

A PICTORIAL HISTORY OF THE POT-IN-POT RESEARCH PLOTS AT STEPHEN F. AUSTIN STATE UNIVERSITY 2006 – 2009

This project was supported partially by a grant from the Texas Nursery and Landscape Association (TXNLA).

Feb 2006 – bed preparation – sand purchased and spread (120 cubic yards) to enhance drainage. \$720 for 200' of PIP row (200 containers). Nurserymen with sandy well-drained soils would not need this step – this is LaNana Creek bottomland, so we felt it prudent and sufficiently cost effective. A bobcat used to shape the bed with edges shaped by students..

March 2006 – Bed preparation; 200' 4' wide raised bed, 6' weed barrier – applied by hand. Mainlines set for drip irrigation system - (1 gph submatics).

March 2006 – Heath Lowrey cuts holes with a torch – the flashing was used to perfectly center holes and prevent fraying at hole edges.



March 2006 – two rows per bed -
triangular design – 20” X 24” –
3.45 square feet per container



March 2006, for the first year of
this project – we utilized
Rhododendron ‘G.G. Gerbing’
liners provided by Greenleaf
Nursery. Substrate was 90%
composted pine bark fines and
10% sand. Top dressed with slow
– release fertilizer



April 2006 – Bo Spears, Mast
Arboretum student assistant, puts
the irrigation system and battery
operated controller into action.
One single emitter per plant. Plant
water use recorded for the entire
experiment.



May 2006 – Experiment in place – 1st year’s study tests the effects of weed barrier color (white or black) and the effects of a center drip line timed to keep the soil moist between containers, thus perhaps cooler.



Summer 2006 – Temperature readings were taken in afternoon on sunny days. Pot in pot containers were markedly cooler than plants grown in full sun and comparable to plants grown in 50% shade. Temperatures were taken at edge of container, center of container and bottom of container. This figure demonstrates temperatures from the edge of containers.

Edge of the Container			
Reading	Shade Container	Full Sun Container	Pot-in-pot
9-Aug	95.75	116.25	95.5
15-Aug	100.25	119.87	101
24-Aug	98.75	117	98.25
31-Aug	96	117.25	97.75
7-Sep	97.5	118.75	93.75
14-Sep	98.25	118.75	95.75

Summer 2006 – view of the pot in pot – white weed barrier section – this illustrates the three drip lines per bed (two for irrigating the crop and one to keep soil moist between containers).



September 2006 – Brennan Whitehead, graduate research assistant, managed the plots during this first year’s project. G.G. Gerbing Azaleas were grown in three locations: this pot in pot plot, in the Mast Arboretum shade house (50% shade), and in a full-sun container yard. Growth measurements and pot temperature data collected throughout the experiment.



During the course of this study, Brennan monitored plant water use and this season long study (April – October) indicated the PIP crop used 45 gallons of water per plant.

Table 1. Irrigation usage throughout the 2006 growing season.

Irrigation Date	Length of Irrigation (mins/day)	Irrigation Amt (mls/day/pot)	Days of Irrigation/pot	Total Amt/pot (Liters)
April 7 - July 6	30	800	92	73.6
July 7 – Aug 7	40	900	31	27.9
Aug 8 – Aug 10	55	1150	2	2.3
Aug 11 – Aug 16	55 twice daily	2300	5	11.5
Aug 17 – Sep 5	45 twice daily	1900	20	38
Sep 6 – Oct 7	40	900	32	28.8
Total Amount/Season				182.1 L/pot (45.36 gallons/pot)

We concluded that this figure could be reduced with timelier monitoring of leaching rates and pulsing the daily rate into two or three applications per day (which is something we do currently). At the time of this first year study, our goal was to reach 10% leaching at each watering - which was done periodically on a random basis.

