



Lawn Management

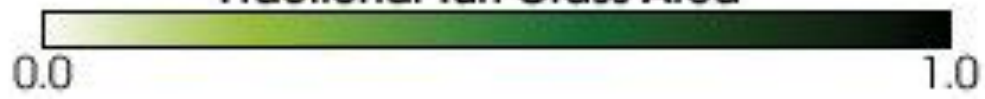
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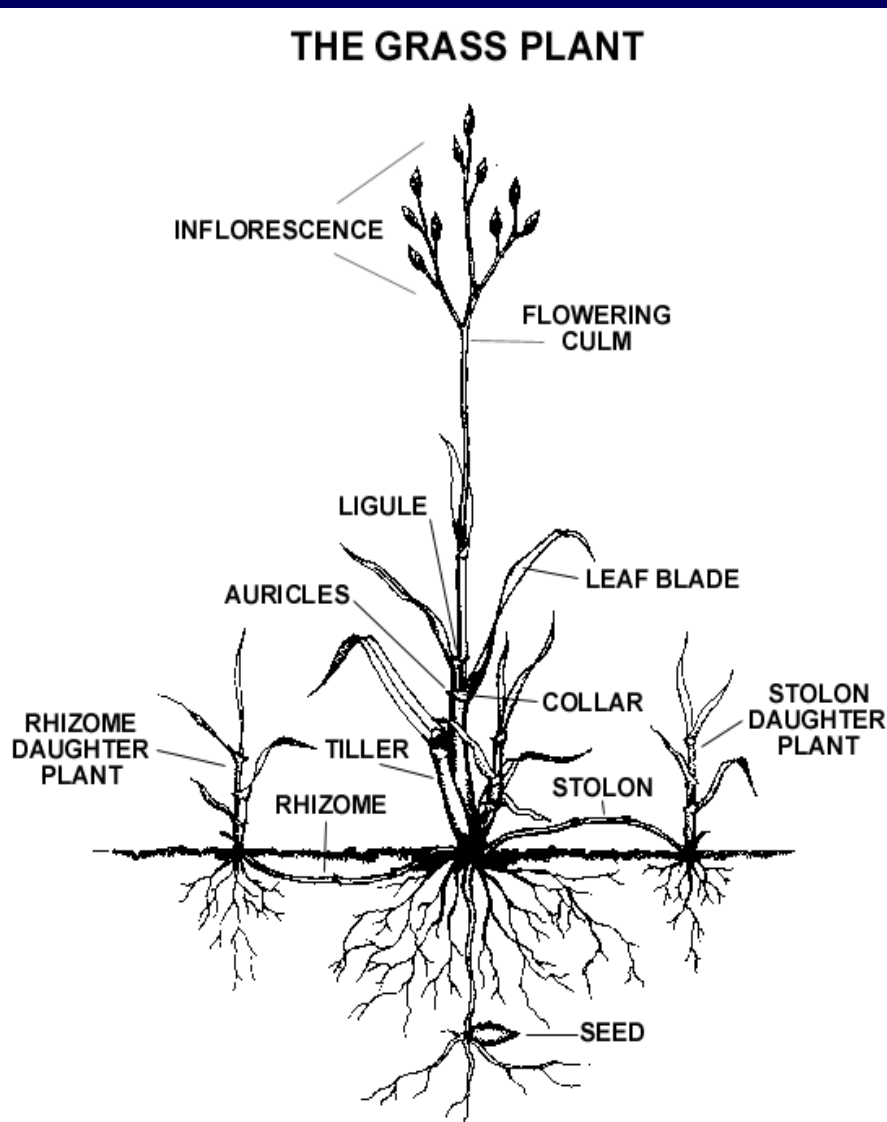
Auburn University



Fractional Turf Grass Area

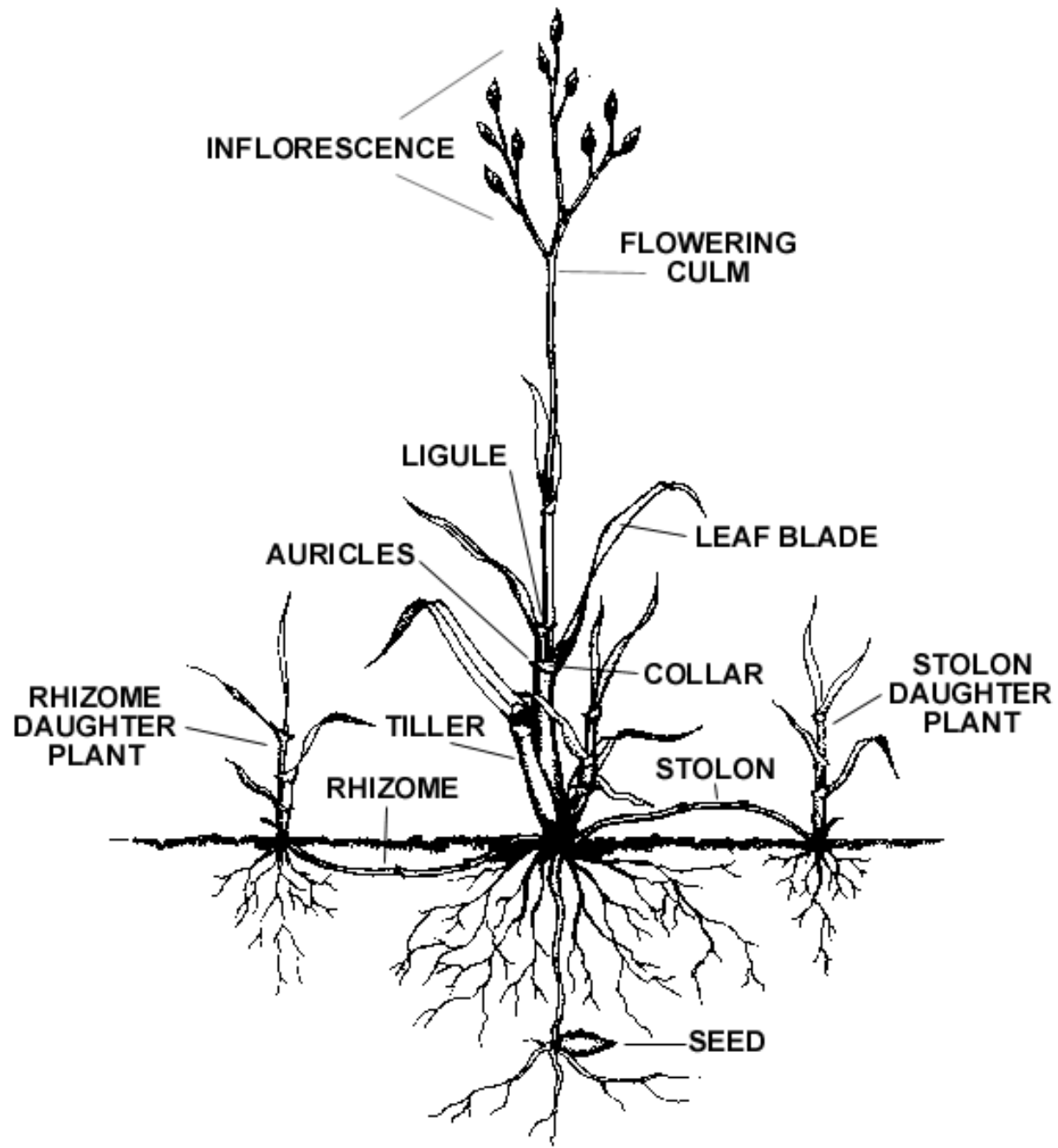


What is a Turfgrass?

