Welcome To The Green, Green Grass Of Home
Turf Grass Management

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Turfgrass Species

Grasses are one of the most diverse groups of plants on earth. They provide most of our food and many other useful functions.
Turfgrass Species

Of the thousands of species, only a few are used as turfgrass. In Northern Utah, fewer than ten types are commonly grown as turfgrass.
All gardeners get excited about their first tomatoes, the exciting new varieties of flowers, the tastiest peach or the largest watermelon.
Most never get excited about their grass. As long it never gives them any problems, they never think much about it.
Turfgrass is the universal crop. More people grow turf than any other single crop in Utah. It covers more acres than alfalfa which is the largest cash crop in the state.
Unfortunately people know less about how to grow turf than almost any other crop in the garden.
It is possible to have a picture perfect lawn in Utah and never touch the lawn. Companies are standing in line to sprinkle, spray, fertilize, mow and otherwise tend your lawn so you never have to do anything but enjoy it.
Basically every wants their lawns to sit there, look good and shut up. As long as it gives them no trouble, they ignore it. The only time the lawn gets noticed is if something goes wrong.
It is the Rodney Dangerfield of the garden or to put it another way, lawns don’t get no respect.
BIOLOGY AND GROWTH OF GRASSES
Grass Plant Anatomy
Anatomy

**Grass Plant**

- Inflorescence
- Flowering Culm
- Ligule
- Leaf Blade
- Leaf Sheath
- Auricles
- Stolon Daughter
- Tiller Senescing Stolon
- Rhizome Daughter
- Mesocotyl
- Seed
- Rhizome
- Adventitious Roots
- Seminal Roots
Growth Habit

- Bunch-type
- Rhizomatous
- Stoloniferous
• A grass plant crown contains tissues where roots, lateral shoots (rhizomes and stolons), and leaves form. Turf can survive all kinds of damage if the crown stays healthy.
Turfgrass has fibrous roots.
Roots grow mostly in the upper 18 inches of soil but never grow deep if the soil is compacted, overwatered, or under watered.
Deep root growth is encouraged by:

- Adequate soil air reaching the roots
- Minimal thatch accumulation
- Minimal soil compaction.
- Raised mowing heights
Deep root growth is encouraged by:

- Low salt levels
- Adequate nitrogen levels
- Adequate levels of phosphorus and potassium
- Good soil pH
Avoid Overwatering

- Fill low spots to avoid standing water
• Two types of shoots arise from the crown. These are vertical shoots or tillers and horizontal shoots or lateral stems. Shoots are made up of leaves or blades and stem tissue.
• Lateral stems grow from the crown, and are called rhizomes if they form below ground, or stolons if they grow above ground. Both can start shoots or roots at any of the nodes.
Grasses may form rhizomes only, stolons only, a combination of rhizomes and stolons, or no lateral stems at all.
GROWTH HABIT

BUNCH TYPE

RHIZomatous

STOLONIFEROUS
Cultural Intensity

- **Sports Turf**: High cultural intensity
- **Lawn Turf**: Medium cultural intensity
- **Utility Turf**: Low cultural intensity
Turf Grass Management

- Turf grass includes home lawns, institutional and industrial grounds, sod, golf courses, and greenbelt areas
Shoot Density

LOW

HIGH
Resiliency
Smoothness

POOR

GOOD
Leaf Texture

COARSE

FINE
Plant Uniformity
Cool Season vs. Warm Season Grasses
• Grasses are cool season and warm season types.
• Cool season grasses perform well in areas with a distinctive seasonal change in temperatures and where freezing temperatures persist through the winter.
• Cool season grasses grow best when temperatures are between 60 degrees and 75 degrees F.
Cool season grasses include bluegrass, ryegrass, bentgrass, and fescue.
• Warm season turfgrasses perform well when winter temperatures do not drop below freezing.
• They grow best when temperatures are between 80 degrees and 95 degrees F.
They include Bahiagrass, Bermudagrass, centipede grass, St. Augustine grass, and zoysiagrass.
Bahiagrass
Bermudagrass
Centipede Grass
St. Augustine grass
Zoysiagrass.
• Warm season grasses are not recommended in our area because they grow poorly except during the summer.
• In most areas of Utah, cool season grasses are best because they stay green much longer.
Kentucky Bluegrass
• Kentucky bluegrasses are dark green in color with medium textured blades.
• They spread by rhizomes and become dense by forming tillers.
• They form the most attractive lawns in our area and perform best on fertile, heavy, well-drained soils.
• During the active growing season, they have moderate water requirements.
During hot, dry periods, bluegrasses change color slightly, but recover rapidly when moisture is reapplied.
• When droughts occur, bluegrass "brown out," and lie dormant (turn brown in color).
The crowns are still alive although the grass blades are dead.
Kentucky bluegrass has moderate disease tolerance and selecting a bluegrass blend with three or more resistant varieties greatly reduces disease problems.
• Mow bluegrass at 2.5 to 3.5 inches to conserve water, develop a dense, thick lawn and help reduce soil compaction.
Fescue

