LAWN DISEASES: FERTILIZE OR IRRIGATE?

Brandon Horvath and J.M. Vargas
Dept. of Botany and Plant Pathology
Michigan State University

Introduction

Many times homeowners notice a problem with the quality of their lawn and ask someone what they or their lawn care professional needs to do to fix the problem. Often times when it comes to diseases, the advice to the homeowner is either buy seed and reseed the diseased areas, or spray a fungicide. For those homeowners with unlimited budgets a fungicide application is a viable option, but for those homeowners that desire to maintain a quality turf within a budget it seems that they will just have to deal with the unsightly appearance dead turf and reseed. This presentation seeks to demonstrate that for three very common diseases the homeowner or the lawn care professional can implement or recommend several cultural practices that may allow the homeowner to maintain their current lawn without resorting to the expensive fungicide applications or the inconvenient reseedings that are otherwise necessary. The two most important cultural practices that affect the appearance of these lawns are proper fertilization and proper irrigation. The three common diseases covered in this presentation have guidelines for managing the lawn with the goal of reducing the appearance of a particular disease. The diseases covered are: melting-out (*Drechslera poae*), necrotic ring spot (*Leptosphaeria korrae*), and rust (*Puccinia spp.*). Knowledge of proper fertility and irrigation practices while keeping the pathogens in mind will allow one to manage a diseased turf while maintaining the appearance of the lawn.

Melting-out

Melting-out is arguably the most important disease of common Kentucky bluegrass. Fortunately, most of the cultivars currently being used have resistance to this disease. As a general rule, one can recognize resistance to melting-out when purchasing seed by those cultivars which are labeled "improved". The primary reason for the importance of this disease is the devastating nature of this pathogen. The causal agent of melting-out is *Drechslera poae*. This disease is a part of the disease which was once referred to as the Helminthosporium diseases. The other disease which is a part of this complex is leaf spot caused by *Bipolaris sorokiniana*. Melting-out is a cool season disease and begins with the onset of cool, wet weather. As the pathogen colonizes the plant, the plants will begin to thin and eventually die. If the plant is not killed as a result of the pathogen, then the plant is often weakened to the point that when temperatures rise above 70°F the degree of recovery from the disease is significantly reduced. The reduction of plant vigor often opens the plant up to other problems that can also kill the plant. Management of this disease in a home lawn situation involves three important factors: mowing, fertility, and irrigation. The mowing height of the grass should be as high as possible (2.5-3.5") in order to help the plant withstand the attack by the pathogen. Proper fertilization is also important in managing this disease in a home lawn situation. Conventional wisdom has spread the notion that fertilization of turfs affected by this disease will make the problem worse. However, research has demonstrated that dormant applications of nitrogen and moderate applications in the spring will reduce the severity of melting-out. The reductions in disease severity through fertilization can often be traced to the fact that healthier plants are more difficult to infect than plants which have been weakened by over or under fertilization. The life cycle of the pathogen is such that it takes about 10 days for the fungus to sporulate, and so turf that is growing rapidly will have the infected areas mowed off before the pathogen produces spores. Another practice that homeowners or lawn care professionals often have a great deal of control is irrigation. Light, daily irrigation can reduce the severity of this disease. Applying the irrigation during midday is the most effective in reducing the severity of the disease. Ideally, approximately 0.1 and 0.2 inches or water should be applied per day. If the irrigation can't be applied midday, then irrigation should be

applied so as to reduce the length of time that the grass blades remain wet. Generally, this means applying irrigation in the early morning beginning at dawn. Using these practices in the management program for a home lawn should allow one to maintain a quality turf while avoiding the high cost of fungicides and the unsightly appearance of reseeded lawn areas.

