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Impact of grasshopper treatments on established populations of biological control agents (*Aphthona* spp.) for leafy spurge

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Abstract:

Established populations of flea beetles (*Aphthona* spp.) on leafy spurge may be in jeopardy in areas of western rangelands where damaging populations of grasshoppers require insecticide treatments. The impacts of actions to manage grasshoppers on flea beetles have not been determined and are of great concern.

Do treatments applied for controlling grasshoppers on rangeland infested with leafy spurge cause mortality to adult flea beetles? Which treatments if any, do not cause mortality? Of those that do, what is the immediate mortality level? What level of suppression on the population of biological control agents' results after one year? How long is required for the affected population to return to pretreatment population levels?

Laboratory bioassays and field evaluations were conducted to determine the impacts of grasshopper control treatments. In laboratory bioassays, diflubenzuron produced no significant mortality. Malathion spray produced moderate (25%-41%) mortality while carbaryl spray produced high (86%-96%) mortality. No differences in mortality in direct impingement studies were detected between *A. nigriscutis* and *A. lacertosa* with malathion, carbaryl or in untreated populations. However, on treated vegetation *A. nigriscutis* was observed higher on the plants and demonstrated higher mortality than *A. lacertosa*. In the season of treatment, field evaluations showed that diflubenzuron resulted in 18% and 0% mortality at 1 and 2 weeks post treatment respectively. Carbaryl bait resulted in low (17%) mortality while malathion spray resulted in moderate (21%-44%) mortality and carbaryl spray resulted in high (60%- 82%) mortality. The impacts at one year after treatment will be determined in 2001.