A deadly disease threatens Texas deer breeding. This researcher may have a solution

BY EMILY BRINDLEY
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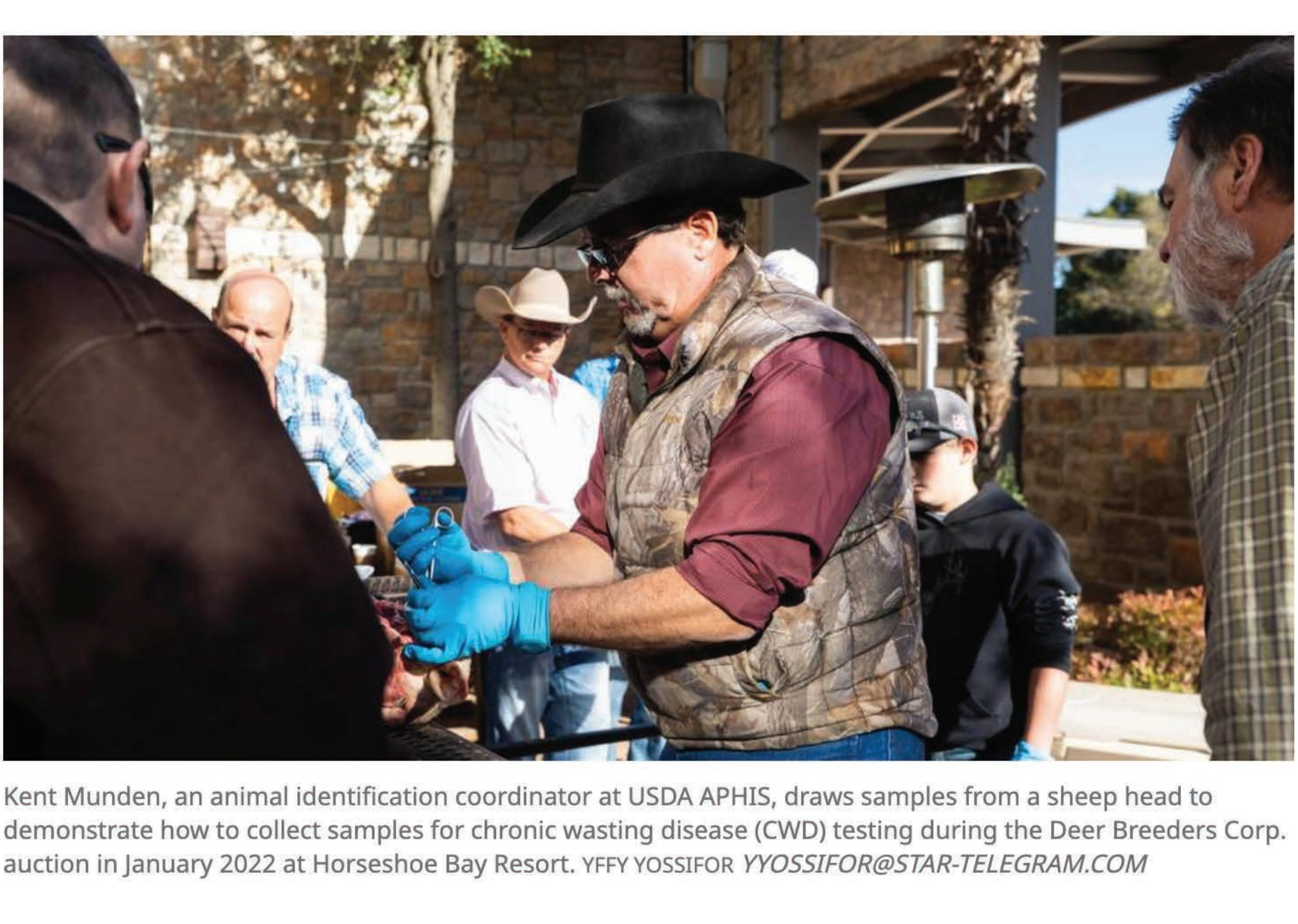

Kent Munden, an animal identification coordinator at USDA APHIS, draws samples from a sheep head to demonstrate how to collect samples for chronic wasting disease (CWD) testing during the Deer Breeders Corp. auction in January 2022 at Horseshoe Bay Resort. YFFY YOSSIFOR *YYOSSIFOR@STAR-TELEGRAM.COM*

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In rural Texas, whitetail deer breeding generates millions of dollars each year. But in the pursuit of antler perfection, breeders are threatened by a deadly deer disease.

