



“Nose Knows Scouting” Uses Trained Dogs to Sniff Out Potato Virus Y

North Dakota potato breeder brings in speaker who has trained a dog to detect potato virus diseases

By Mikkell Pates, Agweek Magazine

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Good news: The newest high-tech tool for diagnosing crop disease is also man’s best friend—a friendly dog.

Specifically, it’s a crew of five dogs trained by Andrea Parish, 46, of Dayton, Wyoming, owner of “Nose Knows Scouting.”

Parish is married to a potato crop consultant and a friend of Asunta “Susie” Thompson, an associate professor and potato breeder in the North Dakota State University (NDSU) Department of Plant Sciences.

Parish and one of her dogs, Zora, flew into Fargo, North Dakota, so that the

pooch could sniff her way through the North Dakota State University potato seed development program, looking for a potato disease known as Potato Virus Y, or PVY.



The NDSU Potato Breeding Program develops new potato cultivars for grower, industry, and consumer adoption, as well as certified seed potatoes of all materials in its breeding pipeline.

NDSU staffers brought potato bags out of coolers for the dog to peruse. Parish and Zora considered each one, as a dozen people looked on.

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Above: Andrea Parish, 46, of Dayton, Wyoming, is trained as a physical therapist. She is married to North Dakota State University graduate David Parish, who consults worldwide for potato growers. Andrea started a business “Nose Knows Scouting,” which uses trained dogs to find Potato Virus Y and other maladies in spuds. Photo taken May 17, 2022, at Fargo, North Dakota. *Photo courtesy of Mikkell Pates/Agweek*

Left: On May 17, Zora the spud-sniffing dog got a close-up whiff of bags of potato seeds in the North Dakota State University potato breeding program, looking for Potato Virus Y. *Photo courtesy of Mikkell Pates, Agweek*

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In a swirling wind (not helpful), Zora considered dozens of bags—the tops, sides and again when the packages were flipped over—and sniffed again. When she found PVY, she’d go into alert behavior—pointing and freezing. She comes off alert when Parish gives her a “click,” or praise.

Zora evaluated NDSU’s entire seed program in half a day. Thompson said it is a tremendous savings of people and resources that can be aimed at other tasks.

BEST PAW FORWARD

Parish started training the dogs for sniffing potato disease in 2019.

She is married to David Parish, owner of AIS Consulting LLC, an agricultural consulting business based in Allen, Texas, specializing in potatoes and operating throughout the world.

David grew up in the Chamberlain, South Dakota, area, graduated from NDSU in biology, and knew Thompson.

Andrea grew up in potato-rich Maine but had no direct connection with agriculture. She pursued a career in



Zora, a black Labrador retriever from Nose Knows Scouting of Wyoming, has been trained to detect Potato Virus Y (PVY), a common disease of potatoes across the nation, saving seed from cross contamination without high laboratory costs. Photo courtesy of Mikkell Pates, Agweek

physical therapy.

In recent years, she’d been doing accounting for David’s business. But she loved dogs and trained them for search and rescue work and later to help hunters track wounded deer and elk. When her dog had a knee injury,

she wondered whether the dog could do other tasks.

She asked David if dogs were ever used in potato disease detection.

David said no, and she saw an opportunity. Dogs’ famous schnozzes can be trained to sniff out cadavers and bombs, and lung cancer and COVID-19 in humans, so she figured they could be used for potato disease.

“The military has proved over 50 years that it’s the best way to detect small amounts of odor, and [potato] disease gives odor,” she says.

She obtained PVY virus from Alexander Karasev, a University of Idaho Extension plant virologist, for training.

“TRAINING ODOR”

It takes only about five days to “train odor” for the receptive dog. The best dogs are the longer-nosed, floppy-eared breeds. But not all of them are good at it.

Parish had a hound that could track for two miles without stopping, but that did not want to check potatoes for disease. Some dogs don’t like

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the environment, walking in front of people or being around farms.

Zora is paid by access to a tennis ball. Parish teaches dog obedience, but that training is separate from the odor training.

"I want her to be obedient to odor," she says. Females "come out working" and seem to do it more quickly.

"To teach it in the environment we're going to work in takes about three months," Parish explains. She calls the good dogs the "one-percenters."

"They're the top 1% athletes in their fields that want to come out and work all the time," she notes.

"I was really lucky," she adds. "I had a couple of companies that took a chance on me and hired me, and I went to farms and got started."

