

## Biological Control Program, 2006

Biological Control Program activities remain focused primarily on exotic pests including the cereal leaf beetle, *Harmonia axyridis*, hemlock woolly adelgid, and imported fire ant. Following are brief summaries of these projects.

**Cereal Leaf Beetle (CLB), Parasitoid Rearing.** One insectary to rear parasitoids of *Oulema melanopus*, a pest of small grains, was operated at the Piedmont Research Station near Salisbury during 2006. For the sixth year, larvae parasitized by *Lemophagus curtus* were found at Salisbury. The insectary now contains the aforementioned species and *Tetrastichus julis*, as well as the egg parasitoid, *Anaphes flavipes*. To assist *A. flavipes* rearing efforts in the western US, about 400 CLB adults were collected at the Piedmont Research Station and NCSU Farm Unit 2 and shipped to the Colorado Department of Agriculture.

***Harmonia axyridis*.** Studies on the introduced multicolored Asian lady beetle *Harmonia axyridis* were continued during 2006.

Two light traps were run on the grounds of the BIL between 14 August and 29 September 2006 and all coccinellids collected. The insects were preserved, packaged and shipped to cooperators at the State University of New York; they are studying infection patterns of the fungus *Hesperomyces virescens* on the beetle. October 30 to 7 December an experiment was set up to investigate behavioral patterns of transmission of the fungus *H. virescens* among *H. axyridis* during the winter aggregation period. The study is ongoing, with results to be tabulated in spring of 2007.

August 23-26 and September 15-17 studies were conducted to determine the diurnal timing of *Harmonia* flight to outdoor blacklight traps; the data are currently being analyzed.

One paper is currently in press and will be published in the Journal of Invertebrate Pathology before the end of the year:

Nalepa, C.A., and A.Weir. Infection of *Harmonia axyridis* (Coleoptera: Coccinellidae) by *Hesperomyces virescens* (Ascomycetes: Laboulbeniales): role of mating status and aggregation behavior.

**Hemlock Woolly Adelgid, Predator Rearing.** A native of Asia, this pest attacks hemlock trees, settling onto branches and sucking sap from the base of the needles. Widespread infestations have been found in North Carolina, in a variety of situations from specimen trees in landscapes to large stands in natural areas. Since chemical treatment is so difficult, a biological control program is being initiated in cooperation with the USDA Forest Service and USDA-APHIS. An insectary was established in our Cary lab in 2002 to rear a small predatory

beetle, *Sasajiscymnus tsugae* (= *Pseudoscymnus tsugae*), a host-specific predator. The operation has expanded each year. About 120,000 beetles were turned over to the Forest Service for release at selected sites during 2006. Plans call for rearing 150-200,000 beetles in the coming year.

**Imported Fire Ant. Phorid Fly Overwintered and Spread in Wake Co.** The phorid fly *Pseudacteon curvatus* was released in Wake County over a two-week period in April 2005. A total of six generations were recovered through December, and flies were found approximately ¼ mile from release mounds. Monitoring resumed in spring 2006 when temperatures returned to an average of 70°F. A total of seven generations of flies were found through November. Flies were found approximately 5.0 miles from the release site. Monitoring of flies will resume next year when warmer temperatures return.

*New Release of Phorid Flies.* Approximately 3,639 phorid flies (*Pseudacteon tricuspis*) were released in Pitt County, NC over a two week period in September 2006. The first recovery of flies occurred 50 days after the initial phorid fly release. Only one generation of flies was found before temperatures dropped too low for fly activity. The previous release sites (*P. tricuspis*) in Wayne, Duplin and Robeson Counties were monitored during the fall, but no flies were collected at any of the sites.

**Business Continuity Plan.** A Business Continuity Plan using the Living Disaster Recovery Planning System (LDRPS) was developed for Plant Industry to use in the event of a major disaster. The plan lists business processes, copies of pertinent forms, regulations and data, supplies and equipment necessary for operations, call lists, assignment of teams with a list of tasks to keep Plant Industry functional during and after a disaster. Copies of the plan were given to Supervisors to keep at home.