

Invasive Grasses of Florida: biology and management



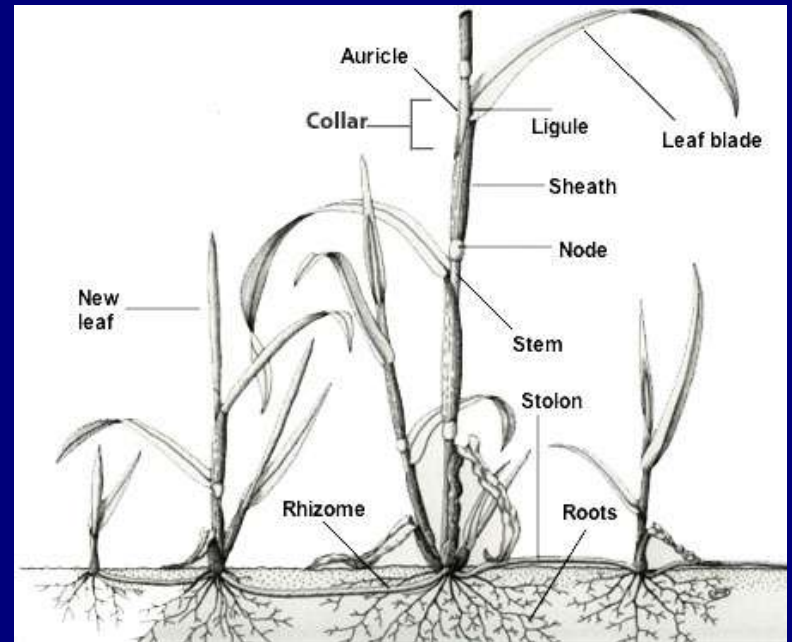
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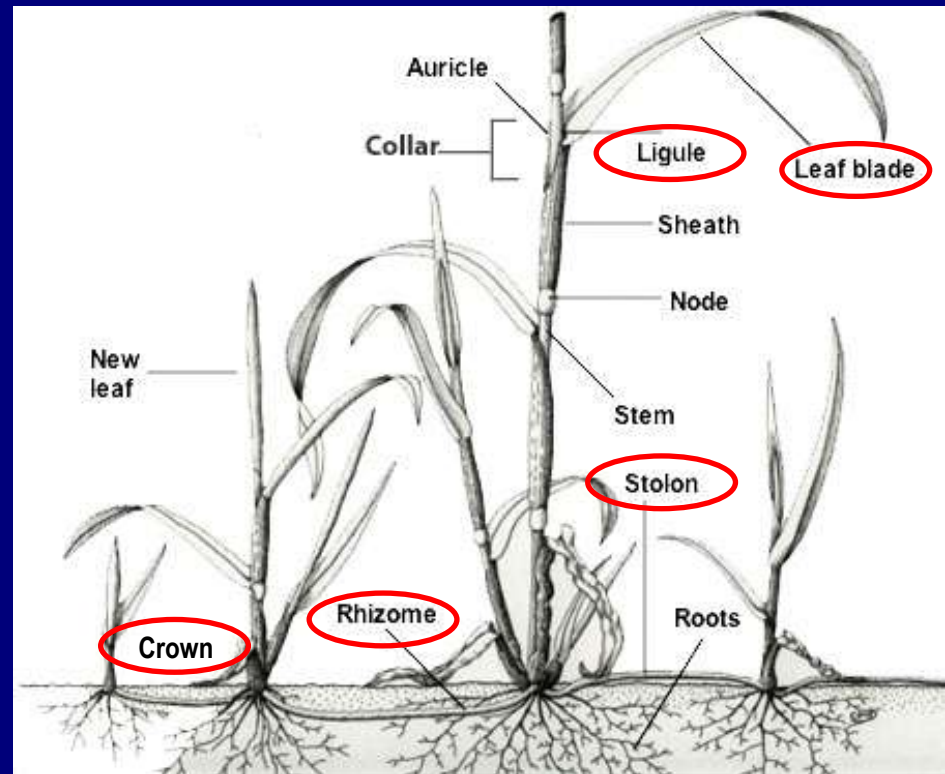
Types of grasses

