

Scouting and Treating for Soybean Rust

Tom Dorn
Extension Educator

This will be the first full growing season since soybean rust (SBR) was discovered in the United States. Producers need to know how rust infects soybean fields, how to detect it early enough to do some good with a treatment and which products are recommended for control.

An important concept of plant pathology is the principle that disease is the result of an interaction between a susceptible host, the pathogen and the environment. This is known as the Disease Triangle. If any of the three factors are missing, then disease will not occur.

Host Plants

Since plant breeders have not yet been able to develop soybean varieties resistant to Asian soybean rust, every

soybean plant is a potential host for the disease. Other known hosts include over 95 species of plants including legume crops such as lima beans, black-eyed peas, kidney beans and green beans. Kudzu is also a known SBR host and is known to survive southern winters, so has the potential to serve as an excellent overwintering host for SBR. *Kudzu is an invasive vine that has spread throughout many southern states and can be found as far north as Missouri and extreme southeastern Nebraska.*

Environment

Based on the experience of countries in South America with similar climatic conditions to US soybean producing states, we know our environment should be conducive to development of the disease — more on environment later.

Pathogen

Light infestations of SBR were detected along the gulf coast and the southern Mississippi River valley in November, 2004. The initial source of the disease is believed to be spores carried from South America during the 2004 hurricane season, most likely by hurricane Ivan.

Soybean rust spores will not survive Nebraska winters. Like wheat rusts, spores must blow up from southern states. Also like wheat rust, we can watch the northerly spread of the disease and will have some advance warning of when to scout our fields or apply preventative fungicide treatments. At the end of April, 2005, the only con-

firmed sites where SBR had successfully overwintered on vegetation are three counties in central Florida where SBR has been found on Kudzu and one county in southwest Georgia where it was found on volunteer soybean plants. Experts agree that even this small area can produce sufficient spores to cause an outbreak that could spread throughout all the soybean producing states in 2005.

Scouting for Soybean Rust

The early stages of soybean rust will not be spotted by driving by the soybean field in the pickup. One must walk the field and pull random plants and examine the lower leaves to detect the earliest signs of SBR so treatment can be scheduled before the upper leaves become infected.

Several environmental factors must be present after a SBR spore lands on a soybean leaf for infection to occur. The optimum temperature

range for infection is between 65 and 85 degrees Fahrenheit. A second critical factor is moisture on the leaf surface. The spores require six to eight hours of moisture on the surface of the leaf to germinate and penetrate the leaf tissue. It doesn't require much moisture, a light dew is sufficient for germination and infection to occur. These conditions are most likely to occur in the lower canopy and is why we must scout the lower plant looking for the first incidence of the disease in the field. Waiting until we can see SBR on the upper leaves will be too late to achieve any measure of control.

Treatment Strategies, Products and Timing

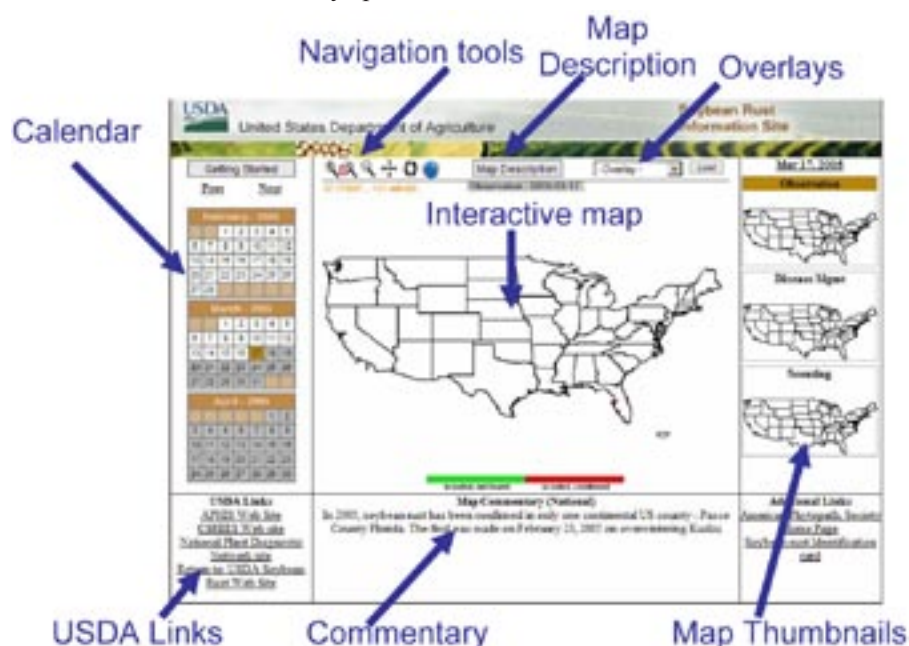
According to a new NebFact written by Extension Plant Pathologist Loren Giesler, it will be important for all producers and crop managers to be aware of where soybean rust is being detected to pursue a treatment that provides the maximum return on investment for any fungicides being used. Giesler states, "Based on experiences in other parts of the world, it is critical that a fungicide application be made prior to significant rust development in the field. Some researchers in South America suggest that at 20 percent disease severity, the leaf damage is already too great for a fungicide to help. The critical window of protection for the soybean crop will be from flowering (growth stage R1) through full seed fill (growth stage R6)".

