

SOYBEAN RUST UPDATE**Ontario
Soybean
Rust
Coalition****The Ontario Soybean
Rust Coalition is on the job**

In addition to the rust management manual you received with your SOYBEAN GUIDE, OMAFRA's field crop pathologist Albert Tenuta has provided the following 4 pages of information to help you plan and prepare for soybean rust

By Albert Tenuta*

A year ago, we went into the 2005 growing season with much trepidation about soybean rust's arrival in the southern U.S. By midsummer, our fear was replaced by relief — rust was not a problem for Ontario soybean growers last year. But 2006 is a new year and my primary concern for the upcoming growing season is grower complacency about soybean rust.

Will 2006 see soybean rust arrive in Ontario? We can't answer this question now, but we do know that soybean rust will remain a potential threat from now on. It is imperative we remain vigilant and proactive. Education, monitoring, sentinel plots, spore traps, prediction models, fungicides — these are the tools

or weapons at our disposal to track and combat the disease. We also have the benefit of unparalleled international cooperation and partnerships within the soybean industry. Although we still have much to learn about this potentially devastating disease, soybean stakeholders on both sides of the border have been working together since rust knows no borders.

With this special issue of SOYBEAN GUIDE, most readers will receive a full-color, 50-page manual entitled USING FOLIAR FUNGICIDES TO MANAGE SOYBEAN RUST. This excellent resource is an example of the co-operative effort in place across North America. The manual is the result of efforts by experts at 22 U.S. universities, the USDA/Agricultural Research Service and the Ontario Ministry of Agriculture, Food and Rural Affairs. A special thanks to editors Anne Dorrance, Don Hershman and Martin Draper for their commitment to this wonderful resource. Keep this manual for future reference as it contains information that will be very valuable should rust become an issue for us.

Ontario growers should also be aware that the Ontario Soybean Rust Coalition is fully engaged in working to mitigate the impacts of soybean rust. The coalition is a partnership of key soybean stakeholders including government extension, producer organizations, public and private researchers, and equipment and chemical company representatives. These partners are fully committed to tackling this debilitating crop disease and providing a unified voice on all matters relating to soybean rust. The goal is to communicate effectively with all soybean growers in Canada.

To date, the coalition has undertaken various activities including soybean rust information workshops, seminars and field days, the production of soybean rust identification cards and management materials,

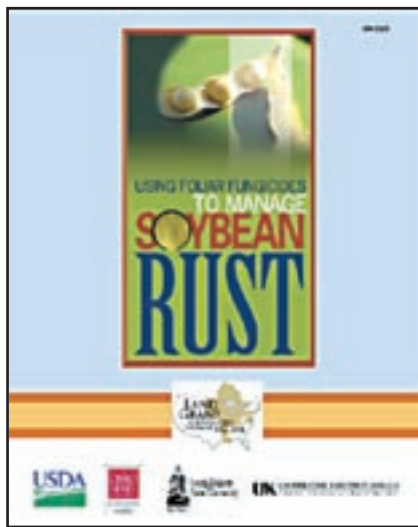


Albert Tenuta inspects rust infested soybeans in Brazil

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If you didn't receive this manual call Albert Tenuta at 519-674-1617 for a free copy

the fungicide manual you've received with this issue of SOYBEAN GUIDE, and the devel-

opment of a Canadian soybean rust web page (www.soybean.on.ca/rustinfo.php).

Coalition members include: the Ontario Ministry of Agriculture, Food and Rural Affairs; Ontario Soybean Growers; University of Guelph; BASF; Bayer CropScience; Dow AgroSciences; E.I. du Pont Company; Laresco; Monsanto; Pioneer Hi-Bred Limited; Syngenta Crop Protection; Syngenta Seeds; and John Deere. Funding for the coalition and the dissemination of the fungicide manual was provided in part by Agriculture and Agri-Food Canada through the Agricultural Adaptation Council's Can-Advance Program.

Appreciation goes out to all the Chatham-Kent 4-H "sticker" volunteers. (Hopefully, the paper cuts will heal soon.) And a final thanks to the Ontario Soybean Growers, the Agricultural Adaptation Council and COUNTRY GUIDE for their support of this and other soybean rust projects. It is through co-operation, perseverance and diligence that soybean rust will be beaten.

business, producers, extension personnel and others with practical, research-based information to help solve and manage field crop production and pest management problems. The newsletter is published weekly in May, June and July and bi-weekly for the remainder of the growing season.

3. USDA Soybean Rust Information Forecast: www.sbrusa.net

This site contains a number of "zoomable" maps including a soybean rust observation map of the U.S. and Ontario. Counties within Ontario and each state are color coded in either green (meaning rust not found) or red (rust confirmed). Sentinel plot information, diagnostic samples and scouting are used to make these determinations.

