



Loropetalum Screening for High Lime Induced Abnormalities

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Nature of Work:

Sizzling Pink *Loropetalum* has developed leafless twigs and produced less top growth when grown in high lime potting mixes. Other *Loropetalum* cultivars have been reported to exhibit similar symptoms under various production conditions. A manganese deficiency is suspected of causing the unusual abnormality in past years based on low levels in the plant tissue. A screening of widely produced cultivars would help to identify those most susceptible to this problem.

Uniform 2 1/4" liners of Ruby, Burgundy, Sizzling Pink and Zhuzhou *Loropetalum* were potted into trade gallons on March 29, 2000. The potting mix was a 6:1 ratio of pine bark and sand. The mix was amended with 4# or 8# of dolomitic lime per cubic yard, 1.5# Micromax per cubic yard, and 14# Osmocote Pro 23-4-8 per cubic yard (the medium rate). A manganese sulfate treatment was surface applied at 0 grams or 3 grams per pot on July 25, 2000. Twelve replicates of each treatment were completely randomized within cultivars in the available space. All plants were grown under standard nursery conditions.

A complete nutrient analysis of the potting mix and leaf tissue samples were done in late October at the end of the trial on Sizzling Pink *Loropetalum*. A combined sample from three pots in each treatment were collected for both the potting mix and the leaf samples. These analysis should show the nutritional status of the media and the plants at seasons end.

The crops were harvested in late October with ten replicates for each treatment. All top growth was removed at the soil line, placed in paper bags and placed in a walk-in dryer for two weeks at 120°F. The plant stems and leaves were completely dried and weighed to record the plant top growth dry weight. This dry weight accurately reflects the growth of the crops during the production season and is used to statistically compare growth of the treatments.

Results and Discussion:

The potting mix and leaf tissue analysis was sampled on October 31, 2000 for Sizzling Pink *Loropetalum*. The other cultivars were not sampled. The potting mix pH was low for all treatments, but increased with each increase in the lime rate. The soluble salts, NO₃, NH₄, and phosphorous levels were all acceptable. The nutrient levels of potassium, calcium, and

magnesium were mostly low. The leaf tissue nutrient levels had nitrogen slightly low while the phosphorous, potassium, magnesium, boron, copper and zinc were all low. The calcium levels were all acceptable. The manganese levels were low for the 0 g. manganese treatment and were acceptable for the 3 g. manganese treatment. The potting mix manganese levels followed the same pattern as the manganese tissue levels.

The potting mix levels of calcium and magnesium generally increased with increased lime levels. The tissue levels of calcium increased with 4# and 8# lime treatment over the 0# lime treatment. There did not appear to much calcium difference between the 4# and 8# lime treatments. The magnesium levels did increase with increasing lime treatment levels in the potting mix and leaf tissue. However, the magnesium levels were low for all treatments. This suggests possible low magnesium in the lime source.

Table 1. Sizzling Pink Loropetalum Potting Mix Nutrient Analysis B October 2000						
Treatments	0# Lime 0 g. Mn	0# Lime 3 g. Mn	4# Lime 0 g. Mn	4# Lime 3 g. Mn	8# Lime 0 g. Mn	8# Lime 3 g. Mn
pH	3.5	3.4	3.8	3.8	4.4	4.3
SS (<i>mmhos</i>)	0.84	1.2	0.82	0.84	0.9	1.57
NO ₃ (<i>ppm</i>)	44	73	51	50	58	99
NH ₄ (<i>ppm</i>)	32	54	29	35	26	63
P (<i>ppm</i>)	8.1	11.1	5.6	6.2	5.5	7.0
K (<i>ppm</i>)	35	51	35	40	35	57
Ca (<i>ppm</i>)	17	20	25	15	36	54
Mg (<i>ppm</i>)	7	7	15	11	26	31
Mn (<i>ppm</i>)	1.7	22.4	2.6	14.6	2.1	12.3
Zn (<i>ppm</i>)	0.59	0.73	0.51	0.50	0.39	0.66