The first year working, she put 100,000 miles on her vehicle and camper and traveled across the

United States from Maine. She has clients in the Upper Midwest but declined to say who, based on confidentiality concerns.

IN LOWER AMOUNTS

Curiously, the dogs are more accurate identifying the PVY in lower amounts, say, 3%, than when the PVY is more prevalent in the seed, at 30%.

The dogs are capable of finding "volunteer" potato plants in fields, but she prefers to work with tubers from seed potatoes.

"We really want to find the disease before you plant so you don't ever plant disease, and then it doesn't get spread," Parish says.

In the field, the dogs can detect infected plants that are 4-6 inches tall, and up to 60 feet away.

"We now have PVY and ring rot dogs," she says. "They can identify the virus in small amounts, so they



Asunta "Susie" Thompson, an associate professor and potato breeder in the North Dakota State University Department of Plant Sciences, in Fargo, is optimistic about whether dogs can sniff out PVY and other potato maladies and is anxious to help compare it to more expensive laboratory verification. *Photo courtesy of Mikkel Pates, Agweek*

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don't have to core it."

The client farms are concerned about biosecurity. They provide collars, kennels, and other paraphernalia. After the visit, the dogs are bathed and disinfected after the farm visit.

Parish now lives at Dayton, Wyoming, but she travels and trains among properties in South Dakota, Texas, Maine, and Arizona.

Besides potatoes, she said other companies, using U.S. Department of Agriculture grants, are working with dogs to find diseases in citrus. Her enterprise is commercial.

CLEANING STORAGES

Potato grower clients hire Parish on an annual basis to keep their farms clean. She visits once every couple of months. If they find the virus, the company cleans storages.

"We actually work the plenums,"

she says.

They teach the dogs to run through the air ducts beneath the storage bins. Once the general location is found, the grower can pull samples for more specifics.

"We take trucks that have seed and run it on a belt [conveyor]," Parish details. "The dog walks the belt and identifies the seed. We're able to pull the PVY seed from large lots

while in storage."

She has worked in potato warehouses across the country, from Maine to Washington states.

Among the pests and diseases that could be in the future for the company are nematodes, potato wart, and powdery scab.

Jennifer Maleitzke, director of communications and external affairs for the R.D. Offutt Company,

*"They're the top 1% athletes
in their fields that want to come
out and work all the time."*

– Andrea Parish,
*referring to dogs she trains that
can sniff out Potato Virus Y*



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headquartered in Fargo, was on hand to watch Zora's work at NDSU.

"If the technology with a dog proves to be successful, it'd be something that we may consider in the future at our seed operations," Maleitzke says, noting the company does that work at Staples, Minnesota, and Atkinson, Nebraska.

CHECKING DATA

Thompson is optimistic about the process but is still evaluating it. The program paid for Parish and Zora to come.

"We want to be able to match up what her dog found and do some of these 'grow-outs' and see how accurate it was," Thompson says.

Besides sniffing the seed tubers, she'd like the dog to come back to check fields and immediately rogue out plants that are positive, thus eliminating cross-contamination or bringing infected tubers into storage.

NDSU's program has an on-campus warehouse and a seed field about 30 miles away near Baker, Minnesota.

There, they grow out single hills for selection, produce maintenance lots for all clones in the breeding program, and generate increase lots of the most promising and advanced selections and "named cultivars" for use in trials conducted by collaborators.

"Many of the more modern or common strains that we see in fields today are difficult to detect, visually, with our eyesight," Thompson says.

ROGUE THE FIELDS

Her crews "rogue" the fields, looking for disease and other problems. They use a laboratory test, called the "ELISA" (enzyme-linked immunosorbent assay) test to verify PVY.

This requires using a melon scoop to remove an eye from every tuber they want to use in their seed field. On top of that, they test the foliage to ensure against PVY. Of course, they can't check every eye.

Thompson said Parish is working

with other researchers in Colorado, Michigan and Idaho. No research has been published to verify the accuracy, and Thompson is one of the first to volunteer to share and match up the data.

Parish has applied for grants to find a best process for finding the virus, ultimately to create a standard for seed certification using dogs.

Ultimately, she'd like three or four teams of certified trainers across the

country where virus and bacteria problems are prevalent and have handlers (possibly retired military trainers) on hand who can use the dogs to clean seed and help farmers succeed.

"I'd like to clean lots of potatoes so that people don't have to throw them away," she says. "We spend, you know, a million dollars to develop a breed and then it gets PVY, and they throw it out." **BC'T**

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