

Poster: Risk Assessment, Quarantine and Post-Harvest

QFly in a warming world: Biosecurity implications for Australia, New Zealand and globally

Authors: Darren J. Kriticos¹, Anna Szyniszewska², Noboru Ota³, Bernie Dominiak⁴ Hanna Gasiorowska², Karol Kozyra², Nikos T. Papadopoulos⁵ & Tania Yonow¹

¹*Cervantes Agritech Pty Limited, Canberra, Australia*, ²*Corvus Geostat, Poznan, Poland*, ³*CSIRO, Wembley, WA*, ⁴*NSW Department of Primary Industries*, ⁵*University of Thessaly*

Queensland Fruit Fly, *Bactrocera tryoni*, is Australia's most economically important horticultural pest. Recent climatic changes have allowed *B. tryoni* populations to overcome cold stress range limitations, expanding its range southward. This has undermined efforts to protect horticultural production in the Tristate area using the Fruit Fly Exclusion Zone (FFEZ), leading to its abandonment as a management tool. Recently *B. tryoni* was detected in Tasmania, and was the subject of an eradication campaign. Also, it has been detected many times in New Zealand and was the subject of successive eradication campaigns. However, it is unclear in all these cases whether in the absence of eradication efforts, the populations would have petered out naturally. Here we apply the CRU TS4 climate dataset to the CLIMEX model of *B. tryoni* to assess the geographical and phenological trends in climate suitability from 1970 – 2019. We found statistically significant trends in improving climate suitability at a range of sites in Australia and New Zealand. Additionally, we applied a business-as-usual future climate scenario to assess the sensitivity of the potential distribution in Australia, New Zealand and globally. We discuss the implications of the expanding potential distribution of *B. tryoni* for biosecurity and protection of market access in Australia and New Zealand and the global potential distribution.

Keywords: CLIMEX, *Bactrocera tryoni*, Qfly, niche modelling, pest risk analysis, distribution, climate change, seasonal phenology, invasion