Identification and Management Strategies for Virginia's Turfgrasses

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Urban Nutrient Management Certification Training

Virginia Cooperative Extension



Basic Identification Tips for Turfgrasses

In order to properly develop a nutrient management plan, one needs to know what grasses are being grown.

The Turfgrass Plant



Main Page Anatomy/Morphology Turfgrass Identification List of Turfgrasses



This diagnostic tool will enable the user to learn the essential features of the turfgrass plant and identify major turfgrass species present in lawns and other turfgrass areas.

How to Identify a Turfgrass Provides a description of the step-wise process commonly used to identify an

Provides a description of the step-wise process commonly used to identify an unknown turfgrass plant.

Anatomy and Morphology

An overview of the essential parts of the turfgrass plant. After you review this information you will be able to properly locate important features and identify turfgrasses.

Turfgrass Identification

This section allows you to key out the various turfgrass species using one or more of the features described in the anatomy/morphology section.

List of Turfgrasses

Provides specific anatomical information in photographs and drawings for all of the major turfgrass species cultivated in the United States.

CREDITS

Black and White Images Provided By: OM Scotts Company Color Images Provided By: Aaron Patton, Cale Bigelow, Kyle Totten and Jason Shore



Cale Bigelow Assistant Professor of Agronomy DEVELOPERS Jason Shore, Ivan Delgado Kyle Tatten, Meagan O'Leary

http://www.agry.purdue.edu/turf/tool/index.html

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Topics •					(74.5 kB)
Reports Extension Academics People FAQs Keyword Index Glossary Diagnostics Lab Related Links Turffiles Site Map About Contact Us	Bluegrass, Kentucky [Poa pratensis L] Kentucky bluegrass is the second most widely grown cool-season species in North Carolina because it has a dark green color, a medium to fine texture, and, due to its aggressive rhizome system, can recover from stresses. It prefers fertile, well-limed soils and full sun to moderate shade. Kentucky bluegrass is often mixed with other cool-season grasses like tall fescue to enhance the ability of the turfgrass stand to recover from stresses. Kentucky bluegrass is often confused with tall fescue and/or perennial ryegrass. However, Kentucky bluegrass has a boat-shaped leaf tip and distinctive light-colored lines on both sides of the midrib.				
TURFGRASSES	and a second			ส้วเห	a Vicsitäte Ilijiversity
Bahiagrass 🔶	Characteristic Seedhead / Flower	Description seedhead is an open panicle, spikelets are flattened, with 3-5 see	eds each.		
Bentgrass, Creeping	Vernation Type	leaves folded in the bud			
Bermudagrass	Growth Season / Life Cycle	membranous; very short, collar-like, 0.008 - 0.04 inches (0.2 - 1 n cool season turf	nm) long		
Bluegrass, Kentucky	Auricle Type	absent			
Bluegrass, Rough	Leaf Blade Tip Shape Leaf Blade Width	boat shaped; usually V-shaped, sharply creased below; two distinct 0.08 - 0.16 inches (2 - 4 mm) wide	ct, clear lines, one on each side of the midrib		
Carpotarass	Stolon Presence	absent			
Centipedegrass	Collar Type	slightly divided by midrib, may have fine hair on edge			
Fescue, Fine	Sheath Margin	closed, but splits with maturity			
Turf ALERTS Sign Up	Sheath Type	trattened; not hairy			
Rounds Research.com		Rentucky bluegrass leaf tip		Kentucky bluegrass ligule	2.4

http://www.turffiles.ncsu.edu/turfgrasses





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PURDUE

TURFGRASS SCIENCE DEPARTMENT of AGRONOMY

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Ligule

Kyle Totten and Jason Shore

Membranous or hairy appendage located on the upper surface of the grass leaf at the junction of the leaf and blade.



Assistant Professor of Agronomy

Rule of thumb: Most cool-season grasses have membranous ligules; most warm-season grasses have hair (and maybe a membranous ligule).





These grasses produce only tillers (i.e. daughter plants)... incapable of rapid lateral spread, but tend to be very high density. Examples: Perennial ryegrass Tall fescue (managed as a bunch) Hard fescue Chewings fescue Annual ryegrass





Stolons are above ground lateral stems. <u>Examples:</u> Creeping bentgrass Bermudagrass Zoysiagrass St. Augustinegrass Centipedegrass



Rhizomes are below ground stems: Kentucky bluegrass Bermudagrass Zoysiagrass Creeping red fescue Tall fescue?







