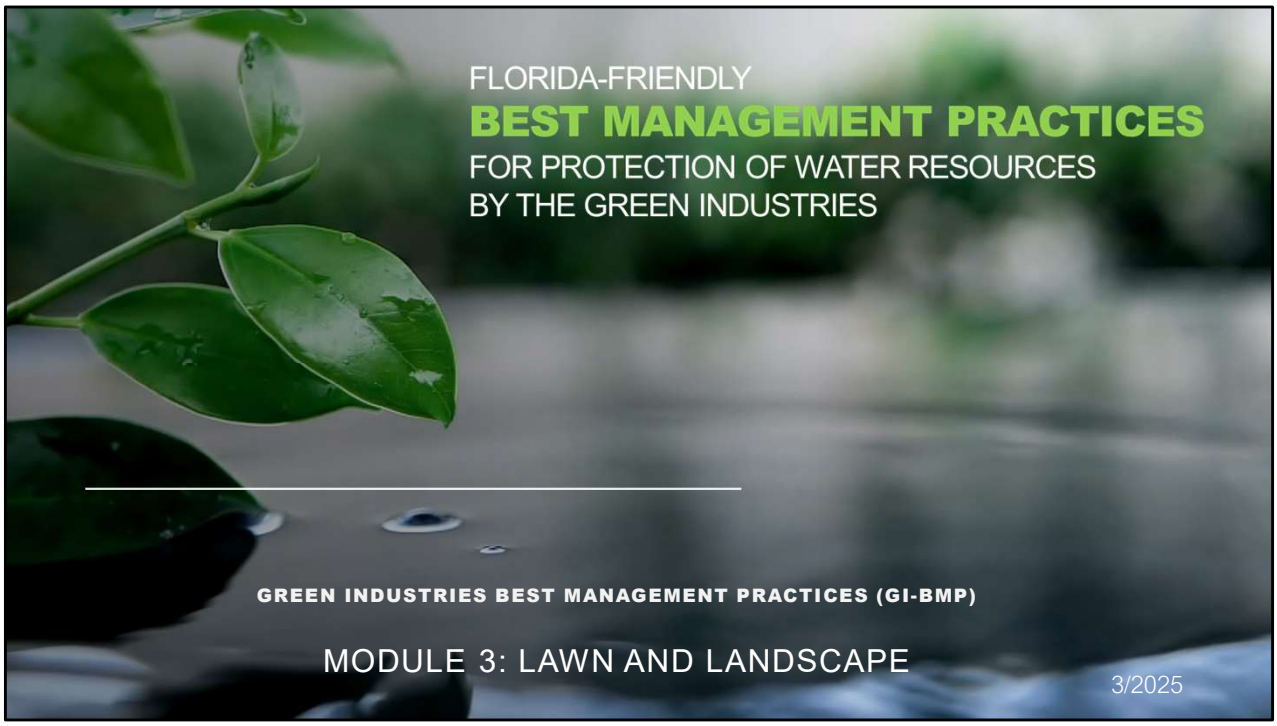


Module 3, best management practices for the Lawn and Landscape. This presentation will cover Florida turfgrass species and characteristics and Florida landscape plants and characteristics, including fertilizer requirements and the effects of landscape design, mowing, irrigation, shade, wear, pest, disease and timing. We will discuss the effects of fertilization on these cultural aspects in addition to direct effects on water quality, including nutrient pollution, erosion and sedimentation, and water usage rates.

At the end of this module, you will be able to:

Describe the components of a Fertilizer Management Plan.
Describe how turfgrass reduces effects of urban nonpoint source pollution.
Name four common lawn grasses used in Florida.
Describe how environmental stresses affect plant health and how they can be managed.
List four landscape best management practices to protect water resources.

LAWN AND LANDSCAPE NUTRIENT BMPS

Fertilize lawn and landscape plants appropriately.

The appropriate fertilizer applied at the correct rate and time can help maintain a healthy Florida-Friendly landscape, which can prevent soil erosion and reduce nutrient runoff and leaching.

WHY FERTILIZE?

To supply nutrients to achieve a defined objective or response such as:

1. **Increasing growth**
2. **Enhancing appearance**
3. **Correcting or preventing nutrient deficiencies**

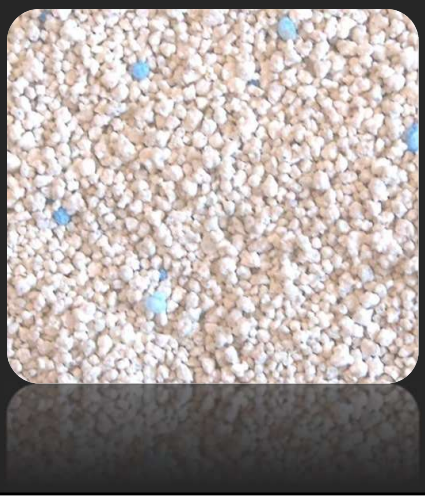
Why fertilize? Unlike natural landscape sites, which appear to grow without supplemental fertilization, urban landscapes often need supplemental nutrients or soil amendments to overcome the challenges of urban soils. Urban soils are highly variable in nutrients and availability.

There are usually 3 objectives for applying nutrients to plants:
1) increase growth or the rate of growth,
2) to make the plant material look prettier or more attractive by stimulating a new flush of growth, by enhancing foliage color, or by encouraging more or larger flowers.
3) to correct or prevent the symptoms of nutrient deficiencies.

FERTILIZER DEFINED

Any substance that:

- **Contains one or more recognized plant nutrients**
- **Promotes plant growth**
- **Controls soil acidity or alkalinity**
- **Provides other soil enrichment**
- **Provides other corrective measures to the soil**



Let's begin the discussion by answering the question, what is fertilizer?

"Fertilizer" means any substance which:

Contains one or more recognized plant nutrients and promotes plant growth, or
Controls soil acidity or alkalinity, or
Provides other soil enrichment, or
Provides other corrective measures to the soil.

RECOGNIZE NUTRIENT DEFICIENCIES

- **Plants that have chronic deficiencies may not be suitable for the site**
- **Test soil pH**
- **Select plants better adapted to the site conditions**

Proper nutrition is essential for any living organism, and plants are no exception. Like all plants, lawn and landscape plants need water and specific nutrients in order to grow and stay healthy. While certain nutrients can be found in the soil, they aren't always present in the right amounts to support good plant health.

A nutrient is deficient if its absence prevents the plant from developing normally. Learning to identify nutrient deficiencies can help to determine which element is limiting growth. Plants that have chronic deficiencies may not be suitable for the site. You may have to replace them with plants better adapted to the site conditions.

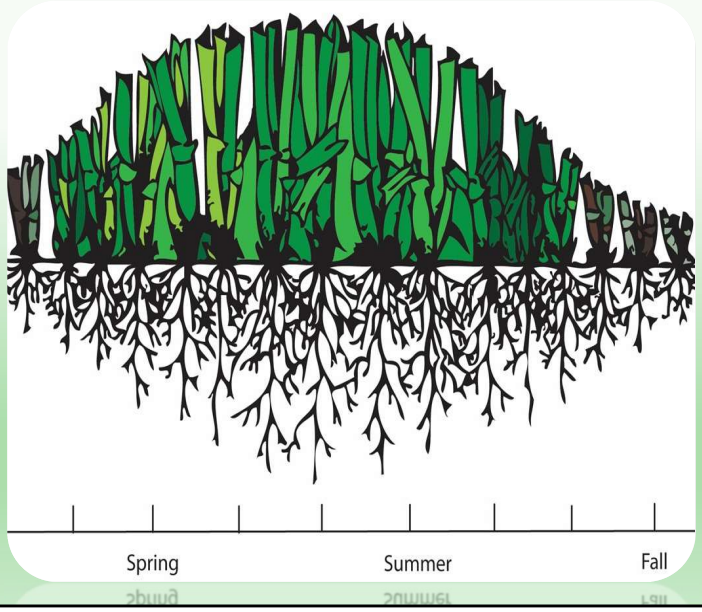
WHEN TO FERTILIZE

Maximize Plant Use

- **Fertilize when plants are actively growing**

Minimize Adverse Environmental Impacts

- **Do not fertilize dormant turfgrass**



Fertilizer should be applied to grass when roots and shoots are actively growing. This varies depending on the use, water stress, and microclimate of the environment in which the grass is grown. Active growth occurs from spring through fall in North and Central Florida and can be year-round in South Florida.

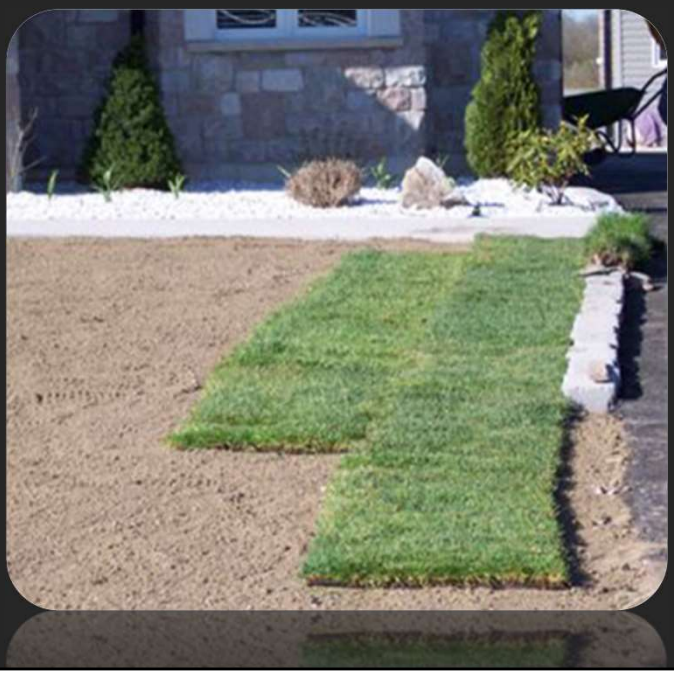
Do not fertilize your lawn during the winter months if you are in a part of Florida where the lawn does not actively grow in the winter. Fertilization during times of dormancy may also contribute to nutrient leaching or runoff since the grass has less root system and, therefore, less ability to take up the nutrients. Applications to dormant turfgrass are not recommended in the fall or early winter. However, if an extra application must be made to meet contractual obligations it is better to do it in the fall, to reduce potential nutrient leaching, as opposed to applying it in the winter or early spring.

