INTRODUCTION

Type | Chemical | Products
--- | --- | ---
Anti-GA | Ancymidol | Abide, A-Rest
Clormequat chloride | Citadel, Cyocel
Daminozide | B-Nine, Dazide
Flurprimidol | Topflor
Paclobutrazol | Bonzi, Paczo, Piccolo, Piccolo 10X, Downsize (drenches only)
Uniconazole | Concise, Sumagic
Structural BA | Configure
GA | Florigib, ProGibb T&O
BA+GA | Fascination, Fresco
Dikegulac sodium | Augeo
Ethephon | Collate, Florel

PGRs Knowing and Using
- Growth Controllers
  - Ancymidol
  - Clormequat
  - Daminozide
  - Flurprimidol
  - Paclobutrazol
  - Uniconazole
- Structural Enhancers
  - Augeo
  - Configure
  - Ethephon
  - GA/BA

Branching Agents
Joyce Latimer, VaTech

Expanding PGR Toolbox

12:00 to 12:30 Eastern

Branching Agents
Joyce Latimer
Floriculture Extension and Research
jlatime@vt.edu

Structural Enhancers
Knowing the Tools & How to Use Them Effectively

PGR University
Sponsored by:

fine

1/18/2015

PGR University

fine

1 FRANCHING AGENTS

Brian Whipker covered in last presentation
Chemical Approach to Branching

Goal is to improve plant architecture

- Substitute for pinching
  - Pinching labor intensive
  - Pinching delays growth and bloom
- Release apical dominance
- Increase branching and improve quality
- Finish plants more quickly

Augeo (OHP, Inc.)

- Uptake is through leaf tissues primarily or through root uptake
- Active ingredient 18% dikegulac-sodium
- MOA
  - Induces leaky cell walls on actively growing terminals
  - Like a chemical pinch
  - Results in decreased apical dominance
- Typically causes leaf chlorosis
  - Apply early in the crop cycle to stimulate branching and allow ample time for new leaf growth to cover any yellowing or leaf necrosis
  - Apply to actively growing plants and stress free
  - Apply sufficient volume to wet the foliage (2 qt/100 sf)

Phlox paniculata ‘Laura’

- 1600 ppm Augeo increased lateral branching
  - Control 13 vs. 1600 ppm 27 branches

WOW Plants (OHP results)

- Lantana
- Fuchsia
- Calibrachoa
- Petunia
- Rates 400 to 800 ppm

Veronica ‘Goodness Grows’

- Finished liners at 3 WAT
  - Augeo ↑ branches
  - Augeo 1600 ppm resulted in stunting
- Finished plants at 8 WAT
  - Augeo ↑ branches
  - Stunting Augeo 800, 1600 ppm
Sedum ‘Autumn Joy’

Finished liners at 3 WAT
- Augeo
  - branches 100% - 200%;
  - 1600 ppm ↓height, shoot wt

Finished plants treated twice
- Augeo
  - branches 200%
  - height, wt 800, 1600 ppm; phyto - yellowing

Configure (Fine Americas, Inc.)
- Active ingredient is BA (10% benzyladenine)
- Labeled uses
  - Branching agent
  - Influence flowering
  - Height control
- Registered for:
  - Hosta, Echinacea and Holiday cactus.
- Stimulates - but does not cause – branching or flowering
  - Windows of opportunity
- Short period of activity (~1 week)
  - Multiple applications may be beneficial
  - Complete spray coverage required
  - Not actively transported throughout the plant

Christmas Cactus

Increases flower buds

Hosta Production

- BA at 1000 to 3000 ppm or multiple applications of 500 ppm, foliar spray
- Increased lateral bud break on the rhizome
- Increased divisions
- Increased sales

Echinacea ‘Magnus’
**Branching of Echinacea (At 4 WAT)**

<table>
<thead>
<tr>
<th>Cultivar</th>
<th>Control</th>
<th>600 ppm</th>
</tr>
</thead>
<tbody>
<tr>
<td>Magnus</td>
<td>3.8</td>
<td>6.6</td>
</tr>
<tr>
<td>White Swan</td>
<td>2.4</td>
<td>11.4</td>
</tr>
<tr>
<td>Doubledecker</td>
<td>1.2</td>
<td>4.6</td>
</tr>
<tr>
<td>Ruby Star</td>
<td>4.4</td>
<td>11.2</td>
</tr>
<tr>
<td>Tiki Torch</td>
<td>1.7</td>
<td>4.1</td>
</tr>
<tr>
<td>Merlot</td>
<td>1.3</td>
<td>2.9</td>
</tr>
<tr>
<td>Fragrant Angel</td>
<td>2.6</td>
<td>4.4</td>
</tr>
</tbody>
</table>

**Configure: Key Points for Echinacea**

- Spring applications:
  - In plug flat or within 3 weeks after planting plugs
  - Actively growing with good root growth
  - Single application of 600 ppm or multiple applications of 300 to 600 ppm at 2-wk interval
- Summer/Fall applications:
  - As above with multiple (2-3 at 2-wk intervals) applications of 300 to 600 ppm
  - Repeat Configure application(s) in Spring

