



Agronomic Alert

Physoderma Brown Spot and Stalk Rot in Corn

- Physoderma brown spot is a minor disease found in most areas where corn is grown, but the leaf blight phase of the disease rarely affects yield.
- Numerous small, round, purple lesions on leaves, leaf midribs, leaf sheaths or husk leaves are typical symptoms.
- Since 2013, the disease has been frequently associated with infection of lower nodes resulting in stalk breakage at later reproductive growth stages.
- Research is underway to better understand the best way to manage the stalk rot phase.

Disease Cycle and Symptoms of Physoderma Brown Spot

Physoderma brown spot (PBS), caused by the fungal pathogen *Physoderma maydis* is typically an infrequent, minor but widespread disease (Figure 1). The fungus survives in crop residue and may be more common in continuous corn and conservation tillage systems. Abundant rainfall in corn fields and temperatures ranging between 73 to 90° F are favorable for PBS.¹ Symptoms of PBS are similar to eyespot (*Kabatiella zea*), common rust (*Puccinia sorghi*), and southern rust (*Puccinia polysora*) and may cause alarm if they are severe (Figure 2).²

Water held behind the whorl or leaf sheaths creates a favorable environment for PBS, which is closely related to other “water-mold” pathogens. The fungus produces sporangia that germinate and release swimming zoospores.¹

Sporangia, which are generally embedded in host tissues, resemble rust spores (Figure 3). The zoospores require light to infect corn plants. Consequently, leaf symptoms may appear in alternating bands (Figure 4).

Symptoms appear as small round to oblong lesions that vary from yellowish to brown in color depending on the host. Lesions can be on leaves, leaf midribs, leaf sheaths, and husk leaves.

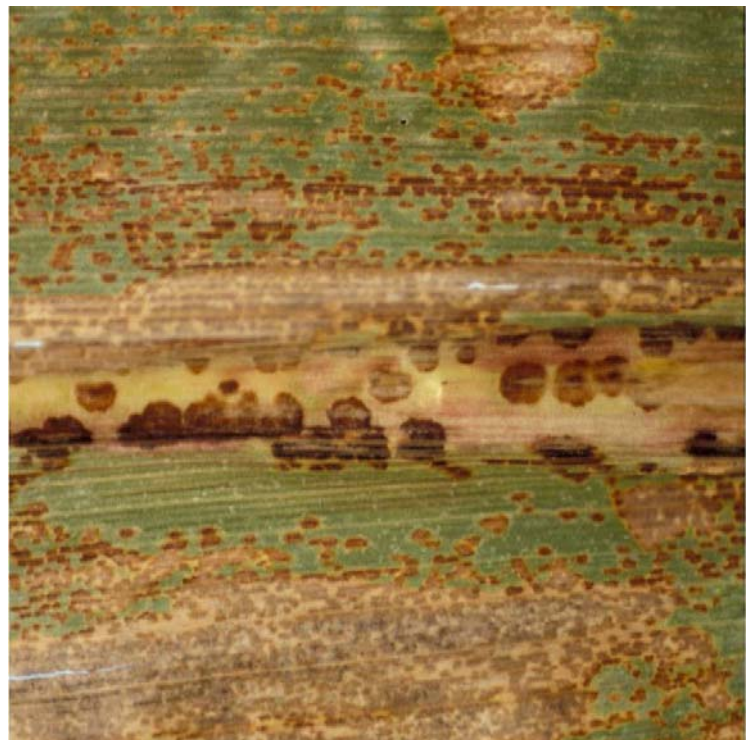


Figure 1. Physoderma brown spot.