Before making any fertilizer application, be sure to check for local ordinances that may prevent application of products containing nitrogen and phosphorus.

NEWLY PLANTED SOD AND SPRIGS

WHEN TO FERTILIZE?

- After the turf has established a root system
- Typically, 30-60 days
- Applying fertilizer too early will result in high leaching potential, meaning the plants do not uptake the nutrients. This wastes money and damages our water.



Do not fertilize a newly planted lawn for the first 30-60 days after sodding. The short root system of the grass during this period of establishment means the grass has little ability to absorb nutrients. As a result, fertilizing during this period may lead to increased nutrient leaching past the roots through the soil.

Additionally, because sod is generally fertilized prior to harvest at the sod farm, the sod will not typically need additional fertilizer during the establishment period. If the sod appears to lack sufficient nutrients (yellow coloration and spindly growth), apply fertilizer no sooner than 30 days after sodding. If possible, ask the sod grower or installer when the sod was last fertilized.

Irrigating Newly Installed SOD

- Schedule is different from established grass
- Establishment irrigation is typically achieved in 30 days
- After 30 days, follow recommendations for established grass
- Assist your clients with programming irrigation controllers

Time	Frequency	Duration
First 7-10 days	2-3 times daily	Short (5-10 mins)-try to keep plant material from drying out
7-10 days after planting	Once a day	Apply ~¼" water-more will be wasted due to short roots
Next 7-10 days	Every other day	Apply ~¼" to ½" of water
3-4 weeks after planting	1-2 times weekly	Apply ~½" water

Planting sod can give you that "instant lawn"

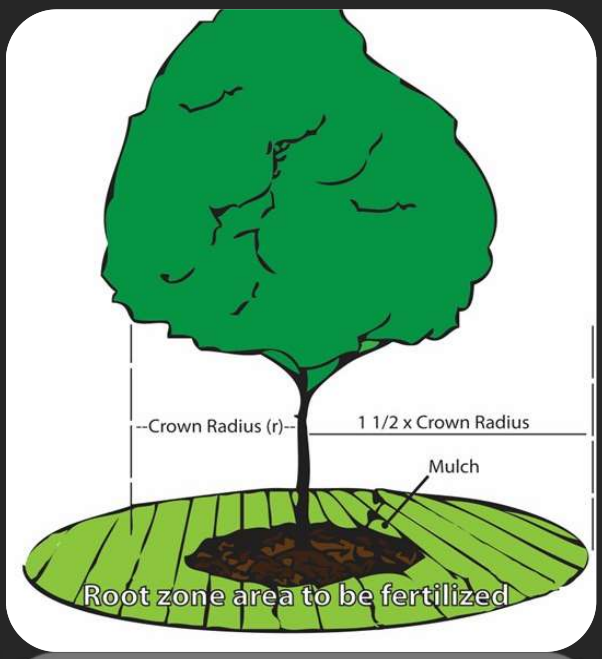
Proper watering is essential for your new lawn's survival. Provide light but frequent waterings for the first two to three weeks, to keep the soil moist but not overly wet. Once the sod is firmly rooted, you can taper off on watering.
Do not apply fertilizer to your new lawn for 30 – 60 days.

WHEN AND WHERE TO FERTILIZE

TREES AND SHRUBS

- Nutrients applied to lawn may meet the needs of shrubs and trees.
- Adding fertilizer to healthy mature trees may not accomplish anything.
- When mature trees have matured green foliage, little reason to add fertilizer.
- Palms have special nutritional needs.

(E.F.Gilman https://hort.ifas.ufl.edu/woody/fertilizing.shtml)



According to UF Specialists, many established trees in managed landscapes are able to scavenge enough elements due to their extensive root systems. They gain access to elements applied as fertilizer to the lawn, shrubs, and garden and typically need no additional fertilizer.
Adding fertilizer that contains nitrogen under the canopy can increase the growth rate on young and medium-aged trees; this is a reasonable objective. However, increasing growth on mature trees may not be desirable.

More growth means increased demands on the tree to maintain more living cells. This could actually lead to decline under certain circumstances.
When you suspect a deficiency, have the soil or foliage tissue tested for important elements before prescribing a fertilizer treatment.
Simply adding fertilizer around otherwise healthy mature trees may not accomplish anything. Applying nitrogen, around stressed or root damaged trees can be harmful.

In general a complete fertilizer for palms should contain Magnesium as well as the N-P-K found in most fertilizers. Ideally, 100 percent of the N, K, and Mg nutrients should be in slow release form to prevent the palms from developing

deficiency symptoms.

Palms appear to have higher needs for micronutrients than other landscape plants. For more information see related EDIS publications found on the Ask IFAS website or at your county Extension office.

FERTILIZER MAY NOT BE REQUIRED

- **If appearance is that of a healthy specimen**
- **If plants are established**
- **If plants are flowering & fruiting**
- **For trees, unless nutrient deficiencies exist.**

The appropriate fertilizer applied at the correct rate and time can help maintain a healthy Florida-Friendly landscape, which can prevent soil erosion and reduce nutrient runoff and leaching.

Supplemental fertilization may not be required if:

- The plant appearance indicates sufficient nutrients are available for healthy growth without extra applications of nutrients

- The plants are established in an area where turf is fertilized on a regular basis

- Plants are fruiting and flowering on a regular schedule and with a good balance of flowers or fruit to the green canopy for the plant species

- And finally, most landscape trees do not require supplemental fertilization unless they are showing deficiency symptoms

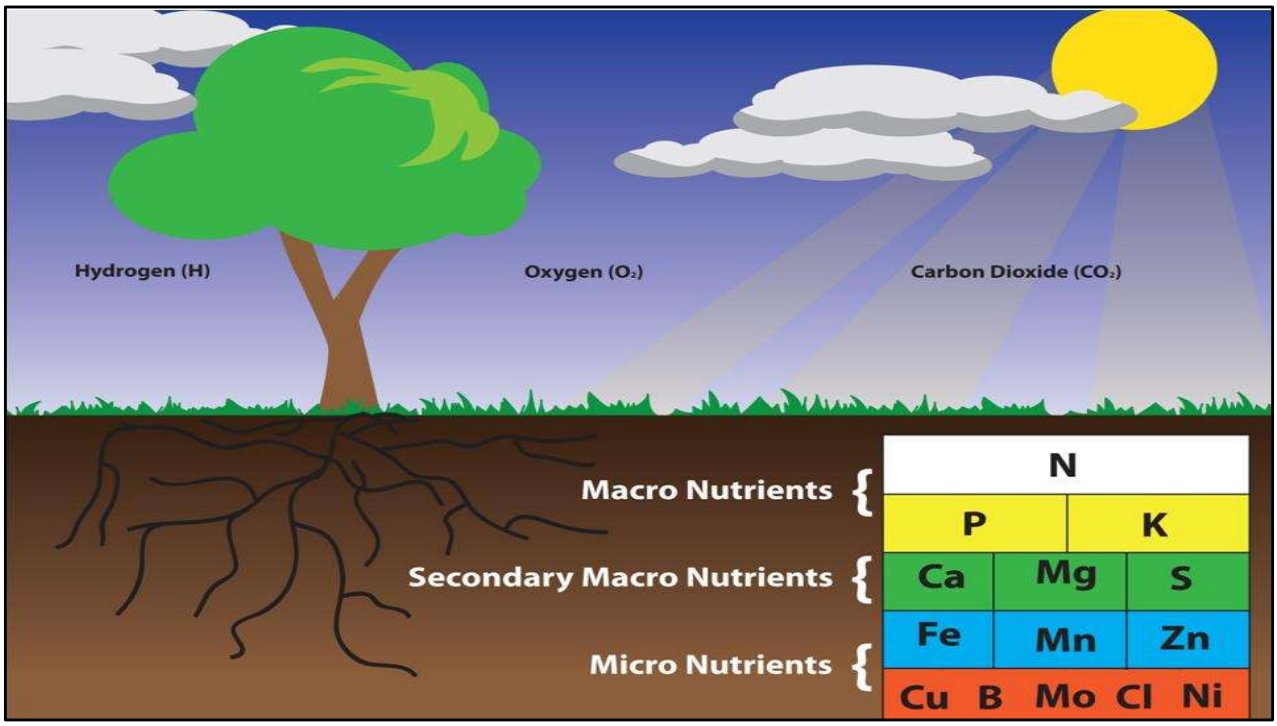
NUTRIENT ANALYSIS

Chemical properties such as soil pH, lime requirement, extractable levels of phosphorus, potassium, calcium, magnesium, and selected micronutrients such as manganese, copper and zinc can be determined through soil testing.

It is strongly recommended that soil testing is performed before any initial phosphorus application and annually if applications are being made based on previous testing.

Where community subdivisions have been determined to have relatively similar soils, this may be reduced to testing 1/2 to 1/3 of the customers each year, rotating the testing so all are tested every 2 or 3 years.

For more information, see IFAS Publication SL-181, *Soil Testing and Interpretation for Florida Turfgrasses, at edis.ifas.ufl.edu/SS317*



Plants obtain nutrients from: minerals and organic matter in soil, air and water. There are 16 essential elements required to sustain plant development and growth. Elements are categorized into two groups: Macronutrients and Micronutrients according to quantities required by the plant. Quantity will vary depending on plant characteristics.

