

*Cool-Season Grasses***Lawn Maintenance Calendar**

**E**stablished lawns may be maintained at different levels of perfection according to individual situations and desires, but good lawns seldom “just happen.” This summary outlines major steps required to maintain a high-quality lawn year round.

Steps in boldface type indicate a minimum program where time, money or interest dictates a usable lawn with least effort. Other selected steps of the schedule may be adopted occasionally or in alternate years to upgrade the program.

Timing is approximate for central Missouri. It may vary two weeks or more from one area to another in the state or from year to year.

**March**

- **Use broadleaf herbicides for perennial and winter annual weeds not controlled in the fall.**
- **Overseed thin spots early if missed last fall.**
- Before growth starts, power rake or mow to remove excess old growth. This also speeds soil warming and lawn green-up. Watch for moles: Traps and baits are excellent means of control. Repellents containing castor bean oil are also effective.
- **Have the soil tested if you have not done so recently.**

**April**

- **Fertilize with 0.5 to 1 nitrogen per 1,000 square feet, preferably with a slow-release fertilizer (see Table 1).**
- **Start mowing as needed at recommended heights (see Table 2).**
- Remove excessive and heavily diseased clippings. Watch for leaf spot and mildew diseases.
- **Aerate if thatch is heavy or soil is compacted.**
- Use crabgrass preventers by April 15. Start top-dressing low spots as grass grows.

**May**

- **Do not apply nitrogen fertilizer, particularly quickly available soluble forms, past May 1 as it will encourage development of foliar diseases.**

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*This publication refers primarily to cool-season grasses such as Kentucky bluegrass, perennial ryegrass, tall fescue and fine fescue. For zoysia and Bermuda grass lawns, see MU Extension publication G6706, Establishment and Care of Zoysiagrass Lawns.*

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- Apply postemergence broadleaf herbicides for summer weeds. If needed, start postemergence control of crabgrass, goosegrass or nutsedge near the end of the month. (See MU Extension publication IPM1009, *Turfgrass and Weeds*.)
- Watch for first brood of sod webworm. Apply insecticides about 10 days after major moth flight.

**June**

- Start watering as needed. Water infrequently to a depth of 6 inches. Don't overwater, as that can promote fungal growth, but water frequently enough to prevent drought stress. All grasses under stress are susceptible to disease. Avoid puddles and runoff.
- **Increase mowing height by ½ to 1 inch if grass stand is thin.**
- Rapidly growing lawns need frequent mowing. Taller mowing heights of about 2½ to 3 inches reduce the chance for turf scalping. Be alert for sod webworm.
- **Lightly fertilize and treat webworm-damaged areas.**
- Let clippings remain unless they are excessive.

**July**

- Continue frequent mowing, and irrigate only enough to prevent turf wilting (about 1 inch of rain or irrigation per week). When irrigation is needed and conditions are hot and humid, water between 6 a.m. and 10 a.m. to reduce disease occurrence.
- **Irrigate two to three times a week as soil absorption allows. Avoid frequent, daily irrigation.**
- **Search for white grubs in brown areas.** Dead turf in those areas easily can be peeled from the surface. If five to 10 grubs appear in 1 square foot, treat with an appropriate grub insecticide near the end of the month. Thoroughly irrigate to move the insecticide into the zone where grubs are active.

**August**

- Fall seeding and sodding is best. Prepare seedbed now.
- Continue watering and insect control. Make plans for fall lawn renovation. Select and purchase grass seed

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and fertilizer. If lawns are to be totally renovated, kill all vegetation with a glyphosate (Roundup) application near midmonth. If trying to kill Bermuda grass, apply glyphosate on Aug. 1 and again one month later.

- Have soil tested if you are unsure of basic fertility level.
- Soak dormant lawns in last week to start fall growth.

