WEED management in the landscape

Limited Commercial Landscape Maintenance (LCLM)
Pesticide Applicator Certification Workshop

Laurie Anne Albrecht
Environmental Horticulture Agent
UF/IFAS Extension – Palm Beach County

UF | IFAS Extension
UNIVERSITY of FLORIDA

PALM BEACH COUNTY FLORIDA

What is a weed?

… any plant growing where it is not desired….

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Weeds

- Customers want weed-free landscapes!

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Three Key Questions

- What is it?
- Where is it?
- Why is it there?

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What is it?

- Positive ID is essential
- Determines best management methods
- Helps you identify cultural problems
- Promotes professional image

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One of first questions

- Is it a broadleaf, grass, or sedge?

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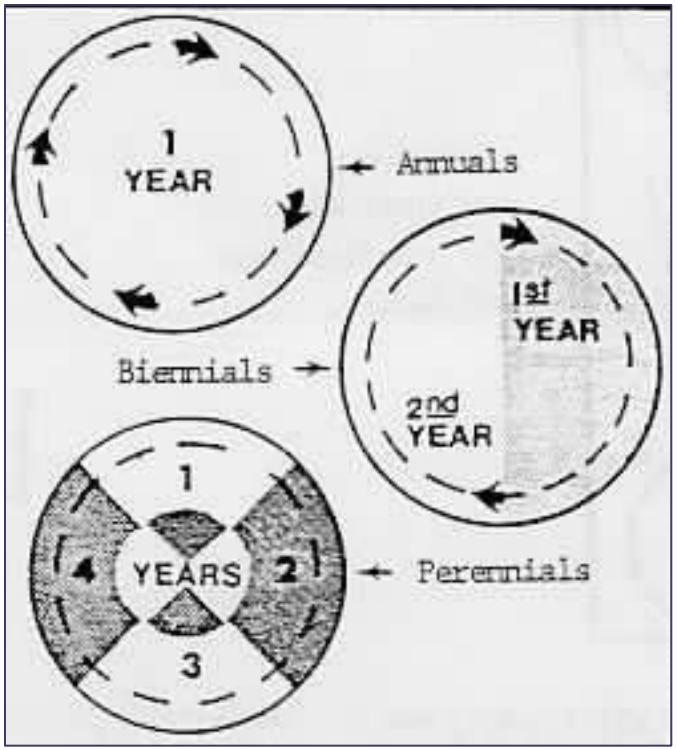
Major weed groups

- **Broadleaf**
  - Showy flowers
  - Net-like veins
- **Grasses**
  - Leaves longer than they are wide
  - Parallel veins
- **Sedges**
  - Grass-like but not true grasses
  - Triangular stems w/leaves extending from three sides

How Long Does It Live?

- **Annual**
  - ***Completes life cycle and dies within one year***
- **Biennial**
  - ***Completes life cycle and dies within two years***
- **Perennial**
  - ***A plant that normally lives for more than two years***



Life Cycles

- Can be very murky in south Florida

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Crabgrass is an annual in most of Florida (north, central)

Ways Plants Reproduce

- **Seeds**
- **Vegetative**
  - Aboveground stems (stolons)
  - Below ground stems (rhizomes)
  - Bulbs & bulb-like structures (i.e. tubers)

Annual, Biennial & Some Perennial Weeds

- Reproduce only by seed
- Fibrous or taprooted root system
- Generally easier to manage than perennials