- Fescues are divided into fine fescues and tall fescues.
Fine Fescue
**Fine fescues are primarily used in seed mixtures designed for sun and shade situations.**
They germinate easily and rapidly, are medium green in color, and spread by tillers and short creeping rhizomes.
• Fine fescues compete very poorly with aggressive grasses.
• Fine fescues are not considered to be as drought tolerant as Kentucky bluegrass.
Chewings and red fescues are types of fine fescues.
• Red fescue or creeping red fescue spreads by tillers and short rhizomes.
• Chewings fescue is similar to red fescue, except it grows better in heavier shade, has more erect growth and, no rhizomes.
Tall Fescue
• Use this grass where a low maintenance lawn is desired.
Tall fescue forms a coarse turf that grows in sun or shade and withstands heavy traffic.
The disadvantages include coarse texture and clump style of growth in thin stands.
Tall fescues form a medium dark green lawn. It is very tough and is excellent for playgrounds and athletic fields. However, it does not mend well if injured.
• Damaged areas must be reseeded.
The lawn may appear clumpy after establishment. Some of this can be reduced by including up to 10% Kentucky bluegrass in the seed mixture and seeding at a heavy rate.
• It is necessary to overseed tall fescues every few years to maintain a thick lawn.
• Cut tall fescue 2 to 3 inches tall. Keep the mower blade sharp or the lawn will have a brownish cast because the blades get shredded.
• Tall fescues establish well in areas where grass is difficult to grow. Because the seed is so large, seeding rates are heavy for good establishment.
Ryegrass
There are three types of ryegrasses: annual or Italian, common perennial, and improved turf type perennial ryegrass.
• Use only improved type of perennial ryegrass as lawn grasses.
Do not use annual or common perennial ryegrass for lawns or as a nurse grass as it becomes very weedy.
• Improved ryegrasses are dark green and medium to fine in texture. All ryegrasses have blades that are heavily veined on the upper surface and glossy on the underside.
• Ryegrasses spread by tillers. Improved ryegrasses show a big improvement in disease resistance over common and annual ryegrasses.
• Mow perennial ryegrasses at 2 to 2 1/2 inches high. Keep the mower sharp.
• To maintain a tight turf with good mending characteristics, mix improved perennial ryegrasses with 20% Kentucky bluegrass in the mixture.
Bentgrass

Colonial Bentgrass
(*Agrostis tenax*)
Bentgrasses are not recommended for use in home lawns in Utah because of the high maintenance and the need to be cut very short very frequently.
Other Waterwise Choices

• Several other kinds of grass will grow in Northern Utah for those who are looking for waterwise alternatives. None of them look or grow like bluegrass.
Buffalo grass
Blue Gramma Grass
Turtle Turf
Fertilization
Fertilizing

