

## The Effects of Crown Weevil, *Trichosiocalus horridus*, on the Growth of Nodding Thistle, *Carduus nutans*

Trish M. Keown

Department of Entomology, PO Box 84, Lincoln University, Canterbury, New Zealand

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Rosettes of nodding, *Carduus nutans*, thistle smother pasture and crops and reduce their availability to stock. It is a weed of major economic importance worldwide and a noxious weed in New Zealand. Cultural and mechanical control are difficult because of the plant's ability to germinate most of the year round and because of the persistence of the seed in the soil. Three biological control agents have been introduced into New Zealand to aid in the control of nodding thistle. A field experiment was carried out to test the effect of varying numbers of *Trichosiocalus horridus* on the growth responses of nodding thistle. Plants of different germination times were subjected to infestation by 5 densities of *T. horridus* larvae. Characteristics of *C. nutans* growth habit were measured both during and at completion of the trial. The extent of damage to nodding thistle is affected by size of the thistle and number of the larvae. It also appears that damage by crown weevil produces a stimulatory effect because the crowns of infested thistle plants were larger than noninfested plants. However, overall thistle size, as indicated by the plant weight, was not increased so overall plant biomass was not affected by crown weevil damage. All infested plants were shorter than noninfested plants. Noninfested plants did not produce any laterals, while the number of laterals generally increased in infested plants with increasing numbers of larvae. Plant mortality generally increased with increasing numbers of larvae, even though the differences were nonsignificant. Plants with larvae had significantly fewer seed heads than plants without. However, the seed heads generally increased in size with increasing larval numbers. The root:stem ratio showed no significant differences between treatments. Thistles showed a general increase in crown diameter in response to increasing infestation by crown weevil. Rosette size did not differ significantly between treatments and the plants with the highest numbers of larvae had the largest rosette size. Crown weevil has the potential to be a good biological control agent of nodding thistle if used in conjunction with other controls to initially reduce the thistle size. Used in this way, crown weevil has the potential to control the population of smaller rosettes.

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