## September

- **This is the most important time to fertilize. Use well-balanced lawn fertilizer to apply 1 to 1½ pounds of nitrogen per 1,000 square feet.**
- **Plant or sod new lawns early. Keep soil moist.**
- **Aerate where needed.**
- Rake. Dethatch. Kill weed patches. Overseed thin spots. Resume top-dressing if needed.
- **Late September is the best time for broadleaf herbicides, especially for perennial broadleaf weeds.**

## October and November

- **Mow at regular heights until growth stops.**
- **Apply lime if soil test indicates need.**
- Fertilize moderately after cool days slow leaf growth. Nutrients at this time will encourage root growth and thickening of turf. Soluble nitrogen fertilizers are used more efficiently by turf in late fall.
- **Keep leaves from packing and smothering grass.**
- **Be sure turf goes into winter with moist — not wet — soil.**
- **Recondition lawn mower. Store mower with clean oil and empty fuel tank.**
- Use soluble fertilizer or calcium chloride instead of salt for melting winter ice.

## Maintenance

The key to good maintenance is doing those things that best counterbalance unfavorable conditions in the lawn environment. To attain equal success, lawns on soils of inferior physical quality or low fertility require more attention than those on deep, friable loam-type soils. Followed properly, the steps below should provide satisfactory lawns.

## Fertilization

Variation in soils, lawn standards and grasses require different approaches to lawn fertilization. The ideal program provides for uniform moderate growth throughout the season. Such growth can be provided through fertilization programs that use organic forms of nitrogen.

Problems arise when rates and forms of fertilizer cause irregular “spurts of growth,” especially in spring and summer. Turf that is not fertilized enough has little competitive ability against weeds or disease.

Nitrogen recommendations and materials tend to overemphasize the dark green color and fast growth

response. In too many cases, this has been detrimental to balanced plant growth and health. For example, much emphasis has been given to early spring as the best time to fertilize bluegrass. If a lawn is stunted and has a pale to yellowish-green appearance, a very moderate feeding at this time would be advisable.

On the other hand, fertilizing a lawn that already had moderate vigor at the time most of us get “spring gardening fever” will stimulate excessive succulent growth. The grass becomes more susceptible to fungi, which will take their toll a few weeks later during summer stress. In addition, excessive leaf growth usually occurs at the expense of new root growth, placing the plant at a further disadvantage for summer.

## When to fertilize

All lawns should be fertilized at least once a year. Additional fertilization will depend on the desired level of turf appearance, turfgrass species, soil type and fertilizer carrier. As indicated in Table 1, other fertilizer applications may be desirable and even necessary.

If only one fertilization per year is desired, September is an excellent time for it.

When a second application is desired, mid-October is a good time for it. Moderate rates in October or November, after days are cool enough to discourage vigorous leaf growth (50 degrees F), will help prolong green color into the winter and at the same time encourage development of a stronger root system for next spring’s growth.

If a spring fertilization is desired, it should be done in April. Two or three fertilizer applications in the fall may eliminate the need for a spring application.

When fertilizer is applied at higher rates, give greater attention to thatch- and disease-control measures, as well as to watering.

## Nitrogen fertilizer

The two basic types of nitrogen fertilizer are **soluble** and **slow release**. Soluble types are available quickly to plants even at low temperatures, stimulate rapid growth and are depleted quickly (3 to 4 weeks). Steady, uniform plant growth requires frequent, light applications. Slow-release types of several different forms release nutrients to plants over longer periods of time (6 to 8 weeks) and very slowly at low temperatures.

Lawn specialty fertilizers often contain 24 to 50 percent of the total nitrogen in slow-release form and the remainder in quickly soluble forms. This combination gives immediate response in cold weather while the remainder is available over a longer period.

When 35 to 50 percent or more of the nitrogen is a slow-release type, rates may be increased at least 50 percent, especially for high-quality management. With these fertilizers, frequency of application may sometimes be reduced.

Precaution: Nitrogen sources from urea (quickly soluble) should not be confused with urea-formaldehyde (UF; slowly available).

**Table 1. Fertilizer application schedule.**

Turf type	Total lb N per year	Apply at recommended rates*			
		April	Sept.	Oct.	Nov.
Common type Kentucky bluegrasses	2–3	■	■	■	
Higher quality bluegrasses	4–5	■	■	■	■
Red fescues	2	■	■	■	
Bluegrasses and red fescue	2–3	■	■	■	
Tall fescues or ryegrass	3–4	■	■	■	

\* Rates usually supply about 1 pound of nitrogen per 1,000 square feet. (In April, rates can be reduced to ½ to ¾ pound of nitrogen per 1,000 square feet.)

