2017 Pesticide Safety - Weed Control Update

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Weed Control Update

Katherine Ghantous and Hilary Sandler
UMass Cranberry Station
Preemergence Herbicides
Efficacy in cranberry?

- **Affected by:**
  - **Soil type**
    - chemicals cling to certain soil particles better
  - **Temperature**
    - some volatilize (lost to air) (e.g. Casoron)
    - some are broken down by microbes, which are more active in warmer temps
  - **Water – irrigation and rainfall**
    - Can wash down below depth where weeds are
    - Can fill up soil air pockets with water (Casoron)
Preemergence Herbicides Efficacy in cranberry?

**Fig.1:** Pepper Trial - PRE- Layby, WSREC, 2007

http://www.calpeppers.com
Casoron - Works on germinating seeds, somewhat on existing weeds. Inhibit cell wall synthesis, on growing points/root tips.

- **Apply when:**
  - perennial weeds are still dormant
  - annual weeds not started germinating
  - during cool weather
    - Soil and air temps ideally below 60 F

- **Must be incorporated**
  - irrigation or rainfall soon after applications
  - “Thoroughly incorporate granules into the surface through watering-in...”
Preemergence Spring Herbicides

Devrinol - Works on germinating seeds
  - Active in the soil, inhibits root development
  - Must be incorporated into the soil by rain or irrigation

Callisto – Absorbed by roots, shoots, and foliage
  - Can be used PRE and/or POST
    - May have a shorter half life in sandy soils

Evital - Absorbed by roots
  - Inhibits pigment synthesis, depletes chlorophyll, bleaching
  - Use caution for spring application, esp. on wet soils and sensitive varieties (like Stevens)
Preemergence Spring Herbicides

**QuinStar** - absorbed by both the foliage and roots.

- Works slowly!
  - twisting, stunting, reddening and chlorosis
  - annual weeds - may take up to three weeks to develop
  - perennial weeds - full effect may not be evident for 3 to 6 months

*Check with handlers for restrictions*
Spring Herbicides After Late Water

Can be applied after late water:

- Casoron
  - Wait for bog to dry down

Likely safe

- Devrinol
- Callisto
- QuinStar

- Evital **NOT** recommended after late water
Options for dodder preemergence

Casoron
- If poor control with 40 lb/A, increase rate to 60 or 80 lb
- Scout! Timing is important.

QuinStar
- Preemergence or early postemergence
- Similar timing as Casoron
- 2nd application is allowed 30 days later
- *Handler restrictions

Callisto
- Some growers have good results using it pre/early post for dodder
- No sig results in GH trials for pre
Cranberry plants at elongation/roughneck may be sensitive to herbicide applications:

- **Clethodim products**
  - e.g. Select Max, Intensity, etc.
  - can cause floral deformities
  - may reduce yields on sensitive varieties
    - Howes seem most prone to these issues

- **Devrinol**
  - noted some very minor yield reduction when applications were made during roughneck
Poverty Grass
Perennial grasses increasingly problematic

2010 survey
• 0% selected perennial grass as their most problematic weed

2015 survey
• 64% rated poverty grass (PG) as one of the four most common weeds
• 59% rated it one of the most difficult weeds to manage
Poverty grass

- Broomsedge bluestem (*Andropogon virginicus*)
- Little bluestem (*Schizachyrium scoparium*)
Poverty Grass Growth

Very slow starter
- Populations seem to explode in August

Successful management
- Stop seedling establishment (PRE)
- Stop seed production (POST)
- Kill adult plants (POST)
Devinol (napropamide)

Devinol - preemergence herbicide

- Greenhouse trials – good controls of BS and LBS seeds
- Control not seen when used in the field

**Broomsedge seedling emergence**

2 months after treatment

<table>
<thead>
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<th>Treatment</th>
<th>0</th>
<th>10</th>
<th>20</th>
<th>30</th>
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<td>Dev 2-XT</td>
<td></td>
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<tr>
<td>Dev DF-XT</td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Untreated</td>
<td></td>
<td></td>
<td></td>
<td>25</td>
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</table>

% seedling emergence
Herbicide activity not overlapping with germination.

Devrinol labeled for application before spring growth begins...
Are later Devrinol apps safe for cranberry?

