



Will ticks  
**ever** be  
 eradicated  
 from the  
 border  
 quarantine  
**zone?**

The 4-Poster, above and below, applies insecticide when deer come to feed.

# Ticking Away at Ticks



By BURT RUTHERFORD

**I**n the old days, controlling cattle fever ticks in the quarantine zone along the 550-mile border between Texas and Mexico was relatively easy. If the tick riders found some infected cattle, the rancher had two choices. He could dip the cattle once and vacate the pasture for nine months, or could keep the cattle in the pasture and dip every two weeks for six to nine months.

With either regimen, the ticks would eventually be eradicated from the pasture and things would return to some degree of normal.

But that was then and this is now. And fever tick control now is more complicated than it was in 1943 when the United States, with the exception of the Texas border quarantine zone, was declared free of the two species of cattle fever tick that spread the deadly “Texas fever.”

“At that time in our history,” says Dr. Mat Pound with USDA’s Knippling-Bushland U.S. Livestock Insects Research Laboratory at Kerrville, “we did not have

appreciable populations of white-tailed deer or other acceptable ungulate host for the cattle fever tick.”

Now-a-days, South Texas is big buck country and people from all over the United States travel to the region with the hopes of harvesting a Boone and Crockett bruiser. Throw in a wide variety of exotics — axis, sika, nilgai and others — and the South Texas brush country is a different place than it was in the early days of the fever tick eradication program.

## Ticks have more options

The cattle fever ticks couldn’t be happier. The two species of ticks that are vectors of “Texas fever” are selective in their hosts, feeding only on ungulates. However, they are just as content taking a free ride and a free meal on white-tailed deer or similar type of wildlife as they are latching on to a cow.

For the people committed to eradicating cattle fever ticks from Texas, that’s a problem. A big problem.

Dip the cattle? Vacate the pasture? The ticks sim-

ply switch hosts, taking up residence on the now-abundant deer or other wild ungulates. "We know that white-tailed deer can maintain populations of both the cattle tick and the southern cattle tick in the absence of cattle," according to Dr. John George, director of the Knipling-Bushland Laboratory. "We have not been able to do the research to understand how they disseminate the ticks from a focal area. But the evidence suggests they are doing that. And we have conclusive evidence that they are sustaining populations of ticks."

### Medicated bait

So, as part of its work to conduct the research and provide the scientific knowledge to sustain the fever tick eradication program, George, Pound and Dr. Allen Miller, the three lead scientists at the experiment station, put their minds to work to overcome the problem of sustained tick populations in wildlife.

Work has centered on developing ways to deliver a pesticide to the deer in a form that would provide adequate, if not complete, tick control. And it's been going on for a number of years.

"In 1989, we got a mandate from USDA to start working on technology that would allow the control of ticks feeding on white-tailed deer and other wild ungulates, mainly exotics," says Pound. "One of the first things we came up with was medicated bait" using whole kernel corn coated with the now-common systemic ivermectin and its chemical siblings.

Deer will consume about one percent of their body weight in whole kernel corn per day, assuming they have access to other adequate food sources. That allowed the researchers to medicate corn with the proper dosage to control ticks on deer.

The entire quarantine zone along the Texas-Mexico border has been a real-world laboratory for the fever tick eradication pro-

gram since it was established, and the scientists took full advantage.

After developing an experimental formulation, they headed to the Apache Ranch in Webb County, which had a free-ranging herd of about 30 elk that were serving as a reservoir for the tick population. When the ranch finished with the prescribed dipping period and put the cattle back out on the pasture, they would become infected again.

In 1992, the researchers fed the medicated corn to the elk for about five months. "At the end of that time, all the cattle scratched free when they rounded them up," Pound says. "That was the first time that ranch had been free of ticks since 1956."

### Treatment limits led to options

While the technique is cost-effective and provides excellent tick control, "The problem is you have to stop treating 90 days before hunting season begins," George says. The compounds are not cleared by FDA for consumption by humans and can only be used for tick control in deer by USDA's fever tick eradication program.

So if the ranch allows hunters to harvest deer in a treated pasture, sufficient withdrawal time is necessary to allow the compounds to clear the deer's system. "If you figure bow season begins in early October and you've got to stop treating 90 days before that, it only leaves about five months you can use that technology," George says.

Their return to the scientific drawing board yielded another equally effective approach combining the long-standing concept of an old-fashioned cattle oiler with a whole corn feeder and some decidedly low-tech applicators as common as the local paint store.

It's called a 4-Poster and its beauty is its simplicity. "It has a central bin in the middle that holds regular, clean, untreated whole kernel corn as an attractant for the deer," says Pound,

who developed the patented device along with Miller and former technician Craig LeMeilleur.

On each end, it has two paint rollers placed vertically next to the feeding area.

"The feeding area is constructed so that for the deer to nibble a few kernels of corn that trickle out into the bins, (the deer) has to rub the side of its head and ears and neck up against the roller," Pound explains.

The paint rollers are soaked with an insecticide containing permethrin, which coats the animal's neck and head. "Then when the animals groom themselves, they transfer the insecticide to a large part of their body," George says. "And we get excellent control, just as good as we get with the medicated corn."

