Does the lime in your potting mix affect your azalea growth?

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Nature of Work: In the spring on March 26,1998 three inch Hinodegiri azalea liners were potted up into trade gallons. The potting mix was bark/sand (6:1) with four dolomitic lime rates and two gypsum rates. The lime was incorporated at 4# / yd^3, 6# / yd^3, 8# / yd^3, and 10# / yd^3. The gypsum was incorporated at 0# / yd^3 and 2# / yd^3. High-N 23-4-8 controlled release fertilizer was incorporated at 16# / yd^3 along with 2# of Micromax micro nutrient mix. On April 23, 1998 the azalea treatments were spaced about 12" apart and two guard rows of potted azaleas were placed around the outside of the randomized treatments. Plants were grown under standard nursery practices throughout the season, providing adequate irrigation and pest control.

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. On November 11, 1998 the tops of ten plants from each treatment were lifted up while the pots were held firm. The length of the intact root ball was measured from the top to the bottom to give an indication of the root development. The potting mix was sampled by combining mix from three pots in each treatment and submitting the samples to the University of Georgia Soil Testing Laboratory for nutrient analysis. Leaf tissue samples were similarly sampled from three to five plants from each treatment and submitted for nutrient analysis.

Results and Discussion: The 4# / yd^3 of dolomitic lime produced more top growth than all the other treatments (figure 1). There were no top growth differences between the 6#, 8# and 10# / yd^3 treatments. The 0# / yd^3 rate of gypsum was not different from 2# / yd^3. Therefore, by seasons end the gypsum had no effect on total top growth. The rooting depth in the pot in November showed great differences. The 8# / yd^3 rate produced plants with deeper roots than 10# / yd^3, 6# / yd^3 was deeper than 8# / yd^3, and 4# / yd^3 was deeper than 6# / yd^3 (figure 2). The roots in the 4# / yd^3 rate filled the pots completely holding the root ball together where none of the other treatment were able to do this (photo 1).

Table 1. Hinodegiri Azalea Lime / Gypsum Treatments
Potting Mix Nutrient Analysis

Treatment	pH	NH_4	Ca	Mg
4# Lime, 0# Gypsum	3.9	21	18.1	7.0
6# Lime, 0# Gypsum	4.3	14	20.5	9
8# Lime, 0# Gypsum	5.1	11	27.5	20.2
10# Lime, 0# Gypsum	5.4	5	16	10.7
4# Lime, 2# Gypsum	4.1	8	18	7
6# Lime, 2# Gypsum	4.4	15	30.6	13.4
8# Lime, 2# Gypsum	4.8	11	28.7	13.6
10# Lime, 2# Gypsum	5.2	6	26.6	14.5

Table 2. Hinodegiri Azalea Lime / Gypsum Treatments

Leaf Tissue Nutrient Analysis

Treatment	Ca	Mg	Mn	Fe	Cu	Zn
4# Lime, 0# Gypsum	1.02	.33	185	47	7	30
6# Lime, 0# Gypsum	.84	.34	95	46	5	25
8# Lime, 0# Gypsum	.83	.33	90	40	5	24
10# Lime, 0# Gypsum	.81	.36	94	56	6	26
4# Lime, 2# Gypsum	1.09	.39	273	50	6	30
6# Lime, 2# Gypsum	.86	.33	126	48	6	24
8# Lime, 2# Gypsum	.89	.36	90	39	6	26
10# Lime, 2# Gypsum	.77	.33	100	45	5	20

The nutrient analysis of the potting mix showed a direct increase in pH and Magnesium (Mg) as the rate of lime increased (table 1). The NH_4 levels decreased with increasing lime levels. No pattern appeared associated with the potting mix levels for NO_3, P, K, and Ca. The calcium and magnesium levels were below the recommended levels. The leaf tissue nutrient levels show a decline in calcium, manganese and zinc with increasing lime levels (table 2). All these nutrient levels in the tissue were within the acceptable levels for good growth.

Significance to the Industry: The incorporation of dolomitic lime above 4# / yd^3 in the potting mix of Hinodegiri azaleas did reduce the top growth and significantly reduce root growth. The azaleas with 4# / yd^3 lime produced roots all the way to the bottom of the pots and held the mix together. Higher lime levels all reduced the development of the root system.

The potting mix pH was much higher with additional lime and the NH_4 levels were lower. The calcium and magnesium levels were generally higher with increased lime levels. The recorded calcium and magnesium levels are below what are generally recommended based on UGA Nursery Media Analysis. In the leaf tissue the calcium, manganese and zinc levels were lower with increased lime levels but not below recommended levels.

Azalea producers should determine if reduce lime incorporation levels will improve their azalea top and root growth.