



# **Invasive Grasses of Florida and their Native Look-alikes**

**FLEPPC Annual Symposium**

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# The Grass Family (Poaceae/Gramineae)

- Poaceae (grasses) is the world's largest plant family, with 700 genera and over 11,000 species.
- Largest plant family in Florida, 447 species in Florida (10% of all species)
- 185 (41%) of the species are exotic
- 16 are listed as invasive by FLEPCC
- Grasses are often confused with other grass-like plants such as sedges and rushes. However, grasses usually have hollow stems that are swollen at the nodes (joints), have flat, two-ranked leaves and different flowering structures

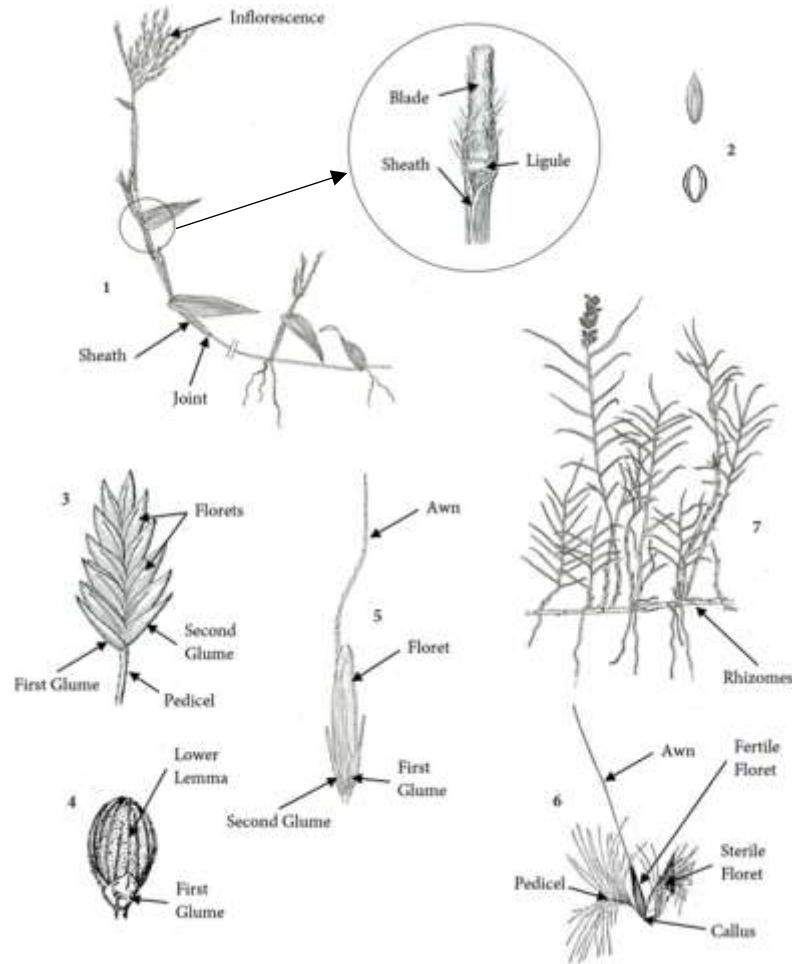
# General Characteristics of Category I Invasive Grasses

- Form dense monotypic stands
  - Upland species have deep rhizomes
  - Most wetland species are rhizomatous and decumbent
- Ability to spread vegetatively
- Wind dispersed seeds
- Ability to thrive with disturbance
- Fast growers and prolific seed producers





# Grass Morphology



**Grass Morphology.** 1. Vegetative features; 2. Caryopsis (grain). 3-6. Spikelets: 3. Spikelet with many florets. 5. 4. Spikelet with 2 florets (dorsally compressed); 5. Spikelet with one floret (laterally compressed); 6. Spikelet with 2 florets (Andropogon); 7. Rhizomes

Internode

Joint  
(Node)

