MEETING SUMMARY (by J. Hough-Goldstein)
Mile-a-Minute Weed Biocontrol Cooperators Meeting, Jan. 26, 2010
Allen Lab, University of Delaware

Forty-seven people attended the meeting, from 7 states plus DC.

Judy Hough-Goldstein briefly reviewed the biocontrol program from its inception in 1996 to the present, and outlined the very encouraging results with monitored releases from 2004 – 2008 (details in Hough-Goldstein et al. 2009). Plant communities can change quickly from mile-a-minute dominated to other species; however, often these other species are also alien invasives, such as Japanese stiltgrass. Continued monitoring in 2009 showed some increases in MAM. It was an unusually cool and wet spring and early summer, which may have enhanced rampant growth by the weed while slowing down weevil development. Although weevils disperse on the order of 200 meters in the first year and ½ mile or so in the second year, estimates of dispersal in following years range from 2.7 to up to 10 miles per year. Even at the highest rate, however, it would take more than 30 years for the weevils to reach the current edge of the mile-a-minute infestation, so distribution is important. Releases in 2009 were conducted in 4 new states, Rhode Island, Connecticut, New York (Hudson River Valley), and Virginia (Fairfax and Front Royal). Additional releases were conducted in NJ, WV, MD, and PA. MA is hoping to release next year, and has a good web system in place for reporting MAM, as does CT. Research in China (not yet published) comparing MAM grown from North American seeds and Chinese seeds in a common garden suggests that the MAM here has evolved greater seed production and lower resistance to *R. latipes* damage. Results from a sun/shade study conducted in the Hough-Goldstein lab suggest that weevils are more abundant in sun than in shade, possibly contributing to greater weed suppression in the sun. Larval damage was found on 20-30% of all stems in sun plots with an established population of weevils.

Matt Frye, UD grad student, described a study he and Ellen Lake conducted last summer to determine the field host specificity of the weevil. He reviewed the "filter of safety" that must be satisfied before a new biocontrol agent can be introduced, and the studies that were done with *R. latipes* before approval. A pilot study was conducted to show that marking weevils with fluorescent dust did not alter their ability to disperse. Then 12 species of Polygonaceae that had shown some level of adult or larval feeding in prior tests, plus a "plastic plant" with triangular leaves (in case the insect searches visually rather than chemically) were transplanted into an array in the field, replicated 6 times. Ten yellow (dusted) weevils were released at the base of the mile-a-minute plant in each replicate, and ten red (dusted) weevils were released at the base of each of the other potential host plants. Red weevils moved from the other hosts to the mile-a-minute plant within 3 hours, while yellow weevils (from MAM) were never found on the alternate hosts. After 3 days the mile-a-minute plants were cut at the base and allowed to die, at which point all weevils left the arrays. No feeding damage or eggs were found on the non-target hosts.

Kiri Cutting, UD grad student, described her MS research project, which involves a field and a greenhouse study comparing mile-a-minute success in replicated plots with and without the addition of a native seed mix, and with and without weevils (present in the area, but eliminated on relevant plots using a systemic insecticide, dinotefuron). Mean percent cover of MAM was

lowest in the field in the weevil/seed mix treatment, but results were compromised by inconsistent germination of both MAM and the planted seed mix. In the greenhouse, MAM cover and final biomass were both much lower in treatments with seed mix (which germinated very well under greenhouse conditions) than those without competing plants, regardless of the presence of weevils. In both lab and field, weevil populations were low, possibly because the insecticide-treated plants were acting as a "sink," attracting weevils and then killing them. Experiments will be repeated in 2010.

Ellen Lake presented monitoring results from 2009 at the sites that she has been following since 2005 (Laurels and two BVA sites). Unfortunately MAM cover increased last summer and weevil density was generally lower than previous years, probably again reflecting the cool wet weather last spring and summer. She described her integrated weed management experiment, which involves four replicates (at four different sites) of four treatments: high-density goldenrod, low-density goldenrod, low-density goldenrod plus elm trees, and control (no planting), all with weevils and ample MAM populations. Half of each plot was treated with pre-emergent herbicide. The treatments were established in fall of 2008, and therefore few differences were expected (or found) during the 2009 establishment year. However, the elms were significantly taller in plots with herbicide, reflecting release from competition with MAM (and possibly Japanese stilt grass). Goldenrod at some but not all sites was browsed by deer.

