MSU lab gives early warnings about biological invaders

January 22 2008

Montanans don't think a lot about "Homeland Security," but one Montana State University unit that serves both ag producers and home gardeners also serves to keep us safe from other biological invaders.

The Schutter Diagnostic Lab on the Bozeman campus recently received a five-year grant for roughly $40,000 per year from the USDA, largely because the lab provides an early warning system of biological invaders, whether those invaders arrived here accidently or because of someone's intention.

"What has been put in place is the ability to detect early, to diagnose correctly and then to communicate information to those with the authority to respond," says Jim Stack, the current director of the Great Plains Plant Disease Diagnostic Network and, until recently, director of the National Plant Disease Diagnostic Network.

Mary Burrows, a plant pathologist and supervisor of the Schutter Diagnostic Lab, says a specific pest identification protocol developed by the national network is used frequently. It allows the lab both to identify more traditional agricultural pests and keep the system ready for emergencies.

"We are sent mystery samples," says Burrows. The team identifies whether the samples are true invading pests or harmless look-alikes. Part of the national funding has purchased a Web-enabled microscope, which allows the diagnostic team at MSU to confer with USDA specialists in

Beltsville, Maryland, or anywhere in the world, while they all look at the same microscopic image.

The MSU diagnostic team also includes Nina Zidack, a plant pathologist, Will Lanier an insect and information technology specialist, and Cathy Seibert, a weed identification specialist. Barry Jacobsen and Bill Grey, plant pathologists with row crop, mycotoxin and seed certification expertise, also contribute to diagnoses.

The MSU lab leads the regional system's training and education program, with Lanier and Zidack serving on the network's National Committee on Teaching and Education. In 2006, the lab facilitated a mycotoxin education program by Jacobsen, who is one of the national experts on the topic. Due to demand for the program, MSU then co-hosted a nationwide mycotoxin workshop with Purdue. Sixty participants from 15 states were linked together for an interactive workshop using an MSU Extension Web server.

In a sense, the network has built a nationwide team of plant pest experts, who work together to identify pests, teach each other from their personal fields of excellence and track the development of threats to agriculture or, potentially, human health. They also train Extension agents, crop advisors and master gardeners to identify potential disease and insect threats as "first detectors."

Having many people able to help track the development and dispersal of threats is a huge contribution to keeping agriculture and Americans safe, Stack says.

Because of the national system, when an ag producer, Extension agent or consultant detects a suspicious pest in a field, that information no longer stays isolated in that county or even in the state. The detection is fed into a national computer database, which allows experts to learn many things

about the invader and often to forecast where it might move next. The data allows answers to questions such as: What is the path of the pest's dispersal since it was first detected? What are the geographical and climatic conditions where the pest has been found? What other parts of the country have a similar setting?

"The nature of agriculture has changed," Stack says. "We are now so dependent on the import and export of ag products that we need the capability for early detection and diagnostics. The longer it takes to detect introductions, the costlier it is to respond to them." By early detection, the lab buffers potential "ecological damage and economic damage through reduced yield and qualities, and public health if toxins get into food or feed."

The national system has a "chain of command," which allows confidentiality until a pest has been confirmed, Burrows says.

Why confidentiality" Take the example of pale and golden cyst nematodes of potatoes, pests that have been identified in areas neighboring Montana (the pale cyst nematode in Idaho and the golden cyst nematode in Alberta) but not yet in Montana.

"Say the news got out that Montana had either golden or pale cyst nematode in potatoes," Burrows says. "If that got into the news media before it was confirmed, other states and countries could refuse to buy our potatoes, but we might not have the problem at all."

So the team employs the chain of command to confirm their identification of lesser threats. For instance, a crop consultant can submit photos or a physical specimen to the lab of a plant that is infected. It might be a common disease, or it might be something new to Montana.

"We can go through the chain of command exercise to practice handling

a situation before a crisis occurs," she says.

Crisis mode is, however, just one aspect of the lab's service to Montana and the country.

The experts serve Montanans each day, diagnosing the causes of plant growth problems and developing management recommendations for both agricultural producers and home gardeners. The public can submit diseased plant, insect and weed samples through their local county Extension office.

Source: Montana State University

Citation: MSU lab gives early warnings about biological invaders (2008, January 22) retrieved 26 April 2024 from https://phys.org/news/2008-01-msu-lab-early-biological-invaders.html

This document is subject to copyright. Apart from any fair dealing for the purpose of private study or research, no part may be reproduced without the written permission. The content is provided for information purposes only.