LOUISIANA LAWNS

LSU AgCenter Research & Extension



Louisiana Lawns Best Management Practices (BMPs)

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Why BMPs Are Important to Louisiana

In Louisiana we are blessed with beautiful and abundant waters to enjoy fishing, hunting, boating or just relaxing on the shore. Many people in Louisiana are able to reside along the water's edge and enjoy beautiful views of our coastline and bayous. Most of the water in Louisiana's rivers and lakes comes from rainfall runoff. As this runoff travels across the soil surface, it carries with it soil particles, organic matter and nutrients; especially of concern are nitrogen and phosphorus.

Residential activities of caring for our lawns can contribute to the amount of these materials entering streams, lakes, estuaries and groundwater. Lawns adjacent to lakes and bayous are of most concern, but that in-town lawn will drain into a ditch or street drain that ends up in a bayou. Louisiana residents must do all they can to protect their environment.

Research and educational programs on environmental issues related to the use and management of natural resources have always been an important part of the LSU AgCenter's mission. Working with other states' universities, the LSU AgCenter has taken the lead in Louisiana to assemble a group of Best Management Practices (BMPs) for homeowner lawn care.



Collecting Turf Runoff

BMPs are practices used to control the generation and delivery of pollutants from lawn care activities to water resources of the state and thereby reduce the amount of pollutants entering our surface and ground waters. Each BMP is a culmination of research and demonstrations conducted by the LSU AgCenter and other universities.



Introduction

Following the BMPs given here should help keep your lawn in good condition. A healthy and properly cared for lawn will resist weeds and other pest problems; thus, a minimum of pesticide products will be needed.

Basic lawn care consists of proper fertilizing, watering, mowing and appropriate pest management as needed.

Louisiana Lawns BMPs



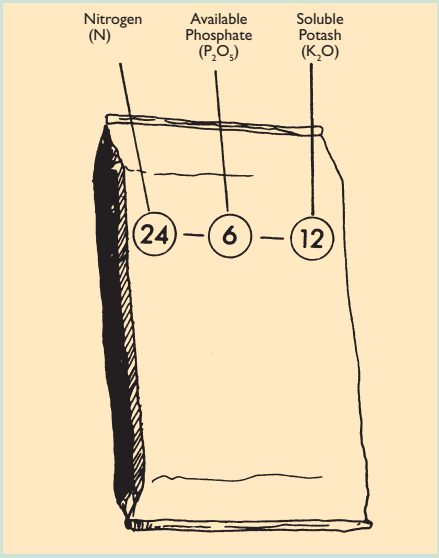
Basic Lawn Care

Fertilization and Application

Most Louisiana soils are deficient or will become deficient in certain soil nutrients. A properly fertilized lawn is more resistant to weeds and other pests. It also will recover more quickly from stress. Soils and their fertility vary greatly within the state, and our lawn grasses have different fertilization requirements. The best approach to turfgrass fertilization is to occasionally take a sample of your soil and have a pint of it tested. The LSU AgCenter offers a low fee service to analyze soil samples for the major soil fertility factors. You may bring the sample to your local AgCenter agent and fill out a form listing the grass type and contact information. Your agent will also get a copy of the results and can help you plan your fertilizer program.

Fertilize with phosphorus, potassium and lime if indicated on the test results. Soils that are too acidic require the application of a lime to improve the root environment. A calcitic lime also supplies calcium to the soil, and a dolomitic lime supplies both calcium and magnesium; so, go with the recommended type of lime. If applying more than 45 pounds of lime to turf, split it into two or more applications applied several months apart and during the cool or winter months.

These nutrients will then be brought to their ideal level for healthy growth. The grass growth can then be controlled with common turf fertilizers that are higher in nitrogen, lower in phosphorus and moderate in potassium. Continual fertilization with common fertilizer such as 8-8-8, 13-13-13 can result in poorer turf health and too much phosphorus in the soil. High phosphorus may leach through sandy soil or be lost with sediment carried by surface water runoff to undesirable places. Excessive phosphorus can result in a decline in turfgrass quality, especially in centipedegrass. Avoid high soil phosphorus in lawns.





Soil Sampling

Table 1 shows the recommended range of nitrogen fertilization. If you use a fast-release nitrogen, such as urea or ammonium nitrate, apply no more than 1 pound of actual nitrogen per 1,000 square feet. You can achieve this proportion by using about 2 pounds of urea (46-0-0) or 3 pounds of ammonium nitrate (32-0-0) per 1,000 square feet. Higher rates of nitrogen with a fast-release source will result in excessive grass growth, may "burn" the grass, build thatch and can predispose the grass to pest damage. Slow-release nitrogen may be put on at higher rates because of its time release factor. Table 2 contains suggested fertilization schedules.

Table 1. Maintenance recommendations.

	Soil Acidity (pH)	Nitrogen (Lb./1000 Sq. Ft./Yr.) *Min - Max*		Mowing Height (Inches) *Min - Max*		Mower Preferred
Common Bermuda	5.8 - 7.2	3	4	1 ¼	1 ½	Reel
Hybrid Bermuda	5.8 - 7.2	4	6	¾	1	Reel
Zoysia	5.8 - 7.2	2	3	1	2	Reel
St. Augustine	6 - 7.5	2	4	2	3	Rotary
Centipede	5 – 6	1	2	1	2	Rotary
Carpet	5 – 6	½	1	1 ½	2	Rotary

Table 2. Suggested schedule using a fast- or slow-release nitrogen fertilizer for turfgrasses in Louisiana.

	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct	Nov.	Dec.
Common Bermuda												
fast	X	X		1		1	1*	1		X	X	X
slow	X	X		1		1-2		1		X	X	X
Hybrid Bermuda												
fast	X	X		1	1	1	1*	1	½ *	X	X	X
slow	X	X		2		1-2	1*	1		X	X	X
Zoysia & St. Augustine												
fast	X	X		1		1		1*		X	X	X
slow	X	X		1		1		1*		X	X	X
Centipede & Carpet												
fast	X	X		½		½ *		½		X	X	X
slow	X	X		1			1 *			X	X	X

X: Nitrogen fertilization is usually wasteful and may harm warm-season turf if applied in the months indicated with X.
* These N applications may be eliminated if color and growth are satisfactory.

Slow-release Nitrogen

Slow-release nitrogen sources are highly recommended for all turf. They can be applied at higher rates without fear of burn or excessive leaching, and, because the nitrogen is released slowly, usually will not cause a major flush of growth. Slow-release nitrogen costs much more than fast-release nitrogen, but you reduce labor costs (or time) because you need fewer applications. A fertilizer containing 100 percent of slow-release nitrogen usually is not available; however, fertilizers containing about 30 percent to 50 percent slow-release nitrogen are common. Other names or indications of this slow-release feature are the terms water-insoluble (WIN) coated, controlled release or slowly available. Urea is a soluble form of nitrogen. Choose fertilizers with slow-release nitrogen, especially in the cooler spring when growth is slow. They should also be chosen if you have sandy soils, lawns that are near surface water or where there is a shallow water table.

Rates and frequency of nitrogen fertilizations should be determined by the color of the grass and rate of growth desired. Several factors other than nitrogen also affect turfgrass color. Some turfgrasses like centipede and carpetgrass are naturally light green and should remain so for best health.

Lighter and more frequent fertilizer applications, up to the seasonal limit for that turfgrass, are the best idea. They provide a moderate and continuous feed with less potential for leaching loss. They are especially recommended for property adjacent to bodies of surface water or drainage ditches. You may follow the directions on the fertilizer bag for application or use a little less and apply more often. If you must guess at application parameters, guess to the lesser amount; you can apply more later, but you can't take it back once it goes down.

To calculate the amount of a particular fertilizer needed to supply 1 pound of actual nitrogen per 1,000 square feet, you must read the nutrient analysis on the fertilizer bag. The analysis is in the form of three numbers (for example, 27-3-4, 8-8-8, 24-6-12, 38-0-0 or 0-0-62). The series of three numbers refers to the percentage by weight of nitrogen (N), phosphate (P_2O_5) and potash (K_2O), in that order, in the fertilizer. Dividing the first of these three numbers into 100 gives the number of pounds of fertilizer needed to supply 1 pound of nitrogen. Therefore, 12.5 pounds of 8-8-8 will supply 1 pound of nitrogen (100 divided by 8 = 12.5).