Seasonal Growth and Developmental Patterns of Cool and Warm-Season Turfgrasses

Seasonal Growth Patterns: Cool-Season Turfgrasses



Seasonal Growth Patterns: Warm-Season Turfgrasses



Choosing a grass for VA is like this doorbell... just because it works doesn't mean it's always easy to use!



The primary coolseason turfgrasses of Virginia

Adaptation Zones: National



Tall Fescue

• Scientific name:

- Festuca arundinacea Schreb.



Tall Fescue

• Description:

- Medium/coarse texture but most recent turftype varieties match up well in leaf texture with bluegrasses...
- Distinctly rolled vernation
- Very prominent parallel veins on leaf surface
- Short membranous ligule, but difficult to see
- Very stiff bladed, upright growing leaves -similar to zoysia; serrated leaf margins
- Typically has purple color at base of stem



Needle-like leaf tip of tall fescue.



Prominent rolled vernation & parallel veination on leaf surface.

Tall Fescue

Adaptation and Use:

- Managed as a bunch-type grass but can produce determinate rhizomes; "rhizomatous tall fescues" released with further improvements likely.
- Adapted to wide range of soil conditions... wet, dry, acid, alkaline
- Does reasonably well in heat and drought b/c of drought avoidance... a very deep root system
- Moderate to poor cold tolerance
- Average shade tolerance
- seed and sod readily available
- Primary uses: home lawns, general purpose turf where 'close clipping' is not required, highway ROW, lower maintenance athletic fields

Tall fescue is the best adapted cool-season turfgrass across the state of Virginia

Characteristics:

Excellent color and turf quality potential in fall through spring period
Requires a very sharp mower blade.

Tall Fescue

- Cultural intensity:
 - Low/medium maintenance intensity... but still delivers an aesthetically pleasing canopy
 - 0.25-1.0 lbs N/1000sq ft/growing month... Turf
 Type tall fescues respond to higher
 maintenance levels, forage types don't need it
 - Particular problems with Brown Patch and Gray Leaf Spot under high maintenance situations (and improperly timed N fertilizer applications)
 - Little to no thatching tendency
 - Mowing height: 2-3" under optimal growing conditions; 'as high as mower can go' is desirable in summer for most parts of VA

Kentucky bluegrass

• Scientific name: *Poa pratensis* L.



Kentucky bluegrass

• Description:

- Fine to medium texture; prominently folded vernation
- Determinate
 rhizomes, but still an
 aggressive growth
 habit... good
 recuperative potential
- Ligule is very short, membranous; very difficult to see... <u>not</u> <u>seeing it</u> is an ID feature





Folded vernation and a prominent mid-vein

Boat shaped leaf tip: note the "split" that can be made at the tip





The remaining 'large acreage' cool-season grasses (Kentucky bluegrass, perennial ryegrass, and fine fescues) are best adapted to the Valley and Ridge region of Virginia



Kentucky bluegrass (Poa pratensis)

The most widely used cool-season turfgrass in the United States.

Lots of seed sources available; quite slow to germinate (≥ 60°F soil temp = 10 days; < 60° F = 14-21 days to germination); experimental cultivars showing faster establishment traits

Exceptionally dark green color and very dense turf: highly desirable features... but very difficult to grow in Piedmont and Tidewater regions of VA

Kentucky bluegrass

- Adaptation and Use:
 - Full sun turfgrass
 - Prefers well drained soils, slightly acid pHs, high phosphorus levels
 - Excellent winter hardiness;
 Summer dormancy mechanism
 - Primary uses: full sun sites on home lawns, athletic fields, and golf course fairways (especially if newer, 'more tolerant of closer clipping' varieties are used)



Kentucky bluegrass is notoriously slow for spring greening... covers are being used to accelerate spring greening on the VT Football Practice Field.

Kentucky bluegrass

- Cultural intensity:
 - Moderate to high level of maintenance required to optimize its performance.
 - -0.5-1 lb N/1000 sq ft/growing month
 - Very aggressive grower, heavy thatch former; can require vertical mowing
 - Mowing height: 1-2.5" (consider what this means for using on athletic fields and/or golf courses)
 - seed and sod available.