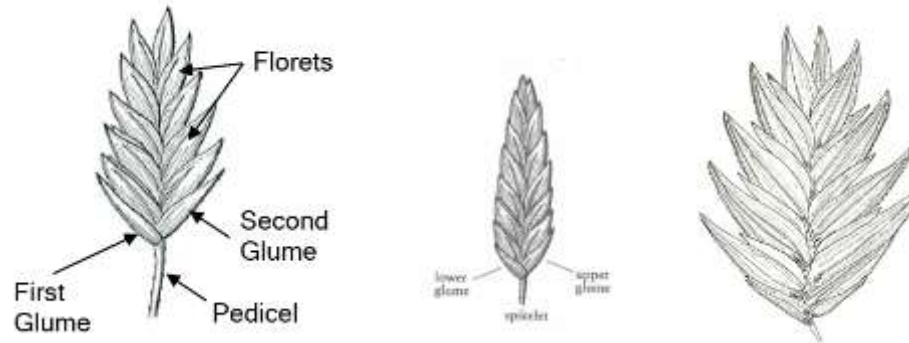
Ligule hairs

Blade  
(parallel venation)

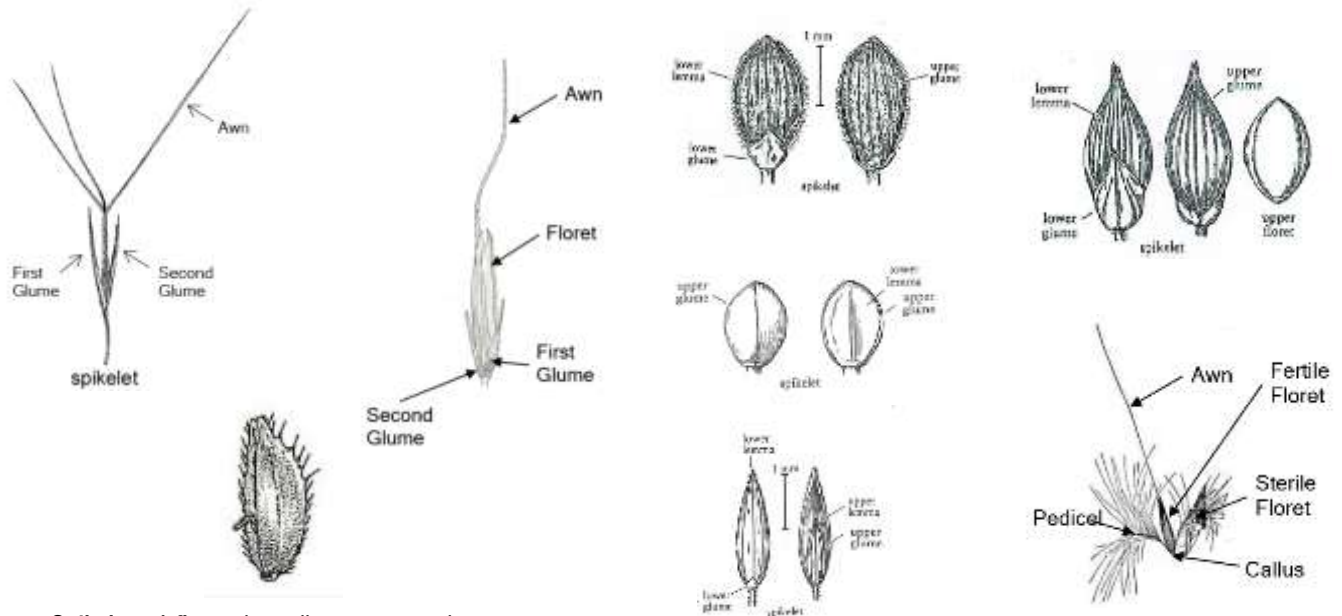
Sheath (overlapping)



# The Grass Spikelet



Spikelets 2+ florets, laterally compressed. Glumes present.