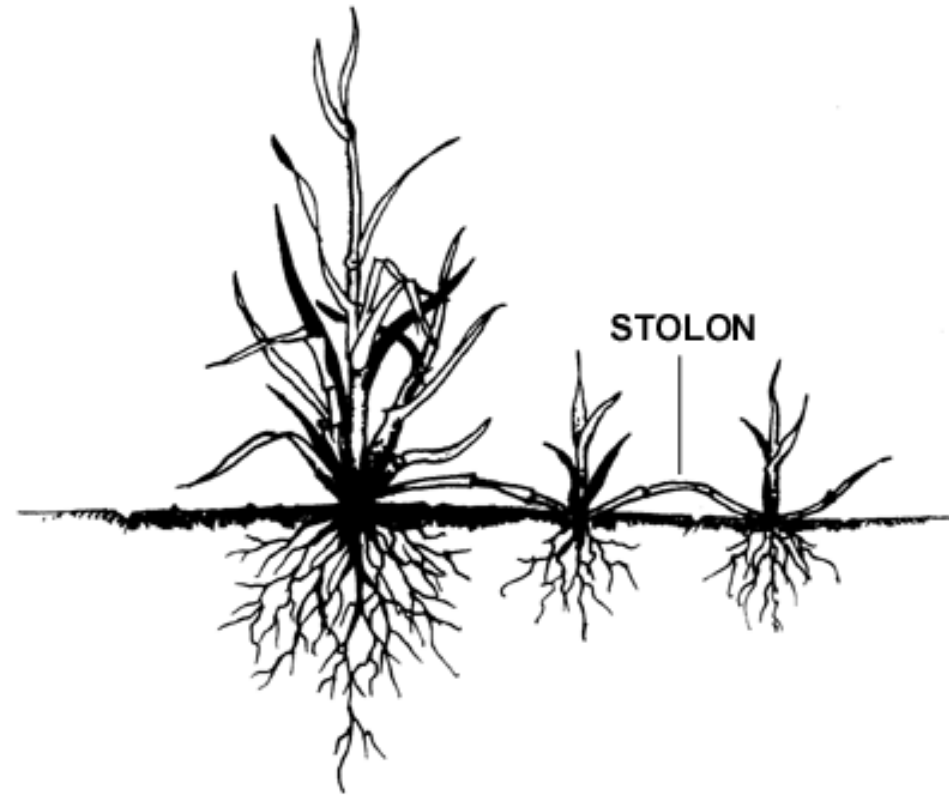


- Grass: Family Poaceae
- Two-ranked leaves, parallel veins, hollow stems, fibrous roots
- Turfgrass: Ability to survive close mowing
- Growth point : Crown
- Reproduce by seed or vegetatively
- Vegetative reproduction via tillers, stolons, rhizomes
- About 40 species used as turf : 10 in South

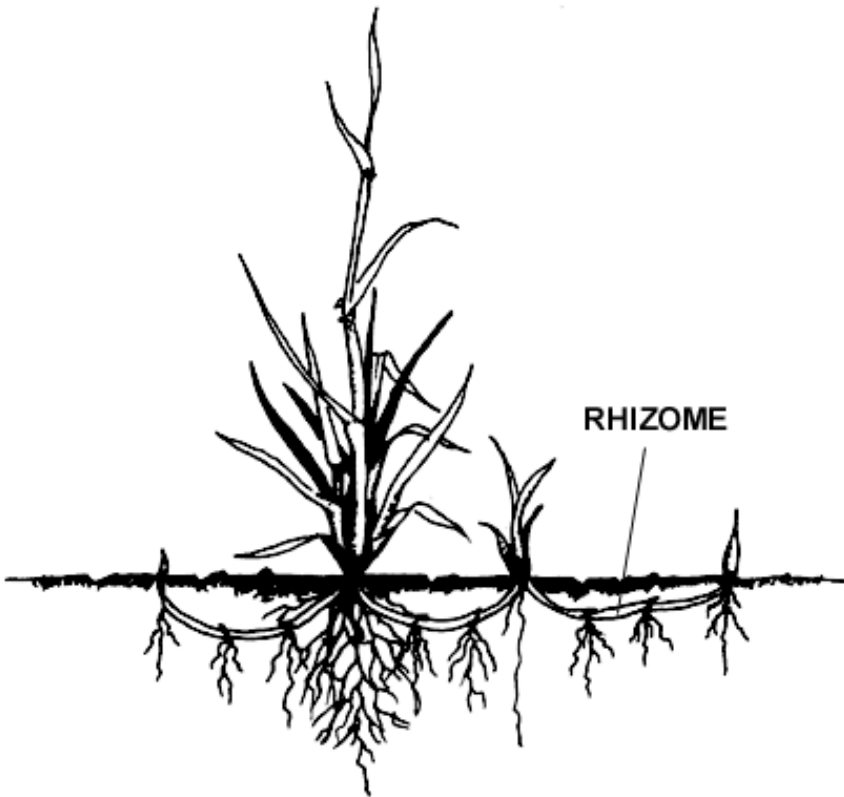
THE GRASS PLANT



STOLONIFEROUS PLANT

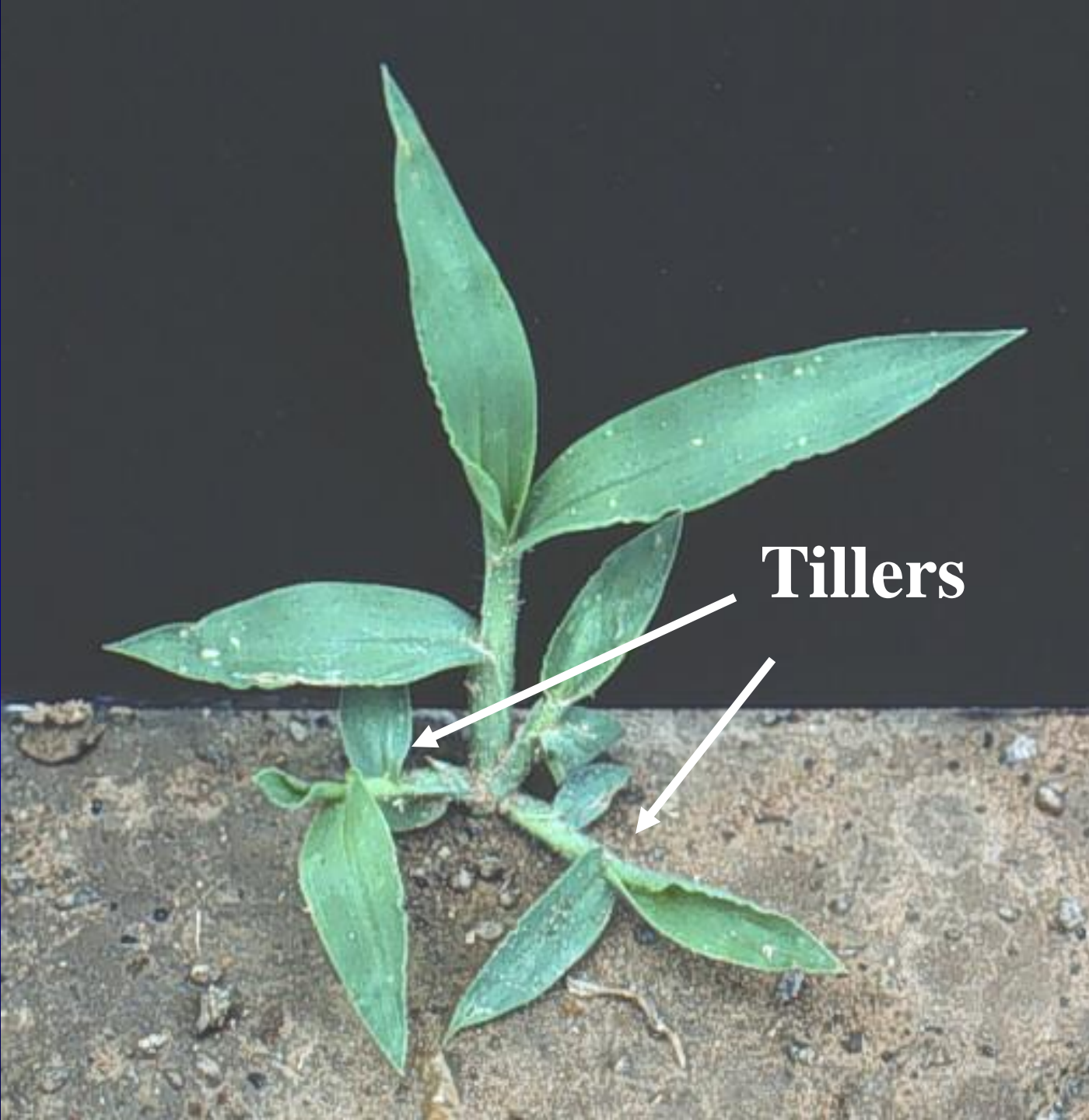


RHIZOMATUS PLANT



Stolons





Tillers

Selecting the Right Turfgrass: Criteria

- Environmental considerations
- Level of turf quality desired
- Level of maintenance you can provide
 - Time and money
- Potential use of the lawn

