

TAKE-ALL PATCH OF BENTGRASSES



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Take-all patch caused by *Gaeumannomyces graminis* (formerly *Ophiobolus graminis*) is a serious disease of all species and cultivars of bentgrass in temperate climates throughout the world. It is most severe on newly established creeping bentgrass turfs. Symptoms appear in late spring or early summer as small, circular, light brown to reddish brown patches. Patches may persist through the summer, reappear in successive years, and can reach diameters of 3 ft or more. Patches may coalesce into large areas of dead or dying turf and affected areas heal slowly. The centers of patches are often invaded by weeds, fescues, or bluegrass species. Symptoms may intensify with the onset of summer stress, with bronzed turf fading to a dull brown. Affected patches may appear gray in the winter. The roots, rhizomes, stolons, and crowns turn dark brown to black and black ectotrophic hyphae may be seen on the surface of the roots. Fruiting bodies (perithecia) of the pathogen may develop beneath the leaf sheathes around crowns in late spring or autumn.



G. graminis survives as mycelium in infected plant debris and infection of host tissues occurs during the autumn and the spring. Initially, the fungus colonizes the surface of the roots, but under favorable conditions (cool, moist weather); the root interiors are infected with extensive colonization of host tissues occurring. Take-all patch is most severe in sites with a high sand content or recently fumigated soils. The pathogen is favored by low fertility, high pH, manganese deficiency, and when cool, wet weather is followed by hot, dry conditions. In some cases, take-all patch will decline in severity after several years, presumably because of the build up of antagonistic microflora.



Management:

- Cultivars of *A. stolonifera* with moderate levels of resistance are available.
- Planting a mixture of bentgrass with fine-fescues may reduce disease severity.
- Maintain soil pH below 6.5, preferably between 5.5 and 6.0.
- Avoid nitrate forms of nitrogen. Use acidifying fertilizers such as ammonium sulfate or urea based nitrogen sources.
- Maintain adequate potassium and phosphorous fertility.
- Where manganese is deficient, apply 2 lb/acre in the spring or fall.
- Avoid excessive levels of nitrogen.
- Avoid excessive irrigation and moisture stress.
- Improve surface and subsurface drainage.
- Make light, frequent applications of fertilizer to compensate for root damage.
- Aerify to reduce soil compaction.

Chemical recommendations:

azoxystrobin (Heritage): 0.4 oz/1000 sq ft (REI 4h). Apply when conditions are favorable for disease development. Make 2 applications 28 days apart in the spring and repeat in the fall. Alternate azoxystrobin with a fungicide with a different mode of action to prevent resistance development. Do not alternate with pyraclostrobin (Insignia).

fenarimol (Rubigan A.S.): 4.0 fl oz/1000 sq ft (REI 12 h). Apply preventively in two applications at 30 day intervals before permanent snow cover or frozen soil. Thoroughly irrigate before spray has dried to move into roots/crowns.

myclobutanil (Eagle 20EW): 2.4 fl oz/1000 sq ft. Make 1-2 fall applications when night temperatures drop to 55° F and 1-2 applications in early to mid-spring. Ensure penetration to roots and crowns by irrigating turf before spray dries.

propiconazole (Banner Maxx): 2 to 4 fl oz/1000 sq ft (REI 24 h). Make 1-2 fall applications when night temperatures drop to 55° F and 1-2 applications in early to mid-spring.

pyraclostrobin (Insignia): 0.9 oz/1000 sq ft (REI 4 h). Begin applications when conditions are favorable for infection. Make 2 applications 28 days apart in the fall and repeat in the spring. Alternate pyraclostrobin with a fungicide with a different mode of action to prevent resistance development. Do not alternate with azoxystrobin (Heritage).

thiophanate-methyl (Cleary's 3336): 4 to 8 oz/1000 sq ft (REI 12 h). Apply in mid-July or when symptoms first appear and repeat at 7-14 day intervals for suppression. Irrigate turf before spray has dried to move the fungicide into the active root zone.

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