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When a captive Texas deer tests positive for chronic wasting disease, it can mean the deaths of every deer in the herd.

"If it's positive, we're out of business," said John True, a deer breeder and the president of the Texas Deer Association. "It's a death sentence on numerous levels."

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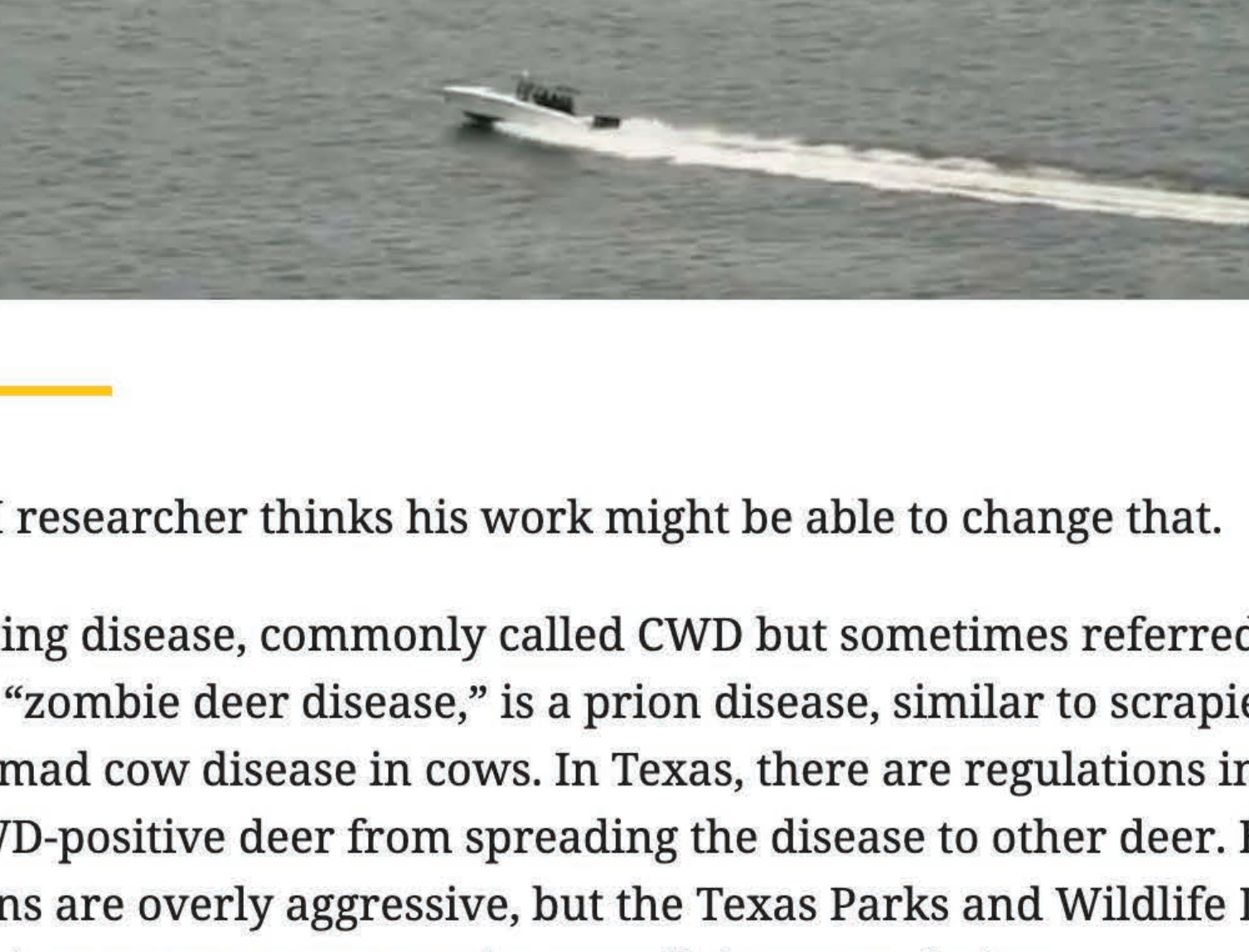

A Texas A&M researcher thinks his work might be able to change that.

Chronic wasting disease, commonly called CWD but sometimes referred to in the media as the "zombie deer disease," is a prion disease, similar to scrapie in sheep and goats or mad cow disease in cows. In Texas, there are regulations in place to prevent a CWD-positive deer from spreading the disease to other deer. Breeders say the regulations are overly aggressive, but the Texas Parks and Wildlife Department says they are just meant to protect the overall deer population.

