# BIOLOGICAL CONTROL OF MILE-A-MINUTE WEED

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## ABSTRACT

Mile-a-minute weed (*Polygonum perfoliatum* L.) is an alien invasive weed from Asia that infests natural areas in a variety of habitats. This annual vine is a prolific seed producer and has become a serious problem in the mid-Atlantic region. The North American population is thought to have originated near York, PA, in the 1930s, probably accidentally introduced with holly seed imported from Japan (Moul 1948). Although it was recognized as a potentially dangerous weed that should be eradicated, no action was taken, and the weed can now be found from Delaware west to Ohio, south to West Virginia, and north to Massachusetts. A biological control program was initiated by the U.S. Forest Service in 1996. Over 100 insect species were identified on mile-a-minute weed in China, including several that appeared to have a narrow host-range (Ding et al. 2004). One of these, *Rhinoncomimus latipes* Korotyaev 1997, was tested on plant species in China and in quarantine in Delaware, and found to be extremely host-specific (Colpetzer et al. 2004). This insect was approved by APHIS for release in 2004.

Eggs of *R. latipes* are laid on plants and hatch in about 5 days. Neonates crawl along stems and enter a node, where they feed internally for about 1-2 weeks, after which they drop out of the stem and pupate in the soil. Adults emerge about 1 week later and feed on mile-a-minute weed leaves and terminals. The weevils have been reared at the N.J. Dept. of Agriculture Phillip Alampi Beneficial Insect Laboratory since fall of 2004, and in 2006 more than 20,000 weevils were reared and released. Most releases have occurred in New Jersey, but insects have also been released and have established in sites in Delaware, Pennsylvania, West Virginia, and Maryland. Although it is too soon to assess their impact in the field, plant mortality has been observed in some areas where weevils have heavily defoliated mile-a-minute weed plants in New Jersey.

The impact of the weevil on *P. perfoliatum* seed production was assessed on single plants in replicated field cages (N=6 per treatment) in 2006, with two levels of weevil numbers (5 or 20 per cage) added at two different times (May 26 or June 23); plants in cages with no weevils were included as a control. Seed production was almost completely suppressed between late July and mid-September in the cages with early application of weevils, both low and high levels; however, all plants produced numerous seeds in October, resulting in no significant difference by treatment in total seed production over the season. In this experiment the caged plants were unusually large and robust because of minimal competition with other plants. The experiment will be repeated in 2007 with the addition of more natural levels of plant competition, which should lead to greater impact by the herbivore.

In summary, *R. latipes* can be successfully laboratory reared, and the weevils have been shown to establish well in a variety of field situations. Multiple, overlapping generations occur during the season, and there are indications of plant mortality in the field where heavy defoliation has been observed. A preliminary cage study showed a definite impact of weevil feeding on the phenology of seed production by individual plants, but without the stress of competition, caged plants survived and produced large numbers of seeds even with substantial weevil damage.

## Literature Cited

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