Perennial Ryegrass Lolium perenne

<u>Uses</u>: components of lawns, fairways, tees, winter overseeding on bermudagrass, component of sports fields, popular as a component in mixtures with Ky BG and/or fine-leaf fescues for sun:shade turf

Characteristics: Bunch-type, weak sod former, noted for very quick establishment, shiny leaf not particularly cold hardy

Virginia

Perennial Ryegrass

- Description:
 - Fine/medium texture
 - Bunch-type
 - Dark green color
 - Purple color at base
 - Folded vernation
 - Prominent mid-vein
 - Pointed rather than boat- shaped leaf tip
 - Waxy upper leaf surface results in a lot of glossy reflection: used for 'striping' turf



Leaf ID Tips for PR vs. KBG



<u>Perennial ryegrass</u> -prominent midvein but many ridges on leaf surface -leaf tip not prominently keeled as Ky BG



<u>Kentucky bluegrass</u> -prominent midvein but smooth leaf surface -keeled or "boat shaped" leaf tip

Purple color at the base of the stem can be important in identifying Lolium and Festuca's.
Perennial Ryegrass

- Adaptation and Use Characteristics:
 - Not tolerant to temperature extremes, but being bred for better heat tolerance... is this a good or bad thing? It depends on your use.
 - Extremely rapid seed germination (4-7 days)
 - Winter overseeding as a monostand used to be very popular for winter color/playability of warm-season turfs. Only bermudagrass is recommended for winter overseeding due to its aggressive recuperative potential and the availability of new selective herbicides for ryegrass control. Winter overseeded ryegrass will have an additional fertility requirement in nutrient management plans.
 - Primary uses: home lawns (alone or in combo with KBG), sports turf, golf turf in mixtures with Kentucky bluegrass

Perennial Ryegrass

- Cultural intensity:
 - Moderate to high levels of maintenance (0.5 to 1 lb N/1000 sq ft per active growing month... comparable to Kentucky bluegrass... ryegrass has a lot of disease pressure in much of Virginia)
 - Quick to green in spring, high mowing requirement during periods of active growth
 - The most wear tolerant cool season turfgrass (but poor recuperative potential)
 - No thatching intensity as it is a bunch grass
 - Mowing height: 0.5* to 2.5"... distinguishes itself from most Ky bluegrasses in its tolerance to closer clipping heights



There are three major fine-leaf fescue species used for turf in Virginia

<u>Creeping red fescue</u> *Festuca rubra* L.

<u>Hard fescue</u> *Festuca brevipila* Tracey



<u>Chewings fescue</u> Festuca rubra L. ssp. fallax (Thuill.) Nyman

<u>Sheep fescue*</u> (more prominently used as an ornamental) *Festuca ovina* L.



Needle-like leaf texture

Fine fescue

• Description:

- The finest leaf texture of the major turfgrasses...
 its most important 'identification' characteristic
- Folded vernation
- Managed as a bunchtype although creeping red has slender rhizomes
- Highly variable colors



Fine fescue (hard fescue)... in 2009, this was a 3-yr old stand on a 'no mow' hillside in Spotsylvania Co.

NO MOW AREA

Fine fescue

- Adaptation and Use Characteristics:
 - Best shade tolerance of cool-season turfgrasses
 - Low water requirement
 - Intolerant of poorly drained soils
 - Excellent choice for low input turf in Valley and Ridge regions of VA ... poor soils, steep slopes, 'low maintenance turf'
 - Poor traffic tolerance
 - Many cultivars display excellent tolerance to glyphosate
 - Primary uses: home lawns (alone or in combo with KBG), particularly those in the shade; highway ROW turf, cemeteries, any other turf with low maintenance requirements

Fine Fescue

- Cultural intensity:
 - Best "poor-man's" grass for cool season climate; typically the lowest maintenance cool-season grass managed in VA
 - fertility requirements: 1-2 lbs N/1000 sq ft/ growing season
 - Mowing height: 1-2.5" typical, but can remain unmowed for the "native" look; slower growth habit than other cool-season grasses

Creeping Bentgrass

- Scientific name:
 - Agrostis stolonifera L.



