



Crypt Gall Wasp

Creates a Mystery on Cape Cod

A feature black oak on a property on Chappaquiddick, at Martha's Vineyard island off Massachusetts, with dead leaves on branch ends, typical crypt gall wasp damage. Courtesy of Mark DiBiase, Bartlett Tree Experts.

The death of oak trees baffled tree care experts in the coastal Massachusetts' tourist region. The culprit? A native species that has also wreaked havoc on Long Island

By David Rattigan

The stubbornness of this Cape Cod mystery may be best illustrated by what the foremost expert admits he doesn't know.

"If you ask any 10 arborists how to manage this insect, you're going to get 11 opinions," says Don Booth, entomologist for Bartlett Tree Experts research lab in Charlotte, North Carolina. "The trick would be how reliable is this and can you really replicate it? The answer to both those questions is no. They're not reliable and can't be replicated."

While other tree care experts point to

him as the leading authority on this issue, Booth is straightforward in admitting that the best management technique is just one of the things he doesn't yet know about the crypt gall wasp, a native insect that's



Crypt gall wasp, courtesy Bartlett Tree Experts

wiped out oak trees in huge numbers on Long Island, and more recently baffled arborists along the southern coast of Cape Cod, Massachusetts, as well as the nearby island of Martha's Vineyard.

"We don't even know what suddenly causes these outbreaks," Booth admits, noting that the boom-and-bust cycle of the insect on Long Island has brought a temporary reprieve for arborists and landscapers, but made research difficult.

"That's one problem with this insect," Booth says. "By the time we realize it's bad, the population is just about ready to crash. So, several times over the years by the time somebody like Cornell University

or a private lab like us begins to really look at it, the pest is basically gone.

"It's a native insect on a native tree, so there's a lot of biological control here. It undergoes these huge population swings, and what seems to happen is you have a couple of years where there's just an outbreak, and following two, three, four years of a real outbreak, the black oaks really begin to look bad. You see branch dieback, you see dead trees, and this is just about when the insect is about to disappear. Often you don't see it again for five years. So it's been a frustrating one to work on."

The Cape is a popular tourist and vacation spot particularly during the summer months, and has a year-round population as well. The tree care market on the Cape is highly competitive, but the threat to its landscape last summer brought like-minded arborists together to try to solve a riddle that has baffled them so far.

They await the return of spring unsure whether they have seen the worst of a threat that has already killed or damaged significant numbers of trees. If it does return, the next question is how to stop it from doing further damage.

Dead oaks

While some arborists say they've seen the damage from the crypt gall wasp for three to four years, it wasn't accurately identified until 2012.

There have been other oak gall wasps on the Cape – the gouty oak gall wasp, for example – but those caused less damage than the crypt gall wasp, and the gall that they created had different characteristics.

Tree care workers disagree on when they first noticed damage from the crypt gall wasp. Some say they saw a few cases for a couple of years, and widespread damage for two. Others say the widespread crypt gall wasp damage began in 2012.

"Toward the beginning of the season we noticed a lot of the oak trees just not pushing out as much growth as normal, and it seemed sudden," recalls Chris Turner, arborist for TCIA-member Forest



The lower trunk and crown of the same feature black oak as on facing page. Courtesy of Mark DiBiase, Bartlett Tree Experts. Inset: a crypt gall wasp damaged black oak twig.

Keepers Tree Care of Hyannis, Mass. "Trees that were previously healthy, or relatively healthy, all of a sudden had really sparse, withered-looking growth. We thought maybe it was residual damage from a storm we had, but we didn't know what was going on at first."

Turner found the damage to be along the

southern portion of the cape, most of it in the coastal towns of Yarmouth and Falmouth. Steve Heywood, CTSP, with Osterville-based, accredited, TCIA-member Bartlett Tree Experts, says he found it in Yarmouth, Dennis, Orleans and Eastham.