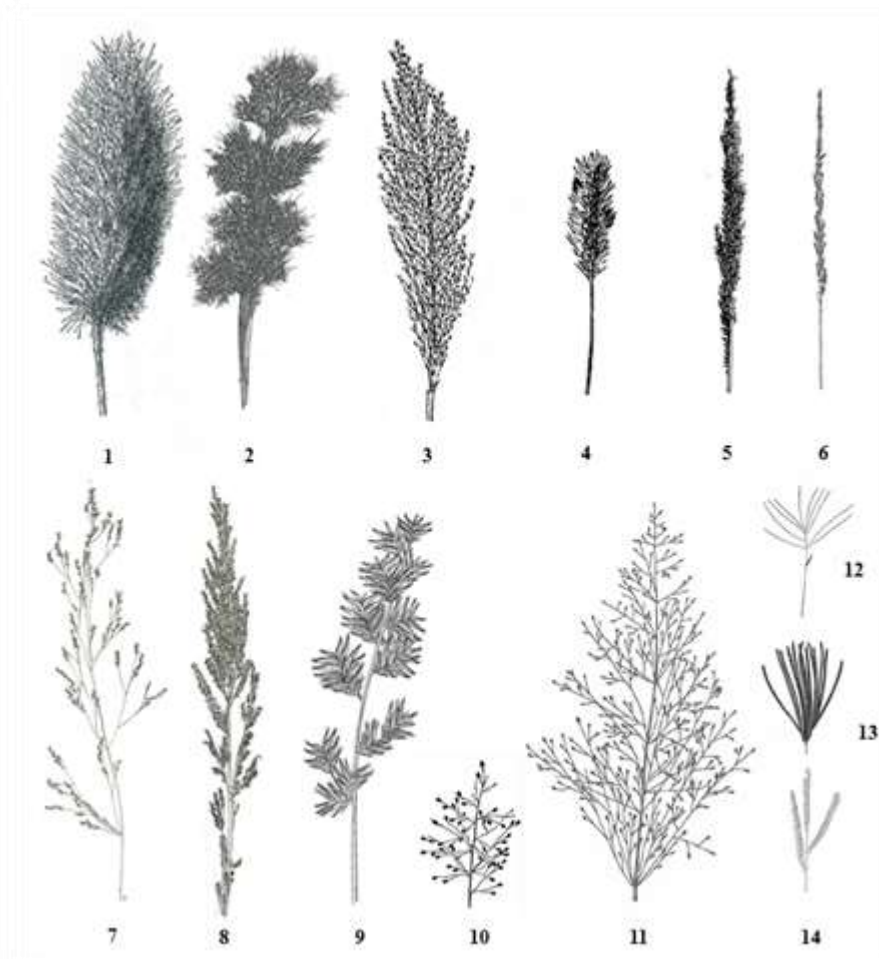


Spikelets 1-floret, laterally compressed

Spikelets 2 florets, dorsally compressed.



# Grass Inflorescence Types



1, 2, 3. Inflorescence feathery, silky or cottony. 4. Inflorescence a cylindrical spike  
5, 6. Inflorescence a narrow or wand-like spike 7-11. Inflorescence a panicle  
12-14. Inflorescence digitate or racemose

# *MOLASSES GRASS, CROWFOOTGRASS AND COGONGRASS*

## **MOLASSES GRASS** – *Melinis repens* and *Melinis minutiflora*

Perennial, caespitose to 1.50m tall, branching and sprawling or matting, rooting at the lower nodes. Sheaths glabrous or pubescent. Ligule hairs 1-2mm long. Spikelets 1.7-2.4mm (*M. minutiflora*) or 2-5.4mm (*M. repens*) purplish or red. Native to Africa and listed by FLEPCC as invasive. Inflorescence showy and very distinct.

## **CROWFOOTGRASS** – *Dactyloctenium aegyptium*

Stoloniferous perennial or caespitose grass with digitate inflorescences and spikelets arranged along the side of the rachis. Spikelets 3-4.5mm long. Fruit rugose and ridged.

## **COGONGRASS** – *Imperata cylindrica*

Perennial, rhizomatous to 2-meters tall. Blades light green, to 1.5 m long, linear-lanceolate, with scabrous margins. Midrib whitish, and off-center. Ligule hairs 0.2-3.5 mm. Inflorescence a cylindrical cottony or feathery spike. Forms dense stands in mostly upland habitats.



Credit: Jennifer Possley, FTBG





# LIMPOGRASS

## *Hemarthria altissima*

**Description:** Perennial; rhizomatous and/or stoloniferous to 1.50 cm; with erect or ascending, flattened culms.

**Ligules:** 0.2-1 mm;

**Leaves:** basal and cauline; blades flat to conduplicate, glabrous, margins ciliate basally.




**Sheaths:** mostly glabrous, margins sparsely ciliate basally, scabrous distally;

**Inflorescence:** Rames 2-10 cm, erect.

**Spikelets:** one sessile one pedicillate.

**Recognition:** Limpogras resembles two native grasses, crimson bluestem (*Schizachyrium sanguineum*), and jointtailgrass (*Coelorachis rugosa*).