Creeping Bentgrass

• Description:

- Stoloniferous grass but it is managed essentially as a bunch grass given its low clipping height requirements for golf turf use.
- Rolled vernation
- <u>Very prominent</u> membranous ligule
- Numerous parallel veins on leaf surface
- Sharp pointed leaf tip
- Very soft to the touch ("baby powder" feel)

Unmowed, creeping bentgrass displays an aggressive stoloniferous growth habit. Managed at heights of 0.25" or less, it essentially behaves and is managed as a bunch grass.



Very prominent membranous ligule.

Distinctive needle-like leaf tip with prominent parallel veination.

Creeping Bentgrass

- Adaptation and Use:
 - Almost exclusively used for golf turf... almost all greens, many tees, and some fairways around the state; regular mowing height requirements (typically 3-6 days per week during active growing periods) of 0.1 to 0.5 inches; outside of golf turf use it is usually considered a problematic weed
 - Average shade tolerance
 - Outstanding cold tolerance
 - The shallowest root system of the maintained coolseason grasses
 - Poor drought and traffic tolerance, while heat tolerance is surprisingly good
 - The most disease susceptible cool-season turfgrass

Creeping Bentgrass

• Cultural intensity:

- Very high (likely the highest maintenance cool-season turfgrass)
- -Reel mowers are usually required
- Supplemental irrigation and fungicide applications necessary
- -0.25 to 1#N/1000 sq ft/growing month typical depending on the situation
- Vertical mowing (dethatching) likely required over time

The primary warm-season turfgrasses of Virginia

Primary concern with use of warm-season grasses by homeowners is winter dormancy period.

Bermudagrass adaptation zones



Bermudagrass

- Description:
 - Folded vernation, but can be difficult to tell
 - No prominent mid-vein on leaf blade
 - Ligule: fringe of hairs... often hairs on the leaf and blade as well
 - Both rhizomes and stolons
 - Seedhead... "pinwheel" arrangement of spicate branches
 - mostly 4 to 5 branches within an area => usually denotes "common" type
 - mostly 3 branches => vegetative (triploid) hybrid

Bermudagrass: Cynodon spp.









Bermudagrass

Adaptation and Use:

- The most aggressively spreading warm season grass...
 very high mowing requirement in the summer.. Top turfgrass, major weed.
- Almost any application in adapted zone... lawns, highway ROW, sports fields, golf courses
- 4-5 months of dormancy in late fall/early spring
- Very efficient user of water; deep root system
- Minimal pest pressure
- Shade tolerance very poor
- Winter kill potential? Can be of concern. Certain cultivars are selected with this in mind.



Vegetative Bermudagrass Varieties 5/20/2011 Turf Research Center, Blacksburg, VA



Seeded Bermudagrass Varieties 5/20/2011 Turf Research Center, Blacksburg, VA

Bermudagrass: Cynodon spp.

Two species of major importance:

"Common types" (C. dactylon) -- establishment from seed is likely, but most cultivars have traditionally been considered inferior in turf quality as compared to vegetative varieties. However, times have changed.

"Hybrid bermudagrasses" (C. dactylon x transvaalensis) -- sterile grasses that can only be established vegetatively. These grasses have typically provided superior turf density and finer leaf textures.



Bermudagrass

- Cultural intensity:
 - Low to High... what is the situation?
 - Low = highway ROW turf in Piedmont and Coastal Plan regions.
 - High = golf course fairways, tees, high-end athletic fields
- Fertility for mod-high maintenance:
 - 0.5-1#N/1000 ft²/growing month possible
- Cutting heights: (vary with cultivar)
 - 0.5 to 1" on golf fairways, tees, and athletic fields
 - 1 to 2.5" on home lawns; 4-6" for ROW turf

Zoysiagrass

- Scientific name:
 - -*Zoysia japonica* Steud. -- common name is 'Japanese lawngrass'
 - -*Z. matrella* (L.) Merr. => 'manilagrass'

Zoysiagrass adaptation zones



Zoysiagrass

- Description:
 - prominent rolled vernation
 - both stolons and rhizomes; rhizomes with the right angle branching and stolons with the "spear" tips where leaf blades are not expanded as compared to the leaf sheaths.
 - slender raceme for an inflorescence; for most cultivars, usually present in the spring
 - Leaf tip has characteristic steeple shape