Dec 2006 – Brennan is cheerful – no plants died in the experiment – Brennan collects plants from our 50% shade house, sun container yard, and PIP plots to obtain data: plant height, dry weight, visual appeal rating scale, and dry weights of above ground parts.

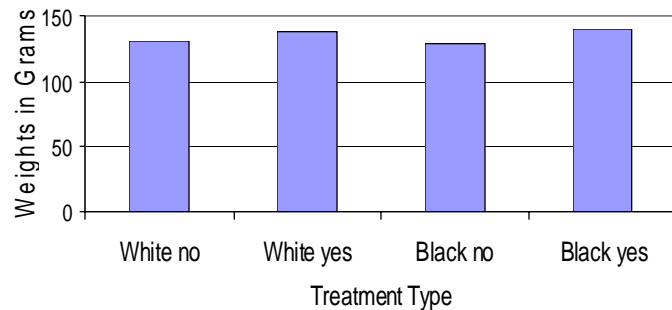


Dec 2006 – comparison of root systems; on left is G.G. Gerbing grown in a full sun container yard; on right is G.G. Gerbing grow in the pot in pot plots. Consistent differences, but not statistically analyzed because of differences in plot location, but visual evidence was impressive.



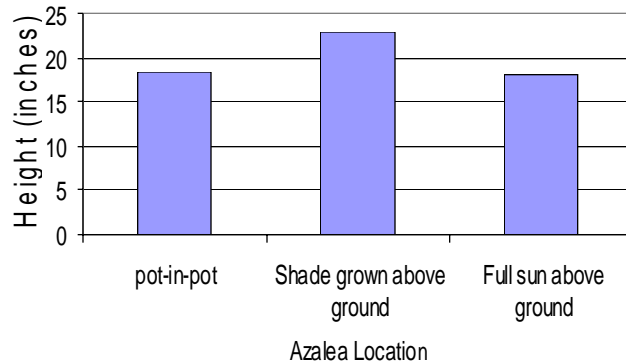
RESULT: Weed barrier color made no difference on growth of G.G. Gerbing azaleas in this study – data Shown here. A center line irrigation line created no significant differences in growth. We did not observe marked differences in temperature in the sections irrigated or not irrigated. It was always moist between all containers at all times.

Influence of weed barrier color (white or black) and in-line irrigation (yes/no) on growth of G.G. Gerbing azaleas in a pot-in-pot production



RESULT: – Plants grown in the shade house were taller

Influence of the three areas observed on the height of G.G. Gerbing azaleas



RESULT: Pot in pot plants were heavier - and had high quality ratings.

Comparisons of dry weight of G.G. Gerbing azaleas under three systems (gms)	
Pot-in-Pot	134.55
Shade grown above ground	93.91
Full sun above ground	106.37

In the second year of this TXNLA-SFA project (2007), we added more PIP container production space and repeated the experiment with Rhododendron ‘Autumn Rouge’ Encore azaleas. Results were much the same as with G.G. Gerbings. However, quality rankings in 2007 were lower than in 2006 due to a one time infestation with azalea lace bugs and less growth.

April 2007 – Laura Blackburn, SFA Horticulture undergraduate student, puts the final touches on two new beds. Brings PIP container production area to 600 containers.



May 2009 – this year’s project was managed by Ms. Lijing Zhou, PhD student whose main research work focuses on *Taxodium* salinity and alkalinity tolerance. Liners were stuck in April and Lijing produced a nursery crop with 12 different woody ornamentals, with special emphasis on plants normally grown in part shade.



OCT 2009 – two crops that performed well in our sunny PIP plots in 2009. *Hydrangea quercifolia* (Oakleaf Hydrangea) and *Clethra alnifolia* (Summersweet), both normally grown by nurserymen in our area in part shade conditions, were tight, stiff and had good branching.



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For the full version Brennan Whitehead’s MSc 2008 thesis, go to: <http://ag.sfasu.edu/UserFiles/File/MAST%20ARBORETUM/potinpot.pdf>