Use a Spreader

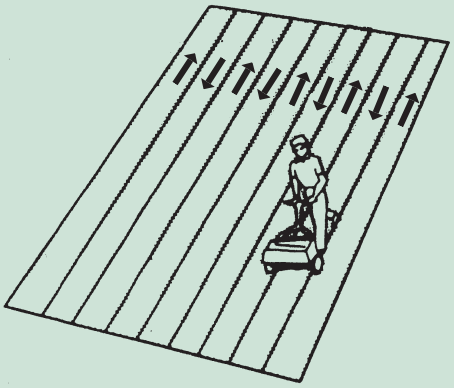
Even the cheapest spreaders are much more accurate than hand slinging. Hand application will usually produce streaking, foliar burn and over or under fertilized areas. Fill spreaders over hard surfaces for easy cleanup of spills, but fill sprayers over grass surfaces for absorption of spills. When washing application equipment, also do so over turfgrass. Do not overfill the hopper and risk spillage. Calculate how much material you will need to cover your job, and mix or load that amount. You may return granulars back to original containers. Apply all mixed material to the target crop so that disposal is not an issue.



Drop Spreader

Drop spreaders accurately place material just between the wheels, so application can be precise with very low drift. If using a drop spreader, use single pass coverage. Allow the inside wheel to run in contact with the material just spread in the last pass. In this way, the edge of one drop width comes in contact with the edge of the next.

Drop spreaders are good choices for urban lawn care.



Drop Spreader



Broadcast Spreader

Broadcast whirling spreaders have heavy spots in the center and thin spots to the flanks in their broadcast patterns. Apply broadcast materials at half the rate and cover at half the swath width, allowing for the overlap of about 50 percent (the half pass method). For example, if your effective swath width is 10 feet, set the spreader to broadcast at one-half the output and overlap the area in 5-foot swath widths. If applying broadcast in a one-pass fashion, allow for about one-third overlap of the swath width to provide for more uniform coverage. Broadcast spreaders cover more area faster, but are more difficult to use accurately. They will throw granules everywhere if you're not careful.



Broadcast Spreader

Always apply fertilizers when the grass blades are dry, and then water in lightly. This will set the fertilizer into the soil and minimize surface water contamination from surface runoff. To avoid heavy and light bands on the lawn, hold spreader handle at a level height and walk at a medium-fast (3mph), but continuous rate. Start walking before you open the release lever and close lever before you stop moving. Never operate boom sprayers or spreaders while turning 180 degrees for the return pass. Avoid applying materials on windy days.

On soils that have a moderate level of potassium, the equivalent of about 1/2 pound of potash per 1,000 square feet is generally needed in spring and again in August or early September. This can be applied with or without the recommended nitrogen for that season and turf type. An August application is needed most on sandy soils and may be helpful on any soil in preparing the grass for winter. Applying potash in late summer-early fall is called "winterizing" and is particularly advised to toughen grass when high rates of nitrogen have been used.

Some carpetgrass, centipede and shaded zoysia lawns have not regularly received fertilizer and have good quality. Fertilization of centipedegrass with more than 2 pounds of nitrogen per 1,000 square feet per year can result in centipede decline or death of a mature grass sward. One pound of slow-release per year, split into two half-pound doses, is sufficient for adequate growth and minimal cutting. Sometimes a darker green may be achieved on turf with monthly applications of 2 or 3 ounces of iron (ferrous) sulfate in water applied to 1,000 square feet. Chelated forms of iron provide superior results, but iron application is not recommended on sensitive centipedegrass.

Recently established lawns or thin, starving turf should be fertilized more often with nitrogen.

Recently established lawns or thin, starving turf should be fertilized more often with nitrogen. After the grass has filled in the voids, normal nitrogen is needed. Too much nitrogen stimulates too much shoot growth, reduces root growth and increases thatch formation. Disease, insect, drought and weed problems also may be increased by excessive nitrogen fertilization.

Our warm-season grasses may be overseeded in October or early November with about 8-10 pounds of ryegrass seed per 1,000 square feet for a green winter lawn. The rye will benefit from a complete balanced fertilizer after planting and one or two light applications of nitrogen throughout the winter. Heavy nitrogen applications in the fall will cause excessive winter kill of permanent turf, especially if we have a cold winter or if a sudden hard freeze follows mild weather. Consider the earliest fertilizer topdressing of overseeded rye about Thanksgiving in North Louisiana (mid-December in South). About seven weeks later, the second topdressing can be applied. A slow-release lawn blend is recommended.



Liquid Iron Concentrate

Retest soil

Retest soil every three years. Testing is important because the chemical properties of soil change constantly. In particular, keep the soil's pH (an index of acidity), phosphorus content and potassium content, at levels that promote healthy growth and a healthy environment. Too much fertilizer or lime can be as harmful as not enough.



Watering the Lawn

To maintain a healthy, green lawn, the grass must have an adequate supply of soil moisture. If moisture is improperly applied, the results can yield wasted cost, unhealthy turf and extra burden on the watershed. Overwatering may cause nitrogen fertilizer and some soluble pesticides to penetrate down into our groundwater. Overwatering and watering too fast can cause surface water to move both soluble materials and those held on clay and organic matter to wash into storm drains and bayous.

Outdoor water use averages 30% of domestic water use nationwide.

In general, irrigate to moisten the soil to a depth of 4 to 6 inches. A spaded wedge or soil sample tube can show wetting depth. Do not water again until you see first signs of moisture stress such as graying of turf or footprints that remain after walking. Dry soil will also be very difficult to probe with a large screwdriver. Water when needed as soon as feasible. Light, frequent waterings wet only the surface of the soil and result in developing shallow roots and a weak turf. Where much water is needed and soils are clayey or compacted, apply water in several shorter cycles to avoid runoff and maximize absorption. This applies to sloped lawns as well. Irrigate to first runoff, then stop; allow for percolation, then repeat as needed to meet wetting requirement.

Outdoor water use averages 30% of domestic water use nationwide. One way to reduce inefficient water use is to set and properly maintain automatic irrigation systems. This means checking to see that sprinkler heads are functioning properly, that pipes are not leaking and that timers are set correctly. Set heads to avoid spraying any walks or hardscape if possible. Use sprinklers that provide uniform coverage. Check coverage with a series of collection containers such as empty tuna cans spaced every 3 feet radiating out from the sprinkler.



Checking Sprinkler Coverage

A new product category, weather-based irrigation controllers, can be used in place of a clock timer. These controllers use real-time or historic weather information to adjust irrigation automatically by plant type and can also be used with moisture sensors. These devices reduce irrigation water use by an average of about 20 percent to 30 percent. More about water use efficiency can be found on EPA's Web site www.epa.gov/owm/water-efficiency.



Irrigation Controller

The best time to water is in the morning. It is safest, from a disease standpoint, not to keep a grass wet all night long. Watering established sod during midday is discouraged because of extra loss from evaporation. You may have to water when you have adequate municipal water pressure to ensure proper sprinkler function and coverage.

The best time to water is in the morning.

When drought comes, grass stops growing and may enter a dormant state. Such advanced dormancy is characterized by browning of foliage and a resting state of growing points. These growing points are found in the crowns, stolons and rhizomes of the turfgrass. When soil moisture levels are increased to favorable levels by rain or by irrigation, the growing points start the growth of new leaves and stems. The shallow-rooted centipedegrass and carpetgrass are very responsive to irrigation when conditions are dry.

Brown turf caused by drought is not desirable, but it is some consolation to know that grass can usually survive without irrigation. You can avoid dormancy and discoloration by irrigating as needed. In general, 1 or 2 inches of water are needed per week in times of drought to keep turfgrasses actively growing. Coarse sandy soils absorb well but don't hold much moisture, so they require less water per irrigation, but require more frequent irrigation. Finer clay loams will require more water per irrigation, but supply that moisture longer than do sandy loams. To avoid turf loss during very dry periods, water established lawns about once every other week with at least 1 inch of water to keep turf alive until the drought breaks.