In addition, the site provides commentaries for Ontario and individual states that cover the 5 aspects of rust management:

- Observations
- Management
- Scouting
- Growth stages
- Forecast outlook

4. The North American Plant Disease Forecast Center:

www.ces.ncsu.edu/depts/pp/soybeanrust/index.php

The soybean rust forecast center was developed by North Carolina State University (NCSU). The web site provides an updated soybean rust forecast every Monday, Wednesday and Friday from March to October. Some of you may be familiar with this web site as it also provides the tobacco blue mold disease forecast for North America.

The rust forecasts provided at this site show possible pathways or patterns that soybean rust spores could travel from confirmed locations. They do not track the disease but use the information provided by the North American Soybean Rust Monitoring System at the USDA web site www.sbrusa.net. The NCSU Disease Forecast Center will use the USDA confirmed soybean-rust source locations and predict how the disease may spread or move taking into account the risk of soybean rust spores moving in the atmosphere.

5. OMAFRA Soybean Rust Hotline :

You can also pick up the phone and call the OMAFRA soybean rust hotline at 1-877-424-1300 or the OMAFRA CropLine at 1-888-449-0937.

Need soybean rust information? No problem!

Soybean growers need access to 2 kinds of information when it comes to soybean rust. First, we all need to learn all we can about this disease, what it can do, how it moves and spreads, and how we can control the disease and reduce the negative impacts it can have.

The second kind of information relates to in-season monitoring of the disease on a North America-wide scale. As a grower, you should be aware of flare-ups of soybean rust in the U.S. and any trends or developments that could put your crop at risk. We know early detection is critical for effective control, so this kind of information is extremely valuable.

Fortunately, there is a great wealth of information available and the Internet helps enormously. There are 5 important information sources Ontario growers should be aware of and use to assist in the monitoring, management and assessment of soybean rust in 2006:

1. Ontario Soybean Rust Coalition site:

www.soybean.on.ca/rustinfo.php

This soybean rust information site is sponsored by the Ontario Soybean Rust Coalition and supported by both the Ontario Soybean Growers and OMAFRA. The site provides weekly

updates on any spread of the disease in North America. Sentinel plot scouting information is provided specifically for Ontario on a county-by-county basis and includes soybean growth stages and rust treatment recommendations when applicable.

Early detection of rust is key to minimizing disease spread and its effect on yields, and this web site will help get information out quickly and effectively. The maps posted on the web site use GPS technology from Laresco, a London-based land resource company. Crop scouts will frequently check the growth stage and health of plants at dozens of sentinel plots across Ontario and upload their findings.

The goal of the site is to provide soybean rust tracking and management information for Ontario and other Canadian soybean growing regions.

2. Crop-Pest Ontario Newsletter:

www.omafra.gov.on.ca/english/crops/field/news/news_croppest.html

Updates on soybean rust and other field crop problems can be found in the CROP-PEST ONTARIO NEWSLETTER, which is provided by OMAFRA. The Crop-Pest newsletter provides agri-

Will rust arrive in 2006?

Soybean rust was not a concern for Ontario growers in 2005, but what about 2006? When we review what has occurred over the past year, it becomes difficult to say with certainty that rust will not be a problem. This is not to say that rust is likely to show up in Ontario in 2006, but it is a possibility and the odds are better than at this point last year.

Going into winter, the area in the southern U.S. infected with soybean rust had grown significantly from a year ago. In addition, the disease has established itself much earlier this winter. As of February 1, 2006, soybean rust had been found in 12 counties (10 in Florida, one in Alabama and Georgia, respectively). Last year, rust was not detected and confirmed until February 23 in Pasco County, Florida and it took until early July to reach 12 confirmed counties.

These observations lead us to believe that soybean rust levels are likely to be higher and the disease may spread more quickly in the southern U.S. in 2006. This could have implications for Ontario. In 2005 the disease was slow to develop because it took time for spore numbers to build up and spread.

What happens during the remaining winter months and the early spring will have a significant effect on soybean rust activity in 2006. Kudzu is a wild plant that



Kudzu leaves infected with soybean rust

provides another host for soybean rust in the south. Will -4°C (28°F) temperatures occur and knock back much of the infected kudzu in Georgia and Alabama or will the more typical winter conditions in the southern U.S. continue, enabling the disease to build and spread?

Last year, it was unusually cold and much of the kudzu along the gulf coast and into mid-Florida froze and died back.

But this weather represented a once-in-20-year event. The more time soybean rust has to build and establish in the southern U.S., the greater the possibility of spore movement into other soybean regions including Canada.