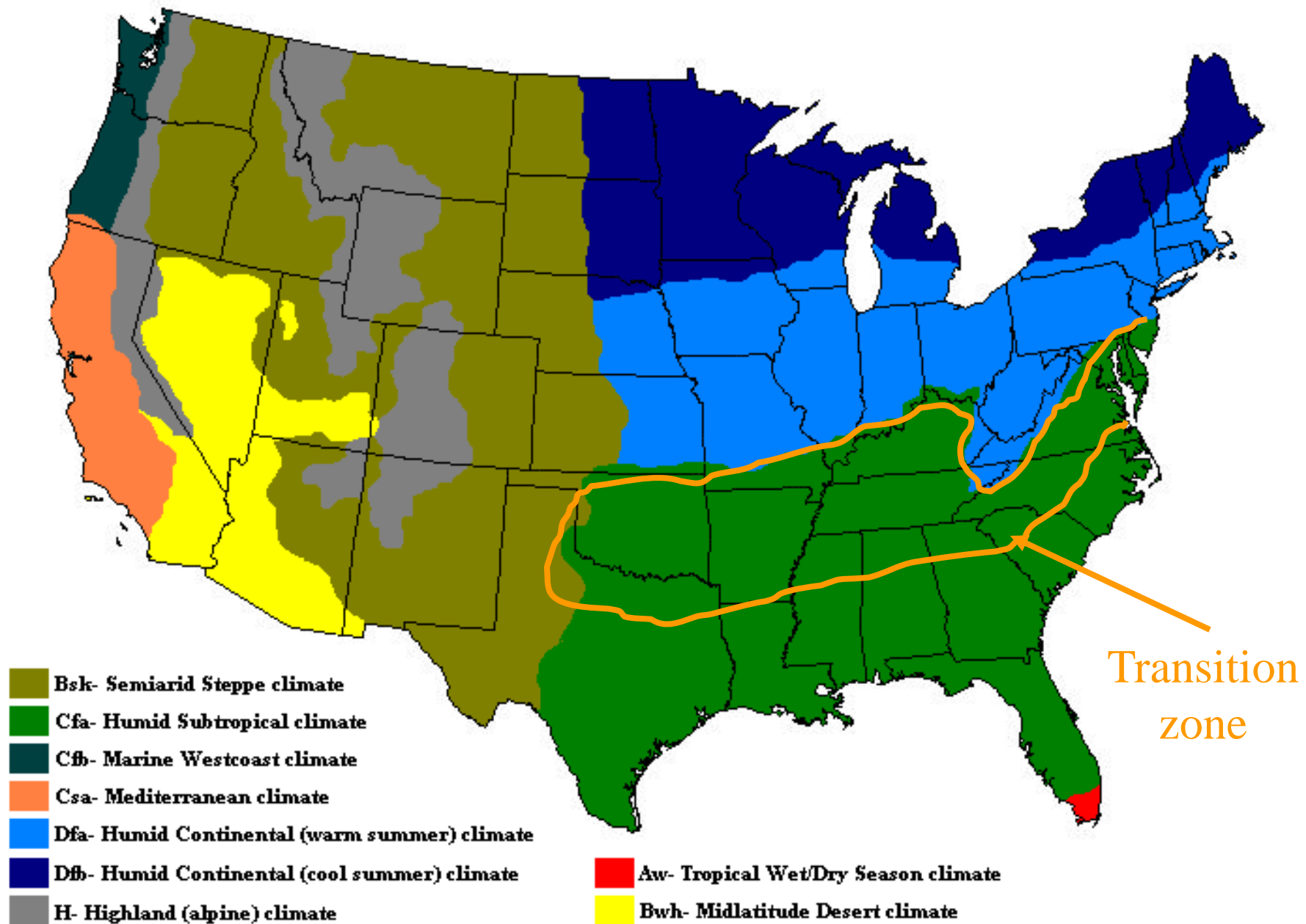
Environmental Considerations Affecting Turfgrass Selection

- Climate
- Shade
- Soil pH
- Water Availability
- Drainage
- Soil Type

Climate and Zones of Adaptation

- Cool season grasses
 - Bluegrass, Bentgrass, Ryegrass, Fescue
- Warm season grasses
 - Bermudagrass, Zoysiagrass,
Centipedegrass, St. Augustinegrass,
Seashore paspalum

Climate Zones of the Continental United States



Properties of Cool Season Grasses

- Shoot growth maximum at 60 – 75 F (air temp)
- Root growth maximum at 50 - 60 F (soil temp)
- Generally will not winter kill at temperatures above 10 F
- In Alabama, cool season grasses remain green and actively growing throughout winter, but most suffer greatly in summer heat and humidity

Cool Season Grasses Managed for Turf in Alabama

- Permanent Lawns
 - Tall fescue, fescue blends, heat-tolerant bluegrass
- **Overseeded warm-season turf**
 - **Annual ryegrass, perennial ryegrass**
 - Fescues
 - *Poa trivialis* (**Rough bluegrass**) (golf courses)
- Golf greens
 - Creeping bentgrass

Properties of Warm Season Grasses

- Shoot growth maximum at 85 – 100 F (air)
- Root growth maximum at 75 - 80 F (soil)
- Danger of winter kill starting in the low 20s F
- In Alabama, warm season grasses grow vigorously in the summer and become dormant during winter

Warm Season Grasses Managed for Turf in Alabama

- Permanent Lawns
 - Common bermudagrass, hybrid bermudagrass, zoysiagrass, centipedegrass, St. Augustinegrass, bahiagrass
- Athletic fields and golf fairways
 - Common and hybrid bermudagrass, zoysiagrass, seashore paspalum
- Golf greens
 - Hybrid bermudagrass

Shade

- All turfgrasses prefer as much light as possible
- Some tolerate shade better than others
- In general, cool season grasses are better in shade
- Locations in full sun tend to be prone to heat and drought stress
- Some cool-season turfgrass species prone to heat or drought stress will do better in Alabama in partial shade if no irrigation is available







