

Soybean Plant Health and Foliar Fungicides

More frequently, growers are considering the use of foliar fungicides in soybean management. The potential spread of Asian soybean rust in the U.S. along with higher commodity prices allow greater use of yield enhancing and protecting inputs. New claims of “plant health” effects with strobilurin fungicides have also expanded the use of foliar fungicides. These effects include longer green leaf retention, increased water efficiency, and increased stress tolerance during flowering and pod fill.

Protecting Plant Health

Because pod set and pod fill are critical periods of development and yield potential in soybeans, reducing plant stress during these stages is beneficial. While we cannot control the weather, foliar fungicides are an option for disease management.

Fungal diseases that may affect soybean include *Cercospora* leaf blight (*Cercospora kikuchii*), brown spot (*Septoria glycines*), Frogeye leaf spot (*Cercospora sojina*; Frogeye), pod and stem blight (*Diaporthe phaseolorum*), and anthracnose (*Colletotrichum truncatum*). All of these diseases are favored by warm and humid or wet conditions.

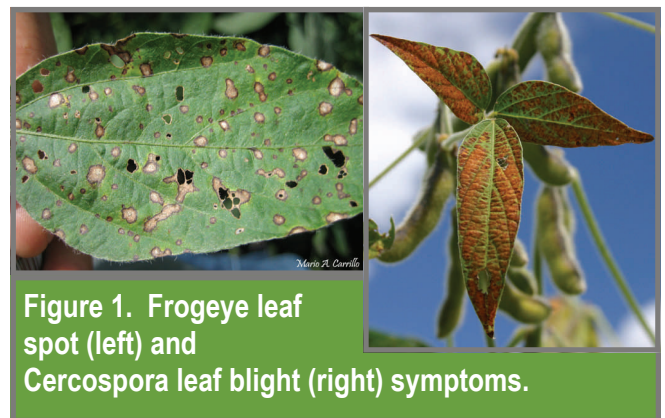
Identifying Diseases

Symptoms of *Cercospora* leaf blight, brown spot, and Frogeye may appear on leaves (Figure 1). Leaf defoliation is of concern with these diseases. Healthy, green plant material is necessary for photosynthesis and converting sugars for pod fill; therefore, it is important to protect leaf tissue.

The symptoms of pod and stem blight and anthracnose are similar. Both diseases can be found on stems, petioles, and pods in the early reproductive stages as irregularly-shaped brown blotches. While neither disease usually causes severe yield loss, it is important to scout and assess overall plant health throughout the reproductive stages.

Fungicides and Diseases

Cercospora leaf blight, brown spot, Frogeye, pod and stem blight, and anthracnose are all labeled targets on various commercial fungicides. Deciding whether to



spray can be a tough decision, one that should be based on disease severity and timing.

Fungicide applications in soybeans are generally not needed in the early vegetative growth stages (VE through V6). Fungicide applications for late-season diseases are generally made between R3 and R5 (pod development stages). As previously mentioned, the pod set through seed fill stages (R3 through R6) are the most critical period for seed yield. Leaf loss can significantly reduce yield if diseases attack during early seed filling. Spraying fungicides after R6 is generally no longer necessary and not recommended.

Fungicide Application Considerations

Spraying fungicides is different than applying herbicides and insecticides. Fungicide spray needs to be placed as deep into the canopy as possible. Soybean diseases usually start in the lower canopy and move into the middle, then upper canopy as the crop matures. Sprayer reconfiguration may be necessary to obtain good

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coverage and canopy penetration. Using a spray volume of no less than 15 GPA is important to provide good coverage. Spray volumes at 10 GPA may give acceptable coverage early in the season with less canopy density, but greater spray volumes are needed as the season progresses because the canopy is deeper and denser.

Nozzle type, spray pressure, application volume and speed will determine the uniformity of spray deposition and penetration into the canopy. Flat-fan pattern nozzles are generally the best choice, provided the spray from these nozzles is characterized as high-fine to mid-medium (200-300 micron droplets in diameter). Proper nozzle orientation and overlap is also critical to achieve good spray deposition.

