

Abstracts of presentations at ICE2022Helsinki

Effect of propagule pressure and temperature on establishment success of *Bactrocera zonata*

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Abstract: The peach fruit fly, *Bactrocera zonata* (Diptera: Tephritidae) is a major pest of mango, peach and guava. It is of Asian origin, and is currently present in southern Asia, the Middle East and north eastern Africa. It is of concern to areas where it is not yet established, and is listed as a quarantine pest in Europe, Australia and the Americas. Preventing the establishment of *B. zonata* in new areas relies on understanding the factors influencing its population establishment potential. The two most influential factors for successful establishment of new populations has been shown to be environmental suitability and propagule pressure – that is, the number of founding individuals, and the timing and frequency of introduction events. This study aimed to determine the influence of, and interaction between, the size of the founding population, number of introduction events and environmental temperature on the establishment success of *B. zonata* colonies in a laboratory experiment. *Bactrocera zonata* colonies were initiated by introduction of founding individuals to 3L plastic containers providing ample space and food for colony growth. Five different founding population sizes (n=2, 4, 8, 16 and 20) introduced at four different introduction rates (all at once or incrementally) were tested. This was repeated at three different temperatures (20°C, 25°C and 30°C) to determine the influence of ideal (25°C) or adverse (20°C and 30°C) temperatures on establishment success. We considered establishment to be successful if adult emergence in the F1 generation was greater than the number of founding individuals. We found that adverse hot and cold temperatures resulted in significantly increased mortality and decreased establishment success of *B. zonata* colonies. Increasing the number of introduction events and the size of founding population also increased successful establishment, especially at adverse temperatures. The results obtained highlight the factors important for establishment of *B. zonata*, and give insight into factors and interactions that may be important for establishment and invasion of fruit fly pests in general