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The influence of leafy spurge genetic diversity on the reproductive success of leafy spurge gall midge (*Spurgia esulae*)

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The leafy spurge gall midge, *Spurgia esulae*, was introduced into the U.S. in 1986 and has increased significantly in number since that time. Field cage studies with seven leafy spurge biotypes indicated that the number of galled stems and larvae per gall varied with biotype. These data suggest that biotypic differences can have a significant influence on the reproductive success of the gall midge. Restriction fragment length polymorphism (RFLP) analysis of chloroplast DNA (cpDNA) has been used to assess genetic diversity among the seven biotypes. Twelve restriction enzymes and six mung bean cpDNA probes were used to detect variation in the chloroplast genome. Twenty-seven of the probe/enzyme combinations revealed polymorphisms that were used to distinguish the biotypes. Six of the seven biotypes could be separated from each other by their unique combination of polymorphisms. The two biotypes with the fewest number of larvae per gall in the field study were found to have identical cpDNA patterns. These data suggest that genetic variation in leafy spurge can influence the reproductive success of biocontrol agents and that neutral DNA markers could facilitate biocontrol of non-endemic weedy species by providing a means to match agents with acceptable target genotypes.