

1st International e-GRO Webinar Conference

e-GRO Electronic Grower Resources Online

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2:30 to 3:15

Branching Out with PGRs

Joyce Latimer




Cultural Practices

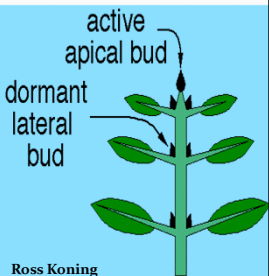
- Spacing
 - Light is best PGR
 - High light promotes branching
- Shearing/pinching
 - Moderate pruning promotes branching
 - Hard pruning promotes leaders
 - High labor costs



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

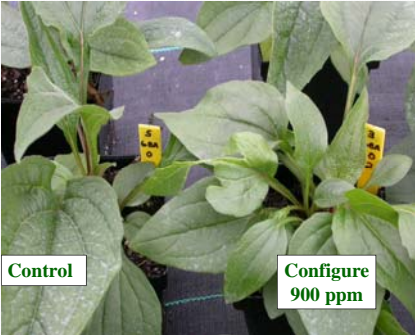


Ross Koning

Three Chemistries

- **Augeo** (OHP, Inc.)
 - Active ingredient 18% dikegulac-sodium
- **Configure** (Fine Americas, Inc.)
 - Active ingredient 2% BA (benzyladenine)
- Ethephon
 - **Florel Brand Pistill** (Monterey Chemical)
 - 3.9% active ingredient
 - **Collate** (Fine Americas, Inc.)
 - Xx% active ingredient

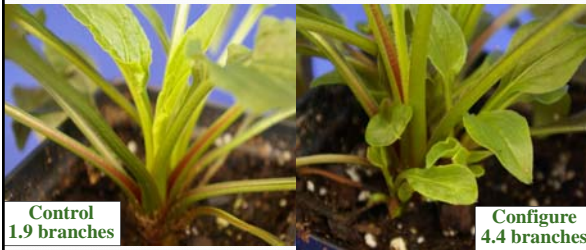
Echinacea 'Magnus'



Control

Configure 900 ppm

Echinacea 'Doubledecker'



Control 1.9 branches

Configure 4.4 branches

- 600 ppm Configure; photo at 4 WAT

Echinacea (# branches at 4 WAT)

Cultivar	Control	Configure 600 ppm
Magnus	3.8	6.6
White Swan	2.4	11.4
Dobledecker	1.2	4.6
Ruby Star	4.4	11.2
Tiki Torch	1.7	4.1
Merlot	1.3	2.9
Fragrant Angel	2.6	4.4

Control 600 ppm

Gaillardia arista 'Dazzler'

Control 23 branches Configure 153 branches

- Configure 600 ppm; photo at 4 WAT
- Interrupted flowering ~1 month delay

Lobelia cardinalis

2 WAT

Control 4 branches Configure 13 branches Control 7 branches Configure 13 branches

- 600 ppm Configure increased basal branching

Lobelia cardinalis

6 WAT

Control 11 branches Configure 16 branches

- 600 ppm Configure increased number of basal branches; 6 WAT

Heuchera 'Raspberry Ice'

4 WAT

Control Configure

- 600 ppm Configure increased number of basal branches


Heuchera 'Raspberry Ice'

4 WAT

Control 12 branches Configure 18 branches

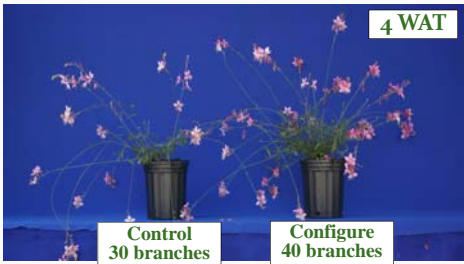
- 600 ppm Configure increased basal branching

Penstemon digitalis 'Husker Red'




- 600 ppm Configure increased basal branching

Gaura 'Siskiyou Pink'



- 600 ppm Configure increased number of shoots per pot and numbers of laterals and flowers

Phlox paniculata 'Laura'




- 600 ppm Configure increased lateral branching

Echinacea 'Sombrero Hot Pink'




- 800 and 1600 ppm Augeo increased basal branching
- Control 6.0 vs. 1600 ppm 9.5 branches (fewer flowers)

Phlox paniculata 'Laura'



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

Earlier Pot Fill - *Echinacea* 'White Swan'




- Improved pot fill with earlier Configure applications

What about EARLY Application?