- Life cycle
 - Annual vs. perennial
- Growth habit
 - Bunching vs. spreading
- “Runner” type
 - Stolons vs. rhizomes
- Seed production
 - Viable vs. non-viable vs. no seed production
- Habitat
 - Upland/dryland vs. aquatic/semi-aquatic



Management

- Identification!
- Control method
 - Level of infestation
 - Location
 - Other factors
- Post monitoring
 - Treatment efficacy
 - Regrowth
 - Reinfestation



Tools in the toolbox

- Prevention
- Cultural
- Mechanical
- Biological
- Chemical



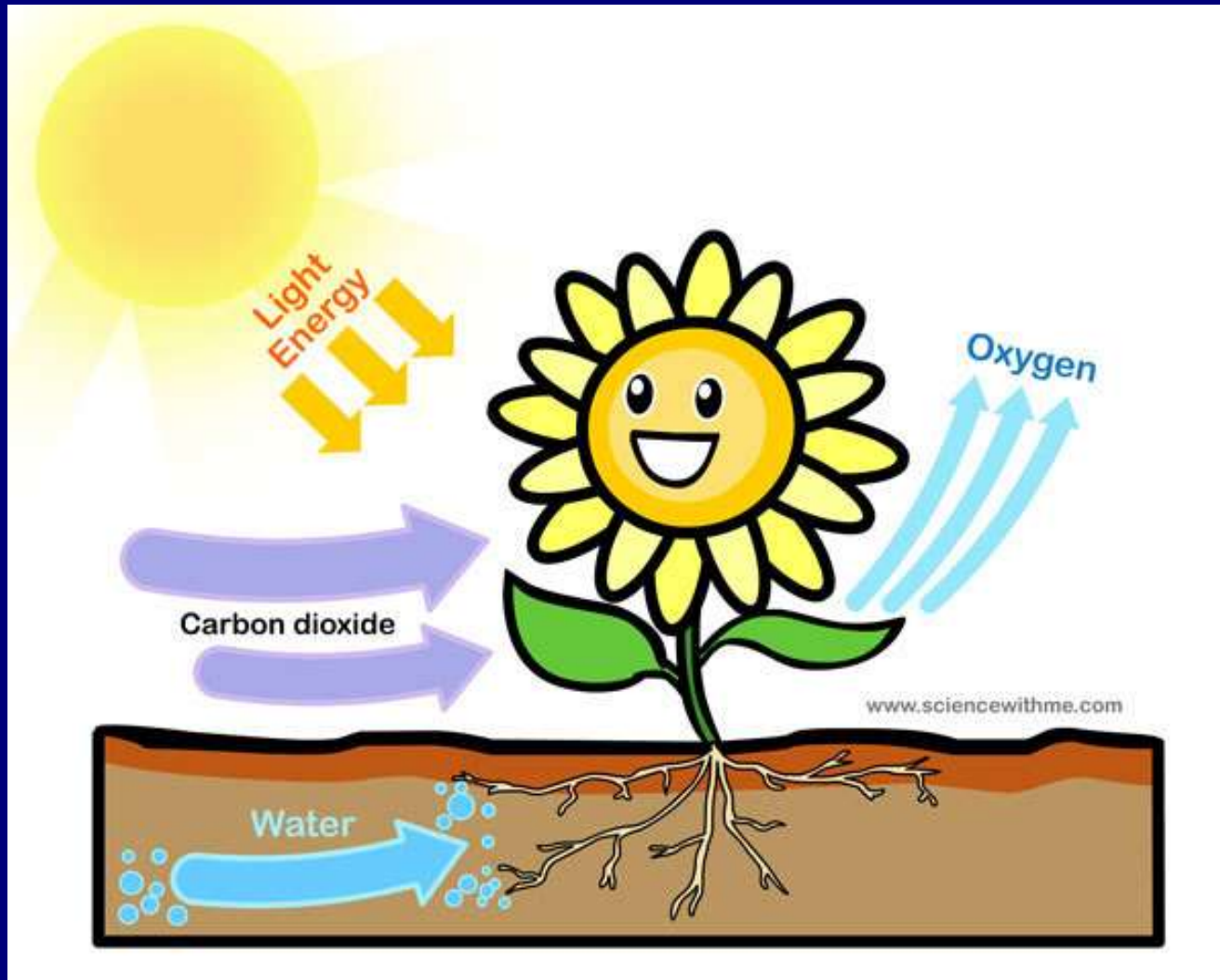
Prevention

- Just like it sounds...