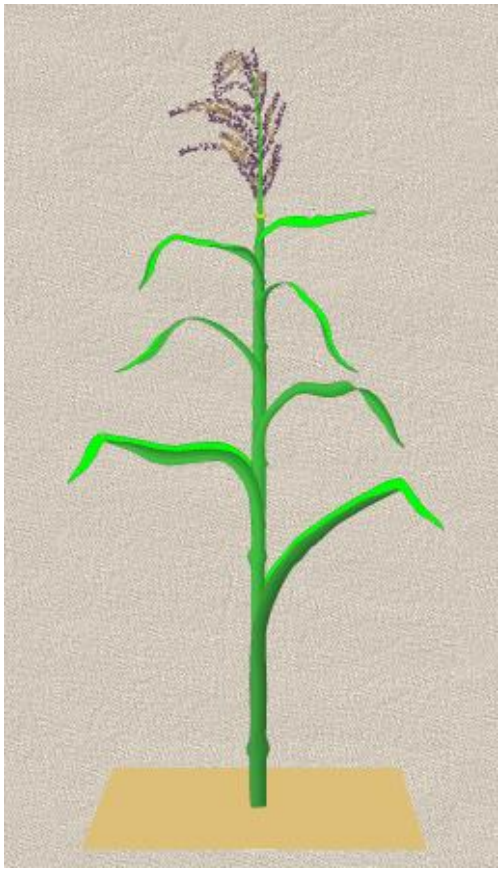
“Tougher to Manage” Perennial Weeds

- Reproduce by seed & above- or below-ground stems or bulb-like tubers

Nutsedge tubers: Joseph DiTomaso, bugwood.org

Weed ID Often Based on Flowers

Leaf arrangement



Alternate

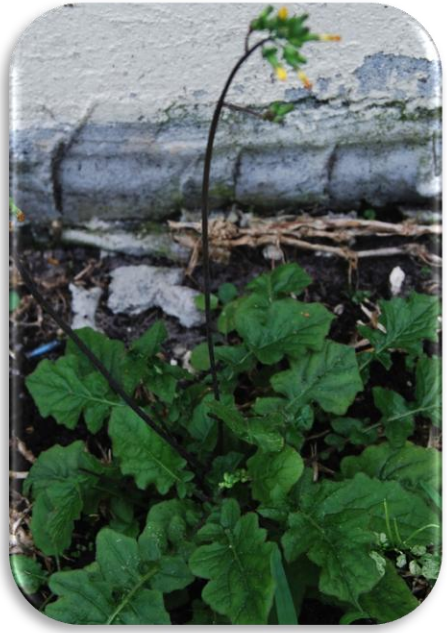
Rosette/Basal Whorl

Whorled

Opposite

Leaf type, color, shape, texture, smell

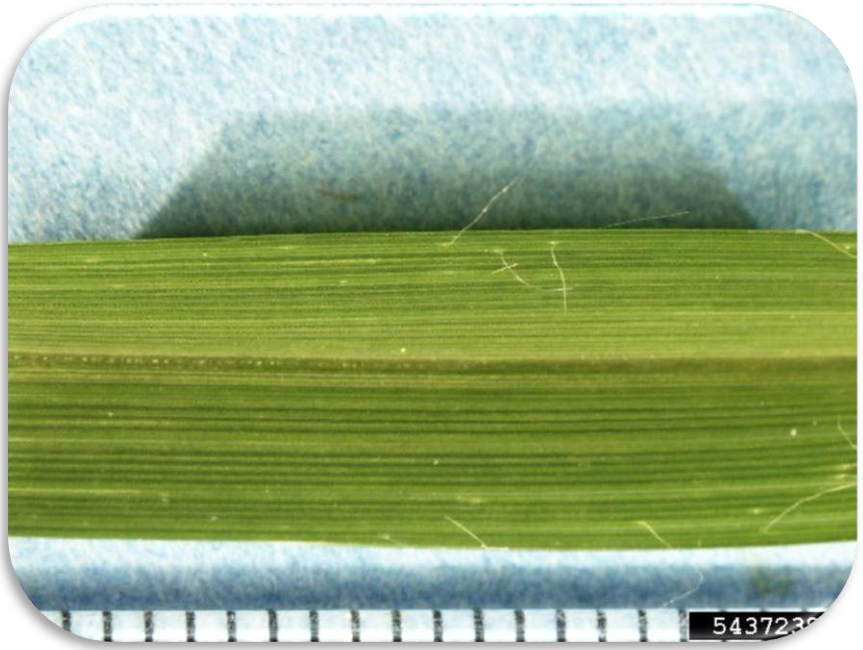
Major Weed Classifications



Photos: UF/L Albrecht

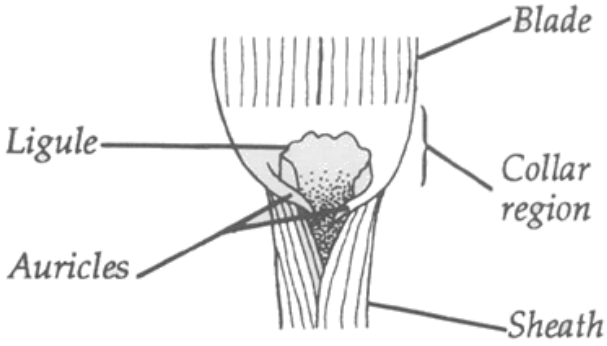
Grass ID

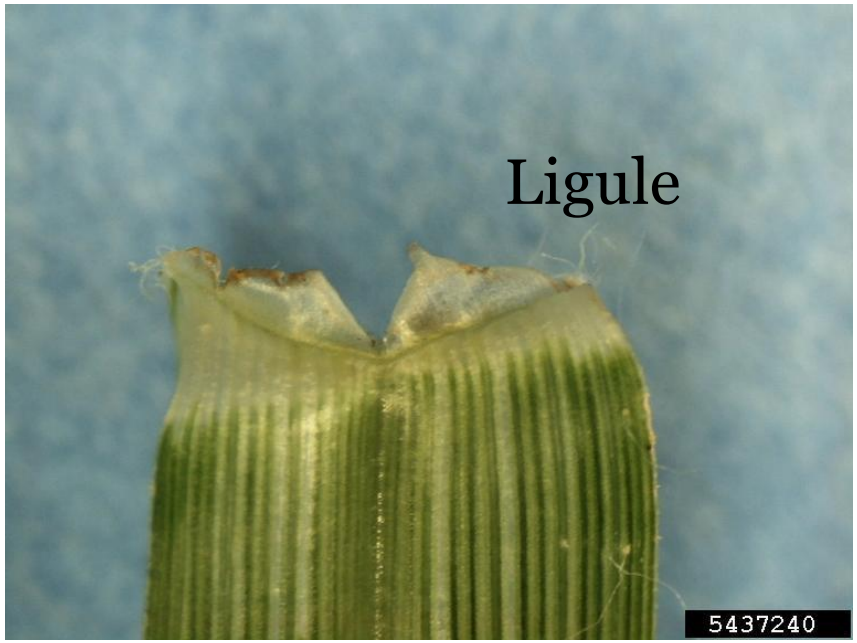
- Leaves longer than wide
- Parallel veins
- Hollow, rounded or flattened stems



Bruce Ackley, The Ohio State University, bugwood.org

