Melting-out was considered to be one of the most important diseases of Kentucky bluegrass, other cool-season turfgrasses, and bermudagrass. While it is still a problem, many resistant cultivars and management strategies have been developed for melting-out, thus making it much easier to manage. This fungal disease affects all parts of the plant, including leaves, shoots, and roots.

Description and Life Cycles

Originally the fungi that cause melting-out diseases of turfgrasses were assigned to the genus *Helminthosporium*, but now they are more properly identified as species of the genera *Drechslera* and *Bipolaris*. These fungi (facultative saprophytes that live on dead and decaying tissue) attack living tissue under specific environmental conditions. Melting-out disease first forms leaf spots in a “bulls-eye” pattern before it spreads to the leaf sheaths, crown and roots, ultimately killing the plant. During hot weather, the leaf symptoms may not occur, but the rest of the plant is affected. Multiple dead plants form a patch and several patches coalesce as the disease spreads causing the turfgrass to appear to be melting-out.

The life cycles of these fungi are straightforward. When the spores are exposed to moisture on leaf blades and appropriate temperatures for a few hours, they germinate and penetrate the leaf tissue, killing the cells. Asexual spores, called conidia, are produced on the infected tissue within a few days to repeat the cycle.

During the spring, leaf spots caused by the cool-weather pathogen *Drechslera poae* are almost always present in lawns. Continual infection occurs, seriously diseased plants die, and patches enlarge and join together, which leads to the melting-out effect in the turfgrass. *Bipolaris sorokiniana* is a warm-weather pathogen that attacks turfgrass during the summer. It is particularly destructive at temperatures above 85 °F when the relative humidity is high. In some cases, both pathogens may be present and active.

Symptoms

*Drechslera poae*, which affects cool-season turfgrasses (bluegrasses, ryegrasses, bentgrasses, fescues, etc.) and bermudagrasses, causes leaf spots, the early phase of the disease, which then progresses to the melting-out phase with complete death of the plant. The leaf spot phase occurs during the cool, wet weather of spring and late fall. Affected plants will have oval, water-soaked lesions on the leaves that are purplish brown with a tan or white spot in the middle (Fig. 1). When viewed from a distance,

![Leaf spots of melting-out disease on bermudagrass. (Courtesy of Clemson University.)](image-url)
heavily infected turf with low nitrogen levels will look yellow or tan, whereas high levels of nitrogen will cause the turf to appear blackish brown.

If conditions are favorable for the disease, the lesions may cover the whole blade and cause dark brown scars and dieback from the leaf tip. The older leaves are the first to have lesions, but the disease soon spreads to the leaf sheaths and then the crowns and roots. The invasion of the crown and roots is the melting-out phase of the disease, which occurs during the warm, dry summers.

During hot weather, the leaf spot stage is sporadic or does not occur, but the crown is infected and the melting-out phase spreads rapidly. This may occur because the leaf blades dry out, but the relative humidity remains high near the crown favoring the spread of the disease. In the melting-out stage, there is severe thinning of the turf and the rotting causes it to appear reddish brown, and later black. Severe melting-out in Nevada results in irregular, dull, straw-colored patches of dead turf (Fig. 2).

*Bipolaris sorokiniana* leaf spot looks similar to *Drechslera poae* disease, but it is more common during the summer or hot weather.

In southern Nevada, melting-out disease is often confused with the recurring summer patch on tall fescue and ryegrass. Since less Kentucky bluegrass is grown in southern Nevada, the disease incidence has shifted and summer patch is dominant.

### Management

For plant disease to occur, three conditions are simultaneously required: 1) there is a susceptible plant (host), 2) the disease organism (pathogen) is present and 3) the environmental conditions exist for disease growth and development. Elimination of any of these prevents the disease. Think about this as the following management options are discussed:

#### Prevention

The most important method of prevention is to keep the disease organism out of the area. When possible, sow and overseed with disease-free seed of resistant turfgrass cultivars. Melting-out organisms are spread primarily by leaf clippings, but also wind, rain, irrigation water, equipment, and feet of animals (including humans). Always clean equipment thoroughly after use in or near infested turfgrass. Mow infested areas last to reduce the spread of the disease to uninfested turfgrass.

Secondly, maintaining a healthy, vigorous turfgrass may keep the disease from becoming established. This requires proper mowing, fertilization, and watering. Anything that causes stress can make the turf more susceptible to melting-out.

