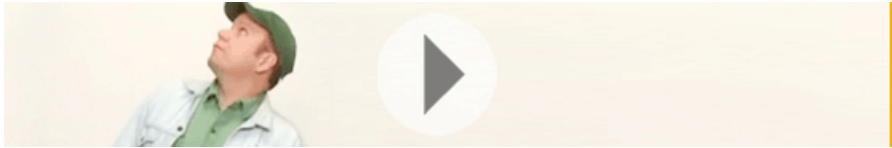


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Ag's Holy Grail: quest for nitrogen-fixing cereal

By Barry Wilson, Ottawa bureau

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GUELPH, Ont. — An Ontario plant researcher is fixated about finding ways that farmers can reduce their need for buying expensive nitrogen fertilizer.

Manish Raizada's ultimate goal is to design plants that are more efficient at taking nitrogen out of the soil, or perhaps developing a cereal that can fix nitrogen into the soil from the atmosphere.

"It is our dream," said Raizada, who works at the University of Guelph. "I see it as a challenge, occupying the rest of my career."

He has assembled a team of researchers, graduate students and support staff to accomplish these efforts.

"I think the ability to develop plants or management practices that help farmers do production that requires less synthetic fertilizer has huge implications both here and in developing countries," he said.

"In developing countries, lack of N is an issue for productivity while the price of N fertilizer is a huge cost for farmers here."

Raizada has designed a three-phase research plan that combines better management practices to reduce the use of nitrogen fertilizer and long-term development of plant varieties that either make better use of available nitrogen or fix their own nitrogen from the atmosphere as pulse crops and several others now do.

Phase one is the simplest and shortest term.

Ontario farmers can test their soil for nitrogen content, but the tests cost \$10 each.

"Since you need to do a lot of testing to get a good reading of your land, this is very expensive, prohibitive for many."

Guelph researchers have engineered bacteria that emit light indicating the amount of nitrogen in the soil sample.

Raizada said a soil test kit that would use the bacteria could cost \$1. Understanding how much nitrogen is in the soil will help farmers manage how much more to add, if any. The samples would still have to be taken to labs for analysis.

"The vision is that the farmer could get a kit from us for one-tenth of what they now pay, meaning they could do 10 times the testing," he said.

"Farmers often are inclined to apply too much fertilizer just to be sure, and that is a very expensive item that cuts into their profits, so if they can more accurately determine what they need through affordable soil tests, it could save thousands of dollars for a very small investment."

He said a pilot project could come as soon as late 2011.

The second phase would be to develop an even less expensive test for soil nitrogen content. Farmers could use 10 cent sticks treated with enzymes to test their own soil and gauge how green manure, mulch and other natural treatments would affect nitrogen content.

"I think this would change fertilizing habits, show farmers the practical effect of less expensive and more natural ways to treat soil and really reduce fertilizer costs," he said.

"I think we should be returning as much power as we can to farmers, both here and in developing countries, and I think this would. If we can reduce the cost of soil testing from \$10 to \$1 to 10 cents, that's transformational."

The third phase is Raizada's lifetime commitment — developing plants that are more efficient at using nitrogen already available in the soil or developing cereal plants that can take nitrogen from the air and fix it into the soil.

He said researchers are already studying plants that are better able to take nitrogen from the soil, including research on the root hairs of corn plants that have thrived for thousands of years.

"If we could make plants more efficient at using available nitrogen stocks more efficiently, it would be a huge benefit for farmers. That is research into the future."

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