

Asian Soybean Rust – Frequently Asked Questions V: Monitoring, Tracking, and Scouting

David Holshouser, Extension Soybean Specialist, Tidewater Agricultural Research and Extension Center

Elizabeth Bush, Special Research Associate, Department of Plant Pathology, Physiology, and Weed Science, Virginia Tech

Pat Phipps, Extension Plant Pathologist, Tidewater Agricultural Research and Extension Center

Erik Stromberg, Extension Plant Pathologist, Department of Plant Pathology, Physiology, and Weed Science, Virginia Tech

How important is scouting for Asian soybean rust (ASR)?

Scouting for ASR on a nationwide basis is probably the most important aspect of managing the disease. If scouting is effective, the rust can be tracked as it moves through United States soybean-growing regions. Scouting locally is also important because ASR could leapfrog areas as it moves north, and without a coordinated survey in Virginia, early infection could go undetected. Virginia plant pathologists and agronomists use tracking and forecast information to determine when fungicide applications to control diseases should begin in Virginia, the class of fungicide that should be applied, and if scouting should be intensified. This is critical for controlling a disease such as ASR that develops very rapidly under favorable environmental conditions.

When do I need to start scouting for ASR and how should I scout fields?

Scouting is key to ASR control, since this disease progresses very rapidly and the presence or absence of the disease will determine which class of fungicide to use. Scouting should begin when the first true leaves appear. This is an excellent time to check stands and monitor for other problems, in addition to ASR. Scouting intensity should increase as plants enter reproductive stages and continue through full-pod (R1 through R6) stages.

Scout fields at least every other week during vegetative stages and weekly from R1 (beginning flower) stage through the late R6 (full-pod) stage. Do not just

check the perimeter of fields. Walk fields in a ‘W’ pattern. Depending on field size, check six to ten locations within each field. Make sure to scout shady parts of the field, low-lying areas, areas near bodies of water, and any site where high moisture conditions will be favorable for disease development. Also scout areas with any suspicious yellowing. After rainy periods, or when disease forecasts and tracking data indicate that the movement of ASR into Virginia is likely, increase scouting frequency and intensity.

Use a 20X hand lens to check leaves of differing ages on plants (i.e. leaves from the plant bottom, middle, and top). Pay particular attention to the lower main stem leaves, where initial infections usually begin. In the early stages of the disease, yellow flecks or tan to brown or reddish-brown pinpoint spots appear on the upper leaf surface. Hold leaves up to the sky to back-light them for visualization of early and hard-to-detect symptoms of ASR. In later stages of the disease, powdery, pale brown pustules that contain the urediniospores form on the undersides of leaves.

It is difficult to positively identify ASR in the field so laboratory identification is necessary. If ASR is suspected, collect ten to 20 symptomatic leaves and place them in a sealable plastic bag. Keep leaf tissue from damage or drying out during transport to a Virginia Cooperative Extension office or plant diagnostic lab. Keep the tissue in a sealable plastic bag in a refrigerator if the sample cannot be transported or mailed right away.

www.ext.vt.edu

Soybean producers using an early soybean production system (e.g. early-maturing cultivars planted in April) should begin intensively scouting fields in June when flowering begins. For May-planted and traditionally used maturity groups, intensively scout from July through September. For double-crop soybeans, begin intensive scouting in late July to August, and continue through mid- to late October.

Can soybean rust be diagnosed in the field?

No. Current technologies only allow qualified individuals to give a preliminary diagnosis in the field using a 20X or more powerful hand lens. Positive identification of ASR must be made by trained plant pathologists in a laboratory. There are other soybean foliar diseases that may be mistaken for ASR. Bacterial pustule, for example, is easily mistaken for ASR. Product development for a serological test, suitable for use in the field, for ASR is ongoing and it is possible that this product may be available sometime in the future.

Is Virginia cooperating with other states to track and monitor ASR?

Virginia is part of a nationwide monitoring, tracking, and forecasting system. Scouting for ASR will take place in Virginia and all other soybean producing states. The public can access scouting information at the USDA Soybean Rust Information Site (www.sbrusa.net). At this website, one can observe where scouting has occurred, where ASR has been found, and see county-specific scouting recommendations and disease management information.

Does Virginia have a soybean rust monitoring program?

