

New insect pest a threat to onion and related crops in Pennsylvania

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The allium leafminer never had been found in the Western Hemisphere until it was discovered recently in Lancaster County, Pennsylvania. Credit: Sven Spichiger, Pa. Department of Agriculture

An insect never before found in the Western Hemisphere has been discovered in Pennsylvania, and agriculture officials are asking growers

and home gardeners to help monitor and manage the new invasive pest.

The allium leafminer—also known as the onion leafminer—is a threat to several species of [crop plants](#) in the genus *Allium*, such as onion, leek, garlic, chive, shallot and green onion, warned Shelby Fleischer, professor of entomology in Penn State's College of Agricultural Sciences. He noted that the insect's full range of [host plants](#) is unknown.

"More study is needed to assess the potential impact of allium leafminer under Pennsylvania conditions, but literature from other countries suggests that organic and market-garden production systems and home gardens tend to experience more damage than conventional production systems," Fleischer said.

"Conventional growers may have fewer problems due to the insecticidal controls they are likely to use and to shorter time windows in which host plants are available," he said. "However, wild *Allium* species that exist as weeds in our agroecosystems may alter this."

The allium leafminer's first U.S. appearance was in Lancaster County, where it was found infesting leeks and onions. The Pennsylvania Department of Agriculture reported that it since has been discovered in Lehigh, Chester, Dauphin and Delaware counties.



Leaf punctures arranged in a linear pattern may be the first sign of allium leafminer damage. Credit: Sven Spichiger, Pa. Department of Agriculture

Native to Germany and Poland, the allium leafminer's geographic range recently has been expanding rapidly, most likely transported with commercial cargo, in shipments of affected crop plants or in passenger baggage, according to state agriculture officials.

"It is now present throughout Europe, reaching the United Kingdom in 2004," Fleischer said. "It recently has been reported in Asia, Turkey, Russia and Turkmenistan."

Plant damage occurs when female leafminers make repeated punctures in leaf tissue with their ovipositors, and both females and males feed on the plant fluids. "Leaf punctures arranged in a linear pattern towards the

distal end of leaves may be the first sign of damage," Fleischer said. "Leaves can be wavy, curled and distorted."

The larvae mine the leaves and move toward and into bulbs and leaf sheathes, where they pupate. Both the leaf punctures and mines serve as entry routes for bacterial and fungal pathogens.

"High rates of infestation have been reported," Fleischer said. "There can be from 20 to 100 pupae per plant, and 100 percent of plants in a field may be infested."

Allium leafminer adults are small grey or matblack-colored flies with a distinctive yellow or orange patch on the top and front and yellow on the side of the abdomen. They hold their wings horizontally over their abdomen when at rest. Their legs have distinctive yellow "knees."

The larvae are headless white, cream or yellowish maggots, measuring up to 8 millimeters long at their final instar. The insect's pupa stage is dark brown and 3.5 millimeters long.

Allium leafminers overwinter as pupae in plant tissue or surrounding soil. Based on the insect's life stages in areas of Europe that have climates similar to Pennsylvania's, adults typically emerge as early as March and perhaps as late as May before laying eggs at the base of plant stems

Larvae mine leaves, and move downward into the base of leaves or into bulbs, where they pupate. These pupae develop into adults that emerge in the fall. This second generation of adults then lays eggs, which develop through the larval and into the pupal stage before overwintering to emerge as adults in the spring.

To monitor for allium leafminer, Fleischer said growers can use yellow

sticky cards or yellow plastic bowls containing soapy water to capture adults. Excluding the pest by covering plants starting in February and continuing through spring emergence of adults may help to protect crops.

In addition, Fleischer suggested that infestation rates can be reduced by delaying planting until late spring to avoid the adult egg-laying period. Covering fall plantings during the second generation flight also can be effective.

"Systemic and contact insecticides can be effective, but EPA registrations vary among Allium crops," he said. "Check labels to ensure the crop is listed and for rates and days-to-harvest intervals."

Provided by Pennsylvania State University

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