Headline® is a broad-spectrum strobilurin fungicide that provides protection against major foliar diseases in soybean, including the five diseases mentioned on

page 1. The strobilurin chemicals move into the plant and are considered locally systemic, meaning that movement is limited and may not extend beyond the point of uptake. All strobilurins have the same mode of action (inhibit fungal cell respiration) and are broad-spectrum fungicides. Strobilurin fungicides, such as Headline and Quadris®, provide about 14 to 28 days of disease protection at labeled rates.

Headline Recommendations: (Figure 2)

- Optimum Timing — R2 through R4
- Rate of Headline — 6 to 9 ounces per acre
- Insecticides — Headline may be tank mixed with insecticides when appropriate.

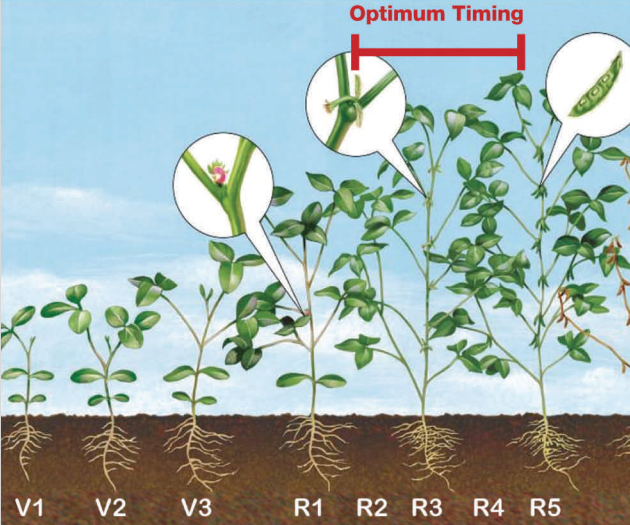
Please refer to the Headline label for more information on additives and application methods.

It should be noted that a different approach to fungicide use is necessary for Asian soybean rust management.

Please contact your local agronomist for more information on soybean plant health and foliar fungicides.

Sources: Brown Spot—Septoria Leaf Blight. Iowa State Univ. Extension. January 2006. Online at <http://extension.agron.iastate.edu>
Compendium of Soybean Diseases, Fourth Edition. APS. 1999.
A. Dorrance, M. Draper, and D. Hershman. Using Foliar Fungicides to Manage Soybean Rust. Plant Health Initiative. NCERA publication SR-2008.
C. Grau, B. Jensen, and J. Gaska. 2006. Fungicides, soybean health and productivity. Wisconsin Soy Sentinel. Winter 2006.
D. Mueller. Fungicides: Plant health fungicide applications. Iowa State Univ. Integrated Crop Management. IC-496(17). June 26, 2006.
Soybean Anthracnose. Iowa State Univ. Extension. February 2006. Online at <http://extension.agron.iastate.edu>

Figure 2. Application recommendations for Headline® at 6 to 9 oz. per acre.

Headline: 6-9 oz/A	Adjuvant Usage
Ground or Aerial application	Flexible Adjuvant
<p>Headline may be applied at all vegetative and reproductive stages of soybean development.</p> <p>The optimal application timing is from R2 stage through R4.</p> <p>Headline may be tank mixed with other products, such as insecticides.</p> <p>R2 Full bloom: One open flower at one of the upper two nodes</p> <p>R3 Beginning pod: Pod 1/4" long at one of four uppermost nodes on main stem</p> <p>R4 Full pod: Pod 3/4" long</p>	

Individual results may vary, and performance may vary from location to location and from year to year. This result may not be an indicator of results you may obtain as local growing, soil and weather conditions may vary. Growers should evaluate data from multiple locations and years whenever possible. **ALWAYS READ AND FOLLOW PESTICIDE LABEL DIRECTIONS.** Tank mixtures: The applicable labeling for each product must be in the possession of the user at the time of application. Follow applicable use instructions, including application rates, precautions and restrictions of each product used in the tank mixture. Monsanto has not tested all tank mix product formulations for compatibility or performance other than specifically listed by brand name. Always predetermine the compatibility of tank mixtures by mixing small proportional quantities in advance. Technology Development by Monsanto and Design(SM) is a servicemark of Monsanto Technology LLC. Headline® is a registered trademark of BASF Corporation. All other trademarks are the property of their respective owners. ©2010 Monsanto Company. 07082010ABT