

LEGUME PRODUCTION

VULNERABILITY RATING
(Low—High)



PROGNOSIS

With increasing temperatures and growing degree days and a reduction in frost risk, legume production is set to expand into new territory across the region. However, as a result of increased rainfall intensity and longer periods of drought throughout the region, growers will need to focus on erosion control and water management.

THE FUTURE OF LEGUME PRODUCTION IN THE CRADLE COAST REGION

Legume species and cultivars are grown as both cash crops (vegetables and potentially grains) and fodder crops (pasture species). Fodder species are particularly important for grazing industries, while cash crops are important in crop rotations. Including legumes in the rotation drives pasture production by producing nitrogen and they are important for weed and disease management. Legumes also improve the protein levels and digestibility of pastures¹.

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 State². Changes in rainfall, however, will vary across the region (Figure 1). In zone 1 rainfall is expected to increase up to 20% in winter and spring and decrease by 10-20% during summer and autumn. In zone 2 there will be an increase in summer and winter rainfall by up to 10% and a slight decrease in the spring, however, little change is expected during autumn¹.

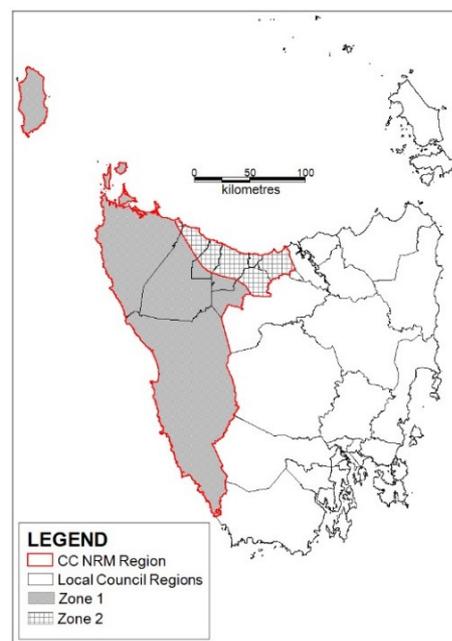


Figure 1. Cradle Coast Region depicting Zones 1 and 2.

¹ Hall, 2006

² Holz et al., 2010

These changes in rainfall are expected to generate more intense downpours along with longer dry periods¹ which could have impacts on the legume production. This increase in rainfall intensity is also likely to increase the risk of soil erosion. The increase in summer rain projected in zone 2 could also present harvesting challenges of grain legumes due to high humidity³.

Frost during flowering can be detrimental to legume crops resulting in seed abortion¹ Frost risk days are projected to decrease significantly across the entire region² (Figure 2) and may allow growers to consider new growing sites.

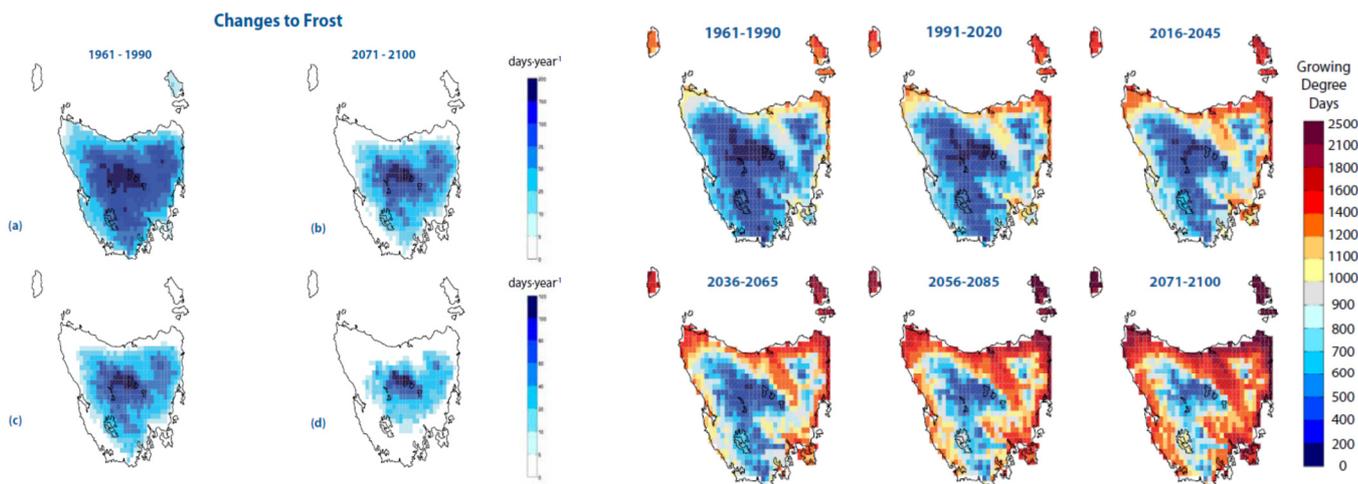


Figure 2. Frost incidence under the A2 emissions scenario. (a) and (b) days with less than 2°C per year (c) and (d) days with less than 0°C per year. Source: Holz et al., 2010.

Figure 3. Annual growing degree days under the A2 emissions scenario. 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 crops². Under climate change the number of GDDs is projected to increase across the region (Figure 3).

ADAPTATION OPTIONS FOR LEGUME PRODUCERS

- ⇒ Adapting planting times for annual cash crops.
- ⇒ Changing to better adapted cultivars.
- ⇒ Water management through increasing capacity to capture runoff as drier summers place additional pressure on irrigation systems.

³ D. Armstrong (personal communication 29.4.2014)

- ⇒ Managing soil erosion risk where annual leguminous crops are grown, through landscaping including the use of cereal straw on rip lines.
- ⇒ Exploring potential for land use change, particularly in regions currently limited by temperature and frost incidence and summer rainfall during harvesting in zone 1.
- ⇒ Awareness of and monitoring for pests and disease.

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

REFERENCES

Hall, E, 2006, *Species for Profit - A Guide for Tasmanian Pastures and Field Crops*, Edited by Jonathan Knox, Robin Thompson and Sarah Campbell, Department of Primary Industries Water and Environment, Tasmania, pp. 108

Holz GK, Grose MR, Bennett JC, Corney SP, White CJ, Phelan D, Potter K, Kriticos D, Rawnsley R, Parsons D, Lisson S, Gaynor SM & Bindoff NL 2010, *Climate Futures for Tasmania: impacts on agriculture technical report*, Antarctic Climate and Ecosystems Cooperative Research Centre, Hobart, Tasmania

Vadez, V; Berger, JD; Warkentin, T; Asseng, S; Ratnakumar, P; Rao, KPC; Gaur, PM; Munier-Jolain, N; Larmure, A; Voisin, AS; Sharma, HC; Pande, S; Sharma, M; Krishnamurthy, L; Zaman, MA. *AGRONOMY FOR SUSTAINABLE DEVELOPMENT*; JAN, 2012; 32; 1; p31-p44

Image: Hall, E, 2006, *Species for Profit - A Guide for Tasmanian Pastures and Field Crops*, Edited by Jonathan Knox, Robin Thompson and Sarah Campbell, Department of Primary Industries Water and Environment, Tasmania, pp. 108



Australian Government

This project is supported by Cradle Coast NRM, through funding from the Australian Government