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Christopher Seabury, an animal genetics researcher and a professor at A&M, is studying the genetic components of CWD. His research, when applied, could help ranchers selectively breed deer that are less likely to contract CWD, eventually crafting a herd that's less susceptible to the disease.

Seabury hopes that, at some point, breeders who discover CWD in their herds might be able to routinely respond with something other than "depopulation," which is the formal term for killing an entire herd.

"I think that in the future we will learn to manage and reduce the prevalence of CWD, and live with it knowing that it's out there, but I think that we will have alternatives to full depopulation," Seabury said.

Some breeders are skeptical of the idea, in part because the research is funded by two government organizations — Texas Parks and Wildlife and the U.S. Department of Agriculture. Some breeders see the agencies as hostile to the deer breeding industry.

But other breeders are excited about the potential that the research holds, the possibility that it could lift death sentences for deer across Texas.

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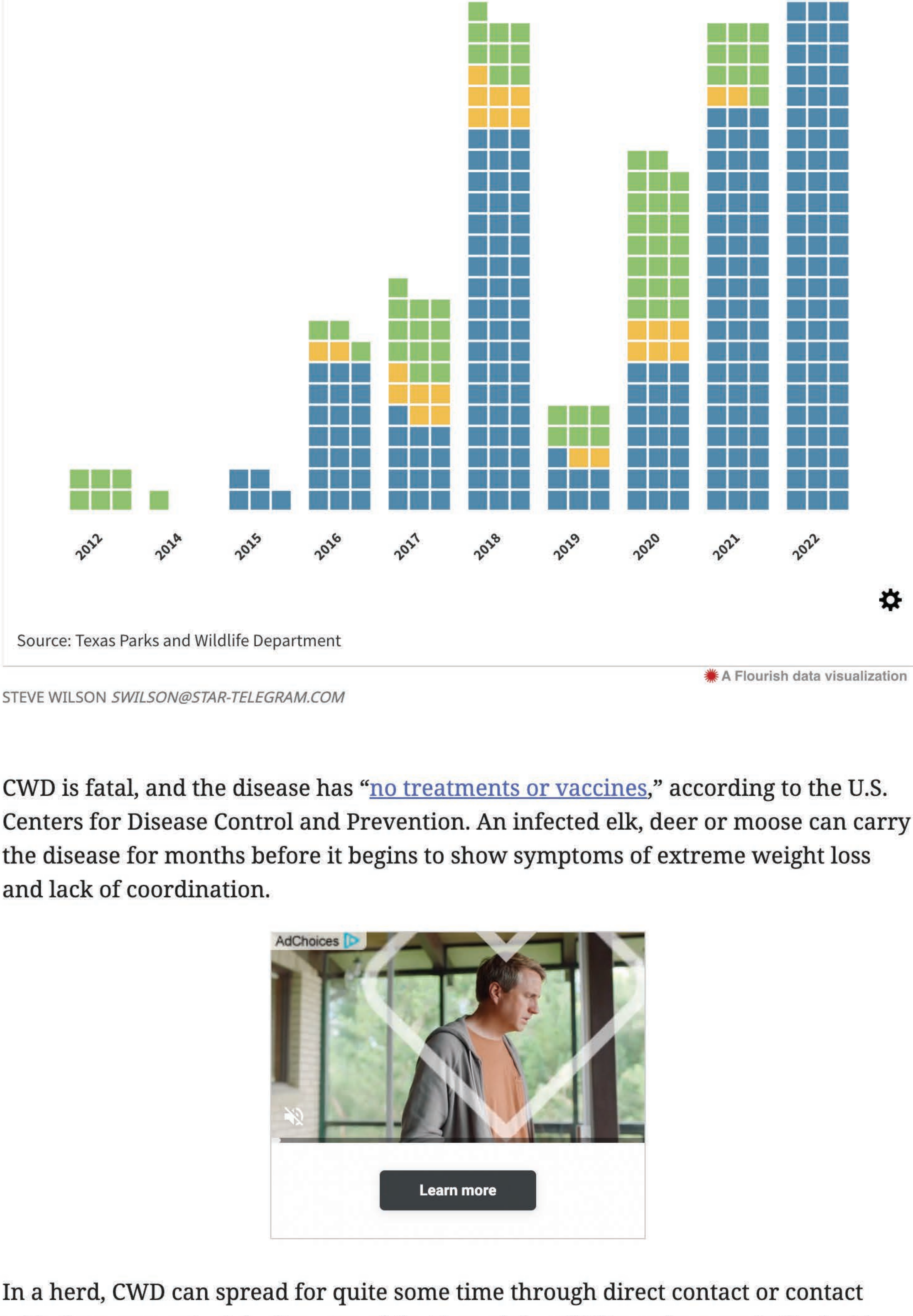
'A TYPHOID MARY SITUATION'

Chronic wasting disease, and its attendant regulations, is a flashpoint in the deer breeding world.

