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The estimated 200 million rabbits in Australia and the damage they cause by overgrazing has caused the country's agricultural industry to lose about $115 million annually. Photo provided

Australia getting help from Penn State professor to manage rabbit infestation

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For almost 150 years, Australians have been battling non-native feral rabbits that stress the country's agriculture industry and wreak havoc on ecosystems. They've had success thinning out the numbers, but to build on that success, they're getting a helping hand from an unlikely source — an economics professor from Penn State.

More than 10,000 miles from the farm fields of Australia is Ted Alter's office on the campus of Penn State University. There he's surrounded by rugby memorabilia, pictures of his family and relics of an over 40-year academic career. It's where the soft-spoken, but confident professor, who holds a doctorate in resource economics and policy, looks through his wire-framed glasses

to write lesson plans and prepare lectures to help the next generation of economists tackle agricultural and economic challenges.

It's also where, in 2012, he received an invitation to the University of New England in New South Wales, Australia, to help advance research and strengthen collaborative efforts to manage the country's infestation of rabbits.

"The Australian government makes strategic investments every year in areas that they think are critical issues to the future of the country," Alter said. "This was an opportunity to have input into addressing the country's invasive animal problem and I just couldn't pass it up."

Like most agricultural systems in the world, the Australian system faces the daunting task of feeding a rapidly growing population. Australian farmers have had remarkable success in a difficult farming environment, which has led to the export of almost 80 percent of what they grow and produce.

The result is a robust agriculture economy that accounts for almost $100 billion each year, which is about three percent of the country's gross domestic product.

Michael Reid, program manager of the Biosecurity Division of the Australian Department of Agriculture, Energy and Resources, estimates that there are about 200 million rabbits on the continent. Unfortunately, one of their favorite things to do is eat vegetation, which ravages pasture land that is critical to the agricultural process.

The rabbit overgrazing leaves little food for livestock, but it also causes erosion problems that can lead to production loss as well as water run-off problems. With no vegetation to slow the water, silt banks can erode affecting the water supply, which has a ripple effect through the surrounding ecosystems.

The result is an annual agricultural industry loss of about $115 million due to the feral rabbits and the numbers are on the rise, according to the New South Wales government office of Environment and Heritage.

After accepting the invitation and heavily studying the issue, Alter was ready to see it in person. He traveled to Australia late in 2012 and got to work just hours after getting off of the plane.

"As soon as we were in the field we saw them," Alter said. "And it was clear that eradication was long past because the only way you can control these invasive species is if you get them immediately. Their reproductive biology is such that in a very short period of time, the growth curve is exponential."

The rabbit population growth curve is likely something that English settler Thomas Austin didn't think of when, on Christmas day in 1859, he set free 24 rabbits on his ranch in the southwest corner of the country.

Austin was a member of the Victorian Acclimatization Society, which was a group of English colonials who altered ecosystems of newly settled lands with native plants and animals from

England in an effort to make it more like their homeland. His release simply followed a regular VAS practice, but it also etched his name into the history books as originator of the problem.

“The introduction of a few rabbits could do little harm and might provide a touch of home, in addition to a spot of hunting,” Austin wrote in a society publication.

By 1866 “a few” turned into 14,000 on Austin’s ranch alone and by 1920 the rabbit population reached the highpoint of 10 billion. By 1950, the rabbits invaded almost the entire continent making them the fastest colonizing mammals in the world.

As the population swelled, Reid said the government had to act and did so by the early 1900s.

“The reality is, the problem was spiraling out of control,” Reid said. “And without action, the country’s early agricultural infrastructure would have collapsed.”

The rabbits live underground in warrens, which is essentially an underground den that can be home to as many as 20 rabbits. Non-biological control methods include warren fumigation, shooting, poisoning and trapping, but warren ripping is the most effective and expensive, according to Reid.

Ripping involves using a tractor or similar piece of equipment to submerge thick metal claws, that can be as long as 3 feet, into the ground and dragging them through the warrens. The soil collapses the warren and the rabbits die from suffocation.

In 1901, a Royal Commission tried a more practical approach and constructed a rabbit-proof fence that spanned more than 1,100 miles and is considered the longest fence in the world.

The fence is still maintained and has helped to control the issue, but Reid said biological solutions have produced the best results.

In the early 1950s, the government introduced the rabbit virus Myxomatosis, which decreased the population by between 40 and 60 percent, according to Rabbit Free Australia, a nonprofit company that manages one of the country’s largest rabbit research funds.

After the rabbits developed a resistance to the disease, the Australian government was testing Rabbit Hemorrhagic Disease Virus on an island off the south coast. A fly picked up the virus and transported the pathogen to the mainland, but the government caught a break and the virus had great success. It was officially released in 1996 and while it remains the only biological control option. Its use is controversial.

“You might say, ‘That’s awful, we couldn’t cause rabbits to hemorrhage internally and die, how cruel,’ ” Alter said. “A farmer’s going to say, ‘Those rabbits are causing me on my station, my farm, tens of thousands of dollars of lost production.’ ”

Rabbit control as a whole is a hot-button topic that is highly politicized and contested. Disagreement on control methods, and the role the government plays, is at the center of many debates. One way the Australian government has handled the lack of consensus on how to control the rabbits is through legislation, Reid said.

“It’s in our law that if you own property, it’s your responsibility to get rid of the rabbits and if you don’t you will and can be taken to court,” Reid said. “If it goes to court it usually has to be a pretty serious situation. We’ve had some wins in court and we’ve had some pretty embarrassing losses as well.”

The prosecution rate is low, Reid said, but the law has effectively shifted control of the rabbits to the private sector.

The result in Victoria, and other parts of the country, is that government is scaling back its involvement in the issue and decreasing funding for research and control.

“Now, a lot of community is sort of saying ‘hang on we need you to do enforcement’ and so there’s a lot of tension there,” Reid said. “And this is where Ted’s work has been important.”

Over a period of five years, Alter engaged the community from a “human dimensions perspective” in an effort to find common ground for all stakeholders to better-understand competing rabbit control perspectives. Simply put, he got people to come together.

Using a democratic and systems-strengthening approach, his success has led to the development of the Victorian Rabbit Action Network, a community-led group that explores and implements sustainable and effective rabbit management.

“It’s sparked a bit of a revolution in terms of how we are working together to manage the species and has changed the politics of how we work together,” Reid said. “We are now in the process of extending Ted’s approach to four other established invasive species through a $4 million government investment.”

What started as an invitation to have a fresh set of eyes on an invasive animal problem that dates back to the mid-1800s has resulted in a collaborative and systemic management solution. Thomas Austin’s rabbits will always remain in Australia, but as the community navigates through the problems created by the invasive animals, they will be better-prepared thanks to an economist from an ocean away.

“Ted’s fingerprints are all over how we come together and work in new ways. It’s been a major shift in our mindsets,” Reid said. “Quite honestly, he’s a legend down here.”