## Rates and frequency

Recommendations are usually based on amounts required to supply a given amount of nitrogen per 1,000 square feet of lawn. Most lawn fertilizers are “complete” in that they contain nitrogen (N), phosphorus (P) and potassium (K), and so, the amount of phosphorus and potassium applied is determined by the ratio of these two elements to nitrogen.

Two fertilizers with label analyses of 20-5-10 and 12-12-12 would contain 20 and 12 percent N, 5 and 12 percent P, and 10 and 12 percent K, respectively. The N:P:K ratio would be 4:1:2 for the first fertilizer and 1:1:1 for the second.

The amount of fertilizer required to apply 1 pound of nitrogen to 1,000 square feet can be calculated by dividing 100 by the percent of nitrogen in the fertilizer (for example,  $100 \div 20 = 5$  pounds fertilizer per 1,000 square feet). The same formula would apply for phosphorus, potassium or any other nutrient percent.

## Suggested annual fertilization schedule

For routine maintenance where a soil test or experience indicates no major deficiencies, use a lawn fertilizer with an approximate ratio of 3:1:1 or 4:1:1 or 4:1:2 at recommended rates according to the schedule in Table 1.

Where a soil test indicates low phosphorus or potassium levels, or where basic fertility levels are not known, use fertilizers with a ratio that more closely approximates 1:1:1 or 2:1:1 or 3:1:2. If lawn application rates are not given on the container, amounts to apply can be calculated as in the example above.

## Lime

Do not routinely apply lime to established lawns unless a soil test indicates a need. Excess can be as harmful as deficiency. Established lawn soils seldom need to be limed unless a soil test indicates a moderately to severely acid soil of pH 5.8 or lower.

Where such need is indicated, apply finely ground or specially pelletized agricultural limestone at rates up to 50 pounds per 1,000 square feet. If more is required, make separate applications about six months apart. Limestone

**Table 2. Recommended seasonal mowing heights for cool-season grasses in Missouri.**

Turfgrass	Seasonal mowing heights (inches)*		
	Spring	Summer†	Fall
Tall fescue	2.0–3.5	3.0–4.0	2.5–3.5
Kentucky bluegrass	1.5–2.5	2.0–3.5	1.5–2.5
Perennial ryegrass	1.5–2.5	2.5–3.5	1.5–2.0
Creeping red fescue	1.0–2.0	2.0–3.0	1.0–2.0
Chewings fescue	1.0–2.0	2.0–3.0	1.0–2.0
Hard fescue	1.5–2.5	2.0–3.0	1.5–2.5
Sheep fescue	1.5–2.5	2.0–3.0	1.5–2.5

\* Mowing heights may be adjusted according to climatic conditions, intensity of culture and intended use.

† Summer mowing heights should be used when turfgrasses are grown in shaded conditions.

can be applied almost any time, but fall or early winter is the best time.

## Mowing

Mowing height and frequency directly affect the performance of a lawn. The shorter turf is cut, the more frequently it should be mowed. The common practice of mowing a lawn short under the assumption it will require less frequent cutting is responsible for much lawn deterioration.

When grass is cut too closely, not enough leaf surface remains to manufacture necessary foods for sustenance and root growth. For this reason, a standard guide is to never remove more than one-third of the green leaf area with a single mowing. If a mowing is missed, cut only half the way back to the intended height, and then a couple of days later cut to the regular level. Recommended mowing heights are presented in Table 2.

Clippings need not always be removed. When they are short enough to filter down to the soil surface, they decay and recycle nutrients back to the soil. Remove clippings when they remain on the surface or when excessive thatch is already causing a problem.

## Watering

Bluegrasses, fescues and other cool-season grasses naturally protect themselves by going into a semidormant stage during periods of high temperature or drought. They cease growth and turn brown but bounce back quickly with sufficient water and cooler temperatures, usually in September.

Except in cases of extreme prolonged drought, tall fescue and Kentucky bluegrass do not need water to stay alive during the summer; however, their appearance suffers. During dormancy, drought-tolerant weeds such as crabgrass, plantain, thistles and dandelion dominate lawns.

