Landscape Weed Management

- Site Preparation
- Sanitation & Exclusion
- Preemergence Weed Control
Preemergence weed control options

Mulches prevent germination and establishment by excluding light

Preemergence Herbicides Prevent seedling establishment
Mulches: #1 defense against annual weeds
Mulches

Control many annual weeds from seed

Do not control perennial weeds from roots, tubers or rhizomes

Must be replenished yearly

Pigweed: an annual weed controlled by mulches

Horsenettle: a perennial weed not controlled by mulches
Mulches

Types: organic, inorganic, geotextile

Function: exclude light to prevent seed germination and seedling establishment

Also, holds moisture and improves aesthetics
Kinds of mulches
What makes a good Mulch?

- Coarse texture to dry out
- Aesthetically pleasing
- Will not wash
- Relatively weed free
- Not phytotoxic

Lava rock – some like it, some don’t

Bark nuggets wash easily
Phytotoxic mulch?

- Anaerobic mulches can burn tender plants. Make sure mulches are properly composted and stored.
- Pine straw can stunt pansy growth.
How much mulch is enough?

% Weed Cover

Source: Greenley and Rakow, 1991
Mulches -- How Much?

- Organic mulches: ~ 3-4 in
- Inorganic mulches: ~ 3 in
- With a geotextile: ~ 2 in
Mulches -- How Much?
In annual color beds:

🌟 Organic mulches: ~ 1 in. Just enough to cover the surface. Bedding plants should provide the cover.

🌟 Inorganic mulches: Do not use

🌟 With a geotextile: Do not use
How Much Mulch Do You Need?

Bark mulch: 1 cu yd covers ~ 100 sq ft to a depth of 3 inches

Pine Straw: 1 bale covers about 35 sq ft.
When to mulch?

- Typically done in late winter
- Before summer annuals germinate
- Cover up winter weeds
- Before ornamental plants leaf-out
Mulches do not control creeping perennial weeds

Vegetatively propagated perennial weeds can emerge through mulches

- Bermudagrass
- Nutsedge
- Mugwort
Geotextile fabrics

- Woven or spun-bonded plastic fabrics
- Allow water and air to penetrate
- Often sold at “weed mats” or “weed fabrics”
Geotextile fabrics -- Advantages

🌟 Long term annual weed control
🌟 Soil stabilization
🌟 Holds moisture
🌟 Possible add-on service $$

Landscape Weed Control – JC Neal, NCSU
Geotextile fabrics -- Disadvantages

Cost – materials and installation

Site preparation: eliminate perennial weeds

Must cover with mulch

Perennial weeds can penetrate

Annual weeds grow on top

Mulches slip off

In heavy soils, it may hold too much moisture

Decomposing organic mulches create a humus layer where weeds can germinate
Geotextile fabrics do not control perennial weeds

Vegetatively propagated perennial weeds can emerge through geotextile fabrics

- Bermudagrass
- Nutsedge
- Mugwort
Many perennial weeds can grow through geotextile fabric mulches.

Equisetum will emerge through geotextiles.
Weeds germinating on top can grow through the mulch

Roots penetrate the fabric more easily than shoots

Weeds growing through the mulch damage the geotextile
Biggest problem with geotextiles is proper installation

Not installed correctly:
Edges come up, mulch washes off.

Unsightly and ineffective.
Steps in proper installation

- Dig trench around perimeter of bed
Step 2: place geotextile over bed

- Install geotextile over plants.
- Don’t try to plant through the bed.
- Dirt on top of the fabric leads to weeds.
Step 3: Anchor edges in SOIL (not mulch)

- Bury edges in soil. [remember, roots will grow through the fabric]
- Mulch-only will allow edges to come up
Step 4: Cover with enough mulch to prevent light degradation
Types of Geotextile fabrics

Lots of different types:
- Spun bonded
- Woven
- Needle punched

Are there differences? Yes, between consumer and professional grade products.
Study Questions -- mulches

