

**BIOLOGICAL CONTROL AND NOXIOUS WEEDS  
SEMI-ANNUAL ACCOMPLISHMENT REPORT  
Cooperative Agreement Number 05-8209-0195**

**[Accounting Codes 552-8703-325 (Biological Control) and 552-8703-455 (Noxious Weeds)]**

Year            2005  
State           Connecticut  
Agency       The University of Connecticut

**I. Activities.** Progress made toward accomplishment of calendar year 2005 work plan objectives during the period January 1, 2005 through June 30, 2005.

A.     Cooperator    Donna Ellis  
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B. Member name, if applicable, of National CAPS Committee: N/A

C. All objectives established for the period January 1, 2005 through June 30, 2005 have been met. Please see the individual surveys below for details of actual accomplishments.

D. All objective have been met.

E. No cost overruns.

F. N/A

G. NAPIS database submissions: There were no database submissions during this time period. Surveys are ongoing and data will be entered into NAPIS once confirmations have been made.

**II. Individual Survey Activities**

**A. BIOLOGICAL CONTROL PROGRAM FOR PURPLE LOOSESTRIFE**

**Survey Methodology.** Recruitment and training of new beetle farmers who are rearing and releasing their own colonies of *Galerucella* beetles occurred during the reporting period from January to June. Target groups of beetle farmers were identified and contacted through the educational outreach component of the project, and these groups were encouraged to adopt a local wetland site for biological control. Through workshops, field demonstrations, and other interactive programs, the beetle farmers learned about the rearing process and were encouraged to raise their own *Galerucella* beetles locally. All introductions of biological control agents into new wetland locations will be made in accordance with Federal and State release permit

specifications and conditions set forth by the Connecticut State Entomologist. A consent letter is being obtained from each property owner prior to the release of biological control agents on state, town, or privately owned land.

During the summer months, existing biological control study sites will be visited and examined visually to determine whether *Galerucella* populations have become sufficiently established to designate the sites as field insectaries, and also to determine if biological control of purple loosestrife is underway.

**Rationale Underlying Survey Methodology.** The purple loosestrife (*Lythrum salicaria*) biological control program continued during 2005 with greater emphasis on 1) increasing the production and distribution of the biological control agents *Galerucella californiensis* and *Galerucella pusilla*, 2) initiating and maintaining field insectaries where the biological control agents will or have become established, and 3) enhancing the educational outreach component of the program by identifying target groups (“Beetle Farmers”) to engage cooperators to participate in local rearing and release projects. The program has evolved from a concentration on applied research and long term monitoring of study sites where the biological control agents have been released to a targeted focus on educational outreach.

Since the purple loosestrife biological control program was initiated in Connecticut in 1996, each year the demand for biological control agents always exceeds the supply available for release. At the current time there are a limited number of wetlands in the state that have been designated as field insectaries where sufficient *Galerucella* beetle establishment had occurred and these organisms are of a satisfactory population to collect and use for rearing programs. Availability of the beetles becomes a limiting factor in the success of the purple loosestrife statewide program. This shortfall not only limits the initiation of new release and monitoring sites but also limits the number of ongoing study sites where supplemental releases are needed to allow the biological control agents to become established.

Shipments of *Galerucella* beetles from the USDA were phased out in 2004. State cooperators must now find other options to continue biological control programs for this invasive species. One option to increase production and distribution is to collect and rear the biological control agents locally. In Connecticut, from 1999 through 2003 more than 160,000 *Galerucella* beetles were reared at the University of Connecticut Department of Plant Science Research and Teaching Facility and a total of 300,000 beetles were released statewide. Local field insectaries are an important source of the natural enemies to collect and redistribute throughout the state. A successful field insectary, however, may require 5 to 10 years before the biological control agents become sufficiently established to collect and redistribute to other locations. Beginning in 2004, the emphasis of the purple loosestrife biological program in Connecticut shifted from long-term monitoring studies to an enhanced outreach education component. With the redirection of this program toward public education, greater numbers of volunteers are being recruited to learn about the biological control program, rear *Galerucella* beetles, find new local release sites in their areas where purple loosestrife has become invasive and control is desired, and release these beneficial insects into the wetlands.

**Survey Dates.** 1 January 2005 through 31 December 2005. Educational materials on purple loosestrife, invasive plants, and biological control information were compiled between January and April 2005 and will be disseminated throughout the project period. Selection of sites where the biological control agents will be introduced will be determined during the winter, spring, and summer months based on input from beetle farmers and previous purple loosestrife field reports. Educational outreach programs, including workshops and other training sessions, will occur throughout the project period, beginning March with four beetle farmer workshops. Rearing and introduction of the biological control agents began in April and will continue through July 2005. Locality data where the biological control agents are introduced into a new wetland site will be compiled and submitted to the NAPIS database once the releases occur in the summer and all appropriate data are obtained from the beetle farmers.