Liz Drummond described her study comparing three methods of monitoring for weevils, the visual count method that we currently use; a "tap" method, where MAM terminals within a quadrat were placed in a white plastic bucket and tapped against the side, causing them to fall to the bottom where they could be counted; and a "vacuum" method using a reverse leaf blower to suck up weevils in the quadrat. The count method yielded the highest numbers of weevils, probably because the other two methods created disturbance that caused the weevils to drop to the ground before they could be caught. The tap method was slightly less time-consuming than the count method, while the vacuum method was the most time-consuming. In the discussion that followed we noted that to collect weevils to transport to other sites, tapping the terminals into a white plastic bucket with a snap-on lid can be very efficient. Putting pieces of foliage in the bottom keeps them from crawling up the sides as collection continues.

<u>Afternoon session</u>: integrated weed management; new projects

Ray Clarke described a restoration project conducted by the Open Land Conservancy of Chester County, a non-profit volunteer-managed land trust established in 1939. While initially desiring to "let nature do its thing," recently it has become clear that some parts of the Valley Creek preserve have been over-run by invasives. These were mechanically cleared in March 2007, but by June the site was a vast monoculture of MAM. Herbicides were applied in June 2007, and no-till drill seeding of a native plant mix (mostly warm-season grasses) was done the following April, 2008. However, mile-a-minute completely covered these plantings by July 2008. A combination of selective herbicides was applied, and by September 2008 the grasses reclaimed the site. Grasses were again dominant in 2009.

Rick Johnstone, from Integrated Vegetation Management (IVM) Partners, presented some of his projects in which he has consulted with industry to attempt to produce a better outcome in rights-

of-way, primarily using mixtures of selective herbicides rather than routine mowing, which is often the current industry practice. The aim is to provide a center "wire zone" which is a meadow, and a shrub zone at the edges to transition into woods. He stated that in his experience restoration planting is generally not necessary to produce a mixed native stand with rare plants coming back. Unfortunately Alex Brown from PECO, was unable to attend, but Ben LaPage and Stephanie Everett from their Environmental Services dept. were able to answer some questions.

Hough-Goldstein mentioned that she is thinking of trying to organize a "collect your own" event where Delaware residents could come to a site with numerous weevils present (such as White Clay Creek State Park) and collect weevils to take back to their own mile-a-minute patches, as a way of speeding the spread of the insects throughout the state. This could be a pilot project that, if successful, could serve as a model for other states.

She also discussed a Biocontrol in the Schools project, intended to raise awareness of invasive plants and biological control among school children and their parents. In 2009, a pilot project by Hough-Goldstein and her three grad students showed that plastic cages with MAM plants and 10 weevils each (provided by the Trenton lab) could be successfully used to rear a new generation of weevils within about 5 weeks, and could be compared to plants without weevils, providing data that teachers could use in teaching graphing, percentages, etc. We plan on trying this out in actual schools this year.

Finally, discussion ensued concerning the continued spread of mile-a-minute in North America, and the need to implement the biocontrol program at the edges of the infestation. Yun Wu is still working on producing a new map, but stated that so far she has 30 new counties to add where infestations have been located since the 2008 update. Lisa Tewksbury described releases and monitoring conducted in Rhode Island in 2009, and Donna Ellis and Carole Cheah send a presentation on activity in Connecticut. Jennifer DeSio provided a handout summarizing the successful rearing of more than 133,000 weevils by the NJDA Phillip Alampi Beneficial Insect Laboratory in 2009, and stated they hope to surpass this number in 2010. Finally, Jil Swearingen presented information on using EDDMaps to map both MAM and weevil releases. Hough-Goldstein and Wu will be following up on this, as well as contributing images of *R. latipes* to the Bugwood Network site that hosts EDDMaps.