Cultural

- Growth requirements



Cultural



Mechanical

- Disrupt, damage or remove



Mechanical



old World climbing fern
Lygodium microphyllum
Photo by Jeff Hutchinson
© 1999 University of Florida

Biological

- Natural enemies



Chemical

- Act on plant processes
 - Photosynthesis
 - AA/protein production
 - Respiration
 - Hormones/growth processes
- Which herbicide?
- Rate
- Timing
- Application method



Management tools

- Need identification first!
- IPM when possible

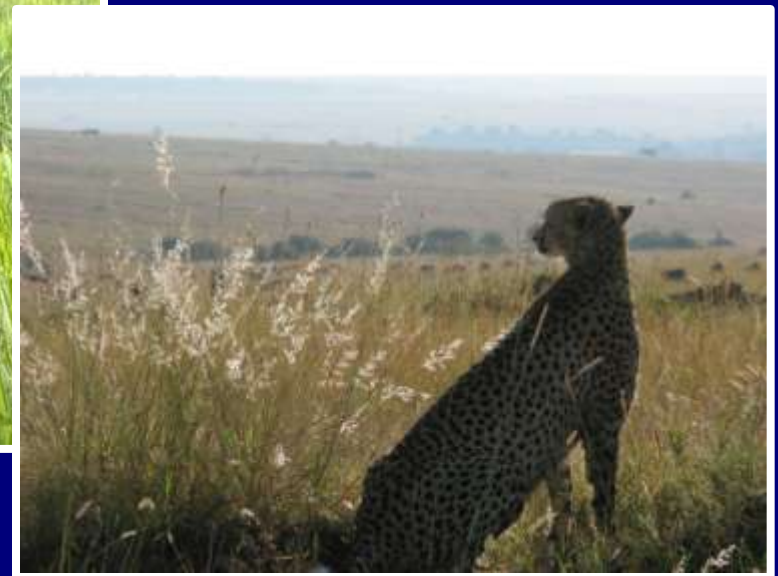


Selected Florida grasses

- Upland/dry
 - Cogongrass
 - Natalgrass
- Aquatic/semi-aquatic
 - Torpedograss
 - West Indian marsh grass
 - Paragrass
 - Limpograss
 - Tropical American watergrass