Grass ID





Photos: Bruce Ackley, The Ohio State University, bugwood.org

Crabgrass (*Digitaria* spp.)

- Considered an annual
- Finger-like seedhead

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James H. Miller & Ted Bodner, Southern Weed Science Society, bugwood.org

Goosegrass (*Eleusine indica*)

- Usually low growing
- Often w/white center
- Germinates later than crabgrass
- Can indicate compaction

Photos: UF/L Albrecht

Bermudagrass (*Cynodon dactylon*)

- **Perennial**
- Mat forming
- Small leaves
- Spreads by seed & above- and under-ground stems

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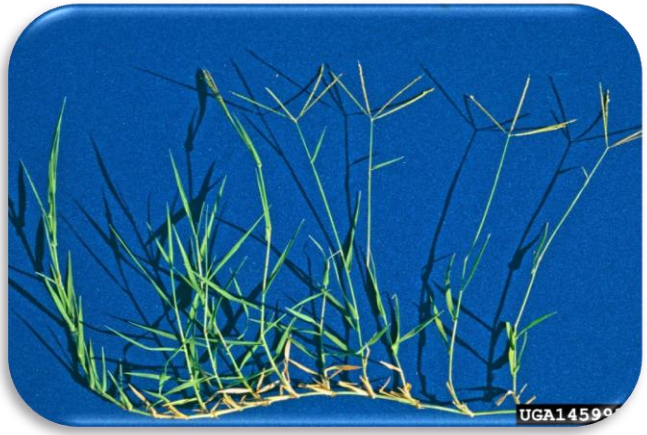
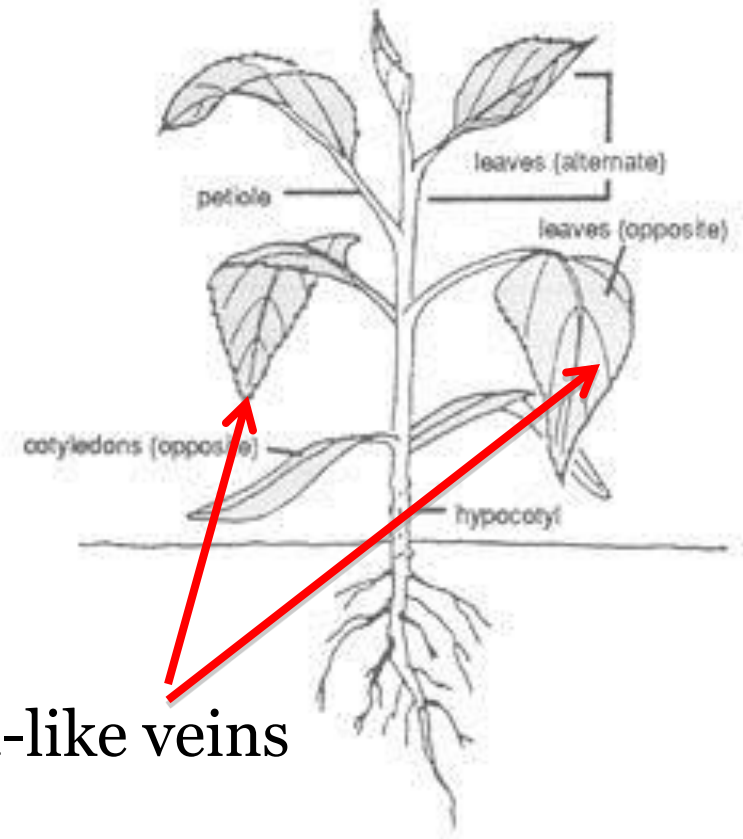