In interviews, several breeders pre-empted any questions about CWD and said they didn't really want to talk about the topic or its political implications.



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Texas saw its first case of chronic wasting disease in 2012, when a free range mule deer tested positive. Three years later, the state's first captive deer tested positive. Texas has now seen more than 350 CWD cases, along with tightened regulations that state officials say are a necessary protective measure and deer breeders say are overly restrictive.

Chronic Wasting Disease (CWD)

Deer that have tested positive for CWD in Texas

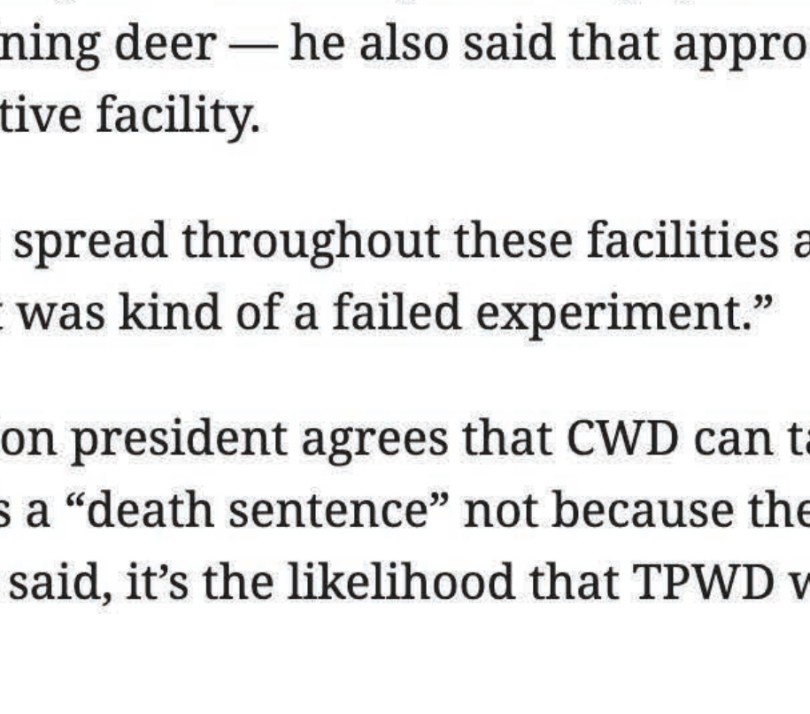
Free Range/Captive 🟦 Breeder Deer 🟨 Breeder Release Site 🟩 Free Range

Source: Texas Parks and Wildlife Department

A Flourish data visualization

STEVE WILSON *SWILSON@STAR-TELEGRAM.COM*

CWD is fatal, and the disease has "no treatments or vaccines," according to the U.S. Centers for Disease Control and Prevention. An infected elk, deer or moose can carry the disease for months before it begins to show symptoms of extreme weight loss and lack of coordination.



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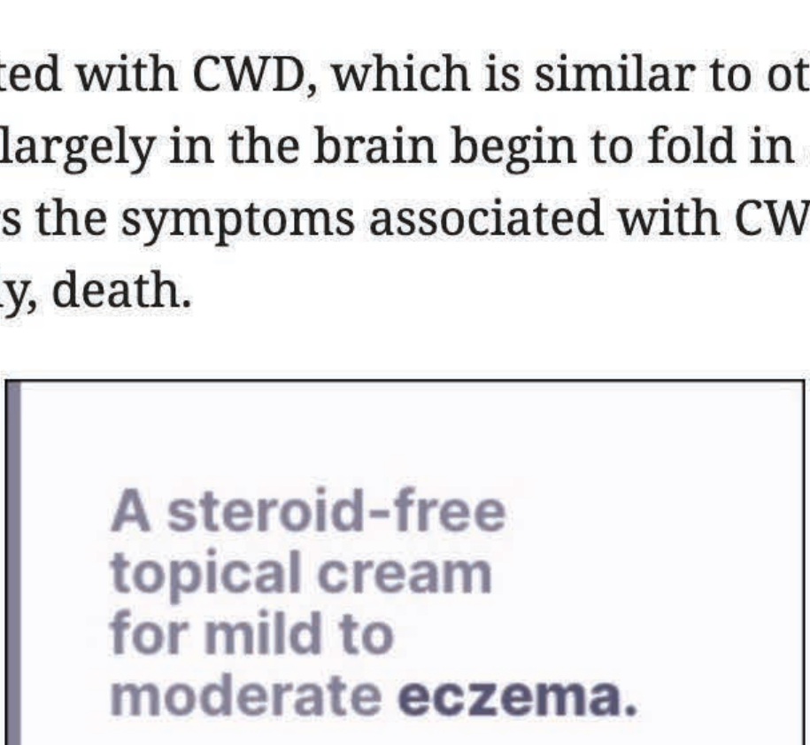
In a herd, CWD can spread for quite some time through direct contact or contact with the same materials. Because of that long delay, CWD can become "a Typhoid Mary situation," said Mitch Lockwood, big game director at Texas Parks and Wildlife.