Upland/dryland grasses

- Cogongrass
- Natalgrass

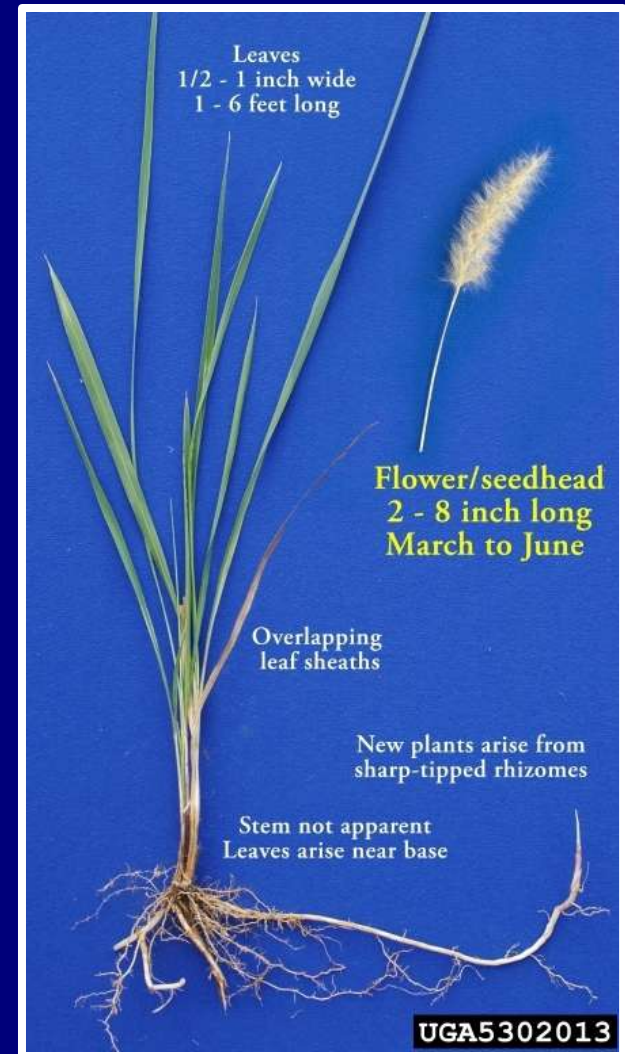


Cogongrass



Cogongrass

- *Imperata cylindrica* – top 10 WWWW
- Southeast Asia; 1940s forage
- Perennial; < 6' tall
- Extensive rhizome system
- Highly adapted
 - Poor soils
 - Drought
 - Pyrogenic ecosystems
 - Low light environments



Cogongrass identification



Prevention

- Rhizomes: equipment and fill dirt
- Seed (200 heads/m², 3,000 seeds per plant)



Cultural control

- Seeds require light
 - Maintain good cover



Mechanical control

- Deep plow/disk several times during dry season
- Cut to a depth of $> 6''$
- Ensures most rhizomes have been cut



Chemical control

- Imazapyr (Arsenal, etc.)
 - High rates – 1.5 to 4 pints/A (0.5 to 1% solution)
 - Non-crop areas (ROW, fence rows)
 - Treated areas will be bare for 6-12 months
 - Off-target damage
- Glyphosate (Roundup, etc.)
 - High rates – 3 to 4 qts/A (2 to 4% solution)
 - Multiple applications needed
 - No residual soil activity



Integrated control

- Burn, mow or till before herbicide application
 - Ideal: summer (1 to 4 month regrowth; 12")
 - Herbicides applied to actively growing leaves
 - Maximizes herbicide uptake
- Herbicides late summer to early fall 1 month prior to average first killing frost



Natalgrass



Natalgrass

- *Melinis repens* (syn. *Rhynchelytrum repens*)
- Africa; 1870s forage
- Annual; 2 to 4 feet tall
- Bunch-type
 - Seeds
 - No stolons
 - No rhizomes
- Dry; disturbed



Natalgrass identification



Leaves linear, 8 to 12"



Prevention

- Do ***NOT*** let them set seed
- Seeds extremely viable
- Wind-dispersed



Mechanical control

- Dig 'em up
 - Reseeds/resprouts quickly after fire
 - Mowing not effective



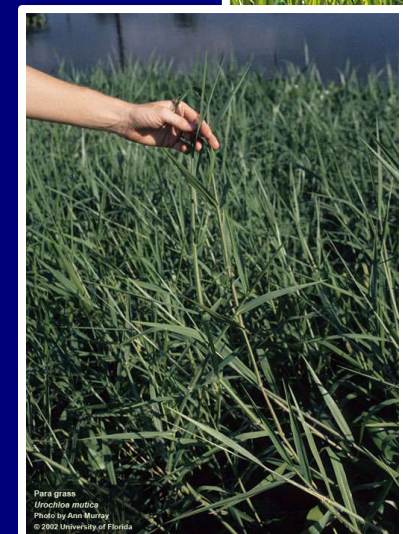
Chemical control

- Glyphosate at 1.5 to 3 qts/A
 - Very effective
- Imazapyr at 1 to 2 pints/A
 - Good control
 - Soil persistence
- Imazapic: suppression
 - Better selectivity



Aquatic/semi-aquatic grasses

- Torpedograss
- West Indian marsh grass
- Paragrass
- Limpograss
- Tropical American watergrass



Torpedograss



Torpedograss
Panicum repens
Photo by Vic Ramey
© 2003 University of Florida

Torpedograss

- *Panicum repens*
- Africa/Asia; 1800s forage; 1920s, 1950s
- Perennial; < 3' tall
- Stolons, rhizomes
- Roots on shore
 - Dense monocultures
 - Extends out
 - Grows through water column



Torpedograss
Panicum repens
Photo by Ann Murray
© 2003 University of Florida

Torpedograss identification



Torpedograss
Panicum repens
Photo by Ann Murray
© 2003 University of Florida

Prevention

- Don't plant as forage...
- Clean equipment



Mechanical control

- Remove existing plants
 - Small infestations can be removed with repeated, aggressive tillage
- Burn to remove aboveground biomass
 - May enhance chemical control measures