Because of its deep extensive root system, tall fescue remains green longer into the summer than other nonirrigated cool-season grasses.

Kentucky bluegrass has many underground stems, called rhizomes. Each rhizome can produce several new bluegrass shoots that result in turf thickening when water becomes available following summer dormancy, usually in September.

Perennial ryegrass and fescue, other than tall fescue, should not be grown as monocultures — only one grass species — without irrigation in Missouri because of their tendency to bunch during severe moisture stress.

The principal purpose of summer watering is to maintain an attractive green surface when it may be appreciated the most. Watering will not substitute for poor fertility or improper mowing, and can encourage crabgrass and other weed problems. Extra growth stimulated by watering increases fertility requirements, thatch accumulation and other problems.

If, in the desire for a summer green lawn, you cannot give attention to related management, let the turf follow its natural tendencies to go dormant during summer. (Plants are brown in appearance from lack of water but are not necessarily dead.) Homeowners who have a lawn-care service should not allow their lawn to enter drought dormancy.

### **Rules for watering**

- Shallow, frequent sprinkling to add a little water each day is the worst way to water a lawn. It only encourages shallow, weak roots, crabgrass and disease development. Instead, irrigate to full depth of the root system, and wait until the supply is nearly exhausted before watering again. But do not let the grass undergo drought stress. (See MU Extension publication G6720, *Home Lawn Watering Guide*.)
- Bluegrass and red fescue roots may not reach depths greater than 4 to 6 inches during the summer. About 1 inch of water (620 gallons per 1,000 square feet) can be stored in an average Missouri soil to this depth, and this should last about a week. A reasonable rule for summer lawn irrigation is to apply enough water in addition to natural rainfall to total 1 inch per week. On sandy soils that cannot store this much, greater frequency of lesser amounts may be required.
- Don't guess how much water must be applied to reach desirable wetting depth. Place tall, straight-sided cans in the sprinkler pattern, and measure water depth in the cans when the root zone is thoroughly wetted, that is, when puddles and runoff begin to form. Or, when the root zone is thoroughly wetted, thrust a small probe such as a screwdriver into the soil. Decreased resistance to the probe in wetted soil can help gauge depth of wetting.
- Most sprinklers apply water faster than soil can absorb it. Few established lawn soils in Missouri can absorb ½ inch per hour, and many absorb much less. To prevent waste, move sprinklers frequently. Properly engineered permanent irrigation systems with timing controls for interval watering do the best job. A soaker hose is also an excellent choice.

- Steep slopes, hard spots and hot areas require special attention. Mechanical aeration, extra-slow watering and use of wetting agents may help water infiltration.
- Water in the early morning hours (4 to 7 a.m.) instead of during the day or at night. Early morning irrigation will reduce the time leaves are wet and will rinse dew and guttation fluids (water droplets containing sugars and proteins exuded from the plant) off leaves, reducing the chances of foliar disease. Also, winds are calmer in the morning, increasing irrigation efficiency and coverage.

### **Aeration**

On clay- or silt-type soils, or any turf receiving constant traffic, soil sealing and compacting can seriously impair turf growth. Grass roots are injured because air, water and fertilizers cannot reach them in sufficient quantities. Mechanical aeration to break through this barrier is essential for continued turf health. Fertilizer applications following aeration most efficiently provide nutrients to the turf roots.

Aeration is best done by power equipment that pulls out small cores of soil, or by cutting vertical grooves to provide openings every 3 to 4 inches. Power equipment is usually available at rental stores. Lawn-care companies may also provide this service to their customers.

For small areas, suitable hand-equipment is available, but using it is hard work. Even an ordinary spading fork plunged into the soil at 3-inch intervals when the soil is lightly moist — not wet — is far better than nothing at all.

Aeration should be done at least once a year where compaction is a problem. Early fall is the best time for bluegrass lawns, but aeration will be highly beneficial anytime the grass is actively growing, except possibly during midsummer heat.

### **Thatch control**

Thatch is a layer of undecayed plant parts accumulating at the turf base. It forms a barrier to water and air movement in the same manner as compaction.

