Types of Grasses

- Perennial or Annual
- Bunch or Spreading
- Stolons or Rhizomes
- Viable Seeds or Not-so Viable?
Structure of a Grass Plant

- blade
- crown
- tiller
- stolon
- rhizome
- root system
GRASSES

- Upland annual grasses
  - seed producing
- Upland perennial grasses
  - both seed and non-seed producing
- Aquatic perennial grasses
  - both seed and non-seed producing
Masai Mara National Reserve, Kenya

Natalgrass
**Cogongrass**

- Native to southeast Asia
- Highly adapted to poor soils, drought, pyrogenic ecosystems
- Extensive rhizomes
- Successful/persistent in low light
NEW ‘OLD’ PROBLEMS

- Bamboo – running and clumping types
- Elephantgrass
- Arundo
- Burma-reed
- Phragmities
- others?
TORPEDOGRASS

- Native to Africa and or Asia
- Introduced into Florida in late 1800’s as a wetland forage grass
- Perennial, spreads through stolons and rhizomes
- Named for sharply pointed or ‘torpedo-like’ growing tips
**Mature Plant**

- Perennial grass, roots on shore and will extend several feet out into shallow water
- Will grow up thru the water column
- Forms dense monoculture along shoreline of lakes and ponds
Paragrass

- Semi-aquatic grass
- Stolons only
- 3 ft tall erect; up to 15 ft long
- Prefers water fluctuations
- Terminal spike flower - 8 in. long with branches
  - Often purple-tinged

- Seed produced but low germination

- Leaf sheath - dense stiff hairs
- Leaf flat 0.5 wide and 10-12 in. long
- Hairy and swollen nodes
LIMPOGRASS

- Semi-aquatic grass
- Stolons only
- 3 to 6 feet tall
- Introduced as a forage and still widely utilized
- Leaf sheath smooth, sometimes with fringe of hairs
- Often a red tinge
- Leaves 2 to 6 in. long; 0.25 wide

Single spike - 2 to 8 in. long
Seed - Few produced, but highly viable
NEW PROBLEMS?

- Luziola - Tropical American water grass
- Sweet tanglehead
- energy grasses?
MANAGEMENT STRATEGIES

Key Steps:

1) identification
2) control procedure/method*
   - level of infestation
   - location/ecosystem
3) monitor regrowth or reinfestation
METHODS OF MANAGEMENT

- Prevention
- Cultural
- Biological
- Mechanical
- Chemical – Herbicide Selection
  - Rate, Timing, Application Type
  - Glyphosate, Imazapyr, etc.
Preventative and Cultural

- How does it spread? **Rhizomes or seed**
- Rhizomes moved through equipment, water (flood events), fill dirt, dredging
- Seed spread is more difficult, moved through same ways, but also animals, wind
- KEY is minimizing disturbance and maintaining a good cover of desirable species
Biological Control

- Selectivity is the big issue
MECHANICAL

Plow or Disk

- deep enough to cut through (6-12 inch)
- multiple times, passes
- during dry seasons if possible
- if mechanical only, need 2 to 3 intervals of disking to ensure rhizome kill
- if integrating herbicides, allow for good regrowth ~ 12 to 18 inches
- if the grass spreads by seed, it may make the problem worst
FLOODING

- use water to aid in control
- time herbicide or mechanical control prior to water
- essentially drown the plants as they try to recover
- key is getting water above the foliage
BURNING

- very effective in removing dead thatch, leaves
- stimulates regrowth, depletes carbohydrate reserves
- generally results in better control with herbicides – must wait for good regrowth (12-18 inches)
- can be used with flooding also
HERBICIDES

NON-SELECTIVE – will control all species

Imazapyr (Arsenal, etc.)
- Use high rates – 1.5 to 4 pints/A (0.5 to 1% solution)
- Non-crop areas such as rights-of-way and fence rows
- Treated areas will be bare for 6 months to a year
- Be wary of off-target damage

Glyphosate (Roundup, etc.)
- Use high rates 3-4 qt/A (2-4% solution)
- Multiple applications are needed
- No residual soil activity
Glyphosate

- Rapidly absorbed by foliar/green tissues
- Translocated in phloem to areas of active growth
- Binds to the enzyme EPSP synthase
- Blocks the shikimate acid pathway
- Prevents aromatic amino acid synthesis
- Plant cannot make proteins, enzymes
- Growth stops, meristems die, plants die
Imazapyr and Imazapic

- Rapidly absorbed by foliar/green tissues and roots
- Translocated in phloem to areas of active growth
- Binds to the enzyme acetolactate synthase
- Blocks the ALS/AHAS pathway
- Prevents branched chain amino acid synthesis
- Plant cannot make proteins, enzymes
- Growth stops, meristems die, plants die
HERBICIDES

SELECTIVE TOWARDS GRASSES ONLY

- Grass control in natural/aquatic areas
- Recent registration - TIGR Herbicide - SePro
- Used in cropping systems since 1980’s
- Good on annuals, moderate on perennials
- However, may provide suppression to allow desirable species to dominate
- Also evaluating Fluazifop
Sethoydim and Fluazifop

- Foliar active only, grasses only due to different form of target enzyme
- Rapidly absorbed by foliar/green tissues
- Translocated in phloem to areas of active growth
- Binds to the enzyme Acetyl-CoA carboxylase
- Blocks the fatty acid/lipid synthesis pathway
- Prevents fatty acid synthesis
- Plant cannot make lipids, cell membranes
- Growth stops, meristems die, plants die
Symptomology on Grasses
NEW OPPORTUNITIES

- Pre-emergence herbicide options
  - indaziflam (Esplanade), pendimethalin
- Target those grasses that are prolific seeders
- Provide control of germinating grass seedlings, but other seedlings as well
- Generally will not injure established plants
- Timing is critical – need to understand germination phenology