Ensemble Approach to Soybean Rust Forecasting for the 2006 Pipe

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Ensemble Approach in the IT Paradigm for Plant Pathology

Data

Modeling

Integration

Interpretation

Dissemination

Environment

Pathogen

Host

Disease

=
Why Ensemble Forecasts

Ensemble forecasts are designed to capture the *probabilities* for weather events and the range of *uncertainty* inherent in each forecast situation so that the forecaster knows what to convey to the public.

Ensemble Products

Ensemble products use various statistical and graphical methods to combine multiple model runs, which can be based on one of the approaches. Ensemble products can include information about the level of uncertainty, the most likely forecast outcomes, and the probabilities of those outcomes.

Ensemble Products
Example of a Spaghetti Plot

Forecast ensemble represents range of uncertainty in predicted weather event

Most-likely outcome
Ensemble Forecasting Approaches

• Vary initial conditions of a single model.
• Vary numerical methods of a single model.
• Vary physical parameterization of a single model.
• Combine output from multiple models.
• Combine output from multiple models plus human interpretation (used by National Hurricane Center).

The goal of the ensemble approach for the soybean rust forecasting is to provide trained interpreters meteorological output from multiple numerical weather prediction models and disease movement and severity output from multiple pest prediction models.
Legume PIPE (Interpreter Screen)
Legume PIPE (Interpreter Screen)
Legume PIPE (Interpreter Screen)

Soybean Rust Research Forecast (issued: 2006-09-04)

Current Conditions
The boundary between cool air over the Gulf States and Southeast and a cooler air mass in the northern tier remains active with clouds and showers. Only spotty showers are occurring across the interior Northeast, but a widespread area of rain and thunderstorms is migrating east along the front in north Texas and southern Oklahoma. A few showers mark low pressure near Chicago. The northern and central Plains are dry and pleasant.

Risk Factors: Thunderstorms developing over Florida, eastern Georgia and South Carolina will promote deposition in these areas, however winds are light and somewhat variable, though
Legume PIPE (Interpreter Screen)
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National Soybean Rust Commentary (updated 09/05/06)

Soybean rust was reported on soybeans in a sentinel site in Colquitt County, Georgia (9.05). Currently rust has been found infecting this year's soybeans in 19 different counties in seven states: AL, FL, GA, IA, MS, SC, and TX. Including reports on beans, there is a total of 28 counties in seven states with rust this year including five in Alabama, 13 in Florida, eight in Louisiana, seven in Georgia, one in Mississippi, and two in Texas and South Carolina. Spore trapping continues throughout the U.S. using both active and passive traps. Any positive spore trap information does not imply infection has taken place and plant samples are used exclusively for recording positive rust occurrence. Recent shower activity has been reported in some of the infected areas and local infection has increased in some cases. Much like the 2005 season, more soybean rust finds are expected this season through the past several months. Please consult your state extension.

Management Toolbox

See Public Site
Legume PIPE (Interpreter Screen)
Legume PIPE (Interpreter Screen)
Legume PIPE (Interpreter Screen)

Soybean Rust Public Forecast (issued 2006-09-04)

Current Conditions

The boundary between sultry air over the Gulf States and Southeast and a cooler air mass in the northern tier remains active with clouds and showers. Only spotty showers are occurring across the interior Northeast, but a widespread area of rain and thunderstorms is migrating east along the front in north Texas and southern Oklahoma. A few showers mark low pressure near Chicago. The northern and central Plains are dry and pleasant.

Risk Area: A slight increase in risk is expected in South Carolina and Georgia due to limited sunshine and more showers. Risk increase is also expected for adjacent counties of infected areas in the Florida peninsula as showers and thunderstorms develop. Visitors are encouraged to check the Observation and State Update screens on this website to follow the progress of sentinel plots and scouting in their local area. Visitors are also encouraged to frequently consult the Forecast Outlook and Disease Management commentaries supplied by state soybean specialists.

1 - 2 Day Forecast

September 5-6

Dissipated weather will migrate southward through eastern Texas and parts of western Louisiana. A front pushing slowly east through the Carolinas will keep the shower risk high. Showers farther north will be migratory and should pass from the region by Wednesday afternoon. Generally dry and mild conditions will dominate the Great Lakes, Midwest and Ohio Valley. Risk Area: An increase in the risk is expected across east Texas and western Louisiana as showers and thunderstorms develop, light to moderate winds come from the southeast and soybean rust remains localized. Risk will also stay high in eastern and central Georgia and South Carolina due to continued showers. Visitors are encouraged to check the Observation and State Update screens on this website to follow the progress of sentinel plots and scouting in their local areas. Visitors are also encouraged to frequently consult the Forecast Outlook and Disease Management commentaries supplied by state soybean specialists.

3 - 5 Day Forecast

September 7-9

Showers will diminish in the Southeast and near the Gulf Coast as high pressure builds east across the Tennessee Valley. A warming trend will commence in the central Plains, mid-Mississippi Valley and Ohio Valley as winds begin to blow from the southwest. Some showers will develop ahead of a significant cold front that will be moving into the upper Lakes. Risk Area: Little significant change is expected over much of the region, except in Florida where continued thunderstorms will contribute to slow spread into adjacent counties. Visitors are
Thank you!

Questions?