

**ESTABLISHMENT OF *MICROCTONUS AETHIOPOIDES*,  
A PARASITOID OF THE SITONA WEEVIL IN NEW ZEALAND**

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The sitona weevil (*Sitona discoideus* Gyll., Coleoptera:Curculionidae) is a pest of lucerne (*Medicago sativa*) in New Zealand. A parasitoid of the adult stage, *Microctonus aethiopoides* Loan (Hymenoptera: Braconidae) originating in the Mediterranean area was introduced via Australia as a biological control agent against sitona in May 1982, reared in a quarantine laboratory at Lincoln and first released in October 1982 (Dr J.A. Wightman and M.W. Stufkens, unpublished). Studies of Canterbury populations of *M. aethiopoides* were carried out in 1985-86 (Goldson and Proffitt 1986). This paper describes the release programme and reports the results of surveys of *M. aethiopoides* populations in the South Island in 1985 and 1986.

**Releases**

*M. aethiopoides* was reared in the laboratory under a diurnal temperature regime of 18 °C (day) and 15 °C (night) with a 14:10 L:D photoperiod. Sitona weevil adults fed on potted lucerne plants were provided as hosts. Adult sitona weevils (>80% parasitised) or reared adult *M. aethiopoides* were released on a total of 17 lucerne crops in Marlborough, Canterbury and Central Otago (Vincent County) (Table 1). Totals of 30,450 sitona weevils and 2,390 adults parasitoids were released.

**TABLE 1: Numbers of parasitised sitona weevils and adult *M. aethiopoides* (in parentheses) released on lucerne crops.**

Counties	n releases	1982	1983	1984	1985	Total
Marlborough	3	1200 (200)			3500 (200)	4700 (400)
Amuri	3		300 (80)		4500 (200)	4800 (280)
Malvern	2	600 (200)				600 (200)
Ellesmere	6	7800 (450)	— (390)	4700 (530)		12500 (1370)
Ashburton	2	2900 (100)		1000 —		3900 (100)
Vincent	1		450 (40)	2000 —	1500 —	3950 (40)
TOTAL	17	12500 (950)	750 (510)	7700 (530)	9500 (400)	30450 (2390)

**Recoveries and Population Density**

Surveys of South Island lucerne-growing areas were made in April-June 1985 and 1986, and in November 1986. Sitona weevils were collected by sweep-net from lucerne crops (sites) encountered on road transects. Some crops where parasitised sitona had previously been released were surveyed, but not until at least 1 year after release of the parasitoid. Adult parasitoids were reared from samples of approximately 100 weevils/site in 1985. In 1986, parasitoid larvae were sampled by dissection of 25-50 weevils/site. Table 2 shows the total number of sites, number of sites with detectable parasitoids, the number of sitona weevils parasitised by *M. aethiopoides* and the proportion of parasitised weevils in sites supporting *M. aethiopoides*.

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**TABLE 2: Recoveries of sitona from surveys, showing total lucerne sites (n), sites with *M. aethiopoulos* (n), total sitona from the latter (n), parasitised sitona (n), and proportion of parasitism at sites with *M. aethiopoulos* (%).**

Counties	Total sites n	Sites with <i>M. aethiopoulos</i>			
		n	Total sitona n	Parasitised sitona n	%
<b>1985 April-June</b>					
Marlborough	2	2	126	7	6
Amuri	2	1	100	2	2
Ellesmere	13	13	1141	340	30
<b>1986 April-June</b>					
Eyre	13	7	190	26	14
Malvern	6	2	50	11	22
Ellesmere	26	24	600	210	35
Ashburton	33	32	800	287	36
Strathallen	8	7	175	37	21
<b>1986 November</b>					
Vincent	2	2	50	22	44
Maniototo/Waihemo	5	0	0	0	0
<b>TOTAL</b>	<b>110</b>	<b>90</b>	<b>3232</b>	<b>942</b>	<b>29</b>

*M. aethiopoulos* became established in several lucerne-growing areas of the South Island, particularly in mid-Canterbury (Ellesmere, Ashburton) where in 1986 considerable parasitism (>30%) occurred. In population studies at a site near Ashburton 40-55% parasitism was recorded in April-June 1986. These levels of parasitism are comparable with that recorded in Morocco (Aeschlimann 1978) and in south-eastern Australia (Cullen and Hopkins 1982). However, Goldson and Proffitt (1986) point out that mortality of adult sitona, due to parasitism, is followed by strongly density-dependant mortality of neonate larvae during their spring establishment in lucerne root nodules. This may negate the mortality effected by *M. aethiopoulos*.

Life-table studies on sitona mortalities, including that due to *M. aethiopoulos*, are in progress (Goldson *et al* in prep.) to further evaluate the potential of *M. aethiopoulos* as a biological control agent.

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