Chemical control

- Surfactant: 0.25%
- Broadcast applications for large areas
 - Glyphosate at 3 to 4 qt/A
 - Imazapyr at 1.5 to 4 pts/A*
- Spot treatment for smaller areas
 - Glyphosate – 2 to 3% solution
 - Imazapyr – 0.5 to 1% solution*



Integrated control

- Burn, mow or till before herbicide application



West Indian marsh grass



West Indian marsh grass

- *Hymenachne amplexicaulis*
- West Indies, C/S America; 1950s/1960s
 - Birds?
 - Forage?
- Perennial; 3 to 8' tall
- Stolons, seeds
- Prefers water fluctuations & high nutrients

West Indian marsh grass identification



West Indian marsh grass
Hymenachne amplexicaulis
Photo by Ann Murray
© 2000 University of Florida



Prevention

- Do ***NOT*** let it set seed
 - One inflorescence → 4,000 seeds, 98% viability
- Clean equipment
 - Single-node stolons



Cultural control

- Drawdown?
- Flooding?



Mechanical control

- Dig 'em up
- Fire
 - May trigger germination of buried seeds



Chemical control

- Glyphosate: 7 pts/A
- Imazapyr: 4 to 6 pts/A



Integrated control

- Cut and flood
- Drawdown and burn



Red Dragon Vegetable Bed Flamer

Paragrass



Paragrass

- *Urochloa mutica* (syn. *Bracharia mutica*)
- Africa; 1870s forage
- Perennial; 3' erect, 15' long creeping
- Stolons (seeds = rare)
- Prefers water fluctuations



Paragrass identification

Main Photo - Arthur Cameron
© DBIRD



Inset - ILRI ©



Para grass
Urochloa mutica
Photo by Vic Ramey
© 2002 University of Florida

orida

Prevention

- Clean equipment



Mechanical control

- Dig 'em up
- Disk or burn (VERY short-term)



Chemical control

- Glyphosate: 6 pts/A
 - Re-treat escapes
- Imazapyr: 2 to 4 pts/A
 - Long-established stands → higher rate
 - Quicker recovery of natives in standing water



Integrated control

- Burn, mow or till before herbicide application



Limpograss



Limpograss

- *Hemarthria altissima*
- S Africa; 1964 forage
- Perennial; 3 to 6' tall
- Stolons (seeds rare)
- Allelopathic
 - Seed germination



The screenshot shows a news article from "DROVERS" dated October 23, 2014. The article is titled "Two new limpograss cultivars released to select Florida cattlemen" and is written by Brad Buck, University of Florida. It features a photograph of two cows grazing in a field of green grass. The text describes the release of two new limpograss cultivars by the University of Florida in partnership with Florida Foundation Seed Producers Inc., aimed at increasing forage variety for cattle. It also notes that Florida beef cattle producers use limpograss for its high digestibility and tolerance to poorly drained soils. The new cultivars, 4F and 10, are noted for their superior traits, including persistence under grazing.

Two new limpograss cultivars released to select Florida cattlemen

By **Brad Buck, University of Florida** | October 23, 2014 | 11:06 am EDT

COMMENTS

The University of Florida, in partnership with Florida Foundation Seed Producers Inc., has released two new limpograss cultivars so ranchers can increase the forage variety they feed their cattle.

Florida beef cattle producers use limpograss, a warm-season, perennial grass for its high digestibility, cool-season growth and tolerance to poorly drained soils.

The new lines, limpograsses 4F and 10, have superior traits, including persistence under grazing, good