- Fertilizing makes a dense stand of grass that is resistant to weeds, and more tolerant of heat, cold, drought, and wear. The grass also survive disease and insect invasion more successfully.
1. Slow vs. Rapid Release Fertilizers
• Rapid release fertilizers are applied at least four times each year. Slow release fertilizers require one or two applications.
• The most common nutrient in a slow release form is nitrogen. Other elements may be present, but not in the form of a slow release component.
When using slow release nitrogen add an application of iron at the beginning of the season.
• Slow release fertilizers are applied in the spring of the year at a rate comparable to a season-long application of rapid release nitrogen.
Application
Fertilizer application depends on the type of fertilizer and the soil type. Follow fertilizer labels for a suggested application timing. Adjust the rates to get the best results with the least amount of fertilizer.
Apply fertilizer in two directions, perpendicular to each other for an even application.
Fall is the most important time to fertilize
• Midsummer fertilizer applications will not damage lawns. Burning from fertilizers is from over-application.
• Because of higher temperatures and lower humidity, there is a greater chance of burning if the lawn dries out too quickly. Apply water after fertilizing.
Use lower rates of fertilizer in midsummer as a precaution against burning the grass.
Nitrogen Deficiency
Phosphorous Deficiency
Iron Chlorosis
Mowing
Mowing is the most expensive part of growing a lawn.
• Adjusting a mower to the proper cutting height can reduce water needs by one-third. The proper cutting height of Kentucky bluegrass is between 2.5 and 3.5 inches.
- Bluegrass plants should remain upright and do not lie down. Raising mowing height helps prevent compacted soils by acting as a cushion to foot traffic.
• In shaded areas, increase grass height to capture as much sunlight as possible.
Mowing frequency is just as important as proper mowing height. Generally no more than one-fourth to one-third of the grass blade should be removed at one mowing.
• Reel mowers should be sharpened annually. Rotary mowers should be sharpened more frequently.
• Dull mower blades cut the grass blade poorly and leave a brown, shredded cut end which gives the lawn a yellow-brown appearance.
Sharpmower blades cut the grass blade cleanly and the cut end heals quickly without excessive water loss.
• When mowing regularly, there is no need to catch grass clippings. Recycling grass clippings into the lawn provides nutrients, especially nitrogen, phosphorus, and potassium. It also helps water to move into the soil.
Core Aerating
• Core aerating is a needed operation for attractive lawns. Aerating is the practice of pulling plugs from the lawn.
The advantages of aerating are:

1. Allow better water movement into soils
2. Allow better air movement into soils
3. Help to decompose thatch layers in turfgrass
4. Encourage deeper movement of surface-applied phosphorus fertilizer
• An aerated lawn needs less water and respond to fertilizers and soil warming faster than a poorly aerated lawn.
Aeration is needed about once a year on an average home lawn with light traffic. South or west facing slopes of lawn will need frequent aerating and attention. These slopes dry out quickly and have little chance to absorb water if water is applied at a rapid rate.
• Core aerating removes soil cores or plugs. After the operation, the soil has small holes about 1/2 inch wide and 4 inches deep. The cores or plugs are left on the soil surface.
• Using golf shoes while mowing accomplishes absolutely nothing. Make sure the soil is moist, so the aerator will penetrate.

• Aerating is best done in the Spring or Fall.
Aerated Lawn

• Looks like 1,000 dogs have been on your lawn
ESTABLISHING A LAWN
• Selecting the Grass
• Turfgrass in Utah requires certain characteristics.
  – Tolerate wear
  – Compaction
  – Good mending qualities when injured
• Grasses with strong rhizomes, such as Kentucky bluegrass, are a good choice in recreational lawns. If the lawn is in heavy shade, use a fine fescue.
Packaged grass seed is either a mixture or a blend of different grasses. A blend is a combination of several varieties of the same kind of grass. There are several types of Kentucky bluegrass.
Grass mixtures have several types of grasses in the same package such as a package containing Kentucky bluegrass, red fescue, and perennial ryegrass.
• If the package of grass seed is a mixture and not a blend, the varieties of each grass type should be listed.
• The variety listing protects the consumer insuring the seed is a certain grass seed with definite characteristics.
• The seed label contain a term called "other crop." This refers to other grass seed that is present in the seed package.
• "Other crop" seed can be grass seed not mentioned on the label such as types of ryegrass or bentgrass.
• Up to two percent "other crop" seed is allowable in a seed package, but good quality seed packages will contain less than one percent.
Site Preparation

• Prepare the site for establishing a lawn:
  • (1) control persistent problem weeds
  • (2) remove debris
  • (3) deep cultivation
  • (4) fertilization
  • (5) seeding or laying sod
  • (6) watering.
• Hard-to-control perennial weeds including quackgrass, field bindweed (Morning glory) and whitetop can destroy a lawn.
Control perennial grasses such as quackgrass with a nonselective grass killer.
• Control broadleaf weeds with a selective broadleaf herbicide.
• Remove Debris
• Remove large rocks, wood, and other debris.
• Remove as much of the root system of woody plants as possible.
• Clean up soil contaminated with building materials, such as concrete cement residues.
• Deep Cultivation
• Cultivate 6 to 10 inches deep, especially where heavy equipment has compacted the soil.
• Soil Modification
• Soil-modifying materials such as peat moss or clean manure should be used.
• Bring soil up to grade (within 1/2 inch below sidewalks and driveways).
Fertilization