Scientific Name	<i>Hemarthria altissima</i>	<i>Coelorachis rugosa</i>	<i>Schizachyrium sanguineum</i>
Specimen			
Inflorescence	Spike-like racemes	Spike-like racemes	Spike-like racemes
Spikelet	Paired, dorsally compressed, not awned	Paired, round, not awned	Paired, awned (15-25mm)
Ligule	Membranous ciliate, 0.2-1mm	Membranous ciliate	Membranous, 0.7-2mm
Blade	n/a	n/a	n/a
Sheath	Glabrous	Compressed-keeled	Glabrous
Culms	Erect or decumbent, rooting at nodes	80-120 cm, compressed-keeled	40-120cm, erect, no rooting or branching at lower nodes
Other	Rames 2-10cm, flattened	Rames 3-9.5cm, round	Rames

# *WEST INDIAN MARSHGRASS*

## *Hymenachne amplexicaulis*

**Description:** Perennial, to 3.5 m tall, 1 cm or more thick, decumbent.

**Ligules** 1-2.5 mm, brownish;

**Leaf blades** 15-33 cm long, 12-28 mm wide, lax, flat, glabrous.

**Panicles** 10-40 cm long, spike-like, dense, sometimes lobed near the base;

**Spikelets:** 3.5-5 mm, lanceolate, acuminate.




**Habit:** forms dense stands along the margins of lakes and waterways.

**Distribution:** South and Central Florida

**Recognition:** *Hymenachne amplexicaulis* most resembles *Panicum hemitomon*, *Sacciolepis striata*. All three species form somewhat dense stands and share similar habitat preference. West Indian Marshgrass has subcordate blades that clasp around the culm (stem). Maidencane and American cupscale blades are tapered and do not clap around the culm.





Scientific Name	<i>Hymenachne amplexicaulis</i>	<i>Sacciolepis striata</i>	<i>Panicum hemitomom</i>
Specimen			
Inflorescence	Spike-like or congested	Spike-like or congested	Spike-like or congested
Spikelet	3.3 - 4.3mm	3.1 - 4.2mm, saccate glabrous	2.1-2.7
Ligule	1 - 2.5mm, ciliate	0.2-0.7mm, membranous, ciliate	<1mm, ciliate
Blade	Flat, cordate	Flat, tapering	Flat, tapering
Sheath	Glabrous, with hairs on upper margins	Glabrous or with papillose base hairs	Usually glabrous
Culms	Decumbent, rooting at the nodes	Ascending or erect, lower culms bending and rooting at the nodes	Erect, sometimes bending and rooting at the nodes
Other	Stoloniferous	With or without rhizomes	Rhizomatous

# JARAGUA

## *Hyparrhenia rufa*

**Description:** Cespitose perennial, with short rhizomes.

**Ligule:**

**Blades** 30-60 cm long, 2-8 mm wide.

**Inflorescence:** Racemose. Rames 1.5-2.5 cm.



**Spikelets:** paired, one sessile one pedicillate. Lemmas awned, awns 2-3 cm.

**Habit:** clumping grass found growing along roadsides, in ditches and/or pastures.

**Distribution:** South and Central Florida.

**Recognition:** Like beardgrasses (*Andropogon* spp.), the *Jaragua* inflorescence is subtended by a modified canoe-shaped bracts (spathe). Jaragua spikelets are longer and reddish/maroon; whereas beardgrasses awns are shorter and straw colored. The spikelets for the beardgrasses are densely pubescent giving them a fuzzy/feathery appearance.



Scientific Name	<i>Hyparrhenia rufa</i>	<i>Andropogon floridanum</i>
Specimen		
Inflorescence	False panicles, peduncles with 2 rames	False panicles, peduncles in 2-13 rames
Spikelet	Paired, one sessile one pedicillate; awns to 2-3cm, spikelets pubescent, reddish	Paired, one sessile one pedicillate; awns to 1.1cm long; spikelets densely pubescent
Ligule	Membranous not ciliate	Membranous ciliate
Blade	30-60cm long, 2-8mm wide	13-109cm long, 20.9-9.5mm wide
Sheath	Glabrous	Glabrous or scabrous
Culms	To 30cm to 350 cm	20-250cm
Other	n/a	n/a



# TROPICAL AMERICAN WATERGRASS

*Luziola subintegra*

**Description:** Perennial; aquatic, floating or emergent; stoloniferous, mat-forming. Culms decumbent, or creeping and rooting at the nodes.

