Pathogens, insects in line to cause widespread post oak decline

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All over Texas this summer, people are asking why their post oaks are dying. Texas A&M AgriLife officials say a combination of stress from the 2011 Texas drought and overly wet conditions in 2016 are the reason. Credit: Texas A&M AgriLife photo by Kathleen Phillips

In the lush green landscape of a season with plentiful rain, memories of

the record Texas drought of 2011 could fade. But hundreds of calls, emails and tree samples sent to the Texas Plant Diagnostic Lab in College Station tell a different story.

"Since the early spring to late summer, there have been many inquiries as to why post oaks have 'suddenly' died," said Dr. Kevin Ong, director of the lab, which is operated by the Texas A&M AgriLife Extension Service.

"When you get a whole bunch of folks asking the same question, and they are from all over Texas—even in the Panhandle—you know that something widespread is up."

What's up is that leaves start yellowing, may develop spots and ultimately turn brown but still cling to the tree limbs, according to Sheila McBride, the lab's lead diagnostician. At that point, the tree is already dead.

"We are seeing the symptoms everywhere. It's in the urban environment. It's in the rangeland environment. It's in the woodland environment. It's not just happening in one spot," she said.

McBride said a few cases were reported in 2011 and again in 2013, mostly from arborists checking trees in their areas. But the flood of calls this year, beginning in the spring when post oaks should be bursting into a showy display of green leaves, was an alarm for plant pathologists who monitor diseases and other stresses that impact Texas flora.

McBride and Dr. David Appel, Texas A&M AgriLife Research forest pathologist in College Station, call the phenomenon rapid oak decline. But they agree that "rapid" is in the eye of the beholder and that by the time someone notices the symptoms – the yellowing, spotted or brown leaves on a tree—the tree has been declining over time.

"People will say the tree died overnight. But actually it has been developing these early symptoms for a long time before that. It collapses. It dies. It turns completely brown very quickly," Appel said.

Especially hard hit is the Post Oak Savannah region of Texas, which is between the blackland prairies and the eastern pineywoods. According to the Texas A&M Forest Service, the area extends from the Oklahoma border to south of San Antonio and was part of the historic oak belt that once ranged from near Canada to Central America.

Appel, who has researched oak wilt for decades, stressed that the current problem is not that disease. Oak wilt targets primarily live oaks whereas this situation is impacting post oaks, which are very resistant to the wilt.

To understand why post oaks are declining, he explained, one needs to understand their ecology. Post oaks are a type of white oaks, which are "very, very susceptible to site disruption and rapid environmental changes.

"They have particular areas where they like to grow, but as they get older and bigger, the stand gets more crowded. That means the competition for resources gets to be a problem," Appel said. "So when we go through rapid environmental extremes from year to year, that makes for a tough time on the post oak physiology."

That's why plant pathologists peg the 2011 drought as the beginning of the decline of so many post oaks in Texas. Following the drought, several years of unusual weather patterns made it hard for the large, old post oaks to compete for the carbohydrates they need to live.

"Then this year included an extremely wet spring followed by a very hot, dry period," Appel said. "Those two factors combined with the stress that was put on these trees in 2011 to cause the death of so many post

oaks this year."

Further complicating the situation is that no one pathogen is responsible, so there are few treatments available to reverse the decline, he noted. Thus, while several trees in one stand may die, it is not from a pathogen spreading but because the area is ripe for the condition.

"We have a perfect storm of environmental conditions," Appel said. "The tree's physiology is weakened by the drought and weather extremes, and then we get what we call contributors – canker-causing pathogens, root rot pathogens and insect borers. We believe that that is what's really leading the problem with the post oaks."

Appel said all of these situations have been found in any given year on post oaks for decades, but the mortality rate has been much higher and more widespread this year.

Whether something can be done about it depends on each situation.

"You have to look at what the specific site conditions are," he said. "In an urban environment, there may be ways to make up for the environmental extremes that have been happening. It may be useful to water the trees occasionally but only every three or four weeks at most.

He said too much water can be as harmful as drought because water accumulating around the base of a tree can encourage root rot organisms.

"A tree should be allowed to dry out very nicely and stay dry, because post oaks hate to have wet feet," Appel said.

He said other possible aids in urban areas include not letting turf grow to the base of the tree to avoid having to water it, or try vertical mulching by drilling holes (in the ground) around the base and extend beyond the

drip line of the tree. Then fill the holes with organic matter that allows the soil to dry out and encourages the growth of the roots in the immediate vicinity of these holes.

In rural woodland areas, there are fewer options, he said.

"There's really very little we can do about this. When you see these trees dying off, if it's a forest management situation, we may suggest thinning of the stand because if you remove the weakened individuals it may help the others have more available nutrients," Appel said. "The idea is to increase resources for all the remaining trees. These things might help, but it's probably not really practical."

For now, he said, tree owners should hope for a good dose of the right weather conditions to help remaining healthy trees replenish their nutritional needs.

"As we near the end of the growing season, all the trees are going to start showing symptoms of defoliation and will look very much like the sick trees. So at the end of the summer when you see a tree that is changing colors, you don't want to assume that you've got the rapid decline of post oak. The best thing to do is to wait until the following spring and see if that tree leafs out again.

"Next spring, see what the state of the health of the trees is and if you really think the tree is in trouble, then you need to start considering some possible treatments," Appel said.

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