Limpograss identification



Prevention

- Clean equipment



Chemical control

- Glyphosate: 6 pts/A (even to very old growth)
- Imazapyr: 2 pints/A

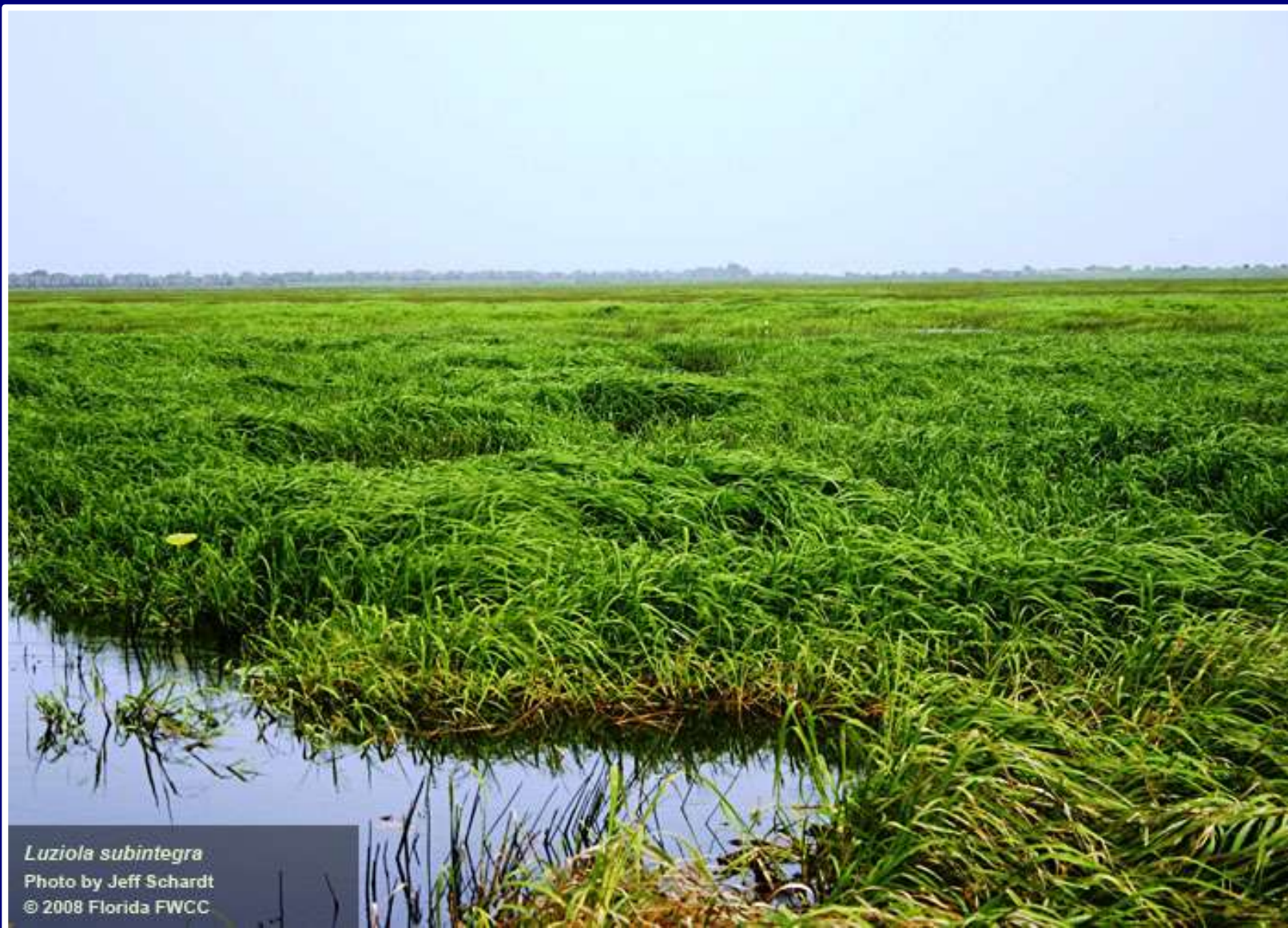


Integrated control

- Mowing before herbicide application may **REDUCE** efficacy...



Tropical American watergrass



Luziola subintegra
Photo by Jeff Schardt
© 2008 Florida FWCC

Tropical American watergrass

- *Luziola subintegra*
- Central and South America; 2007
- Perennial, mat-forming
 - Immature: creeping, floating leaves
 - Mature: 2 to 3' tall
- Stolons
- Not invasive under dry conditions



Tropical American watergrass ID



Luziola subintegra
Photo by Mike Bodle 2009
© South Florida Water Management District



Luziola subintegra
Photo by Mike Bodle 2009
© South Florida Water Management District

Prevention

- Rhizomes: equipment and fill dirt
- Seed spread



Cultural control

- Drawdown...



Chemical control

- Imazapyr 2 qt/A + glyphosate 7.5 pts/A
- Fluridone?



