in some U.S.

# Soil sampling goes to the robots

The rubber-tracked AgroBotics AutoProbe travels over fields at 11 km-h, plucking a soil core on-the-go every five metres

Ron Lyseng

been trying to take the drudgery out of soil sampling for decades. A new machine might be just what they've

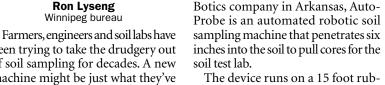
been looking for. Introduced this winter by the Agro-

In the utility vehicle, each set of

20 individual cores are blended

into one grid sample and

dumped into a waiting bag.



through the one hole in the track to snatch a core. At a ground speed of 11 km-h, one

> core is lifted every 1.5 seconds. The rapid-fire probe and core gathering equipment are pneumatically driven to achieve the instant response required to push the probe into the soil and pull it out again as the machine maintains its ground speed.

Once every rotation, the synchro-

AutoProbe is capable of continuous operation and doesn't need to stop until the utility vehicle needs gas or the driver needs a coffee break.

The machine gathers 19 or 20 cores every 100 metres, totalling approximately 0.45 kilograms of soil. The soil is then pneumatically transferred to the utility vehicle, bagged as a single sample and labelled.

A 100 metre run is used because grid system sampling is commonly performed on a 2.5 acre grid, measuring 100 by 100 metres.

With this calibration, the GPS controlled AutoProbe can automatically sample a grid. Depending on the accuracy of the GPS, an operator may be able to pull cores from exactly the same than previous sampling methods.



The AgroBotics AutoProbe automatically pulls 20 soil cores from each 2.5 acre grid, as it prints out a label with the exact field co-ordinates and data needed by the lab. (Photos courtesy of AgroBotics)

spots in the field year after year.

Operators can use GPS guided autosteer on the utility vehicle to keep their hands free to apply a label to each sam-

ple. Labels include field co-ordinates and other relevant data needed by the soil lab.

AgroBotics chief executive officer Jeff Burton said the AutoProbe never becomes confused, despite multi-tasking at a high ground speed. The machine's just

fine at that speed," he

"But the operator might get confused with all that

stuff happening at the same time." He said AutoProbe is more accurate

"The typical method has always been to go out to the middle of the grid and pull a core. With this system, you get a uniform representation because you

"With this one side to the other." The idea for Autosystem, you Probe originated with get a uniform Jeff's father, Jim Burton, representation who farms with his son near Tupelo, Ark. because you have The elder Burton said 19 or 20 cores

- Jeff Burton,

the other."

that in his 35 years of from one side to farming, soil sampling was the most mundane chore he had to endure.

have 19 or 20 cores from

"It's just no fun. It's backbreaking, tedious and hot. But there's no doubt that farmers are more successful when they have their nutrients right."

He said even though farmers know

soil testing is critical to profitable farming, the average producer might only sample a field once every three years.

Jim started farming after graduating as an agricultural engineer in 1965. When GPS became available in the early 1990s, he envisioned it as a key to simplifying the task of soil sampling. The challenge would be to marry GPS to an automated robot that could collect cores at precise locations.

#### On-the-go sampling

It wasn't until 2002 that his first AutoProbe prototype finally went into the field. Although there are other mechanized soil samplers, Jim said their machine is the only one that has fully automated, programmable GPS steering and that can pull cores on-the-go.

Added Jeff: "Everything is mapped

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historical records can be kept almost down to the exact centimetre of farmland. That ends up sample collection is similar to industry rates. saving on chemical and treatment costs.

He said the initial target markets available to rent are soil sampling services, ag retailers, agronomy consultants, fertilstates but are izer co-ops and farmers with large acreages or high value crops. not yet available

The Burtons had originally in Canada. planned to sell the AutoProbe for about \$25,000 each, but decided instead to put the first batch into the hands of clients who they think will make the most use

For 2008, they will have six machines in the 501-551-7999 or visit www.AgroBotics.com.

out for each individual farm. More accurate field on a contract basis with high-use customers. Jeff said the charge of \$2.50 per acre for

> "For this year, all the AutoProbes will be in the lower 48 states. But we've already had inquiries from your neck of the woods (Canadian Prairies) so we'll be heading there even-

> "Also, we anticipate developing a probe that will pull a 12 inch (deep)

On Feb. 14, the AutoProbe was

2008 World Ag Expo in Tulare, California. For more information, phone Jeff Burton at

named one of the Top 10 new products at the

are delivered to the cab of the utility cart. Autosteer allows the driver to label samples according to information on the data screen. (Photos courtesy

Soil samples

### Soil sampler says probe will save on fertilizer

AgroBotics' AutoProbe was a dream come true for Scott McKee.

The chief executive officer of A&L Soil Labs in Memphis, Tennessee, had been talking with his staff about how they might develop a GPS-driven robotic automatic soil sampling machine to make sampling easier.

"Then all of a sudden these guys from Arkansas showed up here with their invention," McKee said.

"They had just gone ahead and flat out built the very machine we were already talking about. I just got back yesterday (April 15) from watching the machine at some field demos in California. It's an ingenious piece of engineering. And it

He estimated the new probe is 10 times faster than a conventional probe mounted on a truck and will probably allow an operator to take 10 times as

really works."

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McKee said mechanical automation

removes the human fatigue factor from As long as the operator can drive the

utility vehicle, every sample from morning until night will be consistent and from the same depth.

He said 20 cores per grid are far better than most people deliver.

"A lot of guys, when they're doing sampling, will drive to the centre of

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the grid and just take one big sample especially later in the afternoon," he

"The machine gives us 20 uniform cores per grid. The result is a more accurate fertilizer recommendation and better use of your fertilizer dollar."

McKee said he and Jeff Burton of AgroBotics are talking about how A&L and AgroBotics can work together to expand the probe's use.

"What we want to do is ride along on their success wagon because they have the technology. And Jeff says they want to ride along on our wagon because of our reputation. But really, we're in this together."

#### Improvements underway

McKee said he wants to improve the automated container and labelling system so that samples will move seamlessly from field to lab, improving turn around time for the re-

While AgroBotics is targeting producers of high-value crops such as fruit and vegetables, McKee said broad acre crops such as wheat and canola will benefit as well.

"I think this machine has a fit any

The soil sampling probe sticks through the tracks and is set up for a depth of six inches. Plans are underway for a 12 inch probe.

place a farmer is doing some sort of precision agriculture or trying to do a better job of managing his fertility pro-

— LYSENG

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