The Irrigation Association offers these BMPs for your automatic system:

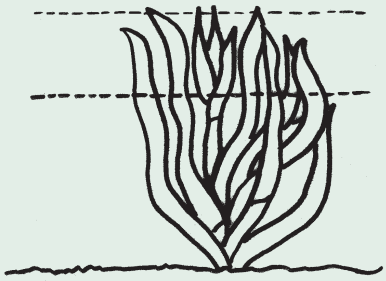
- Install a rain shut-off device to prevent watering when it rains. These inexpensive devices save water and money.
- Consider "smart" technology — a controller or soil moisture sensor that schedules irrigation based on weather or soil moisture conditions.
- Inspect all sprinkler heads while they are operating to be sure they are functioning correctly.
- Have an irrigation audit conducted by a Certified Irrigation Auditor to find out if your system is operating correctly.
- Water before 9 a.m. when the sun is low, winds are calm and temperatures are low to reduce evaporation.
- Make sure your irrigation contractor shows you how to use your system. Water deeply in several short sessions with 15-minute breaks between to allow water to soak in and minimize runoff.
- If your system uses a timer, adjust the timer according to seasonal water demands and weather conditions.

Mowing the Lawn

Mowing has a profound effect on the way a grass plant grows and is what you do most to the turf. The ability of a grass to sustain itself through frequent close clipping is one factor that distinguishes a grass species as a turfgrass. Grasses such as wheat, corn, Johnsongrass, etc. cannot tolerate the stressful treatment of frequent, close mowing. This principle is an important concept in weed control.

How often should a turf be mowed? The rate of growth and the height of cut determine the frequency of mowing. The rate of growth depends on the type of grass, soil fertility (especially nitrogen content) and the weather. Lawns in Louisiana are warm-season grasses. These grasses grow faster and need to be mowed more frequently in the hot summer if moisture is adequate.

A general rule is to mow before the grass becomes 1 1/2 times as tall as the cutting height of your mower blade. This is 50 percent regrowth.



Do not remove more than the top one-third of the grass at any one clipping.

Another way to say this is: Do not remove more than the top one-third of the grass at any one clipping. For example, if the height of cut is 2 inches, mow whenever growth reaches 3 inches in height. You may mow more often if desired. If you continually allow your grass to grow too tall between mowings, a thin, weak and weedy turf may develop.

The rate of nitrogen fertilization and the frequency and height of cut are major factors that determine the health and quality of turf.

You can decrease the frequency of mowing by:

- **Choosing a slower growing turfgrass.**
- **Reducing the rate of nitrogen fertilization.**
- **Raising the cutting height of your mower.**

Mowing height depends on the type of grass, your objectives and your willingness to work. Table 1 shows the recommended range of cutting heights. If you choose the shorter 'carpet' look, you will need to have full sun exposure, mow more frequently, have a more level terrain and apply a higher rate of nitrogen fertilization. Choose from the taller range of cut for better sustainability, especially if there is considerable shade.



Rotary Mower

Most people mow with **rotary mowers**. These mowers have horizontal blades that chop at the leaf blades. A rotary mower becomes noticeably duller as the season progresses and should be sharpened 1 to 3 times as needed each season for a healthy turf. Frayed leaf tips from dull blades cause lawns to be less attractive, increase water use and develop more plant stress. Some tough grasses like the zoysia will dull a blade quicker.



Reel Mower

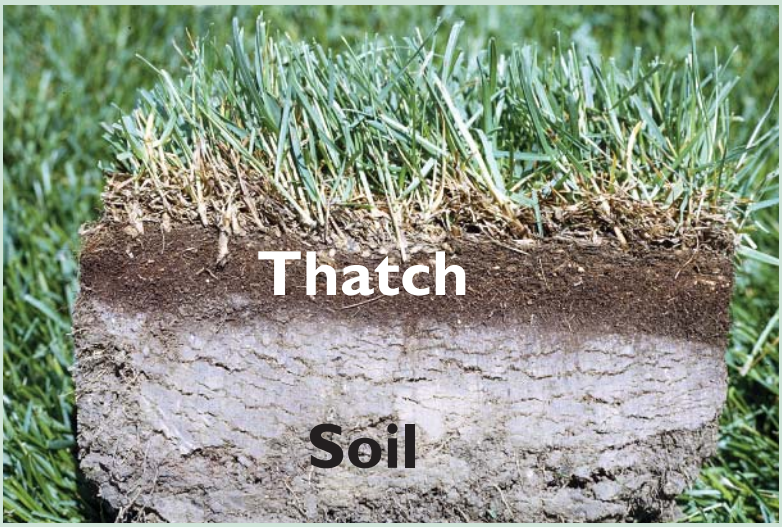
Reel mowers have clean, scissor-like cuts and produce a better quality turf than do rotary mowers. A reel mower is more difficult to sharpen, but it should require less frequent sharpening. A reel mower may be more expensive, but it is normally more rugged and uses less fuel. Most reel mowers are particularly recommended for bermuda and zoysia grasses when mowed at 1 inch or lower. A turf, free of sticks and other debris, is necessary when using a reel mower.

Removal of Turfgrass Clippings

Removal of turfgrass clippings is not necessary if you mow as recommended. Research has shown that moderate amounts of small clippings decompose rapidly in warm weather with good moisture. Nutrients in the clippings are recycled in slow-release form without contributing greatly to the thatch layer. This is often called "grasscycling." Nitrogen fertilization can be reduced if clippings are not removed. Clippings should be removed and composted if they form clumps (overlay) on the surface. Overlay normally occurs only if the grass is allowed to grow too high before mowing or if mowed when wet. A well-designed mulching mower minimizes this problem by recutting the clipping into much smaller pieces. Zoysia and centipede leaves do not decay as readily as leaves of other grasses, so these should be collected and composted when growth is very rapid.

Thatch Control

Thatch is a layer of living and dead grass plant parts and pieces located between the soil surface and the green vegetation. Thatch is normally a problem only on zoysia, but St. Augustine, centipede and bermuda can develop serious problems if not on some thatch control program. A thin layer of thatch is desirable because it provides composted nutrients, cushions grass crowns from abrasive damage and reduces water and fertilizer loss from the soil. Thatch may accumulate faster than it decomposes when lawns are overfertilized, overwatered, mowed too infrequently or mowed too high.



Excessive thatch (more than 3/4 of an inch) begins to create many problems. Turf plants begin growing in the thatch instead of the soil. Insects and diseases thrive in the thatch environment. Water and fertilizer cannot move well through the thatch. The puffiness of the thatch can cause the mower to sink into the thatch layer and scalp off too much grass. Excessive thatch increases winter damage and drought susceptibility, too.

Water and fertilizer cannot move well through the thatch.

The rate of thatch accumulation can be decreased and controlled by lowering the fertility rate, watering properly and by following correct mowing practices. By applying annual light topdressings of soil or sand 1/4-inch thick, you can reduce thatch problems. At this rate, you will need 3/4 cubic yard of sandy soil to topdress 1,000 square feet.

When the thatch layer exceeds an inch, dethatching is in order. You can remove thatch by using a specially designed hand rake, vertical mowers (dethatcher) and core aerifiers. This equipment, with exception of core aerifiers, may be rented from most rental stores.

Core Aerifier

The core aerifier punches small holes through the thatch and into the soil. It deposits these soil cores on the turf surface. This soil can be incorporated back into the turf by raking or mowing over and is desirable since soil dressing helps thatch degrade. The holes created by aerification allow immediate penetration of fertilizer, water and air — all of which also contribute to thatch decay. In heavy and compacted soils, sand may be spread and swept, raked or washed into these holes to reduce future compaction. Core aerification and dethatching can be contracted through some lawn care services.