Macronutrients are consumed in larger quantities. There are nine macronutrients. Carbon, Hydrogen and Oxygen are obtained from air and water. The others – Nitrogen (N), Phosphorus (P), Potassium (K) , Calcium (Ca), Magnesium (Mg), and Sulfur (S) – are obtained from soil and applied fertilizers.

Additionally, there are many micronutrients, required in smaller amounts. Plant micronutrients include Iron (Fe), Manganese (Mn), Zinc (Zn). Copper (Cu), Boron (B), Molybdenum (Mo),Nickel (Ni) Chlorine (Cl) and Sulfur (S). These are obtained from soil and applied fertilizers.

It is important to note that micronutrients Fe and Mn can be limiting in high pH soils or in lawns that are irrigated with high pH, reclaimed water or from

limestone aquifer ground water and may need to be supplied to lawns under these conditions.

BASIC SOIL TESTING

DETERMINING A FERTILITY PROGRAM

Soil Test

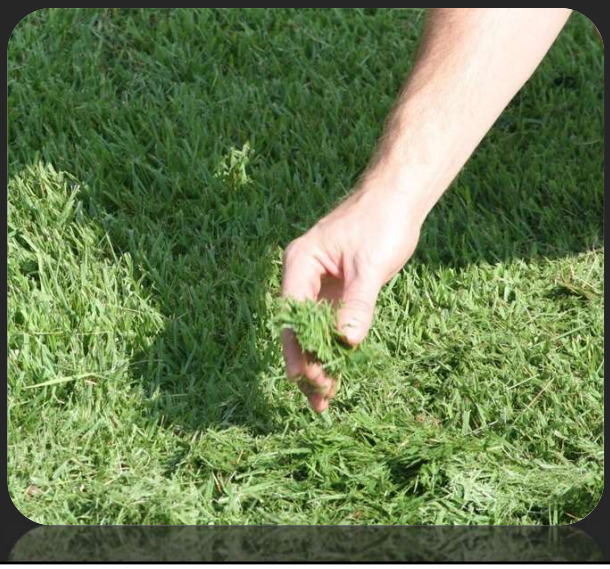
- **pH**
- **Phosphorus**
- **Potassium**
- **Magnesium**
- **Calcium**
- **Sulfur**
- **Lime and fertility requirements**

Soil testing is an applied science and can be used as one of the tools in the maintenance of healthy turfgrass and landscapes. For the effective management of nutrients, soil testing should be used in conjunction with tissue testing. Soil test recommendations are based on a correlation between the level of a given nutrient extracted from the soil and the anticipated plant response. The amount of nutrients extracted by a particular extractant is only an index relative to crop response. It is not a direct measure of actual plant nutrient availability.

Although it may not be an essential practice for the everyday maintenance of a healthy landscape, testing to determine the soil's chemical properties before installing turfgrass or landscape plants is a recommended practice. Through soil testing, the initial soil pH and Phosphorus level can be determined. Soil pH is important in determining which turfgrass is most adapted to initial soil conditions.

TISSUE TESTING

- Nitrogen
- Phosphorus
- Potassium
- Calcium
- Magnesium
- Iron
- Copper
- Manganese
- Zinc
- Boron



A soil analysis is a snapshot of what is present at the time of sampling, but does not always indicate the availability of some nutrients to plants. Tissue analysis can be a more reliable indicator of appropriate fertilization and plant health. Potential nutrient deficiencies can be detected with leaf analysis before visual symptoms appear. Leaf analysis, along with appearance and soil analysis, can be used to diagnose the problems and the effectiveness of a fertilization program, especially for micronutrient deficiencies.

Turfgrass Characteristics and Culture

A healthy stand of turf and/or other landscape plants can help to control erosion and reduce runoff, but it must be properly established and maintained to protect water quality.

BENEFITS OF FUNCTIONAL TURFGRASS

Healthy turfgrass:

- Slows stormwater from moving to water bodies
- Filters and removes contaminants
- Reduces leaching
- Reduces erosion
- Protects groundwater

The dense root and shoot system of healthy turf gives it an excellent ability to filter runoff – and to take up applied fertilizer. Healthy turf is often referred to as “nature’s best water filter” for this reason. It is important that turfgrass managers perform all cultural practices correctly, to ensure a healthy, dense turf system which can reduce effects of urban nonpoint source pollution.

ST. AUGUSTINEGRASS

Advantages:

- Good shade tolerance (relative)
- Good salt tolerance (coastal areas, reclaimed water)
- Tolerant to wide range of soil pH
- Establishes quickly from sod
- Grows vigorously under many conditions

Optimal Mowing Height (inches)

- Cultivar Dependent: 3.5" – 4.0"
- Dwarf Cultivars: 2.0" – 2.5"

Advantages of St. Augustinegrass

St. Augustinegrass is the most widely used turfgrass in Florida and is adapted to most areas of the state. It in general has the best shade tolerance of any of our lawngrasses. St. Augustinegrass has good tolerance to salts in coastal or reclaimed water and tolerates a wide range of pH. In high pH soils, the micronutrients iron and manganese may be limiting, which can result in chlorosis (yellowing of the leaf blades). Last it is easy to establish in most parts of the state and grows vigorously during the long days and high temps of summer.

ST. AUGUSTINEGRASS

Disadvantages:

- May require supplemental water
- Poor wear tolerance
- Forms excessive thatch
- For most cultivars, chinch bugs are difficult to control
- Lack of herbicides for grassy weed control

Disadvantages of St. Augustinegrass

Like all of our warm season grasses, St Augustinegrass will not stay green without supplemental water through times of drought. It has poor wear tolerance, and it accumulates thatch, particularly with excess N and water.

Chinch bug control continues to be difficult for homeowners and landscape managers. Post emergence herbicide products labeled for control of grassy weeds in St. Augustine lawns are extremely limited or not available at all.

St. Augustinegrass Varieties

Variety	Year	Attributes
Bitter Blue	**1930s**	**Old cultivar;** Good cold and shade tolerance
Floratam	**1973**	**Most widely produced;** Poor cold tolerance
Palmetto	**1980s**	**Semi dwarf;** Will grow in partial shade
Seville	**1990s**	**Dwarf;** Good shade tolerance
ProVista	**2010s**	**Slow growing;** Glyphosate tolerance
Citra Blue	**2018**	**Blue-green color;** Good shade and disease tolerance
Cobalt	**2023**	**Drought Resistant;** Good shade and disease tolerance

There are many selections of St. Augustinegrass available in the market. Many of these selections have been available for decades. The dwarf and semi-dwarf selections tend to be more shade tolerant. Many of the newer selections were chosen for their color, drought resistance or other attributes.

ZOYSIA JAPONICA
COURSE LEAF TYPE

Advantages:

- Can be maintained with less nitrogen than St. Augustine
- Dense growth habit
- Low mowing height
- Rotary mower
- Moderate shade tolerance
- Faster establishment than previously available types

Optimal Mowing Height (inches)

- Cultivar Dependent: 1.5" – 2.5"

Advantages of Zoysiagrass

Zoysia is becoming more widely used throughout the state. Empire, Jamur and CitraZoy (Hybrid) are some selected cultivars used in Florida. It should be mowed at approximately 1.5" - 2.5" (with a rotary mower) and grows densely. The leaf blades are much finer and smaller than St. Augustinegrass, giving it a more "carpet-like" appeal. Research over multiple years has shown that it will stay green with less nitrogen than St Augustinegrass. High rates of nitrogen can increase disease issues and time required for spring green up in central and north Florida.

ZOYSIA JAPONICA

COURSE LEAF TYPE

Disadvantages:

- Same water requirements as St. Augustinegrass
- Hunting billbug pests
- Susceptible to large patch disease
- Thatch forming

Disadvantages of Zoysiagrass

Zoysiagrass is often thought to require less water than St Augustinegrass, but this is not true. Both need about the same amount of water to stay green. Its main insect pest is the hunting billbug. Zoysiagrasses are susceptible to a disease called “large patch,” and fungicides may be required for management. Because of its low growth, thatch can build up (watch the nitrogen).

Zoysia Japonica Varieties

Variety	Texture	Attributes
Empire	**Coarse**	**Most widely available;** Susceptible to large patch disease
JaMur	**Medium-Coarse**	**Good shade tolerance;** Susceptible to large patch disease
Palisades	**Coarse**	**Good shade tolerance**
El Toro	**Coarse**	**Good cool season;** Color and drought tolerance, Susceptible to large patch disease
CitraZoy (Hybrid)	**Medium-fine**	**Best winter color retention;** Good shade tolerance

Zoysiagrasses were introduced into the United States from Asia and provide attractive turf throughout much of the United States. In recent years, newer cultivars of zoysiagrass have entered the market with improved insect resistance, accelerated establishment, and better overall performance. Zoysiagrasses are adapted to a variety of soil types and have good tolerance to shade, salt, and traffic. When properly managed, they produce a very dense ground cover that resists weed invasion, but certain pests can be problematic. Zoysiagrasses spread through rhizomes and stolons.

BAHIAGRASS

Advantages:

- Good ability to survive drought
- Resumes green growth when watered
- Lower fertility/maintenance requirements
- Low maintenance
- Tolerant of sandy, infertile soils
- Establishment: seed, sod

Optimal Mowing Height (inches)

- 3.0" – 4.0"

Advantages of Bahiagrass

Bahiagrass can be described as having low maintenance inputs, with relatively low inputs of water, fertilizer and pesticides required. It has a good ability to survive drought, thrive in sandy, infertile soils and green up again when water becomes available. Bahiagrass establishes from seed or sod, and is also a good choice for non-irrigated grounds or large areas.