For these reasons we need to continue being proactive, vigilant and prepared to take action. Complacency is not an option with soybean rust.

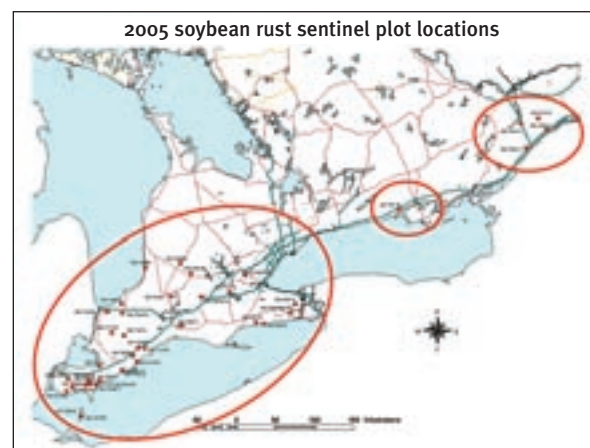
What are sentinel plots?

The risk to Ontario and Canadian soybean producers from soybean rust has increased substantially with the confirmation and subsequent spread of soybean rust in the southern U.S. As an extension of the comprehensive monitoring program and early warning system put in place for the 2005 growing season by the United States Department of Agriculture (USDA), United Soybean Board (USB) and the North Central Soybean Research Program (NCSRP), a series of soybean sentinel plots (44) were established in southern Ontario across the soybean production belt from Windsor to Ottawa (see map).

The sentinel plot program involves intensive scouting for rust in the field by OMAFRA staff in conjunction with industry partners. Questionable leaf samples are

screened for the pathogen by Dr. Sarah Hambleton with Agriculture and Agri-Food Canada in Ottawa using a molecular testing technique developed by the USDA. Scouting results are posted on the Ontario Soybean Growers web site www.soybean.on.ca and the USDA web site www.sbrusa.net.

Although soybean rust was not detected anywhere in Canada during the 2005 growing season, the sentinel plot network provides an effective decision support tool for producers and advisors considering whether a fungicide application is appropriate. In addition, based on the southern U.S. expe-

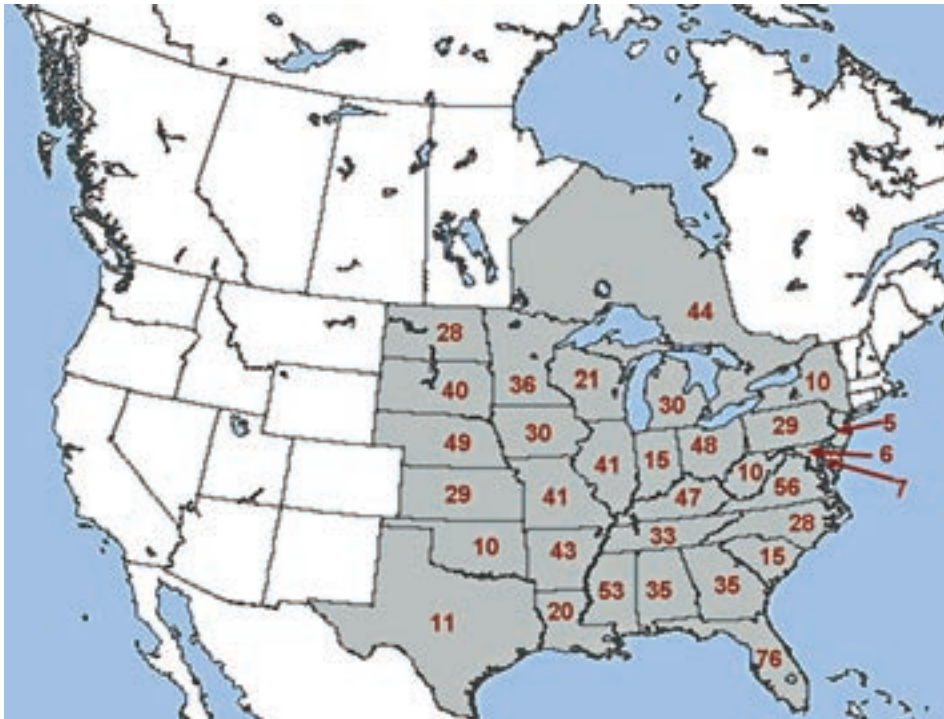


Sentinel plots provide early warning should rust arrive

rience, soybean rust was detected on soybeans or kudzu weeks before it was detected in commercial fields. These were significant findings because in order for a

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A vast network of sentinel plots will track the spread of soybean rust in North America

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preventative fungicide to be effective, it must be applied prior to the disease establishment. Hopefully, the sentinel plot network will provide growers with sufficient lead time to maximize a preventative treatment program.

