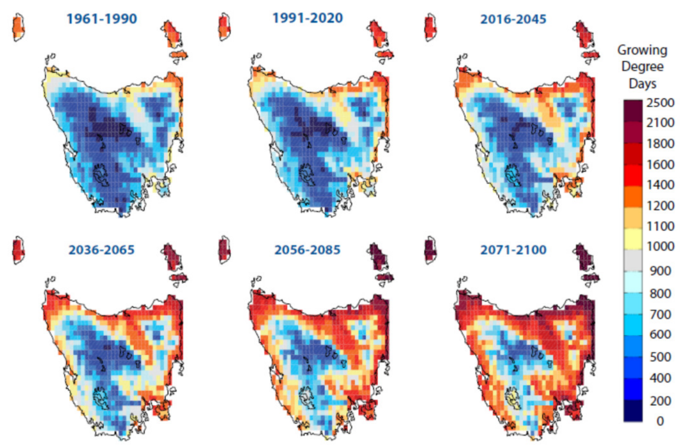

Figure 3. Annual growing degree days under the A2 emissions scenario. Source: Holz et al 2010

The most detrimental climate impact on the productivity of current cultivars and viability of fruits, nuts, vegetables and viticulture is likely to be the projected changes in winter chill hours. Chill hours, or chill units, are a measure of a plants cumulative exposure to chilling temperatures which, for the model used[1], do not occur below 0°C or above 9 °C.

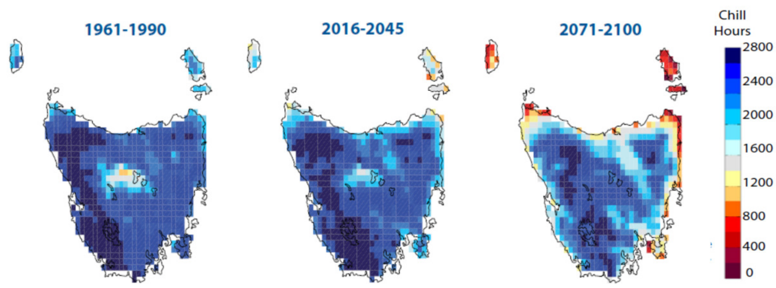

Figure 4. Annual chill hours under the A2 emissions scenario. Source: Holz et al 2010.

Under the A2 emissions scenario chill hours at low altitutes are expected to decrease significantly (Figure 4) and will add significant pressure on horticulturalists to manage their crops.

ADAPTATION OPTIONS FOR THE HORTICULTURE INDUSTRY

⇒ Adapting planting times and changing to better adapted cultivars and alternative crops.

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⇒ Adaptation methods to compensate loss of chilling.

⇒ Adapting to increasing rainfall through crop protection.

⇒ Continued management of frost risk.

⇒ Water management through increasing capacity to capture runoff as drier summers place additional pressure on irrigation systems.

⇒ Managing soil erosion risk through landscaping.

⇒ Exploring the potential for land use change which may arise in areas currently limited by temperature.

⇒ Understanding and managing disease and pests and considering the introduction of disease resistant crops.

It is expected that generally a combination of adaptation strategies will work best and there will be overlap between the benefits of adaptation to various sectors.

REFERENCES

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