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Effect of leafy spurge biotypes and herbicides on *Aphthona* spp. establishment

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The effect of herbicides applied to leafy spurge on *Aphthona* spp., survival and establishment was evaluated. The experiment was established at seven locations, four *A. nigriscutis*, two *A. cyparissae*, and one *A. flava* location. *Aphthona* spp. were released in the center of a 100 feet by 100 feet plot divided into four equal 50 feet by 50 feet quadrants. The herbicide treatment of picloram plus 2,4-D at 8 plus 16 oz/A was applied to quadrants one and two the first year, to quadrants two and three the second year, and so on. In general, most adults were found in quadrants that were sprayed the previous or current year, or quadrants that have never been sprayed, but not in quadrants treated 2 years consecutively.

The timing of herbicide treatment on *A. nigriscutis* survival and establishment was evaluated. *A. nigriscutis* was released in 1989 and herbicide treatments were initiated the spring of 1992 in a dense stand of leafy spurge near Cuba, ND. The treatments included spring-applied picloram plus 2,4-D at 4 plus 16oz/A fall-applied picloram plus 2,4-D at 8 plus 16 oz/A, and a control of no herbicide. Stem density was evaluated in June of 1992 before herbicide treatment and May of 1993. Stem density increased in the spring-treated plots from 43 stems/ml in 1992 to 52/m^2 in 1993. A large decrease in the fall-treated plots from 43 stems/m^2 in 1992 to 3/m^2 in 1993 was observed due to the herbicide treatment. A decrease from 57 stem/m^2 to 36/m^2 was observed in the control. The *A. nigriscutis* population declined when the herbicide was applied in the spring from an average of 2 beetles/m^2 to 0.3/m^2 12 months after treatment (MAT). The fall-applied herbicide treatment was less disruptive to the *A. nigriscutis* population which was averaged 19 beetles/m^2 compared to 32/m^2 in the control 12 MAT.

Survival and growth of *A. cyperissae, A. czwalinae, A. flava*, and *A. nigriscutis* was evaluated on leafy spurge biotypes from Austria, Manitoba, Montana, Nebraska, North Dakota, South Dakota, and Wyoming. The seven biotypes in 6-inch pots were placed in a cage with approximately 50 adults. The plant position in the cage was rotated every 3 days. Plants were replaced after 9 days for a total of three replications per year, and the experiment was repeated 2 years. Adult feeding was monitored, by counting the number of insects on each biotype at the same time each day. No feeding preference was found except slightly less by *A. flava* on the Nebraska biotype. Eggs were found in all pots but there was poor adult emergence in 1991 and no adult emergence in 1992.