



Physoderma Brown Spot and Stalk Rot in Corn

Key Points

// Physoderma brown spot (PBS) and physoderma stalk rot (PSR) are fungal diseases caused by the *Physoderma maydis* pathogen.

// PBS is not usually considered an economically important disease in the Midwest but PBS occurrence has increased over the last decade.¹

// PSR causes nodes to become weakened and the stalk breaks at lower stalk nodes.

// Crop rotation and tillage may reduce available physoderma inoculum in the soil.

// Most seed products have adequate tolerance to PBS.

// Currently products are being evaluated for reactions to the stalk breakage symptoms. High yield conditions and excess water during the growing season have contributed to increased PSR susceptibility during the last several years.

Symptoms

Foliar symptoms of PBS include numerous small (about 1/4 inch in diameter) yellowish to brown, round to oval lesions that usually occur in broad bands on leaves (Figure 1 and 2).¹ Dark purplish to black lesions can also appear on the leaf midrib, stalk, leaf sheath and husks (Figure 2). Lesions on the leaf midrib often coalesce to form larger dark blotches. Symptoms typically appear prior to tasseling. Foliar leaf symptoms appear similar to eyespot and southern rust (Figure 3), however those diseases do not have the dark, larger lesions on the leaf midrib.¹

PBS leaf symptoms are often not visible on plants expressing physoderma stalk rot (PSR).¹ Plants affected with PSR often appear healthy, however nodes are weakened and often the stalks snap in two at the lower nodes. Stalk nodes where the breakage occurs are black and rotted (Figure 4).

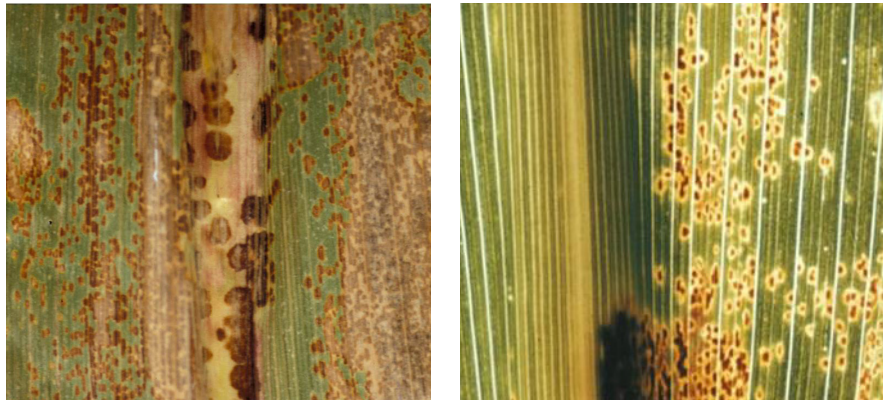


Figure 1. Physoderma brown spot lesions. Note the darker, larger lesions on the leaf midrib.



Figure 2. Left: PBS leaf lesions appearing in a broad band. Right: Larger, darker, purplish PBS lesions on the leaf sheath.

Photos courtesy of Dr. Carl Bradley, University of Kentucky.

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Figure 3. Left: Southern Rust.
Right: Eyespot.



Figure 4. Physoderma stalk breakage.
Photo courtesy of Dr. Alison E. Robertson, Iowa State University.



Figure 5. Rust-colored sporangia at perimeter of node on overwintered stalk debris.

Disease Development

The pathogen survives in overwintering structures called sporangia, which can be viable for 2 to 7 years in crop residue from infected plants.² The sporangia are wind dispersed or splashed onto corn plants. Infection commonly occurs in the plant whorl where water tends to accumulate from rain and irrigation. Since the pathogen requires a combination of sunlight, water, and warm temperatures (75 to 85 °F)³ to germinate, infection in the whorl tend to develop lesions in bands across the leaf (Figure 2).

Plants are most susceptible during early vegetative growth and become more resistant with age. PBS may be more common in continuous corn and conservation tillage systems.

Sources

1 Robertson, A.E., Jesse, L., Munkvold, G., Salaa-Rojas, E., and Mueller, D.S. 2015. Physoderma brown spot and stalk rot of corn caused by *Physoderma maydis* in Iowa. Plant Health Brief BR-15-0003. Plant Health Progress. Vol. 16, No. 2. The American Phytopathological Society. <https://www.plantmanagementnetwork.org/>

2 Robertson, A. 2015. Physoderma brown spot and stalk rot. Integrated Crop Management. Iowa State University. <https://crops.extension.iastate.edu/cropnews/2015/07/physoderma-brown-spot-and-stalk-rot>

3 Wise, K., Kennedy, B., Mehl, K., and Bradley, C.A. 2018. Physoderma brown spot. University of Kentucky. <https://plantpathology.ca.uky.edu/>

4 Jackson, T. Physoderma brown spot. Crop Watch. University of Nebraska-Lincoln. <http://cropwatch.unl.edu/plantdisease/corn/physoderma> Web sources verified 05/10/18. 130819060802

Legal Statement

Performance may vary, from location to location and from year to year, as local growing, soil and weather conditions may vary. Growers should evaluate data from multiple locations and years whenever possible and should consider the impacts of these conditions on the grower's fields. ALWAYS READ AND FOLLOW PESTICIDE LABEL DIRECTIONS. 130819060802. 6005_S3

Management

Management of PBS and PSR includes reduction of available inoculum with crop rotation or tillage although sporangia can be transported long distances and live for multiple years in the soil.¹ Planting tolerant products also reduces infestations. Products are being evaluated for their reactions to the stalk breakage symptoms.

Many fungicides are labeled for PBS, although there is limited efficacy or application timing data. Fungicide application is not recommended for PBS at this time. Further research is underway at public universities to evaluate effectiveness of fungicide application in preventing stalk breakage due to BSR.