Necrotic Ring Spot

This disease was once called Fusarium blight. Researchers later correctly identified the problem as two distinct diseases called summer patch and necrotic ring spot. Necrotic ring spot is the most commonly occurring patch disease on Kentucky bluegrass in Michigan. The pathogen that causes this disease is *Leptosphaeria korrae*. The pathogen infects the plants by invading the roots causing the plant to have a severely restricted root system that is poorly prepared to supply the plant with nutrients during stressful periods. The pathogen begins by infecting the plants during the fall. The stressful summer periods are when the pathogen's damage becomes apparent. Those plants with diseased root systems are unable to survive these stressful conditions, and therefore these plants die leaving a patch of dead turf. Each year as summer approaches, the patches appear and may eventually join to form large patches of diseased turf. Also, patches that are more than two years old may have areas in the center of the patch that are unaffected. This situation is what produces the distinctive "frogeye" pattern that is commonly associated with the patch diseases. Other potential colonizers of the center of the patches are weed species that are unaffected. It is these problems in addition to the unsightly nature of the disease that prompts one to control this disease. Necrotic ring spot is one disease that has a well developed plan for treating the disease without fungicide inputs in a home lawn situation. The use of proper cultural practices is the key to enabling the elimination of fungicide inputs in the home lawn environment. Irrigation is a critical part of the management scheme for this disease. Because the pathogen has destroyed the root system of the plants, the use of light, frequent irrigation is necessary to supply the plant with the needed water to cool the plant, and enough water to keep the plants alive during the warm summer periods. Also the irrigation should be done during between 12:00 and 4:00 PM in order to maximize the cooling effect of light applications of water. Additionally, the use of light applications of water helps maintain a moist soil and thatch layers that helps to maintain high populations of bacteria. These bacteria have been shown to produce compounds that inhibitory to many plant pathogens. The use of proper irrigation practices can aid the homeowner and lawn care professional in managing this disease. Another practice that is crucial to the management of this disease is proper fertility. The key factor in choosing a nitrogen source to help manage this disease is the need to use a slow release form of nitrogen. Research has shown that slow release sources of N like coated ureas, IBDU, and UF are more effective in managing the disease than fast release sources like urea. Overall, the goal for management of this disease is to allow the plant to survive the most stressful periods of the year and allow the homeowner to maintain the quality lawn they desire without major expense.

Rusts

The rusts that occur on home lawn turf are very common. These diseases are also somewhat easier to control that the other two diseases that have been discussed. Typically on mowed lawns rusts are more of an appearance problem than an actual problem that endangers the health of the turf. However, many times the lawn care professional is faced with job of explaining to the client that the "stuff" that colors their shoes orange are not a problem to the health of the turf. The client often responds that they want the "stuff" cleared up so their shoes don't keep turning orange when they walk in their yard. Rusts are caused by fungi from the genus *Puccinia*. These organisms often can have very complex life cycles often involving more than one plant species. Rusts can be problems on many different turfgrasses, but they are most severe on Kentucky bluegrasses and perennial ryegrasses. The spores of the fungus present on the grass blades are often orange pustules that can be rubbed off onto clothing, shoes, etc. Management of this disease involves maintaining proper nitrogen levels in the plant. A good rule of thumb in assessing the severity of the rust problem is that if the lawn can be mowed once every seven days, rust should not be a major problem. Therefore, rusts usually appear in areas of slow growth and in areas that are nitrogen deficient. Practices that encourage healthy growth are beneficial in the management of this disease. A few words of caution should be mentioned with regard to this disease- during late fall, applications of nitrogen can make the turf susceptible to snow molds that can be devastating to a home lawn. In the fall cool temperatures often causes the growth of the turf to slow down, and during this time addition applications of nitrogen will not benefit the turf. Since rust is a minor disease that will not re-occur until the next late summer period and therefore no fungicide applications are recommended.

Conclusion

To summarize the cultural practices that affect disease severity in a home lawn situation the following table is included:

Disease / Cultural Practice	Fertility	Irrigation
Melting-out		light, daily apps afternoon
Necrotic Ring Spot		light, daily apps afternoon
Rusts		—

Keeping the ideas presented here in mind when assessing a disease management strategy for a client can save the client money, and reduce the potential chemical inputs that could be incurred by chemically treating the disease. These concepts clearly demonstrate that by educating the client to what the turf needs in order to maintain a quality lawn one can have a high-quality lawn without causing an undue financial burden.