Applied at various cranberry stages
(pre-budbreak, roughneck, hook stage, bloom, fruit set)

✓ No yield differences between any timing and untreated
✓ Residues from all timings below MRL
✓ Will try to work with UPI on a 24-C for future use
Clethodim for POST grass control

• Shown to be effective in GH and field trials
• Most effective when PG is actively growing
  • Cranberry fruit is present during this time
  • Treating with sprayer caused damage from foot traffic
• 4 apps allowed (9 -16 fl. oz per app, max 64 oz/A)
  ...many growers not using any!
Many growers not using good tool!

Application is a major hurdle

- Can be applied by backpack, mist blower, or aerial (were allowed)
- Can NOT be applied by chemigation
  - Main method of pesticide application for MA cranberry growers
Clethodim chemigation - cranberry crop safety

16 oz/A Intensity One with NIS at 0.25% v/v

Broadcast applications (BC) - 30 gal/A (281 L/ha)
Chemigation applications (CH) - 400+ gal/A (3,742 L/ha)

11 treatments

1x BC or CH
- roughneck
- after bloom
- 14 days after bloom

2 x BC or CH
- roughneck + after bloom
- after bloom + 14 days later

untreated control
Intensity One Chemigation Results

Cranberry fruit was collected from 1 ft² in each plot

Evaluated for number & weight of sellable fruit

✓ No differences between any treatment and untreated control
✓ No differences between BC and Chem plots
Clethodim Results

- Plots visually monitored throughout the season
  - No injury
  - Some floral deformities in roughneck treatments
  - Most severe in Howes
  - No yield difference in our experiment
  - Have had a grower report crop loss from roughneck apps on Howes
Chemigation of clethodim

Intensity One or Intensity only

- Avoid roughneck applications, esp. on Howes
- Use a surfactant!
  - Intensity One – NIS
  - Intensity – Crop Oil
- Apps must be min. 14 days apart
- 30 day PHI
Herbicides on large-fruited varieties

- Crop safety is based on older varieties
- There may be differences in varietal response
- Five newer large-fruited varieties tested
  - Crimson Queen
  - Demoranville
  - GH#1
  - Mullica Queen
  - Stevens
<table>
<thead>
<tr>
<th></th>
<th>Treatment</th>
<th>Rate</th>
<th>Active Ingredient</th>
<th>Application Method</th>
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<td>1</td>
<td>Untreated</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
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<td>2</td>
<td>Callisto - Spot 2x</td>
<td>8 oz/A</td>
<td>mesotrione</td>
<td>Broadcast</td>
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<tr>
<td>3</td>
<td>Callisto - Chem 2x</td>
<td>8 oz/A</td>
<td>mesotrione</td>
<td>Chemigation</td>
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<tr>
<td>4</td>
<td>Casoron</td>
<td>60 lbs/A</td>
<td>dichlobenil</td>
<td>Granular</td>
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<tr>
<td>5</td>
<td>Devrinol</td>
<td>18 qt/A</td>
<td>napropamide</td>
<td>Chemigation</td>
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<tr>
<td>6</td>
<td>QuinStar - Chem 2x</td>
<td>8.4 oz/A</td>
<td>quinclorac</td>
<td>Chemigation</td>
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<td>Intensity One</td>
<td>16 oz/A</td>
<td>clethodim</td>
<td>Broadcast</td>
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<tr>
<td>8</td>
<td>Evital (Fall) – 2016</td>
<td>80 lbs/A</td>
<td>norflurazon</td>
<td>Granular</td>
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<tr>
<td>9</td>
<td>Evital (Spring) - 2017</td>
<td>80 lbs/A</td>
<td>norflurazon</td>
<td>Granular</td>
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</table>
So far, so good!

• No injury was observed for any herbicide, except:
  o Some Stevens’ Callisto chemigation plots showed slight whitening of cranberry tips (treated 6/6/16)
  o No symptoms in these plots when retreated 6/28/16

• By August, Yellow Vine Syndrome (YVS) Casoron plots of all varieties
  o Damage rated as being between minor and moderate
  o Stevens most impacted

• Evaluated for number and weight of sellable fruit
  ✓ No differences between any treatment and untreated control