

Maintaining Turfgrass

By

James Horton

Director

Birmingham Botanical Gardens

Maintaining lawns seems to baffle many homeowners, and that is understandable since everyone has an opinion about the subject, but there are some simple guidelines one should follow to save time and money while protecting the environment. These guidelines can be described as Best Management Practices (BMPs) for maintaining high quality turfgrass. BMPs are methods or techniques that have consistently shown results superior to those achieved with other means, and that are used as benchmarks. In addition, "best" practices can evolve to become better as improvements are discovered.

However, first let's consider two very important questions, especially if you are at the point of installing a new lawn.

What are your expectations? To answer the expectation question, a homeowner has to decide what level of turfgrass quality they are looking for, and how much time and money they are willing to spend. If you want the best quality turfgrass possible, you need to be prepared to spend more time and money than someone who is just satisfied with keeping their lawn regularly mowed. The phrase "No Pain, No Gain" comes to mind. You will receive proportionally better results with the more time and money spent, within reason.

What are your environment conditions? All homeowners should understand the limitations the environment around their home has to offer a grass species. It's therefore most important that the correct grass species be chosen for the lawn with the environment in mind. The environment would include the climate, sun, shade, soil pH, soil type and drainage. In the Birmingham/Central Alabama area, we typically find warm season turfgrasses grown for home lawns. These would include Bermuda, zoysia, centipede and St. Augustine, and to be honest, the last two mentioned really should be grown further south than Birmingham. The only cool season turfgrass grown as a permanent lawn in the Birmingham area would be fescue, and that would perform best if grown in some shade. Fescue actually performs much better if grown further north in Alabama. To narrow the choices again, consider the amount of light your lawn will receive daily. I would not try to grow Bermuda grass in less than 8 hours of sun light per day; centipede 8 to 6 hours; zoysia 6 hours; St. Augustine and fescue 6 to 4 hours. No grass will grow well in shade or dense shade. If you have a shady spot, save yourself some grief and install shade tolerant plants or cover the location with mulch.

As for soil pH, take a soil sample and send it to Auburn University; it will be the best \$7.00 spent toward producing quality turfgrass. Soil sample boxes and forms can be obtained at many garden centers or the Alabama Cooperative Extension System office at the Birmingham Botanical Gardens. Not only will the soil test results tell you how to correct the pH if needed (most turfgrass species prefer a pH of 6.0 to 6.5), it will indicate the nutrient level of the soil and what types of fertilizer to use so you won't waste any money or hurt the environment by applying some elements to toxic levels (more about fertilization later). Soil types are difficult to alter without spending a great deal of money. The best advice here is to use a turfgrass tolerant of your soil conditions. However, drainage issues can be changed and it is best to do so before installing your lawn. Make sure water does not pool in spots anywhere you expect to grow turfgrass or plants unless they happen to be aquatic species. Grade the soil so water will gently drain across and off the area.

Hopefully, if you are installing a new lawn, you have taken a soil test, followed the recommendations to adjust the pH, added nutrients that are deficient, tilled to a depth of 6 inches, amended the soil, graded the soil to allow drainage and installed the proper turfgrass for your local environment.

At this point let's consider that you have an established lawn. The following is a list of BMPs that will assist you in producing the quality lawn you want:

1. Mowing
2. Fertilization
3. Watering
4. Weed Control
5. Insect and Disease Management

Mowing: Mowing is the single most important factor in maintaining turf quality - yet is often overlooked. Each species of turfgrass has a range for the optimum mowing height.

