

Asian Soybean Rust – Frequently Asked Questions IV: Cropping Systems and Cultural Practices

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Are there advantages to either narrow-row or wide-row planting?

Research does not show differences in Asian Soybean Rust (ASR) incidence and severity among different row spacings. In a wide-row situation, it is thought that there is more turbulence within the rows during a rain-storm, which would result in greater dispersal of spores throughout the canopy and field. On the other hand, the microenvironment is more favorable for rust development in narrow rows because of longer periods of high relative humidity compared to wide-row spacing. The plants require complete coverage with fungicides for control. Some believe it is more difficult to achieve coverage in a narrow-row situation. However, if the correct sprayer, nozzle technology, and application methods are used, adequate coverage can be achieved with narrow-row spacing. It is best to choose the row spacing that gives the best yield and then apply fungicides according to Virginia Cooperative Extension recommendations. Scientists at Virginia Tech are conducting research to address this issue.

Does the planting date affect soybean rust incidence and severity?

The planting date does not directly affect rust incidence or severity. However, by planting early, the crop matures earlier. This potentially reduces the time that the crop is exposed to ASR, since the plant's lifetime is shorter. In Virginia, soybeans can be planted in April, but there is no advantage compared to planting in May. Additionally, planting seed into cold soils will delay

germination and increase the risk of seedling disease, which could reduce stand and yield. One should choose the planting date that will give the best yield and then implement ASR control measures if needed.

Are double-crop soybeans more at risk of ASR than are full-season soybeans?

Double-crop soybeans are not inherently more susceptible to the disease; however, double-crop soybeans face more disease pressure due to later maturity dates, compared to full-season soybeans. Since double-cropped soybeans are planted at the end of June or the first of July, they are likely to be at an earlier development stage when colonized by ASR and would, therefore, be exposed to ASR for a longer period of time.

Will double-crop soybeans require more fungicide applications than full-season soybeans?

This will depend on when ASR arrives, weather conditions, and disease incidence and severity. However, assuming the disease arrives in August, or later, and disease pressures are equal, it is more likely that double-crop soybeans will require more fungicide applications, because a later maturing crop will have to be protected longer.

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Produced by Communications and Marketing, College of Agriculture and Life Sciences,
Virginia Polytechnic Institute and State University, 2009

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How does maturity group affect ASR infection and severity?

One maturity group is no more or no less susceptible to the disease than another. Since ASR cannot overwinter in Virginia and must move here from the south, later-maturity groups are more likely to experience exposure to ASR and/or higher inoculum levels than early-maturity groups. Early-maturing cultivars will enter into the reproductive stages sooner; therefore these cultivars are likely to be in later stages of development when ASR arrives. Risk of yield loss progressively decreases as soybeans move past the late-pod development (R4) stage. Therefore, less yield loss would occur for a maturity group III in the late-seed (R6) stage, than would occur for a maturity group IV in the early-seed (R5) stage. Likewise, a maturity group IV in the early-seed (R5) stage would incur less yield loss than a maturity group III in the late-pod (R4) stage.

Later-maturity groups are also more likely to require multiple fungicide applications. Early-maturity groups will reach “safe” development stages (R6.5 to R7) earlier in the year than later-maturing cultivars. Unless ASR moves into Virginia early (i.e., before any maturity group flowers), the later-maturity groups will need to be protected longer. Therefore, fungicide applications are more likely for later-maturity groups.

Should I begin growing earlier-maturing cultivars to reduce the risk of ASR?

The best recommendation is to grow cultivars that are best adapted to your growing area and give the highest yield. Early-maturing cultivars will not always perform as well as later-maturity groups, especially with drought or late planting, which is the norm in double-crop systems. More dollars can be lost from poor cultivar selection than saved by one less fungicide application.

Producers should use the maturity group that has traditionally yielded highest for their region of the state and their farm. Continue to select cultivars that yield well and possess needed traits. At the most, select a cultivar in the earlier end of the maturity range that is adapted to the region.

Should I change my cropping system?