Soil pH

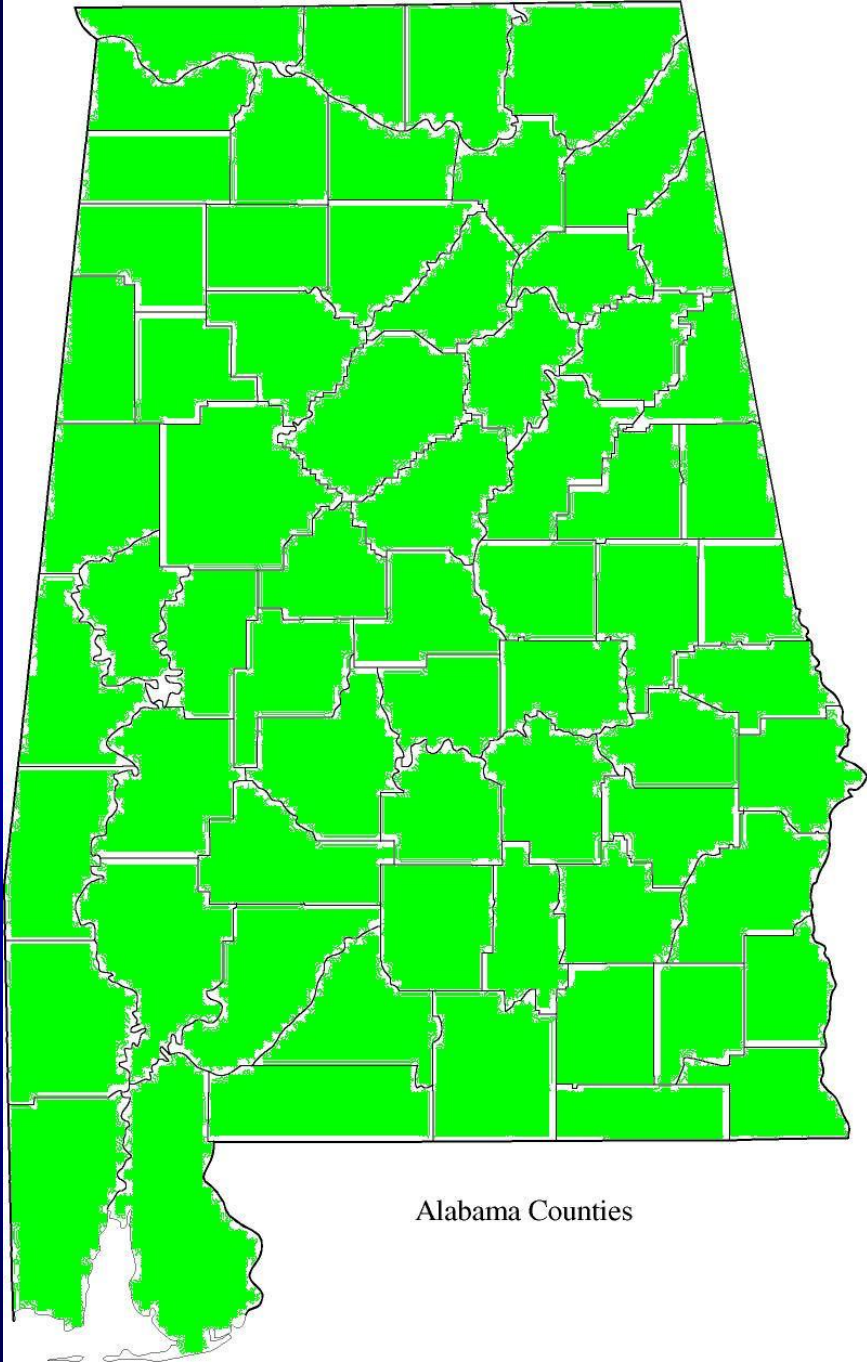
- Most turfgrasses perform well at pH of 5.6-7.0
- Centipedegrass is more acid tolerant, but also can grow just fine at pH of 6.0 - 7.0
- St. Augustinegrass is a bit more tolerant of alkaline soils
- Recommendation: pH of 6.0-6.5 for home lawns with any type of grass

Heat and Drought

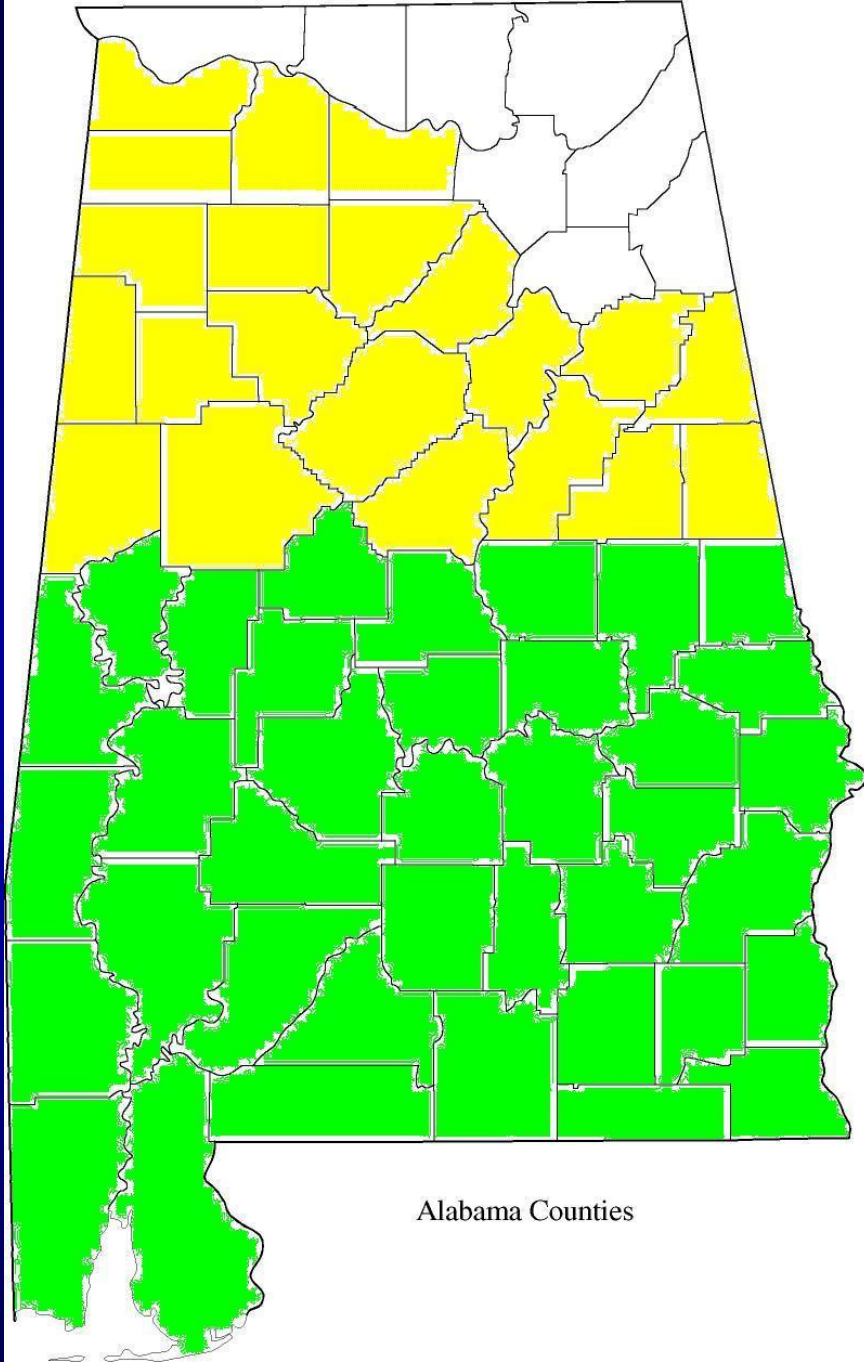
- Cool season grasses in Alabama require irrigation
- Warm season grasses can withstand drought stress by going dormant
- Some grasses are more drought resistant