• Use a high phosphorus fertilizer/low nitrogen at the rate of two pounds of phosphorus per 1000 square feet.
• Add phosphate fertilizer to the soil before roto-tilling so that the phosphorus is incorporated into the root zone.
• Cultivate soil so that amendments (fertilizer and soil-modifying material from item 4) are incorporated evenly.
• Do not over-cultivate. Soil clods should be golf ball size.
• Pulverized soil repels water. After rototilling, the soil should be a homogenous mixture to the depth of tilling.
Level Area

- Use a flexible metal door mat, drag chains, or hand raking to establish the final grade.
Roll

- If footprints are more than one-half inch deep, water to compact the soil.
Seeding

- Choose only top quality grass seed. Check the seed package for types of grasses used in the mix or blend.
• Avoid nurse grasses like annual rye.
• Use at least three different varieties
• Do not exceed 20 percent of the mixture with perennial rye grass.
• Lawns with heavy shade should use a shade-tolerant Red or Chewings fescue in the mixture.
• Seed in the spring or fall.
• Spring and fall planting of bluegrass seed are the most popular.
• Fall planting of grass seed gives the greatest success.
Seed Kentucky bluegrass at three to four pounds of seed per thousand square feet. For good establishment, a proper seedbed, fertilization, and moisture are very important.
• The seeding rate will vary with the mix or blend. Excessively high seeding rates waste money and can cause weak seedlings that are slow to establish a strong, mature sod.
• Spread seed is at a uniform rate over the entire surface. Seed can be applied with a mechanical drop spreader or a cyclone-type of spreader.
• Divide the seed into two equal parts. Apply one half in one direction and the other half applied at right angles to the first.
• Cover the seed with 1/4 inch of soil by hand raking or spread a thin mulch of clean straw or peat moss over the seed.
Watering and Fertilizing

- Water seeds as needed and wet the soil 4-6 inches deep.
- As grass seedlings emerge (10 to 14 days) watering frequency can be reduced to a single, longer watering period.
- Apply nitrogen fertilizer after four weeks.
Watering and Fertilizing

• Allow 8 to 12 weeks before heavy traffic is allowed.
• Do not apply herbicides until after the third mowing.
Hydroseeding
• Hydroseeding applies seed using water as the carrier for seed, fertilizer, and mulch.
• It is excellent for slopes and difficult rocky sites
• Use hydroseeding for seeding commercial areas and some homes.
• Hydroseeding is limited to larger areas, and contractors have a minimum area to seed by this method.
• The mulch is often dyed green so the area covered looks green appearance after seeding.
• Soil preparation for hydroseeding is the same as for hand seeding.
Laying Sod
Sod Selection

• Select sod with the desired seed mixture
• Check sod for bunchgrass or quackgrass difficult-to-control weeds.
Sod Selection