BAHIAGRASS

Disadvantages:

- Produces abundance of seedheads during summer
- Open growth habit encourages weed competition
- Susceptible to mole crickets
- Coarse stems wear out mower blades
- Not wear tolerant

Disadvantages of Bahiagrass

Bahiagrass is not as popular as other species due to its image as “pasture grass” or low quality grass. However, it can produce a nice lawn if properly maintained. It grows in “bunches” rather than from stolons (above ground runners), so is not as dense or carpet-like as some other grasses. During long days, bahiagrass produces seedheads about every 4 days. These wear out mower blades, but do provide some viable seed to the stand. You can see here that wear tolerance is not good.

CENTIPEDEGRASS

Advantages:

- Low fertility and water requirement
- Grows well in acidic/infertile soils
- Fewer insect and disease problems
- Slow growing above ground stems
- Survives drought by going dormant

Optimal Mowing Height (inches)

- 1.5” – 2.5”

Advantages of Centipedegrass

Centipedegrass is well adapted to the climate and soils of Central and Northern Florida and a common home lawn grass in the Florida Panhandle.

Centipedegrass does very well in acidic soils (pH 4.5–6.5) and infertile soils. It has fair shade tolerance and survives drought conditions by going dormant, which results in brown turf. It can be established from seed, sod, or plugs, and it spreads by aboveground stems called stolons. Maintenance and fertility requirements are low compared to other turfgrasses.

CENTIPEDEGRASS

Disadvantages:

- Susceptible to nematodes and ground pearls
- Naturally pale yellow - green color
- Does not perform well in alkaline and saline soils
- Prone to Centipedegrass decline (TAR)
- Low wear tolerance

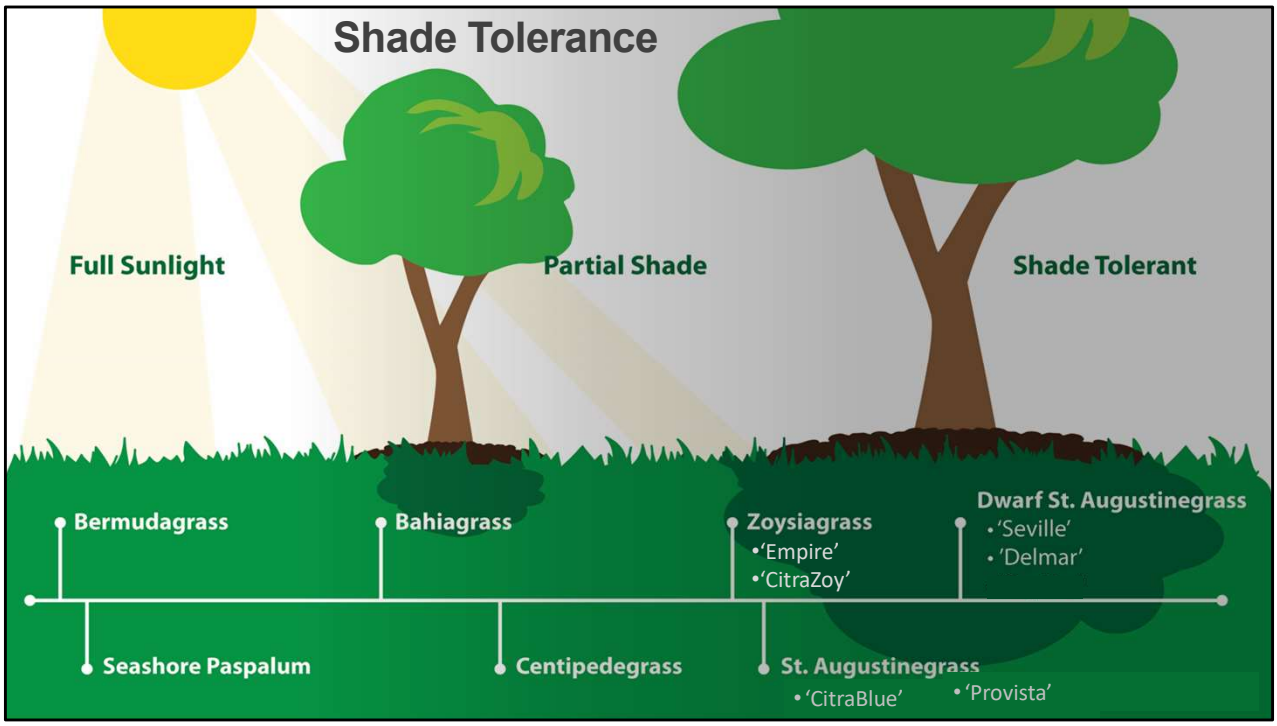
Disadvantages of Centipedegrass

Centipedegrass is highly susceptible to damage from plant-parasitic nematodes (especially ring nematodes) and the scale insect known as ground pearls.

Most centipedegrass cultivars have a naturally pale yellow-green color and are prone to iron chlorosis (yellowing of leaf blades). It has poor salt, wear, and freeze tolerance. Centipedegrass stolons have high lignin content and contribute to a heavy thatch layer, particularly when high nitrogen fertilization rates are applied.

The grass is often subject to centipedegrass decline, a fungal disease caused by *Gaeumannomyces graminis* var. *graminis*. The decline is influenced by improper management practices, particularly high nitrogen fertility.

TAR (Take All Root Rot)



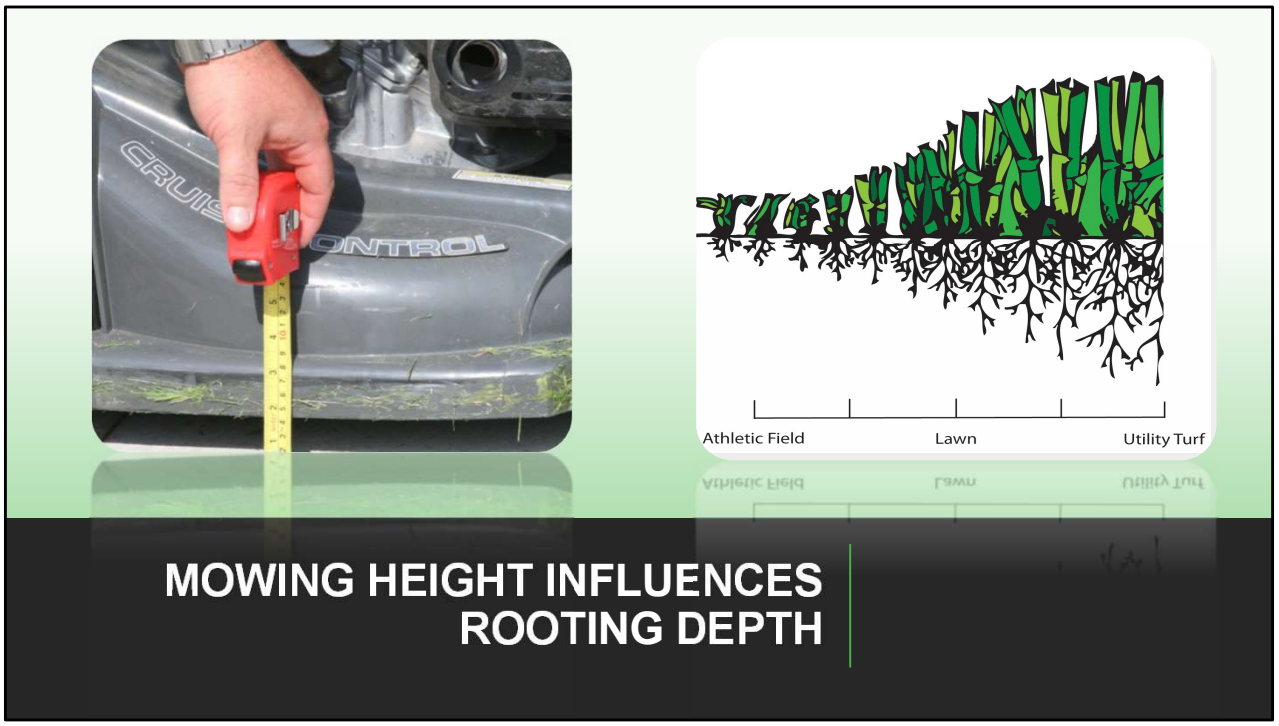
Shade Tolerance

Good shade tolerance is a relative term – no grass will do well in deep shade or if there are not enough hours of sunlight available. Even shade-tolerant grasses need at least 5 hours of sunlight daily. In very shady areas, we recommend that an alternative shade-loving ground cover be used.
Some selections and cultivars within these species, are better suited for use in shaded areas.

