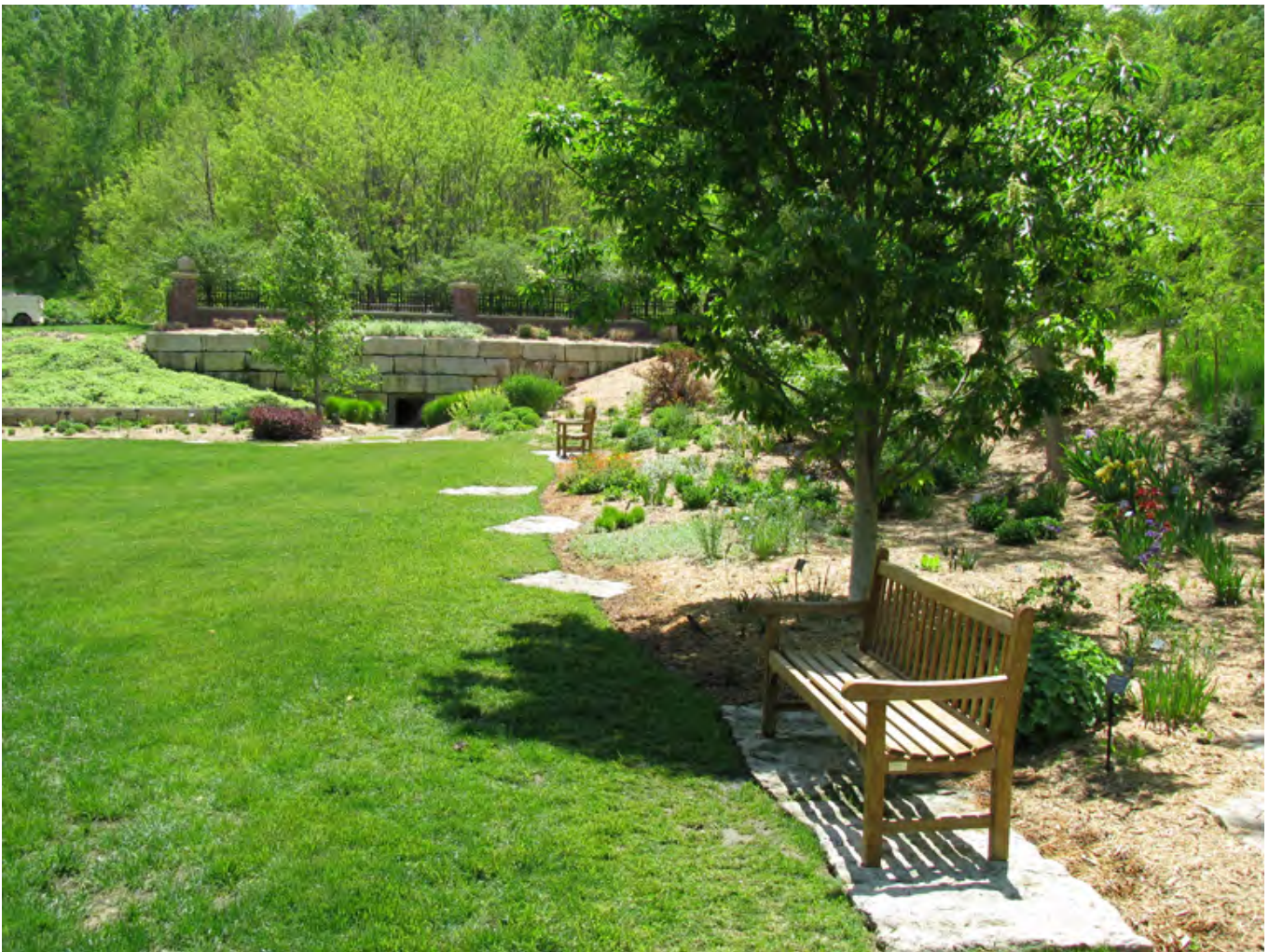


The Relationship Between Irrigation and Pest Control

Use these tips to improve how irrigation impacts your integrated pest management on client's lawns.



[1]
Because turf and ornamentals have different irrigation needs, it's wise to group them accordingly. Photo: John C. Fech

One of the most obvious integrated pest management components in terms of pest control is the advent of disease-resistant cultivars of turf and ornamental plants. One needs only to participate in a field day at a land grant university turfgrass research facility to quickly understand their influence. Some IPM components are not so readily observable. The influence of irrigation on pest populations and pest control efficacy is a good example.

Surface leaf moisture

Certain foliage diseases of turf and ornamental plants require “free moisture” on the leaf surface for the spore to germinate and infect the plant. For example, the common disease leaf spot/melting out of turf is caused by a pathogen (actually two closely related pathogens) that is favored by dry periods that alternate with prolonged cloudy, wet weather. Under favorable conditions, an abundant number of spores are produced and are spread to uninfected leaves via wind, mowers and other turf equipment, splashing water, foot traffic and infected grass clippings. They germinate when they come into contact with water droplets on the leaf surfaces that remain for more than four hours.



As plants grow, they can encroach and deflect the output of irrigation heads, leading to the inefficiency of pesticide applications. Photo: John C. Fech



[3]

Photo: John C. Fech

The conditions required by leaf spot and most other foliage diseases to become a pest in the landscape are worsened through poor irrigation procedures/timing. When trying to lessen the spread of these diseases, it's important to water in the early morning hours so leaf surfaces can dry during the daytime. Late-evening watering tends to extend the natural period of leaf wetness, increasing the likelihood that infection will occur. When watering ornamental plants, using drip irrigation to avoid wetting the foliage altogether is a technique to consider.