In addition, tracking the disease within the province can assist in the switch from “protective” to “curative” fungicides. The sentinel plot system proved to be a very effective and successful tool for producers, extension, consultants and the soybean industry. The sentinel plot system will again play an integral role in our preparedness for soybean rust in 2006.

The sentinel plots provide benefit even when rust is not a concern. In 2005, aphid counts were conducted on a regular basis at sentinel plots and provided a province-wide assessment of aphid pressure as the season progressed.

Trapped rust spores don't indicate infection

A lot of effort is being made to monitor the spread of soybean rust and rightfully so. In addition to monitoring soybean fields and sentinel plots for signs of disease, other monitoring efforts involve “trapping” spores. Spores are like seeds for fungal diseases and spores can travel great distances in the air.

Growers need to be aware of the different monitoring methods and what the results mean. Just because a soybean rust spore is detected in Minnesota does not mean the disease is present in that region. Consider the following when interpreting rust monitoring reports:

• “Rust-like” spores versus confirmed rust

Identification of soybean rust spores can be done by microscopic or genetic analysis. Both are time-consuming and unless a genetic analysis is performed, it is difficult to claim a definitive identification of soybean rust spores based solely on microscopic observations. In 2005, numerous spore traps yielded what researchers called “rust-like spores”. There were reports of spores being detected as far north as Minnesota, but this is misleading in many ways. Often a molecular analysis could not be done on these trapped spores due to limited numbers and insufficient DNA for testing. This



This spore trap was located in a southern Georgia soybean field

does not mean that these spores were not soybean rust spores but, on the other hand, they could not be positively identified. This created some confusion last summer and in many cases this scenario was not communicated effectively to producers.

• Spores alone don't make a disease

The old saying “the devil is in the

details” applies nicely here since what was detected in these reports were “soybean rust-like spores” and not rust-infected plants. This is extremely important and will have a substantial impact on a producer’s risk to soybean rust. Many factors

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and conditions need to occur in order for a rust spore to infect the soybean leaf on which it has landed. Once infection is initiated, the risk for soybean rust under favorable environmental conditions increases. However, if conditions are not favorable for infection, the risk is low or non-existent.

• Spore viability is another issue

To what degree these rust-like airborne spores are viable (alive and capable of infecting a susceptible plant host) is not known. Many factors, including ultraviolet radiation, altitude and temperature, have an impact on local or long-distance air dispersal of soybean rust spores. All of these factors have an impact on spore viability and hence the risk for disease.

As mentioned earlier, it makes sense to include spore traps in the rust monitoring system. This disease will spread as increasing numbers of spores move to areas currently unaffected by rust. But there are limitations to the results generated by spore trapping and one must keep it all in perspective.

Spore trap network: GIS map of U.S. locations and trap status



Spore traps show how far rust spores travel from infected regions

Experience shows soybean rust can be managed!



Treated plots are easy to spot in this aerial photo from Georgia

Many growers view the arrival of soybean rust as the end of profitable soybean production in North America. This is an attitude based on a fear of the unknown. The single most important lesson we have learned over the past year is that the impact of rust can be minimized.

We have the tools available to manage this very destructive disease and 2005 showed this. Monitoring, early detection and timely fungicide applications are critical and have proven very effective. The manual, USING FOLIAR FUNGICIDES TO MANAGE SOYBEAN RUST, that you received with SOYBEAN GUIDE is an excellent resource that explains how to get the most out of fungicides. Keep this manual for future reference, as it will help if and

when the time comes to select and apply fungicides for rust control. We won't review all the material in the manual, but we can cover the experience gained last summer when fungicides were applied for rust control in the southern U.S.

Admittedly, it's a good news, bad news story. The bad news is that soybean rust can significantly reduce soybean yields under North American

conditions. At the University of Georgia, a 40% to 60% yield reduction was observed between treated and untreated plots infected with soybean rust (see photos). Up to 20 bushels per acre in yield loss was observed in commercial soybean fields in both Georgia and Alabama. But the good news is that the products available work. If you have doubts, check out the field pictures (see photos). Fungicide plots remained healthy (green) in comparison

to the completely defoliated untreated plots.

The southern U.S. experience confirmed the importance of a well-timed fungicide application early in the infection process. In addition, it was found that fungicide-treated plots (rows) were not adversely affected by adjacent untreated plots. In other words, the fungicides helped to limit the spread of the disease. The implications of these findings suggest that growers need not fear untreated, neighboring fields. **SG**

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Growers and researchers have found that fungicides can provide effect control of soybean rust