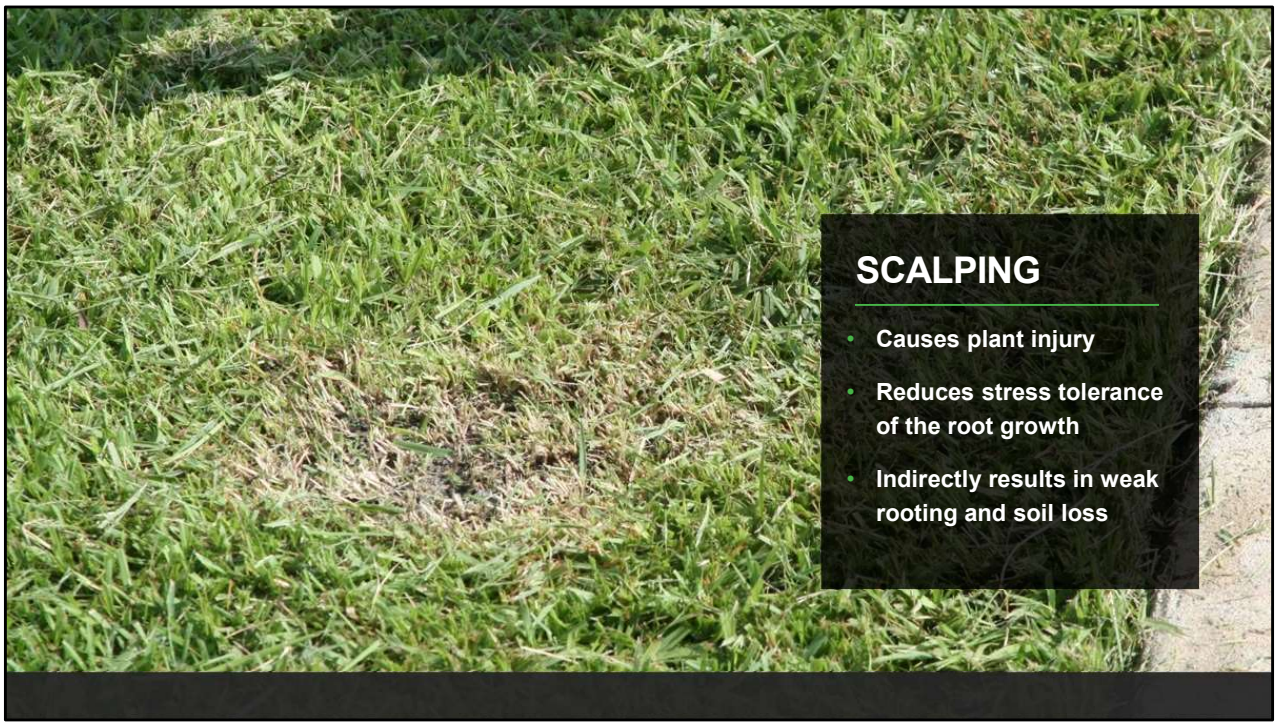
St. Augustinegrass is somewhat better than others for growth in partial shade, although it also performs well in full sunlight. Cultivars that exhibit the most shade tolerance include 'Seville', 'Delmar' and 'CitraBlue'.

Zoysiagrass is another good choice for partially shaded areas. Like St. Augustinegrass, it also does well in full sunlight. Generally, any cultivar of zoysiagrass performs well in partial shade.

Bahiagrass is not recommended for use in shaded conditions, but centipedegrass tolerates some partial shade. Seashore paspalum and bermudagrass do not do well in shaded situations.



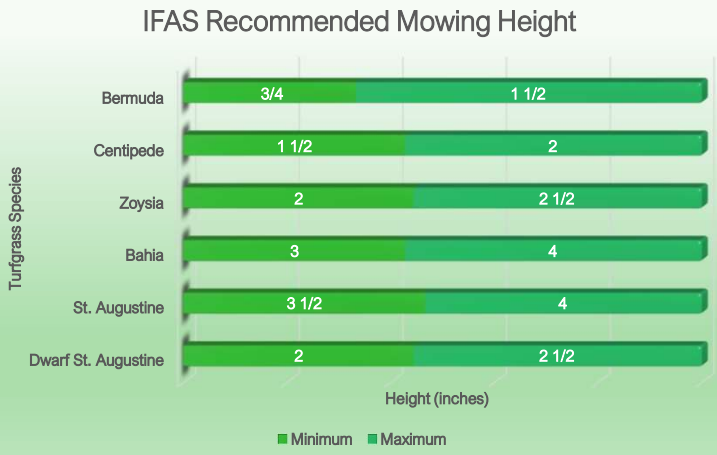
Mowing is one of the most important aspects of maintaining a good quality lawn. The length of the leaf blade is directly proportional to the length of the root system. Mowing increases turfgrass density, producing a tighter lawn that is resistant to weeds. Proper mowing practices, along with fertilization and irrigation, can largely determine the success or failure of a lawn. The two main components of mowing are cutting height and frequency. Both of these factors depend on the turfgrass species, cultivar, and the level of lawn quality desired.



This grass has just been mowed too low also known as scalping. This results in a short root system that has less ability to handle other stresses and soil loss. Turfgrass undergoes physiological stress with each mowing event, particularly if too much leaf tissue is removed. Effects of “scalping,” or removal of too much shoot tissue at one time, can produce long-term damage to the turf. This can leave turf susceptible to other stresses such as insects, disease, drought, and sunscald.

MOWING CULTURAL PRACTICES

- **Pick up stones, sticks, and other debris before mowing to avoid damaging the mower or injuries.**
- **Mow at highest recommended height for species.**
- **Don't remove more than 1/3 of the leaf blade at any one time.**
- **Leave clippings.**



Mowing Cultural Practices begin with picking up stones, sticks, and other debris before mowing to avoid damaging the mower or causing injuries.
As a rule of thumb, mowing should be done often enough so that no more than one third of the leaf blade is removed at any one mowing. For example, if a St. Augustinegrass lawn is mowed at a height of 4 inches, it should be mowed when it grows to a height of 5.5 to 6 inches. Following this practice minimizes the effect of mowing on photosynthesis and helps to maintain the high percentage of leaf surface necessary for healthy root development. Do not scalp the grass if a mowing is missed- mow at a higher height and bring it down gradually.
Leaving clippings in the turf area will add nutrients and organic matter back to the lawn.

MOWING CULTURAL PRACTICES

- Keep mower blades sharp!
- Don't mow grass when wet
- Blow/remove clippings and weed seeds from mowers between properties
- Use Protective Safety Equipment

Tips of grass blades ripped by dull mower blade

Be sure to keep mower blades sharp for best cut and reduced leaf tissue injury. Mowers will transport weeds and disease between properties, so wash or blow off equipment in between properties. As a provider of landscape services, you may not be in charge of mowing your properties, but this is a very important cultural practice that can affect turf health over the long run.

Here are a few important cultural practices that can have a positive impact on turf:

- Don't mow grass when wet – this can clog the mower, produce a poor cut and could be dangerous with a walk mower or on steep slopes
- Keep mower blades sharp – this can improve appearance and greatly reduce insect and disease infestation
- Mowers should be washed off, or at least blown off, between properties to reduce pest infestation

- Avoid wearing open toed-shoes. Wear ear protection and eyewear while mowing.

MOWING: Never leave clippings on impervious surfaces

BMP

Mowing BMP: Never leave clippings on paved surfaces.

Leaf blades contain nutrients such as nitrogen and phosphorus, both of which can cause pollution if they wind up in a water body. It is very important to sweep or blow these clippings back up on the grass to reduce accidental pollution. Clippings should never be left on a paved surface and should never be blown down a storm drain.

Storm drains lead to water bodies. Leaves, clippings and other material degrade quickly and release their nutrients or other pollutants into the water. Be sure to ALWAYS blow or sweep leaf blades back onto turf and to pick up any branches, leaves, or other landscape debris.

DIRECT ENVIRONMENTAL CONSEQUENCES
INAPPROPRIATE CULTURAL PRACTICES

Excessive nutrient loading may harm aquatic life:

- Lower oxygen levels
- Clogs gills
- Disruption of food chain
- Increased turbidity
- Blocks sunlight

Inappropriate cultural practices can directly impact environmental systems. Direct effects of incorrect or poor cultural practices include excess N and P loading to natural systems, often resulting in excessive plant and algal growth in water bodies, lower oxygen levels, fish kills and other consequences.

INDIRECT ENVIRONMENTAL CONSEQUENCES

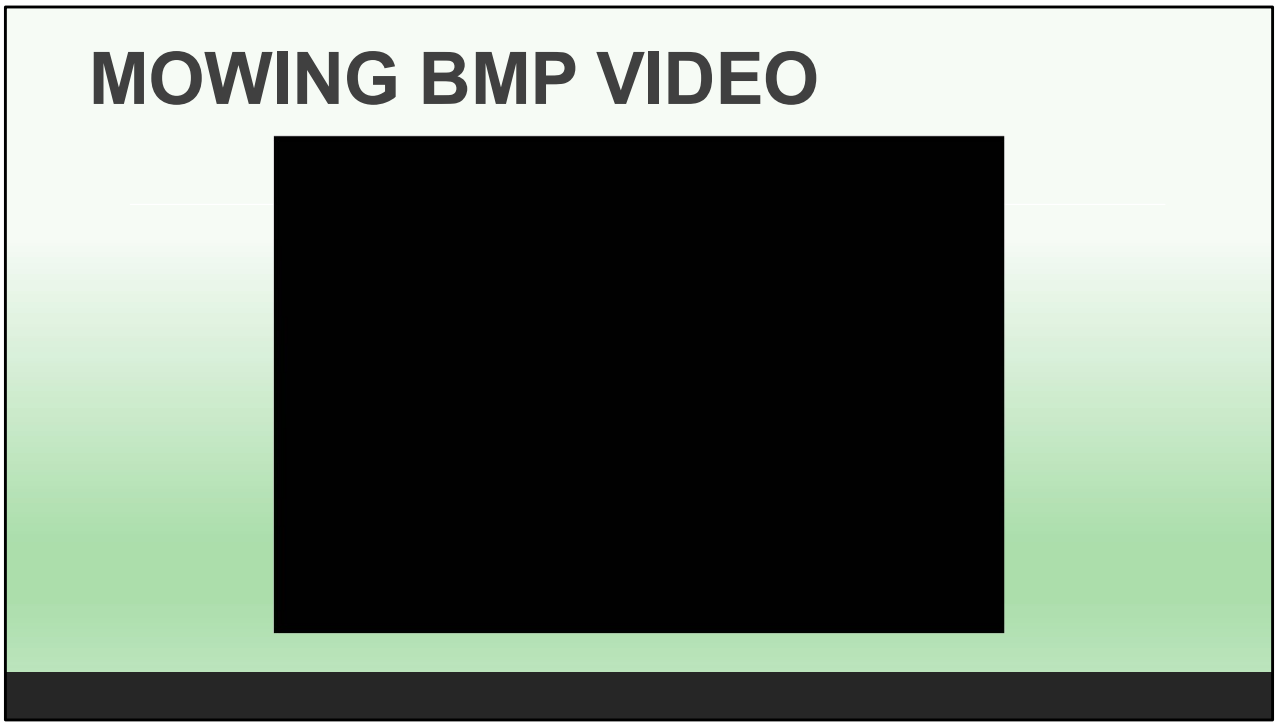
INAPPROPRIATE CULTURAL PRACTICES

Loss of vegetative cover results in:

- Erosion and sediment buildup
- Increased pests
- Wasted water and nutrients
- Reduced water quality

Over time, inappropriate cultural practices often result in unhealthy plants, which may indirectly impact environmental systems.
Too little nutrition makes plants weak resulting in loss of vegetative cover.

