

Rust Diseases of Turfgrass

All turfgrass species are susceptible to rust diseases. The level of susceptibility is affected by environmental conditions, shade, turfgrass cultivar, and management practices at the time of infection. Home lawns, low-maintenance golf courses, and athletic fields more commonly experience outbreaks of rust infections. However, rust also occurs on intensively managed turf stands.

Symptoms

From a distance, rust-infected turf has a dull yellow-green to light brown cast (figure 1). Close-up, initial symptoms appear as individual yellow lesions or flecks that enlarge over time. Mature rust spore-producing structures are visible as orange-colored powdery pustules. Some vary in shades of yellow, red, or brown (figures 2-4). The spores rub off easily like powder on fingers, shoes, or clothing. Spores are dispersed from the pustules of infected plants to healthy ones by wind and rain splash. Through multiple infections, severely infected turf stands become noticeably thin and may die. Severely rusted stands may winterkill because the rust reduces photosynthesis and therefore carbon reserves.

Conditions for disease development

Moderate temperatures (68 to 85 degrees Fahrenheit) and extended periods of wetness stimulate leaf rust infections. Once infection has occurred, slightly higher temperatures favor symptom development. Turfgrasses



Figure 1. Perennial ryegrass with a yellow-green cast due to rust disease. Photo by Ken Obasa, Kansas State University.

under stress (drought, shading, low fertility, excessively low mowing height and high temperature) are more likely to be more seriously damaged by the disease.

Rust symptoms may start to appear in mid-summer in Kansas especially on susceptible cultivars of Kentucky bluegrass, tall fescue, perennial ryegrass, and zoysiagrass. Symptoms usually become more common and severe during late August to early September and continue through the rest of the fall. Depending on the weather conditions, turfgrass species, and plant vigor, rust also may develop at other times of the year. The rust fungi (*Puccinia* spp.) overwinter in infected plants and also can be reintroduced into turf stands each summer from windblown spores.



Figure 2. Rust pustules on perennial ryegrass. Photo by Megan Kennelly, Kansas State University.

Disease management

Resistant cultivars

Turfgrass varieties differ in their levels of susceptibility to rust infection. However, under good cultural practices the difference can be negligible. Some turf varieties with high resistant ratings for rust include: tall fescue (CE 1, 3RD Millennium SRP, Aggressor), Kentucky bluegrass (Belissimo, Solar Eclipse J-2399), and perennial ryegrass (APR 1648, DP 1). A complete list of turf variety ratings for rust disease is available from the National Turfgrass Evaluation Program at www.ntep.org.

Use of cultural practices

Turfgrass provided with appropriate levels of fertilizer and water is less likely to become severely damaged by rust. Refer to fertilization guidelines for specific turfgrass species for recommendations of rates and timings. Appropriate fertilization helps turf withstand regular mowing, which removes infected leaf tips from the plant and consequently helps to reduce inoculum level. The best mowing strategy is to mow frequently at the recommended height. Avoid night watering, which increases the length of time the leaf blade remains wet. Early morning watering will help to reduce prolonged periods of leaf wetness.

Fungicides

The decision to use fungicides is often difficult because applications need to be made relatively early in rust development. Since a rust epidemic is dependent on weather conditions, it is often difficult to make the judgment for early application. In most years, rust does not reach damaging levels before the turfgrass enters winter dormancy. Therefore, fungicides are not routinely used for rust control in home or commercial landscapes. However, combined with sound cultural management practices, well-timed fungicide applications may help to reduce disease severity.

Several fungicides are labeled for the control of rust (see table). In general, these products work best when applied early in disease development or as recommended on the labels. For Kentucky bluegrass, this application is normally in late August or early September.

Fungicides for management of Rust disease

- Always check the label. It is the responsibility of the user to read, understand, and follow the label.



Figure 3. *Rust pustules on Kentucky bluegrass.* Photo by Ken Obasa, Kansas State University.



Figure 4. *Rust pustules with spores (Urediniospores) on Kentucky bluegrass leafblade.* Photo by Ken Obasa.

Additional references

Identification and Management of Turfgrass Diseases by B. Corwin, N. Tisserat and B. Fresenburg. 2007. University of Missouri Extension Publication IPM1029. Available online at <http://ppp.missouri.edu/ipm/pubs.htm>

Active ingredient	Efficacy ⁺	Application interval (days)	Examples of products
azoxystrobin	Excellent	14-28	Heritage
<i>Bacillus subtilis</i> , strain QST 713	L	7-10	Rhapsody
chlorothalonil	Good	7-14	Chlorostar, Daconil Ultrex, Echo, Manicure, Concorde SST, Pegasus L
copper hydroxide + mancozeb	L	7-14	Junction
mancozeb	Good	7-14	Fore, Dithane, Protect DF, Manzate 200, Pentathlon
metconazole	L	14	Tourney
myclobutanil	L	14-28	Eagle
propiconazole	Good-Excellent	14-28	Banner MAXX, Spectator, Savvi
pyraclostrobin	Good	14-28	Insignia
thiophanate-methyl	Fair-Good	7-14	Cleary's 3336
triadimefon	Good-Excellent	14-30	Bayleton, Proturf fungicide VII
trifloxystrobin	Fair-Good	14-21	Compass
triticonazole	L	14-28	Trinity, Triton

⁺ L = limited published data on effectiveness.

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