Geographic range of adaptation for bermudagrass and zoysiagrass in Alabama

Green - Well adapted
Yellow - Marginally adapted



Geographic range of adaptation for common centipedegrass in Alabama

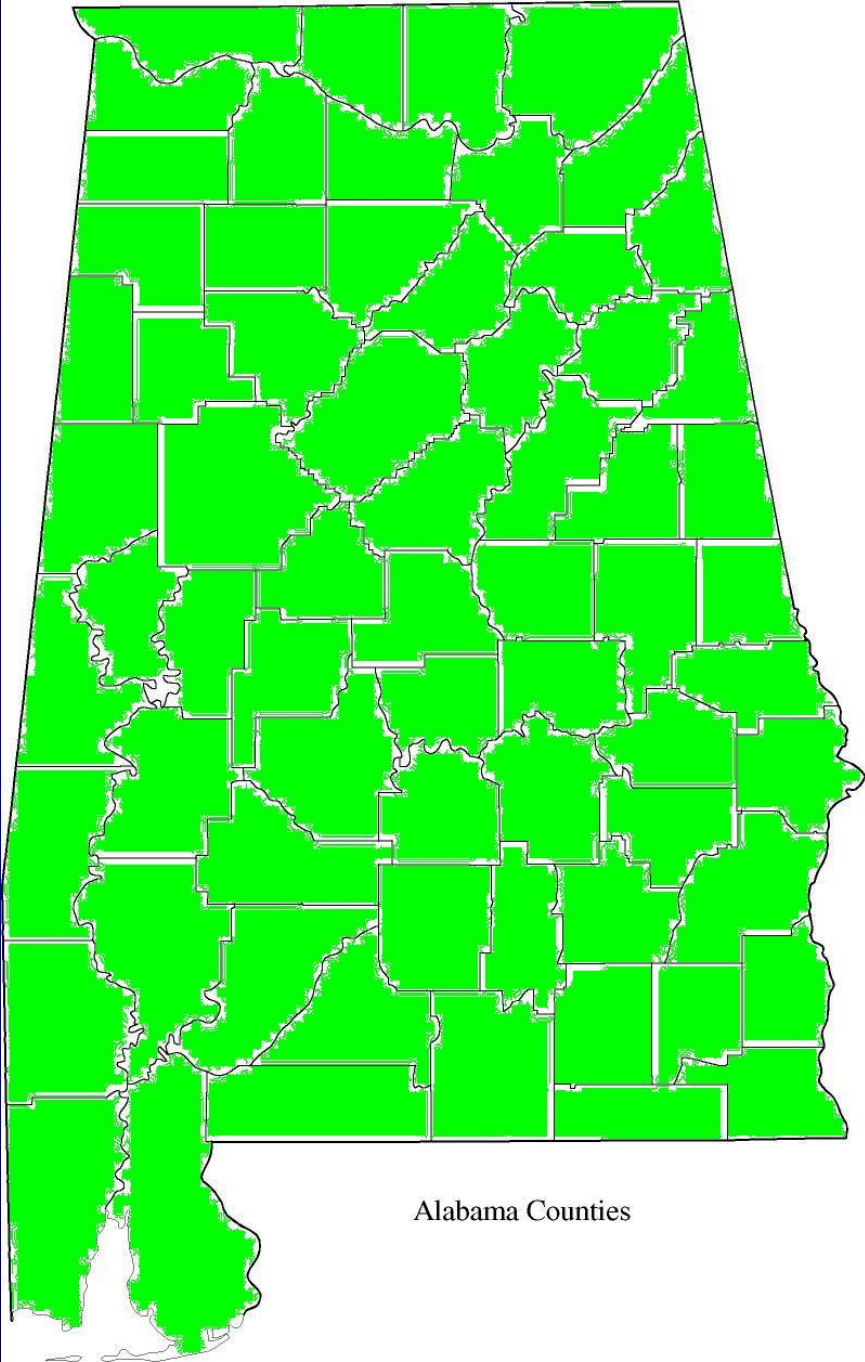


Alabama Counties

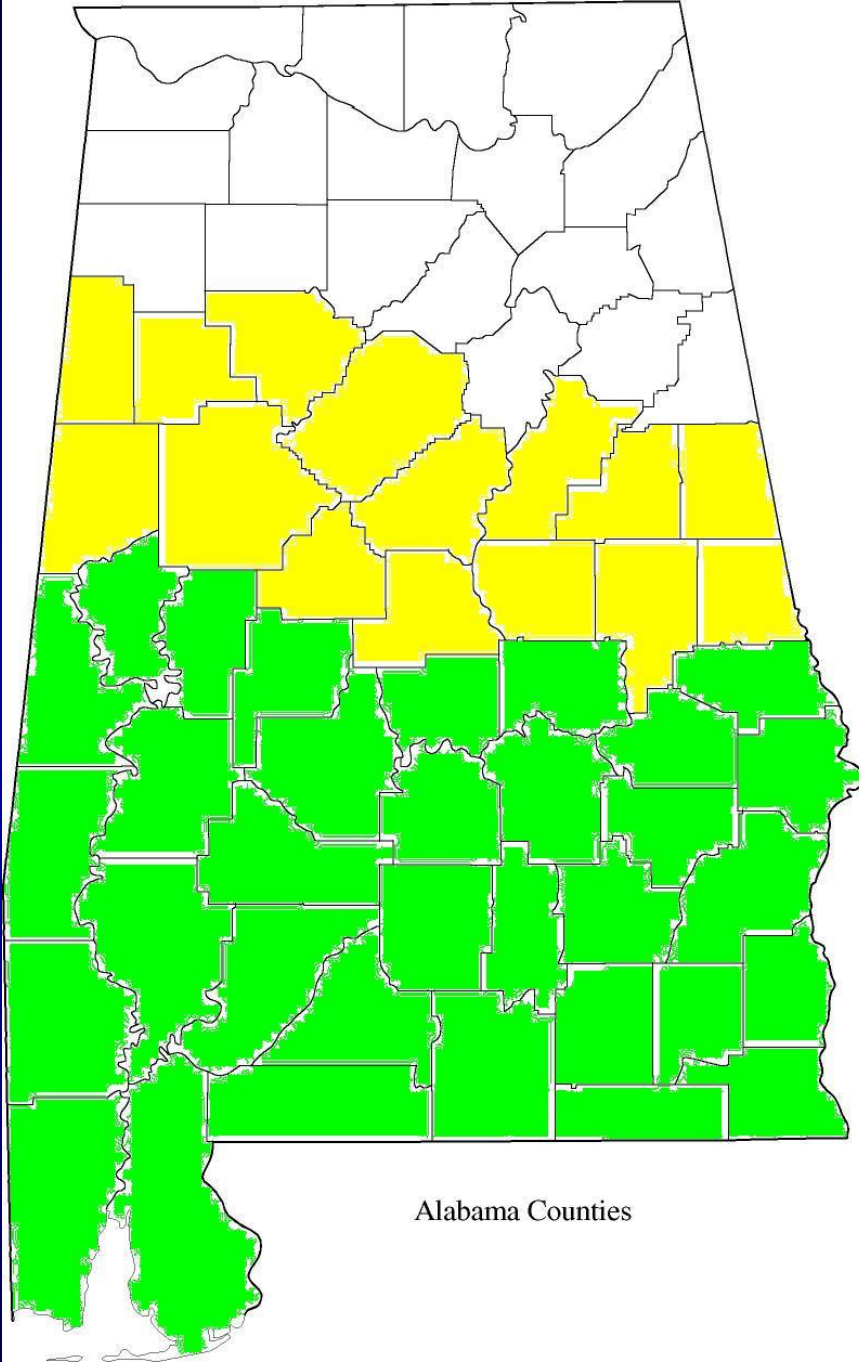
Green - Well adapted
Yellow - Marginally
adapted

Geographic range of adaptation for 'TifBlair' centipedegrass in Alabama

Green - Well adapted
Yellow - Marginally adapted



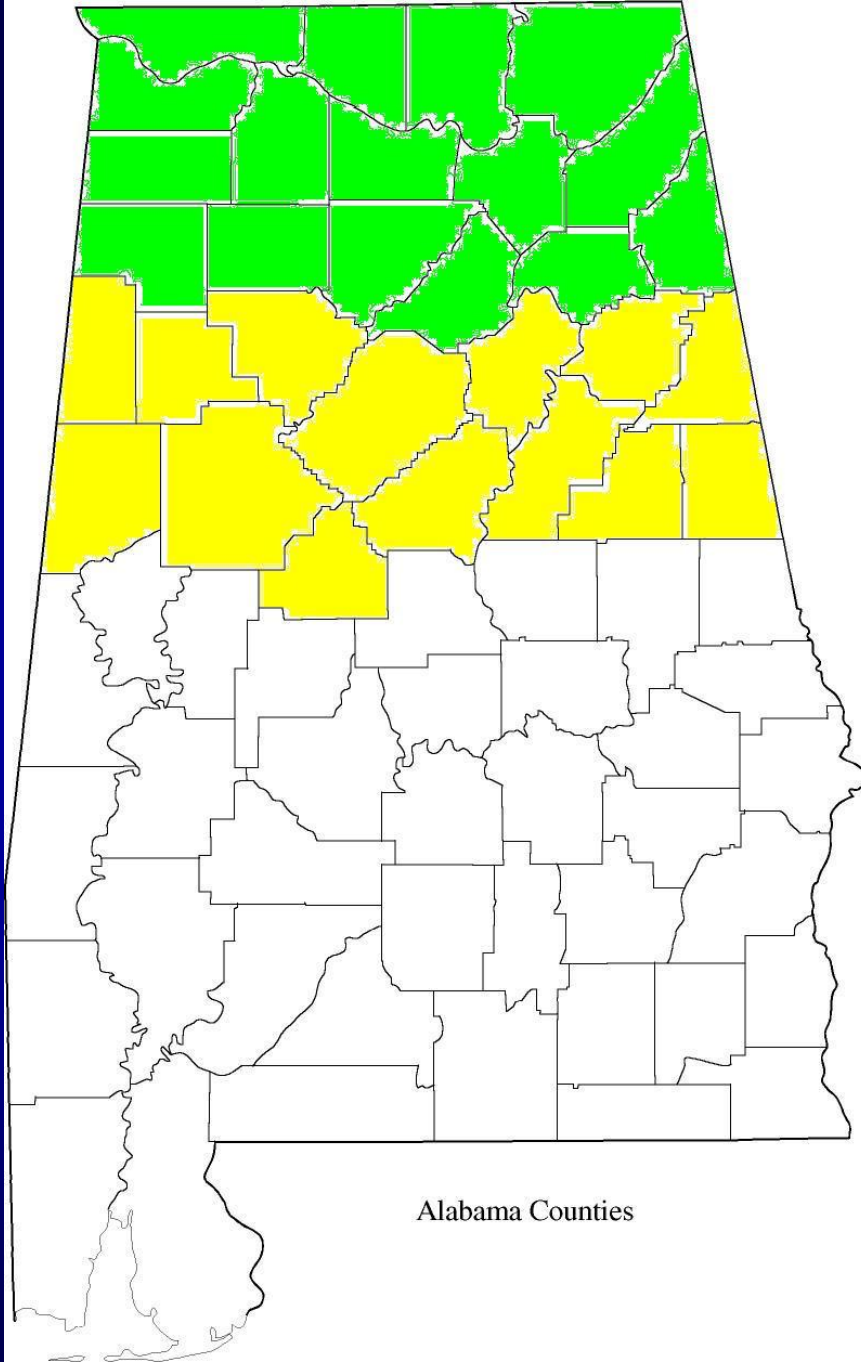
Geographic range of adaptation for St. Augustinegrass in Alabama



