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Integration of the flea beetle, *Aphthona nigriscutis*, and herbicides for control of leafy spurge, *Euphorbia esula*

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Integration of the Flea Beetle, *Aphthona nigriscutis*, and Herbicides for Control of Leafy Spurge, *Euphorbia esula*

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Aphthona nigriscutis has reduced the density of leafy spurge at many locations; however, there are locations where *A. nigriscutis* has not established or is found at densities too low to be effective. Therefore, it may be necessary to integrate biological and chemical control to reduce leafy spurge densities to non-economic levels. The objective of this experiment was to evaluate the integration of picloram plus 2,4-D and *A. nigriscutis* for leafy spurge control. *A. nigriscutis* were released into cages in June and oversprayed with picloram plus 2,4-D at 0.56 plus 1.1 kg/ha on four dates, August 15, September 1 or 15, or October 1. Previous data indicated that picloram plus 2,4-D applied in the spring was not compatible with *A. nigriscutis*. *A. nigriscutis* were sampled from soil cores and in the field to determine the effect of herbicides on the population. Regardless of herbicide application date, the number of *A. nigriscutis* collected from soil cores or in the field were similar compared to the untreated control. Leafy spurge root nutrient content was not affected by picloram plus 2,4-D applied in the fall. Soluble, insoluble carbohydrate and soluble protein concentrations were similar among herbicide application dates compared to the untreated control. The combined treatment of *A. nigriscutis* plus herbicides tended to have better leafy spurge control compared to *A. nigriscutis* or herbicides used alone. The reason for increased leafy spurge control in the combined treatment was not clearly understood. Radioisotope studies indicated there was no increase in herbicide absorption or translocation in plants with or without *A. nigriscutis* larvae. The increase in leafy spurge control was likely a result of preferential feeding by *A. nigriscutis* larvae on root buds combined with the number of root buds killed from the herbicides.