Liner work by Mara Grossman in completion of her M.S. degree in Horticulture, Virginia Tech, 2012

Methods and Materials



- Unrooted cuttings (URC) stuck into 72s
- Rooted under mist until roots visible on all 4 sides of liner


Achillea at time of liner treatment

PGR Treatments


- Configure
 - One or two spray applications of 300, 600 ppm
- Augeo
 - One or two spray applications of 400, 800 or 1600 ppm
- Florel
 - One spray application of 500 ppm
- Collate
 - One application of 125, 250 or 500 ppm spray or liner dip at 10, 20, or 40 ppm

Crops in Liner Studies

- *Achillea* 'Moonshine'
- *Agastache* 'Purple Haze'
- *Aster* 'Professor Kippenburg'
- *Campanula* 'Cherry Bells'
- *Cosmos atrosanguineus*
- *Delosperma* 'Table Mountain'
- *Gaillardia aristata* 'Gallo Red'
- *Gaura lindheimeri* 'Siskiyou Pink'
- *Lavandula x intermedia* 'Provence'
- *Leucanthemum x superbum* 'Snowcap'
- *Nepeta x faassenii* 'Walker's Low'
- *Phlox paniculata* 'Bright Eyes'
- *Rosmarinus officinalis* 'Hill Hardy'
- *Salvia nemorosa* 'May Night'
- *Sedum spectabile* 'Autumn Joy'
- *Verbena bonariensis* 'Lollipop'
- *Veronica* 'Goodness Grows'



Configure on *Leucanthemum* 'Snowcap'

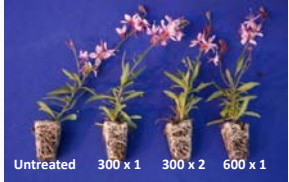


Untreated 300 x 1 300 x 2 600 ppm

Finished liners at 4 WAT: ↑ branches 100%,
↓ root weight


Configure on *Gaura* 'Siskiyou Pink'

Finished liners at 4 WAT



Untreated 300 x 1 300 x 2 600 x 1

Finished plants



Untreated 300 x 1 300 x 2 600 x 1

Finished liners

- ↑ branches, leaders

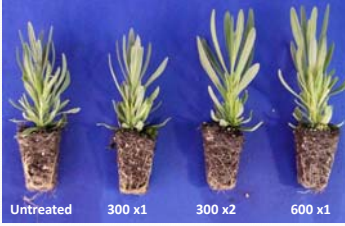
Finished plants

- ↑ branches, leaders

Configure on *Lavandula 'Provence'*

Finished liners at 4 WAT


- ↑ branches, ↑ leaders 600 x1
- ↑ shoot dry weight all Configure treatments



Configure on *Lavandula 'Provence'*

Finished plants (8 wk after treatment)

- ↑ branches
- ↑ leaders 300 x2




Configure on *Veronica 'Goodness Grows'*



- Finished liners at 4 WAT, all trts: ↑ branches, control 2.3 vs 9.3

Augeo and Florel on *Veronica*



Finished liners at 3 WAT

- Augeo and Florel ↑ branches
- Augeo 1600 ppm resulted in stunting

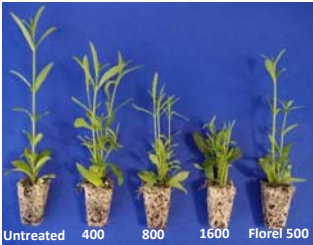
Augeo and Florel on *Veronica*



Finished plants

- Augeo and Florel ↑ branches
- stunting Augeo 800, 1600

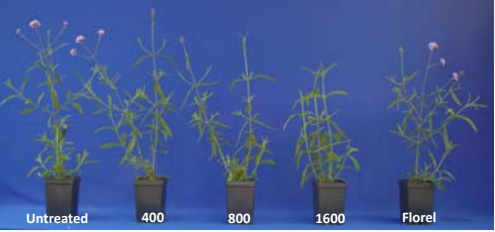
Augeo or Florel on *Verbena bonariensis 'Lolipop'*



