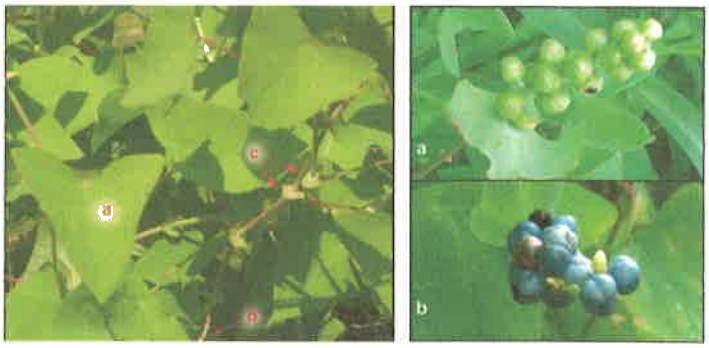
Control of Mile -a-Minute Weed with the Mile-a-Minute Weevil, *Rhinoncomimus latipes*

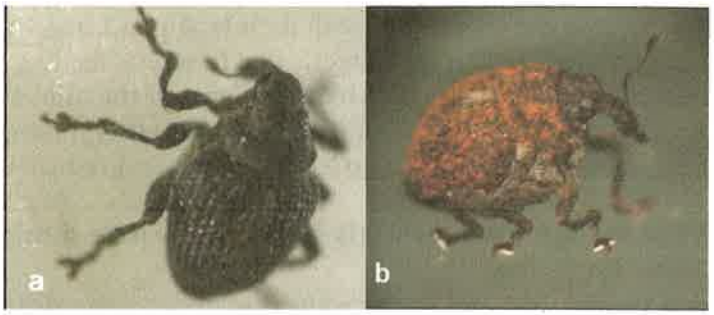
Basic Information: the plant



MAM (left) with triangular leaves (a), backward projecting spines (b), and flared ocreae (c). MAM berry-like fruit clusters (right) immature (a) and mature (b).

Mile-a-minute weed (*Persicaria perfoliata*) is an aggressive annual vine that was accidentally brought from Asia to the mid-Atlantic region of the US in the 1930s. It grows rapidly during the summer, and can produce a near-monoculture, out-competing other plants and preventing regeneration of trees by overtopping saplings. It is covered with small spines, which help it to climb over other plants and also make it a painful nuisance to humans. Berry-like seeds are produced in clusters during the summer and fall, turning from green to blue as they mature. Some of the full-sized green seeds are viable, ranging from 35% in mid-August to more than 80% in late September. Vines die in the fall, and seeds germinate the following spring under old vines, or in places where they have been spread by wildlife or water. Seeds can remain viable in the soil for 6 years.

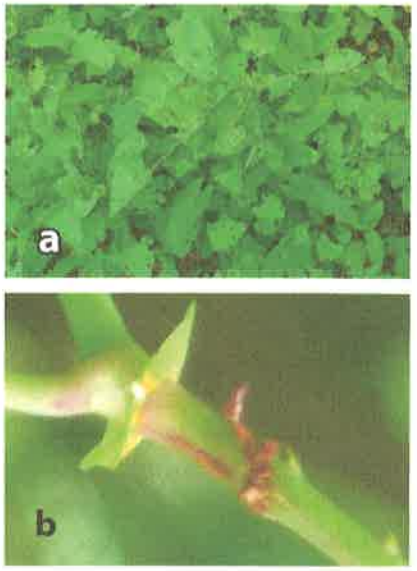
Basic Information: the weevil



Adult weevils are black (a) upon emergence, but turn brown (b) soon after feeding on MAM.

The mile-a-minute weevil (*Rhinoncomimus latipes*) was imported into the US from China in 2004, following extensive testing showing that it feeds and reproduces only on mile-a-minute weed and is not likely to have any negative direct or indirect effects in North America. Adults feed on mile-a-minute leaves, and lay eggs on the plant. Newly emerged larvae bore into the plant stems at nodes, feeding internally until they are full-grown, when they leave the plant and pupate in the soil. Adults emerge, mate, and lay eggs. The entire life cycle from egg to adult takes about 25 days (shorter under warm conditions and longer when it is cool). About 3 or 4 generations are produced during the summer. In late August the weevils stop laying eggs, and adults spend the winter in the soil or leaf litter.