Broadleaf weed ID

- Variable in appearance
- Leaves typically have netlike veins
- Flowers often showy



Largeflower Pusley/Mexican Clover
(*Richardia grandiflora*)

- "Florida snow"
- Indicator of dry conditions
- Can be confused with Florida pusley

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Large Flower Pusley

- Darker leaves, larger flowers

Florida Pusley

- Smaller leaves, smaller flowers

Dollarweed (*Hydracotyle* spp.)

- **Perennial**
- Aka pennywort

Photos: UF/L Albrecht

Indicator for over-watering

Purslane (*Portulaca oleracea*)

- Succulent stems & leaves
- Waxy, leaves

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Dayflower (*Commelina* spp.)

Likes moisture

Woodsorrel (*Oxalis spp.*)

Above: James H. Miller & Ted Bodner, Southern Weed Science Society, bugwood.org

The Regents of the University of George

Spurges (*Euphorbia/Chamaesyce* spp.)

- May be indicator for nematode damage

- Opposite leaves
- Contain milky sap

Photos: UF/L Albrecht

Grassleaf Spurge (*Euphorbia graminea*)

Photos: UF/L Albrecht

Asiatic False Hawksbeard (*Youngia japonica*)

- Basal rosette, hairy leaves w/wavy edge
- Yellow flowers

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Ragweed (*Ambrosia artemisiifolia*)

- Dissected leaves
- Major cause of hayfever

Photos: UF/L Albrecht

Florida Pellitory (*Parietaria floridana*)

- See-through stems
- Likes shade
- Doesn't tolerate hot weather

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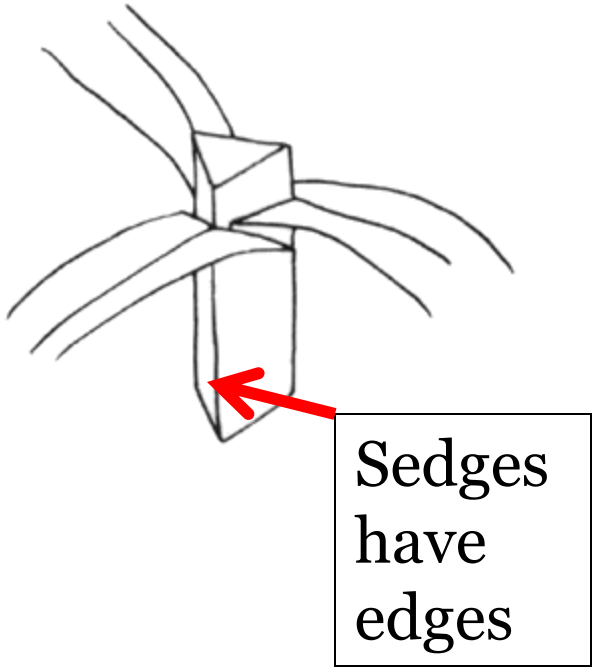
Artillery Weed (*Pilea microphylla*)