The Virginia Soybean Aphid and Rust Monitoring Program was initiated during the summer of 2004, expanded in 2005, and will continue. Scouts monitor commercial soybean fields and smaller soybean plots containing multiple maturity groups. These fields and plots are located throughout all soybean-growing regions of Virginia and are scouted on a weekly basis. Scouts collect suspect ASR-colonized leaf samples for examination at the Tidewater Agricultural Research and Extension Center. Final diagnosis of suspect ASR samples is made by plant pathologists. Results of the monitoring program are uploaded to the USDA soy-

bean rust information site and are also available at the Asian Soybean Rust website at Virginia Tech (www.ppws.vt.edu/ipm/soybeanrust/index.htm).

If we need to apply fungicides before rust arrives, why is scouting on my farm or in Virginia so important?

ASR will most likely move from south to north. Therefore, Virginia may actually be more dependent on North Carolina scouts than those in Virginia. However, spore deposition may not occur in a linear fashion from south to north, but leapfrog over areas due to climatic/weather patterns and events. Additionally, Virginia is a component of the nationwide scouting system and scouting in Virginia is a critical component of the ASR detection system. The presence or absence of rust within a region will determine whether a preventative, curative, or premix fungicide should be used.

Does Virginia's soybean rust monitoring program include spore trapping?

Yes. Traps are located in or near sentinel plots and are sampled once per week.

What are spore traps?

Urediniospores are the principal fungal structures responsible for spread of ASR. Therefore, the ability to detect these spores is important for early detection. Spore traps are small devices used to collect spores at strategically placed locations throughout the country. The type used in Virginia is a passive-design trap that samples air like a weather vane, where the opening to the trap is pointed towards the wind and any material in the air is then captured onto a glass slide coated with petroleum jelly. Traps are located in or near sentinel plots and are sampled once per week. Slides are express-mailed to a scientist at a university lab for identification.

The presence of rust spores does not mean the ASR is in the area and present on host plants. At this time, spores cannot be positively identified as ASR spores. Therefore, at this time, the procedure must be considered experimental. Confirmation of ASR can only be accomplished with laboratory identification of the disease on leaves.

If rust spores are detected in one of Virginia's traps, the sentinel plot and surrounding soybean fields will be vigorously scouted. Leaves will be collected and brought back to the laboratory for a thorough evaluation.

How will I know when and if I need to treat my fields?

To determine fungicide application recommendations, Virginia Cooperative Extension specialists in agronomy and plant pathology will be observing forecasting models, tracking rust movement through the United States, and evaluating leaf samples submitted by the Virginia Soybean Aphid and Rust Monitoring Program and other first detectors.

After soybean rust is confirmed by Virginia Tech plant pathologists, they will notify all pertinent Extension agents, certified crop advisors, and other first detectors. Information and recommendations will be distributed by the Internet, mail, mass media, etc.

Check the Asian Soybean Rust home page, www.ppws.vt.edu/ipm/soybeanrust/index.htm, or hotline, (757) 657-6450 x103, frequently for on the status of ASR in Virginia and up-to-date fungicide recommendations.

Other ASR resources:

Asian Soybean Rust website at Virginia Tech –
<http://www.ppws.vt.edu/ipm/soybeanrust/index.htm>

USDA Soybean Rust Tracking site –
<http://www.sbrusa.net/>

North American Plant Disease Forecast Center–
<http://www.ces.ncsu.edu/depts/pp/soybeanrust/>

The Southern Plant Diagnostic Network –
http://spdn.ifas.ufl.edu/soybean_rust.htm

Related Publications

Asian Soybean Rust – Frequently Asked Questions I: Background and General Information, Virginia Cooperative Extension publication 450-301

Asian Soybean Rust – Frequently Asked Questions II: Identification, Biology, and Ecology, Virginia Cooperative Extension publication 450-302

Asian Soybean Rust – Frequently Asked Questions III: Control with Fungicides, Virginia Cooperative Extension publication 450-303

Asian Soybean Rust – Frequently Asked Questions IV: Cropping Systems and Cultural Practices, Virginia Cooperative Extension publication 450-304

Asian Soybean Rust – Frequently Asked Questions VI: Sprayer and Nozzle Technology, Virginia Cooperative Extension publication 450-306

Acknowledgments

The authors would like to express their appreciation for the review and comments made by Ames Herbert, David Moore, Mike Parrish, and Wade Thomason.