• Use freshly cut sod. Avoid sod that sits for long periods.
• Keep sod in the shade and water if necessary to keep it from drying out.
• Avoid purchasing sod grown on soil drastically different than your own soil.
• Sod grown on clay and planted on a sandy soil creates future problems.
• Make arrangements so that the soil is prepared prior to transplanting the sod. Soil preparation should be the same as for seeding a lawn. It is important that the soil be moist when the sod is laid.
C. Watering
• Utah lawns require about two inches of water each week in mid-summer.
• During the cool spring and fall, this may drop to 1 to 1 1/2 inches per week.
Most homeowners apply twice as much water to their lawn as they should.
By following a simple guideline, homeowners can cut summer water use on lawns by at least one-third.
• First, measure the sprinkler output. Use six straight-sided cans (at least 3 inches deep) located at different distances from the sprinkler head.
• Turn the water on for 30 minutes. Measure the sprinkler output by averaging the amounts in the six cans. Your amount will be in terms of inches in 30 minutes.
Measuring Sprinklers
Second, measure the depth of water penetration with a long screwdriver or steel rod. Push it into the soil in several places in the watered lawn. The rod or screwdriver will be harder to push in dry soil than in damp soil.
• Measure the depth of the easy push. You now know how deep the water penetrated into the soil, the amount of water used in inches, and how long it took to put the water on the lawn. Ideally water should penetrate 10 to 12 inches.
Third, determine how frequently the lawn needs water each week.
If the lawn requires 1.5 inches each week and you applied one-half inch in 30 minutes which watered to a depth of ten inches, you need to water three times each week.
If you applied one-half inch in 30 minutes and water penetrated only 2 1/2 inches, you need to apply enough water to wet the soil to a depth of 10 inches.
• This means you need to water for two hours (1/2 hour = 2 1/2 inches; 2 hours = 10 inches).
• The best time of day for applying water is during the morning or evening hours. Water pressure is generally best in the morning hours.
• Automatic sprinkler systems should be reset for different water outputs in May and September. This can save water.
• Symptoms of a lack of water in a lawn include footprinting, darkened or blackish areas, and lawn browning.
Footprinting can be determined by walking across a lawn and watching to see how long it takes for footprints to disappear. If the grass has had adequate water, footprints will hardly be noticed.
If moisture is limiting, the grass will be very slow to stand back up. The blackened grass areas need to be watered immediately. If not, they will be brown the next day.
Blackened areas will usually yellow even if water is applied, and they indicate that the area has been without water for too long.
Overseeding
Overseeding is a technique for sowing grass seed over an existing lawn.
It is done usually for two reasons: (1) to thicken or invigorate an existing lawn, or (2) to introduce desirable grasses into problem areas.
• Thicken thin or sparse lawns by seeding over existing turfgrass. Power rake the area to overseed before seeding is done.
• Set the cutting blades to cut about 1/2 inch into existing sod. Apply seed evenly over the entire area. Water as you would a newly seeded lawn.
• Use only top quality seed. If the lawn is Kentucky bluegrass use a blend of straight Kentucky bluegrass types.
• Overseeding can also be used to improve or adapt a lawn to special conditions. Shady spots in a lawn can be reseeded with a shade-tolerant grass.
• Overseed older lawns with perennial disease problems with resistant varieties. Overseed lawns periodically to keep them vigorous.
Pest Control
Weed prevention is the primary method needed for effective weed control.
Weed prevention is best accomplished by: (1) raising the mower height to 2 to 3 inches; (2) fertilizing with adequate amounts, kinds, and frequency; (3) watering with proper amounts of water; and (4) controlling weeds in the lawn when they are small problems, not large ones.
Physical Control
Mowing