Hybrid Bermuda	1/2" – 1.5"
Common Bermuda	1" – 2"
Centipede	1" – 1.5"
Fescue	2" – 3"
St. Augustine	2" – 3"
Zoysia	1" – 2"

The BMPs for mowing are:

- Mow frequently enough so no more than 1/3 of the leaf is removed at any one time
(If mowing at 1 inch, mow before grass exceeds 1.5 inches)

(If mowing at 1.5 inches, mow before grass exceeds 3.0 inches)

- The higher the mowing height, the less frequently the turf needs cutting
- The lower the mowing height, the more frequently the turf needs cutting
- Raise the mowing height in shade or during very hot weather
- The higher the grass is cut, the deeper the roots grow
- The shorter the grass is cut, the more shallow the roots grow
- Sharpen blades to cut rather than tear
- Grass mowed with dull blades will have a yellow appearance from desiccating torn blades
- Balance blades to avoid scalping
- Cross-cut the mowing pattern on alternate mowing dates
- The larger the mower, the more important to vary the mowing pattern
- Avoid mowing rings around trees; this creates wheel patterns in turfgrass
- Avoid using weed-eaters around tree trunks
- To view striped grass: Dark stripes mowed toward you; Light stripes away from you
- DON'T mow wet grass; clippings will clump, and if not removed, will cause grass to yellow beneath the clumps
- Mowing regularly will reduce weeds by keeping flowers and seed heads cut-off
- Rotary mowers are easier to maintain
- Rotary mowers for most lawns are more than adequate
- Rotary mowers should be used for grasses cut over 1.5 inches in height
- Power reel mowers are expensive to purchase and maintain
- Reel mowers give a cleaner, better-looking cut; the look is dramatically better
- Reel mowers can only be used for grasses cut less than 1.5 inches in height
- Mulching mowers work only with dry grass no taller than the 1/3 rule
- Clippings decompose rapidly if small enough and won't contribute to thatch
- Allow all clippings to fall back into the turf when possible
- Clippings must reach the soil to decompose, allowing nutrients to return to the soil
- No substantial negatives and some positives to leaving the clippings on the lawn
- Nutritional levels of grass clippings = 4% Nitrogen; 1% Phosphorus; 2% Potassium
- Equates to the addition of 1 pound of nitrogen per 1000 ft² per year
- Returning clippings to the turf can reduce the annual nitrogen requirement by as much as 25%

- **Remove clippings from hard surfaces like sidewalks and curbs, so they don't wash into a water source and contribute to non-point water pollution; this is like throwing fertilizer into a body of water and should be avoided**

Fertilization: Soil testing needs to be the foundation of your fertilization program! Nitrogen (N), Phosphorus (P) and Potassium (K) are the big three nutrients needed by all plants including turfgrasses. The proper ratio of N:P:K is a 4:1:2 ratio during the spring and summer and a 2:1:4 ration in the fall for warm season grasses. These warm season grasses should not be fertilized in the spring until the ground temperature is consistently 65°F to 70°F at a 4 inch depth. Cool season grasses like fescue should be fertilized in the fall (2:1:4) and again in the spring (4:1:2) before the soil temperature climbs above 65°F to 70°F at a 4 inch depth. It should be noted that phosphorus and potassium recommendations are based on soil tests while nitrogen recommendations are based on experience by the soil lab and the quality of turf desired by the homeowner.

The first step before actually applying fertilizer is to calculate the square footage of your lawn. Many people skip this step entirely and they have no idea how much to apply and therefore just buy a bag of whatever is on sale and apply the entire bag not knowing if that was too much or too little. This is horrible for the environment since they could be adding more nutrients like phosphorus to the soil than may be needed for years to come. In addition, they usually purchase the cheapest fertilizer possible which is mostly readily available, meaning that it is entirely soluble when irrigated. If a heavy rain occurs during, just after, or within days of the application, most of that fertilizer would be carried off site in the runoff, wasting their money, time and effort, not to mention **contaminating local streams**. Don't apply fertilizers within 10-20 feet of lakes and streams for that same reason. The heavy dump of fertilizer on the lawn will cause a very quick green-up and growth spurt, causing the homeowner to mow more frequently than normal. The excessive fertilization with nitrogen can encourage lush leaf growth at the expense of roots and actually cause the turfgrass to be more susceptible to pests and diseases as well as environmental stresses like drought. The green-up would not last very long (3-6 weeks) depending on rainfall and irrigation before the grass again would lose color. **Avoid the temptation to over-fertilize!**

The BMP for a home owner to apply fertilizer correctly is to follow the recommended rate from the soil test per the calculated area of their lawn and no more. The proper way to apply fertilizer is by applying half the amount in one direction and the other half in the cross direction. Given time and experience, homeowners will learn the art of calibrating their fertilizer spreaders. Cyclone spreaders are much preferred over drop spreaders. If home owners purchased fertilizers that contained at least half or more of the product

as a slow-release or organic form of fertilizer, a heavy rain would have little chance of carrying the fertilizer off-site. Yes, the grass would green-up a little slower but the greening would last longer (8-12 weeks or more) and would not spike the mowing frequency like the readily available soluble fertilizers would. The slow release and organic fertilizers are more expensive but worth the money.

