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Metro

Wasps infesting, imperiling area's black oaks

By David Abel

WEST TISBURY — Professor Joe Elkinton scanned the stand of black oaks for clumps of prematurely dead leaves, swollen twigs, and other signs of the lethal pest.

Moments later, the entomologist hoisted a pole pruner into the foliage and clipped one of the many suspicious branches in the Polly Hill Arboretum. After it fell to the ground, one of his graduate students pointed to telltale exit holes of the oak crypt gall wasp and used a pocketknife to expose the larvae, pupae, and adults that had ravaged the decades-old tree.

Over the past year, as the wasps slowly kill vast swaths of black oaks from Providence to Provincetown, the entomology professor has embarked on a crash course to understand the tiny insect, whose origin, life cycle, and sudden surge in numbers remain a troubling mystery.

“This is a severe threat, and it’s almost embarrassing how little we know about it,” said Elkinton, of the University of Massachusetts Amherst. “There are not a lot of insects that have an effect like they’re having.”

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Hundreds of thousands of black oaks over more than 1,500 acres in Southeastern Massachusetts, mainly on Martha’s Vineyard and Cape Cod, have shown signs of infestation this year by the gall wasps, according to aerial photos taken by officials at the state Department of Conservation and Recreation. That’s nearly 400 more acres than last year.



JULIA CUMES FOR THE BOSTON GLOBE

Tom Clark of the Polly Hill Arboretum in West Tisbury inspected a branch. Hundreds of thousands of black oaks in Southeastern Massachusetts have shown signs of infestation by tiny gall wasps this year.

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Ken Gooch, director of the agency's Forest Health Program, noted that black oaks — the only known host of the gall wasps — account for about a quarter of all the deciduous trees on Cape Cod and the Vineyard. Only pine trees are more numerous.

“We could lose a lot of shade,” said Gooch, who is concerned about the rate of the spread of the gall wasps. “This could also be a problem for wildlife, which feed on the acorns.” It's unclear whether the gall wasps are a native species or migrants, like the Asian longhorned beetle, which has claimed tens of thousands of maple trees around Worcester.

But they harm the trees in similar ways. The asexual wasps burrow chambers in twigs, where they deposit eggs that hatch larvae, which eventually bore tiny holes in the branches.

The holes can sever a tree's vascular system, encourage fungal growth, and over several years, produce structural weakness, ultimately killing the tree.

Elkinton and others surmise that the spike in gall wasps may be attributed to the rise of winter moths, a nonnative pest that has defoliated tens of thousands of acres of trees across the state in recent years. The moths, combined with drought conditions, may have weakened so many trees that they have become good hosts for gall wasps, they said. Weakened oaks may have reduced ability to produce tannins and other chemicals, which protect them from herbivores.

SCOURGE OF THE WASPS

■ Oak crypt gall wasps have infested thousands of black oaks on Martha's Vineyard and Cape Cod.



Climate change may be playing a role as well, with warmer weather perhaps making it easier for the gall wasps to thrive and harder on their host trees.

“This is one major concern for climate change, namely that new combinations of environmental conditions and perhaps associated stresses will trigger unusual responses in native organisms,” said David R. Foster, director of the Harvard Forest in Petersham.

As they search for ways to counter the gall wasps, neither Elkinton nor others has identified a potential predator.

At the Polly Hill Arboretum, where at least 90 percent of oaks are infested, the staff has been experimenting with ways to rid the trees of the wasps, which are the size of sesame seeds when fully grown and do not sting humans.

The various chemicals they have used, however, have been expensive and not particularly effective. It has cost between \$240 and \$360 per tree to treat their mature oaks.

“There’s definitely not a straightforward solution yet,” said Tom Clark, curator of the arboretum. “What we’ve done is only feasible [if it works] in cultivated landscapes. It’s not going to happen in the forest.”

Among those seeking a foil to the gall wasp is Peter Wild, the chief executive of Arborjet Inc., a Woburn firm that has developed solutions to eradicate similar insects in Hawaii.



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UMass Amherst graduate student Monica Davis, who is studying environmental conservation and doing her master's thesis on the gall wasp infestation, looks for signs of the pest on a black oak tree in the Polly Hill Arboretum in West Tisbury.

He said it could take years for a natural predator to emerge against the gall wasps, noting it took many years and the loss of much of the forests of Nova Scotia before a surge of flies arose to combat the scourge of winter moths.

Wild advised homeowners in areas affected by the gall wasps to pay close attention to their oaks. "If the trees look three-quarters dead, it's probably too late," he said. "Only viable trees can be treated" with chemicals that prove to be effective.

For now, the best hope for the oaks is that the gall wasps will vanish as quickly as they emerged.

The only previous known outbreak, on Long Island in the early 1990s, lasted several years. By 1996, after thousands of trees in Nassau and Suffolk counties were infested, the gall wasps suddenly disappeared.

Elkinton said no one knows what happened. It could have been a natural enemy, the weather, or some unknown defense mechanism triggered in the trees, though he thinks it was probably a predator.

"Right now, our best hope is that this will go away on its own accord," he said. "In the meantime, we need to learn as much as we can about them."

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