

# Soybean Stem Zone Lines: Fact and Fiction

**FACT: The presence of soybean stem zone lines is associated with stem disease in the Diaporthe-Phomopsis disease complex.** This disease complex includes Phomopsis seed decay caused by *D. longicolla*, pod and stem blight caused by *D. sojae*, and stem canker caused by *D. caulivora* and *D. aspalathi*.

**FICTION: Soybean stem zone lines are associated with the stem disease charcoal rot, caused by the fungus *Macrophomina phaseolina*.** However, this association of soybean stem zone lines and charcoal rot is incorrect, and has persisted for several years, resulting in misdiagnosis of the disease.

Zone lines associated with *Diaporthe* species appear on the inside of lower soybean stems and roots when split longitudinally, or if the outside layer of the stem is scraped away (Fig. 1). Lines are thin and dark, appearing in irregular patterns and small circular shapes in mature soybean plants.



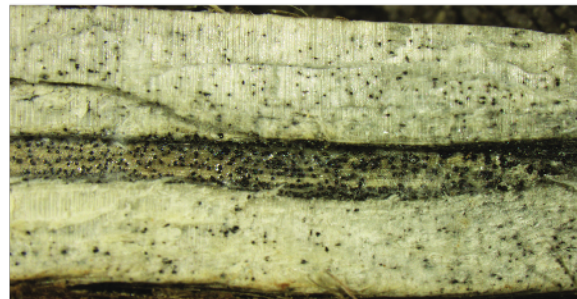
**Figure 1. Split soybean stem or scrape away outside layer to show “zone lines” caused by *Diaporthe* fungi**



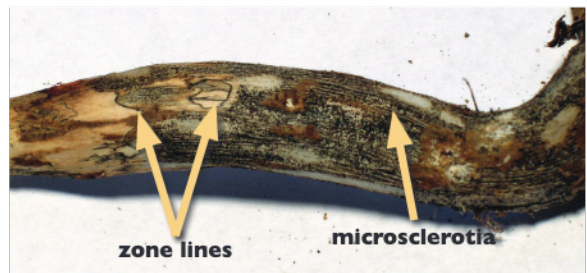
Signs of charcoal rot are tiny, dark survival structures called microsclerotia within and on the surface of the lower stem and taproot. Microsclerotia cause light gray discoloration or a charcoal-like appearance of these plant parts (Fig. 2).



**Figure 2. Microsclerotia within and on the surface of soybean stem or root tissue**



However, signs and symptoms of charcoal rot and zone lines may appear in the same soybean stem, because simultaneous infection by *M. phaseolina* and *Diaporthe* species can occur in the same plant (Fig. 3).



**Figure 3. Soybean stem showing symptoms of infection by *M. phaseolina* and *Diaporthe* species**

The bottom line is that **zone lines on the interior of soybean stems are associated with *Diaporthe* fungi and not the fungus that causes charcoal rot**, as previously thought. This discovery provides a clearer picture of soybean diseases and the symptoms that result from pathogen infection. Accurate disease identification is the first step to making better disease management decisions, which improves farm profitability and stewardship.



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