One last comment regarding fertilizing: after the application has been made, go back and sweep or blow all fertilizer off all hard surfaces like sidewalks, driveways, parking areas and streets before watering or rainfall. Be especially careful to prevent fertilizer from getting into storm drains. This will reduce the amount of fertilizer that is carried away by stormwater runoff.

Watering: The standard rule regarding turfgrass is that it needs 1 inch of water per week, especially in the growing season. Warm season grasses can use less while in dormancy during late fall – winter – and very early spring unless there exists a drought. Cool season grass like fescue also needs 1 inch of water per week year around to survive especially in the hot Alabama summers when it goes dormant late June to mid-September. Luckily in Birmingham, we average 53.71 inches of rain per year. If that came evenly each week, we would never have to water but we know that's not true. Stay in tune with the weather and the conditions of your lawn to know when to water.

The BMPs for watering are:

- DON'T overwater.
- Water only living things, NOT sidewalks, driveways, etc.
- DON'T neglect your irrigation system; proper maintenance is key
- DON'T mow or fertilize to stimulate growth during drought periods
- DO choose turfgrasses that are adapted to your climate.
- DO calibrate your irrigation system to estimate how much water is applied per minute
- You should set cans out in the lawn to measure the water applied, even if you use a wave sprinkler to irrigate your turfgrass, so you know how long to leave the sprinkler in place before moving or how much time to set your zones using an automatic system
- Upgrade irrigation systems by adding rain sensors (save 30-35%), moisture sensors (save 76%), and pressure regulators to all irrigation systems
- Install evapotranspiration (ET) based controllers
- Install drip systems where possible and save 50%
- Install sub-meters to reduce sewer charges
- Perform regular irrigation system maintenance
- Maintain as-built maps of all systems as repairs are made
- Use the correct irrigation head for the intended application

- Keep up with new equipment designs, i.e. Matched Precipitation (MP) rotary heads which save up to 30%
- Install check valves on traditional or drip systems and eliminate systems draining
- Irrigate in early morning hours when wind and heat are lowest
- Don't irrigate past 9:00 a.m. if possible
- AVOID mid-day water cycles
- Adjust automatic controllers to seasonal changes
- Maximize output rates at .4" per hour and virtually eliminate runoff
- Cycle irrigation applications (on-off-on-off) to allow penetration and avoid runoff.
- Weather-based irrigation controllers (Smart Controllers) allow for more accurate, customized irrigation by automatically adjusting the schedule and amount of water in response to changing weather conditions. Not only does this save water by reducing unnecessary watering, it allows you to tailor irrigation to meet your landscape's specific plant and climate needs.
- Install other features to help manage water loss like Flow Meters and Master Valves
- Look for ways to capture rain water from rooftops and other hard surfaces using holding ponds and rain barrels
- Most importantly, remember that besides being expensive, over watering is a waste of this precious resource

Weed Control: There are some very basic reasons to control weeds in turfgrass: they compete with the turfgrass for water, nutrients, and light; they harbor insects and diseases; and they lower the aesthetic appeal. Homeowner should know that weeds can be divided into various groups such as: annual, perennial, or biennial weeds; summer or winter weeds; and broadleaf or grassy and grassy-like weeds. Knowing into what group to place the weed will greatly aid in choosing the herbicides to control the specific weed. **So identification is the major key in controlling weeds.** The other major key to weed control is knowing that **pre-emergence herbicides are the foundation of annual grass control.** And since summer and winter is one way weeds are divided, you have to apply pre-emergent herbicides twice a year to control the weeds in both seasons.