- Tiny, lime green leaves
- Ejects seeds

Photos: UF/L Albrecht

Sedge ID

- Grass-like leaves
- Stems triangular in cross section
- Leaves in threes
- Propagation primarily by tubers
- Thrive in wet areas



Purple Nutsedge *(Cyperus rotundus)*

Virginia Tech

- **Perennial**
- Long tapering leaves in 3s
- Reddish-purple seedhead
- Tubers in chains on rhizomes

Yellow Nutsedge (*Cyperus esculentus*)

Lynn Sosnoskie, bugwood.org

- **Perennial**
- Long tapering leaves in 3s
- Yellowish-brown spikelet flowers
- One tuber per rhizome

Yellow and Purple Nutsedges

Yellow nutsedge

- A - sharp or needle like tip
- Tubers produced at end of rhizomes
- Sweet taste

Purple nutsedge

- B - boat shaped tip
- Tubers produced along the length of rhizomes
- Bitter taste

Which nutsedge is this?

Photo bottom left: Joseph DiTomaso, bugwood.org

Green Kyllinga (*Kyllinga brevifolia*)

Rebekah D. Wallace, , Bugwood.org

- **Perennial**
- Dark green , narrow 3-ranked leaves
- Light green seed head turns brown
- Purple rhizomes

Methods of Controlling Weeds

- Physical/Mechanical
- Cultural
- Biological
- Chemical

Photos: UF/L Albrecht

Weed management in landscape ornamentals

- Requires an integrated approach
  - Prevention, sanitation, hand weeding, mulching, cultivation, use of herbicides
- Herbicides may have a lesser role w/balanced approach

Prevention & sanitation

- **Prevent weed introduction**
  - Contaminated potting soil
  - Contaminated stock plants
  - Mowers

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Prevention & Sanitation

- Scout
- Avoid weed seed production
- Remove containers w/perennial weeds
- Dispose of pulled weeds
- Manage perimeter areas

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Physical / Mechanical Weed Control

- Hand- pulling
- Most effective method for some weeds

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Cultural Weed Control

- Select healthy, vigorous plant material
- Put the right plant in the right place
- Plant in groupings to reduce open spaces between plants
- Mulch

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Mulching

- Effective method of weed control
  - Reduces light necessary for germination
  - Creates a physical barrier
  - Decreases need for herbicides

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Mulching

- Natural organic
  - Wood chips, hardwood bark, softwood bark, pine straw, etc.
  - 2-3 inches, after settling
  - Keep wood mulch away from bark of trees & shrubs
  - Do not “volcano mulch”

Photos: UF/L Sanagorski

Mulch

- **Natural inorganic**
  - Sand, pebbles, stones, shale
  - Require plastic mulch on soil surface beneath them or use of herbicide
- **Synthetic materials**
  - Polyethylene or woven synthetic fabric
  - Prevent weed seeds from germinating

Photos: UF/L Albrecht

When is the best time to manage emerged weeds?

Herbicides

- A **supplemental** solution to a weed problem
- Name comes from Latin verb meaning “to kill”

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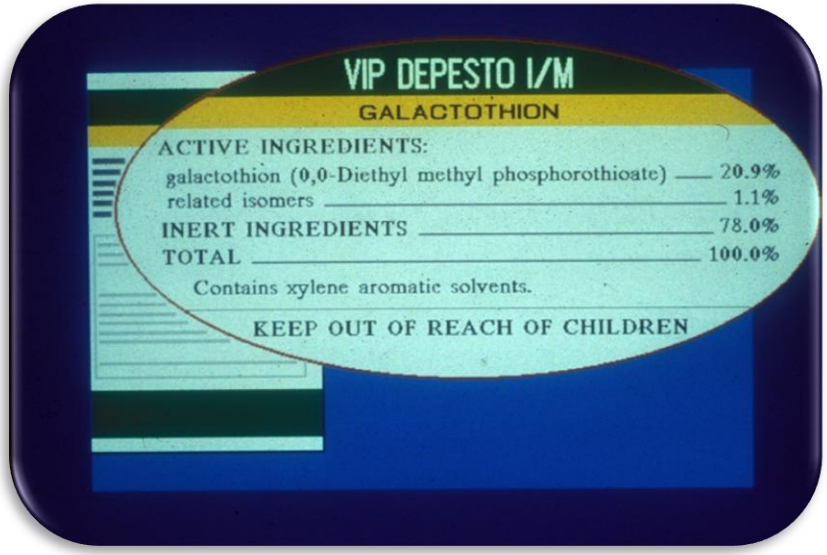
Chemical Weed Control