Dry periods alternating with moist and cool conditions favor melting-out. Plants in moist or poorly drained areas are more likely to be affected. Surface and subsurface drainage may be needed to prevent the disease. Prune or remove dense trees and shrubs from the turfgrass areas where air movement is limited to reduce the disease incidence.

The disease will be more severe on closely mowed turf (at a height of one inch or less) or on turf with high nitrogen fertilization. Thatch buildup, frequent irrigations, soil compaction from traffic, and piles of clippings on the turfgrass will also increase the incidence and severity of the disease.

#### Mechanical Control

Mow frequently and raise the height during cool, wet weather in spring and fall to help the turfgrass survive a melting-out attack. A height of two to three inches should be maintained for bluegrass, ryegrass and turf-type fescue. To reduce the incidence of
melting-out, do not cut cool season grasses lower than one and one-half inches. Mow hybrid Bermudagrass at one-half inch to one inch tall and common bermudagrass at one inch to two inches. Be sure to remove any clippings from the disease prone area. Of course, bentgrass in greens and tee boxes is the exception, they are cut much lower.

Dethatch by using a vertical mower, power rake, or power aerifier if the thatch is thick. Maintain a thatch layer of less than one-half inch. Only dethatch during cool weather in the spring or early fall and irrigated immediately thereafter. Aerate the lawn in the spring or fall to help reduce thatch buildup. Again dethatch, vertical mow, and aerate any healthy turfgrass first and then work the diseased areas last.

Cultural Control

Reseeding with resistant cultivars is an easy and effective way to manage the disease. Improve soil aeration and water drainage before reseeding the affected areas, even when using melting-out resistant seed.

Avoid excessive nitrogen fertilization in spring to reduce abundant, lush growth, which is susceptible to an attack by melting-out organisms. The total amount of fertilizer used annually should be divided between applications in the spring and fall. Having well-balanced fertilization will help control the disease.

Daily irrigation of 0.10 to 0.20 of an inch in summer and less in spring and fall reduces the severity of melting-out. However, many communities in Nevada are under water restrictions which permit only every-other-day or twice weekly irrigations. Whenever possible, apply water early in the day so that the leaves, crowns and thatch dry quickly, which discourages disease infection and spread. Where irrigation frequency is mandated by a community to conserve water, do not over water on a designated watering day. Instead, use on and off watering. Irrigate until water ponds or runs off (often less than 5 to 15 minutes), then turn the water off to allow the water to move downward through the soil. In sandy soils this may take 30 minutes to a couple hours. With heavier soils, clay loams, silts, and clays it is best to wait much longer (two to eight hours) then irrigate again for the same time, or until water runs off or ponds. Do not let the plants become stressed for moisture.

Chemical Control

Fungicides can help control melting-out disease if they are applied when the disease first appears. It will be less effective during the melting-out phase as most of the infested plants are dead or dying. If the disease has continually occurred in an area, chemical applications will only be successful in combination with cultural or mechanical methods of control. Before treatment, remove any loose thatch and dead plants. Reseed with a mixture of resistant species and cultivars adapted to the area. Make sure surface and subsurface drainage is adequate. Manage fertilizer applications and irrigations to stimulate healthy grass but not the spread and development of the disease. Always alternate fungicide products (those with different active ingredients) to avoid developing resistance in the fungi to a particular product and mode of action and apply them in a timely manner when they are most effective.

Systemic fungicides provide control, particularly when absorbed by the roots. Iprodione and vinclozoline will provide control and should be applied on a 14- to 21-day schedule. Contact fungicides such as anilazine, chlorothalonil, and maneb must be applied every seven to ten days in order to be effective. The fungicides can also be used preventively just before the disease season begins.

Avoid applying broadleaf, phenoxy herbicides such as 2,4-D and plant growth regulators when leaf spot or melting-out disease is present, they encourage its growth, development and spread.
References

Figure 1 (Photograph UGA1436042) is courtesy of IPM Images, www.ipmimages.org, and Clemson University.
Figure 2 is courtesy of Kansas State University, www.oznet.ksu.edu/dp_hfrr/extensn/problems/leafspot.htm.

Information herein is offered with no discrimination. Listing a product does not imply endorsement by the authors, University of Nevada Cooperative Extension (UNCE) or its personnel. Likewise criticism of products or equipment not listed is neither implied nor intended. UNCE and its authorized agents do not assume liability for suggested use(s) of chemical or other pest control measures suggested herein. Pesticides must be applied according to the label directions to be lawfully and effectively applied.