Finished liners at 3 WAT

- **Augeo** ↑ branches control 1.3 vs. trt 9-12, phyto twisted leaves
- **Florel** ↑ branches (5)

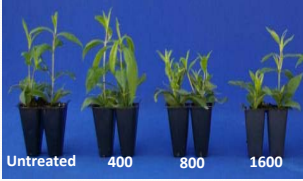
Augeo or Florel on *Verbena*



Finished plants

- **Augeo** ↑ branches 800, 1600 ppm control 28 vs. 32-38
- **Florel** ↓ branches (18)

Augeo on *Phlox paniculata* 'Bright Eyes'




Finished liners – 2 WAT

- ↑ branches & ↓ shoot wt 1600 ppm
- ↓ height 800, 1600 ppm

Finished plants stunted with two treatments


Configure on *Phlox* 'Bright Eyes'



Finished liners at 2 WAT

- ↑ branches
- ↑ shoot dry wt


Configure on *Phlox* 'Bright Eyes'



Finished plants treated twice

- ↑ branches 2 x 600 ppm
- Slight delay in flowering


Augeo or Configure on *Sedum*



Finished liners at 3 WAT

- **Augeo** - ↑ branches 100% -200%; 1600 ppm ↓height, shoot wt
- **Configure** - ↑ branches 300%


Augeo or Configure on *Sedum*



Finished plants treated twice

- **Augeo** ↑ branches 200% ↓height, wt 800, 1600 ppm; phyto – yellowing
- **Configure** 600 ppm x2 ↑ branches 200%


Collate - *Veronica* 'First Love'



Control	10	20	40	125	250	500	Pinched
	ppm liner dip			ppm foliar spray			

- Collate at 2 WAT had no effect on branching
- Pinching increased branching

Collate on *Veronica* – 8 WAT

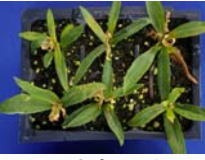


Control	10	20	40	Pinched	125	250	500
	ppm liner dip				ppm foliar spray		

- Collate increased number of leaders and branches
- Pinching decreased leaders but same number of branches

Phytotoxicity on Liners

- Configure
 - Aster – significant tipburn
 - Cosmos – distorted leaves
- Augeo
 - Verbena – distorted leaves – plants grew out normally
 - Sedum – yellowing
- Collate/Florel – no phyto under moderate conditions




600 ppm Configure on Aster

Branching Agents on Liners

- Generally improves branching during liner production
- Apply after rooting but moderate decreases in root growth do not affect finished plant quality
- Note phytotoxic effects on some crops (aster, cosmos)
- Has short-term activity in some crops which indicates a value in reapplying branching agents
- Make second applications shortly after transplanting liners to finished containers (note ethephon effects on flowering)
- For photos of additional crops, visit our website:
 - <http://www.hort.vt.edu/floriculture/presentations.html>


Configure - Keys to Use

- Stimulates - but does not cause – branching or flowering
 - Windows of opportunity
 - Active growth
- Short period of activity (~ 2 wks activity)
 - Multiple applications may be beneficial
- Complete spray coverage required
 - Not actively transported throughout the plant



Augeo – Keys to Use



- Apply early in the crop cycle to stimulate branching and allow ample time for new leaf growth to cover any yellowing or leaf necrosis that may occur
- Apply to actively growing plants
- Plants should be stress free
- Apply sufficient volume to wet the foliage (2 qt/100 sf)



Augeo[®]
PLANT GROWTH REGULATOR

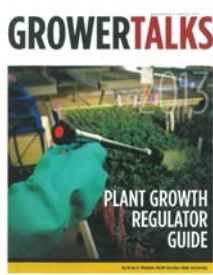
Ethephon – Keys to Use



- A cost effective method of controlling growth and increasing branching
- Acidify the solution to final solution pH of 4 to 5
- Allow the solution to dry slowly over 4 hours to enhance uptake
- Drench/liner dip applications increase the options for using ethephon
- Must manage timing to avoid flower delay
- Species and cultivars vary in response – conduct your own rate trials!

PGR Rate Guides for Floriculture

- Sponsored by Fine Americas, Inc.
- <http://www.fine-americas.com/>



For More Information:
 Joyce Latimer;
 jlatime@vt.edu
 540-231-7906
<http://www.hort.vt.edu/floriculture>

Floriculture

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