



## Detection dogs show promise in sniffing out pests

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By Jerry Jackson

Scientists have yet to invent a smell detector as sensitive and practical as a dog's wet nose.

So researchers have turned to man's best friend for a little help in sniffing out pests, such as citrus canker, that are difficult or impossible to spot in the field.

Even the best trained human scouts looking for signs of canker on leaves, stems or fruit in trees are no match for canines and their ability to pick up the faintest of scents.

Humans have been relying on dogs for many years to find lost people, track escaped convicts, detect narcotics or contraband, trail deer and other animals for hunters. Their feats of odor detection have amazed people for millennia.

In more recent years, dogs have been recruited to sniff out termites, bedbugs, mealybugs, gypsy moth larvae, screw worms and other agricultural pests.

Now add citrus canker to the list, and, most likely, citrus greening, says Tim Gottwald, a senior scientist with the U.S. Department of Agriculture's Horticultural Research Laboratory in Fort Pierce. Gottwald received a \$50,000 grant to oversee a feasibility study for canine canker detection.

Although the research is still underway, he says the early evidence supports the concept.

"We've found them to be 97 to 99 percent accurate detecting canker in fields with randomized, potted trees in the ground— tests at various levels of canker," Gottwald says. "They miss very few. I guess we shouldn't be surprised," he notes, based on the long history of dogs and their well-documented olfactory powers.

USDA research into canine canker detection began as early as 1999, but the work was interrupted when the Sept. 11, 2001, terrorist attacks shifted priorities nationwide. Security at airports, seaports and other locations took precedence, and every dog that could be drafted for the effort was rushed into service.

Now that the citrus research has resumed as a result of the USDA grant in 2010, a trio of dogs has been undergoing training and testing in a variety of settings at a citrus research site in north Florida and in Fort Pierce.

The dogs participating in the research are owned by J&K Canine Academy, a nationally recognized pest-detection and behavioral training school in Alachua County near Gainesville.

The University of Florida's Institute of Food and Agricultural Sciences worked with J&K Canine Academy in the 1990s to develop teams of termite-detection dogs, capable of locating subterranean termites and other hard-to-find types.

Private pest control companies have since incorporated canines into their home and property inspection programs. More recently, J&K Canine Academy trainers have been busy teaching dogs to find bedbugs, as those tiny pests have become a recurrent problem in hotels and homes.

### Technique worked 'quite well.'

In California, family-owned Honig Vineyard and Winery proved that trained dogs could reliably detect mealybugs in vineyards even when the tiny pests could not be seen. Dogs picked up the scent of

mealybug pheromones on individual vines, giving vineyard managers a tool for fine tuning their pest control, says Michael Honig.

"It worked quite well," he says, as long as the amount of acreage covered by the dogs at any given time was limited. "They get tired if you try to cover hundreds of acres," and accuracy declines.

As mealybug control in Napa Valley has improved significantly in recent years, Honig says the vineyard dog patrol is no longer used.

### **Dogs on patrol**

In the Florida field tests, researchers have been transporting the dogs in training with commonly used grove vehicles, moving slowly through the rows while the canines sniff the air.

Citrus growers and industry leaders are searching for ways to survive the constant pressure from the spread of canker and greening, also known as huanglongbing or HLB.

If pest detector dogs eventually move from the laboratory and testing to actual field work, assisting humans as they scout the groves, "that would be wonderful," says Donna Garren, executive director of the Florida Gift Fruit Shippers Association, based in Orlando.

"It would be an all natural method" of early pest detection, says Garren, whose association members ship more than 9.5 million pounds of fresh grapefruit, navels and other varieties annually during the winter holiday season.

### **Challenges remain**

Vero Beach citrus grower Louis Schacht, one of 38 grower-members of the gift-fruit shippers association, also applauds the canine research but remains skeptical about whether the concept will ever prove to be practical on a large scale.

"You would need a lot of dogs" to cover even a fraction of Florida's more than 540,000 acres of citrus trees, he says.

Schacht says he and neighboring citrus growers already coordinate their pest control efforts and probably would consider pooling resources to pay for a pest-detector dog if they became commercially available and widely used.

"For greening, it would be really helpful," Schacht says, "because it's even harder to spot [visually] than canker."

USDA researchers are not as far along with their work on greening detection as with canker, in part because of the technical challenges in establishing positive and negative plants for training and testing the dogs.

There are many other challenges as well.

Dogs tend to report more false positives for canker than false negatives. And in at least some cases of false positives—dogs indicating canker when the test-tree was known to be disease free—researchers later determined that a canker-infected tree was once on the site.

In enclosed areas, such as a citrus packinghouse, the dogs have been particularly adept at detecting even individual pieces of fruit that have canker. Still, their accuracy diminishes rapidly if the dogs get too hot and begin panting.

"It's still not ready for prime time," Gottwald says of citrus pest detector dogs as a commercially viable technique. "We need a lot more data and we need to see all of the caveats."

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