**Taxonomic Services.** Identification of *Galerucella* beetles, purple loosestrife or other plants and/or insects was confirmed by Donna Ellis.

**Benefits and Results of Survey.** Four Beetle Farmer Workshops were conducted in March 2005 in Manchester, New Britain, Simsbury, and Yalesville, CT. The workshops were attended by approximately 100 people. Step-by-step instructions to raise and release the beneficial beetles, lists of materials needed to complete the project, and references on invasive plants and purple loosestrife were provided during the workshops. Starter kits containing guidelines on rearing and releasing *Galerucella* beetles and other pertinent information were provided to beetle farmers at the four workshops conducted in March or upon request.

Beetle farmers gathered for “Dig Days” in April and May in wetlands across Connecticut to dig purple loosestrife plants and grow them in containers prior to releasing a starter colony of beetles on the plants to rear the next generation. From late May through mid-June the beetle farmers collected adult *Galerucella* beetles from field insectaries throughout the state and released the beetles as starter colonies onto their potted purple loosestrife plants. The next generation of *Galerucella* beetles will emerge in July, upon which time the volunteers will release the new beetles into wetlands where purple loosestrife control is desired.

A new Beetle Farmer electronic mailing list (BEETLE-L), created and moderated by Donna Ellis, will serve as a communication network to exchange pertinent and timely information on the beetle farmer project, biological control updates, and general purple loosestrife/invasive plant information. The electronic mailing list, initiated at the University of Connecticut in April 2005, now has more than 200 subscribers receiving announcements and information about the program. Recruiting and training of beetle farmers will increase the number of biological control agents available for release in the state and the potential for additional field insectaries in subsequent years. An increase in the volunteer beetle farmers will greatly enhance outreach educational efforts of this project throughout the state via schools, Scouting organizations, 4-H, conservation groups, and the general public.

The IPM website ([www.hort.uconn.edu/ipm/](http://www.hort.uconn.edu/ipm/); Marilyn Chase, webmaster) has a large section devoted to the Beetle Farmer program and includes related information on purple loosestrife and biological control. The new Beetle Farmer section has been very popular with participants of purple loosestrife biological control in Connecticut and the region and for those with interest in

other invasive plant projects. The website now contains a revised PowerPoint presentation with step-by-step instructions on growing purple loosestrife and rearing the beetles, a detailed rearing guide, color images of the insects, consent forms for new release sites, newsletter and newspaper articles, and other relevant information.

Participants in the Beetle Farmer program included Connecticut citizens, families, schools, Scouts, and organizations that reared beetles, provided purple loosestrife plants on which to rear the beetles, and/or requested that the beetles be released on their property. Partnerships established or ongoing during 2004 that are continuing in 2005 include the Connecticut Department of Environmental Protection, Pratt and Whitney, the Quinnipiac River Watershed Association, the Girl Scouts of America, the Boy Scouts of America, Friends of Ball Pond, University of Connecticut faculty, Connecticut Invasive Plant Working Group, Connecticut Master Gardener Program, Southbury Parks and Recreation, Panthorn Park in Southington, Westmoor Park Staff in West Hartford, West River Memorial Park staff in New Haven, Wallingford Country Club, Cheney Vocational & Technical School, Harris AgriScience & Technology Center, Wethersfield Conservation and Inland Wetlands Commissions, Lake Kenosia residents in Danbury, Danbury Department of Public Health, the Juniper Ridge Tax District in Danbury, the Still River Greenway in Torrington, Simsbury Conservation Commission, Simsbury Land Trust, Covenant Village in Cromwell, and the White Memorial Foundation in Litchfield.

Summaries of biological control activities (release information, graphs and tables of monitoring results and plant inventories) from selected sites were produced and provided to cooperators and others upon request. Project results were presented at professional society meetings, meetings with conservation organizations, and via other educational outreach programs (please see the next section, "State Survey Coordinator Activities" for outreach that occurred relating to this work plan). Results obtained from the project will enhance the national program through implementation of biological control release strategies in Connecticut. Greater emphasis on educational outreach strives to encourage and engage cooperators to rear and release the biological control agents in areas where purple loosestrife management is needed.

