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Bentgrass Dead Spot: A New Disease Incited by *Ophiosphaerella agrostis*

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In late summer of 1998, a new fungal disease of relatively young creeping bentgrass (*Agrostis stolonifera*) putting greens in Maryland, Virginia, Pennsylvania and Ohio was discovered. The causal agent was reported to be an undescribed species of *Ophiosphaerella* (Dernoeden et al., 1999). An isolate obtained from a bentgrass nursery with similar disease symptoms was obtained from Dr. Randy Kane of the University of Illinois. The Illinois isolate also was confirmed to be the same undescribed species of *Ophiosphaerella*. The disease since has been found in Georgia, Massachusetts, Missouri, New Jersey, and North and

South Carolina. In 1999, we confirmed the disease in Texas in a "Champion" bermudagrass (*Cynodon dactylon* x *C. transvaalensis*) research green at Texas A&M University. Hence, **the disease has been found in eleven states and has probably gone misdiagnosed in many other areas of the country.**

There are about seven other known species of *Ophiosphaerella*, and three have been reported to be turfgrass pathogens. *Ophiosphaerella herpotricha*, *O. korrae* (syn. *Leptosphaeria korrae*) and *O. narmari* (syn. *L. narmari*) are causal agents of spring dead spot of bermudagrass (*Cynodon* spp.). *Ophiosphaerella herpotricha* also incites spring dead spot of American buffalograss (*Buchloe dactyloides*), while *O. korrae* is the causal agent of necrotic ring spot in creeping red fescue (*Festuca rubra* var. *rubra*), Kentucky (*Poa pratensis*), and annual (*Poa annua*) bluegrasses. All of the aforementioned *Ophiosphaerella* species are turfgrass root pathogens. A unifying characteristic of these turfgrass pathogens is that they produce darkly pigmented hyphae on roots, but none of these pathogens has been associated with creeping bentgrass (Clarke and Gould, 1993; Wetzel et al., 1996). A study of colony characteristics, spores and fruiting bodies was made from a collection of isolates from eight of the affected clubs. This morphological data and information, when compared to published descriptions, indicated that the new pathogen may be an unknown species of *Ophiosphaerella*. **Through DNA testing, the fungus was shown to be an undescribed species of *Ophiosphaerella*. The pathogen was named *O. agrostis* and the disease will be known as bentgrass dead spot** (Camara et al., 2000).

This new disease of creeping bentgrass first appeared between August and September of 1998 on putting greens in Maryland, Virginia, Pennsylvania and Ohio. According to Dr. Randy Kane, however, the disease was first noted at the Skokie C.C. in Glencoe, Illinois in the autumn of 1997. In 1999, the first known outbreak of bentgrass dead spot was observed in June at Trenton C.C. in New Jersey, and additional confirmations were forthcoming in July, August and into early autumn. The disease is less common on tees and collars, and thus far has not been found on fairways.

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Bentgrass Dead Spot...


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Disease symptoms appear initially as small, reddish-brown spots in turf that are 0.5 to 1.0 in. (13 to 25 mm) in diameter. Spots enlarge to only about 3.0 in. (7.6 cm) in diameter, and have tan tissues in the center and reddish-brown leaves on the outer periphery of larger, active patches. The symptoms at times are similar to those associated with copper spot (*Gloeocercospora sorghi*), dollar spot (*Sclerotinia homoeocarpa*), *Microdochium* patch (*Microdochium nivale*), black cutworm (*Agrotis ipsilon*) damage, and ball mark injury. No foliar mycelium is evident on turf in the field, however, foliar mycelium will develop in a laboratory humidity chamber. The foliar mycelium is pale-pinkish-white, and may take from three to five days to develop on diseased plants maintained under high humidity.

Bentgrass dead spot appears during warm to hot and dry weather from June to October. The disease, however, may remain active until hard frosts occur in November. **Unlike dollar spot, the spots or patches caused by *O. agrostis* rarely coalesce.** Sometimes depressed spots or "crater pits" develop. Darkly pigmented hyphae, typical of the other *Ophiosphaerella* species that attack turf, are not found on roots. The pathogen, however, has been isolated from leaves, stems and roots of diseased plants. It is unknown where infection first occurs, but observations suggest that the pathogen may attack leaves first. The fungus then appears to move from leaves into stem bases and eventually into stolons and roots. **Numerous black, flask-shaped fruiting bodies called pseudothecia may be found embedded in necrotic leaf and sheath tissues.** The fruiting bodies contain large numbers of needle-shaped spores (i.e., ascospores). When mature, ascospores exude through a pore in the top of the neck of pseudothecia. These spores can be found in large numbers on diseased and nearby healthy leaves. The fruiting bodies often are produced in abundance in late summer, and sometimes can be found embedded in dead tissues throughout the winter months.

According to anecdotal information provided by several golf course superintendents dealing with the disease in 1998, the symptoms were arrested by Daconil® (chlorothalonil), Chipco 26GT® (iprodione), and CL 3336® (thiophanate), but little or no suppression was provided by triazole or strobilurin-based fungicides. These observations were confirmed in fungicide trials conducted by

Dr. Henry Wetzel at North Carolina State University in 1999. Control may last for only 7 to 10 days, after which time active symptoms may recur. Water-soluble nitrogen fertilizers should be applied to stimulate growth of surrounding, healthy creeping bentgrass plants. Stolon growth into the dead spots or patches is restrained or inhibited. Some recovery occurs as a result of tillering of adjacent healthy plants, but many dead spots do not fully recover prior to winter. During winter, inactive spots or patches appear whitish-tan. Diseased spots often are void of living tissue, and the underlying bare, sandy soil remains evident in the center of dead areas during the winter and following spring.

Virtually nothing is known regarding the disease or biology of the pathogen. The disease does not appear to be specific to any single creeping bentgrass cultivar. On the affected golf courses surveyed, numerous cultivars and blends were used including G-2, L-93, Crenshaw, Pennlinks, Penncross, Providence, Southshore, and SR 1119. All greens' root zone mixes involved were of high sand content, and the mixes were obtained from different regions and/or distributors. Most clubs affected by the disease are 1 to 3 years old, but greens as old as six years have developed the disease. To date, most injury is associated with greens in open or exposed locations, rather than shaded sites. While the disease appears to be widespread in creeping bentgrass, the distribution and importance of the disease in bermudagrass needs to be assessed. 

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Terminology Note

The seasons of the year are frequently used in discussions concerning the timing of various turfgrass cultural practices. This includes winter, spring, summer and autumn. There also are subdivisions used, such as early, mid, and late spring. In this regard, it is important to know the exact calendar dates to which each of these seasonal

terms relates. In the northern hemisphere spring is the period from the March equinox of approximately the 21st to the June solstice of approximately the 22nd. Thus, the period from March 21st to April 21st would be early spring, April 21st to May 21st mid-spring, and May 22nd to June 22nd late spring. 