EARLY-SEASON FERTILIZATION

Applying the right fertilizer at the right rate and at the right time is an important step toward growing high quality turf.

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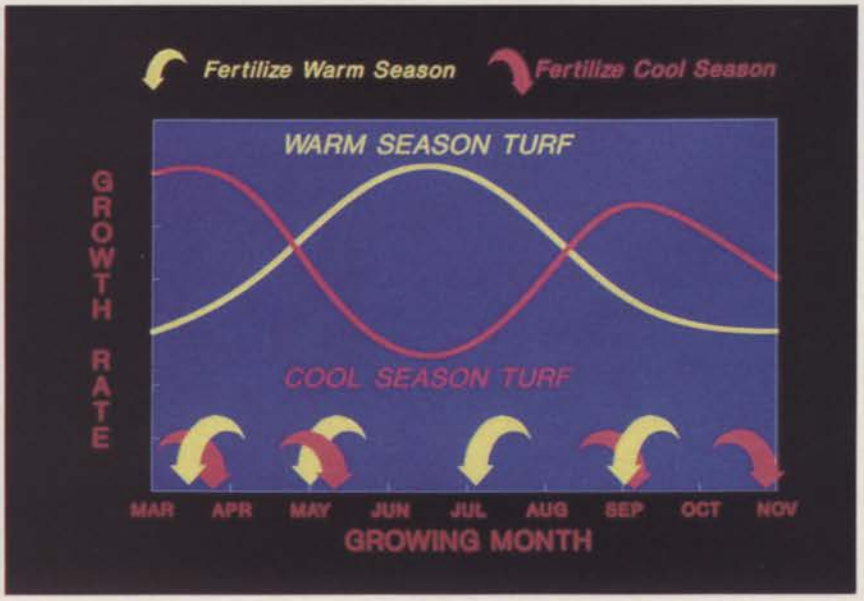
To get a high quality turfgrass stand, you need to conscientiously and judiciously implement a number of management factors. Fertilization, one cultural practice, involves several considerations. If it is properly addressed, it can help you maintain quality turfgrass.

Correct choice of fertilizer carrier, laboratory soil analysis to determine fertility needs, and equipment calibration—all need to be completed before the growing season as they are vital to success.

Fertilizer that is poorly applied can result in lost revenue from call-backs or turf loss. Therefore, application equipment should be calibrated regularly.

FIGURE 1.



Nutritional needs

Nutrients required for turfgrass plant growth are divided into two general categories. Nitrogen, phosphorous, potassium, magnesium, sulfur and calcium, required by turfgrass in relatively large quantities, are called macronutrients. Iron, boron, manganese, copper, zinc, chlorine and molybdenum, needed in relatively small amounts, are termed micronutrients.

Supplemental application of magnesium and calcium, as well as boron, manganese, copper and chlorine is not usually necessary because these elements are in abundant supply in the growing environment. So are carbon, hydrogen and oxygen, which also are required for turfgrass growth.

The primary nutrients the turfgrass manager is concerned with are nitrogen, potassium and phosphorous. These elements are used by the growing turf in large quantities and must be replaced in the soil via fertilizers to insure healthy green growth.

In some instances sulfur, iron and zinc may also require supplemental application.

The turf manager's decision of the

product to use depends on the turf's nutritional needs. These needs are best determined by soil testing at a reputable soil testing laboratory.

Most state universities have a soil testing facility. Cost is relatively inexpensive. Commercial testing laboratories are also available. Check with your local county extension office for the availability and cost to analyze your soil samples.

Follow guidelines

Many testing laboratories will provide sample containers as well as guidelines for proper sample collection. Follow these guidelines explicitly; test results can be no better than the sample collected in the field.

A basic fertility test will include pH, available phosphorous and exchangeable potassium. Because nitrogen is very transient in the soil and a sound fertility program will include nitrogen application, nitrogen analysis is not required or recommended. The basic fertility test will, however, indicate the need for supplemental phosphorous or potassium.

In certain regions of the country, especially the western U.S., a soluble salts test is also recommended.

Nitrogen sources

A myriad of nitrogen sources are available on the market, each with characteristics that influence their adaptability to a turf care operation.

Nitrogen sources can be categorized as "slow" or "quick" release, depending on the speed of release in the carrier and its availability for plant growth.

Release of nitrogen from fertilizers is by chemical or biological means, depending on the nitrogen source. Urea, ammonium nitrate and ammonium sulfate are very water soluble and quickly dissolve after a rainfall or when irrigated. Other carriers, such as ureaformaldehyde or natural organic fertilizers, require microbial activity for nutrient release.

Conditions which favor microbial activity with these types of fertilizers, such as moist soil and warm temperatures, also hasten nitrogen availability.

The nitrogen in IBDU becomes available as the product is hydrolyzed, so release depends on soil moisture, as well as fertilizer particle size. Another important facet of nitrogen sources is the salt index, which indicates the burn potential of a particular fertilizer. The higher the index, the greater the potential for fertilizer burn.

