

# Finally, a mug shot for a crop-killing NH pest

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The speckled brown *Paraphlepsius irroratus* is between 5.5 and 6.5 mm long and has a bluntly angled face. Credit: NH Agricultural Experiment Station

They may be a small insect, but some leafhoppers can carry a big punch, devastating crops and causing millions of dollars in damage. But now New Hampshire farmers have a new source to help them identify the "bad" leafhoppers from the "good" leafhoppers. For the first time, New Hampshire's nearly 600 leafhoppers have been identified and cataloged by researchers at the NH Agricultural Experiment Station (NHAES) at the University of New Hampshire College of Life Sciences and Agriculture.

"Leafhoppers are an important economic group, particularly for some

tree crops such as peaches and cherries that are tremendously valuable crops. There are important diseases that are carried only by the leafhoppers that can devastate orchards and fruits, vegetables, and cut flowers," says entomologist Don Chandler, a UNH zoology professor and NHAES researcher who oversaw the project and who curates the university's insect collection.

Specifically, Chandler and his team looked at which leafhoppers carry Aster yellows, which can damage vegetables and cut flowers, and X-disease, which can damage fruit crops.

New Hampshire's agriculture industry is rapidly changing in the direction of high value/acreage crops, such as organically grown crops, stone fruits, grapes, woody ornamentals, and flowers grown outdoors for the retail market. Chandler says these have values as high as \$7,000 an acre for peaches, and \$15,000 to \$30,000 an acre for sweet cherries. All are known to be attractive to certain leafhoppers, and most of these are susceptible to Aster yellows or X-disease. X-disease can limit the lifespan of fruit trees to about 10 years, and susceptible stone fruits can die within one to two years.

"Relatively little was known about their abundance and where they are found in the state. New Hampshire, for whatever reason, is exceptionally diverse in leafhoppers. Our goal was to investigate which leafhoppers are present, not only in managed and organic farms but also from the source areas around these farms, to see if there are differences in the insect forms, and to document the biodiversity of New Hampshire," Chandler says.



*Scaphytopius acutus* is about 4.5 mm long with an elongate pointed head and yellow below its face. Credit: NH Agricultural Experiment Station

Over the course of the three-year project, Chandler and his research team found that New Hampshire seems to be an exceptional area regarding the biodiversity of leafhoppers.

Researchers identified upwards of 600 species of leafhoppers in just the New Hampshire Seacoast and Merrimack and Hillsborough counties, and they believe the state has many more species of leafhoppers. To put this into context, based only on the current sampling New Hampshire has more than half of the amount of Canada's 1,100 species of leafhoppers but is less than 1 percent the size of Canada in land.

Of those roughly 600 species of leafhoppers, researchers found that only about 40 were economically significant because they either carried

diseases or fed heavily on plants. Leafhoppers are well-known for the problem heavy feeding creates for many crops, ornamental shrubs and trees, and flowers, with two species once engendering common names such as the inimical leafhopper and the destructive leafhopper.

Of those 40, six were known to carry X-disease but only three were commonly found in the state – *Paraphlepsius irroratus*, *Scaphytopius acutus*, and *Colladonus citellarius*. The speckled brown *Paraphlepsius irroratus* is between 5.5 and 6.5 mm long and has a bluntly angled face. *Scaphytopius acutus* is about 4.5 mm long with an elongate pointed head and yellow below its face. *Colladonus citellarius* is between 5 and 5.5 mm long with a rounded face and conspicuous yellow spot on its back. They all feed on a wide variety of plants, including one of their favorites, the chokecherry.

And it is from the chokecherry where leafhoppers usually pick up X-disease, which they then spread to other [fruit crops](#). According to Chandler, one of the best ways to manage the damaging leafhoppers is to get rid of chokecherry. Entomologist Alan Eaton, UNH Cooperative Extension professor, has partnered with Chandler to publish a pest fact sheet on how to identify chokecherry and provide more information about the three leafhoppers that carry X-disease:

[http://extension.unh.edu/resources/files/Resource001720\\_Rep2400.pdf](http://extension.unh.edu/resources/files/Resource001720_Rep2400.pdf).



*Colladonus clitellarius* is between 5 and 5.5 mm long with a rounded face and conspicuous yellow spot on its back. Credit: NH Agricultural Experiment Station

Eaton recommends farmers mow regularly, get rid of red clover, mulch under trees or use herbicide strips to reduce the habitat of the invasive leafhoppers. Unlike Aster yellows, which is carried to the Granite State by leafhoppers migrating up from the southern states, Eaton says X-disease is very predictable.

"There is more potential here for incidences of X-disease outbreaks because we have more people growing peaches and cherries. However, if the management techniques are appropriate, farmers don't need to worry about identifying the species of leafhopper," Eaton says.

Founded in 1887, the NH Agricultural Experiment Station at the UNH College of Life Sciences and Agriculture is UNH's original research center and an elemental component of New Hampshire's land-grant university heritage and mission, since before UNH was located in

Durham. We steward federal and state funding to provide unbiased and objective research concerning diverse aspects of sustainable agriculture and foods, aquaculture, forest management, and related wildlife, natural resources and rural community topics. We maintain the Woodman and Kingman agronomy and horticultural farms, the Macfarlane Greenhouses, the Fairchild Dairy Teaching and Research Center, and the Organic Dairy Research Farm. Additional properties also provide forage, forests and woodlands in direct support to research, teaching, and outreach.

Provided by University of New Hampshire

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