Core Aerifier

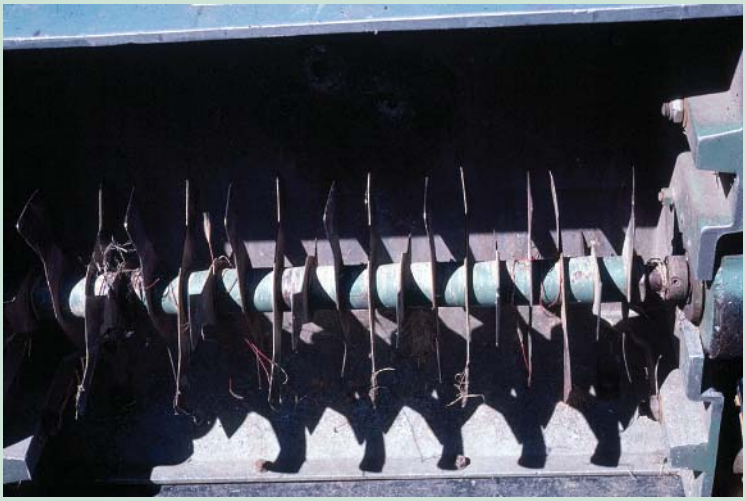
Other Methods

Other methods of thatch reduction cut slices through the turf and thatch. These methods also provide a way for water, air and fertilizer to better reach the soil and can remove some or much thatch material. A special vertical mower (dethatcher) can be rented. Use a vertical blade spacing set for 1 to 2 inches on bermuda and zoysia, 2 to 3 inches on centipede and carpet and 3 inches for St. Augustine lawns. A soil or sand topdressing following thatch reduction practices is very beneficial.

If you decide to dethatch your lawn, it is best to do it in mid- to late spring. This allows the grass time to recover before the hot, dry summer. The warm-season grasses may be dethatched in Louisiana, May through August. Preemergence herbicides, if used for control of crabgrass or other weeds, should be postponed or reapplied after dethatching.



Dethatching with Vertical Mower



Vertical Mower Blades

Care Calendars

LSU AgCenter Research & Extension

Care Calendar for Cool-season Grasses

Management	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Comment
Fertilization		•	▬	▬	▬	▬	▬	▬	•				As needed for color
Liming	•	•	•	▬	▬	▬	▬	▬	▬				According to soil test
Mowing		▬	▬	▬	▬	▬	▬	▬	▬	▬			Throughout growing season
Watering	▬	▬	▬	▬	•	•	•	▬	▬	▬	▬	▬	As necessary, water deeply
Aerification			▬	▬				▪	▬	▬			Coring is best
Dethatch			▬	•	•			▬	▬				As needed
Weed Control			▬	▬	▬		▬	▬	▬	•	•		Broadleaf weeds & Crabgrass preemergence
Insect Control	▬	▬	▬					▬	▬	▬			Grub control
	▬	▬	▬							▬	▬	▬	Sod webworm control
Disease Control		▬	▬	▬				▬	▬	▬			Direct control against specific disease problem when it occurs.
Reestablishment & Overseeding		▬	▬				•	•	•				Fall is best.

recommended ▬ might be done • • • • •

LSU AgCenter Research & Extension

Care Calendar for Warm-season Grasses

Management	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Comment
Fertilization	▬	▬						▬	▬	▬	▬	▬	
Liming	•	•	•	•	•	▬	▬	▬	▬	•	•	•	According to soil test
Mowing	▬	▬	▬	▬				▬	▬	▬	▬	▬	Throughout growing season
Watering (general)	▬	▬	▬	▬	▬				▬	▬	▬	▬	As necessary, water deeply
Aerification	▬	▬	▬							▬	▬	▬	Coring is best
Dethatch	▬	•	•	•					▪	▬	▬	▬	May be necessary in Aug-Sep if overseeding
Weed Control	▬	▬	▬	▬	▬		▬	▬	▬	▬	▬	▬	Broadleaf weeds
	•	•	•				▬	▬	▬	•	•	•	Crabgrass preemergence
	▬								▬	▬	▬	▬	Crabgrass postemergence
Insect Control	▬	▬	▬							▬	▬	▬	Identification is critical
Disease Control	▬	▬	▬	▬				▬	▬	▬	▬	▬	Identification is critical
Overseeding		▬	▬	▬			•	•	•				Perennial rye works best
Sodding	▬	▬		•	•	•	•	•		▬	▬	▬	Avoid Oct and March
Seeding	▪								•	•	▬	▬	Late Spring is best

recommended ▬ might be done • • • • •

Integrated Best Pest Management

Pesticides are just one tool in the management of lawns. Weeds, insects and fungal diseases are the main pests of turfgrass. Pesticide control of these pests is often possible, but, in many instances, the use of chemicals on the home lawn may be unnecessary and the best materials restricted and cost prohibitive. If you have a properly adapted turfgrass and follow proper irrigation, fertilization, thatch control and mowing procedures, you should have a competitive and resistant lawn. Such a turf is capable of withstanding much pest pressure and recovering from damage that occurs without much pesticide use.

Lawn Insects

Chinch Bugs

Damage by chinch bugs to St. Augustinegrass lawns in Louisiana can be extremely heavy. The first indication of the presence of chinch bugs in a lawn is the yellowing of the grass, with eventual drying and dying of the runners. The greatest injury occurs during hot, dry periods in summer. The small black and white adults, together with the reddish nymphs (immature forms), may be found at the base of the grass plants sucking the sap.

The full-grown insect has a black body 1/8 inch long. The white wing covers are each marked with a triangular black patch at the middle. The insect, when crushed, gives off a vile odor. The eggs hatch into small, very active, reddish bugs with a band of white across the back just behind the wing pads. They become darker as they grow and acquire wings. Two forms of adults may be found: the long-winged and short-winged.



When heavy infestations occur in a lawn, these small insects can be seen by parting the grass and examining the grass runners near the soil surface. In light infestations, a better method of checking is to float them with lemon-scented dish soap solution. (See pg. 18.)

Sod Webworm

Sod webworms feed only in the caterpillar stage. As soon as the eggs hatch, the tiny worms begin feeding on the grass blades. It is not until they reach full size that the damage becomes apparent, developing rapidly. These worms feed only at night. Damage is usually seen only in patches, with the grass blades notched on the sides or chewed back. The grass may die if the foliage is stripped in hot, dry weather. Sod webworms prefer new lawns and attack a wide variety of lawn grasses.



The adult sod webworm is a whitish or gray moth with a wingspread of about 3/4 inch. When at rest, the wings are folded closely about the body. The larvae when fully grown are about 3/4 inch long and light brown to blackish. They build burrows or tunnels close to the surface of the soil and reinforce these with bits of dirt and pieces of grass, line them with silk and live in them. To find the

larvae, part the grass and look for small "worms" curled up on the soil, or break apart some of the drying sod in the infested area and look for the tunnels and larger "worms" or drench with the lemon-scented soap solution to flush them into view.

Armyworms

Armyworms and fall armyworms, when numerous in a lawn, may devour all of the foliage down to the ground. When they have eaten all of the food in one lawn, they march to the next. No lawn grass is immune to their attack.

The adult insect is a moth with a wingspread of about 1 1/2 inches. It has grayish-white hind wings



with dark mottled fore wings. Young larvae begin to feed near the ground and can do considerable damage before they are noticed. The caterpillars vary from light tan to green or black with three yellowish hairlines down the back. The fall armyworm does not hide during the day.

Mole Crickets

Mole crickets have become a serious pest of turf throughout the coastal plain areas of the Southeast. They have a wide host range and are particularly damaging to the roots of grasses. They damage seedling turf and all warm-season grasses by feeding and tunneling, which dries out the roots. There are three species of mole crickets in Louisiana: the northern; the southern; and the newest and, most damaging, the tawny mole cricket.



Mole crickets generally overwinter as either nymphs or newly developed adults 3 to 10 inches deep in the soil. They are capable of going deeper but are limited by a shallow water table. Our mole crickets become active in mid-February to March (weather dependent) and feed until they are fully mature in late spring. In May and June, adults emerge and collect around lights to mate. Eggs are laid in the soil. Hatching occurs in 10 to 40 days, depending on temperature. Nymphs develop through eight instars and may become adults by winter or may overwinter as immatures. One generation occurs each year.

Fire Ants

Fire ants will feed on a wide variety of foods, including insects, plant parts and seeds. Fire ants prefer land open to the sun. Fire ants have a severe sting, attacking anything that disturbs the colony. Each ant can sting several times, causing a burning, itching sensation followed by the formation of a white pustule.



Fire Ant Mound

The red imported fire ant of 1918 is a troublesome species, infesting some 330,000,000 acres and forcing out both the native and southern fire ants. The colony is made up of three casts: the winged fertile females (queens), which lay eggs; winged fertile males (kings); and three classes (sizes) of worker ants. The average colony may contain 100,000 to 500,000 workers and a few reproductive forms. After an aerial mating swarm, the fertilized queens land and lay eggs to start a new colony.