**Sheaths:** inflated, spongy;

**Ligules:** 10-40 mm long, membranous, auriculate, acuminate;

**Blades:** 10-75 cm long, 7-20 mm wide.

**Inflorescence:** An open panicle with pistillate and staminate spikelets.




**Habitat:** freshwater marshes and lakes.

**Distribution:** Miami-Dade, Glades and Osceola\*.

**Recognition:** *L. subintegra* is more robust than the native *L. fluitans*. The two species overlap in a few counties in central Florida. *L. fluitans* much smaller. *L. subintegra* has similar distribution, habitat preference and appearance as water paspalum (*Paspalum repens*) and maidencane (*Panicum hemitomon*)

\*Source: [eddmaps.org](http://eddmaps.org)



Scientific Name	<i>Luziola subintegra</i>	<i>Paspalum repens</i>	<i>Panicum hemitomon</i>
Specimen			
Inflorescence	Panicle racemose, pulvini evident	Panicle with racemes, rachis broadly winged	Spike-like, congested
Spikelet	Staminate spikelet 5-7mm Pistillate spikelet 3-5mm	1.3-1.9mm	2.1-2.7mm
Ligule	10-40mm, membranous, auriculate	1-4mm	<1mm, ciliate
Blade	7-20mm wide, flat	4-20mm wide, flat	Flat, tapering
Sheath	Inflated, spongy, glabrous	Glabrous or pubescent	Usually glabrous
Culms	Decumbent, matt forming, rooting at the nodes	Decumbent, floating, spongy, rooting at the nodes	Erect, sometimes bending and rooting at the nodes
Other	Stoloniferous	Rhizomes sometimes present	Rhizomatous

# BURMAREED

## *Neyraudia reynaudiana*

**Description:** Perennial, cespitose with short thick, scaly rhizomes. Culms usually 2-m tall, thick and sturdy (reedlike).

**Sheaths:** glabrous, with tightly overlapping margins.

**Ligule:** a cartilaginous ridge subtending a line of hairs.

**Inflorescence:** a terminal plumose panicle.

**Spikelets:** laterally compressed. Lemmas awned, recurved and with hairs along margins.

**Habitat:** abandoned farm fields, and pine rocklands.

**Distribution:** South Central Florida and South Florida. One disjunct population in Flagler County (2001)\*.



**Recognition:** *Neyraudia* resembles common reed (*Phragmites australis*), a large native grass with a similar inflorescence. *Neyraudia* lemmas have recurved awns and pubescent. *Phragmites* lemmas are not awned and lack hairs.

\*Source: [edddmaps.org](http://edddmaps.org)

Credit: Jennifer Possley, FTBG





Scientific Name	<i>Neyraudia reynaudiana</i>	<i>Phragmites australis</i>
Specimen		
Inflorescence	Cylindrical spike with fascicles	Cylindrical spike
Spikelet	4.3-6.0mm, subtended by bristles falling with the spikelet, lemmas awned, awns curved	1.9-2.4mm, subtended by two bristles not falling with spikelet, lemmas not awned
Ligule	1.5-5.0mm, membranous and ciliate	1-2mm, ciliate
Blade	Flat, scabrous	Flat, scabrous
Sheath	Glabrous or pubescent	Glabrous, smooth or scabrous
Culms	Erect	Erect, with ring of hairs below the nodes
Other	Cespitose	Cespitose

# TORPEDOGRASS

## *Panicum repens*

**Description:** perennial, rhizomatous, forming dense, extensive stands. Culms to 90cm tall, glaucous.

**Sheath:** glabrous or hispid.

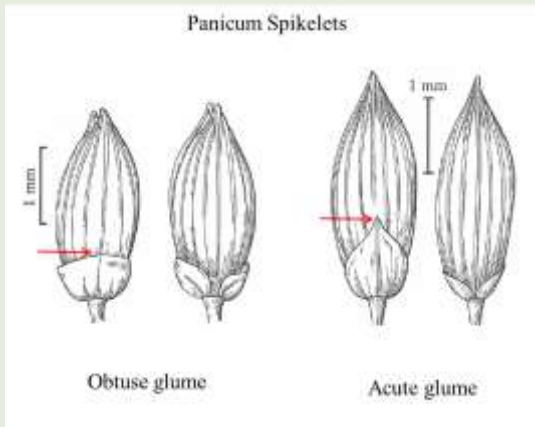
**Ligules:** hairs 0.5-1mm long




**Inflorescence:** An open panicle.

**Spikelet:** 2.2 – 2.8 mm long. Lower glumes subtruncate or obtuse.

**Habitat:** Lakeshore or canal margins, swales and disturbed (wetland) areas.

**Recognition:** Torpedograss can be distinguished from other species in the *Panicum* complex by having an open panicle and spikelets with a subtruncate or obtuse lower glume. The only other common *Panicum* with an obtuse first (lower) glume is *P. dichotomiflorum*, which is much larger and cespitose. *Leersia hexandra* can resemble *P. repens*, but *Leersia* is sharply scabrous throughout.



