



UNIVERSITY OF WISCONSIN AGRONOMY, SOYBEAN RESEARCH, UNIVERSITY OF WISCONSIN-EXTENSION

Foliar Fungicides for Corn and Soybean – Don't Rush to Spray

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We have started to receive questions and initial reports regarding the need to spray foliar fungicides in corn and soybean. Many of these questions have been received in part because of initial observations of lesions on both plants. Actively scouting fields is an important step in the decision making process about whether or not a foliar fungicide is needed. Given the weather we have had, it is not a surprise that we would see diseases in both crops like (Figure 1):

1. Brown spot of soybean (*Septoria glycines*)
2. Bacterial blight of soybean (*Pseudomonas syringae*)
3. Anthracnose of corn (*Colletotrichum graminicola*)



Figure 1. Bacterial blight of soybean (upper left), brown spot of soybean (upper right), and anthracnose of corn (lower middle).

In soybean, remember that the use of a foliar fungicide will have no affect on bacterial blight and the best application timing to slow down the severity of brown spot is from bloom (R1) to pod fill (R3). Furthermore, data suggests that brown spot severity must be fairly significant to see a significant yield response and even when there has been control of brown spot, there has not been a significant yield response (Shaner and Buechley 2007).

Overall, as corn and soybean head into the tasseling and silking stages or flowering stage, respectively, remember that the decision to apply a foliar fungicide following an integrated pest management approach examines a combination of factors, including:

1. Hybrid or cultivar susceptibility
2. In corn, the amount of crop residue left in the field
3. Planting date
4. Yield potential
5. Disease pressure at VT/R1 (corn) (tasseling into silking) or R1-R3 (soybean) (beginning bloom into beginning pod)
6. Weather conditions at the time of disease assessment and the forecasted weather conditions during reproductive development
7. Fungicide and application cost
8. Grain market value

If the decision has been made to apply a foliar fungicide, consult the label for recommendations and restrictions accordingly. Also, for corn, given this year's weather conditions during planting and early emergence, and the fact that in many fields, corn may be at a range of growth stages, it is best to consider delaying applications at R1 (silking) for a few days to enable all the corn plants to get into tasseling and silking. This may help reduce the risk of any physiological damage that was seen in 2007.

Another consideration is economics. Even though at the writing of this article, corn prices were hovering from \$7-8/bushel and soybean from \$15-16/bushel, the ability to obtain an economic return from applying a foliar fungicide needs to be considered. In Tables 1 and 2, the breakeven bushels necessary to cover the cost of the foliar fungicide application presented. Even when corn is approaching \$8/bushel, the necessary return (in bushels) to cover the cost is around the breakeven point based on University trials in 2007 with different fungicide products (Bradley 2007).

Also for soybean is the need to consider the economic cost due to wheel track damage. Sprayer wheel traffic from first flower (R1) through harvest can damage soybean plants and reduce yield (Hanna et al. 2008). Our research suggests that an adequate soybean stand (more than 100,000 plants per acre) planted in late April though mid-May can compensate for wheel tracks made when a field is sprayed at R1. Yield loss can occur, however, when wheel tracks are made at R1 or later in thin soybean stands (less than 100,000 plants per acre) or late planted soybeans. Regardless of stand, plants could not compensate for wheel tracks made at R3 (early pod development) or R5 (early seed development). The average yield loss per acre is based on sprayer boom width (distance between wheel track passes). In our trials yield losses averaged 2.5, 1.9, and 1.3% when sprayer boom widths measured 60, 90, and 120 foot, respectively. Multiple trips along the same wheel tracks did not increase yield loss over the first trip.

Table 1. Breakeven yield (in bushels) needed to cover the cost of a foliar fungicide application in corn.

Application cost (\$)	Fungicide cost (\$)	Corn value (\$/bu)		
		4	6	8
6	10	4.0	2.7	2.0
	15	5.3	3.5	2.6
	20	6.5	4.3	3.3
8	10	4.5	3.0	2.3
	15	5.8	3.8	2.9
	20	7.0	4.7	3.5
10	10	5.0	3.3	2.5
	15	6.3	4.2	3.1
	20	7.5	5.0	3.8

Table 2. Breakeven yield (in bushels) needed to cover the cost of a foliar fungicide application in soybean.

Application cost (\$)	Fungicide cost (\$)	Soybean value (\$/bu)		
		10	12	14
6	10	1.6	1.3	1.1
	15	2.1	1.8	1.5
	20	2.6	2.2	1.9
8	10	1.8	1.5	1.3
	15	2.3	1.9	1.6
	20	2.8	2.3	2.0
10	10	2.0	1.7	1.4
	15	2.5	2.1	1.8
	20	3.0	2.5	2.1

Our groups have put out much information over the winter period that summarizes current results regarding the foliar fungicide trials in corn and soybean. We summarize a list of the information to help you in understanding and interpreting the results from those studies:

1. <http://corn.agronomy.wisc.edu/>
 - a. To spray or not to spray – Will a foliar fungicide be routine in the new corn production economics? December 2007 Field Crops 28.45-52.
 - b. Using foliar fungicides on corn: 2007 plot results from the University of Wisconsin
2. <http://www.soils.wisc.edu/extension/wfapmc/> (Conference Proceedings & Presentations – Wisconsin Fertilizer Aglime & Pest Management Conference)
 - a. Results of Wisconsin corn foliar fungicide trials (2008)
 - b. Foliar fungicides for corn (2008)
3. <http://coolbean.info>
 - a. Soybean “Plant Health” Studies
 - b. Using Foliar Fungicides to Manage Soybean Rust
 - c. Managing Fungicide Applications in Soybean
 - d. 2008 Agronomy Update Meetings

Also, forthcoming in the next few weeks and available through the *Focus on Soybean* on the Plant Management Network (<http://www.plantmanagementnetwork.org/infocenter/topic/focusonsoybean/>)

will be a recorded talk entitled, “Use of Foliar Applied Fungicides for Soybean in the North Central States”. Please note that the Plant Management Network is a subscription site if you attempt to access this presentation.

References:

Bradley, C. 2007. Foliar fungicides on corn in 2007: Summary of University trials. NCDC-214 Meeting, Dec. 2007, Chicago, IL.

Hanna, S., Conley, S. P., Shaner, G., and Santini, J. 2008. Impact of fungicide application timing and crop row spacing on soybean canopy penetration and grain yield. Accepted to Agronomy Journal (3/27/2008).

Shaner, G., and Buechley G. 2007. Control of diseases of soybean in central Indiana with foliar fungicides, 2006. Plant Disease Management Reports 1:FC007.