That, Lockwood said, is why TPWD has enacted fairly strict rules around CWD testing. And while Lockwood said that the agency will work with breeders to try various containment strategies — include partial depopulations with enhanced monitoring on the remaining deer — he also said that approach has so far not worked at any CWD-positive facility.

"We watched the disease spread throughout these facilities and onto the release sites," Lockwood said. "It was kind of a failed experiment."

The Texas Deer Association president agrees that CWD can take out entire herds, but True thinks the disease is a "death sentence" not because the disease itself will kill every animal. Rather, he said, it's the likelihood that TPWD will enact a full depopulation.

It's a stance that's central to the Texas Deer Association's platform. The group, which is part-business association and part-lobbying group, pushes hard against any state regulations that it feels are detrimental to deer breeders. And there is nothing more detrimental to a breeder than losing an entire herd.



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From True's perspective, Seabury's research offers a new path that wasn't always available to breeders who find CWD in their herds.

"I think that's where we're headed," True said of the research. "I think that's what you'll see going forward as Option B."

THE RESEARCH

When CWD infects a deer, it distorts the functioning of basic building blocks of the brain.

When an animal is infected with CWD, which is similar to other so-called prion diseases, proteins found largely in the brain begin to fold in abnormal patterns. That abnormal folding triggers the symptoms associated with CWD: the weight loss, stumbling and, eventually, death.

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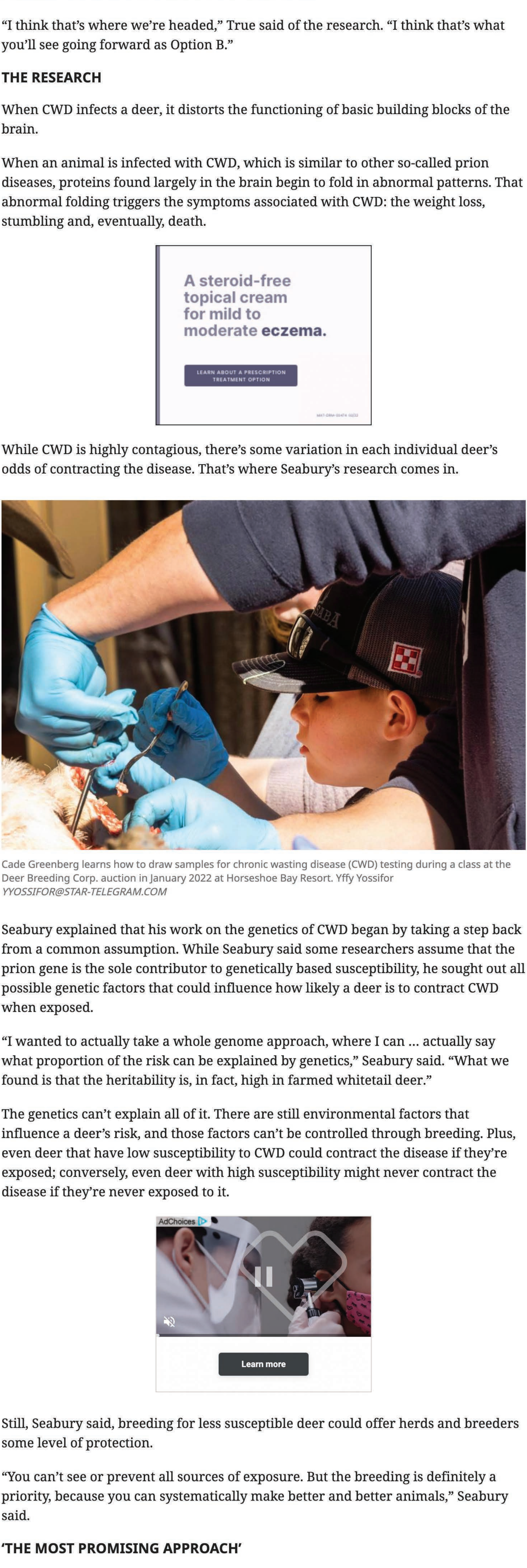
While CWD is highly contagious, there's some variation in each individual deer's odds of contracting the disease. That's where Seabury's research comes in.