Scientific Name	<i>Panicum repens</i>	<i>Leersia hexandra</i>	<i>Leptochloa fusca</i> var. <i>fascicularis</i>
Specimen	 <p>A herbarium specimen of <i>Panicum repens</i> showing a dense, upright panicle with numerous thin, ascending branches. A small map of Florida is in the top left, and a blue ruler is placed horizontally below the specimen for scale. A label with text and a small map of Florida is in the bottom right.</p>	 <p>A herbarium specimen of <i>Leersia hexandra</i> showing a panicle with several long, thin, ascending branches. A small map of Florida is in the top left, and a blue ruler is placed vertically to the left of the specimen. A label with text is in the bottom right.</p>	 <p>A herbarium specimen of <i>Leptochloa fusca</i> var. <i>fascicularis</i> showing a panicle with several upright, branched stems. A small map of Florida is in the top left, and a blue ruler is placed vertically to the left of the specimen. A label with text is in the bottom right.</p>
Inflorescence	Open panicle, with ascending branches	Open panicle, with ascending branches	Open, racemose panicle
Spikelet	Dorsally compressed or round, awnless; glumes present	3.2-4.7mm, laterally compressed, awnless, lemmas ciliate, glumes lacking	5-12mm, dorsally compressed or round, lemmas with a short awn or notched, glumes present
Ligule	0.5-1mm, membranous ciliate	1-3mm, membranous	2-8mm, membranous
Blade	Flat or folded, ascending, glabrous to pubescent, strongly distichous	Ascending, glabrous or pubescent	Flat, glabrous or scabrous
Sheath	Glabrous or pubescent	Glabrous or coarsely scabrous, margins often ciliate	Glabrous or scabrous
Culms	Erect, rigid, sometimes branching	Decumbent, rooting at the nodes, terminal portions erect, often floating, branched or	Prostrate to erect; compressed, often branching



# NAPIERGRASS

## *Pennisetum purpureum*

**Description:** Perennial, sometimes rhizomatous, with erect culms 2+ meters tall and forming extensive monotypic stands. Introduced as an ornamental or forage plant.

**Sheaths:** Glabrous or pubescent

**Blades:** flat, with a white midvein.

**Ligule:**

**Inflorescence:** A cylindrical spike.



**Spikelet:** 5 - 9.7 mm. Bristles subtending and falling at maturity with the spikelets; antrorsely scabrous or long-ciliate.

**Habitat:** wide range of upland to mesic and wet habitats.

**Distribution:** Throughout Florida.

**Recognition:** Napiergrass is similar in appearance to giant bristlegrass (*Setaria magna*); but can be recognized by having spikelet articulation below the bristles (i.e. the bristles fall away with the spikelets). In giant bristlegrass the spikelet articulation is above the bristles, therefore the bristles do not fall away with the spikelet. Giant bristlegrass is mostly restricted to wet habitats.



Scientific Name	Pennisetum purpureum	Setaria magna
Specimen		
Inflorescence	Cylindrical spike with fascicles	Cylindrical spike
Spikelet	4.3-6.0mm, subtended by bristles falling with the spikelet	1.9-2.4mm, subtended by two bristles not falling with spikelet
Ligule	1.5-5.0mm, membranous and ciliate	1-2mm, ciliate
Blade	Flat, scabrous	Flat, scabrous
Sheath	Glabrous or pubescent	Glabrous, smooth or scabrous
Culms	Erect	Erect, with ring of hairs below the nodes
Other	Cespitose	Cespitose



# ***SMUTGRASS***

## ***Sporobolus indicus* var. *pyramidalis***

**Description:** Cespitose perennial to 1.20 m tall. Its common name, smutgrass is derived from the dark gray or black fungi that often covers the spikelets and upper leaves.