The impact of the biological control agents on reducing the spread of existing purple loosestrife infestations, preventing new occurrences of this aggressive plant, and improving associated plant species diversity and abundance in Connecticut wetland ecosystems will significantly enhance the quality of these important habitats. Results from this project will be utilized to further develop biological control methods for broader application by cooperators with an interest in managing purple loosestrife on federal, state, municipal or private wetlands not only in Connecticut but throughout the United States as well. Management of purple loosestrife through introductions of biological control agents and establishment of field insectaries, followed by judicious documentation of project results, publication in peer-reviewed journals, newsletters and technical reports, and presentations at meetings may serve as a model for other invasive plants.

The response to this program has been very enthusiastic, and a great deal of positive feedback has been received. At this time, the new *Galerucella* beetles reared by the beetle farmers are in the process of being released into wetlands throughout the state. A summary of the project will be presented in the final accomplishment report for calendar year 2005.

## **B. NOXIOUS WEED (GIANT HOGWEED) SURVEY PROGRAM**

*(Prepared by Elizabeth Corrigan and Donna Ellis)*

**Survey and Educational Outreach Methodology.** A delimiting survey, management, and educational outreach project is being conducted for giant hogweed in Connecticut during 2005. Surveys for giant hogweed in Connecticut are necessary to further determine the distribution of this invasive plant throughout the state. Results from the delimiting surveys will be used to develop management recommendations and encourage property owners to control this invasive plant, preferably before seed production occurs. Educational outreach and media communications will be provided to landowners where giant hogweed is found in the state, to the public, to garden clubs and to state agencies. This information, to include giant hogweed identification and management options, will detail negative impacts of the Federal Noxious Weed to discourage the public from growing or allowing its spread in Connecticut and the region, and to encourage its removal.

Additionally, supplemental information will be made available on the Connecticut Invasive Plant Working Group website at [www.hort.uconn.edu/cipwg](http://www.hort.uconn.edu/cipwg) where a Giant Hogweed Alert has been posted. Geographical information depicting site locations, descriptions of each incursion, plants commonly mistaken for giant hogweed, a giant hogweed poster, and an online reporting system will be updated on the website.

**Rationale Underlying Survey Methodology.** Giant hogweed (*Heracleum mantegazzianum*) Sommier & Levier, is a Federal Noxious Weed that was recently confirmed in Connecticut. A survey, management, and educational outreach project is occurring during 2005 with a goal of continuing to build upon work that was accomplished from 2001 through 2004 in Connecticut. The visual survey will further delimit the existing infestation, which has now spread to 18 towns in seven of the eight Connecticut counties since it was first reported in 2001, and provide additional distribution data on this invasive non-native weed in Connecticut. Property owners and state agencies affiliated with sites where giant hogweed is detected are being provided with management options and encouraged to control these invasive plants. Educational outreach programs are continuing throughout Connecticut to alert and inform the public about the environmental and public health hazards of giant hogweed. Management recommendations are being emphasized.

**Survey Dates.** Surveys for giant hogweed will occur from May through October 2005. Educational outreach will occur during the entire 2005 calendar year.

**Taxonomic Services.** Specimens of the suspect invasive plant that are found during the survey period are being collected. Confirmation of plant specimens are being made by E. Corrigan (Botanist), D. Ellis (University of Connecticut), L. Mehrhoff, (Invasive Plant Atlas of New England), or others affiliated with the University of Connecticut or Connecticut Invasive Plant Working Group. Voucher specimens will be deposited in the George Safford Torrey Herbarium at the University of Connecticut.

**Benefits and Results of Survey.** Work is continuing to locate and document new occurrences of giant hogweed in Connecticut. Sites reported from previous surveys are being revisited to determine whether plants have spread to other areas and to assess success of eradication efforts. Education through outreach is a strong component of this year's work. Eradication of plants is continuing with the help of The Connecticut Agricultural Experiment Station.

Visual surveys are primarily being conducted by Botanist Elizabeth Corrigan. Donna Ellis, Connecticut Invasive Plant Working Group (CIPWG) members, and other project cooperators also conducted surveys during May and June.. The delimiting surveys are occurring in the 18 towns in seven counties (Fairfield, Hartford, Litchfield, Middlesex, New London, Tolland, and Windham Counties) where giant hogweed was found during previous survey activities from 2001 through 2004 or reported by the public during educational outreach activities. Surveys will extend from each existing infestation to surrounding areas.