Loss of cover will eventually result in soil erosion and sediment buildup; increase pest; wasted water and nutrients and reduced water quality.



VIDEO SCRIPT

Mowing is an important maintenance operation, and when performed correctly, increases turf density, promotes plant health and suppresses weeds. Naturally, turfgrass undergoes physiological stress with each mowing, particularly if too much leaf tissue is removed. By integrating the recommended mowing BMPs located in the training manual, you can promote good plant health and an attractive lawn for your clients.

Let's review the following recommended mowing BMPs:

Inspect and adjust the cutting height routinely. Do so by setting the mower on a driveway or sidewalk, using a ruler to measure the distance between the ground and the blade.

Mow turf when dry: reduce potential disease, fungus and machine clipping discharge/mulching problems associated with wet grass clippings.

To prevent tire rutting, unintentional scalping, and wear patterns, mow in a different

direction every time the lawn is cut. This reduces grain patterns by preventing grass laying over in the same direction.

The growth habit and leaf width of a turfgrass species determines the optimum cutting height, frequency and preferred mower type. Removing more than one-third of the foliage at one time causes plant stress and reduces the plant's ability to function. It is important to leave as much leaf surface as possible for photosynthesis, so use the highest acceptable mowing height.

Quality of cut is important in the eyes of your clients. Sharpen mower blade frequently enough to prevent a ragged appearance to the turf.

Periodically, clean mower parts after use to reduce rusting and extend the life of your machine. Reduce transport and spread of weed seed by blowing off mower decks between properties.

Last, do not remove clippings from the lawn area; instead, practice grass recycling and return nutrients to the soil. Do not direct clippings into bodies of water or onto impervious surfaces. Remove any clippings that are blown onto sidewalks, driveways, and other impervious areas.

If clumping occurs, distribute the clippings by re-mowing, lightly raking, or using a blower.

ENVIRONMENTAL TURFGRASS STRESS

Turfgrass faces many types of stresses, from living organisms including insects, disease, and weeds, and from environmental factors including shade, salinity, wear, drought and pH. All of these may alter the required management levels and health of the turf.

Environmental stresses can be managed in two ways:

1. Choosing the most stress-tolerant species or cultivar for a particular area, and
2. Using proper cultural and management practices to alleviate the effects of the stress.

Excess vehicular or foot traffic causes multiple injuries to turfgrass. One injury involves grass shoot tissue, where physical damage to leaf blades appears as abrasions, tearing, or stripping of the leaf tissue. This injury results in death of the leaves and a reduction in photosynthetic capacity. Another area that can be damaged by traffic is the root system because of soil compaction from the weight of the traffic. Wear tolerance varies based on the capacity of the grass to tolerate traffic injury; the growth rate of the turf, which determines how long it will take the grass to recover from the injury; the severity of the injury.

Examples of wear injury may be abrasions, scrapings, and improper mowing heights. There are specific management and maintenance cultural practices that will improve the wear tolerance of turfgrass, for example, increase mowing height, manage nutrients, moderate thatch levels, improve soil aeration and drainage, and control foot traffic.

Modify cultural practices during extended periods of drought

BMP

Drought stress tolerance can be defined as the ability of the grass to recover from extended periods of drought. All cultural practices (fertilization, irrigation, mowing) need to be modified during extended drought periods.

During extended periods of drought, all of our warm season grasses will go into dormancy. They typically turn brown and shut down much of their physiological functions.

During this time, reduce plant stress and do not try to fertilize. Nitrogen encourages the plant to develop new tissue forcing the grass to keep green and grow. That will cause further stress to the grass. Until water becomes available, withhold fertilizer or apply low rates.

Last, try to avoid other stresses such as salinity or wear. Once water is available, many of the grasses will resume growth and become green again, signaling that they have started functioning.

Florida's dry season is typically winter and spring with hottest/dryest times in April and May. Be sure to calibrate and check your irrigation systems before the Spring dry season.

Increase mowing height in shaded areas to avoid thinning | BMP

Shade BMP: Increase mowing height in shaded areas to avoid thinning.

To produce better turfgrass growth in shaded situations, increase the mowing height. This allows for more leaf area to intercept as much available light as possible. In addition, leaf blades are longer and narrower in the shade, and a lower cutting height excessively reduces leaf length, which is not good for the grass. Increased mowing height also promotes deeper rooting, which is one of the key mechanisms of stress tolerance for turfgrasses.

OVERCOMING SHADE

- Allow more light
- Use shade-tolerant groundcover or mulch bed
- Reduce traffic
- Reduce irrigation
- Reduce nitrogen

In many landscape settings, grass receives a minimum amount of light for enough of the day to maintain adequate growth, even if an area is shaded for other portions of the day. In some situations, however, a grassed area may be shaded for most or all of the day, making it difficult for the grass to obtain either an adequate intensity or duration of light for growth.

Avoid the effects of vehicle and foot traffic. Grass growing in shade is more easily injured by traffic, and may not be able to recover. Water use is substantially reduced under shaded conditions, so adjust irrigation accordingly. If the irrigation system covers an area that is partially shaded and partially in sun, consider removing the sprinkler heads from the shaded areas and irrigate by hand when rainfall is inadequate. Reduce nitrogen in shaded areas. It encourages the plant to develop new tissue, which will add additional stress to a shaded plant.

MORE INFORMATION

THIS CONCLUDES THE TURFGRASS CULTURE AND SPECIES SECTION

HTTPS://EDIS.IFAS.UFL.EDU/TOPICS/LAWNS

This concludes the Turfgrass culture and species section.
Next, we will discuss plants in the landscape.

Many of the plants used in Florida vary widely in their adaptation. Choose grasses and other plants that are suited to the particular environment.

PLANT SELECTION CRITERIA: RIGHT PLANT, RIGHT PLACE

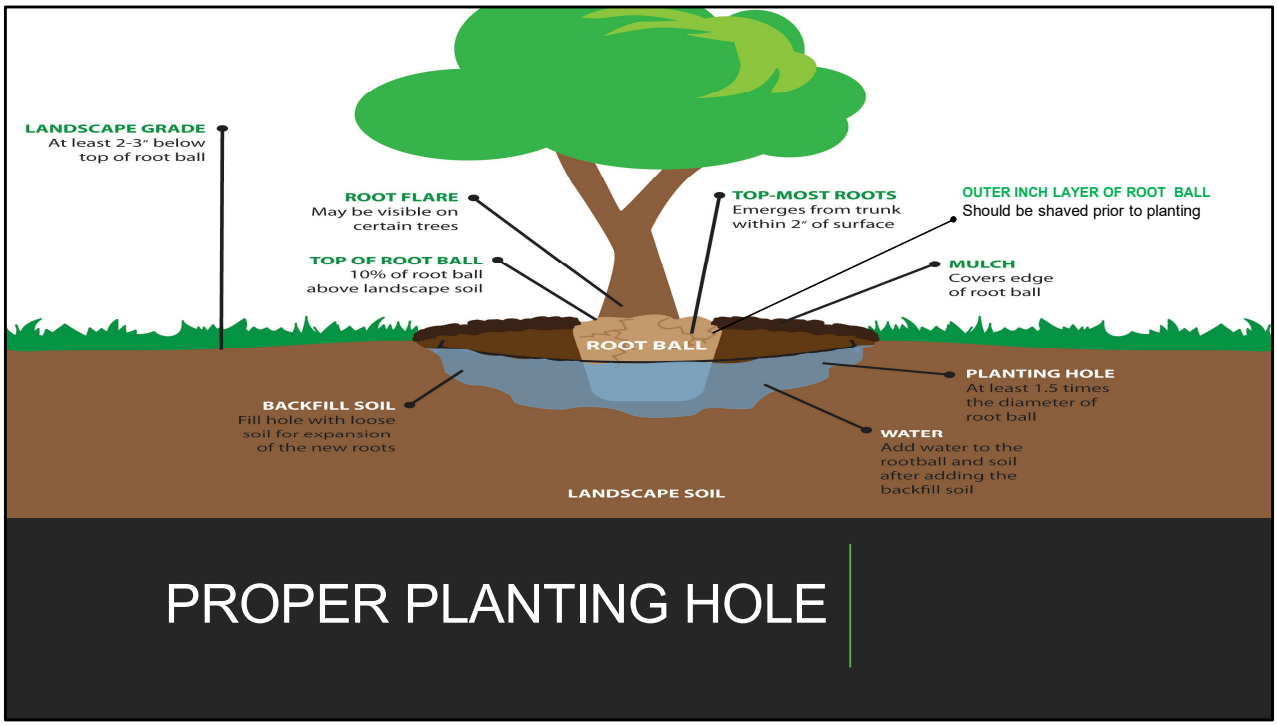
Based on characteristics of planting site:

- Soil texture
- Soil pH
- Maintenance
- Space for mature plant
- Possible pest pressures and environmental stress
- Water supply

The long-term value of a landscape depends on how well it performs for its particular objectives.
Therefore, the first step in selecting plants for a landscape is to conduct a site evaluation, which may consist of studying planting site characteristics such as the amount of sun or shade, salt spray exposure, soil type, pH, soil compaction, slope and water drainage.