- This control many erect weeds. Time the mowing before seedhead formation to help reduce weed spread.
• Low growing weeds that escape mowing can be removed by pulling. Most perennial grasses cannot be removed this way.
Annual weeds can be removed from perennial grasses by covering infested areas of the lawn with clear plastic on hot sunny days.
• The sunlight heats the area under the plastic causing dieback of all plant tissue above the ground. The perennial weeds and grass will send out new leaf blades.
• The annual weeds will die because of their inadequate root system. This must be done before annual weeds have seeded.
Chemical Control
• Chemicals used to kill weeds (herbicides) can be divided into nonselective, selective, preemergent, and postemergent.
Some are translocated (they move to a plant part where the application has not been made) and some are not.
If the chemical is translocated, the herbicide is called a systemic herbicide.
• Non-selective herbicides will kill all treated plants. They can be translocated or not.
Systemic non-selective herbicides usually take from 5 to 21 days to see a visual effect.
• Non-systemic herbicides usually take from 1 to 3 days.
Selective herbicides are used to kill weeds without damaging the turfgrass. Most selective herbicides are systemic.
Visual effects may not be seen for 5 to 10 days. Because of the systemic activity, air temperatures will have an effect.
• Lower air temperatures will mean a longer time will pass before weed kill.
Preemergent herbicides are applied before germination of weed seeds. Most commonly these are used for control of annual grasses, such as crabgrass, annual bluegrass, and foxtail.
Once applied, the chemical is watered into the soil and left undisturbed during weed seed germination (usually 30 to 60 days).
• Preemergent herbicides do not prevent seeds from germinating but kill the weed seedling as it is germinating.
Preemergent herbicides are available in combination with fertilizer or can be bought separately as a dry product for the homeowner.
Postemergent herbicides are applied after the weed has emerged from the soil.
Postemergent types include selective and nonselective herbicides. These include any type that needs leaves or foliage present for absorption of the chemical by the weed.
• Timing of the application of the herbicide is extremely important. Preemergents must be applied before weed seeds germinate.
If germination time is missed, control will be poor. Selective herbicides have precautions on the label concerning the air temperatures which are best for getting good control.
Weeds are usually easier to kill when young, and much more difficult to control when mature.
Spring and fall applications of selective herbicides have the best chance of controlling weeds.
When selective herbicides are used to kill weeds which seem to spring back from the roots, a good time of application is at the first sign of bloom.
• Blooming in some plants is related to the stored food reserves of the plant. When stored food reserves are low, plants will bloom.
• Continued killing of the weed tops when in bloom will deplete the food reserves and limit regrowth. Constantly destroying the tops of persistent weeds will eventually eliminate the weed.
Methods of Application
Herbicides are available in dry or liquid form. They are also available separately or mixed with other chemicals such as fertilizer, insecticides, or fungicides.
Instructions for fertilizer combinations containing a preemergent weed killer direct the consumer to wash the chemical onto the soil surface after application.
This is because the preemergent herbicides must provide a protective barrier on the surface of the soil. The chemical is not absorbed by the grass leaves.
Always follow label directions exactly to obtain good results.
When herbicides are purchased as a dry form, the percent of actual herbicide by volume is very low compared to the liquid.
The liquid can be applied many different ways. Hose end applicators are very popular. The major drawback is the tendency for the person making the application to waste herbicide.
If using a hose end applicator, apply the chemical evenly over the lawn surface walking at a constant rate.
A weed in the lawn does not need an "extra dose." Pump-up type compressed sprayers are also popular and give a more even application over the surface area.
• Check the labels for precautions and directions. Other methods of application of liquid herbicides include sprinkler cans, hand mist sprayers, "killer kanes," ultra low-volume herbicide sprayers, and many others.
Other types of applicators exist for dry applications. The drop spreader and cyclone type spreader are fine for spreading fertilizer herbicide combinations.
• Drop spreaders are more accurate than the cyclone type, but are slower. If using a cyclone type, know where you are applying. The cyclone is harder to maneuver safely through shrubs and susceptible plants.
Insect Control
• `Most insect damage problems can be prevented by regular inspection of lawn areas, and spot treatments where necessary."
Most insect damage problems can be prevented by regular inspection of lawn areas, and spot treatments where necessary.
Damage caused by insect feeding is usually localized in spots in the lawn rather than distributed evenly over the lawn area.
Early season damage starts in lawn areas that warm up first, such as near driveways or sidewalks and on west or south facing slopes.
Different insects are affected by different conditions. Lawn damaging insects can be divided into above-ground feeders and below-ground feeders.
Insect Detection
Almost all of the insect pests that invade lawns in Utah and cause damage can be controlled with the proper insecticide.
Detection and identification of the insect should be done first. Sometimes the insects cannot be found so the damaged areas should be inspected for insect damage.
Insect damage is usually very obvious. The grass in the damaged area pulls up very freely in handfuls.
• Green grass will not pull up easily if disease is present. Take handfuls of grass on the border, between the healthy and the damaged region.
• If insects are present, small amounts of green grass pulled up will be lacking a root system--usually a clean cut as if cut by a small scissor.
Another detection method is carefully digging around the roots of grass. The grubs can be found feeding below the soil surface on grass roots.
Cultural Practices
• The first line of defense against turf grass pests is a program of good cultural practices. Poorly kept turf shows pest injury sooner and recovers more slowly than vigorous, well-kept turf.
• Thatch, if allowed to accumulate to greater than 1/2 inch thick, may act as a breeding ground and haven for many insect pests.
• The thatch layer occasionally stays moist and warm where breeding is encouraged.
