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Effect of leafy spurge biotypes on biocontrol insects and insect-herbicide interaction for leafy spurge control

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The effect of leafy spurge biotypes on *Spurgea esulae* and *Aphthona* spp. survival and growth was evaluated. The leafy spurge biotypes included plants from Austria, Manitoba, Montana, Nebraska, North Dakota, South Dakota, and Wyoming. These experiments are in progress and data presented are from initial evaluations and are not the final results.

S. esulae galls were collected from the field and placed in a cage with 6 plants of each biotype in a randomized complete block design. The adults emerged, laid eggs, and galls formed. The percentage of tips galled per biotype and the number of larvae per gall were averaged over two trials. The largest percentage of galled tips (68%) were on the Wyoming biotype and no galled tips were found on the Montana biotype. The most larvae per gall (14) occurred on the Nebraska biotype and the least (3) on the North Dakota biotype.

Survival and growth of *A. cyparissiae*, *A. czwalinae*, *A. flava*, and *A. nigriscutis* on leafy spurge biotypes was evaluated. Seven leafy spurge biotypes in six-inch pots were placed in a cage with approximately 50 adults of each species in separate trials. Plants were rotated within the cage every 3 days and replaced after 9 days for a total of 3 replications. Feeding was monitored. No feeding preference was observed except there was slightly less feeding by *A. flava* on the Nebraska biotype. Eggs were found in pots of each biotype, but there was poor adult emergence.

The effect of herbicide treatments on *S. esulae* was evaluated. The treatments were 2,4-D at 16 oz/A, picloram plus 2,4-D at 4 plus 16 oz/A, and imazethapyr at 2 oz/A. The leafy spurge top-growth died and gall counts in the herbicide treated plots declined from an average of 30 to 0/4 ft² 1 month after treatment (MAT) compared to 46/4 ft² in the untreated control. Galls were again found on regrowth of treated leafy spurge 3 MAT and averaged 3 galls/4 ft² compared to 8 galls/4 ft² in the control. The number of stems galled were similar 12 MAT regardless of treatment and averaged 4 galls/4 ft².

The effect of herbicide applied to leafy spurge on *Aphthona* spp. establishment was evaluated. *Aphthona* spp. was released in the middle of four 2500 ft² quadrants. The herbicide treatment of picloram plus 2,4-D at 4 plus 16 oz/A was applied to quadrants one and two the first year, quadrants two and three the second year, and so on. Adult movement at four sites was monitored. Adults were distributed equally between the sprayed and unsprayed quadrants.