

Managing Lily Leaf Beetles through Parasitoid Release

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Abstract

Lilies, Fritillaria, and related native plants suffer defoliation due to a new invasive exotic pest, the lily leaf beetle. States in New England have had success in controlling this insect through biological control. This project is releasing these same parasitoids in four NY regions, monitoring results over a three-year period, and educating the green industry and consumers about the pest and its biological control through the CCE network.

Background and Justification

Cultivated and native Lilies and Fritillaria suffer defoliation in many locations in NY which have infestations of lily leaf beetle (*Lilioceris lili*), a serious invasive exotic pest. Lily leaf beetle was first confirmed in NY in 2004 and continues to spread across the state, devastating landscape plantings of lilies. Nurseries and garden centers have reported problems with the lily leaf beetle damaging wholesale and retail host plants.

A survey of CCE educators conducted in the fall of 2015 found that lily leaf beetle has been detected in at least 30 counties. When asked to rate the level of damage caused by the lily leaf beetle, 73% of the respondents indicated that the damage levels were "High, with Lilies

Devastated". Fifty-eight percent of respondents indicated that consumers stopped growing lilies because of the beetles. They also indicated that sales of both lilies and Fritillarias are down.

There are concerns regarding NY native lilies which host the lily leaf beetle as well. NY is home to three native lily species, *Lilium superbum*, *L. canadense* *L. philadelphicum*, each of which are considered rare or endangered in NY. In their natural environment we feel biological control will be the most sustainable solution for protecting these native plants from lily leaf beetle damage.

The three parasitoid biocontrols released in New England states have reduced the populations and damage caused by lily leaf beetle. We look forward to bringing this success to NY.

Objectives

This project is introducing lily leaf beetle parasitoids at locations across NY. Cooperators will be monitoring and reporting on the success of the establishment of these beneficials. As a result of this effort the appearance and survival of both the garden and native lily populations and the people who care for them will benefit from parasitoid/pest relationship and reduced pesticide usage.

In addition, this project will train CCE educators and Master Gardener Volunteers on recognition and the lifecycle of both the lily leaf beetle and parasitoids. The outreach regarding invasive pests will highlight both the release of the biological control strategies and landscape practices (e.g. insecticides avoidance and habitat plantings) that support beneficial insects. Resources developed (press releases, presentation materials, displays) will be made available to other educators throughout the state and region. As a result, gardeners will adopt landscape practices that support beneficial insects in their gardens.

2018 Progress Summary

In late winter and early spring of 2018 video conferencing meetings allowed our state-wide project team to make plans for spring larvae collection and parasitoid releases. The educational outreach is taking shape with three different Powerpoint presentation in a shared box folder for use by the PI's and extension educators. Surveys of attendees at 2018 extension programs resulted in over 200 completed surveys. Many of the survey respondents included their email address to receive project updates.

Two additional sites for monitoring were added in 2018 The first at Cornell's Bluegrass Lane in Ithaca where Lily leaf beetle were found infesting the planting and a second plot is at Cornell Agri Tech in Geneva NY where lilies were established, and no lily leaf beetles were noted in 2018.

During the growing season lily leaf beetle larvae were collected, packaged and mailed to our collaborating lab in Rhode Island for analysis. Seven locations in NY were represented in those samples. Specific 2018 accomplishments regarding monitoring and release are below:

Project Locations, Monitoring and Release Details

2018 Lily Leaf Beetle Parasitoid Release and Monitoring Sites			
Release Plot Name Location	No. Larvae Examined for Parasitoids & Results of check	Parasitoids Released 2018	Proposed Releases 2019
Dan Gilrien Long Island Research and Education Center Display Garden 3059 Sound Ave, Riverhead, NY 11901 40°57.761' N, 72°43.049' W	6/1/18 19 larvae No parasitism 6/12/18 20 larvae No parasitism	20 <i>T. setifer</i> , 1F L. <i>errabundus</i> , released 6/28/18 24 <i>T. setifer</i> , 1F L. <i>errabundus</i> , 7F, 3M D. <i>jucunda</i> released 6/29/18	<i>T. setifer</i> <i>Diaparsis?</i>
Dan Gilrien 217 Arrowhead Ave. Riverhead, New York 11901 40°56.724' N, 72°40.209' W	6/2/18 9 larvae No parasitism	No Release	<i>Lemophagus errabundus</i>
Dan Gilrein, Wading River, NY	6/7/18 16 larvae No parasitism	No Release	
Marie Camenares 27 Glenmere Way, Holbrook, NY 11741 40 °46.708' N, 73°03.426' W	6/4/18 7 larvae No parasitism	No Release	<i>Lemophagus errabundus</i> and <i>T. setifer</i>
Jennifer Stengle Lerner Tilly Foster Community Garden Putnam County, NY 41.419403 N -73.634613 W	6/15/18 15 larvae 2 <i>T. setifer</i>	No Release	<i>Diaparsis jucunda</i>
Joellen Lampman CCE – Albany County 24 Martin Road Voorheesville, NY 12186 42.643722 N, -73.964076 W	6/19/18 5 larvae No parasitism	40 <i>T. setifer</i> released 6/22/18	<i>T. setifer</i> and <i>D. jucunda</i>

Sharon Bachman Buffalo Olmstead Conservancy 84 Parkside Ave., Buffalo, N.Y. 14214 Garden beds are located west of main building 42.932557, -78.852899	No activity	No Release	<i>T. setifer</i> and <i>D. jucunda</i>
Brian Eshenaur 130 Antlers Drive	No activity	N/A	N/A
Elizabeth Lamb/William Miller	6/12/18 36 larvae No parasitism	N/A	N/A
Brian Eshenaur Cornell AgriTech Geneva NY	No Larvae Present No Parasitism	N/A	N/A

2018 Results and Discussion

In 2018 we were happy report that parasitoids which we introduced to NY in 2017 in Putnam county were found infesting larvae in 2018. This is the first confirmation of lily leaf beetle parasitoid establishment in New York State! We anticipate picking up additional parasitoids that are becoming established from our other release sites during the 2019 growing season.

2019 will also mark a time for increased educational programing about this project through presentations scheduled throughout the state.