Earthworms

Earthworms are usually beneficial to the soil and plants, but, when populations reach high numbers, they can be a detriment. The first indication of severe infestation is the numerous piles of excrement and shed skins that appear in the grass. These little piles look like miniature crawfish stacks but are made of soil and skins. Gradually, affected turf begins to thin and die out. This is caused when the high earthworm population begins to aerify the soil and dry out the roots. At this point, it is necessary to thin out the worms by spraying turf with Sevin. This will kill some earthworms and cause the remainder to disperse, leaving only a good population. In many cases low spots in the yard remain moist. This encourages the worm population. Improve these areas, and earthworms should not be a problem.



Worm Castings

Fleas and Ticks

Fleas and ticks are carried by pets, squirrels, rats, mice and other small animals from lawn to lawn. Ticks have a strong reproductive system and can carry disease. Fleas feed on blood, but the larvae feed on organic matter and dry blood in and around the bedding area. They can survive for a long time without feeding.

White Grubs

White grubs are the immature form of June beetles and chaffers. They damage grass and other plants by feeding below ground on the roots, causing the grass to yellow. Damaged sod is easily pulled out of the ground by hand. The C-shaped larva has an orange-brown head and white body except for the last two segments, which are gray. Adults are light brown to black, are night fliers and foliage feeders. Adults emerge from April through June and are attracted to lights. The adults spend the daylight hours in the soil. To check for infestations, cut an inch-deep square foot of sod on three sides and peel it back. Where more than three grubs are found per square foot, treatment is needed.



White Grub Damage

Sampling Soil Insects

Sampling for soil insects can be done using a solution of 1 to 2 tablespoons of lemon-scented dish soap in a gallon of water. This solution can be poured on a square foot of sod that has some injury and allowed to soak in for a couple of minutes. This works for all soil insects except white grubs. Many times it appears that the insects come to the surface and die, but they do not. The soap will cover the spiracles or breathing tubes of the insects and cause them to pass out. Shortly, the film breaks from the spiracle; the insect begins breathing and goes back into the soil. You may also dig a grass plug about 6 inches in diameter from the area adjacent to the dead grass and place it in a pail of soapy water. Any bugs present will float to the surface. Another method, which will not damage the grass, involves cutting both ends of a gallon can. Force the can rim into the sod 1 inch deep and fill the can with the soapy water. Any bugs in the can will float.

Many times it appears that the insects come to the surface and die, but they do not.

Insecticides and Application

Spraying

It is important to realize that, when spraying, your results are only as good as your effective coverage of the material. The pesticide label directs you; follow the label. It may be essential that all surfaces are covered when spraying, or that the material is delivered as directed. Spraying the upper surface of a leaf will not control the pests feeding in the crowns. Many insects do little or no movement once they begin to feed, so increased volume and recommended surfactants will provide you with better coverage of the plant and more potential contact with the pests.

Spray Mixture pH

When spraying for insect control, it is best to check and, if needed, adjust the water pH. High water pH is a problem in Louisiana and leads to a problem called alkaline hydrolysis. This occurs when the pesticide is broken down by the alkaline water before it has a chance to work. This leads to the use of additional sprays to manage the same population and increases the potential for the development of resistance to the insecticide and injury to the plants sprayed or the environment. To check pH, it is best to use a digital pH pen that can be obtained from some nurseries, pesticide dealers or supply houses. It is best to check the water pH each time you spray because pH is affected by rain, drought and temperature. The water pH can be adjusted by using a buffer or an acid, like vinegar. When using vinegar, apply the spray immediately after mixing the insecticide. First, check the water pH, add vinegar or buffer if needed (about 1 to 2 teaspoons per gallon) and recheck until it reaches 5.5 to 6.5. Now add the insecticide, mix and spray. It must be done quickly. If the sun warms the water, it can break down the vinegar, and the pH will go back up, breaking down the insecticide. If buffers are used, they lock in the set pH over a longer period.

High water pH is a problem in Louisiana and leads to a problem called alkaline hydrolysis.

Turf Insect Management Guide

Insect	Insecticide	Amount per gallon	Remarks
Chinch bug	Scimitar CS	7 ml/1,000 sq ft	Follow label
	Carbaryl	4-6 oz/1,000 sq ft	
	Mavrik Aquaflow	0.75-1.5 tsp/1,000 sq ft	
	[1,a]Cyfluthrin/Imidacloprid L	6.5 oz/1,000 sq ft	
	[1,a]Cyfluthrin/Imidacloprid G	2 lb/1,000 sq ft	
Sod webworm	Scimitar CS	1 tsp/1,000 sq ft	Follow label
Armyworms	Mach 2	1.5 oz/1,000 sq ft	
	Spinosad	0.25 oz/1,000 sq ft	
	Bacillus thuringensis (Bt) Various Bt products		Follow label
	Mavrik Aquaflow	0.75-1.5 tsp/1,000 sq ft	
	[1,a]Cyfluthrin/Imidacloprid	6.5 oz/1,000 sq ft	
	[1,a]Cyfluthrin/Imidacloprid G	2 lb/1,000 sq ft	
	[1,b]Dylox	2 lb/1,000 sq ft	
Mole crickets	[1,c]Imidacloprid 0.2%	2.9 lb/1,000 sq ft	Follow label
	Scimitar CS	1.5 tsp/1,000 sq ft	
	[1,b]Dylox	3 lb/1,000 sq ft	
Fire ants	Extinguish	1-1.5 lb/acre	Follow label
	Extinguish Plus	1-1.5 lb/acre	
	Distance	0.35-0.5 oz/1,000 sq ft	
	Award/Logic	1-1.5 lb/acre	
	Amdro	1-1.5 lb/acre	
	Amdro Pro	1-1.5 lb/acre	
	Orthene (OTTO) 75S	2 tsp-1 tbs/mound	
	Spectracide Fire Ant Bait		
	Maxforce Bait	1 oz/1,000 sq ft	
	Talstar	2.3-4.6 lb/1,000 sq ft	
	[2]Deltamethrin Ultradust	1 tsp/mound	
	Citrex	8 oz/gallon/1,000 sq ft	
	[1,d]Cyfluthrin G	1-2 tsp/mound	
Fleas/Ticks	Scimitar S	1.5 tsp/1,000 sq ft	Follow label
	[1,a]Cyfluthrin/Imidacloprid L	6.5 oz/1,000 sq ft	
	[1,a]Cyfluthrin/Imidacloprid G	2 lb/1,000 sq ft	
	Carbaryl 50WP	10 tbs/1,000 sq ft	
White grubs	Sevin 50WP	10 oz in 30 gallons/1,000 sq ft	Follow label
	Mach 2G	3 lbs/1,000 sq ft	
	[1,c]Merit 0.2%G	2.9 lb/1,000 sq ft	
	[1,b]Dylox	5 lb/1,000 sq ft	
	[1,a]Cyfluthrin/Imidacloprid L	6.5 oz/1,000 sq ft	
	[1,a]Cyfluthrin/Imidacloprid G	2 lb/1,000 sq ft	
	[1,c]Imidacloprid 0.2%	2.9 lb/1,000 sq ft	
Argentine ants	Max Force Ant Bait	1 oz/1,800 sq ft	Follow label
	Delta Gard G	3 lb/1,000 sq ft	
	Orthene 75S	2 tbs/colony (nest site)	
	Demon EC	1 oz/gallon water/1,000 sq ft	Drench nest
	Cynoff EC	1 oz/gallon water/1,000 sq ft	Drench nest

Note: Adjust pH and read label before using.

[1]Bayer Advanced Garden products: [a]Complete Insect Killer; [b]Grub Killer Plus; [c]Grub Control; [d]Multi-Insect Killer, or Fire Ant Killer.

[2] Bengal IGR-Insect Growth Regulator.

Lawn Diseases and Control

Turfgrass diseases, like any pest problem, should be managed with all the tools (genetic, cultural and chemical) available for the grower. Good cultural practices for growing lawn grasses will go a long way in either preventing, or at least reducing, disease development and damage.

Turfgrass damage should be diagnosed as soon as possible. Damage is often blamed on diseases or insects when climate, environmental conditions or poor growing practices are the real causes. Tree competition, cutting height, cutting frequency, thatch layers, herbicide damage and soil compaction sometimes help diseases to develop.

