Nutrients, irrigation affect turf disease

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Turfgrass managers control the variables associated with fertilization—the N source, the amount applied and timing.

Quality turf needs fertilizer. Nitrogen is the most important of the 17 elements essential for turf. It provides for leaf growth and green color. Nitrogen requirements vary by turfgrass species and cultivar.

Turfgrass managers can control variables associated with turfgrass fertilization—the nitrogen source, quick release versus slow release, pounds of N applied per year, amount applied per application.

Fairy ring disease can appear in all turfgrasses.

The amount of applied N effects turf growth and disease development. Limited turf growth occurs under low nitrogen fertility. Only a few turf diseases will develop because of low, inadequate nitrogen levels.

Lush growth a target

The majority of diseases result from too much N causing lush leaf growth and plants with reduced disease tolerance, particularly when the turf may be under environmental stresses.

A single application of large amounts of N can also pose problems. It creates lush leaves that are predisposed to pest attack. Infections occur as the growth effect from nitrogen begins to wear off and the rate of leaf elongation slows down. To avoid this, either apply smaller amounts of quick-release or use slow-release nitrogen fertilizers.

In general, highly maintained turf like golf greens with a low height of cut, require more nitrogen than a typical home lawn. Nitrogen also has to be applied more frequently in smaller amounts per application on a golf green than on a home lawn. Different turfgrass species and the ability of the underlying soil to hold nutrients contribute to the rate and frequency of fertilization. Golf greens are fertilized at ¼ to ½ pound of nitrogen every three to four weeks while a home lawn gets one pound of nitrogen every two to three months.

Potassium a help

Potassium is one of the few other nutrients directly identified with disease development in turf. Adequate levels of potassium in the soil make turf more tolerant to stress and pests. High potassium levels may not eliminate turf diseases but they reduce disease severity. Inadequate potassium nutrition makes turf more susceptible to diseases like spring dead spot of bermudagrass.

A casual relationship has been noted with phosphorus with turf diseases. Turf grown on phosphorus deficient soils has shown an increased susceptibility to pythium and root rot

DISEASES THAT BECOME SEVERE UNDER LOW NITROGEN LEVELS

anthracnose
cercospora leaf spot
dollar spot
red thread
rust
take-all patch.

DISEASES THAT BECOME SEVERE UNDER HIGH NITROGEN LEVELS

brown patch
copper spot
curvularia blight
fusarium patch
gray leaf mold
gray snow mold
leaf spot, melting out
necrotic ring spot
pink snow mold
powdery mildew
pythium blight
stripe smut
summer patch
yellow turf
yellow patch

Brown patch in St. Augustinegrass. The disease likes high N content.

SUGGESTED NITROGEN FERTILIZER SCHEDULES

Turfgrass species	Lbs. N/1,000 sq. ft. per year	Number of fertilizer applications/year
Bahiagrass	2-3	2-4
Bentgrass		
Greens	4-8	6-10
Fairways	1-4	2-5
Bermudagrass		
Greens	8-12	8-14
Fairways	2-5	3-6
Athletic Fields	2-5	3-6
Home Lawns	2-4	3-6
Centipedegrass	2-3	2-3
Fine Fescues	2-4	2-3
Kentucky Bluegrass		
Fairways	3-5	4-6
Home Lawns	2-4	2-5
Perennial Ryegrass		
Fairways	3-5	4-6
Home Lawns	3-5	3-5
Overseeded Greens	4-6	5-8
St. Augustinegrass	4-6	4-8
Tall Fescue	2-5	3-4
Zoysiagrass	2-4	3-5

diseases. These observations have been made primarily on sand/soil-based golf greens.

The role of pH

Other soil factors have indirect influences on turf disease development. Take-all patch, summer patch, and pink snow mold are more severe under pH conditions. Adjusting the soil pH minimizes disease severity. Ammonium sulfate as an acidifying nitrogen fertilizer source to lower soil pH reduces the severity of these diseases.

Turf irrigation

Turf requires about 43 inches of water per growing season. The eastern United States and the Pacific Northwest usually have adequate annual rainfall. Even so, rainfall is unpredictable and irrigation is sometimes a necessity to keep turf green. Too little moisture causes turfgrass to wilt and, eventually, go dormant.

Too much moisture can lead to disease. Irrigation rates and frequency depend on the weather, turf species, soil and turf management level. For instance, periodic wetting and drying of turf provides conditions favoring some turf diseases, such as *Helminthosporium* leaf spot complex in early summer.

Nighttime irrigation has been thought to increase disease. Irrigate at 4 a.m. to 6 a.m., when wind is at a minimum, for greatest efficiency. Sunlight will then dry the turf.

Dry spots

Localized dry spots are often misdiagnosed as disease or insect problems. The turf turns brown and dies in patches when the soil dries out beyond the wilting point.

Non-ionic surfactants or wetting agents give short relief.

Weather effects

Regardless of management practices, the weather ultimately dictates disease severity. Most turfgrass pathogens are always present in the thatch or soil. For example, the *Rhizoctonia* organism is routinely found in turf samples submitted for diagnosis. Turfgrass pathogens cause disease symptoms under optimum plant susceptibility, temperature and moisture conditions.

Disease control

There are two basic approaches to the application of fungicides—preventive or curative. Effectiveness depends on the disease organism and the mode of action of a given fungicide.

Curative fungicides take care of easy-to-control diseases such as brown patch that cause primarily cosmetic damage.

Difficult-to- control diseases such as summer patch or *Pythium* are typically treated on a preventive program. □

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