Landscape Weed Management Goals

Goals:
- Primarily aesthetic: improving the visual appearance of the landscape

What Else Do Weeds Do?
- Cause allergies
- Harm people
- Harbor insects and plant pathogens

Develop A Landscape Weed Management Plan – Plan Before You Plant – a 5-step process for developing a landscape weed management plan

1. Site Assessment
2. Define the Planting:
   - 5 Types of Landscape Plantings
3. Selection of ornamental species and compatible weed management options
4. Site Preparation
5. Implementation

Step 1. Site assessment
- Survey the site. Identify weeds.
- Grass weeds can be controlled POST with selective herbicides
- Key weeds – perennial broadleaves and sedges

Grasses are easy to control

Perennial Broadleaves and Sedges are more difficult to control
Step 1. Site assessment

Key weeds – perennial broadleaves and sedges
Grass weeds can be controlled POST with selective herbicides
Ask yourself the question:

“Can I control these weeds after Planting?”

Step 2. Define the Planting:

5 Types of Landscape Plantings

- The type of planting will define the post-plant weed management options and the importance of pre-plant weed control.
- Woody Tree and Shrub beds
- Woody groundcover beds
  - Annual beds
  - Perennial beds
  - Mixed Plantings

Landscape Weed Management

Options depend upon the types of landscapes and weeds present

Table 1. Weed management options and limitations for the 5 types of landscape plantings.

**Tree and Shrub Beds:** Densely shaded plantings exclude weeds.
- But, such beds are often open allowing weeds to grow
- Geotextiles and mulches are useful.
- Many PRE & POST herbicides
- Spot or directed applications of non-selective herbicides
- Therefore: species selection is flexible and pre-plant weed control is not as critical.

Woody Tree and Shrubbery Beds

Most post plant weed control options

Fewest post plant weed control options

What weed control can you do here,

That you cannot do here?
Table 1. Weed management options and limitations for the 5 types of landscape plantings.

**Woody Ground Cover Beds:**
The ground cover should ultimately exclude most weeds.
- Limited uses for non-selective herbicides;
- Control perennial weeds before planting;
- Do not use geotextiles where ground covers are expected to root and spread;
- Control annual weeds with mulching, hand weeding, and/or PRE herbicides;
- Several PRE herbicides are available;
- Few uses for POST herbicides;
- POST control of annual and perennial grasses is possible.

**Annual Flower Beds = Bedding Plants**
A closed canopy will shade-out many weeds.
- Periodic cultivation (annually or between display rotations) will suppress many weeds;
- Very limited use of non-selective herbicides; control perennial weeds before planting;
- Geotextiles generally are not useful (due to the short-term nature of the planting);
- Few PRE herbicides are safe; careful species and product selection are required;
- Mulches will suppress many annual weeds – but too much mulch is a problem to manage.

**Herbaceous Perennial Beds**
Similar to Annual Flower Beds except:
- Lack of periodic cultivation will encourage perennial weed encroachment;
- Fewer herbicides are labeled; check the labels carefully;
- Geotextiles may useful in clump-type plantings or to restrict growth of spreading-types;
- Very limited use of non-selective or postemergence herbicides.
Table 1. Weed management options and limitations for the 5 types of landscape plantings.

- **Mixed Plantings (of woody and herbaceous plants):**
  - More complex due to the diversity of species.
  - Different areas of the bed could receive different treatments.
  - Site preparation is usually critical.
  - Few herbicides are registered for a wide spectrum of ornamental plant types.
  - Geotextiles may or may not be useful.

Step 3. Selection of ornamental species and compatible weed management options.

- Selecting ornamental plants with weed control in mind may reduce maintenance costs in the future.
- Example 1: Florida betony cannot be selectively controlled in beds planted to herbaceous ornamentals. Therefore, opting for a woody planting instead will make maintenance easier by allowing the use of effective herbicides.

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- Example 2: Yellow nutsedge can be controlled with preemergence applications of Pennant Magnum in Ageratum or Petunia beds but not in Begonia or Coleus.
  - If yellow nutsedge has been a problem in the past – plant petunias instead of coleus or begonia.

Step 3. Selection of ornamental species and compatible weed management options.

