Weed Control Options in Citrus

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Annual and perennial weeds infest citrus orchards
Annual and perennial weeds

- Crabgrass (a)
- Barnyardgrass (annual)
- Pigweed (a)
- Buttercup (a)
- Horsenettle (perennial)
- Thistles (biennial and annual types)
Why are weeds so persistent?

- Most weeds produce a lot of seeds

- Survival of weed seed in soil – some weed seed can live in the soil for 50 years

- Vegetative reproduction – plants reproduce from plant parts - roots, nodes etc.
Why so many weeds? – Pigweed is a good example

✓ 13,000 – 1,000,000 seed/year
✓ Dormancy – survives 30 to 50 years
✓ Don’t allow seed production
Types of Weeds Found in Citrus

- **Broadleaves** –
  - Netted veination
  - 2 cotyledons
  - Taproot
  - Showy flowers

- **Grasses** –
  - Parallel
  - 1 cotyledon
  - Fibrous roots

- **Sedges** – “nutgrass”
  - Triangular stems
  - Leaves in 3’s
Broadleaf vs Grass Leaf

Broadleaf leaf veins (netted)  VS  grass leaf veins (parallel)
Methods of Weed Control
Options for Weed Control

- Light disking or cultivation – root damage potential, erosion

- Mowing – establish a permanent sod like bermudagrass – some weeds just can’t handle mowing

✓ Herbicides

✓ Weed control – often a combination of herbicides and mowing
Brief Herbicide School Session
Preemergence? Postemergence?
Types of Herbicides

• **Preemergence** – Weed preventer/residual herbicides – controls weeds before you see them

• **Postemergence** – kills weeds that are actively growing
How do preemergence herbicides work?
Effective Preemergence Application

- Apply before weeds germinate

- Adequate rainfall or irrigation is needed

- Do not expect all season control – reapply if the label allows
How do preemergence herbicides work?

✓ Herbicides provide a barrier at or just below soil surface
How some of the preemergence herbicides work (generally speaking)
Common Preemergence Herbicides Labeled for Citrus
Some Pre Herbicides available for citrus

- **Prowl H₂O** – pendimethalin – annual grasses and small seeded broadleaves (pigweed, spurge, purslane etc)

- **Surflan** – oryzalin – annual grasses and small seeded broadleaves (pigweed, spurge, purslane etc) – every 2.5 months

- **Norflurazon** – Solicam – a bleaching herbicide

✓ No post activity - similar control spectrum
Some Pre/post herbicides available

- **Karmex (diuron)** – often applied in strips – early post activity too – at least 1 yr old trees
  - 2 applications per year
  - Strong on broadleaves and good on annual grasses
  - Tank mixes well with glyphosate
  - Good on summer weeds
Some Pre herbicides available

- Princep (Simazine) – very good pre for winter weed control – grapefruits and oranges only

- Good on winter broadleaves and annual bluegrass

- Not good on ryegrass

- do not use on less than 1 year old trees

- 2 qt/A in Oct/November followed by 2 qt/A in February

- Tank mix with glyphosate or other post herbicide
Some Pre herbicides available

- Goal (oxyfluorfen) – mainly pre on broadleaf weeds
- Non-bearing trees
- Long residual
- – 6 pt/Acre
- Tank mix with glyphosate or other post herbicide
Bromacil

- Bromacil 80
- Band treatment – beneath or between trees
- Not for home use – commercial only
- 2 to 4 lbs. per application
- Spring followed by summer application (60 days apart)
Krovar / Sweep

- Diuron + bromacil
- Band treatment – beneath or between trees
- Not for home use – commercial only
- 2 to 4 lbs. per application
- Spring and summer app
- Rate based on soil type
Somewhat New Pre/post herbicides

- **Chateau** – flumioxazin – good pre for many broadleaves and grasses

- **6-12 oz / acre**

- **Apply to at least 1 year old trees**

- **Good post on doveweed**
Somewhat New Pre herbicides

- **Alion** – indaziflam – good pre for grasses and small seeded broadleaves (pigweed, spurge, purslane etc)

- 5 to 6.5 oz / acre

- Apply 30 days before or 30 days after transplanting

- Long residual on annual grasses and small seeded broadleaves–

- Apply on trees established for at least 1 year

- Good pre on doverweed
Doveweed – moisture loving annual – becoming more of a problem
Doveweed

- Doveweed germination is later in the spring
- Also reproduces by stem fragments
- Grass-like in appearance
- Has showy flowers
- Roundup has no effect
- Chateau effective postemergence
Postemergence Herbicides
Types of Herbicides

- **Nonselective** – kills everything – glyphosate, glufosinate (Rely), paraquat

- **Selective** – controls certain plants and releases other species – simazine, Aim
Postemergence Herbicide Examples
Non-selective post
Roundup and generics

• Active ingredient – glyphosate

• Will kill or injure most plants

• A systemic herbicide – good on perennial weeds

• Deactivated when it hits soil

• Doveweed and morninglory are weaknesses

• Resistance is now a big problem
Will we lose glyphosate?

• It is a target

• No pesticide regulatory agency in the world considers glyphosate to be a cancer risk

• What are some alternatives?
Paraquat

- **Paraquat** – non-selective – non-bearing – no soil activity

- Contact herbicide – quick burn down

- Add crop oil

- No soil activity

- **Restricted use herbicide** – EPA requires training for certified applicators to use parquat
Rely – glufosinate

Little if any translocation in plant

Not as good on perennial grasses as glyphosate

no soil activity

Between glyphosate and paraquat in activity
Scythe – fatty acid

- Non-selective – pelargonic acid

- Works well on tender annuals – 7 to 10% solution

- Poor on perennials

- Expensive
selective post herbicides
Selective Post Herbicides

- **Aim** – carfentrazone – broadleaves – contact herbicide – morningglory

- **Sethoxydim, clethodim or fluazifop** – herbicides that only control grasses
Somewhat New POST Herbicide available for citrus

- **Treevix** – saflufenacil
- Mainly works on broadleaves
- Quick burn back – root and shoot uptake
- PPO inhibitor
- 1 oz/A + mso
- Can be applied as late as the day of harvest
- May be tank mixed with glyphosate
Tips for weed control
What does a surfactant do?

- Reduce surface tension on leaf
- Gets herbicide in plant quicker
- Herbicide sticks to leaf better
- Check label – some require it some don’t
- Some require crop oil or mso
Environmental Factors – Foliar Herbicides

- Light – enhances absorption by increasing photosynthesis – sunny days are better

- Temperature – warmer is better

- Humidity – high humidity better than low

- Wind – off target movement

- Rainfall – may wash residues off foliage
Weed control important during establishment

- Bare area around trees improves survival
- Improves growth rates
- Reduces the time needed for trees to start producing
Be careful with young trees

- Protectors may be necessary to prevent contact with bark in immature trees.

- Avoid boomless nozzles – lot of drift issues.
Weed Control Strategies

• Weed free strips

• Combination of post and pre herbicides

• Grow turf in alleys

• Don’t use the same herbicides over and over
Read Labels

• How long trees are established - consult herbicide label

• Bearing versus non-bearing, harvest intervals

• Mowing can be an important part of weed control

• Manage resistance – change modes of action