Charcoal Rot (*Macrophomina phaseolina*)

This disease can be a yield robber! Hot and dry conditions at pod fill can lead to issues with charcoal rot. I found a significant issue with charcoal rot east of the Groton area this year, and weather conditions were favorable in that area for the disease. Charcoal rot can cause premature death of the soybean plants, prior to adequate pod fill, leaving small, “BB” beans.

**Symptoms and Signs**  
Symptoms of charcoal rot usually appear after flowering. Initial symptoms are patches of stunted or wilted plants. Leaves remain attached after plant death (see photo, right). The lower stem and taproots of these plants are discolored light gray or silver. The fungus produces numerous tiny, black fungal structures called microsclerotia that are scattered throughout the pith of taproots and lower stems. These give the tissue a charcoal-like appearance (Figures 4 & 5 below).

**Disease Development and Management**  
The fungus survives in soil or soybean residue as microsclerotia. Microsclerotia infect roots of soybean plants, sometimes very early in the season. Charcoal rot is most prevalent during hot, dry weather, especially when it occurs during the R1-R7 soybean growth stages. 2018 was an ideal year for development. The fungus is more abundant in soil when pH is very acidic or alkaline. Many environmental factors affect microsclerotia survival, root infection and disease development. **Rotation to small grains can reduce microsclerotia numbers. Resistant soybean varieties are not available; however, varieties vary in susceptibility. Avoid excessive seeding rates and plant full season soybeans.** Corn is also a host, so it will not significantly reduce levels of the fungus when planted in rotation. However, the fungus is less damaging to corn.

**Disease Update: Phomopsis Seed Decay- *P. longicolla***

For many years, the presence of black lines, called zonate lines (Figure 6), on the outside of the lower stem or in the stem pith was assumed to be charcoal rot. Newer pathology research has shown that these lines are produced by a seed decay organism called *Phomopsis longicolla*. Yield loss is undetermined to date, but this is similar to Pod and Stem blight and is likely managed by: planting clean seed, using seed treatments and reducing disease-laden residue. The lower stem disease makes fungicide use difficult.