• The thatch layer is organic and binds insecticides that are applied to kill insects, reducing its effectiveness.
Thatch buildup results in poor water and air penetration, which weakens turfgrass and makes it more susceptible to insect injury. Good fertilization, watering, and cultural management cannot be over-emphasized.
Application of Insecticides
Most insect pests can be controlled by granular or liquid-applied insecticides. These chemicals should be watered into the soil after application for best control.
• If surface feeders such as cutworms are the problem, then a liquid application is preferred, without a thorough watering after, but watering a few hours before application. In all cases read and follow label directions carefully.
Underground Feeding Insects
These insects do their damage by chewing off the roots of the grass plants. Examples are white grubs and billbug grubs.
• White grubs are one phase in the life cycle of various beetles such as the June beetle and some chafers.
• These insects are about 1 to 1 1/2 inches long with a brown head, six large legs, and the hind section of their body is smooth and shiny.
• The grub does damage by chewing and feeding on grass roots. This allows the turf to be rolled back like a carpet thus exposing the grubs.
• The greatest concentration of grubs is generally near green areas bordering damaged turf. The grubs hibernate deep in the soil during the winter and early spring.
As the soil warms in the spring they move out of hibernation and resume feeding. During mid-summer, the grubs pupate and emerge from the soil as adult beetles.
Unlike the white grub, the billbug overwinters as an adult beetle. The black adult billbug moves out of hibernation during the first warm days of spring, feeds on grass, and deposits its eggs into grass crowns or surrounding soil.
• The adult is a black beetle with a snout and measures about 1/4 to 3/8 inch long.
• About 4 to 14 days after eggs are laid, the small legless grubs hatch.
They are white and measure about 3/8 inch long and have a reddish brown head. The grub is characteristically curved.
The billbug grub causes damage by feeding near the crown and eating roots slightly below the soil surface. Most damage in Utah is noticed by homeowners some time in July.
Above-ground Feeding Insects
Two major above-ground insects have been found causing damage to lawns in Utah, the sod webworm and the cutworm.
The sod webworm is the larval stage of the lawn moth. These worm-like insects are 1/2 to 3/4 inches long.
• Their caterpillar-like body has stiff hairs protruding from dark brown circular spots. Adult moths are grayish brown.
The female moth flies over the turf in a jerky, zig-zag pattern dropping eggs into the grass. Eggs hatch in about 6 to 10 days, and larvae begin to feed by chewing grass blades.
Blades are cut in half and some plants are severed at the crown. The damage is yellowish brown in color, similar to drought damage.
The webworms spin silk-lined tunnels in thatch or debris and remain hidden during the day.
Their life cycle is about six weeks. All grasses are attacked, but bluegrass is most susceptible. Damage usually is noticed in July, August and September.
• Several species of cutworm appear to damage turfgrass, including the variegated and glossy cutworms.
These are thick bodied caterpillars from 1 to 2 inches long when fully grown. They are dull colored, greenish, gray, brown, or blackish, often with spots or stripes.
The adults are night-flying moths sometimes called "miller moths." Moths fly at night and lay eggs on leaves of all grasses.
• The larvae feed at night and hide in holes, under debris or organic matter (thatch) during the day.
• Breeding occurs all season long so that multiple generations appear each year. Most damage occurs in the spring.
The cutworms feed on the leaves and crowns of the grass and may cut off plants at the soil line. Adult moths cause no damage.
Disease Control
- Utah is very fortunate in lawn disease prevention because of low humidity and high temperatures.
• Low humidity and rapid movement into summer temperature prevents many diseases from occurring.
• In order for a disease to spread, high humidity is usually needed. The major lawn disease problem in Utah is leaf spot disease or "melting out." Some minor importance can be assigned to snow mold.
Disease Prevention
Leaf spot disease can be prevented, and kept from returning to lawns that are extremely susceptible, by using the proper preventive measures.
• There are some excellent bluegrasses available which show good resistance to leaf spot diseases.
A blend of 2 or 3 resistant varieties should be used to overseed the lawn. If the disease is an occasional problem, fungicide sprays are available which stop such fungus diseases as leaf spot.
• Some cultural methods for control include: (1) trying to minimize the amount of shade on the area by thinning plants or limbs from trees to desirable heights,
• leaving the grass longer,
loosening compacted soil by aeration, and
• preventing the grass from becoming dry during the spring months.
Use of Chemicals
Fungicides are primarily preventive chemicals for controlling turfgrass diseases.
• They control the disease long enough so the grass outgrows the disease, or until the weather becomes less suitable for disease existence.
Fungicides can be contact or systemic types. Systemic fungicides are absorbed and translocated throughout the plant. They control infections by killing the fungus inside the grass plant.
To be effective, fungicides should be applied in several applications spanning weeks until the disease is under control.
• To obtain control, the disease must be identified properly.
The plant diagnostic laboratory located in Logan can be reached through the County Extension Office and can be of assistance in identifying diseases for proper control.
• In any case, control should start as soon as possible and the causes for the disease isolated and corrected.
Leafspot disease is not localized in spots like drought or insect injury, but rather the spots are general and are spread by wind-borne spores of the fungus.
• Symptoms first appear as a yellowish cast through the turf. The disease can be confused with iron chlorosis and in some cases, drought.
Close inspection of the leaf surface reveals small conspicuous leaf spots or lesions outlined in black or brownish spots with straw colored or brownish centers.
Lesions enlarge and merge on the infected plant. The lesion girdles the leaf and causes it to turn yellow and, finally, brown.
• The disease may continue down the plant and into the crown, killing the plant. Cool moist conditions favor the disease (spring and fall).
If the disease is not severe, it will stop when warmer dry weather arrives.
Preventive Management

