



# BAYER SOLUTIONS

## Take-All Patch

### **The Problem:**

Take-all patch is an important root disease of all bentgrasses. It is caused by the fungus *Gaeumannomyces graminis* var *avenae*. The disease can appear in wet, cold conditions or in warm-hot conditions when plants are experiencing stress. Aboveground injury to bentgrass is due to root infection below ground because the fungus disrupts vascular tissue within the root cortex. Take-all survives as mycelium on previously infected roots and it can be a recurring problem on infected plants.

### **What to Look for:**

Take-all symptoms usually appear in late spring to early summer during the time period coinciding with first wilt stress. Initially reddish-brown to bronze patches are small, only a few centimeters in diameter. In time individual patch size will increase, eventually reaching 1 meter or more in diameter. A primary indication of take-all in the field is that only bentgrass is affected whereas other turf species inside the patch remain unaffected and healthy. In severe cases the patch interior thins significantly. Often, weeds or other grasses will colonize the thinned patches of bentgrass. Roots of infected creeping bentgrass are colonized by dark brown to black ectotrophic runner hyphae. The hyphae then produce mats of mycelium and lobed hyphopodia which are useful for microscopic identification of *Gaeumannomyces* species. Infected roots change in appearance and the central root cortex loses its transparent colour and becomes darkened, with roots turning dark brown to black as the infection advances.

Creeping bentgrass golf surfaces are vulnerable to take-all and the disease is most prevalent in growing seasons which experience drought. Interestingly, take-all symptoms lessen and often disappear during midsummer (peak soil temperatures suppress root infection), but symptoms can return in the fall. Over time, the disease can naturally decline, but in other situations take-all patch will remain a chronic disease after 10+ years.

### **Bayer Solutions:**

Cultural practices that are successful in reducing take-all patch rely on maintaining soil pH between 5.5-6.0 and use of ammonium sulfate in spring and fall. Liming and use of nitrate forms of nitrogen should be minimized as both can enhance disease. Take-all patch severity can be reduced by applications of manganese sulfate (2.2 kg per ha in the spring). Fungicides are often used in conjunction with cultural strategies because soils deficient in manganese or high in pH can be difficult to correct.

DMI and QoI fungicides are most effective against take-all. Best control of take-all patch occurs when fungicides are applied preventively in the fall (Sep-Nov) when soil temperatures are 7-16°C at a 5 cm depth. In situations of chronic Take-all, fungicides should be reapplied preventively in the spring when soil temperatures reach >13°C for 5 days at a 5 cm depth with 2-3 applications every 21 to 28 days required. Curative applications in early summer can be helpful in speeding recovery. Fungicides must target infected roots, so apply at high label rates with flat fan nozzles in 8-20 L of water per 100 m<sup>2</sup> (or use 0.6-1.3 cm of irrigation immediately after application) to ensure fungicide contact with the rootzone.

# Take-All Patch

Mirage Stressgard® contains a DMI fungicide labeled for Take-all patch in other regions such as the United States as well as Stressgard Formulation Technology™ and will help reduce summer stress on cool-season turfgrass, and this can improve recovery potential following damage. Signature® Stressgard tank mixes promote plant health and reduce the effects of summer decline as well as wilt stress associated with certain diseases such as take-all patch.



*Take-all patch affecting a creeping bentgrass fairway in late spring.  
Photo: Dr. Derek Settle*



*Take-all patch affecting a creeping bentgrass fairway in late spring.  
Photo: Dr. Derek Settle*



*Close up of take-all patch affecting a creeping bentgrass fairway with a dandelion weed unaffected by the disease.  
Photo: Dr. Derek Settle*