

Report Prepared For XYZ Country Club; Mr. Joe Smith, CGCS

21 July 2007

Report Prepared by Turfgrass Disease Solutions, LLC; Steven McDonald, M.S.

Photo one not shown

Photo 1. Turfgrass Disease Solutions, LLC visited with Mr. Joe Smith on Friday 21 July to examine greens for possible disease with mobile diagnostic lab. The greens were seeded to a mix of A-1/A-4 less than two years ago. Symptoms were present on greens 1 through 5 and 17.



Photo 2. While on the course, plugs were examined using a portable macro-scope for disease. No foliar mycelium was visible at 0630 hours. Patches appear to have loss density and sunken into canopy. These symptoms are typical take-all-patch.



Photo 3. The collars are also affected by the symptoms and a general circular thinning can be observed in them. The disease is most common in 'walk-off' areas of greens that have early morning shade.



Photo 4. Aerification on Friday morning. This practice will increase rooting of healthy plants along with increasing oxygen and water movement in the greens. This is beneficial practice for the long term. However, aerification when symptoms are present can often times make the disease worse. If possible, skip greens with active symptoms. Typical aerification should occur in spring and autumn.



Photo 5. A plug was removed from the front of the second green for on-site examination. This patch had an orange-bronze look. The soil was washed from the roots and they were extensively examined for the presence of the black ectotrophic fungi on the roots. A black fungi was found in high enough populations on the roots and crown tissue that this was typical to the casual agent of take-all patch.



Black fungi on interior with white on outside

Photo 6. An infected root from the second green. Notice the blackened stele (interior portion). The other roots did appear healthy and may be the key for recovery.

Overall Summary and Recommendations For Managing Take-All Patch at XYZ Country Club

Take-all patch (caused by *Gaeumannomyces graminis var. avenae*) is a severe disease of creeping bentgrass putting and bowling greens throughout the world. Throughout my travels in the mid-Atlantic and northeast regions, I am seeing an increasing level of take-all patch on creeping bentgrass greens less than ten years old. Take-all patch is a disease in high-sand content soils where younger (<12 year old) bentgrass is grown and the soil rhizosphere pH is greater than 6.0. Typically, we see symptoms to a lesser extent in following years, until a point where the disease is no longer active (may take twelve years). The disease survives in mycelium from previously infested plants and the germination and infection happens during cool-wet periods in the autumn and/or spring. The key to managing take-all patch is to prevent that infection during those periods. The patches you are seeing now are the result of an infection that could have actually happened last autumn.

The spring of 2006 was marked by extended periods of drought followed by heavy rains with warmer temperatures in June and July. Most recently we have experienced many days of strong sun and high ambient air temperatures. All of these factors have contributed to the stress of putting greens. Take-all patch is a disease that typically is always present in young greens, however, only manifests itself strongly (i.e. decline of turf) under periods of stress. This can happen in early-to-mid summer in the mid-Atlantic region. Under high heat, drought and traffic stress, patches have the ability to decline and collapse in what seems like overnight. In a lot of cases, when cooler temperatures are present the patches seem to recover.

An integrated approach is the best way to manage this disease.

Fungicides: Two applications of a strobilurin (QoI, group 11) fungicide in the autumn and spring to prevent infection during cool-wet periods. Spring-time applications should begin with the first few mowing and the two autumn applications should occur before the last mowing for the year. There are a few strobilurin fungicides available and these have minor differences in their movement within plants. However, there are very specific in their activity on fungi.

Please use these materials at labeled rates, intervals and for labeled diseases.

Active ingredient	Trade Name	Penetrant movement
Azoxystrobin	Heritage	Upward movement
Fluoxastrobin	Disarm	Upward movement
Pyraclostrobin	Insignia	Localized
Trifloxystrobin	Compass	Localized

1. Although using fungicides when visual symptoms are present (Curatively) in the summer, may provide some relief of the symptoms. It is difficult to obtain complete control with applications curatively. You may want to make applications of various materials on a 14-28 day interval targeting take-all patch until the middle of August. Then make the two applications in the autumn. Other materials are labeled for take-all control include: Banner MAXX, Bayleton, Eagle and Headway.

2. pH: Reduce rhizosphere pH to below 6.2. It is important to monitor the pH where most of the roots are growing and not the bulk soil pH. There is a direct relationship between pH and severity of this disease. The application of acidifying fertilizers, such as ammonium sulfate, in cool weather is a tool to reduce soil pH gradually over time. Use ammonium sulfate carefully because it has potential to cause foliar damage (tip-burn) on leaves in heat (even above 80°). Furthermore, do not attempt to change soil pH quickly as this will increase the intensity of the disease.

3. Fertilizer Use: Manganese deficiencies also greatly enhance the development of take-all patch. On manganese-deficient sites, applications of Mn totaling 2 pounds Mn/Acre. Some research has shown that it is also important to apply the Mn fertilizer in the spring and autumn as well as during the summer. Many soil test consider 25-80 ppm Mn adequate. See attached article on Mn use in a research trial. Manganese fertilizers have been used at XYZ Country Club in the past and I encourage the increased use of it in order to suppress the disease.

4. Culturally: Reduce stress! Any factor that restricts root growth may increase the severity of take-all patch. If possible increase early morning sunlight and air movement in affected areas especially in the autumn. This period is critical for root initiation and development. Avoid excessive irrigation (especially night-time), alleviate soil compaction and increase air and water movement into the root zone with aeration. Because the disease symptoms are present, maintain frequent light irrigation cycles (syringes up to 5 to 7 times daily if needed) and frequent applications of foliar fertilizers to maintain root health. As difficult as it may be, try to not let the patches wilt. When these patches wilt, they begin to thin very quickly. All of these practices will help to compensate for the pathogen damage to the root system. Increase height of cut if possible and use solid rollers until symptoms subside.

Please use all pesticides according to label and if there are any questions please contact Turfgrass Disease Solutions, LLC.