According to the NebFact, "One fungicide group often discussed for

Online Tracking of SBR Pathogen

Meteorologists are monitoring and tracking wind currents in the areas where SBR has been found. They will alert trained first detectors when the wind may have carried spores into areas with host plants and climatic conditions favorable for disease establishment.

Lancaster and most other soybean producing counties in Nebraska will have a sentinel plot which will be closely monitored for SBR by local extension educators and University specialists.



To view maps of sentinel plot locations and confirmed outbreaks of SBR in the U.S., go to the Plant Disease page on the Lancaster County Extension Web site at <http://lancaster.unl.edu/ag/crops/diseases.htm> and click on **USDA SBR Map**.

Counties with active sentinel plots but no SBR will be colored green and counties with confirmed SBR will be red. You will be able to track the spread of the disease over time by clicking on different dates on the calendar.

soybean rust management is the triazoles. Triazoles include products with myclobutanil, propiconazole, tebuconazole and tetraconazole as the active ingredient. These products provide rapid systemic activity with the ability to kill the rust fungus once it infects plant tissues. A triazole or triazole-strobilurin mix should be used if soybean rust is present in the field.

The second group of fungicides is the strobilurins which include azoxystrobin, pyraclostrobin and trifloxystrobin. This group has some systemic activity, but the strobilurins are not as rapidly absorbed as the triazoles. This group is also not as systemic as the triazoles and does not appear to be as effective in killing the fungus once it is established in the plant. Strobilurins should only be used in preventative applications or in combination with a triazole if rust is present in the field.

The final product is the contact fungicide Chlorothalonil, which is strictly a protectant and has activity only on the leaf surface when the rust spore is germinating. Since this product is not

systemic, the residual activity can be affected by environmental conditions (specifically rain or irrigation). Chlorothalonil is generally considered to have a shorter residual activity and will need to be reapplied more frequently than the systemic products."

Crop Insurance

Crop insurance requires producers to follow best management practices. Scouting is critical and fungicide application may be required by the insurance carrier if yield response will result. Check with your crop insurance agent for specific management guidelines required for crop insurance protection to remain in force.

REFERENCES:

- NebFact NF05-634 "Fungicides to Manage Soybean Rust: What are the Product Differences?" by Loren Giesler, Extension Plant Pathologist and Thomas J. Weissling, Adjunct Research Professor, online at <http://ianrpubs.unl.edu/PlantDisease/nf634.htm>
- NebFact NF05-633, "Soybean Rust: How Great is the Threat for Nebraska?" by Loren Giesler, Extension Plant Pathologist, online at <http://ianrpubs.unl.edu/plantdisease/nf633.htm>

The Nebraska LEAD Program

(LEADERSHIP EDUCATION/ACTION DEVELOPMENT)

Applications are now being accepted for Nebraska LEAD Group XXV, which begins in the fall of 2005. Thirty highly motivated individuals with demonstrated leadership potential will be selected.

Application deadline is June 15, 2005

The Nebraska LEAD Program is specifically designed for both males and females involved in production agriculture or agribusiness, in the general range of 25-50, who are intent on making a difference by providing quality leadership for the future of the industry of agriculture and the state of Nebraska.

For application or re-application materials and/or further information, call the Nebraska LEAD Program at 472-6810 or e-mail ablezek1@unl.edu.

LEAD

Nebraska LEAD Program
Nebraska Agricultural Leadership Council, Inc.

See our Web site at
www.ianr.unl.edu/lead

June is Noxious Weed Awareness Month

Governor Dave Heineman signed a proclamation declaring June as Noxious Weed Awareness Month, while recognizing the potential noxious weeds have to reduce Nebraska's crop yields. Six of Nebraska's designated noxious weeds can be found in Lancaster County: musk thistle, Canada thistle, plumeless thistle, purple loosestrife, leafy spurge and saltcedar.

University of Nebraska Cooperative Extension has the following educational resources about controlling noxious weeds:

- The "2005 Guide for Weed Management in Nebraska" (cost \$3)
- NebGuide G92-1109-A "Musk Thistle"
- NebGuide G80-509-A, "Canada Thistle"
- NebGuide G87-834-A, "Leafy Spurge"

These resources are available at online at <http://lancaster.unl.edu/ag/crops/weed.htm> or the Lancaster Extension Office.

The Lancaster County Weed Control Authority at 441-7817 can also help identify noxious weeds and assist with proper control recommendations.