**Configure on Perennials (600 ppm; p≤0.05)**

<table>
<thead>
<tr>
<th>Crop</th>
<th>Untreated</th>
<th>BA</th>
<th>WAT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gaura ‘Siskiyou Pink’</td>
<td>29.8</td>
<td>39.4</td>
<td>4</td>
</tr>
<tr>
<td>Euphorbia ‘Chameleon’</td>
<td>13.5</td>
<td>20.0</td>
<td>6</td>
</tr>
<tr>
<td>Gaillardia ‘Dazzler’</td>
<td>23</td>
<td>153</td>
<td>4</td>
</tr>
<tr>
<td>Heuchera x ‘Raspberry Ice’</td>
<td>11.8</td>
<td>18.1</td>
<td>4</td>
</tr>
<tr>
<td>Lobelia cardinals</td>
<td>7.3</td>
<td>12.9</td>
<td>4</td>
</tr>
<tr>
<td>Penstemon ‘Husker Red’</td>
<td>6.2</td>
<td>7.7</td>
<td>4</td>
</tr>
<tr>
<td>Lychnis ‘Vesuvius’</td>
<td>3.1</td>
<td>5.3</td>
<td>4</td>
</tr>
<tr>
<td>Veronica ‘Icicle’</td>
<td>2.5</td>
<td>3.6</td>
<td>2</td>
</tr>
<tr>
<td>Coreopsis ‘Zagreb’</td>
<td>43.2</td>
<td>98.8</td>
<td>2</td>
</tr>
<tr>
<td>Leucanthemum x ‘Alaska’</td>
<td>9.5</td>
<td>14.9</td>
<td>2</td>
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**Configure on Perennial Liners**

- Echinacea purpurea ‘White Swan’
- Improved pot fill with earlier applications

**Herbaceous Perennials**

- Substitute for pinching/sharing
- Looking for better and faster pot fill along with better plant architecture
Configure on Perennial Liners

- Generally improves branching during liner production
- Apply after rooting, just after off mist
- Phytotoxic effects on some crops (aster, cosmos)
- Has short-term activity in some crops; multiple applications effective (liner stage and again shortly after transplanting to finished containers)
- Minimum 2 week interval between applications
- For photos of additional crops, visit our website: [http://www.hort.vt.edu/floriculture/presentations.html](http://www.hort.vt.edu/floriculture/presentations.html)

Ethephon

- Florel Brand Pistill (Monterey Chemical)
  - 3.9% active ingredient
- Collate (Fine Americas, Inc.)
  - 21.7% active ingredient
- Can have a range of effects on crops, including abortion of flowers & buds, increase branching, and inhibit stem extension
- Applications
  - Sprays: 250 to 500 ppm (on label)
  - Drench: 250 to 500 ppm
  - Liner Soaks: 125 to 500 ppm
- Responses can be variable and less predictable
- Generally inexpensive

Shoot Number

Increase in shoot number observed with 500 ppm Ethephon

Ethephon – Keys to Use

- A cost effective method of controlling growth and increasing branching
- Must pay attention to application details
- Acidify the solution to final solution pH of 4 to 5
- Allow the solution to dry slowly over 4 hours to enhance uptake
- Avoid applications to stressed plants - ethephon can enhance stress
- Must manage timing to avoid flower delay – 6 wk before sale
- Drench applications increase the options for using ethephon
- Species and cultivars vary in response – conduct your own rate trials!

Collate on Veronica ‘First Love’

- No effect on liners at 2 WAT but at 8 WAT Collate increased number of leaders and branches
- Pinching decreased leaders but same number of branches
Collate Drench - Veronica

- Treatment applied one week after transplanting
- All ethephon drenches increased shoot production with a maximum effect at ~100 ppm
- Spray application did not significantly increase branching

GA/BA Growth Promoters

- Fascination (Valent)
- Fresco (Fine Americas)
- Active Ingredients:
  - Gibberellins (GA_{4+7}) + Benzyl adenine
  - Prevention of leaf yellowing and to delay flower senescence of lilies
  - Increase leaf and bract size on poinsettia
  - Increase stem length
  - Plants are too short (cut flowers)
  - To counter a PGR overdose

Effects of Fascination on Poinsettia Bract Size (E. Runkle, MSU)

- Control without Bonzi
- Control with Bonzi
- 3 ppm Fascination applied 30 days after a Bonzi drench

Average Bract Area (in²):

- 214
- 146
- 193

Suggested Uses of Fascination or Fresco on Poinsettia (E. Runkle)

- A single spray application of Fascination at 3 to 5 ppm can increase plant height by 1” to 2” and promote bract expansion
- To increase plant height, apply before or soon after first bract color
- To increase bract size, apply 20 to 30 days after first bract color
- [http://www.flor.hrt.msu.edu/assets/Uploads/Fascinationonpoinsettia.pdf](http://www.flor.hrt.msu.edu/assets/Uploads/Fascinationonpoinsettia.pdf)

Phlox paniculata ‘Franz Schubert’

- Fresco, 6 WAT
- Excessive height with higher rates, early increase in branching that did not persist
Overdose in the Plug Flat

Reversal of Retardant Effects
- Start with low rates of Fresco or Fascination, 1 to 3 ppm
- Thorough coverage required
- Soil active, take care with volume
- Repeat in 5 days, if necessary

PGRs for Flowering
- Active ingredient - GA₃
  - Florgib (Fine Americas)
  - ProGibb (Valent)
- Breaking dormancy
- Timing and rate critical
- Earlier, more uniform flowering
- Azalea, cut flowers
- Potent growth promoter – follow label carefully

Expanding PGR Toolbox

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Questions

Thanks for Coming!