Impact of weevils on mile-a-minute weed



Adult weevil feeding damage (a); damaged nodes from larval feeding (b).

Feeding damage by weevils can delay and reduce seed production, decrease vine elongation, and reduce the overall growth of mile-a-minute. Various environmental conditions can affect this interaction:

- **Sun versus shade.** Both the weed and the weevil do better in the sun than in the shade. Weevils are attracted to sunny areas and thrive on sun-grown plants. Mile-a-minute may "hang on" in the shade in sites where it has been suppressed by weevils in the sun, but plants in the shade will not be as vigorous, and will produce fewer seeds.
- **High versus low moisture conditions.** Mile-a-minute is a moisture-loving plant, and can grow very rapidly when rain is plentiful. Conversely, with its shallow root system, the plant may die under dry conditions, especially if it has been damaged by weevils.
- **Surrounding plant community.** Mile-a-minute grows well when the surrounding plant community has been disturbed – for example, where trees have fallen or been harvested, where power line rights-of-way have been mowed, or where a site has been cleared in anticipation of future construction

(but seeds are present in the soil). Mile-a-minute is not likely to invade a well-established plant community. Before releasing weevils, you should assess the plant community present with the mile-a-minute. If it consists primarily of other invasive non-native plants (such as Japanese stiltgrass) then you should consider replanting the area with desirable native plants in conjunction with weevil release.

Frequently Asked Questions:

How many weevils should I release? When should I release weevils?

Even small releases (20-50 weevils) any time from mid-May through August are likely to become established, but the more you release and the earlier in the season weevils are released, the more rapidly they will build up their populations and begin impacting the weed. A typical release is about 250 to 500 weevils depending upon the mile-a-minute infestation.

How soon will I see results?

This depends on site and weather conditions, the number of weevils, and timing of release. However, you should not expect anything like the immediate impact of an herbicide application. The impact of weevil feeding will be gradual, and may take several years to become noticeable. Take photos before release to remind yourself how bad the problem was before weevils were present!

What will the weevils eat after they kill off the mile-a-minute weed?

The weevils are co-evolved with their host plant, and therefore it would not be to their advantage to kill it off. We rarely see death of plants directly due to weevil feeding. The more common scenario is suppressed plants that languish in competition with other plants. If the mile-a-minute does die or deteriorate substantially, the weevils will leave the area, flying off in search of another mile-a-minute patch. The weevil will not eradicate mile-a-minute weed, but it will help to suppress it and reduce its competitive advantage over native plants.

Even though they currently feed only on mile-a-minute, couldn't the weevils evolve the ability to eat something else?

It is possible, but not likely. Some insects are generalists, feeding on a broad variety of unrelated plants. This includes the Japanese beetle, which you may see feeding on your mile-a-minute weed in addition to many other plants. The monarch butterfly is an example of a specialist insect that responds to the unique chemical cues from milkweed and whose caterpillars can only develop on milkweed. Like the monarch, the mile-a-minute weevil specializes on feeding on mile-a-minute weed, responding to its unique plant chemistry.

If I release weevils, can I also control mile-a-minute using herbicides or mechanical means?

Yes, but we recommend that you set aside a "weevil nursery" area, preferably in a sunny but out-of-the way place, where the weevils can be left to reproduce and build up their population to the point where they will impact plants and disperse to other patches. Mile-a-minute can be controlled using herbicides, mowing, or pulling in areas of high traffic or high ecological importance, leaving these nursery areas undisturbed. All management techniques are most effective when applied early in the summer before mile-a-minute starts to produce seeds.

If I spray or pull mile-a-minute plants that have weevils on them, will the weevils die?

Adult weevils will fly off as their host plant deteriorates, but any eggs or larvae present on the plants will die.

Can I move weevils around on my property or give some to my neighbors as the population increases?

Yes, as long as you are moving them within a state (you need a permit to move them between states). Adult weevils can be collected using a large funnel placed in a narrow-necked plastic container. Tap or beat the foliage with weevils on the side of the funnel and they will drop into the container.

For more information, see http://canr.udel.edu/biocontrol/mile-a-minute-weed/