Alabama Counties

Green - Well adapted
Yellow - Marginally
adapted

Geographic range of adaptation for tall fescue and heat-tolerant bluegrass in Alabama



Green - Well adapted
Yellow - Marginally
adapted

Turfgrass	Planting Method	Color	Texture	Shade Tolerance	Drought Tolerance
Bermudagrass - Common - Hybrid	Seed, Sod Sod, Sprigs	Medium Medium	Medium Fine	Very poor Very Poor	Very good Very Good
Centipedegrass	Seed, Sod	Light	Coarse	Fair	Good
St. Augustinegrass	Sod, Sprigs	Dark	Coarse	Good	Good
Tall Fescue	Seed, Sod	Medium- Dark	Medium - Coarse	Good	Poor
Zoysiagrass -Meyer -Emerald -Empire -Zenith	Sod Sod Sod Seed	Dark Medium Dark Dark	Medium Fine Coarse Medium	Fair Fair Fair Fair	Good Good Good Good

An aerial photograph of a lawn showing a grid pattern of mowed stripes. The stripes are formed by alternating rows of green grass and brown, mowed grass. A central path or driveway runs vertically through the center of the lawn. The word "Establishment" is overlaid in the center in a bold, yellow, serif font with a black outline.

Establishment

Establishing a Lawn

- Seed, Sprig, Plug, or Sod?
 - Most popular warm-season grasses are sprigged or sodded
 - Sodding provides an instant lawn and can be done under a wide variety of conditions
 - Sprigging and plugging are generally less expensive than sodding but require grow-in time
 - Seeded bermudas, zoysias becoming more popular
 - Cool-season grasses are usually seeded or sodded

Timing

- Fall is the best time to establish cool-season grasses (Ryegrass) - September - October (70 - 80 F)
 - Gives the grass time to mature and develop a healthy stand before summer stress
- Late spring / early summer is best for warm season grasses - May - June (80 - 90 F).
 - Gives the grass time to mature before the onset of winter
- In general - seed or sprig during good growing weather for the grass you are planting

Ideal Site Preparation

- Soil Test!
 - Collect samples from yard and have tested by a reputable lab
- Adjust pH and add fertilizer according to soil test recommendation
- Till to at least 6 inch depth
- Add topsoil if removed or organic matter
- Remove foreign objects, level and moisten
- Final grading and raking
- Leave soil level about 1 inch below pavement, patios, etc. so sod is level



Seeding

- Rates: (All in pounds Pure Live Seed per 1000 square feet)
 - Bermudagrass: hulled, 1-2; unhulled, 2-4
 - Centipedegrass: ½ - 1
 - Zoysiagrass: 1-3
 - Tall Fescue: KY-31, 8 - 10; turf types, 5-8
- Pure Live Seed = (Total amount of seed in bag) x (Percent actual grass seed) x (Percent of seed that will germinate)
- Even distribution is critical

Germination

- Cover seed lightly with soil or mulch
- Roll lightly to establish good seed-soil contact
- Keep moist with frequent light watering until seeds germinate
- Then reduce frequency of watering until you are watering infrequently and deeply
- When grass reaches 1 1/2 times the mowing height, begin mowing

Sprigging

- Prepare soil as for seeding
- Sprigging rates:
 - Bermudagrass: Broadcast or plant in rows: 5 - 15 bushels per 1000 square feet
 - St. Augustinegrass, Centipedegrass: Roughly 5 bushels / 1000 sq. ft.
 - Zoysiagrass: 3-5 bushels / 1000
- Follow same post planting care as for germinating seedlings
- Moisture is key - don't let sprigs dry out







Bermuda Ring





Sodding

- Sod can be laid at any time the ground isn't frozen
- Recommend avoiding sodding during periods of stress however
- Prepare ground as for seeding, then lay sod
- Keep moist until sod "knits down" and roots grow into underlying soil

Installing Slabs

- Begin with straightest edge possible
- Avoid gaps
- Avoid overlapping pieces
- Begin at bottom of hills
- Keep off newly-laid sod
- Tamp or roll - lightly



Possible Problems





Caring for Your Lawn and Common Problems





Mowing

Mowing

- Mowing is the single most important factor in maintaining turf quality - yet often overlooked
- Cardinal rules of mowing:
 - Use a sharp blade
 - Mow frequently enough so no more than 1/3 of the leaf is removed at any one time
 - If mowing at 1 inch, mow before grass exceeds 1.5 inches
 - Raise the mowing height in heavy shade or during very hot weather

Mowing Equipment

- Reel or Rotary?
- Rotary is easier to maintain
- Power reel mowers are expensive
- Reel gives a cleaner, better-looking cut, but is more difficult to maintain
- Rotary for most lawns is more than adequate



Turfgrass

Optimum mowing height (inches)

Hybrid Bermudagrass

1/2 - 1 1/2

Common Bermudagrass

1 - 2

Centipedegrass

1 - 1 1/2

Ryegrass

1 - 3

Tall Fescue

2 - 3

St. Augustinegrass

2 1/2 - 4

Zoysiagrass

1 - 2



Do you need to bag clippings?

- No, not if you mow often enough
- Clippings decompose rapidly if small enough
 - won't contribute to thatch
- Return nutrients to lawn
- DO bag if mowing while grass is wet or diseased!



Thatch Control

- What is thatch?
- Layer of dead, partially decayed turf parts between the soil surface and the green canopy of the turf
- Gives “sponginess” to lawn
- Some is desirable
- Too much can hurt the plants’ health



When Is Thatch a Problem?

- If the lawn feels excessively spongy
- If the mower is sinking into the thatch and scalping the lawn
- If water can't penetrate the thatch and wet the soil
- If the turf roots are in the thatch only, not the soil, and it is easy to pull up

Dethatching

- Cuts through thatch and turf to pull out dead material
- Also opens up canopy and stimulates lateral growth
- Manually with rakes, or with power equipment





Aerification & Drainage

Soil Compaction

- Biggest year-to-year problem on home lawns and landscapes
- Compacted soil literally has the air and water squeezed out of it
- Lowered rooting, less microbial activity, increased thatch
- Makes the lawn susceptible to weeds, insects and diseases



Compaction Relief

- Aerify, Aerify, Aerify
- Core aeration works best
- Solid tine, slicing, deep-tine, drill, hydroject are also used
- If all else fails - Renovation



Drs. Nagel & Goatley Po' folks cultivation determination device.

