

Potential distribution of *Chloris truncata* (windmill grass) in relation to climate and soils

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Summary *Chloris truncata* is a short-lived summer-active stoloniferous grass that is widely established throughout temperate regions of Australia except Tasmania. Although considered a valuable rehabilitation and potential pasture species in Australia, it is otherwise regarded as a significant weed of agricultural systems due a range of factors including allopathic effects and hosting of pests and diseases. *Chloris truncata* has been widely dispersed since the 18th century within Australia where it has been a wool contaminant. Since that time, the waste from wool scouring plants located across the northern hemisphere has led to numerous introductions of *C. truncata*, but not all have survived. Its proposed use as a pasture species meant further introductions including by the prolific seed disperser Ferdinand von Mueller in the 1880s, through to more recent introductions in the 1970s to experimental field stations in USA—there was mixed success in its establishment. This provides an opportunity to examine the prediction of a species distribution (not only to regions predicted to be suitable, but also to where it is known to be unsuitable).

We developed a distribution model for *C. truncata* using CLIMEX, a program that models the potential response of a species to climate based on geographical distribution, biology and seasonal phenology. The growth response of *C. truncata* to constant temperatures was measured and used along with values for moisture inferred from the Australian distribution to

develop parameters for a CLIMEX model of potential distribution. We used the native distribution of eastern Australia and introduced areas of Western Australia to verify the model and to show associations with soil types. The projection of the model to the world was tested for presence and absence using the observed established and failed distributions. The verified model was then projected to future conditions due to climate change showing a reduced distribution in Australia, but an expansion overseas. Full details of the development of the model and results can be found in Michael *et al.* (2012).

Keywords CLIMEX, distribution model, climate.

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REFERENCES

Michael, P.J., Yeoh, P.B. and Scott, J.K. (2012). Potential distribution of the Australian native *Chloris truncata* based on modelling both the successful and failed global introductions. *PLoS ONE* (accepted subject to revision).