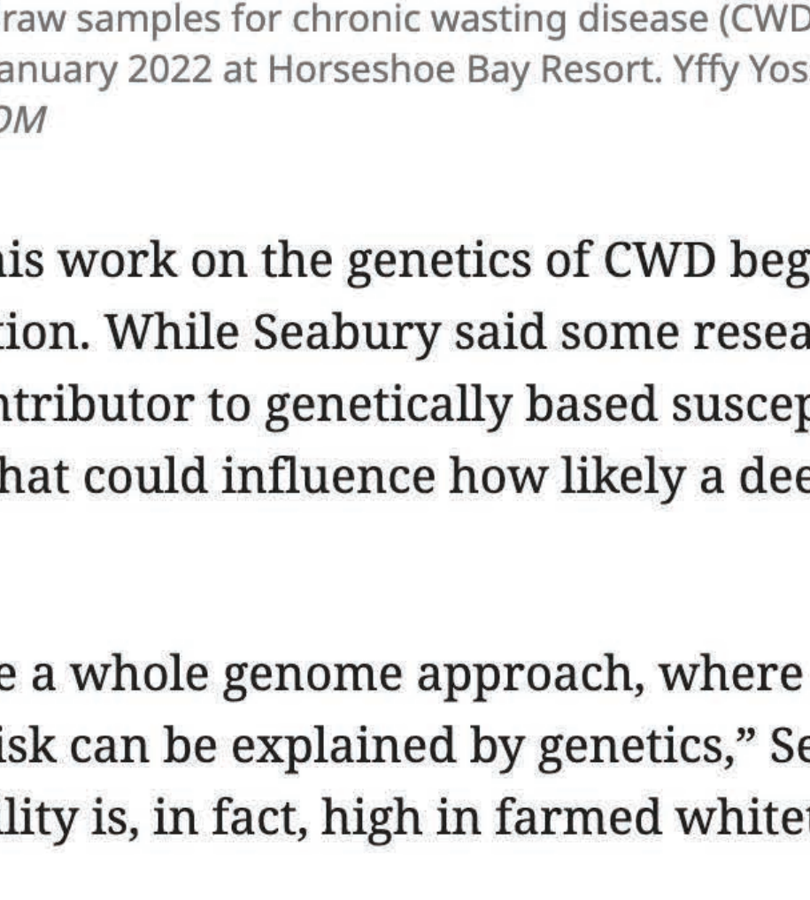


Cade Greenberg learns how to draw samples for chronic wasting disease (CWD) testing during a class at the Deer Breeding Corp. auction in January 2022 at Horseshoe Bay Resort. Yffy Yossifor *YYOSSIFOR@STAR-TELEGRAM.COM*

Seabury explained that his work on the genetics of CWD began by taking a step back from a common assumption. While Seabury said some researchers assume that the prion gene is the sole contributor to genetically based susceptibility, he sought out all possible genetic factors that could influence how likely a deer is to contract CWD when exposed.

"I wanted to actually take a whole genome approach, where I can … actually say what proportion of the risk can be explained by genetics," Seabury said. "What we found is that the heritability is, in fact, high in farmed whitetail deer."

The genetics can't explain all of it. There are still environmental factors that influence a deer's risk, and those factors can't be controlled through breeding. Plus, even deer that have low susceptibility to CWD could contract the disease if they're exposed; conversely, even deer with high susceptibility might never contract the disease if they're never exposed to it.