Thus far, two additional sites of giant hogweed have been documented from the town of Salisbury; both occurrences are from gardens. At some of the previously reported sites, where plants have persisted for years prior to control or eradication, seedlings and older emergents have been documented from adjacent areas but in close proximity of the original site of introductions. One site, however, is of concern in that young plants were unexpectedly observed in the adjacent forest understory, 100 feet or more uphill from the nearest source which had been eradicated years earlier. In addition to informing individual property owners on a case-by-case basis about the dangers of giant hogweed and methods of control, adaptation of the USDA APHIS/Pennsylvania Department of Agriculture giant hogweed educational brochure for Connecticut is being finalized and the Connecticut Invasive Plant Working Group (CIPWG) website is being updated with current information. Eradication efforts by Dr. Todd Mervosh (The Connecticut Agricultural Experiment Station) and individual property owners have been successful. Some populations have been eliminated while others are showing signs of decline.

Survey results will contribute delimiting data on the distribution and range of giant hogweed in Connecticut. Survey summaries and educational materials are being made available to the public to help them learn how to identify and control this invasive species. Providing management recommendations for giant hogweed may help reduce the spread of this troublesome plant in Connecticut and throughout the region. Efforts will also continue to develop a core of volunteers from the Connecticut Invasive Plant Working Group or other affiliations who will assist with public inquiries of giant hogweed in the state.

An electronic mailing list for invasive plants (CIPWG-L) was created in January 2005 at the University of Connecticut by Donna Ellis. The mailing list provides an avenue for exchange of information on invasive plant issues. Approximately 500 people have subscribed to the mailing list to date.

Delineated maps are being revised to show the current range of giant hogweed. Educational information on giant hogweed is being compiled and distributed during the project period to property owners, garden clubs, Connecticut Department of Environmental Protection staff, Connecticut Department of Transportation staff and other appropriate agencies, and the public.

This information will also be made available on the CIPWG website where it can be linked to other websites.

New occurrence records that are not new county records will be submitted to the NAPIS database following creation of voucher specimens and confirmation of identification. No new county records have been confirmed to date.

## **II. STATE SURVEY COORDINATOR ACTIVITIES**

### **Teaching**

Master Gardener Training Program: March 24, 29, 30, April 4, and 8, 2005; taught five full-day classes on invasive plants to the 2005 class of Master Gardeners at five Cooperative Extension System locations in Connecticut.

Guest Lecturer, PLSC 290W, Environmental Planning, University of Connecticut, February 11, 2005. Lecture topic entitled, "Invasive Plants."

Middlesex Adult Learning Center, Middlesex Community College, Middletown, CT, Open House presentation January 7, 2005 and Course presentation January 24. Course presentation entitled, "Invasive Plant Identification and Introduction."

### **Websites**

The new section on "Beetle Farming" has been added to the UConn Integrated Pest Management (IPM) website at [www.hort.uconn.edu/ipm/](http://www.hort.uconn.edu/ipm/) (Marilyn Chase, webmaster).

### **Refereed Publications**

Li Y, Z. Cheng, RW. Smith, D. Ellis, Y. Chen, X. Zheng, Y. Pei, K. Luo, R. McAvoy, H. Duan, C. Thammina and D. Zhao. 2005. Gene transfer approaches to neutralize invasiveness of exotic ornamental plants. *Journal of Crop Improvement* (Invited and peer-reviewed, in press).

### **Curriculum Developed**

*The Connecticut Curriculum for Integrated Pest Management (IPM)*. Development continues on a new science-based curriculum on IPM. The curriculum for students in kindergarten, first grade and 4-H youth was printed in early 2005. The K/1 curriculum includes 5 units, 22 lessons, and supplemental activities. Five curriculum workshops for teachers and other educators were presented by Donna Ellis and Cheryl Kusmer between March and May at Regional Education Service Centers throughout Connecticut and at several area-wide educational conferences. The workshops included a presentation at the Northeast Region Urban and Community IPM Conference in New Hampshire. Additionally, an original show on the IPM curriculum developed by performing artist Chris Rowlands was presented at 12 primary and secondary schools statewide in April and May 2005. The curriculum was developed by Richard Ashley, Donna Ellis, Dale Schimmel and Cheryl Kusmer through a grant awarded to Richard Ashley

from the Bingham Trust. The curriculum for grades 2&3 is almost ready to be printed and should be available beginning in the fall 2005, and the curriculum for grades 3&4 is currently under development. Note: each curriculum developed includes information on invasive plants.

### **Magazine Articles**

“College of Agriculture and Natural Resources: Having Fun Learning about the Environment.” UConn Traditions, Spring 2005, page 16. Article written by UConn Traditions staff showcasing the Integrated Pest Management curriculum, including invasive plant topics.

“IPM Program Celebrates 25 Years of Helping Growers Reduce Pesticide Use.” College of Agriculture and Natural Resources Journal, Jan/Feb/March 2005, pages 1 and 8. Article written by Kim Markesich on the 25<sup>th</sup> anniversary of the UConn Integrated Pest Management (IPM) Program, featuring interviews by D. Ellis, L. Los, A. Legrand, L. Pundt, and R. Adams.