### And another option

The 4-Posters, which became commercially available in 2004, are being marketed by the American Lyme Disease Foundation to help with tick control nationwide. In the Texas fever tick eradication zone, any time cattle are scratched positive for ticks and are treated, the pasture must also be treated for a possible deer infestation using one of these two approaches.

But it's a labor intensive approach, requiring constant maintenance to keep the bins full of corn and the rollers soaked with insecticide. And if the deer have free-choice corn available in neighboring pastures, neither the medicated feed or the four posters are fully effective.

But George, Pound, Miller and their support staff already are developing a solution. "We have a patent for a device we made here and patented through the Agricultural Research Service that will apply a band around the neck of deer," Pound says.

Research at the Kerr Wildlife Management Area showed essentially complete control with a neck band treated with an insecticide.

ticide. Much like a tick collar for dogs and cats, it allows the deer to stay free of ticks for up to four months.

The applicator, again using corn as the attractant, automatically applies the neck band to the deer when they stick their head into the feeder. "It individually sizes (the neck band) and it has a signal so if a collar is present, it will not apply a second collar," Pound says. It can identify an old collar and will automatically remove it and apply a new one.

Because of the patent situation, Pounds isn't free to completely discuss the device, but says it is being field tested and should be commercially available soon.

They are working on other technologies that, if they prove successful under research conditions, will be tested for possible use in the future. These technologies include additional devices designed to better apply tick-fighting compounds and alternative approaches to tick control using antigens to vaccinate cattle against ticks and a very long-term look at possible genetic technologies.

That's important because of insecticide resistance issues in the tick population in northern Mexico. Long-term, if fever tick eradication in the United States is to be maintained, new approaches and new technologies will be essential.

Will ticks ever be eradicated from the border quarantine zone? That's difficult to predict because ticks continue to come into the quarantine zone from Mexico, hitching a ride on stray cattle and wildlife. But Pound feels confident the United States will be able to continue to contain the cattle fever tick both within the quarantine zone and elsewhere. "We feel if we did have an outbreak of ticks somewhere in Texas and it got into the deer population, we could come in with a barrage of these technologies and re-eradicate them." ■

## A Look at the Knipling-Bushland U.S. Livestock Insects Research Laboratory

The U.S. fever tick eradication program notches 100 years of dedicated effort this year. For much of the last 50 years, the Knipling-Bushland U.S. Livestock Insects Research Laboratory has been at the center of the fever tick effort, providing the research and scientific knowledge essential to the eradication effort.

Named in honor of the two men who developed the sterile insect technique that led to the eradication of the screwworm, the laboratory was established in the 1950s. Part of USDA's Agricultural Research Service, the facility was initially located in Nuevo Laredo, Mexico, and focused on developing new insecticides to replace the arsenic that had been used to kill fever ticks since 1911, according to Dr. John George, the lab's director.

"The next step in working on cattle fever ticks was a lab that was set up just below Falcon dam," George says. "The research has to go on with live ticks and has to go on in a quarantined facility. And that facility has to be located within the quarantine zone of the tick eradication program."

That facility closed in 1983 because USDA was unable to control its physical security. "You could come across the bridge from either direction and have access to the lab," George says, and the number of break-ins became intolerable.

So the Cattle Fever Tick Research Laboratory was established on the grounds of the Moore Field complex near Mission, near the place where early screwworm production took place. The Moore Field facility is a sub-laboratory of the headquarters facility near Kerrville. Research is conducted at both facilities, with the Mission lab the only place where live ticks can be kept.

"Since then, our research has evolved in a number of directions," George says, revolving around the lab's central mission to provide research support for the cattle fever tick eradication program. "We've done a lot of work on acaricides, which is an essential part of the service we provide the program. We have been doing, for the last 15 to 18 years, a lot of work on the diagnosis of resistance in the southern cattle tick, one of the two species we worry about, to acaricides."

While cattle fever ticks are the lab's central mission, it also has a research program looking at control of biting flies, such as the horn fly and the stable fly. "Also part of our mission is to develop methods that control ticks of public health importance, such as the black-legged tick that is the vector of the agent of Lyme disease," a disease that affects humans in parts of the United States. "And that spills over to the Lone Star tick, which is a big human pest in our area." The Lone Star tick carries a disease similar to Lyme disease.

"We're talking with our counterparts in Mexico," George says, and they are working with the biologists at the Kleberg Wildlife Research Center in Kingsville. George hopes the lab can secure funding to initiate research in northern Mexico, where a tick quarantine doesn't exist.

"Any time you find fever ticks in Texas, you can't do research on them in a natural environment because the laws are such that when an outbreak is found, you have to eradicate," George says. "But in Mexico, we have an opportunity, if we can get some funding, to study the interrelationships between cattle, ungulate wildlife and cattle fever ticks."

For the more than 40 scientists, technicians and support personnel who work tirelessly behind the scenes to maintain eradication of cattle fever ticks from the Southeastern U.S., that's an exciting opportunity. As the second century of the U.S. cattle fever tick eradication program unfurls, the cattle industry can continue to look to that small cadre of dedicated personnel for new breakthroughs.