"I've seen evidence of the bug on every town on the Cape," says Heywood, adding that his company has dealt with it for four years, including two heavily.

"It seems to be entrenched in all of Cape Cod, (the nearby island of) Martha's Vineyard, and I've had reports from people I know who have seen it on (Boston's) South Shore," says Ted Brown, an arborist and the semi-retired founder of Brewster-based Arbortech, Inc.

Previous damage to Cape Cod trees by the species had been seen in small numbers at best. In fact, the insect had not popped up in large numbers anywhere in New England, and the little that is known about the species comes from Long Island, New York, an area where – at that time – no one was looking. Add to that the fact that the gall created by the crypt gall wasp is small and atypical in shape, it was easy to miss.



An infested black oak branch. Exit holes made by the emerging wasps are often present on swollen twigs. The bisection of the twig exposes the damage inside. Photos courtesy of Don Booth, Bartlett Tree Experts.



The dieback of oak trees could have been caused by hurricanes that had hit the region in recent years, creating salt damage on the trees. Another potential culprit suspected by arborists was the winter moth, which has been a

At left, close up of new, 2-year, 3-year and 4-year growth increments from the black oak shown on page 10.

scourge of Cape Cod trees for several recent years.

“Possibly what’s happened is that, because of all of the problems we’ve had over the last three or four years, these things are compounding themselves somehow,” Brown theorizes. “It’s pretty confusing, and the experts at the laboratory at UMass are pretty well dumbfounded also.”

The diagnosis was made more difficult by the fact that the gall created by the wasp, and the insect itself, had characteristics that were distinctly different from its insect cousins.

“We weren’t sure what we were looking at,” Turner admits. “This particular wasp doesn’t create the normally large gall we’re used to seeing, because there are other species of gall wasp down here on the Cape, as with many places. But you expect to see those large, swollen galls. Once you knew what you were looking for it was kind of easy – the twigs get slightly swollen, and almost look arthritic. But because there weren’t those characteristically large galls, it wasn’t apparent right away what it was.”

A gall is defined as an abnormal outgrowth of plant tissues formed when a parasite – in this case an insect larvae – gets into the wood. In simple terms, nutrients and water are sucked into the gall from the tree and feed the larvae as it grows. As University of Massachusetts entomologist Robert Childs explains, “The actual formation of the gall kind of girdles the stem and cuts off the flow of water and nutrients. The branches are strangled and die.”

In typical cases, says Turner, “The gall is a deformation of the wood, caused by the wasp larvae being placed inside. The growth in the tree, created by the saliva of the larvae, is maybe a ½- to 2-inch ball on the twig itself, but not so with these guys.”

The fact that the gall is different than the norm falls in line with a lot of other peculiarities of this case, Booth says, noting, “this isn’t even an insect where entomologists agree on what the scientific name is, and it does not even have a common name.”

A sneaky situation

While the tree care market is competitive, a network of arborists began communications about what they were fac-

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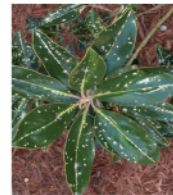
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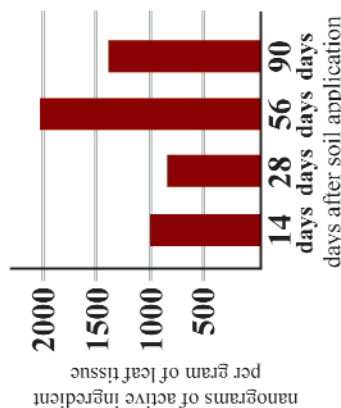
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*Four years +/- growth increments on the same black oak as shown on page 10. Note the amount of exit holes regardless of the fact the tree has been injected with *Lepitect* three years in a row. Courtesy of Mark DiBiase, Bartlett Tree Experts.*

ing, and shared information. It was Childs, called in for his expertise, who first identi-

fied the crypt gall wasp as the oak-killing culprit.