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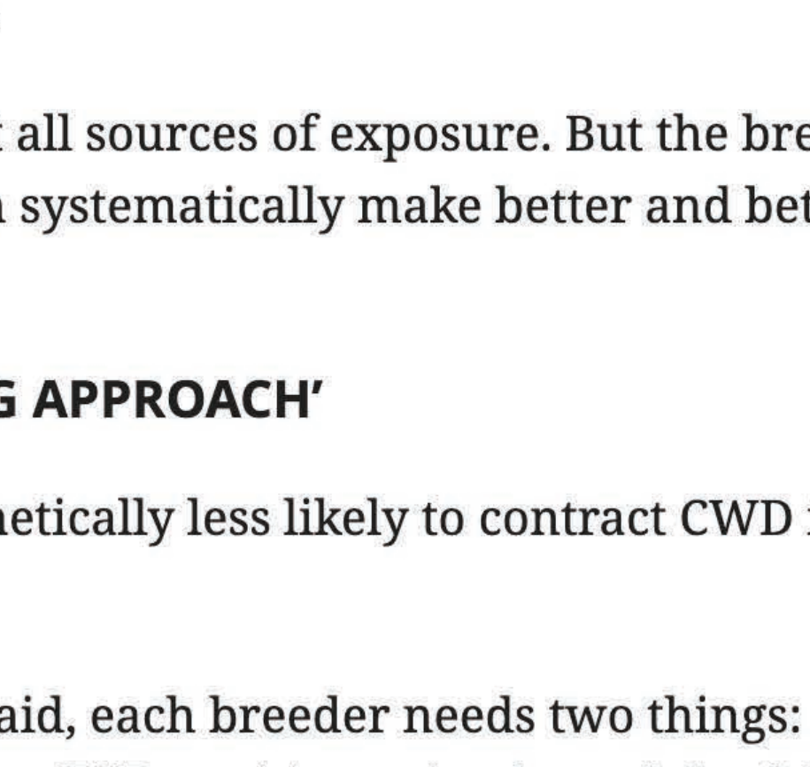
Still, Seabury said, breeding for less susceptible deer could offer herds and breeders some level of protection.

"You can't see or prevent all sources of exposure. But the breeding is definitely a priority, because you can systematically make better and better animals," Seabury said.

'THE MOST PROMISING APPROACH'

Crafting a herd that's genetically less likely to contract CWD isn't a simple or quick solution.

To begin with, Seabury said, each breeder needs two things: a herd that doesn't already have any or many CWD-positive animals, and the full genetic lineup of every deer in the herd.



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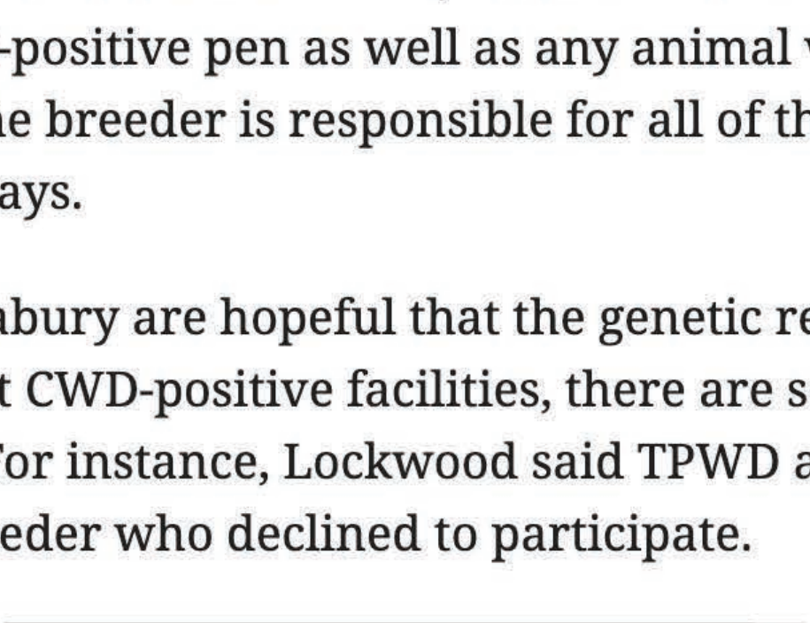
But with those criteria met, breeders could begin putting Seabury's work into practice at any time.

Lockwood said that TPWD officially signed an agreement with a breeder in February to implement genetic testing and susceptibility findings to potentially save some animals from a herd that's already had a positive.

"This herd plan will be considered as an alternative … to complete and prompt depopulation of a CWD-positive facility," the agreement reads.

The plan, which the Star-Telegram obtained through a public information request, is lengthy, lasting a minimum of five years. The agreement also requires the breeder, whose name is redacted from the document, to maintain extensive records and to kill all animals in a CWD-positive pen as well as any animal whose genetics show it is susceptible to CWD. The breeder is responsible for all of the costs of implementing the plan, the document says.

