Research update on sudden death syndrome

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Much of the sudden death syndrome research is funded through the soybean check off from Iowa Soybean Association, North Central Soybean Research Program, and the United Soybean Board. Recently, ISU received USDA and some industry funding as well to research this disease. We thank all of our sponsors for this research.

This update includes the research from several faculty members at ISU and neighboring states. This also includes research from many graduate students.

The pathogen

For as much as we know about sudden death syndrome (SDS), we still do not fully understand a lot about the pathogen, Fusarium virguliforme. Over the past few years we have been trying to develop a protocol for accurately quantifying the pathogen in the soil and on soybean roots. This will help us understand how different management strategies will not only affect foliar disease severity, but pathogen levels. We will summarize all of the new findings about the pathogen and pathogen detection. For example, we will look at how flooding will affect the ability of the pathogen to survive and infect soybean roots.

The plant

Research continues to identify plants resistant to SDS, especially in maturity groups more suitable for Iowa. We have already documented the relationship between SDS and soybean cyst nematode (SCN) – damage due to SDS may be more severe in the presence of soybean cyst nematode (SCN). In recent years, nematode reproduction on SCN resistant cultivars has increased (Tylka, ISU). Of particular concern is a shift in the genetic profile of SCN that can cause symptoms on soybean varieties containing the PI88788 source of resistance (Faghihi et al., 2010). When the PI88788 source of resistance is less effective due to the presence of resistant breaking populations of SCN, farmers using this resistance source may experience greater yield loss from SDS. We will cover the advances in SDS resistance, including how SCN resistance (or lack thereof) affects SDS.

Management

Soybean production practices continue to change as farmers seek to maximize yields. Practices such as earlier planting dates and application of various seed treatments are being adopted and promoted to increase yields. While mid-May planting results in more SDS than early to mid-June planting, it is not known how even earlier planting dates affect the development of SDS under Midwestern conditions, especially given the increased use of seed treatments. We will evaluation crop production practices that are known to affect SDS (e.g., planting date) and production practices that are changing and may affect SDS in the future.