- Must correctly ID weeds *before* selecting herbicide
- Must consider site/method
- Need to be properly applied

James H. Miller, USDA Forest Service, Bugwood.org

Always…

- Read & follow all label directions
  - Better management
  - It's the law



Herbicides – Mode of Action

- Herbicide injury is caused by interrupting or stopping some important plant process…

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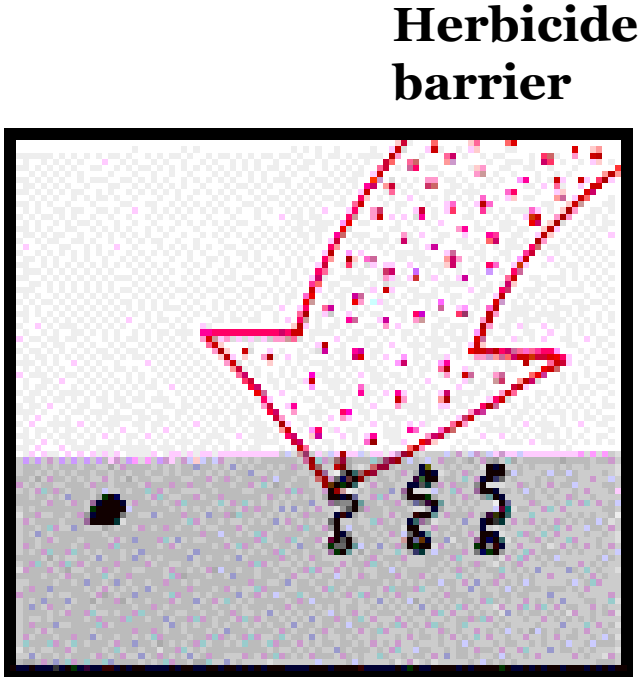
Timing & Application of Herbicides

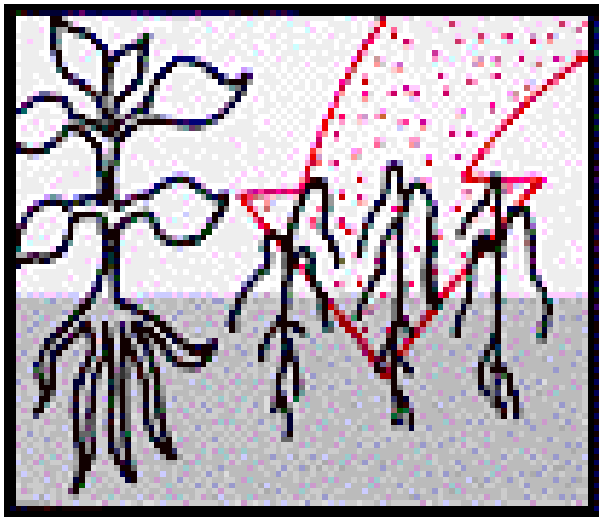
Pre-emergent

- Must be applied ***before*** weeds germinate
- Usually do not control existing weeds
- Soil applied
- Need irrigation to activate
- May not be effective if "weed barrier" is broken



Timing & Application of Herbicides

- **Post-emergent**
  - Controls existing weeds
  - Will not prevent germination of new weeds from seed bank
  - Mostly foliar applied



Types of Herbicides

- **Selective**
  - Control certain weeds without seriously affecting others
- **Non-Selective**
  - Kill or injure regardless of species

Timing & Application of Herbicides

- **Contact**
  - Only affect tissue that comes in contact w/herbicide
  - Complete coverage necessary
- **Systemic**
  - Move within the plant
  - Slower acting than contact

Types of herbicides

Post-emergent*		Pre-emergent*
Selective	**Non selective**	
Fluazifop	Glyphosate	Pendimethalin
Bentazon		Prodiamine
Halosulfuron		Oryzalin
And Others		And Others
Atrazine, 2-4, D (mostly turf)		

