Ronald Kendall received an individual award from the Texas Commission on Environmental Quality for developing medicated feed to restore a key game population.

Thanksgiving Day of 1964 is a day Ronald Kendall, a professor in Texas Tech University's Department of Environmental Toxicology, will never forget.

It was the culmination of years of tagging along with his grandfather and his Llewellin setter, Fannie, on early morning quail hunts, attentively watching and listening to instructions from a seasoned outdoorsman. Though the 12-year-old Kendall had first been introduced to the sport at the age of six, he had never pointed a gun and shot at live birds.

Until that day.

When South Carolina's most famous game population was much higher than it is now, hunting season always opened on Thanksgiving. And after years of anticipation and likely incessant badgering, Kendall's parents finally gave him the green light to use live ammunition while out with his grandfather, who had traveled the short distance from his own home with Fannie for the occasion.

It was a crisp fall morning in Florence County, with frost still on the ground and the sky a demure shade of blue even approaching nine o'clock; the sun lazily rising from its slumber as grandfather and grandson left Kendall's home and headed for the woods.

Within a few hundred feet from the front door, their prized bird dog had already picked up the scent of roughly 20 quail feeding in a circle. Fannie froze on point, one leg in the air, her tail pointing toward the heavens and the rest of her directed at the birds. The time was drawing near for Kendall to take his first shot at a wild quail over a pointed bird dog.

His grandfather nudged the nervous adolescent to walk in front of Fannie and aim his single shot .410 Gauge shotgun, instructing Kendall to pick one bird at the covey flush of the quail and out of the group, focus on one bird to take the shot.

Suddenly, the sky erupted in quail. In a split second, Kendall fixated on a bird flying in front of him. He pointed his gun, closed his eyes and fired.

"My grandfather shouted out, 'Good shot, son!'" Kendall says. "I opened my eyes and feathers were trailing across the sky. I got him."

Bird in hand after Fannie retrieved and delivered it, his grandfather again marveled at how well Kendall had done. Decades later, Kendall laughs while telling the story, adding that he never had the heart to inform his grandfather this milestone was accomplished while essentially blindfolded.

“After that first shot, I’ve always kept my eyes open and focused on one bird to shoot at the covey rise,” Kendall adds.

Before long, the duo of Kendall and Fannie took down three quail on three shots, the first day of a two-week idyll in which Fannie stayed at Kendall’s home. Kendall would follow the setter around his expansive surrounding property, hunting whenever he could, thriving in a landscape filled with quail.

Kendall was around the same age of 12 when he told his parents he dreamed of a career in wildlife and the environment, with a focus on conservation fostered while fishing and hunting with his grandfather.

His foray into environmental toxicology, long before it officially existed, occurred while he was an undergraduate, conducting frontline research in an insect toxicology laboratory on insecticides for cotton boll weevils.

“The only thing the scientists were worried about was killing the insects,” Kendall says. “I was saying, ‘What about the birds and the wildlife?’”

Decades into his life’s work, Kendall has displayed that same care for the environment, working to restore one of the last remnants of what used to be a quail hunter’s paradise across the southeastern United States.

Thanks to Kendall’s invention of QuailGuard® medicated feed, which the Food and Drug Administration (FDA) approved in 2024 and earned him an individual 2025 Texas Environmental Excellence Award (TEEA), the West Texas wild quail population is experiencing a resurgence where QuailGuard® is utilized in treatment.

Saving a Sport

The northern bobwhite quail’s presence in Texas dates back generations to when the state’s grasslands truly thrived, and the experience of hunting them with bird dogs has manifested in longstanding cultural and economic

benefits for Texans.

“Real estate agents selling ranches say if you have wild quail on your property, a lot of them, it’s like having an oil well,” Kendall says. “They’re that valuable.”

But in late 2010, West Texas sportsmen faced a dire problem.

A particularly wet summer providing for an abundance of forage indicated to experts that wild quail reproduction would skyrocket in time for the fall hunting season. By the time November rolled around, however, there were few to be found.

That raised the alarm to sportsmen’s groups like the Park Cities Quail Coalition and the Rolling Plains Quail Research Foundation, prompting them to launch a project charging Kendall and other scientists to initiate significant research into the issue, ultimately identifying the spread of the eyeworm infection in quail in Mitchell County in 2013.

The group was shocked by how a relatively uninfected population could see infection rates of over 90% after a couple of months. They were the first to find that the eyeworms dealt their damage while living in the rear compartments of the birds’ eyes, specifically the Harderian gland.

After confirming this with an ophthalmologist, Kendall’s team started putting their research into peer-reviewed scientific literature, and the research evolved.

They found the eyeworm in songbirds and prairie-chickens, investigated various infection levels and intermediate hosts, launched non-invasive molecular tests of bird droppings and monitored large populations across Texas’ Rolling Plains ecological region south and east of Lubbock.

“I’m really proud of these foundational papers we published in ‘Environmental Toxicology and Chemistry,’ the seminal journal in our field

that demonstrated our FDA work," Kendall says. "It's just been a real scientific challenge to bring all of this together into a plausible and biologically supported process."