To control summer weeds, you need to apply a pre-emergent herbicide in early spring that is labeled for your grass species. The correct timing of this application depends on how early spring comes any given year. This refers to how early the warming temperatures come that influence the germination of weed seed. Generally, for the Birmingham metro area, you should follow these guidelines:

- Be sure to read the entire label and follow all instructions
- Apply pre-emergent herbicides in late February to early March for crabgrass control
- Goosegrass two to four weeks later
- Apply 1/2 the amount per the label recommendation for your square footage of lawn
- Wait 6 to 12 weeks
- Then apply the other 1/2 (This split application may improve control of crabgrass and goosegrass)
- The herbicide may require irrigation or rainfall within a set number of hours or days after application

Some pre-emergent herbicides come with a fertilizer; if so, choose one with a low fertilizer analysis. In February, warm season grasses are not actively growing and do not need a heavy dose of nitrogen. Nitrogen at that time is mostly wasted.

If you “see” weeds in your turfgrass, it’s “too late” for pre-emergent herbicides; you then must use **post-emergent herbicides**. Again, identification is very important to controlling the problem. All herbicides have a list of “weeds controlled” located on the label instructions. If your weed is not listed on a specific herbicide label, you would be wasting your time, money and effort to use it.

The BMPs for weed control are:

- Be sure to read the entire label and follow all instructions
- Know the size of the area to be treated
- Don’t exceed the recommended amount or the turfgrass may sustain damage
- Consider spot treatments instead of entire lawn treatments if the problem is only localized; this will save time, money and reduce chemical pressure on the environment
- **Don’t apply fertilizers and pesticides within 5 -10 feet of lakes and streams**
- The herbicide may require a rain-free period for a set number of hours or days after application
- Use a spreader sticker if it is recommended for liquid application of herbicides
- **Don’t apply pesticides before, during, or just after inclement weather conditions**
- Calibrate your spreader and/or spray equipment often
- Use the recommended spray volume

- Apply the recommended amounts of water to treated areas after the application if necessary
- Evaluate all applications for effectiveness and future use
- All herbicides are labeled as to their **Site of Action (where they work within the plant to achieve control)**. To reduce herbicide resistance, alternate herbicides with different Sites of Actions after two applications.
- Keep accurate records of your treatments; this will help you determine what went wrong if the treatment did not work. Record time, date, weather conditions, application rate, amount of water used, etc.
- Keep all bags and containers labeled and dispose of properly when empty
- **Locate all pesticides and fertilizer storage protected from rain and out of any flood plain**

Insect and Disease Management: Identification is the major key in controlling insect and disease pest problems. You can receive help with identification of these problems at many garden centers. The Alabama Cooperative Extension System office at the Birmingham Botanical Gardens operates a plant diagnostic lab Monday through Friday, 8:00am to 4:30pm where insects and diseased plant samples can be identified and treatments recommended if any exist. Most information is free of charge; however, testing for specific disease diagnoses will require a small fee and may require a week or more to be completed.

Common insects of lawns in the Birmingham metro area include: white grubs, sod webworm, fall armyworm, two-lined spittle bug, chinch bug, bill bug and nematodes (not a true insect). Common diseases include: dollar spot, brown patch, rusts, spring dead spot, fairy rings and stripe smut.

Most turf insects and diseases can be treated with granular or liquid products once accurate identification is obtained. Home lawns usually don't require any preventative applications of insecticides or fungicides. The normal method of treatment for a home lawn is to treat the problem once it manifests itself and is identified.

The BMPs for Insect and Disease Management are:

- The same as those listed above for weed control
- Applications of insecticides and fungicides should be done with consideration for bee safety; read the label and follow all recommendations regarding time of day, season, flowering of nearby plants and drift
- It's worth repeating >>> it is very important to apply the recommended amounts of water to treated areas after the application if necessary; many insects such as grubs and diseases such as fairy rings require the pesticide to be drenched into the soil with enough water volume to reach the pest.

Following these Best Management Practices (BMPs), homeowners should be able to gauge the amount of time and money they want to spend to maintain and achieve the quality of turfgrass they desire while protecting the environment.