- **Steps:**
 - **go to WalMart or sneak a steak knife from the kitchen drawer without getting caught.**
 - **If you can push it in ground with your thumb, you are likely in good shape.**



Aerifying

- Hollow tines pull cores out of the soil
- Most effective form of compaction relief
- Can fill holes with soil or shatter cores & drag back in
- Can topdress after coring



Pull-behind aerification unit



Aerification Equipment







SOIL RELIEVER

CAUTION
DO NOT OPERATE
WITHOUT GUARDS
IN PLACE

CAUTION
DO NOT OPERATE
WITHOUT GUARDS
IN PLACE

CAUTION
DO NOT OPERATE
WITHOUT GUARDS
IN PLACE

WARNING







Topdressing

- Light application of sand to the top of the turf
- Worked in after application
- Helps reduce thatch, smooth surface
- 1/8 to 1/4 inch depth



GUARANTEED ANALYSIS

15-5-10

TOTAL NITROGEN (N)	15.00%
AVAIL. PHOSPHATE (P ₂ O ₅)	5.00%
SOLUBLE POTASH (K ₂ O)	10.00%
MAGNESIUM (Mg)	1.00%
SULFUR (S)	16.00%
COPPER (Cu)	0.05%
IRON (Fe)	0.50%
MANGANESE (Mn)	0.05%
ZINC (Zn)	0.50%

Fertilization

NET WT. 50 LBS.

LAWN FERTILIZER

29-3-4

GUARANTEED ANALYSIS 29-3-4 ← ①

Total Nitrogen (N) 29.0% ← ②

1.1% Ammoniacal Nitrogen

5.2% Nitrate Nitrogen

17.5% Urea Nitrogen*

Available Phosphate (P₂O₅) 3.0% ← ②

Soluble Potash (K₂O) 4.0% ← ②

Total Iron (Fe) 2.0% ← ③

0.02% Water Soluble Iron (Fe)

Derived From: Polymer-coated Urea, ← ④
Ammoniacal Sulfate, Ammoniacal
Phosphate, Muriate of Potash.

**YOUR SATISFACTION
GUARANTEED OR YOUR
MONEY BACK** ← ⑤

LOOK ← ⑥

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visit us on the INTERNET at
www.fertilizer.com or call us at 800-874-6892.

Fertilization Schedule

- Highly Variable
 - Weather
 - Wear
 - Mowing requirement
 - Labor and equipment available
- General timing: during periods of turfgrass growth
 - Spring, summer, early fall for warm season grasses
 - Fall, winter for cool season grasses

Table 3. Recommended Fertilization Schedule for Lawn Turfgrasses in Alabama

Turfgrass	Desired Quality	Total pounds of nitrogen per 1,000 sq. ft. per year	Pounds of nitrogen per 1,000 sq. ft. per month											
			Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
Bahiagrass	Good High	2 3					1 1	1		1 1				
Common Bermudagrass	Good High	3 (4)* 4 (5)				(1) (1)	1 1	1 1	1	1 1				
Hybrid Bermudagrass	Good High	3 (4) 5 (6)				(1) (1)	1 1	1 1	1	1 1	1			
Heat tolerant bluegrass	Good High	3 ½ 5 ½		1 1	½ 1	0 ½						1 1	1 1	0 ½
Centipedegrass	Good High	0 1					1/2		1/2					
St. Augustinegrass	Good High	3 (4) 4 (5)				(1) (1)	1 1	1 1	1	1 1				
Tall Fescue	Good High	2 4			½ 1							1 1	½ 1	1
Zoysiagrass	Good High	2 (3) 3 (4)				(1) (1)	1 1		1 1	1	1			

* South Alabama

Fertilization

- Avoid the temptation to overfertilize!
- Excessive fertilization with N can encourage leaf growth at the expense of roots
- Too much fertilizer can run off and pollute
- N - P - K are the big three nutrients
- We make P and K recommendations based on soil tests
- We make N recommendations based on experience and the quality of turf desired

N sources

- Organic vs Inorganic
- Soluble
- Slow Release
- Factors Affecting release rate
 - Temperature
 - Water

Table 1

Characteristics of Common Turfgrass N Sources					
<i>Classification, burn potential, leaching potential, low temperature response, and residual effect on common turfgrass N sources.</i>					
Fertilizer Source	N Content %	Leaching Potential	Burn Potential	Low Temp. Response	Residual Effect
Inorganic					
Ammonium nitrate	33-34	High	High	Rapid	Short
Calcium nitrate	16	High	High	Rapid	Short
Ammonium sulfate	21	High	High	Rapid	Short
Organic-Natural					
Activated sewage sludge	6	Very Low	Very Low	Very Low	Long
Manures	3-10	Very Low	Very Low	Very Low	Long
Other natural products	3-10	Very Low	Very Low	Very Low	Long
Synthetic					
Urea	45-46	Moderate	High	Rapid	Short
Urea solutions	12-14	Moderate	High	Rapid	Short
Sulfur coated urea	14-38	Low	Low	Moderate	Moderate
Resin coated urea	24-35	Low	Low	Moderate	Long
Isobutylidene diurea (IBDU)	30-31	Mod. Low	Low	Moderate	Moderate
Methylene ureas and Ureaformaldehyde*	38	Low	Low	Low	Mod. Long to Long

*some products may contain urea in addition to the ureaformaldehyde component.

Micronutrients

- Probably not needed in most cases
- Iron (Fe) application will frequently result in a greenup
- Other micronutrient supplements may provide a marginal benefit, though for many the effects have not been thoroughly researched
- Many micronutrient supplements also contain small amounts of N



Irrigation

Irrigation

- Southern turfgrasses survive drought better than most cool season grasses, but will go dormant and turn brown
- General rule for irrigation of any turf: water when it shows signs of drought stress (wilting, greyish or bluish color, rolling leaves)
- Apply enough water to wet the soil to a depth of 4-6 inches but don't let water puddle on or run off the surface - usually about 1 inch of water suffices. Measure it by catching water in a can

Irrigation Timing

- Morning irrigation wastes the least water
- Doesn't increase the amount of time the leaves are wet, so doesn't increase disease problems
- Before 9 am is ideal
- Afternoon is about the worst time to water

Bermudagrass (*Cynodon* spp.)



Advantages and Disadvantages of Bermudagrass

- Aggressive growth
- Appealing color
- Fine leaf texture
- Drought tolerant
- Wear tolerant
- Dense, strong sod

- Aggressive growth
- High nitrogen requirement
- Needs full sun

Seeded Bermudagrass

- Common bermudagrass (*Cynodon dactylon*)
 - Arizona Common, NuMex Sahara, Guymon, Mirage, Jackpot, Sundevil, Savannah
 - Newer varieties selected for improved color, density and texture
- Princess - 77, Riviera



Hybrid Bermudagrass

(C. dactylon x C. transvaalensis)

- Sterile, must be established vegetatively
- Bred for excellent color, vigor and density
- Standards: Tifway (aka Tifton 419), Tifgreen (Tifton 328), TifSport, Tifway II
- Midiron, Quickstand - more cold tolerant
- Others - Baby, GN-1, FloraTex



Bluegrass (*Poa* spp.)



Advantages and Disadvantages of Bluegrass

- Dark green color
- Appealing texture
- Can establish from seed
- Green in winter

- Slow establishment
- Cool season grass, not heat tolerant
- Requires more fertility than fescue
- Most heat tolerant varieties can be expensive

Heat Tolerant Bluegrass

- In Deep South, look for “Heat Tolerant” or “Hybrid Bluegrass” varieties
- Straight Ky. Bluegrass will not survive here
- Even Heat Tolerant varieties have a range similar to Tall Fescue
- Can be alternative to fescue for people who prefer the look of bluegrass
- Will require more fertilizer
- “Why would they carry it in Mobile if it doesn’t grow there?”