Ron Kendall

Those documents were critical for providing data to the FDA in 2014 to support the concept of what became the QuailGuard® medicated feed, the beginning stages of an extensive process to achieve FDA approval.

Kendall made further progress in late 2015 and early 2016 by developing the required framework and numerous experiments to register the feed with the agency. This included the rigorous effort to get the Wildlife Toxicology Laboratory (WTL) at Texas Tech certified under the Principles of Good Laboratory Practice system.

In both the WTL and the field, Texas Tech researchers substantiated the development of long-term inflammation in birds' gastrointestinal (GI) tract

through cecal worms and the safety of the feed.

Using fenbendazole as the active drug to address parasites, the team demonstrated to the FDA the residue depletion of the fenbendazole sulfone, a substance produced as the terminal metabolite during the metabolism process.

When they treated quail with the QuailGuard® medicated feed, the population in the Rolling Plains study site grew 300% as opposed to the control population that didn't receive medicated feed.

These results, all conducted under the FDA purview and involving the submission of thousands of pages of data, culminated in the agency issuing formal registration in the form of a supplemental approval for QuailGuard® in May 2024.

"I was literally ecstatic, because the average drug registration for the FDA is a 10- to 15-year process, and we did it in a little over eight years," Kendall recalls. "Secondly, only about 10% ever get through, so the odds were against us. But we just worked hard, and our staff and graduate students were phenomenal."

Kendall specifically highlights the contributions of administrative assistant Tammy Henricks, who has worked with him for 25 years, for her contributions to the FDA process. In turn, Henricks states her pride in Kendall and past and present WTL staff and students for their determined, cutting-edge research that has produced real results.

"To actually be able to see wild quail numbers increasing because of what our lab has done is incredible," Henricks says. "Bobwhites are thriving in areas where previously they were few and far between simply because Dr. Kendall cares. To me, that is an amazing legacy."

QuailGuard® made history as the first commercially available drug approved

for use in wild quail in their natural habitat, earning Kendall a nomination for an individual TEEA award and prompting a months-long judging process.

Texas Commission on Environmental Quality evaluators came to Lubbock to study the program and interview Kendall, WTL staff and graduate students. The materials for QuailGuard® were reviewed by a statewide committee before reaching the TCEQ commissioners and Texas Gov. Greg Abbott's office, and in early 2025, Kendall was notified he would receive the award.

Kendall calls the accomplishment of being recognized by the state of Texas, which he now calls home, among the highest honors he's achieved throughout his decades-long career.

An Enduring Dedication

Half a century on from studying biology as an undergraduate at the University of South Carolina, Kendall has persisted through a complete transformation of toxicology research, still showing up to the WTL with an unyielding passion for research.

Thinking back to his first hands-on experiences in science, Kendall refers to the TEEA as an acknowledgment of a lifetime of work.

His journey has taken him across the United States, as he earned his bachelor's, master's and doctorate degrees in the southeast, completed postdoctoral research under a U.S. Environmental Protection Agency traineeship in Boston and started his first teaching job as a 27-year-old assistant professor at Western Washington University.

As the 1970s passed into the '80s and '90s, Kendall, a charter member of the Society of Environmental Toxicology and Chemistry (SETAC), made a name for himself.

Through research, contributing to countless publications, some of which was featured in leading scientific journals, consulting on environmental matters

on a national and international scale and pioneering environmental toxicology curriculum in the West, Kendall was well-known in the field when he was recruited to Lubbock in 1997.

Playing a prominent role in the nascent Institute of Environmental and Human Health and Department of Environmental Toxicology, the plight facing Texas' quail population in 2012 provided plenty of work for the WTL Kendall founded that same year.

Students who have rotated through the laboratory since, from undergraduates to doctoral students, received thorough training starting with behavioral expectations and scientific standards and elevating to excellence in the research process.

Kendall defines excellence as being highly productive, beyond merely generating grant proposals and scientific papers. Students must be able to express their ideas well in writing, skills honed through communication seminars and other learning methods. Kendall's program also assists them through the process of preparing and defending their dissertations.

The research they do occurs not only in the WTL but out in the field via the program's Mobile Research Laboratory. Across West Texas, the mobile lab allows for regional surveillance of live quail to understand their health and infection levels from both eyeworms and caecal worms, the latter of which the WTL recently published a paper on regarding its causation of long-term inflammation in the GI tract.

All this work comes together to comprehensively educate students.

"When you're a master's, or particularly a Ph.D. student, the acid test is your scientific publications and your intellectual capability to contribute to the advancement of scientific knowledge," Kendall says. "Generally speaking, students who come out of my lab are extremely well-published and highly marketable for jobs in environmental toxicology."

The field is ever-expanding, too. Kendall forecasted this during his first teaching job at Western Washington, where he answered in the affirmative when students and parents asked whether there would be a future for the industry.

As a member and former president of SETAC, he's witnessed the organization expand from North America to have an international reach, reflecting the continued growth of the human population and emergence of toxins in everyday life.

All the while, Kendall still feels the satisfaction of watching students earn their doctorates and persisting in his passion.

"I'm just glad to still be so involved and have fantastic students," he says. "I'm still in the saddle, still on the ride."