Container Weed Management

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Container vs. field production

- Containers
  - No seed bank
  - Bark substrates are free of weeds initially
  - Isolated substrate volume
  - Irrigated daily
  - No postemergence herbicides
  - No cultivation

- Field crops
  - Abundant seed bank
  - Abundant weed seeds and perennial propagules
  - Soil is continuous
  - Irrigated weekly or less
  - Many postemergence herbicides (directed apps.)
  - Cultivation equipment is common and efficient
Challenges

• Weed control must be preventative
  – No postemergence herbicides
  – No mechanized cultivation devices

• Irrigation is difficult
  – Rates are high
  – Uniformity and precise application rates are difficult

• Intense weed competition
  – limited container volume
Opportunities

- Substrates are initially weed free
- Substrates are low in nitrogen
- Unique container environment only allows for a few select weed species
Container weeds

• Postemergence herbicides
  – Applied to weeds after emergence
  – Kill existing weeds

• Preemergence herbicides
  – Applied to clean, weed-free soil prior to weed emergence.
  – Prevents weed establishment.
  – Kills small weeds as the germinate.

Container production

• Only preemergence herbicides can be used
  – Very limited use of a few postemergence products.
  – Postemergence products can be used in surrounding areas to kill non-cropland weeds.

• Weed control must be preventative.
Total weed management program

Effective weed control

Sanitation
• Weed seed
• Weeds in non-cropland areas

Herbicide management
• Maintain chemical barrier

Diagram:

- Chemical barrier
- Media
Sanitation in non-cropland areas

• Work towards 100% weed suppression
  – Between greenhouses
  – Roadways and aisle ways
  – Around buildings
  – Bark piles
Herbicide chemical barrier

Herbicides move very little in containers. They remain in the top 1 inch of media.

Weeds in containers are small seeded, and generally germinate in the top ½ inch.

- Maintain the chemical barrier
  - Avoid practices that disrupt the barrier
    - Poking fingers through it
    - Spilling containers
    - Walking through treated bands in fields
    - Dragging objects treated bands in fields
Disruption of the herbicide chemical barrier

Uniformity of application

- Mostly a problem with granular applications

- Research shows that even under ideal conditions, amount applied can be from $\frac{1}{2}$ to 2 times the intended rate.

- Take steps to improve uniformity
Uniformity of application

- Apply a single application in multiple passes.

- Takes more time, but dramatically improves uniformity.
Preemergence timing (granular)

• At potting
  – Removal of overwintering

• Prior to overwintering

• Mid-season ???

Herbicide timing - #1 RULE

• You must apply herbicides before weed seeds germinate.

• Preemergence herbicides will not control existing weeds.
Cultural practices - fertilization

- Seed of container weeds are small.

- Seeds must germinate close to the container surface.

- Seed require available nitrogen (N), phosphorus (P), and potassium (K).

Cultural practices - fertilization

- Seed deprived of N, P, or K will fail to germinate, or germinate poorly.
Cultural practices - fertilization

• Fertilizer placement affects weed growth.
  – Topdress
  – Incorporate
  – Dibble
Cultural practices - Irrigation

- Over-watering decreases weed control.
  - Helps small weeds with stunted roots.
  - Excess water increases microbial activity, and microbes degrade herbicides.
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Plastic weed disk

- Rigid
- Difficult to attach
- Rubs plant stems
- Weeds grow through gap
- $0.10 / #1 container
Geotextile disk

- Commercially available
- Held in place with green florist pins
- Last for multiple years
- Weed grow in gaps
- $0.08 / #1 container

Coco disk

- Made from coconut husks
- Similar to other disks
- More forgiving to plants without single stems
- Excellent weed control
- $0.19 / #1 container
BioTop

- Starch-straw byproduct
- Similar in texture to sawdust
- Made in Denmark
- Injures some plants?
- Similar efficacy as sawdust
- $0.03 / #1 container
Sawdust

- Cheap
- Readily available
- Provides control for several months
- Easy to apply
- Removes N from container surface
- Starves weeds on container surface
- Less than $0.01 / #1
Container weeds

- Seed have some sort of active dispersal mechanism
  - Wind-blown
  - Explosive dehiscence
  - Splashed with water
- Germinate in low light levels
- Germinate in moist environments
- Short life cycles
- Prolific seed producers
- Small seeds
Bittercress – *Cardamine hirsuta*

Creeping woodsorrel

- *Oxalis corniculata*
  - Greek *osys* - sour
  - *Corniculata* - horned
Marchantia polymorpha

- Lower plant form (bryophyte)
- Reproduces sexually by spores
- Reproduces asexually by gemmae

Pearlwort – *Sagina procumbens*

*Sagina* – Latin for fodder, once mis-classified in the spurrey genus.  
*procumbens* - prostrate
**E. ciliatum**

vs.

**E. angustifolium**

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**Prostrate spurge – Chamaesyce maculata**

- Summer annual
- Seeds germinate within 5 days
- Plants mature in just 4 weeks
Common groundsel

• *Senecio vulgaris*

- Senex is Latin for ‘old man’
- Vulgaris is Greek for ‘common’

Website

• [http://oregonstate.edu/dept/nursery-weeds/](http://oregonstate.edu/dept/nursery-weeds/)