Continue to use the cropping system that is most profitable to your individual operation. Double-crop soybeans are ten to 15 days behind full-season soybeans

in development and, therefore, more at risk of infection and yield losses from ASR. If more fungicide applications are required for double-crop soybeans, then the double-crop system could be less profitable.

Should I change any agronomic practices?

No, continue to use recommended practices to produce the highest yielding, most profitable crop. A healthy crop will tolerate ASR better than a stressed crop.

Will ASR affect full-season and double-crop systems equally?

ASR could affect both systems equally if ASR were to arrive early in the season when full-season soybeans are in the R1 to R2 stage (e.g. flowering). However, since double-crop soybeans lag ten to 15 days in development, they are at a higher risk of exposure to higher inoculum levels of ASR. However, keep in mind that dry and hot weather could greatly reduce development/movement of ASR. Furthermore, double-crop soybeans produce a smaller, less dense canopy that will not support disease development as well as the larger, more dense canopy of full-season soybeans. The amount of canopy and weather may have more impact on disease development than planting date or maturity group.

What are sentinel plots?

Sentinel plots are small plots (one-half to five acres) that are scouted often and thoroughly for soybean rust. Sentinel plots usually include an early-maturing cultivar and/or are planted two to four weeks prior to the normal soybean planting date. In Virginia, this means planting a maturity group II or III cultivar and/or planting in April or early May. For example, a maturity group III cultivar planted in April will begin flowering in mid-June, four to six weeks earlier than a maturity group IV or V planted in May. Since ASR develops more rapidly in reproductive-stage soybeans, it is more likely to be detected in reproductive stages than in the vegetative stage of the regular crop. Thus, early planting or early-maturing cultivars serve as an early-detection system. Ideally, a sentinel plot will contain two or more planting dates and/or maturity groups. Later-planted or later-maturity groups assist in detecting a late-season invasion.

The Virginia Soybean Rust and Aphid Monitoring Program monitors numerous sentinel plots scattered throughout the commonwealth for early ASR detection. These plots will be scouted weekly from June through October. In addition, the United States has established a coordinated system of sentinel plots which will be used to track soybean rust as it moves through all United States soybean-growing regions.

Should I plant my own sentinel plot?

You may plant your own sentinel plots as an early ASR detection system. However, if these plots are planted early or contain an early-maturing cultivar, they should be scouted regularly – at least weekly during the reproductive stages. If ASR is suspected in these sentinel plots, contact your local Extension agent, certified crop advisor, or the nearest Virginia Primary Diagnostic Center for confirmation. If ASR is positively identified, the plots should be sprayed with a curative or premix fungicide. **We DO NOT recommend planting sentinel plots containing early planting dates or early-maturing cultivars unless they will be scouted on a regular basis.**

How much damage will I do to my soybeans by running over them when I spray for ASR?

The amount of damage to the soybean crop from running over rows will depend on the total number of rows that are damaged. The wider the spray boom and/or the narrower the sprayer wheels, the less damage there is to the crop. Some data are available to answer this question. In Ohio, yield losses from soybeans planted in 7.5-inch row spacing ranged from 1 percent with a 120-foot spray boom to 2.5 percent with a 50-foot spray boom. Indiana data showed a yield loss of 1 percent with a 90-foot boom and 2.5 percent with a 45-foot boom when soybeans were planted in either 7.5- or 15-inch row spacings. Depending on yield potential, losses could range from \$2 to \$8 per acre with soybeans valued at \$5.50 per bushel. This monetary loss can greatly increase with a crop that is marketed at higher prices. Virginia researchers are currently investigating the effect of running over soybean rows in full-season and double-crop systems.

Should I install tramlines or skip rows in my narrow-row soybean?

Yes, you should install tramlines or skip rows in narrow-row plantings to avoid running over reproductive-stage soybeans. Running over one or two rows of soybeans during the pod and seed development stages could reduce yield by one-half to two bushels per acre, depending on width of sprayer; thereby reducing the cost effectiveness of fungicides.

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 V: Monitoring, Tracking, and Scouting, Virginia Cooperative Extension publication 450-305

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 Keith Balderson, Joel Faircloth, Ames Herbert, and Matt Lewis.