These characteristics will most likely differ between areas on the same property. For example, the area on one side of a structure may have significantly different light conditions than an area on the other side.
Construction activities may have produced severe compaction, and non-native soils may have been used as fill in some areas. Such soils may need aerating or amendment to be suitable for planting.

The second step is to select plants with attributes that match the characteristics of the planting site.
Most importantly prevent pest pressures and environmental stress, Does the site contain low fertility subsoils brought in for fill? Is the site irrigated?
Identify water supply: reclaimed or well water may contain high levels of chloride, leading to salt accumulation in the soil. When planning or renovating a landscape, check with the reclaimed water provider regarding chloride levels, and if necessary choose plants that are salt-tolerant.



Before digging the planting hole, call 811 to locate underground utilities in your landscape. Find the top-most root and treat root defects (example: circling roots etc.)

Next, make the hole at least 1.5 times the diameter of the root ball. Gauge the depth of the planting hole, so that the top root is 1-2 inches above landscape soil. No more than about 2 or 3 inches of the root ball needs to be above the soil unless the site is poorly drained. If the soil is poorly drained, plant even higher. If the hole was dug too deep, add soil and compact it with your foot.

Breaking up compacted soil in a large area around the tree (out to the dripline) provides the newly emerging roots room to expand into loose soil. This will hasten root growth translating into quicker establishment.

Remove synthetic materials and shave the outer inch of the rootball, which will remove circling roots. Now, begin to add backfill soil; add water to the root ball and soil after adding the backfill soil. This is an effective means of eliminating air pockets around the root ball. Fill in any holes or depressions with additional backfill soil.

Do not firmly pack backfill soil in an attempt to eliminate air pockets because this could cause too much soil compaction. The water infiltrating the backfill soil will eliminate the large air pockets. The presence of small air pockets could even be of benefit, allowing more air to reach the roots. Finish by staking and adding mulch. Avoid adding mulch on top of the rootball of trees, as it can prevent water from infiltrating the rootball. For aesthetic purposes, a thin layer of mulch can be applied over the rootball. It is important to remove staking material after establishment.

Shrubs, like trees, will benefit from a wider planting hole and should be planted at grade or slightly above for best success. When mulching shrubs and groundcovers, be sure to keep the mulch 1-2 inches away from the trunk or base of plant.

Establishment: The time it takes to regenerate enough roots to stay alive without irrigation

Even the healthiest landscape plants installed in the most ideal circumstances may need a substantial amount of time, care, and proper irrigation to become established. Establishment is the period of time it takes a tree or shrub to regenerate enough roots to stay alive without supplemental irrigation. During the establishment period, the roots are expanding out into the landscape soil, and the shoots and trunk grow more slowly than they did before transplanting.

In most instances, established, drought-tolerant landscape plants have a root system substantial enough to keep them alive with little or no supplemental irrigation. Establishment occurs more rapidly when irrigation is supplied in the correct quantity and frequency.

Mulching: Reduces off-site transport of sediment, nutrients, and pesticides to surface water or ground water

BMP

Mulches provide beneficial effects to the environment by reducing off-site transport of sediment, nutrients, and pesticides to surface water or ground water. Mulches help moderate soil temps as well as moisture levels in the soil.

Mulching

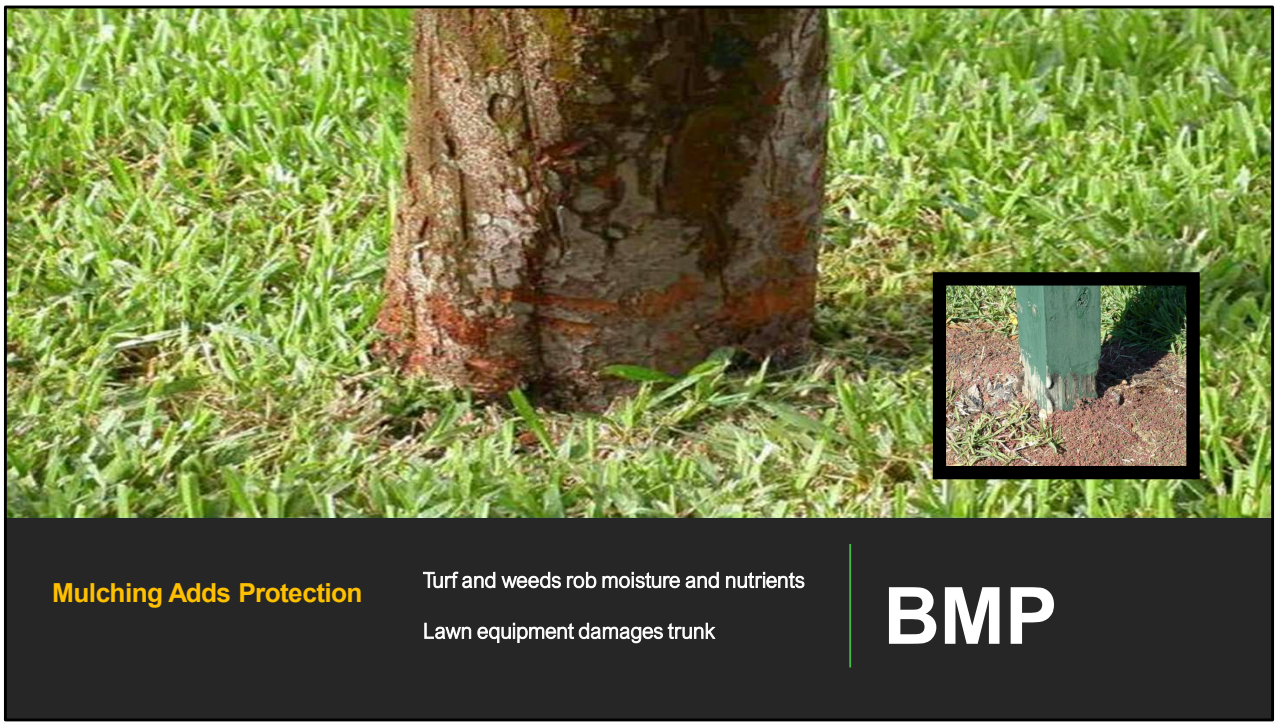
Maintain a 2- to 3-inch-thick layer of mulch (after settling)

1-inch maximum layer of mulch over the root ball of trees

Avoid direct contact to trunk or base

BMP

When mulch is appropriately applied, it will maintain an area weed free without herbicides, discouraging weeds and turf. Maintain a 2- to 3-inch-thick layer of mulch after settling. Apply a thinner 1-inch layer of mulch over the root ball of trees, if necessary, but keep it at least 10 inches from the trunk.



Research demonstrates that trees often perform poorly if turf grass grows up to the trunk. Turf and weeds rob trees of moisture and nutrients, and some produce chemicals that inhibit tree growth.

Mowing equipment and string trimmers can damage trees. Tree trunks that are bumped by mowers, or trees that are used as pivot points for turns, are injured via contact. Mechanical damage to trees can cause progressively bigger wounds, since the trees are hit in the same general area repeatedly over time.

In a worst-case scenario, the tree is girdled and dies. Those trees not killed are stressed and the wounds end up as an entry point for disease and insect infestation.

The whipping action of the nylon string on a trimmer can debark a young tree quickly, causing its demise. The careful use of string trimmers and mowers in the landscape is imperative, and there is no reason to use them around trees. Replacing the grass around the base of trees with mulch provides a buffer zone. The larger the mulched area, the less the turf near the tree is stressed by shade, the more room the lawn mower has to maneuver with ease, and the less the string trimmer needs to be used.

Improper Mulching (volcano-like manner)

Causes trunk rot

Cuts off oxygen to roots, causing stem girdling

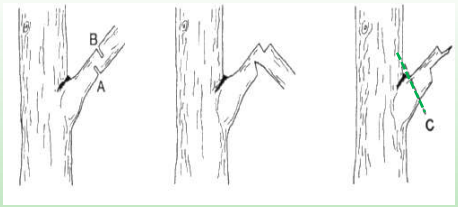
BMP

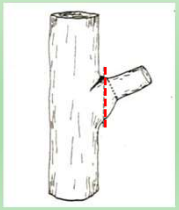
Never pile mulch in a volcano-like manner against the trunk. This can rot the trunk and cut off oxygen to roots. It can keep vital irrigation and rain water out, or can keep roots too wet in poorly drained soils. On some trees, it causes stem girdling roots to form. Some rodents, such as voles, can easily damage the trunk if mulch is piled there. Trees could decline from this problem.

PRUNING

Why do we prune? Pruning is another important landscape maintenance task. Through the selective removal of shoots and branches, pruning a plant can improve its health, reduce the risk of failure, control growth, and enhance fruiting, flowering or appearance. Pruning should be a part of routine maintenance and should not be delayed until the landscape is overgrown. However, close attention should be paid to proper timing, depending on the needs of various plants. Proper plant selection can eliminate many pruning requirements, especially for shrubs.

PRUNING





Steps of the 3-cut method

DO- LEAVE A COLLAR WHEN REMOVING A TREE BRANCH

DON'T- FLUSH CUT!

Trees should not be pruned without a clearly defined objective. Removing the correct stems and branches to accomplish the specified objectives is as important as making the correct pruning cuts. Do – Leave a collar when removing a tree branch. Don't make flush cuts.
If the wrong branches, or too many branches, are removed even with proper pruning cuts, nothing of merit has been accomplished.

Proper tree pruning is vital for tree health and vitality.
When pruning it is important to use the 3-cut method.