*Always refer to label for specific uses and follow label directions to minimize injury

Selective, pre-emergent herbicide

- Pendimethalin
  - Grass and certain broadleaves
  - Example: Pendulum

N-(1-ethylpropyl)-3,4-dimethyl-2,6-dinitrobenzenamine

Selective, pre-emergent herbicide

- Prodiamine
  - Grass and broadleaf weeds
  - Example: Barricade

2,4 dinitro-N3,N3-dipropyl-6-(trifluoromethyl)-1,3-benzenediamine

Post-emergent, selective herbicide

- Contact
- Grass weeds
- Example: Fusilade II

(6)-2-[4-[[5-(trifluoromethyl)-2-pyridinyl]oxy]phenoxy]propanoic acid

Glyphosate

- Post-emergent
- Non-selective
- Systemic
- Use as directed spray
- Example
  - Roundup and others
  - Use Rodeo or similar glyphosate product near water bodies

N-(phosphonomethyl)glycine

Putting It All Together

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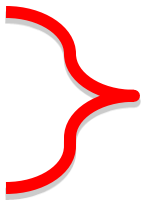
Broadleaf Control in Ornamentals

- Pre-emergent control
  - Check labels
- Post-emergent control
  - Bentazon (Basagran, Lescogran) – check label
  - Glyphosate (directed sprays/use caution)
  - Read the label to avoid damage to desired species!

Selective grass control in ornamentals

- Pre-emergent control
  - **Pendimethalin (Pendulum, Corral)**
  - **Prodiamine (Barricade)**
  - Others
- Post-emergent control
  - **Fluazifop (Fusilade II)**
  - Clethodim (Vantage, Poast)
  - Sethoxydim (Envoy Plus)



Sedges

- Thrive in soils that remain wet
- Do do not like shade
  - Correct drainage
  - Avoid excessive irrigation
  - Use shade to your advantage

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Sedge control (post-emergent)

- Selective yellow nutsedge control
  - Bentazon (Basagran T/O, Hi-Yield Basagran)
  - Contact
  - Repeat apps necessary
- Purple nutsedge control
  - Halosulfuron (Prosedge)
  - Imazaquin (Image)
  - Repeat applications, maybe for years

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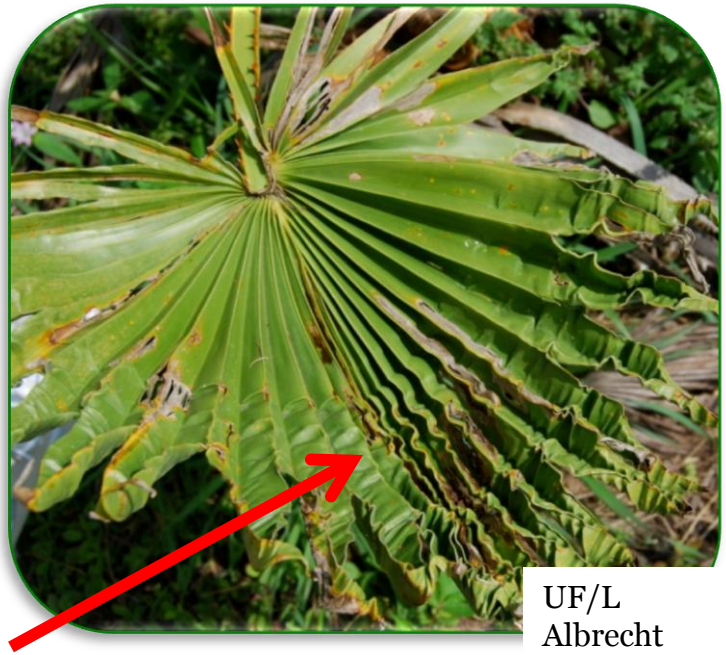
Herbicides - Phytotoxicity

Plant injury that may occur when chemicals are applied



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Glyphosate damage
on young *Washingtonia*

Causes of Phytotoxicity

- Direct applications are made under wrong conditions
- Material is applied improperly
- Drift, runoff, or persistence occurs

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Herbicides - Phytotoxicity

- **Symptoms:**
  - Poor germination
  - Death of seedlings, leaf tips, leaves
  - Death of rapidly growing tissues
  - Stunting
  - Distorted plants, fruits, leaves
  - Dead spots

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thank you.
questions?