Thatch is primarily a problem of intensely fertilized and watered lawns. Even though clippings are removed regularly, thatch still can form because old plants and basal leaves are more resistant to decay than are the clippings.

Thatch removal should be initiated whenever accumulation exceeds ½ inch. Early fall is the preferred time for dethatching lawns.

For more information on thatch, see MU Extension publication G6708, *Thatch — Enemy of Lawns*.

### **Top-dressing**

Top-dressing is the periodic addition of a thin layer, about ¼ to ½ inch, of soil to the surface of growing turf. Mixing soil with accumulating debris hastens thatch decay. Shallow depressions in a turf can be leveled gradually by this practice as well.

The texture of the top-dressing material should be similar to or coarser than the soil on which the turf already exists. When top-dressing with soil to reduce thatch, the addition of compost or peat moss is not required because the thatch layer is already high in organic matter.

Top-dressing may be done immediately after coring, dethatching or slicing. Never bury the existing turf with too much top-dressing soil. After top-dressing, at least three-fourths of the grass plant should be exposed to sunlight. Never top-dress during the heat of the summer.

## Rolling

Rolling is not desirable for smooth, uneven lawns. Surface compaction is common in many lawns, without adding to the problem by heavy rolling. Rolling moist soil causes maximum compaction — a fine way to build roadways but not soils for turf.

When late winter freezing and thawing have resulted in “heaving” young plants out of the ground, or if mole activity is serious, rolling may be required and is acceptable. In such cases, roll soon after spring thaw when the soil surface is relatively dry, and use as light a roller as possible. Don’t roll more than is absolutely necessary.

## Weed control

The best weed control is a healthy, dense, competitive turf. Correct cultural practices to achieve this will keep out most weeds. In particular, maintaining a proper mowing height and not cutting lawns too short will reduce weed invasion.

Chemical weed killers are useful but should not be relied upon entirely to cure lawn weed problems. Suggestions for timing herbicide applications for several common weed problems are indicated in the calendar of this guide.

Relative merits of using fertilizer-herbicide (weed and feed) or fertilizer-insecticide combinations should be considered carefully before they are used indiscriminately. In many cases, at least one of the ingredients may not be

needed or will be used at an inopportune time. (See MU Extension publication IPM1009, *Turfgrass and Weeds*.)

## Renovation

If your lawn is less than acceptable but contains at least 40 percent desirable grasses, you may be able to replant without preparing a completely new seedbed. Start in August with steps similar to the following:

1. Kill weeds and undesired grasses with appropriate herbicides. If only annual weeds are present, skip this step.
2. Remove dead vegetation with vertical renovating machine or heavy rake set deep enough to bring to the surface a small amount of soil. Clear off all debris.
3. Add fertilizer and lime according to soil test, and then aerate thoroughly.
4. In September, scatter seed of desirable variety and drag or rake into loosened soil surface.
5. Water thoroughly and treat as a newly seeded lawn.

If the original problem was due to soil itself, poor drainage or excessively thick thatch, till the lawn and start over following the steps for establishing a new lawn. (See MU Extension publication G6700, *Cool-Season Grasses: Lawn Establishment and Renovation*.)

## Disease and insect problems

Prevention is the best approach to disease problems in home lawns. Often by the time the disease is diagnosed, the damage has been done.

Controlling thatch, avoiding frequent sprinklings and fertilizing properly for healthy but not succulent grasses are simple lawn-grooming practices that aid disease prevention.

Two major insect pests are white grubs and sod webworm. White grubs are described in MU Extension publication IPM1020, *Turfgrass and Insects*. Routinely inspect the lawn for white grubs and sod webworms. Treat only after the insects have been properly identified and only when they are in sufficient numbers to cause a noticeable loss of turf. Treating lawns every year with insecticides as prevention is neither necessary nor advised.

### ALSO FROM MU EXTENSION PUBLICATIONS

- G6700 *Cool-Season Grasses: Lawn Establishment and Renovation*
- G6706 *Establishment and Care of Zoysiagrass Lawns*
- G6708 *Thatch — Enemy of Lawns*
- G6720 *Home Lawn Watering Guide*
- IPM1009 *Turfgrass and Weeds*
- IPM1020 *Turfgrass and Insects*

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