

## Forecasting for Fusarium

***A new research project aims to uncover important clues to improve forecasting and risk management for Fusarium Head Blight, Canada's most costly grain disease.***

It could be called the Mona Lisa smile or Stonehenge of wheat diseases - Fusarium Head Blight, a complex and mysterious disease that seemingly came out of nowhere in the past decade to threaten production and puzzle researchers.



Now, as wheat breeders make hard-fought advances toward the long-term development of resistant varieties, a group of scientists have stepped back to take a broader look at how environmental factors affect the disease. Their work aims to yield important clues to improve disease forecasting and help farmers reduce their risk.

### **A crystal ball to reduce risk**

The project, an examination of how environmental factors affect the type and severity of Fusarium Head Blight, is part of a broader, \$1.52 million, five-year study assessing the impact of growing season weather on wheat quality. The study is funded in part by the Natural Sciences and Engineering Research Council (NSERC).

Headquartered at the University of Manitoba, this broad study involves analysing the effects of air temperature, humidity, precipitation and soil moisture levels on the growth and quality of Canada Western Red Spring (CWRS) wheat.

Fusarium Head Blight is a critical factor affecting both yield and quality of wheat in Western Canada and the levels of the disease vary substantially with growing season weather, says Dr. Dilantha Fernando, an associate professor of plant science. Therefore, one component of the study is aimed at developing an improved disease forecasting system for producers.

By comparing environmental variables with disease severity, researchers can create a predictive model, explains Fernando. "We will be able to predict that under given temperatures, rainfall patterns and other factors, for example, we can expect certain levels of disease severity, and know the impact that will have on overall wheat quality."

### **Protecting feed and food industries**

The Fusarium research project has broad implications for not only grain producers, but for the livestock feed and human food industries as well, he says. "Fusarium infected grain can contain toxins that affect the quality, value and safety aspects of grains used for feed and human food.

The broad study is lead by Dr. Harry Sapirstein, food sciences, and also involves Dr. Paul Bullock, soil science, Fernando and Dr. Martin Entz, with plant science, all with the U of M. Also participating is Dr. Jim Dexter with the Canadian Grain Commission in Winnipeg and Dr. Ron DePauw with Agriculture and Agri-Food Canada's Semiarid Prairie Agricultural Research Centre in Swift Current, Sask.

While much crop research to date has surrounded *Fusarium graminearum* there are several species of the fungal pathogen that can infect wheat crops. The research project will determine whether different environmental factors might affect development of different *Fusarium* species.

"We want to see if different environmental conditions at the flowering stage, in different locations, may influence different species at being more proactive in attacking the plant," says Fernando. "The project will correlate how the environmental factors may affect the level and type of toxins and overall grain quality at the end of the growing season which is important from a food standpoint."

### **Monitoring the heart of Fusarium country**

Launched in 2003, the project continues this year monitoring 20 commercial wheat fields across Manitoba. Ten of the fields are seeded to AC Barrie and 10 to AC Superb. AC Barrie, registered in 1994 and AC Superb, registered in 2000 are high yielding hard red spring varieties rated with fair to poor FHB resistance.

Researchers will also note basic historical field data, says Fernando. Participating producers have offered to provide crop rotation records for at least the past five years, which will show the frequency of wheat in rotation. "We will be able to look at farming practices in previous years which might have contributed to what we see in the field," he says. "For example, we might see high disease pressure on one farm which followed a tight rotation, while another farm with low inoculum had a different rotation that helped in reducing disease levels. These observations will definitely benefit farmers in our final recommendations.

"The goal is to bring all the environmental, crop and pathogen data together to come up with a useful model for predicting severity of Fusarium Head Blight."

Reprinted with permission. Meristem Land and Science, [www.meristem.com](http://www.meristem.com)

## **Fusarium Graminearum Warning**

Imports of feed and seed grain into Alberta are not being tested for *Fusarium Graminearum*; a devastating pathogen that can destroy cereal crops. Fusarium can be spread through infected grain, grass or corn by wind, crop residue or contaminated trucks and equipment. This fungus can destroy Alberta's grain industry by reducing quality, feed efficiency, and eliminate malt and seed potential. Manitoba grain producers are losing over \$40 Million dollars a year to this pathogen. *Fusarium Graminearum* is a declared pest under the Alberta Agricultural Pests Act, which means measures, must be taken to prevent, control or destroy this pest. Any violation can result in fines or imprisonment. This dreaded disease has been called "The Hoof and Mouth Disease of the Grain Industry"

Insist on an accredited test for *Fusarium Graminearum* on any grain, grass-hay, straw or corn that you may be purchasing that was produced out of province. For more information or to express your concerns, please contact your agricultural fieldman or local municipality.

***Protect Yourself, Protect Your Industry***