- How do mulches control weeds?
- What kinds of weeds are controlled by mulches? And, what kinds are not?
- How deep should the mulch layer be for:
  - organic mulches, inorganic mulches, woody beds vs flower beds?
- Advantages and disadvantages of using a geotextile fabric?
- Describe the procedures for proper installation of a geotextile fabric.
Some Weeds Like Growing in Mulches

Herbicides are sometimes needed
Landscape Herbicide Uses

- **Preemergence (PRE)** – controlling annual weeds before they emerge.
- **Postemergence (POST)** – control weeds after they have emerged.
PRE Herbicides in Landscapes

Positional Selectivity

No Herbicide vs. With Herbicide
PRE Herbicides in Landscapes

- Many choices – over 20 products registered
- Most are also used in turf
- Dinitroanalogines are the most common
- Gallery (isoxaben) for broadleaf weed control
- Combinations for broad spectrum control
- Granules are preferred for plant safety and convenience
Dinitroanaline Herbicides

Several similar herbicides
- Surflan (oryzalin)
- Pendulum (pendimethalin)
- Barricade (prodiamine)
- Treflan / Preen (trifluralin)

PRE grass control, some broadleaf weeds – spurge, chickweed, henbit and oxalis

GR formulations are safer
Dinitroanaline herbicides control many common annual weeds
Comparison of Dinitroanaline Herbicides on Winter Annual Weeds

<table>
<thead>
<tr>
<th>Herbicide</th>
<th>Annual Grass</th>
<th>Bitter-cress</th>
<th>Chickweed</th>
<th>Henbit</th>
<th>Horseweed</th>
<th>Sow-thistle</th>
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<td>Surflan</td>
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</table>
Gallery (isoxaben)

- Preemergence broadleaf weed control
- Spray formulation generally tank mixed with Surflan or other PRE grass herbicide
- Safe on most woody ornamentals
- Injures most herbaceous ornamentals
Snapshot TG

- A combination of Gallery + Treflan
- preemergence control of annual grasses and broadleaves
- Broad spectrum preemergence weed control
- Good plant safety – does not burn foliage like some broad spectrum herbicides
- Weak on bittercress & phyllanthis
- Safe on ‘blue-collar’ perennials but injures most bedding plants
Preemergence Herbicides for Other Uses...

- PRE nutsedge control
  - Pennant Magnum
  - Freehand and Tower

- PRE broadleaf weed control
  - Gallery – more commonly Snapshot TG

- Very broad-spectrum herbicides for use around woody plants and in hardscapes
  - Broadstar, Sureguard
Yellow nutsedge control

- Preemergence control with Pennant Magnum, Tower or Freehand
- Selective POST control with Basagran TO or Sedgehammer
- POST control with Roundup or Finale
Pennant Magnum EC (metolachlor)

- PRE yellow nutsedge and annual grass control
- Only available as an EC
- Apply Pennant EC before bud-break (to avoid foliar injury)
- ~2 to 3 months residual. Re-apply as directed spray
Tower EC (dimethenamid-p)

- PRE yellow nutsedge, annual grass and certain broadleaf weeds
- EC formulation
- Apply before bud-break (to avoid foliar injury)
- ~2 to 3 months residual. Re-apply as directed spray

New in 2008
Freehand 1.75G (dimethenamid-p + pendimethalin)

- Preemergence control of annual grasses and small seeded broadleaf weeds
- Suppression of yellow nutsedge
- Safe on most woody ornamentals
- Herbaceous plants ??? Still testing.

New in 2008
Freehand – weeds controlled
Pennant Magnum vs. Freehand

EC Form.
- Yellow nutsedge suppr.
- Ann. Grasses
- Few broadleaf weeds controlled
- Well known plant safety

GR Form.
- Yellow nutsedge suppr.
- Ann. Grasses
- Better on broadleaf weeds
- We are still learning about plant safety

Landscape Weed Control – JC Neal, NCSU
EC herbicide injury to tender spring growth

Tower injury 1 WAT

Pennant Magnum injury 1 WAT
Choosing the right product

- Safety to the ornamentals in the bed – this is complicated by diversity of plants
- Efficacy on the weeds
- Formulation
- Cost
Woody Ornamentals

Many choices

Tolerant of broad spectrum herbicides such as Snapshot, Surflan, Regal OO, Gallery, etc.

