

# Evaluation of Acti-Gro™ Plus 3<sup>R</sup>

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**Nature of Work:** Acti-Gro™ Plus 3<sup>R</sup> is a super absorbent polymer/zeolite blend for nurseries, landscapes, turf and gardens. The material is reported to hold water and nutrients in the root zone, reducing irrigation needs and nutrient leaching. The product was submitted for evaluation under container nursery production conditions in a bark-based potting mix. The product was evaluated under reduced fertilizer and irrigation levels.

On March 31, 1998, three-inch Girard Hot Shot azalea liners were potted up into trade gallons. The potting mix was bark/sand (6:1) with four pounds of dolomitic lime, two pounds of gypsum, and two pounds of Micromax micro nutrient mix per cubic yard. The treatments were 0# and 2# Acti-Gro Plus 3 /yd<sup>3</sup>. High N 23-4-8 controlled release fertilizer was applied as a topdress at two rates, 15g (normal application) and 7g (½ rate).

The crop was placed under normal irrigation (as needed) and under reduced irrigation (approximately 60% of normal). The 60% of normal was applied two to four times each week with enough water at each irrigation to wet the entire pot. Irrigation and rainfall was monitored with four rain gages in each irrigation plot. Each weeks irrigation to the reduced irrigation plot was adjusted to apply approximately 60% of the normal. At seasons end the actual application and rainfall amount was actually higher than the desired 60% reduction. A 105.9" of water occurred from April 23 to October 17 under the normal irrigation treatment and 75.4" under the reduced irrigation making the reduced level 71% of the normal.

Twenty-five plants of each treatment were potted up and were watered the same from March 31 to April 22 to allow establishment and full saturation of the Acti-Gro product. The two irrigation treatments started on April 22, 1998 with pots placed on 12" centers and completely randomized. Two rows of one-gallon azaleas were placed completely around each irrigation block as a border to eliminate any edge effect. Plants were grown in full sun under standard nursery conditions throughout the season.

Leaf-tissue samples were sampled on July 30 and October 21, 1998 from three plants from each treatment and submitted for nutrient analysis at the University of Georgia Soil Testing Laboratory. The nutrient levels in the plant tissue show the uptake under the various treatments at mid- and end-of-season. A visual ranking of the treatments was conducted on October 7 by nurserymen and product representatives. On October 21, 1998, the tops of ten plants from each treatment were cut at the soil line and dried completely. The dry tops were weighed and used as the measure of growth for the 1998 season.

**Results and Discussion:** The July leaf-tissue nutrient levels under 60% irrigation had the nitrogen levels (N below 2%) and iron levels (Fe below 50 ppm) mostly low (Table 1). The zinc (Zn under 15 ppm) was low for nearly all treatments. There does not appear to be any significant differences between nutrient levels with-in the Acti-Gro treatments. The reduced irrigation reduce the nitrogen, phosphorous, calcium, magnesium, manganese, iron, copper and zinc levels in the leaf-tissue. Potassium levels increased under the 60% irrigation treatment. Reduced irrigation reduced nutrient accumulation in the leaves.

On October 21 in the leaf tissue, the nitrogen (N below 2%), phosphorous (P below 0.2%), potassium (K below 0.8%), iron (Fe below 50 ppm) and copper (Cu below 6 ppm) were mostly low for all treatments (Table 2). The Acti-Gro treatments showed little differences as well as the 60% normal irrigation. No nitrogen rate differences were evident. The zinc was higher than the July 30 levels. The fertilizer appeared to have run out and low nutrient levels are now showing up in the tissue.

The top dry weights showed no significant differences between the 0# and 2# rate of Acti-Gro (Figure 1). The 15g nitrogen produced more top dry weight than the 7g nitrogen treatment. Normal irrigation produced almost twice as much top dry weight as did the 60% normal irrigation treatment.

The nursery and product representatives visually ranked the plants for quality (Figure 2) and placed the 0# rate of Acti-Gro above the 2# rate at 15g High N fertilizer under normal irrigation and at 7g High N under 60% irrigation. The 0# and 2# Acti-Gro rates were ranked nearly equal for the 7g High N under normal irrigation and the 15g High N under 60% irrigation. The Acti-Gro applications were not better than the treatments without the Acti-Gro.

**Figure 1. Girard Hot Shot Azalea Top Growth**



## Figure 2. Girard Hot Shot Azalea Visual Quality Ranking



**Table 1. Girard Hot Shot Azalea with Acti-Gro™ Plus 3<sup>R</sup> Treatments  
Leaf Tissue Nutrient Analysis / July 30, 1998**

Treatment	N	P	K	Ca	Mg	Mn	Fe	Cu	Zn			
0# Acti-Gro, 15g Fert, N - Irr*				4.1	.41	1.97	3.47	.63	248	151	8.1	14
2# Acti-Gro, 15g Fert, N - Irr				4.2	.41	1.88	3.78	.72	252	146	8.1	16
0# Acti-Gro, 7g Fert, N - Irr				4.2	.39	1.84	3.20	.52	258	164	7.4	12
2# Acti-Gro, 7g Fert, N - Irr				3.9	.39	1.93	3.77	.66	276	140	6.5	11
0# Acti-Gro, 15g Fert, 60% - Irr				1.6	.28	2.51	.92	.27	47	50	6.5	4
2# Acti-Gro, 15g Fert, 60% - Irr				1.4	.22	2.28	.59	.21	39	44	7.5	2
0# Acti-Gro, 7g Fert, 60% - Irr				2.2	.35	2.74	1.04	.35	64	58	5.5	6
2# Acti-Gro, 7g Fert, 60% - Irr				1.8	.28	2.58	.82	.26	49	45	7.3	4

\* 0# Acti-Gro / yd<sup>3</sup>, 15 grams Fertilizer/pot, Normal Irrigation

**Table 2. Girard Hot Shot Azalea with Acti-Gro™ Plus 3 Treatments  
Leaf Tissue Nutrient Analysis / October 21, 1998**

Treatment	N	P	K	Ca	Mg	Mn	Fe	Cu	Zn
0# Acti-Gro, 15g Fert, N - Irr*	1.4	.11	.69	.76	.28	105	48	3.2	23
2# Acti-Gro, 15g Fert, N - Irr	1.4	.09	.68	.86	.29	113	45	3.2	21
0# Acti-Gro, 7g Fert, N - Irr	1.3	.09	.56	.94	.33	169	61	3.9	28
2# Acti-Gro, 7g Fert, N - Irr	1.2	.06	.58	.91	.30	146	48	3.2	24
0# Acti-Gro, 15g Fert, 60% - Irr	1.7	.11	.81	.61	.27	95	56	5.4	29
2# Acti-Gro, 15g Fert, 60% - Irr	1.6	.10	.80	.71	.30	112	59	5.3	30
0# Acti-Gro, 7g Fert, 60% - Irr	1.4	.10	.68	.76	.32	141	61	6.1	31
2# Acti-Gro, 7g Fert, 60% - Irr	1.5	.09	.65	.75	.31	130	48	5.8	27

\* 0# Acti-Gro / yd<sup>3</sup>, 15 grams Fertilizer/pot, Normal Irrigation

**Significance to the Industry:** Acti-Gro™ Plus 3<sup>R</sup> is reported hold water and nutrients in the root zone of soils and increase growth. The product was evaluated under container nursery production conditions with a pine bark potting mix. It was tested at 2# /yd<sup>3</sup> under normal (15g High N) and half rate fertilization (7g High N), and under normal and ≈60% normal irrigation rate. The product at this rate did not improve top growth or visual quality over the standard practices.