**Sheath:** glabrous

**Ligules:** 0.2-0.5mm

**Blades:** Flat and glabrous

**Inflorescence:** a contracted panicle

**Spikelets:** 2-2.6mm long; glumes present, subequal,

**Habitat:** a wide range of natural communities and disturbed areas.




**Distribution:** Central and southern peninsula.

**Recognition:** There are two varieties of *S. indicus* reported in Florida. Both varieties are not native; therefore, distinguishing one from the other is not overly critical. Spikelet size is the most important feature to consider when trying to separate *S. indicus* from other native *Sporobolus* species. *S. indicus* spikelets are small (0.6-1.3mm) that are often covered by a black fungus.





Spikelet Size (mm)	Species
4-7	<i>S. curtisii</i> , <i>S. floridanus</i>
2-4	<i>S. Indicus</i>
1.5-2	<i>S. indicus</i> , <i>S. pyramidatus</i> , <i>S. dominguensis</i>
<1	<i>S. tenuissimus</i>

Scientific Name	<i>Sporobolus indicus</i> var. <i>pyramidatus</i>	<i>Sporobolus dominguensis</i>	<i>Sporobolus pyramidatus</i>
Specimen			
Inflorescence	Contracted, spike-like	Contracted, spike-like, sometimes open erect	Spreading or open erect
Spikelet	Second glume 0.6-1.3mm	Second glume 1.4-2.0mm	Second glume 1.4-2.0mm
Ligule	Hairs, 0.2-0.5mm	Hairs, 0.2-1.2mm	Hairs, 0.3-1mm
Blade	n/a	n/a	n/a
Sheath	Glabrous	Glabrous	Often pubescent along the upper margin
Culms	30-100cm, Erect	20-100cm, Erect	7-35cm, Erect
Other	Cespitose	Cespitose	Cespitose

# GUINEAGRASS

*Urochloa maxima* = *Megathyrsus maximus*

**Description:** Large perennial grass to 2.5-meters tall. Sheaths glabrous or pubescent. Used as a forage grass.

**Ligules:** hairs, 1-3mm

**Blades:** Flat, erect or ascending, glabrous or pubescent, midvein white, sunken.

**Inflorescence:** an open panicle




**Spikelets:** 2.7-3.6 mm long, glabrous; glumes present. Upper lemmas transversely rugose.

**Habitat:** scrubby flatwoods, disturbed fields, floodplains and hammocks.

**Distribution:** Throughout Florida

**Recognition:** Guineagrass is typically bigger than most of the panic grasses. When in fruit Guineagrass can be distinguished from most other *Panicums* by having a rugose upper lemma. Most likely to be confused with fall panicgrass (*Panicum dichotomiflorum*) or switch grass (*Panicum virgatum*).



Scientific Name	<i>Urochloa maxima</i>	<i>Panicum dichotomiflorum</i>	<i>Panicum virgatum</i>
Specimen			
Inflorescence	Spreading or open erect	Spreading or open erect	Spreading or open erect
Spikelet	Upper lemma rugose, lower glume obtuse 0.8-1.2mm	Upper lemma smooth, lower glume obtuse 0.4-0.8mm	Upper lemma smooth, lower glume acute 1.8-3.9mm
Ligule	Ciliate, 1-3mm	Membranous ciliate, 0.5-2mm	Membranous ciliate, 2-6mm
Blade	Flat, erect, with white midrib	Flat, glabrous or scabrous, white, stout midrib	Flat, erect glabrous or pubescent
Sheath	Glabrous or pubescent	Sparsely pubescent or glabrous	Glabrous or pilose
Culms	Erect, usually large	Erect	Erect
Other	Cespitose, with short thick rhizomes	Cespitose	Rhizomatous



# PARAGRASS

*Urochloa mutica* = *Brachiaria mutica*

**Description:** Perennial stoloniferous grass. Decumbent or mat forming rooting at the lower nodes usually to 1-meter tall.

Sheaths: lower sheaths with dense (papillose based) hairs

**Ligules:** hairs, 1-1.5mm

**Blades:** Flat, usually glabrous, sometimes with sparse hairs.

**Inflorescence:** Pyramidal panicle, with spike-like branches.




**Spikelets:** 2.6-3.5mm long, purplish or green. Glumes present.

**Habitat:** disturbed wet areas, including roadside swales and canal margins.

**Distribution:**

**Recognition:** Paragrass is a matt forming species found growing on roadside ditches and swales. Most likely to be confused with native matt-forming wetland species including *Panicum hemitomon* and *Paspalum repens*. *U. mutica* can be recognized by having a racemose inflorescence and pubescent (hairy) nodes.