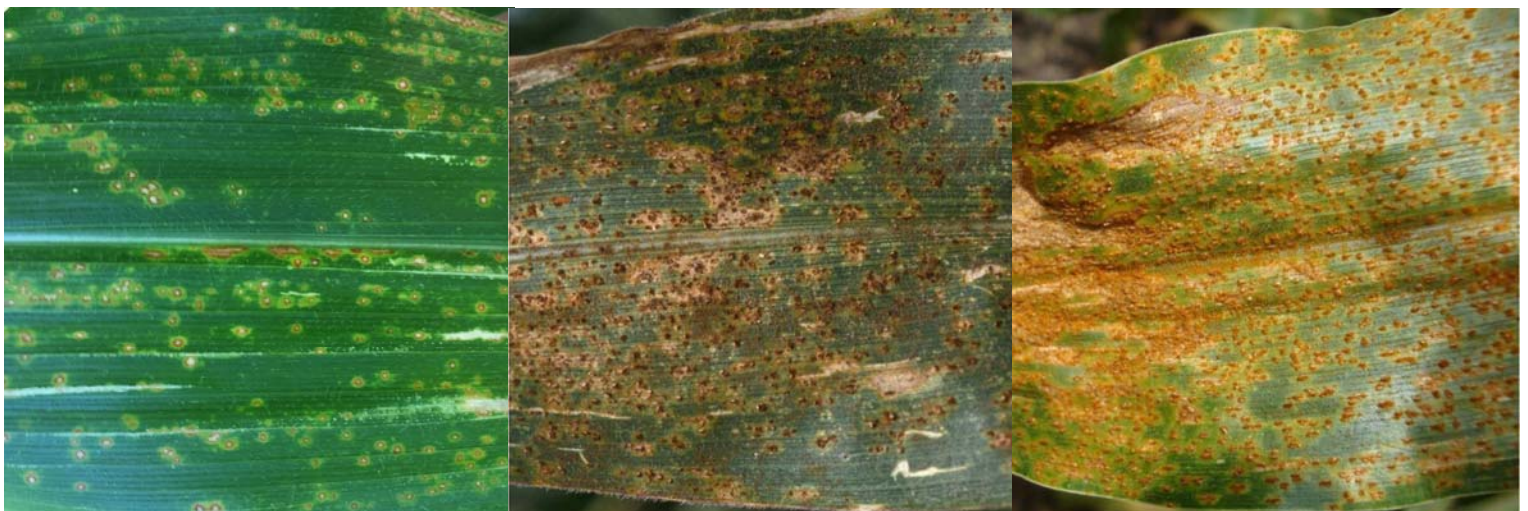


Figure 2. Eyespot (left), common rust (middle), southern rust (right).

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Neighboring lesions join and tend to darken in color from brown to reddish brown or purple (Figure 1).³ Purplish spots along the midrib of infected corn plants are characteristic of the disease.² Leaf lesions generally do not consume enough leaf tissue to affect yield.

Physoderma and Stalk Breakage

Severe outbreaks of PBS in southern Illinois in 1970 were associated with 80% lodging in some fields. These symptoms were not frequently observed again until 2013 when stalk breakage associated with PBS was observed in southwestern and western Iowa. Physoderma stalk rot (PSR), which resulted in stalk breakage, was reported throughout northwest and north central Iowa in 2014 (Figure 5). Exceptionally wet weather appears to be associated with the occurrence of PSR.⁴

Infection at lower stalk nodes causes stalks to become weakened and subject to snapping at those nodes. Sporangia are abundant at the outer edges of the nodes and to some degree within rotted pith tissues (Figure 6). Overwintering sporangia are easily found in the stalk residue of fields experiencing PSR stalk breakage the previous season (Figure 7).

Management of Physoderma Brown Spot

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 adapted tolerant-to-resistant products also provides control. Most products have adequate tolerance to PBS. Products are being evaluated for reactions to the newly-emerged stalk breakage symptoms. Although efficacy data are not widely available, a labeled fungicide applied at the proper time may be warranted if environmental conditions are favorable for severe PBS outbreaks and inocula is thought to be present in corn debris or soil. Further research is underway at public universities to evaluate fungicide efficacy in preventing stalk breakage due to PSR.

Sources:

¹ University of Illinois Extension. 1993. Physoderma brown spot of corn. RPD No. 210. University of Illinois. www.ipm.illinois.edu/diseases/series200/rpd210/

² Robertson, A. 2008. Unusual foliar diseases showing up in Iowa corn. Integrated Crop Management News. Iowa State University. www.extension.iastate.edu/CropNews/2008/0718robertson.htm

³ Jackson, T. Physoderma brown spot. Plant disease central. University of Nebraska. <http://pdc.unl.edu/agriculturecrops/corn/physoderma>

⁴ Robertson, A.E., Jesse, L., Munkvold, G., Salaaui-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.

Web sources verified 7/31/15.

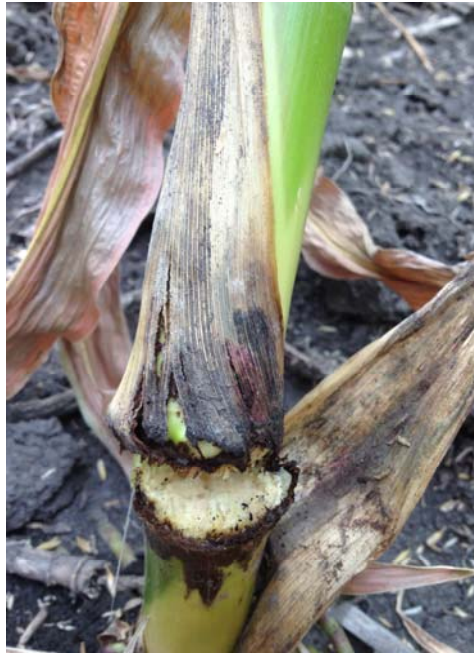


Figure 3. Orange colored sporangia at perimeter of node breakage.



Figure 4. Banded appearance of lesions caused by Physoderma brown spot. Photo courtesy of the University of Illinois.



Figure 5. Physoderma stalk breakage. Photo courtesy of Dr. Alison Robertson, Iowa State University.



Figure 6. Physoderma stalk rot. Photo courtesy of Dr. Daren Mueller, Iowa State University.

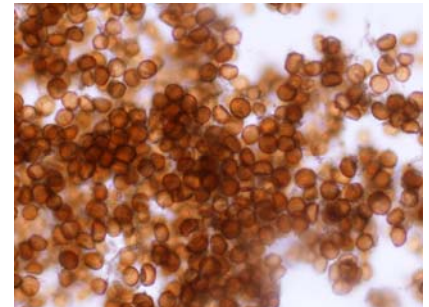


Figure 7. Physoderma brown spot sporangia. Photo courtesy of Dr. Daren Mueller, Iowa State University.

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