Centipedegrass
(*Eremochola ophiuroides*)



Advantages and Disadvantages of Centipedegrass

- Low maintenance
- Can establish from seed
- Low fertility requirement
- Tolerates acid soils
- Moderate shade tolerance

- Slow growing and establishment
- Seed is expensive
- Coarse leaf texture
- Poor cold tolerance

Common Centipedegrass Problems

- Overfertilization
- Weed control

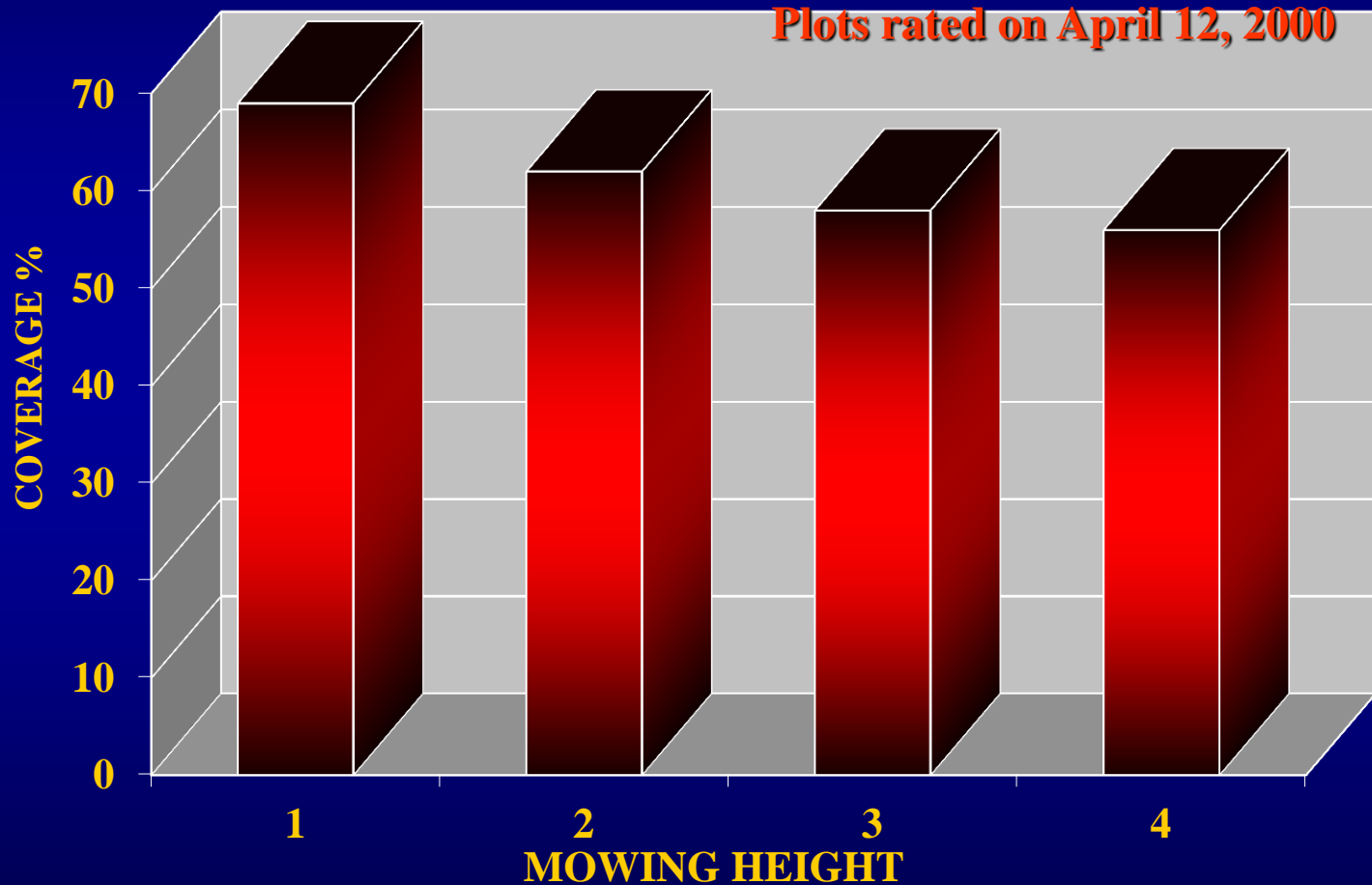
Overfertilization

- Centipedegrass only needs 0 – 1 lb N / 1000 sq ft / year
- Apply in spring or split in two applications
- That's it!
- More N can cause a darker green color but is linked to centipedegrass decline, buildup of thatch and disease problems

NITROGEN RATE AND SURVIVAL OF CENTIPEDEGRASS AT FAIRHOPE, 2000



MOWING HEIGHT AND GREEN-UP OF CENTIPEDEGRASS AT FAIRHOPE, 2000





Weed Control in Centipedegrass and St. Augustinegrass

- Controlling grassy weeds in centipedegrass and St. Augustinegrass is tricky due to sensitivity to many postemergence herbicides
- Vantage, atrazine and Image ok, MSMA is NOT.
- Preemergent control of grassy weeds is much easier for centipedegrass and St. Augustinegrass – for annuals
- Centipedegrass and St. Augustinegrass also show moderate intolerance to broadleaf herbicides such as dicamba, 2,4-D and MCPA. Follow label directions carefully when using these products on centipedegrass



Other Centipedegrass thoughts

- Thatch - seems to be a problem where too much N fertilizer is used or mowing heights are high
- Contributed to winterkill especially when roots are up in the thatch and not in soil
- K fertilization may help improve winter hardiness
- Iron deficiency - linked to excessive P
- Use soil test results to determine P requirement and whether to apply
- Use foliar Fe supplements if needed
- Can withstand higher pH than once thought - up to 7.0

St. Augustinegrass
(*Stenotaphrum secundatum*)



Advantages and Disadvantages of St. Augustinegrass

- Good shade tolerance
- Dark green color
- Dense sod
- Tolerates alkaline soil

- Coarse leaf texture
- Poor cold tolerance
- Poor wear tolerance
- Thatch

Some St. Augustinegrass Cultivars

Cultivar	Mowing Height (in)	Cold Tolerance	Chinch Bug Resistance	SAD Resistance	Take-All Resistance	Brown Patch Resistance
Bitterblue	3-4	Poor	None	None	None	None
Common	3-4	Poor	None	None	None	None
Floratom	3-4	Poor	Good*	Good	None	None
Floratine	2-3	Poor	None	None	None	None
Floralawn	3-4	Poor	Good	Good	None	Moderate
Jade	1.5-2.5	Moderate	Moderate	None	None	None
Palmetto	2-2.5	Good	None	None	Moderate	Moderate
Raleigh	3-4	Good	None	Good	None	None
Seville	2-2.5	Moderate	None	Good	None	None

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Tall Fescue (*Festuca arundinacea*)



Advantages and Disadvantages of Tall Fescue

- Good shade tolerance
- Can establish from seed
- Good wear resistance
- Does well in heavy, clay soils
- Green in winter

- Poor recuperative ability
- Not as heat tolerant as any warm season grass
- Coarse leaf texture
- Cannot tolerate low mowing heights
- Bunch-type growth habit can lead to clumpy lawns

Tall Fescue Varieties

- Kentucky 31
 - Oldest variety, still a standard
 - Hardy, tough variety with wide blades and coarse texture
- Improved “turf type” varieties
 - Rebel series, Emperor, Empress, Gala, etc.
 - Over 150 available - more all the time
 - Lower growth habit, finer leaves, greater shoot density and darker green color than KY-31

Zoysiagrass (*Zoysia* spp.)



Advantages and Disadvantages of Zoysiagrass

- Good cold tolerance (some)
- Appealing color and texture
- Good shade tolerance
- Good density
- Good wear resistance

- Slow growth, establishment
- Difficult to mow (some)
- Fair drought tolerance
- Thatch producer
- Fairly high fertility requirement

Zoysia japonica

- Very cold tolerant
- Medium to coarse texture
- Some have very stiff leaves, others softer
- Includes some seeded varieties
 - Zenith, Companion, Cathay, SR 9150 & 9500, Zen, Korean or Japanese Common
- Popular vegetatively propagated varieties
 - Meyer (Z-52, Amazoy), El Toro, Belaire, Palisades, Empire

**Five
Decades in Business
Providing Premium
Amazoy Zoysia Plugs!**



**Cut Your Mowing By As
Much As 2/3**



Cut Your Water Bills



**Stay Weed-Free All Summer
Long**

**Mow your Zoysia lawn once a
month or less.**

**It rewards you with weed free
beauty like this.**

Amazoy is the Trade Mark registered U.S. Patent Office for
our Meyer Zoysia Grass



Zoysia matrella (Manilagrass)

- Less cold tolerant - from southeast Asia
- Fine leaf texture
- Very dense
- Slow growing and establishment
- Popular varieties
 - Cavalier, Diamond, Cashmere, Zorro Blade, Zeon

Z. japonica x *Z. tenuifolia*

- Very Fine leaf texture
- Very Dense turf
- Thatch accumulates quickly
- Good shade tolerance
- Slower growth than *Z. japonica* types
- Emerald