[4]

Misaligned heads can often lead to drought stress for shrubs and subsequent pest injury. Photo: John C. Fech

Life down under

The growth of a healthy root system is vital to the overall success of the landscape. Hidden as it may be, roots comprise half of the plant tissues and must be alive and thriving to resist pests. Both insects and diseases can cause degradation of the root system.

One of the key factors in white grub population growth is the relative ease of egg laying by the adult, or oviposition. Ideally, you want the soil to be moist enough for the turf plants to have the capacity to draw the water it needs, yet dry enough to resist oviposition. Keeping the soil moist is a function of monitoring soil moisture and adjusting controller run time accordingly. On the other hand, underwatered turf will exhibit pest damage from insects such as sod webworms and bluegrass billbugs sooner than healthy turf, and will be slower to recover after insect or mite injury. Underwatered shrubs, perennials and ground covers respond similarly.

The level of soil moisture can also affect fungal diseases such as Pythium blight. The two most influential conditions for occurrence of Pythium blight are poor soil drainage and a wet turfgrass canopy. Waterlogged soils along with high relative humidity and very warm daytime temperatures provide the ideal environment for its development.



[5]

Because turf and ornamentals have different irrigation needs, it's wise to group them accordingly. Photo: John C. Fech



[6]

Photo: John C. Fech

Influence of thatch

Excessive thatch can also enhance the development of Pythium blight. Layers in excess of .5 inch can act as a retaining agent for waterlogged soils, holding too much water and not allowing adequate oxygen exchange.

Under drier than optimal conditions, the opposite effects take place, with the thatch layer serving as a barrier to the infiltration of irrigation water. This is especially visible in landscapes where the turf is sloping and the water is encouraged to run off after an irrigation event, decreasing the time necessary for adequate infiltration.

In general, thatch accumulations of more than .5 inch reduce heat, cold and drought hardiness, and increase the incidence of localized dry spots, scalping and pest problems. As thatch accumulates, there is a tendency for root growth to occur in the layer of thatch rather than the

soil. This is problematic, as the turf will become poorly rooted and prone to stress injury and damage from pests.



[7]

Excessive thatch can reduce the effectiveness of pesticide applications by facilitating runoff, especially on a slope. Photo: John C. Fech

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Weeds are pests, too

Broadleaf and grassy weeds can be controlled through IPM methods. The best defense against weeds is a thick, dense, well-managed turf that can compete with weeds for light, nutrients and water. When turf stands thin, management strategies should be analyzed, including the application of herbicides to suppress or kill unwanted plants.

[10]

A broken or leaking irrigation head is suspected. Photo: John C. Fech

After applying a preemergence herbicide, it's wise to water the product in with at least a .5 inch of water to move the herbicide off the leaves, through the thatch and into the zone of activity, the upper 2 to 3 inches of soil, where germination occurs. This should be done evenly for best results.

Postemergence herbicides should be utilized differently. It's best to avoid application of postemergence herbicides to turf and weeds under heat or drought stress as injury may occur. Water the turf thoroughly before application to assure weeds are growing actively, but unlike with preemergence herbicides, avoid irrigation for several days after application, as watering can wash the herbicide product off the leaves of the weed.

One overall factor

Problems dealing with root dieback, leaf moisture, thatch, runoff and weed control can be greatly lessened through an irrigation system audit. It has been documented that most landscape clients who control the frequency and run time of their systems tend to irrigate for the dry spots, meaning they simply allow the system to run until the entire turf area is green, regardless of irrigation uniformity.

In some scenarios, both with turf and landscape irrigation, distribution uniformity can be quite inefficient. This is most obvious when an audit is conducted.

[11]

Waterlogged soils can stress root systems by excluding soil oxygen. Photo: John C. Fech

The first step in conducting an irrigation audit is to turn the system on and watch it run. Look for obvious flaws such as heads that don't turn, pop up or spray the street. Water spray deflected by plants that have grown larger since their installation is another commonly ignored flaw. These limitations will reduce the effectiveness of pesticide applications, such as preemergence herbicides that require uniform application of water to be effective.

Next, set out collection devices (tuna cans work great) near and between irrigation heads and run the system for 20 minutes to measure how much each head puts out. Make notes of any discrepancies that exist greater than 20 percent and replace/repair as appropriate.

[12]

As an irrigation audit is conducted, obvious flaws can be identified and marked for repair or replacement. Photo: John C. Fech

In addition to repairs in the irrigation system, it's important to consider adjustments to the landscape design. As groups of plants, each has differing needs in terms of water and nutrients; generally, most ornamentals require a third to half as much as turf.

Instead of colocation, work with your clients to establish various irrigation zones in the landscape. Commonly, a high-maintenance zone will be placed near a building entrance, the

front door to a residence, back patio spaces and other visible and highly trafficked areas. After these have been identified, a medium-maintenance zone and a low-maintenance zone are natural designations. In addition, avoid a single station that waters both sunny and shady areas, as the water needs will be different in each. At the very least, separate the turf from the ornamentals by establishing mulch beds that connect ornamental plants in a grouping, rather than being dispersed throughout the landscape space.

Editor's note: This article was originally published in June 2010 and has been updated for accuracy and comprehensiveness.

Tags: pest control^[13]

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