

## Research team uses new technology to help farmers

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*Rebecca Phillips, a research plant physiologist at the Northern Great Plains Research Laboratory near Mandan, is using new technology to learn how factors such as temperature, moisture and time of day affect the rate that gases enter and leave the soil.*

A scientific research team is using new technology to collect data which, in the long run, will help farmers.

Rebecca Phillips, a research plant physiologist at the Northern Great Plains Research Laboratory in Mandan, is using new scientific instruments to learn how a variety of factors, such as temperature, moisture and the time of day, affect the rate at which gases enter and leave the soil. The study is taking place in a 50-acre alfalfa field south of Mandan.

“What we’re trying to do is model how emissions are affected by these different factors,” she said.

Phillips said the study will run all year, possibly into 2013. She will analyze the study’s findings and write recommendations, which will be available to the public. Farmers will be interested in the findings, she said, as they will be able to learn what conditions are most important to keeping carbon and nitrogen in the soil. The two elements lead to higher soil quality, more nutrients for plants and all around better growing conditions, she explained.

“Carbon and nitrogen are good stuff for your ground and you want to keep it in the ground if you can,” she said.

Phillips has been researching greenhouse gases since the 1990s. The new technology allows her studies to be more specific than ever before. Previously, samples had to be taken manually once a day. Now, with a new laser funded by a NASA research grant, she is able to collect data continuously, 24 hours a day.

“I was always limited by technology ... we just didn’t have the instruments. Now for the first time, I can see the things we always needed to see,” she said.

Phillips and her research team will continue to take samples of the air and soil manually once a day in order to cross reference their data.

“We’ve been doing the manual stuff for so long ... that’s our base,” said Justin Feld, a biological technician with the Northern Great Plains Research Laboratory and a member of the research team. “We’re taking what was standard and creating a new standard.”

The laser is one of few of its kind in the country, Phillips said. Researchers from the Woods Hole Research Center located in Massachusetts tested the laser in a natural forest in Maine. The laser was then deployed to North Dakota for a full-fledged study.

“It’s pretty darn new in this level of accuracy and precision,” Phillips said. “It’s going to open up our understanding, I think, a great deal.”

Students expand their knowledge.

Adam Tollefsrud, a Bismarck State College student studying geographic information systems, and James Norton, a spring 2012 graduate of the same program, are interning with Phillips this summer. Thursday was Norton’s first day on the job. Tollefsrud had been working on the project occasionally since April.

In the geographic information systems program, the two men learned to use software to organize information in a visual way, such as creating maps or charts.

Angie Milakovic, assistant professor of geographic information systems at BSC, said the internship is a great opportunity for her students. Many of the students participate in some kind of internship, she said, but the hands on opportunity to learn about science is unique.

“North Dakota is such an agriculturally based state that having the opportunity to be able to work with a project like this is such good experience,” she said.

Norton said he has no background in biology or chemistry.

“It’s new for me and it’s a great learning opportunity,” he said. On Thursday, he collected his first soil sample.

Tollefsrud and Norton’s duties will include collecting air, soil and plant samples manually, mapping out areas similar to the alfalfa field and learning to maintain and run the instruments, Phillips said.

Tollefsrud is looking forward to creating a database out of the information he will help to collect.

“GSI is all about spatial analysis ... it’s taking information and putting it on a map,” he said. “(The experience of) turning that data into something that can be used ... is something that I can take with me.”

Tollefsrud is excited to intern with the team full time this summer.

“I haven’t been there long, but the work (Phillips) is doing is so cutting edge and worthwhile,” he said.



*By MARA VAN ELLS / Bismarck Tribune Adam Tollefsrud, a student at Bismarck State University, collects a sample of air surrounding an alfalfa plant on Thursday morning.*