Blue Orchard Bee—A Champion Cherry Pollinator

Like cherries? Here's good news from ARS scientists in Utah: The blue orchard bee, or *Osmia lignaria,* continues to rank as an ace pollinator of this delectable summer crop. That's important. If pollen isn't ferried to cherry blossoms by insect pollinators such as this nimble bee, the flowers won't form the sweet, plump fruit that cherry aficionados love.

New information about the gentle bee's superb pollination skills comes from investigations by entomologist William P. Kemp of the ARS Bee Biology and Systematics Laboratory in Logan, Utah, and colleague Jordi Bosch, formerly at the Logan laboratory and now with the Department of Biology at Utah State University.

In a 4-year experiment at a commercial cherry orchard in northern Utah, Kemp and Bosch compared cherry harvests before they brought in blue orchard bees—and then after. "Production was more than twice as high when blue orchard bees were used in place of honey bees," Bosch reports.

Blue orchard bees typically stay on the job despite weather that sends other bees buzzing back to their snug hives. That may help explain why the cherry orchard that the blue orchard bees pollinated produced harvestable yields even in the years when bad weather robbed most cherry growers in the region of their crop.

The researchers also found that blue orchard bee populations continued to increase throughout the study.

Kemp and Bosch encourage beekeepers and orchardists to use this hard-working bee to augment the efforts of the domesticated honey bee, *Apis mellifera*. Many colonies of this familiar honey bee have been devastated in recent years by mites, beetles, and aggressive Africanized honey bees.

The scientists have authored a new, 96-page handbook that's packed with helpful tips on how to use the blue orchard bee to proficiently pollinate not only cherries, but also almond, apple, apricot, and pear trees. Based on nearly three decades of lab, greenhouse, and orchard studies by ARS experts based at Logan, the book makes an excellent reference for growers, professional beekeepers, hobbyists, and home gardeners. *How To Manage the Blue Orchard Bee as an Orchard Pollinator* is available from the University of Vermont, Burlington, (802) 656-0484.—By **Marcia Wood,** ARS.

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Elm Disease Bacterium Identified

When 1,000 mature American elms mysteriously died in Illinois during the last decade, scientists at first suspected that the elm yellows (EY) plant pathogen was the culprit. The theory made sense because the disease syndrome was so similar to that caused by the EY phytoplasma, a cell-wall-less bacterium, which sickened North American elms during the past several decades.

EY is unlike another tree malady, the fungal Dutch elm disease. EY occurs in elms native to North America in a region extending from eastern Massachusetts, New York, Pennsylvania, and New Jersey to Michigan, Minnesota, Nebraska, and Mississippi. But historically, EY had been absent from the northern third of Illinois.

Initial tests on the Illinois elms for EY phytoplasma were conducted by a commercial diagnostic company and were inconclusive.

So what was causing the disease syndrome? To find out, Agricultural Research Service plant pathologist Ing-Ming Lee, with the Molecular Plant Pathology Laboratory in Beltsville, Maryland, in collaboration with scientists from Illinois' Morton Arboretum, tried another approach. They used a tool Lee developed to systematically hunt for any phytoplasma that may be present in the diseased Illinois elms.

Lee's test used polymerase chain reaction and DNA fingerprinting. The phytoplasma detected in tissue scraped from the elms' bark was found to be unrelated to the EY phytoplasma (taxonomic group 16SrV-A). Instead, Lee identified the phytoplasma as representative of a new subgroup (16SrVI-C) of clover proliferation phytoplasma (group 16SrVI). The carrier, or vector, of this newly identified phytoplasma is most likely a leafhopper that is different from the known EY vector.

"We think the Illinois elm disease is being carried by a transient insect coming in from another state," says Lee. "Tiny plant-feeding leafhoppers can migrate up to 1,000 miles on wind power alone." The leafhopper deposits the pathogen while sucking juices from the tree's phloem.

Dr. Lee will now concentrate on locating the leafhopper vector, determining its species, and finding its origin. He will then monitor the insect because, he says, "A rise in the population of the vector signals a warning."—By **Rosalie Marion Bliss,** ARS.

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