### **Newspaper Articles**

“Fighting off an Invading Force.” Article written by Tim Colegrove for the UConn Daily Campus on March 23, 2005. Based on interviews with D. Ellis and others regarding invasive plants and the purple loosestrife biological control statewide project.

“All-Garden Alert! Aliens Have Landed!” Article written by Tovah Martin for The New York Times on March 20, 2005. Based on interviews with D. Ellis and others regarding invasive plants.

“Beetles Help Battle Invasive Plant.” Article written by Peter Marteka for the Hartford Courant on March 8, 2005. Based on interviews with D. Ellis and others regarding purple loosestrife biological control and the Beetle Farmer program.

### **Technical Reports**

Ellis, D.R. 2005. USDA APHIS PPQ Eastern Region: Connecticut, Biological Control. Cooperative Agricultural Pest Survey (CAPS) Semi-Annual Narrative Progress Report for Calendar Year 2004 (reporting period 7/1/04-12/31/04). (Submitted 03/31/05). 4 pp.

Ellis, D.R. 2005. USDA APHIS PPQ Eastern Region Noxious Weeds: Connecticut. Cooperative Agricultural Pest Survey (CAPS) Semi-Annual Narrative Progress Report for Calendar Year 2004 (reporting period 7/01/04-12/31/04). (Submitted 03/30/05). 5 pp.

Ellis, D.R. 2005. DEP 319 Project-2004-2005, Quinebaug Watershed IPM/ICM Summary Report: 12/01/04-02/28/05. (Submitted 03/04/05). 3 pp.

## **Radio Interviews**

WPKN radio, FM, Bridgeport, CT. Live interview with D. Ellis on May 6, 2005 to discuss invasive plants and answer questions from the public.

## **Presentations**

Nature Day, June 2, 2005, Southington, CT. Conducted six interactive workshops for students and teachers on purple loosestrife biological control.

East Haddam Garden Club, East Haddam, CT, May 18, 2005. Invited speaker for garden club meeting. Presentation entitled, "Invasive Plants."

Middletown Garden Club, Middletown, CT, April 21, 2005. Invited speaker for garden club meeting. Presentation entitled, "Invasive Plants."

Shoreline Gardening Today Series, Bauer Park, Madison, CT, April 14, 2005. Invited speaker for gardening series; the topic was invasive plant identification and management.

Charlton Garden Club, Charlton, MA, April 11, 2005. Invited speaker for garden club meeting. Presentation entitled, "Invasive Plants."

Northeast Regional Community and Urban Integrated Pest Management Conference, Manchester, CT, March 15-16, 2005. Invited speaker (with C. Kusmer) to participate in a Curriculum Development and Implementation session on the new Integrated Pest Management (IPM) curriculum. Also presented an interactive educational exhibit on the IPM curriculum.

United Congregational Church of Tolland, Willington, CT, March 7, 2005. Invited speaker for presentation on invasive plants.

Connecticut Flower and Garden Show, Hartford, CT, February 24, 2005. Invited speaker for seminar on invasive plants. Also displayed new invasive plant exhibit for 4-day event.

4-H Leaders meeting, Vernon, CT, February 15, 2005. Invited speaker for presentation on IPM Curriculum for grades K/1 and 7/8 to statewide 4-H leaders.

Connecticut Invasive Plant Working Group (CIPWG) Steering Committee meeting, Storrs, CT, February 9, 2005. Organized and conducted meeting of the CIPWG Steering Committee to discuss relevant invasive plant issues in the region and plan for the upcoming year's activities.

USDA APHIS Cooperative Agricultural Pest Survey (CAPS) Program State Survey Committee meeting, Windsor, CT, February 8, 2005 (D. Ellis, CAPS State Survey Coordinator). Organized and conducted meeting of the CAPS State Survey Committee to discuss past and present exotic pest surveys, educational outreach projects, and other pertinent issues regarding plant health in Connecticut.

Connecticut River Watershed Council Annual Meeting, Springfield, MA, January 14, 2005.  
Invited speaker for regional meeting. Presentation entitled, "Aquatic Invasive Plants."

### **Workshops Planned and Presented**

Four Purple Loosestrife Beetle Farmer Workshops were planned and presented in Manchester (March 23), New Britain (March 12), Simsbury (March 3), and Yalesville (March 21), CT in 2005. The workshops provided training on raising and releasing *Galerucella* beetles for biological control of purple loosestrife.

*Submitted by Donna Elli, with contributions from Elizabeth Corrigan  
July 28, 2005*