

## When density matters: development of teneral Argentine stem weevils under crowded conditions

Jessica Vereijssen <sup>\*1</sup>, Stephen Goldson <sup>2</sup>

<sup>1</sup> Lincoln University, PO Box 84, Lincoln, 7647, New Zealand

<sup>2</sup> Better Border Biosecurity, c/o AgResearch, Private Bag 4749, Christchurch 8140, New Zealand

The introduced Argentine stem weevil (*Listronotus bonariensis*) causes damage to New Zealand pasture grass species. Field population studies have suggested that weevil population fluctuations can apparently be determined by the extent of weevil crowding where high populations have been found to lay low numbers of eggs per capita and vice versa. The objective of this study was to test if the development rate of teneral *L. bonariensis* changes with weevil density and whether there are any physiological consequences for the females. This study was part of a larger programme to determine the effects of confinement and crowding on teneral and gravid weevils. Two weevil densities (15 (low) and 45 (high)) were kept in plastic containers for either 11 or 21 days. Weevils were fed ryegrass proportional to the density and in sufficient quantity to off-set any suggestion that food supply was in any way a limiting factor for development or oviposition. Results showed that females at high density had significantly more oöcyte resorption  $\beta$ -carotene crystals in their pedicels after 11 days. This indicates egg production had stopped, suggesting oviposition rates sharply decreased. By 21 days, the females kept at both densities showed increased crystal inclusions. At 11 days, male weevils under the high density treatment had significantly lower levels of maturity than those at low density although this difference was no longer significant after 21 days. Overall for the females, crowding did not affect wing muscle or ovarian development. For the males, there was no effect on wing muscle development.

