Landscape weed control
James Altland
Oregon State University
Weed control reality

- Weed seeds are present in soil

- You cannot eliminate all weed seed
  - Even fumigation with MeBr is only temporary relief

- Sanitation and management practices should discourage weeds from establishing
Redroot pigweed

• Plants produce up to 100,000 seed
  – 13,860 with no fertilizer
  – Over 34,600 when fertilized

• Seed can be wind dispersed
  – Small size

• Seed survive for more than 30 years
  – Soil surface or buried
Weeds

• Plants that are successful colonizing disturbed, but potentially productive, sites and maintaining their abundance with repeated disturbance.

  Liebman et al.
Landscape weed control

• Sanitation

• Cultural practices

• Mulches

• Herbicide use
Sanitation

• Clean mulch

• Weed-free plant material

• Remove existing weeds
  – Prevent the next generation of seed
Clean mulch

- Bark is generally weed-free
- Storage conditions might introduce weeds
- Examine the source of your bark supply to make sure they use sound sanitation
Weed-free plant material

• Container or field-grown nursery plants can be infested with weeds

• When possible, visit your plant supplier
  – Visit your supplier’s supplier

• Demand weed-free nursery stock
Eliminate existing weeds

- Most ‘weeds’ reproduce prolifically

- Do not allow weeds to mature in the landscape
  - Do not allow perennials to spread vegetatively
Cultural practices

• Watering
• Fertilizing
• Mulching
• Plant density
Irrigation

• Weed seeds require available moisture for germination

• Seeds imbibe water, triggering germination

• Leave landscape surface dry, reduce weed establishment
Irrigation

- Subsurface irrigation is most effective
  - Water moves throughout soil via capillary action

- Sub-mulch irrigation is partially effective
  - Water movement depends on mulch physical properties
Irrigation

• Overhead irrigation is least ideal
  – But also most common

• Fewer irrigation events
  – Longer drying cycles reduce germination
  – Make it more difficult for seedlings to establish
Nutrition

- Seed of many landscape weeds are small.
- Seeds must germinate close to the surface.
- Seed require available nitrogen (N), phosphorus (P), and potassium (K).
Nutrition

• Most bark mulches are very low in available nitrogen (N).
  – Composts are often high in available N.

• Seed germinate poorly in bark without available nutrients.
  – Seed germinate readily in compost.
Landscape nutrition

• Keep the mulch surface free of N
  – Incorporate fertilizers into the planting hole when installing plants
  – Inject or drill fertilizers into soil
  – Do NOT broadcast fertilizers on the surface

• Use a mulch with no available N

• Seeds will germinate and grow poorly in absence of N
Mulches

• Mulches can prevent weed growth
  – Sometimes!!!!

• Mulches prevent weed growth by the following mechanisms
  – Reduced nutrition (especially nitrogen)
  – Reduced moisture
  – Reduced light
Mulches

- Characteristics of a good mulch
  - Resistant to decomposition
  - Large particle size
  - Does not retain moisture
    - If it retains soil moisture, that is generally a good thing, if it retains moisture itself, that is not a good thing.
  - Attractive
Weed fabrics

- Problem
  - Weeds generally will start growing in mulch.
  - Weeds cannot grow up through fabrics.
  - Weeds can germinate on top and root down through!
Plant density

- Dense and vigorous plantings will exclude weed growth.
- Groundcovers
- Turf
Ground covers

- Support vigorous growth
- Use the right plant in the right place
- At planting, use tighter planting density
Summary

• Minimize the potential for new weed germination
  – Sanitation!

• Use management practices that make seedling establishment inhospitable.

• Alone or with herbicides, these practices will improve weed control.
Herbicides in landscapes

- Preemergence herbicides
  - Apply to weed free soil
  - Apply prior to weed emergence
  - Apply uniformly and do not disrupt

- Postemergence herbicides
  - Select the correct type
  - Apply thorough coverage
Preemergence herbicides

- Most seed germinate in the top 1 inch of soil.
- Herbicide placement should occur where seeds will germinate and begin growing.
- Application of herbicide followed by incorporation with water is necessary for proper placement.
Preemergence herbicides

- **Will not** kill weeds present at time of application

- Even small weeds have roots large enough to escape effect of pre herbicides.
Preemergence herbicides

• Do not prevent seed from germinating

• Do not kill dormant seeds!!!!

• Typical herbicidal activity
  – Hypocotyl and epicotyl emerge from seed
  – Grows through chemical barrier
  – Herbicide is absorbed and weed is killed or stunted.
Weed species controlled (pre-em)

- Broadleaf-active herbicides
  - Goal
  - Princep
  - Gallery

- These herbicides provide poor control of grasses, especially at lower rates.
Weed species controlled (pre-em)

- Grass-active herbicides
  - Surflan, Pendulum, Treflan, Factor
  - Ronstar
  - Pennant
- These products provide effective control of grasses and some “small-seeded” broadleaves
Weed species controlled (pre-em)

• Broad-spectrum control
• Tank mix a grass-active herbicide with a broadleaf-active herbicide
  – Gallery + Pendulum
  – Goal + Factor
  – Princep + Surflan
Maintain the chemical barrier

- Incorporate the herbicide
- Reduce unnecessary traffic
- Reduce excessive irrigation
Reduce traffic
Incorporate the herbicide

- Most abused aspect of weed control
- Incorporate immediately after application
  - Herbicides degrade on soil surface
- Incorporate with irrigation if possible
- Do NOT incorporate with drip irrigation!!!
Preemergence herbicides

• If applying to bark
  – Apply to moist bark

• Pre-herbicides applied to dry bark reduces efficacy
  – Dry bark adsorbs the herbicide tightly
  – May not be released with subsequent irrigation
  – Herbicide is rendered ineffective
Postemergence herbicides

• Select the right type of herbicide
  – Contact
  – Translocated

• Apply thorough coverage

• Ensure adequate uptake and movement
Contact herbicides

• Burns only foliage that is contacted.

• Good for control of annual weeds.

• Will not control roots of perennial weeds.
Postemergence herbicides

- Contact
  - Finale (poorly translocated)
  - Gramoxone
  - Scythe (pelargonic acid, soft pesticide)
  - Diquat
  - Acetic acid
Contact herbicides

• Require thorough coverage for complete control

• Best when used on small, recently germinated weeds.

• Not effective against established perennials.
Translocated herbicides

• Absorbed by foliage and other green tissue

• Moved throughout plant along with photosynthates

• Moved to growing points
Postemergence herbicides

• Translocated
  – Moved throughout the plant to control roots and shoots
    • Roundup – all vegetation
    • Vantage – grasses only
    • Fusilade – grasses only
    • Envoy – grasses only
    • Manage - Nutsedge
Translocated herbicides

• Require living, functioning plants.

• Environmental conditions that favor plant growth also improve effectiveness
  – High light
  – adequate soil moisture
  – moderate temperatures
Translocated herbicides

- Coverage is extremely important for controlling perennial weeds
  - *Convolvulus arvensis*
  - Roots grow to a depth of 30 feet.
Translocated herbicides

- Ideal for killing perennial weeds
- Best when used for spot spraying
- Will injure ornamental crops if contact is made
Which type?

• Contact herbicides
  – Faster action
  – Safer around ornamentals
  – Will not kill roots (perennials)

• Translocated herbicides
  – Slower action
  – More effective across all weed types
  – Greater potential injury to ornamentals
Website

• http://oregonstate.edu/dept/nursery-weeds/