Objective: Evaluate PGR materials for improving branching pattern of hydrangea.

Experimental Design:

Target Species: Florist type *Hydrangea macrophylla* 'Merritt's Supreme' or landscape type *Hydrangea paniculata* 'Limelight'.

Use Site: Greenhouse or nursery field container.

Plot Size: Must be adequate to reflect commercial use conditions.

Replicates/plant number:

Nursery type hydrangea: Randomized block design with a minimum of 4 plants per 3blocks (i.e.12 plants per treatment rate) OR completely randomized design with a minimum of 12 plants.

Florist type hydrangea: Since this type of hydrangea is more likely to need a rescue application to address stalled growth of lateral branches use 4 plants per 4 blocks (i.e. 16 plants per treatment rate) in a Randomized block design or a completely randomized design with a minimum of 16 plants.

Plant Size: Rooted Butterfly/Y type cuttings or rooted pinched terminal cutting.

Pot Size: Florist type hydrangea, use 5" pot. Nursery type hydrangea, transplant up to 1 or 3 gallon pot.

Evaluations:

1. *Crop Safety*: phytotoxicity rating on a scale of 0-10 (0= No phytotoxicity; 10 = Complete kill). 1st) compared to the unpinched control. Take evaluations at 2 WAT (weeks after initial treatment). 2nd) 6 WAT (weeks after initial treatment).

2. *Plant Quality*: this is a subjective rating on a scale from 1 to 7 (see below) taken when a) 50% of the plants have developed buds and b) again at the close of the trial.
   - *1 = Significantly worse than unpinched control.*
   - *2 = Moderately worse than unpinched control*
   - 3 = *Slightly worse than unpinched control*
   - *4 = No difference from unpinched control*
   - *5 = Slightly better than unpinched control*
   - *6 = Moderately better than unpinched control*
   - *7 = Significantly better than unpinched control*

   b) *Number of Breaks*: count lateral shoots of Y cuttings at bud set (swollen stems).

   c) *Height and Width: a)* height in centimeters (cm) from top of media to top of plant canopy; b) average width e.g. widest part and 90 degrees to widest part of canopy.

   d) OPTIONAL: *Bloom response:* a) Count buds or blooms at end of season OR, days to first bloom, and b) bloom size approximately March/April of 2013 (0 to 10 with 5 equal to blooms of check; 0-4 smaller or fewer/worse than check, 6-10 larger/better than check.)

Recordkeeping: All operations, data and observations appropriate to this study should be recorded. It is helpful to review the Reporting Template. (See: http://ir4.rutgers.edu/ornamental/OrnReportingForm.pdf . Keep detailed records of weather conditions including temperature, precipitation and/or irrigation, and relative humidity with a minimum of high, low and average daily temperatures. Other information to record includes soil-type or soil-less media, application equipment, irrigation (type & frequency), liner size, plant height & width, and plant growth stage at application and data collection dates. Content of reports should be sufficient to fully understand how the experiment was conducted.

Photographs often illustrate experimental design, site conditions, and impacts of treatments very well. It is encouraged to include a picture or two of the greenhouse, field or landscape where the experiment is sited. It is highly encouraged that pictures illustrating treatment effects are taken if and when these impacts are visually apparent.

If different application methods or evaluations are made, please clearly specify differences in final report and explain reason for change.

Crop Culture and Application Timing:

Phase 1; Initial Rooting, Early Growth and PGR Applications

Approximately April: Plant cuttings in a 32 or 50 cell tray or other high density liner. Allow to root. Allow enough growth so that two new leaf nodes remain after pinching. Pinch the pinched control cuttings and the pinched treated cuttings, allowing for a non- pinched control and non-pinched treated as well (see treatment list). Allow plants to continue to grow 2 more weeks. Cull out odd plants.

June: Pot up.

Late June/July: Apply PGR Treatments paying attention to the Special Instructions in table below. Grow out in greenhouse or nursery as appropriate for type. Growing temperature should be 55F or above for treatment efficacy.

Late July/August: make both (2) crop injury evaluations at 2WAT and 6 WAT (after initial treatment). Take photos if desired.

Approximately 6-8 weeks after chilling evaluate plants for Plant Quality, Number of Breaks, Height and Width. Consider taking photos.

OPTIONAL PHASES

Phase 2, Defoliation/Chilling

October/November: defoliation; an abscission layer may have already begun to develop. If not, putting a bushel of apples in the cooler or using Florel may facilitate defoliation. Other chemical defoliants may cause phytotoxicity. Defoliating by hand is an option. Cutting peduncles about 1" up from the stem, allowing the wound to heal overnight before placing the plants into the cooler will help to avoid oozing and disease. Chill for a minimum of 6 weeks in the dark. Use storage temperatures of 4C until Christmas, then drop to 2C for 2 weeks and then lower to 1C for holding the plants until you are ready to force them. Ensure good air circulation to avoid cold air pockets (which can result in freeze damage e.g. mushy, water soaked leaves.)

After the plants are defoliated is a good time good time for photos.

Phase 3, Final Crop Growth and Bloom Response

January/February: Remove the plants from the cooler in the afternoon and place them in a warm spot out of the sun to allow the substrate and root system to warm up overnight. Repot the next day into a minimum of 6 1/2" pot. Move plants to warm greenhouse for fast forcing. The plants will bloom in 8 to 10 weeks with forcing being shorter as the storage time is extended.

Take bloom evaluation. Plants should be ready for Mothers' Day.

Application Instructions: Use water with pH 6.0 – 8.0 for tank mix. Foliar spray applications should be made using conventional spray equipment consistent with conventional commercial application equipment. To collect the best possible data, manage non-targeted pests and diseases which may damage crop. Make identical maintenance applications to treated and untreated plants. Calibrate application equipment prior to application. Read all available labels before making applications. Avoid treating plants under unusually extreme environmental conditions.

Treatment List:

Product	Priority	Rate	Special Instructions*	Contact Information
Augeo - pinched (dikegulac sodium)	A	400 ppm (0.25 fl oz/gal) 800 ppm (0.50 fl oz/gal 1600 pm (1.0 fl oz/gal)	Use water with pH 6-8. Apply 2 qt./100 sq. ft. as an even wet spray to leaves and stems.	Dave Barcel, OHP, dbarcel@ohp.com 262-392-3004
Augeo - unpinched	A	400 ppm (0.25 fl oz/gal) 800 ppm (0.50 fl oz/gal 1600 pm (1.0 fl oz/gal)		
ProGibb (GA)	B	25 ppm	If lateral branches appeared to have stalled growth apply at 4-6 weeks after Augeo.	Joe Chamberlin, Valent, 770-985-0303 Joe.Chamberlin@valent.com
Untreated pinched		--	--	
Untreated non-pinched				

*Read labels before treating.

Reports:

Reports are due 60 days after last data collection date.

Submit reports electronically on the standard IR-4 Ornamental Horticulture Research Report Form. The basic report can be sent in MS Word, the recordkeeping information as pdf or other electronic documents, the raw data in MS Excel or other suitable program such as ARM, and photographs can be submitted as picture embedded in the report or as separate jpg, bmp, or tiff files.

Please direct questions to:

Kathleen Hester, IR-4 HQ, Rutgers University, 500 College Road East, Suite 201W, Princeton, NJ 08540, Phone 732-932-9575 x4625, hester@aesop.rutgers.edu

OR

Cristi Palmer, IR-4 HQ, Rutgers University, 500 College Road East, Suite 201W, Princeton, NJ 08540, Phone 732-932-9575 x4629, palmer@aesop.rutgers.edu

Draft Date: 4/6/2012
Revised By: KAH