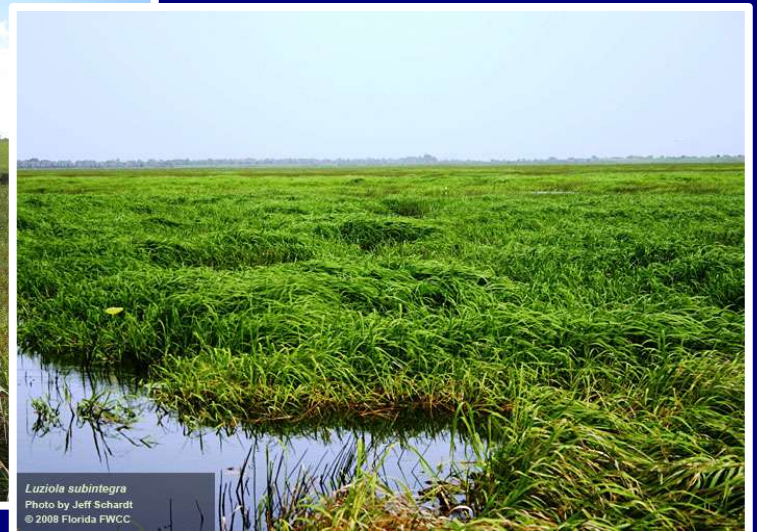
Summary



Tortpedgrass
Panicum repens
Photo by Vic Ramey
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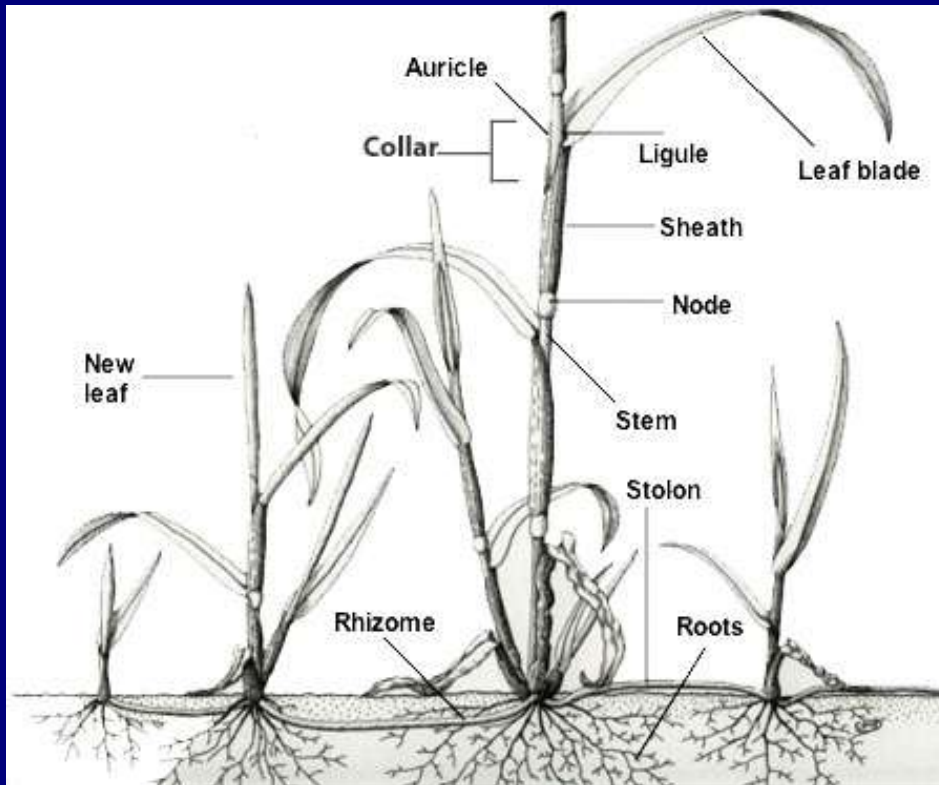
Pine grass
Urochloa mutica
Photo by Ann Murtry
© 2002 University of Florida



Luziola subintegra
Photo by Jeff Schardt
© 2008 Florida FWCC

Summary

- Identification critical
- Prevention is key
- Manage based on situation



Thanks!



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