“He rang the bell on that one,” Turner says.

Childs works with insects of trees and shrubs in the northeast, and one of his specialties is to teach “green professionals” how to identify and intercept insect intruders before they can do too much damage.

“One thing about bugs,” he says, “they constantly keep you busy.”

The crypt gall wasp – which goes by several other names including Cynipid gall wasp, gallflies, and others – is indigenous to the area, and many theorize that they might have been around here and there for a couple of years. What set off the explosion of damage is unclear to Childs.

“For the native insects, and there are thousands and thousands of species of them, there are native controls – parasites and predators and microorganisms like bacteria and fungi – that constantly keep the insects in low numbers,” Childs says. “Once in a while – for some insects it might be every hundred years or so – something changes, the natural controls jump off the map for

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Other galls – The growth of a gall in the tree is created by the saliva of the larvae. A more typical gall, as that of the cynipid wasp gall shown above, is a ½- to 2-inch ball on the twig itself, but not so with the crypt gall wasp. In the case of the crypt gall wasp, the branch only appears swollen, almost arthritic, as shown at left. Photo courtesy of Pennsylvania Department of Conservation and Natural Resources - Forestry Archive, Bugwood.org

whatever reason, (and) then the insect has less natural pressure on it and it can explode in numbers. We see that. All of a sudden some caterpillar species that we've known about forever that's never been a problem will blow up into huge numbers for a couple of years. Then eventually the natural controls come back."

Booth, who identifies the crypt gall wasp as *Bassettia ceropteroides*, suspects that the insect has done damage on the Cape before, as well as along the coastline from New York north. Like Childs, he doesn't know what precipitated the latest outbreak.

Awaiting the spring

Until the natural system of checks and balances returns, however, arborists are intent on saving as many of the remaining trees as possible. The most common method of treating the problem for an individual tree is with an injection that kills the wasp, followed the next year by various treatments aimed at stimulating the tree's growth.

"We've used a few different products, and had success with most of them," says Heywood, who says the process of bringing the tree back to health generally runs three years.

But Booth cautions that the results of scientific trials have been inconclusive.

"A couple of years ago, we set up two

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trials, injecting trees,” he says. “The biggest trial was on Long Island, and I went back a year later to collect my data on it. On the very first property I went to, where we’d injected the trees, I said, ‘Wow, it worked. Look how much better the trees look.’

“Well, because it was a good trial, we also had on the same property a number of



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Tree dieback may not appear until year 2 or 3 of infestation, according to a new fact sheet by Cape Cod Cooperative Extension. Decline often occurs from the top of the tree downward. By early summer, trees that lack initial spring foliage often produce epicormic growth, shoots growing from the trunk and large limbs. Photo courtesy of Bartlett Tree Experts.

black oaks that we did not inject. This was the control group. Guess what? They looked better, too.”

After two days of collecting samples, the group found no difference between the trees that had been treated and the trees that hadn’t.

“At the same time, we had a concurrent trial going on Cape Cod,” Booth says. In this smaller trial, also involving injected and un-injected trees, there were some that were dramatically improved, but not all.

“Almost any arborist can point to success stories but what he isn’t going to tell you is all the times (treatment) didn’t work,” Booth says.

There is a new product on the market, an emerald ash borer treatment called TREE-age (pronounced “trriage”), that Booth is

hopeful may also be effective against the crypt gall wasp, but he notes that no trials have been done.

“We don’t even know the life cycle of the insect, so it’s almost impossible to spray,” he says.

There is some thought the crypt gall wasp population will decline on its own, or fail to reappear with this year’s spring thaw.

“If you’re correct that this has been only two years as an outbreak on Cape Cod, there’s a pretty good chance it will still be around,” Booth says. “I suspect it’s actually been around a lot longer, and now we’re in the fourth or fifth year.

“I don’t think guys like you or me even hear about it in the first two years. I don’t think the average arborist knows it’s there the first two years.”