Brown Patch

The fungus (*Rhizoctonia solani*) responsible for brown patch attacks most species of grasses, but is more serious on bermudagrass, centipedegrass and St. Augustinegrass. Brown patch is seen in spring and fall. The symptoms include brownish to gray, irregular to circular areas a few inches to several feet in diameter. In certain grasses, a narrow, dark, smoke-colored ring may border the diseased area. These



Normal Infected

water-soaked or scalded spots spread rapidly, becoming large, brown areas. Generally, brown patch fungus attacks the base of leaves where they are joined to stolons. Leaves turn yellow in St. Augustinegrass and reddish in centipedegrass before dying. The fungus can, but usually does not, kill the entire grass plant within the affected area.



Brown Patch

In Louisiana, brown patch is more severe on St. Augustinegrass in the fall, especially at temperatures of 60 to 75 degrees F. At 80 degrees F and under dry conditions, the activity of the fungus decreases. Brown patch will increase with high nitrogen fertilizing, watering late in the afternoon and in the presence of deep thatch.

Control:

Dethatch, if necessary.

Water early in the day to allow drying of leaf blades.

Do not apply nitrogen fertilizer.

Remove grass clippings.

When brown patch occurs, use one of these fungicides:

Terraclor, Turfcide, Bayleton, Strike, Chipco 26019, Eagle WSP, ChloroStar FL, ECHO DF, TWOSOME Flowable, Cleary's 3336, Fungo-50, SysTec 1998, Duosan, Cleary's PROTECT, Maneb or Manex. Chlorothalonil-containing fungicides are not labeled for homeowner use. ***Always follow label instructions.***

Gray Leaf Spot

Gray leaf spot usually attacks St. Augustinegrass but may attack centipede. It is a summer disease caused by the fungus *Pyricularia grisea*, and is common in long periods of hot, humid weather. Newly sprigged or rapidly growing grass is more susceptible than well-established grass. Too much nitrogen fertilizer will make the disease more severe.

This disease causes irregular gray, dirty-yellow or ash-colored spots with brown, purple or water-soaked borders on leaf blades. Spots may be covered with gray mold in warm, humid weather. Lesions may occur on stems, spikes and leaves. A yellow halo or general chlorosis may occur around some spots. The disease is usually noticed first in shaded, damp areas. If heavy, it may give the grass a burned appearance. Seldom will this disease kill lawns. Fungus spores are spread by wind, rain, irrigation and animals.



Control:

Avoid high nitrogen fertilization (fast release) in summer. Water during the day so foliage will not go into the night wet. ChloroStar FL, ECHO DF, Thalonil, Cleary's PROTECT, Dithane and Fore fungicides control this disease when used at 10-day intervals during favorable periods.

Fairy Rings

Most fairy rings are caused by fleshy fungi such as mushrooms. They occur wherever grass grows and in soil that is high in organic matter. The rings are usually marked by mushrooms or by a stimulated or depressed growth of foliage. There are three types of fairy rings. Type I produces a ring of dead grass each year and is visible for long periods. The soil is permeated by a white, fungus growth (mycelium) and is usually very dry. Type II produces a dark-green ring. Type III is visible only when the toadstools are produced and does not affect the grass. Fairy rings spread outward a few inches to a few feet per year. The rings may be arcs and may not be completely circular. The fungus prevents the penetration of water into the soil, and the grass is stunted or killed from drought.



Fairy rings type I

Control:

When developing your lawn, do not bury roots, stumps, branches and other large pieces of organic debris. They provide a food source for these fungi. If the only effect of the fairy ring is a stimulation of growth in rings, fertilization will even out the problem.

Forking or removal of soil cores about 1/2 inch in diameter will aid in water penetration. Fill large core holes with fresh sandy soil.

Some experts recommend removing the soil, including 18 inches on each side of the outer stimulated area, to a depth of 1 foot. In removing infested soil, do not spill it on adjacent healthy grass. Fill trench with fresh soil and re-seed or re-sod. Chemical control is generally not effective because the fungus grows deeply into the soil.



Fairy rings type III

Dollar Spot

Dollar spot is a common fungus (*Sclerotinia homoecarpa*) that occurs on several grass types but is most severe on bermudagrass. It attacks neglected turf or areas that are under stress caused by a lack of nitrogen. Warm, humid weather and cool nights with heavy dew promote the disease. Spots may grow together into large areas. They appear first as small, circular, straw-colored spots of blighted turfgrass about the size of a silver dollar. Individual leaves develop lesions that are bleached or straw-colored, bounded by a tan to reddish-brown margin. A white, cotton-like fungal mycelial growth may be seen in early morning when dew is present. The disease is spread by mowers and other lawn equipment.

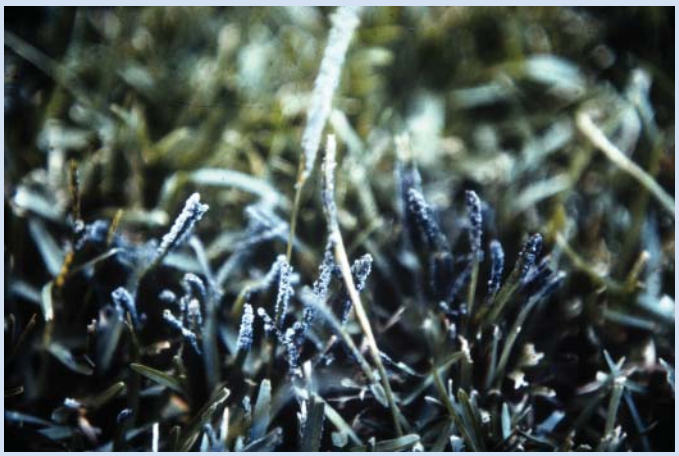


Control:

- Maintain adequate moisture and nutrients.
- Maintain a high level of nitrogen when the disease is prevalent.
- Prevent the buildup of thatch.
- Do not water in late afternoon or evening.
- Use several types of fungicides to control this disease because many strains of this fungus are resistant to certain fungicides. Alternate contact fungicides with systemic fungicides. Trade names include: Terraclor, Turfcide, Bayleton, Strike, Chipco 26019, ChloroStar FL, Daconil 2787, ECHO DF, Thalonil, TWOSOME Floable, Cleary's 336, Fungo-50, SysTec 1998, Cleary's PROTECT, Dithane, Fore, Duosan, Maneb, Manex, Eagle WSP. Follow label instructions. Dithane and Fore are labeled for golf courses, sod farms, industrial or municipal turf areas, and professional applications to residential lawns. Not for use by homeowners.

Slime Molds

Slime molds cover above-ground plants with a dusty-gray, black or dirty yellow mass. Small round balls can be seen scattered over the plant. These balls contain soot-like powder that is the spores of the fungus. Slime molds normally live on the soil where they feed on decaying organic matter. Slime molds do not feed on living plants. They use them for physical support during reproduction. They damage grass and other plants by shading them from sunlight, causing the leaf blades to turn yellow. Slime molds occur in wet weather in spring, summer and fall. They disappear rapidly as soon as it becomes dry.



Control:

- Control is usually not necessary.
- Spore masses can be broken by sweeping with a broom or by spraying with a strong stream of water.
- Avoid doing this in wet weather or if rain is forecast.

Slime molds occur in wet weather in spring, summer and fall.

Melting Out or Leaf Blotch

Melting out or leaf blotch may be caused by several fungi; however, in the South the primary fungus is *Bipolaris cynodontis*. It can be serious on bermudagrass. Symptoms are round or oblong spots parallel to the leaf blade. They are usually brown or purple and are more numerous near the collar area of the leaf blade. The leaf sheath turns brown and dies, resulting in death of the leaf blade. In severe cases, a sheath and crown rot will kill the grass in patches. The grass may be badly thinned over the entire turf area. Fungal spores produce abundantly and travel by wind, water and mowers. Infection by the wind-borne spores results in leaf spotting.