Scientific Name	<i>Urochloa mutica</i>	<i>Paspalum repens</i>	<i>Panicum hemitomon</i>
Specimen			
Inflorescence	Open, racemose panicle	Panicle with racemes, rachis broadly winged	Spike-like, congested
Spikelet	2.6-3.5mm, glabrous and paired	1.3-1.9mm	2.1-2.7mm
Ligule	1-1.5mm, membranous ciliate	1-4mm	<1mm, ciliate
Blade	Flat	4-20mm wide, flat	Flat, tapering
Sheath	Pubescent hairs papillose-based	Glabrous or pubescent	Usually glabrous
Culms	Erect or decumbent rooting at the nodes, lower nodes pubescent	Decumbent, floating, spongy, rooting at the nodes	Erect, sometimes bending and rooting at the nodes, lower nodes glabrous
Other	Stoloniferous	Rhizomes sometimes present	Rhizomatous

# Other Common Non-listed Exotic Grasses

## THALIA LOVEGRASS

*Eragrostris atrovirens*

## JOHNSONGRASS

*Sorghum halepense*

## VASEYGRASS

*Paspalum urvillei*

## GIANT REED

*Arundo donax*



# THALIA LOVEGRASS

*Eragrostris atrovirens*

**Description:** Cespitose, glaucous, perennial grass to 1.3m tall. stoloniferous grass.

**Sheaths:** Glabrous.

**Ligules:** Hairs, 1-1.5mm

**Blades:** Flat to involute, glabrous.

**Inflorescence:** An open panicle.

**Spikelets:** Many flowered (10-22 florets). Laterally compressed. Glumes present.

**Habitat:** wet prairies, roadside swales, trails and railroad beds.

**Distribution:** Throughout Florida

**Recognition:** Thalia lovegrass can be distinguished from other lovegrasses by having glaucous (a waxy, whitish to bluish-green coating) leaves and sheaths. Several native and non-native species that may be confused with *E. atrovirens* include *Leptochloa fusca* var. *fascicularis*, and *Andropogon glomeratus* var. *glaucopsis* and *Andropogon virginicus* var. *glaucus*. Both *Andropogon* and *Leptochloa* spikelets have either awns or a small notch.



# JOHNSONGRASS

*Sorghum halepense*

**Description:** Rhizomatous, perennial grass to 2.0m tall.

**Sheaths:** glabrous.

**Ligules:** hairs, 1-1.5mm

**Blades:** Flat to involute, glabrous.

**Inflorescence:** An open panicle.

**Spikelets:** many flowered (10-22 florets). Laterally compressed. Glumes present.

**Habitat:** wet prairies, roadside swales, trails and railroad beds.

Distribution:

**Recognition:** Robust large plant with droopy inflorescence, and awned spikelets.





# ***GIANT REED***

*Arundo donax* L.

**Description:** Rhizomatous perennial grass 2-10m tall.

**Sheaths:** Open, glabrous.

**Ligules:** membranous, shortly ciliate

**Blades:** Flat or folded.

**Inflorescence:** A terminal, feathery panicle.

**Spikelets:** Many flowered, laterally compressed. Glumes present.

**Habitat:** Ditches, swales, trails and railroad beds.

**Distribution:** Throughout the state.

**Recognition:** *Arundo* is a very large grass, with auriculate or clasping leaves. The inflorescence, a terminal feathery panicle, resembles *Phragmites australis*. However, *Phragmites* does not have auriculate leaves.





# VASEYGRASS

*Paspalum urvillei*

**Description:** Cespitose, perennial grass to 2.2m tall.

**Sheaths:** glabrous or pubescent

**Ligules:** membranous, 1-4mm

**Blades:** Flat, mostly glabrous with a few long hairs near the base.

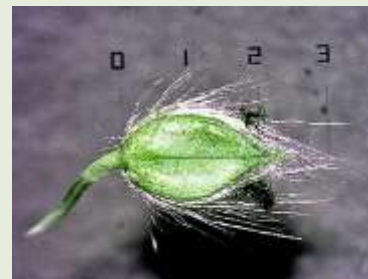
**Inflorescence:** An racemose panicle.

**Spikelets:** two-flowered, paired spikelets.

**Habitat:** disturbed wet habitats.

**Distribution:** Throughout Florida

**Recognition:** Racemose inflorescences with pubescent spikelets along one side of the rachis. Distinguished from other *Paspalum* species by having spikelet fringed by long trichomes (hairs).



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