Can also sometimes use Casoron (diclofenil)
Herbaceous Plants

- Tolerance to herbicides varies among species
- Few herbicides labeled
- Check labels and Extension recommendations
- Hort Info Leaflet #644

http://www.ces.ncsu.edu/depts/hort/hil/
Herbaceous Perennial Beds

- Even fewer options
- Site Prep and sanitation are critical
## PRE herbicides for summer bedding plants

<table>
<thead>
<tr>
<th></th>
<th>Pennant</th>
<th>Barri-cade</th>
<th>Pendulum G</th>
<th>Surf-lan</th>
<th>Tref-lan</th>
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<tbody>
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Source: HIL 644 -- Weed management in annual color beds
What does that mean?

◆ A species is listed on the label – it is “Registered or Labeled”

◆ The company warranties the herbicide safety on this ornamental species

◆ If it’s not listed on the label – it may or may not be safe. No guarantees.
Efficacy – Generally....

- Grasses are easy to control with several options.
- Variable control of broadleaf weeds.
- Sedge – fewer options.
## Comparison of Preemergence Herbicides on Winter Annual Weeds

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Application timing is everything to effective control

- Preemergence means before weeds germinate.
- Applications must be made about 2 weeks before germination.
- Timing depends on the weed’s life cycle.
A typical Landscape Calendar -- PRE

Winter –
- Mulch
- PRE for summer annual weeds

L. Spring / E summer
- 2nd PRE for late germinating summer annuals and nutsedge

L. Summer / E. Fall
- PRE for winter annual weeds
Where to get more information?

- Cooperative Extension Bulletins
- Clemson University Pest Management Guide
- Cornell Recommends for pest management in herbaceous ornamentals
- HIL 644 and other fact sheets
- Trade journals and your peers
How to use the print resources

- One table for efficacy
- Tables for herbicide safety safety
- Cross reference between tables
Example:

What preemergence herbicide would you use to control bittercress in pansy beds?
Step 1: what herbicides are safe on pansies?

Table 5. Preemergence herbicide registrations on herbaceous ornamentals

<table>
<thead>
<tr>
<th>Species</th>
<th>Barri-cade</th>
<th>Gallery</th>
<th>Pend-ulum</th>
<th>Pennant</th>
<th>Surflan</th>
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</table>

R= registered, I = injury has been observed
Step 2: which of these herbicides controls bittercress best?

Table 1. Preemergence herbicide efficacy on annual weeds

<table>
<thead>
<tr>
<th>Species</th>
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<th>Galler y</th>
<th>Pendulum</th>
<th>Pennant</th>
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</tbody>
</table>
Example:

What preemergence herbicide would you use to control bittercress in pansy beds?

XL is the best alternative

- Fair control
- Registered (or labeled for the plant)
Study Questions

How do preemergence herbicides control weeds?

When should a preemergence herbicide be applied? And, how does this relate to a weed’s life cycle? Specific examples.

Why are dinitroanaline herbicides the most commonly used herbicides in landscape plantings?

Give 4 examples of dinitroanaline herbicides labeled for use in landscape beds.
Study Questions

Given the species of weeds and ornamental plants – be sure you know how to use the tables to develop a herbicide recommendation.

Which would be safer on herbaceous ornamentals? And Why? Surflan vs XL; Penulum 2G vs Treflan 5G; Barricade vs. Regakade; Gallery vs. SnapshotTG?

What PRE herbicides would suppress yellow nutsedge?

Of the herbicides discussed in this lecture, Gallery is more likely to injure herbaceous ornamentals. Why? Two reasons…….