Control:

- There are no resistant cultivars.
- Do not allow grass to stay continuously wet. Irrigate early in the morning.
- Keep the grass in good vigor. Do not apply high rates of water-soluble nitrogen fertilizers in the spring.
- Raise mowing height during disease outbreak.
- Remove and destroy clippings from affected lawns when mowing.
- Spray or use one of these fungicides:

Cleary's PROTECT, Dithane, Fore, Maneb, Manex, Terraclor, Turfcide, Chipco 26019, Eagle WSP, Clearly 3336, Fungo-50, SysTec 1998, Duosan, Chloro Star FL, Daconil 2787, ECHO DF or Thalonil. Dithane and Fore are fungicides labeled for golf courses, sod farms, industrial or municipal turf areas, and professional applications to residential lawns. Not for use by homeowners. Follow label instructions.

St. Augustine Decline (SAD, SADV)

St. Augustine decline is caused by a Panicum mosaic virus. The first symptoms appear as a mild chlorosis or mosaic pattern on leaf blades. After infection, it takes about three years or more before the grass begins to die out and become invaded by weedy plants. Early symptoms are often confused with nutrient deficiencies.

The SAD virus is transmitted by lawn mowers, clippings and infected sprigs or sod. The only control for this disease is the use of resistant cultivars such as Palmetto, Raleigh and Seville. Once SAD is present in a St. Augustine lawn, consider renovation. Select another type of grass or a cultivar that is resistant to the virus.

The SAD virus is transmitted by lawn mowers, clippings and infected sprigs or sod.



Nematodes

Nematodes are microscopic worm-like organisms that live in the soil and attack the roots. They are occasionally a problem in home lawns because they feed on turfgrass roots and cause a slow decline of the turf. If you have many nematodes, they can cause a thinning out, stunting and pale color of the grass, usually in patches. There are no absolute above-ground symptoms to confirm the presence of nematodes, however. The only way to determine whether nematodes are a problem is to have a soil sample assayed by the LSU AgCenter's Nematode Laboratory. You may obtain instructions on how to take a nematode sample from your local LSU AgCenter parish office.

Control:
Controlling nematodes in home lawns is different from nematode control in most other plants. There are no resistant cultivars. Biological control cannot be used, and no nematicides can be used in established home lawns. You should use good cultural practices to keep damage minimal. If bringing soil in to form a new lawn, have it tested first for nematodes.



Take-All Root Rot

This patch disease, referred to as "take-all," is caused by the fungus *Gaeumannomyces graminis var. graminis* (Ggg) and others. Disease symptoms in affected areas of turf are circular to irregular and may resemble symptoms of brown patch. It also may be mistaken for chinch bug damage or drought symptoms. Patches of diseased St. Augustinegrass or centipede at first appear yellowish and then die. As diseased stolons die, severe thinning occurs in areas of several feet to even entire lawns.

Remember: this is a root disease; by the time leaf symptoms are noticeable, the root systems have already been severely damaged. Another key symptom of take-all root rot is the ease of lifting stolons from the soil. Take-all invasion is a warm-weather, stress-related disease. You can minimize the disease by following cultural practices that reduce turf stresses.



Control:

- Eliminate excessive irrigation.
- Avoid applying high rates of lime, and maintain a soil pH of 5.5 to 6.0.
- Mow at highest recommended heights with a sharp blade.
- Avoid ammonium nitrate and soluble urea fertilizer, but use acidifying fertilizers such as ammonium sulfate or slow-release urea.
- Maintain recommended levels of potassium.
- Do not use root-inhibiting herbicides on infected lawns. Few fungicides provide acceptable control, but sterol inhibitors such as Eagle or Bayleton may help, as well a strobilurin fungicide such as Heritage.

Lawn Weeds

Weeds are the number one pest problem in Louisiana lawns. At soil level, weeds are in direct competition with lawns for essential nutrients, water and light. The most undesirable characteristics of weeds, however, are their disruption of the visual uniformity and esthetic appearance of turfgrass. Plants that are weeds in lawns are usually very aggressive and able to compete with lawns and tolerate mowing. Many weeds that are problems in gardens and landscape are not problems in lawns because they cannot adapt to frequent mowing.

Types of Weeds

Weed species may be grouped into broadleaves, grasses and sedges/rushes. Another basic division of weeds is by their life cycle into annuals and perennials.

Broadleaves, or dicotyledonous plants, have two seed leaves when emerging from the soil. Mature plants have net-like veins on leaves and flowers that are usually showy. Broadleaf weeds, as the name implies, have a relatively wide leaf compared with grasses. Some common troublesome broadleaf weeds are Virginia buttonweed (*Diodia virginiana*), white clover (*Trifolium repens*), dandelion (*Taraxacum officinale*) and lawn burweed (*Soliva pterosperma*).

Grasses are monocotyledonous plants with one seed leaf, parallel leaf veins and lack showy flowers. They are particularly troublesome because most grasses can adapt to mowing; their selective removal from lawns can be very difficult. There are grasses that can be a turf in one situation and a weed in another. For instance, bermudagrass is an aggressive turf that is useful for home lawns, athletic fields and golf courses. Bermudagrass is very invasive, however, and difficult to remove in centipedegrass and St. Augustinegrass. Some common grassy weeds that infest Louisiana lawns are crabgrass (*Digitaria sp.*), goosegrass (*Eleuscine indica*), dallisgrass (*Paspalum dilatatum*) and torpedograss (*Panicum repens*).

Sedges are grass-like plants that are common in the lawn and landscape and prefer moist conditions. Sedge stems are usually triangular and solid. Common sedges that infest turf are purple nutsedge (*Cyperus rotundus*), yellow nutsedge (*Cyperus esculentus*) and kyllinga (*Kyllinga spp.*).



Buttonweed



White clover



Dandelion



Burweed



Crabgrass



Torpedograss in centipede



Dallisgrass



Purple nutsedge



Annual bluegrass



Dollarweed

Weed Life Cycles

Annual weeds live for several months and die within a year. Summer and winter annuals infest turfgrass in Louisiana. Most are prolific seed producers, and weed populations can increase exponentially from one growing season to the next. Crabgrass and goosegrass are common summer annuals. Annual bluegrass and lawn burweed (sticker weed) are examples of winter annuals.

Perennial weeds live longer than two years and may reproduce several times before dying. They generally have some underground storage organ such as a deep tap root or rhizome that allows the plants to survive adverse conditions like mowing, frost and drought. Warm-season turfgrass species that are grown in Louisiana are perennials that go dormant in cold weather and actively grow during the spring and summer. Most perennial grassy weeds that infest turf in Louisiana also go dormant in the winter and compete with turfgrass during the warm months.

As a whole, perennial grasses are considered to be the most invasive and difficult weeds to manage. Torpedograss, dallisgrass and bermudagrass (*Cynodon dactylon*) are perennial grasses that are some of the most invasive weeds in Louisiana lawns. Virginia buttonweed is a mat-forming perennial broadleaf that has multiple ways to reproduce and easily overtakes thin turfgrass. It is so aggressive that it is considered the most troublesome weed of lawns in Louisiana.



green kylinga



Wild geranium



Dichondra



Yellow woodsorrel



Florida betony



Doveweed

Herbicides and Application

Chemical weed control using herbicides can be a safe and very effective tool for weed management. Herbicides are chemicals that kill or injure susceptible plants. There are two basic types: postemergence and preemergence.

Postemergence herbicides kill or injure existing weeds. Generally, weeds are more easily controlled while young and actively growing. There are several categories of postemergence herbicides (contact, systemic, selective, nonselective) that dictate their effective use.

Generally, weeds are more easily controlled while young and actively growing.

Contact herbicides provide quick leaf die back and are most effective on young annuals. These postemergence herbicides affect only the plant tissue contacted by the spray and have little movement inside the plant. Multiple applications may be necessary to control some weeds because these herbicides will not translocate into underground roots, rhizomes and tubers. MSMA is an example of a contact herbicide.



Systemic herbicides move throughout the plant. These are the most effective for perennial plant control because the materials translocate into roots, rhizomes and tubers. Usually several days are necessary to achieve plant death. Glyphosate (Roundup) and sethoxydim (Vantage) are examples of systemic herbicides.

Nonselective herbicides kill or injure all plants regardless of species. Glyphosate and glufosinate (Finale) are examples of nonselective herbicides useful for turf renovation or spot treatment of weeds.

Selective herbicides control certain plant species and release other plant species. These herbicides are most useful for turfgrass weed management such as sethoxydim for postemergence grass control in centipedegrass. Halosulfuron (Manage) removes purple nutsedge in all southern turfgrasses.