While Lockwood and Seabury are hopeful that the genetic research may help to save some portion of a herd at CWD-positive facilities, there are some breeders who don't buy in to the approach. For instance, Lockwood said TPWD also offered a similar herd plan to another breeder who declined to participate.



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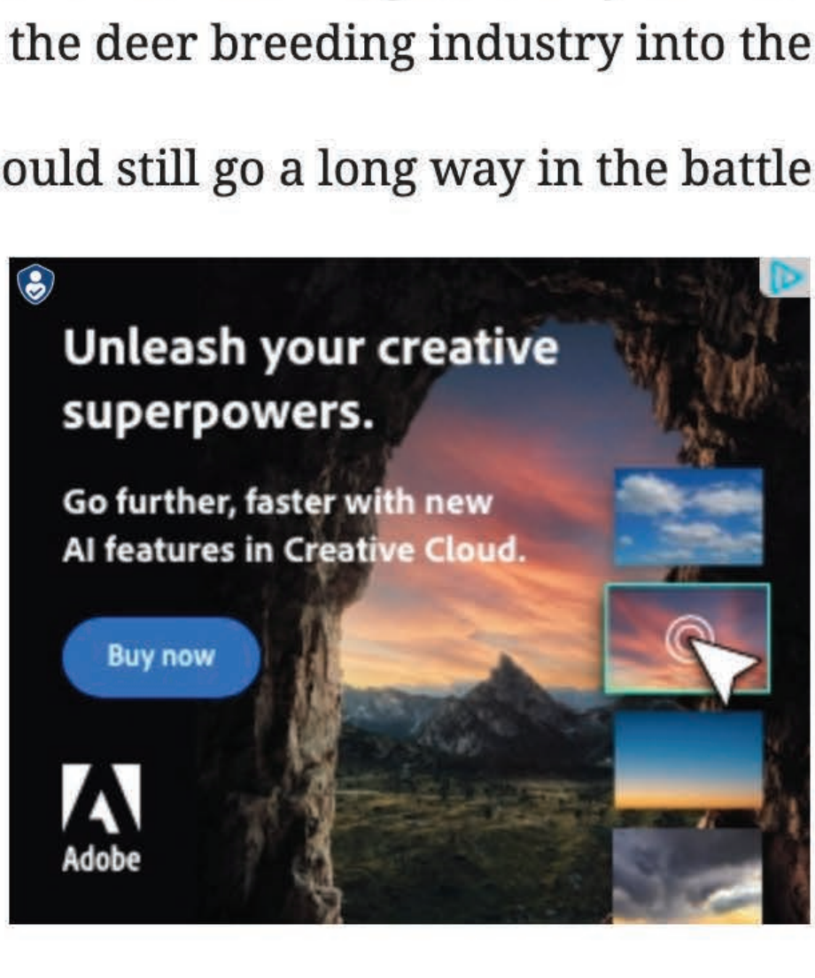
And even breeders who believe in the concept have concerns about the logistics.

Michael Deveny — the ranch manager at Mossy Rock Whitetails & Exotics, about two hours west of Fort Worth — said that he's open to using genetics to protect his herd. But what if the deer that have the lowest susceptibility don't have desirable antlers or other traits? What if the best choices for anti-CWD breeding aren't the best choices for business?

"We will definitely use that as part of our breeding program," Deveny said. But "we still want to grow pretty deer. I can breed a deer that has a great (genetic) breeding value, but if he doesn't produce the antler traits that we're looking for, it doesn't do you any good."

Genetic advantages aren't a silver bullet; genetically based herd plans won't eradicate CWD nor push the deer breeding industry into the next golden age.

But genetic protections could still go a long way in the battle against CWD.



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"It's the most promising approach, that idea, that has surfaced so far," Lockwood said. "We're very hopeful. And I'll even say optimistic."

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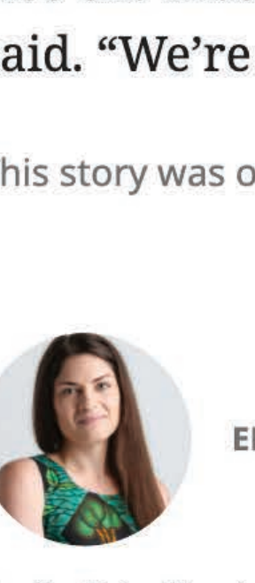

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