

# UK scientist trying to solve state's white oak mystery

LEXINGTON — Sybil Gotsch has spent her career climbing trees in some of the world's most remote rainforests — from Costa Rica to Brazil to Mexico. Now, one of the hardest questions in her career is rooted in Eastern Kentucky.

It's been coined "the white oak problem" and has been worrying foresters, ecologists and bourbon distillers for years. White oak seedlings sprout just fine on the forest floor. Mature white oaks tower overhead in the canopy. But the middle-sized trees — the teenagers of the oak world — keep disappearing. Something is preventing young oaks from growing, and nobody is quite sure what.

"The stakes go well beyond the forest," said Gotsch, an associate professor of forest ecophysiology in the Department of Forestry and Natural Resources (FNR) in the Martin-Gatton College of Agriculture, Food and Environment. "White oak acorns are a food source for deer and turkey, and the trunks

provide roosts for bats. The wood is also essential for furniture, flooring and cabinetry."

And then there's bourbon. By law, bourbon must be aged in new, charred white oak barrels. Kentucky's bourbon industry alone is valued at \$10.6 billion. According to the White Oak Initiative's 2021 assessment, an estimated 60% of surveyed mature white oak acres had no white oak seedlings present, and about 87% had no white oak saplings.

Gotsch, along with fellow researchers John Lhotka and Lance Vickers, have described the situation as two bottlenecks: one where seedlings fail to develop into saplings, and another where saplings fail to climb into the canopy overhead. If the next generation of white oaks doesn't break through, the ripple effects could last decades.

As an ecophysiologicalist, Gotsch studies how plants function in their environment — how they take in water, handle stress and spend their energy. Most of the

researchers tackling the white oak problem have been foresters and ecologists, tracking which trees survive and which don't. Gotsch is asking a different kind of question: What is happening inside the tree that causes it to stall out?

"There are several possibilities," Gotsch said. "One is drought stress. Young oaks stuck beneath the shade of taller trees may not be getting enough water or light to push through to the canopy, especially during dry summers. Another possibility is what scientists call an allocation problem — the tree might be putting its energy into roots or defenses instead of growing taller. Then there is a third factor, which could be competition."

Gotsch's hands-on approach is something she has been refining for over two decades. She got her start in 1998 in the dry forests of Costa Rica, studying how plants survive months without rain. She was supposed to stay six months. She stayed two years.

"I was doing a good enough job that my adviser kept finding money for me to stay," Gotsch said.

Later, while working in the cloud forests of Mexico, Gotsch learned to climb towering oaks and place instruments right next to the leaves, measuring how trees absorb water directly from fog. It was painstaking, physically demanding work hauling sensors and data loggers into the canopy by rope. But it also gave her something most forest researchers never get: a direct read on what a tree is doing in real time, high above the ground.

Those same techniques are what she's now bringing to Kentucky's white oak stands. She's collaborating with Lhotka, a UK FNR professor of silviculture, on a project based in Berea. Because the work involves tracking trees across seasons and years, she expects to return periodically to run new rounds of physiology measurements and build a clearer picture over time.

Gotsch said the canopy is where the real answers tend to hide. Plenty of scientists study forests, she said, but very few actually climb into them. According to her, most of the biologists who do are studying animals such as birds, bats and primates. Tree physiologists like her are rare up there.

The best part, she said, are the surprises — the moments when the data doesn't match what the textbooks predicted.

"You think it works a certain way, and then you get up there and realize you were completely wrong," Gotsch said. "That's what I love about this work — it never stops raising new questions."

That curiosity is now aimed squarely at the white oaks of Appalachia. If Gotsch and her colleagues can figure out exactly why young oaks are stalling, it could help land managers across the region make smarter decisions about which trees to protect and how to give the next generation of oaks a fighting chance.

# Taylor Regional joins Food is Medicine initiative

BY JENNA GEORGE  
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Eating better leads to feeling better, and Taylor Regional Hospital just kicked off its Food is Medicine initiative.

This initiative is an overall statewide coalition which works between both the Kentucky Department of Agriculture and the Kentucky Hospital Association. Conjoining their efforts helps fuel the health requirements of the state, alongside supporting the farmers. Overall, the initiative was begun by Kentucky Commissioner of Agriculture Johnathan Shell in May of 2024.

On June 3, Taylor Regional Hospital officially joined the initiative and declared its first steps in this new direction during a kickoff event.

There were multiple

vendors at the event, such as Running Soles, Green River Meats, and Taylor County Farmer's market. Outside of the vendors there were two special guests, Kentucky Senator Max Wise and Representative Sarge Pollock. Lastly on the special guest list was the keynote speaker, and founder of this initiative, Johnathan Shell.

"It starts with the community, and I really appreciate you all being here, for being mindful of your health, and eating better, and we've got a committee called Eat Better Feel Better," hospital CEO Michael Everett said. "I want you to start thinking of hospitals as a place to go to be healthy. Not just go in a time of rescue or need. We'll always be there for you."

Farmers throughout the state are trying to spread what they are producing, and

sharing the purest form of food they have with hospitals, knowing that individuals within those hospital buildings need healthy food to help make their bodies better.

"When you think about all the consumption that we do in agriculture, it happens inside of the city limits for the most part, and one of the largest consumers across the world and across America and across Kentucky is our hospitals," said Shell. "They have to eat on a daily basis, they got patients, they got employees, they got visitors that are coming in from a consumption center, hospitals are one of the largest consumer points in our communities in the state of Kentucky."

Many different groups are benefiting from this initiative, and will continue with it now in place. Individuals are

helping not only themselves by eating better, but by aiding in the contributions to the local economy and benefiting farmers as well.

"So it's really what we started focusing on, almost from a selfish standpoint in our culture, of looking at how can we provide what we have on the farm and the most healthy, abundant, safe food source in the entire world to our people who need it the most in our hospital settings," said Shell. "That's why we started Food is Medicine and it's so good to have partnerships like Taylor Regional and our other hospitals across the state of Kentucky that have really latched onto this."

Every Tuesday from 11 a.m. until 1 p.m., though sometimes sooner depending on demand, the Farmer's Market sets up at Taylor Regional

Hospital. By doing this the hospital is showing a hands-on approach to not only support the local economy, but the farmers who make states like Kentucky go around.

"Mike is leading that charge and Taylor Region is leading that charge. Really excited about the aggressiveness that the hospital system is taking on," said Shell. "Showing how we do more and more of this to make a difference, not just for our rural areas for our farmers, but also for the patients. It is better. It is healthier."

By beginning this program in Taylor County, and at the hospital specifically, it leaves room for expansion into other subsections of the community.

"What we've really been working on in this journey that we've been on through Food is Medicine, it connects

into our schools as well," said Shell. "We've got a school nutrition program and we're working very aggressively with this. At the end of the day, this is economic development that we're talking about."

This step is only the beginning for Taylor Regional Hospital and their partnership within the Food is Medicine approach, providing a foundation for the future.

"We're gonna keep feeling better, and we're gonna do it one bite at a time, one percent at a time. You don't have to go overboard. You don't have to change your whole lifestyle," said Everett. "Just make it where it's natural, you're moving, you're getting out, your eating is fully getting better. At the hospital, that's what we're trying to do is get one percent better each day, genuinely moving forward."

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