Distinguishing Characteristics Between Zoysiagrass and Bermudagrass

Shoot arrangement	
	Zoysia
	A Contraction
- Al	< C
Bermu	da

Note subtle differences in leaf tips

Zoysia Bermuda

Zoysiagrass

- Adaptation and Use:
 - Exceptional cold tolerance of Z. japonica cultivars lends itself to use just about anywhere in the state. Z. matrella cultivars throughout Piedmont and Coastal Plain... some have shown good performance in Valley and Ridge
 - Highly popular as a lawn grass; some use for golf turf fairways and tees.
 - Average shade tolerance (better than bermuda).
 - Much slower spreading than bermudagrass. Very slow to establish if seeded, sprigged or plugged.
 - 4-5 months of dormancy in late fall/early spring
 - Good water use efficiency; not as good as bermuda



Centipedegrass and St. Augustinegrass



Centipedegrass

 Scientific name: [*Eremochloa ophiuroides* (Munro.) Hack]





Centipedegrass

- Description:
 - prominent folded vernation
 - Strongly stoloniferous; blunt-shaped leaf tip.
 - Individually stacked nodes rather than clusters of two to three
 - slender spike for an inflorescence; for most cultivars, the seedheausually present in the spring
 - Characteristic yellow-green color









Centipedegrass

Adaptation and Use:

- Average shade tolerance
- Average cold tolerance
- Good water use efficiency, but not comparable to bermudagrass
- Excellent turf density with minimal maintenance requirement
- Poor traffic tolerance
- Dormant 4-5 months out of the year
- Not recommended to be overseeded
- Performs best in acidic soils (pH of 5.5-6.5 ideal)
Centipedegrass

• Cultural intensity:

- The lowest input warm-season turf; requires less mowing than any other species and very limited fertility: 1-2 lbs N/1000 sq ft annually
- Seed available; can be established from sod, sprigs, or plugs as well
- 1-2 inch cutting height
- Reponds well to foliar applications of iron
- Primary uses: low-trafficked lawns, highway ROW, cemeteries



St. Augustinegrass Scientific name: *Stenotaphrum secundatum*





St. Augustinegrass

• Adaptation and Use:

- Best shade tolerance of any warm-season turfgrass grown in Virginia
- Poor cold tolerance
- Good water use efficiency, but not comparable to bermudagrass
- Excellent turf density
- High maintenance grass re: mowing requirement and possible pest pressure: the most disease susceptible warmseason grass
- Dormant 4-5 months out of the year
- Not recommended to be overseeded

St. Augustinegrass Stenotaphrum secundatum

- Cultural Intensity:
 - High disease and insect pressure
 - High mowing requirement (aggressive creeper)
 - 2-3 inch mowing requirement
 - -0.5 to 1 lb N/1000 sq ft/growing month
 - -use limited primarily to areas where temperatures are moderated by the Atlantic Ocean, particularly shaded sites
 - Primary uses: homelawns and general purpose turf with shaded sites in particular being popular near the southeastern coast of Virginia



Very thin spike for a seedhead on centipede





Unique spike in which seed are actually embedded in the stem on St. Aug.

Centipedegrass: regularly spaced nodes give "alternate" shoot arrangement St. Augustinegrass: stacked nodes give "opposite" shoot arrangement



Dormant zoysiagrass

Overseeded bermuda

0.5 to 1.5 lb N/1000 sq ft total during winter thru spring growing window of ryegrass

Another alternative for "green" grass – turf paints.





Dec 16, 2009 Before and After - Zoysia

Please utilize our Turf and Garden Tips weblog at: www.ext.vt.edu/turfandgardentips

This site features timely tips in lawn and landscape maintenance.





For further information regarding the most appropriate grasses for your area consult your local Virginia Cooperative Extension office (www.ext.vt.edu/).
Additional educational opportunities:

Virginia Turfgrass Short Course, Dec. 11-13, Fredericksburg Expo and Convention Ctr. (for more info, www.vaturf.org)
Virginia Turfgrass Conference, Fredericksburg, Jan. 28-31, 2013