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## Stage of detection and number of sprays for controlling soybean rust

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# Stage of detection and number of sprays for controlling soybean rust

## **Abstract**

During winter extension meetings, three of the most common questions asked about Asian soybean rust were: when will soybean rust show up in the northern United States; how early should a spray application be made; and how many sprays would be needed. It is incorrect that once soybean rust outbreaks occur in coastal regions of the Gulf of Mexico, the disease can be airborne to Iowa within 2 to 3 days and defoliate soybeans in a week or two if no chemical is applied immediately after the spores arrive. Another recent question is whether spraying at the vegetative growth stage is needed. To address all these questions, we need to know the most likely stage of soybean rust when it appears in the United States.

## **Keywords**

Plant Pathology

## **Disciplines**

Agricultural Science | Agriculture | Plant Pathology

# INTEGRATED CROP MANAGEMENT

## **Stage of detection and number of sprays for controlling soybean rust**

During winter extension meetings, three of the most common questions asked about Asian soybean rust were: when will soybean rust show up in the northern United States; how early should a spray application be made; and how many sprays would be needed. It is incorrect that once soybean rust outbreaks occur in coastal regions of the Gulf of Mexico, the disease can be airborne to Iowa within 2 to 3 days and defoliate soybeans in a week or two if no chemical is applied immediately after the spores arrive. Another recent question is whether spraying at the vegetative growth stage is needed. To address all these questions, we need to know the most likely stage of soybean rust when it appears in the United States.

In the current and previous season, sentinel plots (Figure 1) have proven effective in providing South American farmers with an early warning on when to spray. Last year there were over 500 plots in Brazil, and there are more than 1,000 plots this year. Argentina also has hundreds of plots spread over all soybean areas with the same goal. Brazilian farmers are advised to intensify scouting and prepare to spray preventively when rust is found in the nearest sentinel plots. The current recommendation by plant pathologists at the North Central Pest Management Center's soybean rust working group is to spray whenever the rust is found locally. A national plan is underway to establish a similar sentinel plot monitoring system in the U.S. soybean production regions to provide growers with the needed early warning.



*Figure 1. Scouting in a sentinel plot (30' x 30') next to a late-planted soybean field in Brazil (photo by XB Yang).*

The number of spray applications needed in a season depends on when the rust shows up in your area. Sentinel plot data from Brazil will shed light on how early soybean rust may show up in the northern states during a growing season. The Brazilian data up to February 8 on 518 detection plots and fields show 3 percent of early detections before flowering; 25 percent in R1 and R2 stages; 30 percent in R3 and R4 stages; and 36 percent from R5 onward. Stages at 6 percent of the locations were unreported (Figure 2). Unless kudzu plants in the South produce a big surprise, the detection stages in the United States should be no earlier than what happens in Brazil where climate conditions are much more conducive for rust overwintering and spreading. The fungus can overwinter in almost all soybean areas in Brazil whereas in the United States, the rust overwinters in the Gulf Coast states and will need to move from south to north every season, which takes time.

In Brazil, the average number of sprays is 1.6, varying among regions. With the chart (Figure 2), we can estimate a similar number of sprays. For the field disease occurring after R4, one spray should do the job when weather is not highly favorable season long. There are reports from Brazil that show effective control with only one spray when disease shows up at late flowering when weather is not very favorable to the disease. For the U.S. north central production regions, the number of sprays should be less than Brazil's number. In a previous article, we mentioned that average rainfall in Brazilian soybean areas is much greater than in

the United States, which affects application efficacy and, consequently, also affects the number of applications. In the North Central Region, the critical period for us to protect soybean is from flowering time (R1) to full seed (R6). Generally, it covers the months of July and August. Because the disease is unlikely to show up earlier than in Brazil, we should need to spray less than Brazilian farmers.

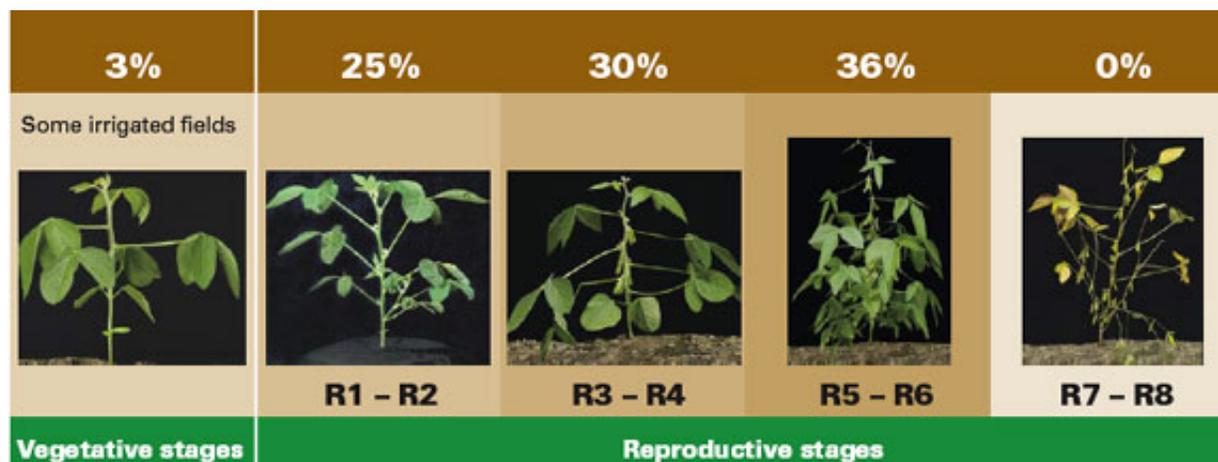


Figure 2. Percentage of soybean rust detections in Brazil relative to crop stage. Values estimated are based on 518 detections in sentinel plots and fields scouted from November 2004 to February 8, 2005; 6 percent of detections are from unreported stages. (Iowa State University Photo Service) Data source: Embrapa Soja and Fundação ABC.

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