Carriers which have a high salt index per unit of N should not be used when conditions are favorable for burn (such as high temperatures and low soil moisture). A summary of some common nitrogen sources and their characteristics is shown in Table 1.

TABLE 1.

N SOURCE CHARACTERISTICS

N-SOURCE	SALT INDEX	RESIDUAL (WEEKS)
QUICK RELEASE		
Urea	1.62	4-6
Ammonium Nitrate	3.18	4-6
Ammonium Sulfate	3.25	4-6
SLOW RELEASE		
IBDU	0.20	6-8
Methylene Urea	0.86	6-8
Ureaformaldehyde	0.20	52+
Sulfur Coated Urea	0.70	Varies
Natural Organics	0.70	Varies

TABLE 2.

MONTHLY N REQUIREMENTS FOR DIFFERENT COOL SEASON TURFGRASS SPECIES AT TWO MANAGEMENT LEVELS

	LBS N/GROWING MONTH/1000 SQ FEET Management Level	
	LOW	MED-HIGH
Chewings Fescue	0.2-0.3	0.4-0.6
Red Fescue	0.2-0.3	0.4-0.6
Italian Ryegrass	0.3-0.4	0.5-0.6
Common Ken. Bluegrass	0.3-0.4	0.5-0.6
Perennial Ryegrass	0.3-0.4	0.5-0.6
Tall Fescue	0.3-0.4	0.6-0.7
Kentucky Bluegrass	0.4-0.5	0.6-0.7
Creeping Bentgrass	0.4-0.5	0.6-0.7

Within each range higher N level should be used if clippings are removed, if soil is sandy and if turf is irrigated frequently or grown in a high rainfall area.

Application timing

Differences in geographic location, soils, climate and species will strongly influence application timing. These general recommendations for timing and rates should only be used as a guideline, making adjustments as necessary.

Application timing is strongly influenced by turfgrass species. Warm-season turfs, like bermudagrass and zoysiagrass, are fertilized at a different time of year than cool-season turfs like tall fescue and Kentucky bluegrass.

This timing difference is closely related to when these turfs are actively growing. Warm-season turfs go off-color in the fall and, depending on location, will not green-up in the spring until as late as April or May. Cool-season turfs, on the other hand, grow actively in the spring and fall, but growth is minimal in the late summer months.

Cool vs. warm

In general, fertilizer is applied to an actively growing turf. There are, however, exceptions to this guideline. Cool-season turfs should be fertilized in the late fall, after the last mowing of the season.

University research and practical experience has shown that cool-season turf fertilized in the late fall has better root growth, fewer weeds, disease and thatch, longer fall color, and earlier spring green-up than turf fertilized in the spring.

A strong disadvantage to spring fertilization is a flush of top growth at the expense of root growth prior to the

TABLE 3.

MONTHLY N REQUIREMENTS FOR DIFFERENT WARM SEASON TURFGRASS SPECIES AT TWO MANAGEMENT LEVELS

	LBS N/GROWING MONTH/1000 SQ FEET Management Level	
	LOW	MED-HIGH
Buffalograss	0.0-0.1	0.2-0.4
Bahiagrass	0.0-0.1	0.2-0.4
Centipedegrass	0.0-0.1	0.2-0.4
Carpetgrass	0.2-0.3	0.4-0.6
St. Augustinegrass	0.3-0.4	0.5-0.7
Zoysiagrass	0.3-0.4	0.5-0.7
Bermudagrass	0.4-0.5	0.5-0.7

Within each range higher N level should be used if clippings are removed. If soil is sandy and if turf is irrigated frequently or grown in a high rainfall area.

Source: Dr. Gaussoin

summer stress period. For this reason, spring fertilization of cool-season grasses is not recommended.

If a spring fertilization is applied for client or owner satisfaction, the rate should not exceed more than ½ lb. N/1000 sq.ft. (see Table 2).

Warm-season grass fertility programs should be started in the early spring, as the turf becomes active, and continue through the active growing season.

Over-stimulation of warm-season grasses in late fall should be avoided because succulent growth may be more susceptible to frost damage or winterkill (see Table 3). A general growth cycle and fertility schedule for warm- and cool-season turfs is shown in Figure 1.

Adjustments for geographic location and attention to previously discussed timing exceptions should be considered before planning application timing.

Proper rates

Application rates of nitrogen fertilizers depend on species, as well as the level of maintenance desired. Turf that is well fertilized will require more frequent mowing and irrigation, but it will be of higher quality.

Management practices will also influence fertility rate. For example, if clippings are removed, higher rates of fertilizer need to be applied to compensate for the loss of nutrients in the removed clippings. Additionally, if the turf is irrigated frequently or grown on sandy soils or in a high rainfall region, higher nitrogen levels should be used (see TABLE 2 for monthly nitrogen requirements for most turfgrass species). **LM**

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