Preemergence herbicides kill weeds as they germinate and before they emerge from the ground.

Preemergence herbicides kill weeds as they germinate and before they emerge from the ground. Therefore, timing this application before weed germination is critical for success. Crabgrass is a summer annual that germinates in late winter in Louisiana when soil temperatures are approximately 55 degrees F. This soil temperature corresponds to late February to early March in Shreveport, but crabgrass may germinate in early to mid-February in New Orleans. Therefore, successful preemergence herbicide application timings will vary across the state but should occur before expected germination. Preemergence herbicides are most effective on small-seeded annuals. Several preemergences are available to homeowners in easy to spread granules and are unlikely to injure established lawns when applied as directed.

Using Herbicides in Lawns

The first step in weed management with herbicides is identification of the weeds. Basic identification starts with determining if the weed is a broadleaf, grass or sedge. This skill is important in choosing the correct herbicide because many materials like 2,4-D target only broadleaf weeds. Halosulfuron specifically kills sedges, but will not control grassy weeds. Even though sedges are grass-like in appearance, sethoxydim kills only many true grasses in centipede but has no activity on nutsedge.

The next step in using herbicides is to read and follow the product label. The label provides the necessary information on product rates, weeds controlled, application techniques and safety precautions. Accurate application is essential to minimize off-target drift and runoff contamination of ground water.

Both granular and liquid herbicides have their unique advantages. Granular herbicides are easily applied with spreaders and are probably the preferred formulation for ease of application. Several preemergence herbicides are formulated as granules and provide excellent control of many annual small-seeded weeds in lawns. Granular preemergence herbicides are only as good as the uniformity of their application, however. To ensure accurate and uniform application of the granules, follow the suggestions for the herbicide application on



the product label. Most preemergence herbicides require irrigation or rainfall within a week of application.

Although granular postemergence herbicides are available, liquid spray formulations are usually more effective. Most liquid herbicides are concentrates that are mixed with water and applied with a pump-up or hose end sprayer. For pump-up sprayer applications, 1 gallon of spray solution should cover approximately 1,000 square feet. Accuracy is important to the dose, so good calibration is a must.

Here are some helpful hints:

- At least two applications are usually required for satisfactory results.
- Young actively growing weeds are easier to control than weeds with seeds.
- Expect some turf injury (especially in hot weather).
- Unless otherwise stated in label, do not use products in flower beds.
- 2 tablespoons = 1 oz.

Weed Control Options

The best weed control is a well-managed turf. Dense healthy lawns are less susceptible to infestations because they are able to out-compete most weeds for space; however, weak lawns with bare spots thinned by disease, insects and improper cultural practices are prone to weed invasion. Cultural practices such as timely fertilization, mowing at the correct height and frequency and integrated pest management programs promote healthy lawns and significantly reduce the potential for weed establishment. Relatively few weeds can compete with properly managed lawns. Chronic weed problems in lawns may indicate unfavorable soil conditions. Procedures that correct soil problems can reduce weed infestations by making growing conditions more favorable for the turfgrass.

Chronic weed problems in lawns may indicate unfavorable soil conditions.

Chemical Control Options for Troublesome Weeds in Home Lawns

Winter Weed Management

Weed (s)	Herbicide (s)	Trade Name (s)	Comments
Preemergence annual bluegrass, chickweed, henbit control for all established southern lawns.	trifluralin and benefin; dithiopyr; pendimethalin	Greenlight Crabgrass Preventer; Sta-Green Crab-ex or Hi-Yield Dimension; Scott's Halts	Apply herbicides in late September to early October before annual bluegrass germination. Granular products applied with rotary or drop spreaders. See label for correct spreader settings.
Preemergence winter broadleaf weeds controlled including lawn burweed. Safe for all established southern grasses.	isoxaben	Greenlight Portrait	Apply Portrait (granular herbicide) in late September to early October before winter broadleaf weeds germinate. Provides no grass control. Safely applied under most established trees when used as directed. See label for correct spreader settings.
Preemergence and early postemergence annual bluegrass and many winter broadleaves in centipedegrass, St. Augustinegrass, zoysia and dormant bermuda.	liquid atrazine	Various atrazine sources including Southern Ag and Hi-Yield	Apply spray in November. Do not apply under the dripline of trees and shrubs. Consider reapplication in February. Sprayable formulations.
Postemergence control of most winter broadleaf weeds including lawn burweed in southern lawns.	2,4-D + mecoprop + dicamba or 2,4-D + mecoprop + dicamba + carfentrazone	Ortho Weed B Gon, SpectracideWeed Stop, or Ferti-lome Weedfree Zone	Apply spray to young emerged weeds from November to March. Better activity at temperatures above 60 F. Reapply if needed.

Summer Weed Management

Grasses	Herbicide (s)	Trade Name (s)	Comments
Preemergence crabgrass and goosegrass control for all established southern lawns.	trifluralin and benefin; dithiopyr; pendimethalin	Greenlight Crabgrass Preventer; Sta-Green Crab-ex or Hi-Yield Dimension; Scott's Halts	Apply herbicides in late February in North Louisiana and mid February in South Louisiana before crabgrass germination. Granular products applied with rotary or drop spreaders. See label for correct spreader settings.
Postemergence bahiagrass control in bermuda, centipede, St. Augustine and zoysia.	metsulfuron	Manor, Blade	Product is very effective on Pensacola bahiagrass.
Postemergence crabgrass, bahiagrass, dallisgrass control in bermudagrass and zoysiagrass.	MSMA	MSMA	Contact herbicide that usually requires a follow-up application within 10 days.
Early postemergence crabgrass control in St. Augustinegrass.	dithiopyr	Sta-Green Crab-ex or Hi-Yield Dimension	Effective when applied before crabgrass tillers or up to 2-3 weeks after germination. Apply February to late March.
Postemergence control of annual grasses, bahiagrass, bermudagrass and dallisgrass in centipedegrass.	sethoxydim	Vantage	Reapplication may be necessary. Will not control annual bluegrass or torpedograss. Use only in centipedegrass.
Broadleaves	**Herbicide (s)**	**Trade Name (s)**	**Comments**
Postemergence dollarweed and dichondra control in all southern lawns.	2,4-D + mecoprop + dicamba + carfentrazone	Ferti-lome Weedfree Zone	Reapplication may be necessary within 2 weeks. Observe temperature precautions concerning St. Augustinegrass and centipedegrass.
Postemergence dollarweed and dichondra control in centipedegrass, St. Augustinegrass and zoysiagrass.	atrazine	Southern Ag, Hi-Yield or Scott's Weed & Feed and various brands	Use either liquid atrazine or weed & feed containing atrazine. Reapplication may be necessary. Observe all label precautions. Do not apply to actively growing bermudagrass.
Postemergence control of lespedeza, clover, spurge, wild strawberry in all southern lawns.	2,4-D + mecoprop + dicamba or 2,4-D + mecoprop + dicamba + carfentrazone	Bayer Advanced Southern Broadleaf Weed Killer, Ortho Weed B Gon, Spectracide Weed Stop, or Ferti-lome Weedfree Zone	Observe temperature precautions concerning St. Augustinegrass and centipedegrass. Reapplication may be necessary in 2 to 4 weeks.
Postemergence suppression of Virginia buttonweed in all southern lawns.	2,4-D + mecoprop + dicamba + carfentrazone	Ferti-lome Weedfree Zone Reapplication may be necessary within 2 -3 weeks.	Observe temperature precautions.
Sedges	**Herbicide (s)**	**Trade Name (s)**	**Comments**
Postemergence control of purple and yellow nutsedge in all southern lawns.	halosulfuron; imazaquin	Manage; Image	Effective herbicides for nutsedge control. Safe on lawns when applied as directed.



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The complex nature of nonpoint pollution means programs designed to reduce its impact on the environment will not be easy to establish or maintain. Controlling these contaminants will require solutions as diverse as the pollutants themselves. Through a multi-agency effort, led by the LSU AgCenter, these BMP manuals are targeted at reducing the impact of agricultural production on Louisiana's environment. Agricultural producers in Louisiana, through voluntary implementation of these BMPs, are taking the lead in efforts to protect the waters of Louisiana. The quality of Louisiana's environment depends on each of us.

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