

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.

Spring dead spot (SDS) is a serious bermudagrass disease along the northern range of its adaptation in the USA. Three distinct root-rotting fungi called *Ophiosphaerella herpotricha*, *O. korrae*, and *O. narmari* (formerly *Leptosphaeria korrae* and *L. narmari*) cause this disease. The purpose of our research is to learn more about the distribution and biology of these SDS pathogens, and based on this understanding, to develop more effective strategies for managing this disease.

Diseased bermudagrass stolons and roots were sampled from golf courses in Kansas, Oklahoma, Mississippi, Alabama, Virginia and Kentucky. *O. herpotricha* and *O. korrae* were recovered from samples in all states, with *O. herpotricha* being more abundant in the Great Plains region and *O. korrae* more abundant in the eastern United States. *O. narmari*, previously reported only in Australia, was detected for the first time in North America from samples collected in Oklahoma and Kansas.

Little is known about the population structure of SDS pathogens on a local and regional scale. We studied the inter- and intra-specific genetic diversity of *Ophiosphaerella* isolates from North America and Australia. The population of *O. herpotricha* at a given location appears to be a mixture of many different individuals. In contrast, just a few distinct clones dominate the population of *O. korrae* in a location.

Field and greenhouse studies are conducted to evaluate the resistance of seed and vegetatively propagated bermudagrass selections to spring dead spot. Field trials in Oklahoma indicated that several bermudagrass entries including *GUYMON*, *SUNDEVIL*, *MIDLAWN*, *MIDFIELD*, *FT. RENO*, and *MIRAGE* and OKS 91-11 were more resistant to spring dead spot. We are currently developing greenhouse and laboratory methods to more rapidly screen bermudagrass selections for disease resistance. Furthermore, we are determining whether there are differences in pathogenicity to bermudagrass selections among the three SDS pathogens. Preliminary evidence suggests that *O. herpotricha*

results in larger dead spots and more shoot kill within the spots than the other spring dead spot pathogens.

Various cultural and chemical control strategies were proposed to control spring dead spot. We established a trial 1998 to evaluate the effects of some of these control recommendations, alone and in combination, for suppression of SDS. Preliminary results indicate that aggressive summer aerification accompanied by fungicide and growth regulator treatments will reduce, but not eliminate symptoms of spring dead spot.