- Example 3: Dodder cannot be controlled in petunia or snapdragons but scaevola and sweet potato are resistant.

Step 4: Site Preparation

- **Goal:** eliminate weeds that cannot be controlled after planting
- **Options:**
  - Cultivation
  - Non-selective herbicides
  - Fumigation (option of last resort)
  - Solarization
Site Preparation

The best time to control perennial weeds is before planting.

There are basically three options:
- repeated cultivation,
- glyphosate (Roundup or similar)
- Fumigation (rarely used)
- Solarization (rarely used)

Controlled by repeated cultivation

- Goldenrod
- Dandelion

Spread by cultivation

Site Preparation with Glyphosate (Roundup-Pro & Others)

- Nonselective, systemic herbicide that kills most weeds – shoots and roots.
- The most common site preparation treatment
- Spray, cultivate no sooner than 5 days
- Will control most perennial weeds

But Roundup does not control all weeds

- Equisetum
- Pokeweed
- Pennywort
Other Site Preparation Methods?

- Few other options
- Chemical fumigation is no longer feasible
- Steam pasteurization?
- Solarization?

Fumigation or Pasteurization

- The only option that kills weed seeds and propagules
- The option of last resort.

Soil Fumigation

- Chemical fumigants kill most weed seeds and vegetative propagules, and soil insects and pathogens.
- Fumigants are very toxic, expensive and require significant site preparation.
- The site preparation choice of last resort!
- Not feasible for most landscape situations due to required set backs.

Alternatives to Chemical Fumigants

- Steam
- Solarization

Steam Pasteurization

- Maintain 180 F for >30 minutes
- Will kill most pathogens
- Many weed seeds will escape

Mobile steam generators are available but are expensive and can be dangerous if not in good repair

Must use a canvas tarp – plastic will melt
Solarization

- Cover soil with clear plastic
- Solar energy is trapped. Soil is heated.
- Try to reach at least 140°F for several days
- Only works in summer
- Generally takes up to 6 weeks
- Works on small-seeded annuals, but generally not very effective on perennials or large-seeded annuals

Solarization is generally not as effective as chemical fumigants

- Methyl bromide
- Solarized then sprayed with glyphosate

Regardless of which method is chosen – Site Preparation is Critical. For Best Results:

- Cultivate to 8 inches
- Soil should be free of debris and clods
- 55°F at 6 inches
- Moist, not wet
- Add amendments before fumigation

After fumigating -- Sanitation!

- Inspect nursery stock
- Add top soil and organic amendments before fumigation
- Use weed-free mulches
  Don’t introduce weeds to a clean bed

Step 5: Installation and Implementation

- Site preparation
- Sanitation
- Mulches
- Preemergence Herbicides
- Postemergence Herbicides
Weed Management Resources
- Hort information leaflets (HIL link)
- CS053 lectures (Dr. Neal’s web site)
- Plan Before You Plant fact sheet
- Ag chem manual (weed control link)
- South Carolina Pest Management Handbook
- Revised NCSU guidelines soon

Landscape Weed Management
- Site Preparation
- Sanitation & Exclusion
- Preemergence Control
  - Mulches
  - Preemergence Herbicides
  - Postemergence Herbicides
  - Hand weedling

Sanitation
- Prevent introduction of weed propagules
- Prevent weeds from going to seed

Invaders - weed dispersal
- Wind
- Surface water
- Birds & animals
- Activities of man
  - site prep, cultivation, planting

How we introduce and move weeds
- top soil
- organic amendments
- equipment
- plants

Study Questions Lecture 1
1. What are the 5 types of landscape plantings? List in order from the most to fewest post-plant weed control options.
2. Give an example of how landscape plant selection can influence your weed management choices.
3. What are the key weed management option differences between the 5 landscape bed types?
4. Following a site assessment -- What is the key question you ask yourself (and answer) concerning the weeds present in a proposed landscape planting?
Study Questions cont.:
5. Describe 3 options for controlling weeds at site preparation?
6. Goldenrod is well controlled by cultivation. Why is this not generally not a feasible option in landscape bed installation?
7. Roundup (glyphosate) is non-selective. Name a few weeds for which this would not be an effective site preparation strategy. And, why.
8. What is solarization?