- Use proper varieties
Preventive Management

- Ensure good soil conditions
Preventive Management

• Establish turf properly
Preventive Management

- Mow to correct height
Preventive Management

• Mow often
Preventive Management

• Fertilize according to needs
Preventive Management

• Remove excess thatch
Preventive Management

• Core compacted areas
Preventive Management
Preventive Management

• Do not plant grasses not adapted to your area
Preventive Management

• Follow disease and insect control measures for your area
Irrigation Management of Turfgrass
Water Requirements Depend On:

- Soil
- Climate
- Temperature
- Wind velocity
Water Requirements Depend On:

- Humidity
- Frequency of rain
- Maintenance practices
Lawn Care Guidelines for Water-Restricted Areas

• Raise the height of your mower blade
Lawn Care Guidelines for Water-Restricted Areas

• When watering is allowed, water evenly and deeply
Lawn Care Guidelines for Water-Restricted Areas

• Feed your lawn only if there is enough rainfall or irrigation to make grass grow - use a controlled-release fertilizer
Lawn Care Guidelines for Water-Restricted Areas

• Apply a weed control if weeds are actively growing
Lawn Care Guidelines for Water-Restricted Areas

• Measure your water
Lawn Care Guidelines for Water-Restricted Areas

Water Lawns When They Show Signs of Stress
Lawn Care Guidelines for Water-Restricted Areas

- Do not aerate or de-thatch lawn now
- Avoid seeding until normal watering conditions return
Management Practices

• Weeds, insects, and diseases are main pests
• Rodents may occasionally be pests
• Good management combines the best available prevention and cure
  – Genetic -- resistant varieties
  – Cultural -- mowing, aerating, watering
  – Chemical -- use of pesticides
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Diagnosing Problems

• Determine variety of grass
Diagnosing Problems

- Determine cause of problem
Diagnosing Problems

• Decide whether the problem is best corrected by management or pesticides
Diagnosing Problems

• Make sure correct chemicals are used
Diagnosing Problems

• Recommend good cultural practices that will aid in recovery
Starting Turfgrass
Seeding Turf
Sodding Turf
The ligule is a structure projecting from the inside of the leaf at the junction of the leaf blade and leaf sheath. The ligule can be absent, have a membrane, or have just a fringe of hairs. The length of margin of the ligule is used in identification of grasses.
• The auricles consist of two appendages that project from either side of the collar at the junction of the leaf blade and sheath. They can be of various sizes or can be absent.
Venation refers to arrangement of veins on the leaf blade. Some grasses may have a prominent midvein (Kentucky bluegrass) while others have veins more uniform along the vein (ryegrass).
• The sheath originates from the node and is the tubular portion of the leaf which wraps around or encloses the stem. The blade is divided from the sheath by the collar and the ligule. The collar can be continuous, divided, broad, or narrow.
• The shoot terminates in a seedhead which is very useful for detailed identification of grass plants.
• Fine fescues are always sold in combination with Kentucky bluegrass.  
• This allows bluegrass to dominate in sunny areas and fine fescue in shady areas.
• Seed fescues at the rate of four pounds per thousand square feet.
When in mixtures, follow the manufacturer(s recommendations.
• Growth Characteristics of Grasses
• Leaves
Leaves vary in width (texture) from one to four millimeters (mm). Leaves constantly change in a grass stand.
New leaves grow from the center of the plant while older outer leaves die off. Leaves grow from the crown so grass withstands mowing without damage to the plant.
Higher mowing helps turfgrass health and vigor. Leaving more leaf surface exposed to sunlight allows more food to be made by photosynthesis.
• Roots
• Grass roots cannot grow leaf blades.
Leaves grow from the crown which is a compressed stem composed of many nodes.
A healthy crown is the key to a thick lawn. A deep root system helps ensure good summer heat survival.
• Rhizomes and Stolons
Rhizomes and stolons store food for the plant. Lateral stems help grasses spread and crowd out weeds.
• Seedheads
• Seedheads form under certain temperatures and day-length conditions.
Flowers develop in late spring and early summer but previous fall conditions determine flower intensity.
• Low soil nitrogen or high phosphorus levels enhance flowering. Allowing flowers to produce seed does not increase turfgrass density.