The Biology and Management of Spring Dead Spot in Bermudagrass

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Objectives:

1. Determine the distribution of the three pathogens (*Ophiosphaerella herpotricha, O. korrae,* and *Leptosphaeria narmari*) associated with spring dead spot on bermudagrass.
2. Test the aggressiveness of each of the three spring dead spot pathogens in field tests at Manhattan and Wichita, KS, and Stillwater, OK.
3. Develop techniques to rapidly screen bermudagrass selections for resistance.
4. Monitor development of spring dead spot fungi on bermudagrass roots during the growing season in order to better understand the seasonal colonization and more accurately time fungicide applications.

Start Date: 1998
Project Duration: 3 years
Total Funding: $65,874

Golf course superintendents managing bermudagrass in the middle United States commonly observe severe injury in spring as a result of spring dead spot disease (SDS). Currently, three root-rot fungi (*Ophiosphaerella herpotricha, O. korrae, and Leptosphaeria narmari*) cause SDS in North America. One of these pathogens (*L. narmari*) was only identified in the U.S. within the last three years.

Although some progress has been made in screening bermudagrass selections for SDS susceptibility and identifying cultural practices that predispose turf to injury, little headway has been made in developing an effective fungicide or IPM control program. This is partly because the biology of the fungi associated with SDS is poorly understood. As a result, SDS is one of the few diseases that largely remains unmanageable by the golf course superintendent.

Our objectives were to determine the distribution and abundance (frequency) of three pathogens that cause SDS in the U.S.; to develop reliable technique for screening bermudagrass selections for SDS resistance; and to develop an integrated approach to managing susceptible bermudagrass.

We have determined that *O. herpotricha* is the most common cause of SDS in Oklahoma and Kansas, whereas *O. korrae* is primarily associated with the disease in Mississippi, Alabama, North Carolina, Georgia, Tennessee and Virginia. Both pathogens are present in Kentucky.

The population of *0. korrae* isolates from southern states appears to be distinct from those collected in more northern regions. *Leptosphaeria narmari* is rarely detected from SDS patches in the United States. In inoculation trials, isolates of *O. herpotricha* caused larger dead spots than either *O. korrae* or *L. narmari*.

Seeded and vegetative selections of bermudagrass in the Oklahoma State University breeding program and the National Turfgrass Evaluation Program (NTEP) trials have been inoculated with isolates of the three SDS pathogens. Several seeded and vegetative bermudagrass selections have been identified with increased resistance to SDS.

Cultural practices for SDS suppression were evaluated. In 1999, bermudagrass treated with the fungicide azoxystrobin plus the growth regulator trinexapac-ethyl had less SDS damage than turf in other treatments. Turf receiving trinexapac-ethyl in combination with one or more cultural practices generally had better spring quality than turf that did not receive the application.

Dr. Ned Tisserat developed a field screening method to determine the susceptibility of bermudagrass cultivars to spring dead spot.

Summary Points

- Spring dead spot is caused by three root-rot fungi: *Ophiosphaerella herpotricha, O. korrae, Leptoshpaeria narmari.*
- *O. herpotricha* is the most common cause of spring dead spot in the central plains while *O. korrae* is the most common in the upper South and East.
- Seeded and vegetative selections were identified with increased spring dead spot resistance
- Aerification and trinexapac-ethyl (Primo) plots had the lowest damage from spring dead spot