The first cut is the undercut. This prevents the

bark from ripping down the trunk when cutting the second cut. The second cut takes the bulk of the branch weight away. If you did not do th e first cut, the branch will likely rip from the we ight, damaging the bark of the main trunk.
The third and final cut removes the remaining nub at the branch bark collar.

PRUNING

NEVER TOP TREES

AVOID OVER-ELEVATING THE CANOPY

Pruning trees selectively removes branches to provide clearance, reduce risk of breakage, or reduce size. When pruning, follow these steps, and then shred the resulting cuttings to add to the compost pile or use as mulch. (You can also toss the cuttings behind a shrub to decompose.)

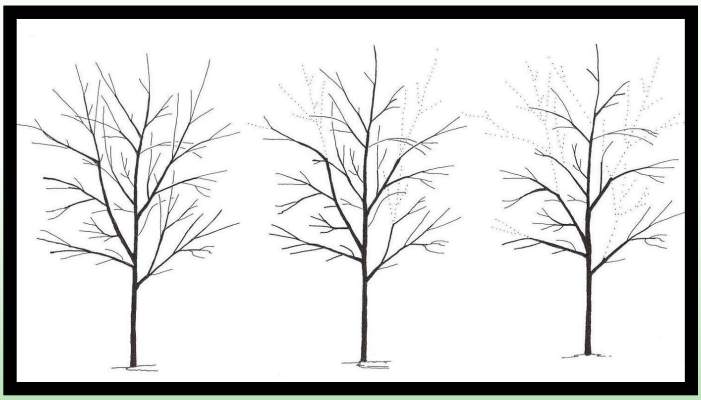
•**Keep it healthy.** Remove all dead, diseased, or injured branches.

•**Keep it strong.** Remove or reduce the length of stems that compete with the main leader.

•**Keep it uniform.** Remove branches that cross or touch each other and any that look out of place.

•**Keep it minor.** You should only tackle minor pruning tasks in your landscape. Hire an arborist certified by the International Society of Arboriculture to prune trees taller

than about 15 feet. Correct pruning makes trees more resistant to hurricane damage.

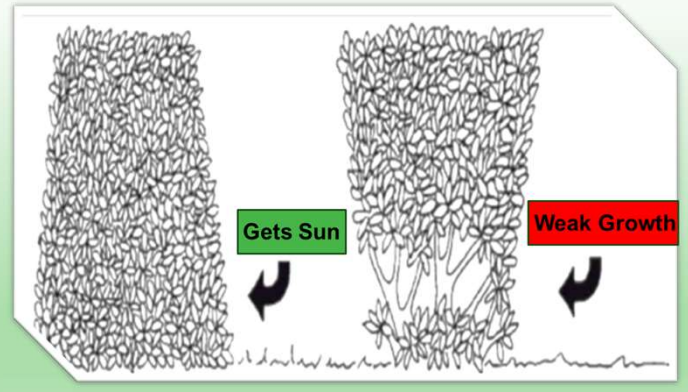


Pruning For A Strong Single Trunk

Remember to prune to maintain a dominant leader (one main trunk) by reducing the length of or removing competing leaders. **This typically means shortening the longest branches** with a reduction cut. Ideally, reduction cuts should be no larger than 2-3 inches diameter on poor compartmentalizers and 3-5 inches diameter on good compartmentalizers.

Pruning Landscape Shrubs:

- Trim wider at the bottom than the top
- Clipped while new growth is green



The method of pruning hedges depends on the type of hedge desired. Informal hedges generally consist of a row of closely planted shrubs which are allowed to develop into their natural shape. Annual pruning consists of thinning and heading just enough to maintain desired height and width.

The desired appearance of a formal hedge is a hard outline of foliage from the top of the hedge to the ground. Two important factors to remember when pruning formal hedges are

(1) Hedges should be clipped while the new growth is green and succulent.
(2) Plants should be trimmed so the base of the hedge is wider than the top.

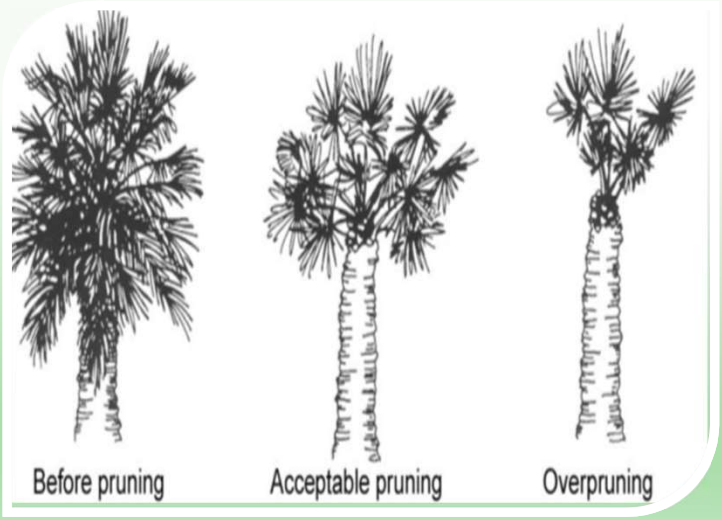
Hedges pruned with a narrow base will lose lower leaves and branches because of insufficient light. This condition will worsen with age resulting in sparse growth at ground level and an unattractive hedge which does not give desired privacy.

Where possible, plants should be pruned with hand shears rather than hedge shears. This will allow for a more natural shape and a healthier plant overall.

Avoid removing green leaves from palms. If needed, use the 9 and 3 rule.

Effects of over pruning landscape palms:

- Slower growth
- More susceptible to pests & diseases



It is rarely necessary to remove green leaves from a palm. However, if you wish to do so, only remove those drooping below an imaginary horizontal line drawn through the bottom of the canopy as shown in the center figure. Growth will be slowed and the palm can be damaged and attract pests and diseases when green leaves are removed from above this imaginary line.

Avoid removing green leaves from palms. If needed, use the 9 and 3 rule.

ACCEPTABLE PRUNING (9:00-3:00)

Never Hurricane Prune Palms

This illustration shows the 3 and 9 rule where no green leaves above this line are removed.

MORE INFORMATION

EDIS CIR. 853 PRUNING LANDSCAPE TREES AND SHRUBS

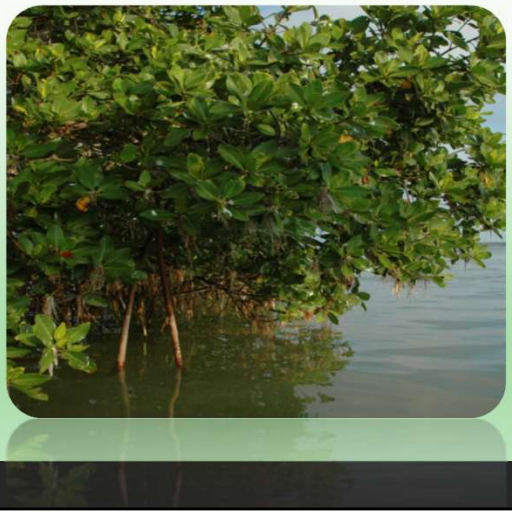
HTTPS://HORT.IFAS.UFL.EDU/WOODY/PRUNING.SHTML

It is important to make the correct pruning cuts to accomplish the objectives. Look to either the IFAS circular 853, found on the EDIS website, or your local county Extension office. There is also a web page maintained by Dr. Ed Gilman of UF/IFAS that provides guidance with clear instructions, diagrams and color photos.

MANGROVES

The 1996 Mangrove Trimming and Preservation Act states that:

- There is a difference between trimming & alteration
- Height must be above 6 feet from substrate
- A professional mangrove trimmer must be employed (under certain conditions)
- Dead mangroves are protected the same as living trees
- Contact area Florida DEP office for more information



Mangroves are usually associated with wetlands and play a critical role in reducing flood damage by storing stormwater when it surges and releasing it slowly over time. Wetlands are invaluable in keeping water clean by acting as filters for pollutants, silt, and sediment. Fish, birds, and wildlife depend upon wetlands for food, nesting grounds, migratory stops, and shelter. Wetlands are also valuable to the Florida economy, as they support commercial fisheries and tourist-based wildlife watching.

Certain areas of Florida contain three wetland native species of Mangroves that are now protected by the 1996 Mangrove Trimming & Preservation Act. This law covers the trimming & alteration of the red mangrove, the black mangrove, and the white mangrove. There are detailed descriptions of each tree in the BMP manual.

The major provisions of this Act include:

1) Definitions of the terms trimming and alteration
2) Height reduction limits
3) Prohibition of trimming mangrove roots

4) The conditions when a professional mangrove trimmer must be used, and finally, dead or alive, mangroves are covered by this law. It is important to understand that both the landowner & the individual hired are responsible for the appropriate trimming of mangroves. If in doubt, ask at the closest Florida Department of Environmental Protection office.
5) Dead or alive

REVIEW TRAINING OBJECTIVES

1. **Describe the components of a Fertilizer Management Plan.**
2. **Describe how turfgrass reduces effects of urban nonpoint source pollution.**
3. **Describe how environmental stresses affect turfgrass health and how it can be managed.**
4. **Describe four common lawn grasses used in Florida.**
5. **Describe four landscape best management practices to protect water resources.**

Now that you have reviewed the Lawn and Landscape module, you will be able to:

- Describe the components of a Fertilizer Management Plan.
- Describe how turfgrass reduces effects of urban nonpoint source pollution.
- Describe how environmental stresses affect turfgrass health and how it can be managed.
- Describe four common lawn grasses used in Florida.
- Describe four landscape best management practices to protect water resources.

FFL Plant Selection App

https://ffl.ifas.ufl.edu/apps/plants

This concludes module three on Lawn and Landscapes.