Treatments	0# Lime 0 g. Mn	0# Lime 3 g. Mn	4# Lime 0 g. Mn	4# Lime 3 g. Mn	8# Lime 0 g. Mn	8# Lime 3 g. Mn
N (%)	1.4	1.3	1.3	1.2	1.1	1.3
P (%)	0.07	0.06	0.08	0.07	0.07	0.08
K (%)	0.9	0.9	0.7	0.6	0.6	0.6
Ca (%)	0.7	0.7	1.1	1.0	1.1	1.2
Mg (%)	0.11	0.01	0.12	0.12	0.16	0.17
B (<i>ppm</i>)	23	25	16	16	20	19
Cu (<i>ppm</i>)	2.6	3.0	1.9	3.3	2.3	2.7
Fe (<i>ppm</i>)	54	69	55	45	65	137
Mn (<i>ppm</i>)	25	120	14	156	13	413
Zn (<i>ppm</i>)	13	14	15	15	12	20

The top dry weight of each cultivar tested was statistically analyzed using ANOV. The Burgundy Loropetalum increased in weight with the lime treatment. The 4# and 8# lime treatments increased top growth dry weight over the 0# lime treatment. The 4# and 8# lime treatments were not different from each other (Table 3). There were no manganese treatment effects. The 4# lime treatment dry weight mean was higher but not significantly so.

Ruby Loropetalum showed the same results as Burgundy. The 4# and 8# lime treatments increased the dry weight over the 0# lime treatment. The 4# and 8# lime treatments were not different from each other. There were no manganese treatment effects. The 4# lime treatment dry weight means were higher, but not significantly so (Table 3).

Sizzling Pink Loropetalum had differences in lime and manganese treatments. The 8# lime treatment was greater than the 4# lime treatment, which was greater than the 0# lime treatment. The 3 g. manganese treatment produced significantly more growth than the 0 g. manganese treatment (Table 3).

Zhuzhou Loropetalum produced differences between the lime treatments but no manganese treatment differences. The 8# lime rate produced more dry weight than the 4# lime rate, which produced more growth than the 0# lime rate (Table 3).

Table 3. Loropetalum Cultivar Dry Weight Statistical Analysis		
Treatments Lime & Manganese	Mean Dry Weight (g)	Non-Significant Range*
Burgundy 0# Lime	39.2	a
Burgundy 4# Lime	60.9	b
Burgundy 8# Lime	53.7	b
Ruby 0# Lime	48.2	a
Ruby 4# Lime	66.4	b
Ruby 8# Lime	60.0	b
Sizzling Pink 0# Lime	21.7	a
Sizzling Pink 4# Lime	47.0	b
Sizzling Pink 8# Lime	56.5	c
Sizzling Pink 0g MnSO ₄	37.1	a
Sizzling Pink 3g MnSO ₄	46.4	b
Zhuzhou 0# Lime	31.8	a
Zhuzhou 4# Lime	41.2	b
Zhuzhou 8# Lime	51.7	c
*Treatments means sharing the same letter are not significantly different using the Student-Newman-Keuls test.		

Summary:

The increasing lime rates increased the pH of the potting mix at seasons end for Sizzling Pink Loropetalum. However, the pH was still very low for all treatments. The potting mix was low for both calcium and magnesium at seasons end. The leaf tissue was acceptable for calcium but low for magnesium. This suggests the magnesium ran out early or was low in this lime source. The addition of 3 g. manganese sulfate in July increased the manganese in both the potting mix and the leaf tissue. The 0

g. manganese treatments were low on October while the 3 g. manganese treatment were acceptable. The addition of 4# and 8# dolomitic lime improved growth for all loropetalum tested. For Burgundy and Ruby there was no difference between the 4# and 8# treatments. For Sizzling Pink and Zhuzhou, the 8#lime treatments produced more growth than the 4# lime rate. The 3 g. manganese treatment was effective in improving growth on the cultivar Sizzling Pink. No improvement was seen on any of the other cultivars.

No deformed leaves or leafless twigs were observed during this trial. The lime rate or quality of the lime source may have contributed to this lack of symptoms, that have been seen in the past. These Loropetalum cultivars do require supplemental lime to maximize growth. Burgundy and Ruby produced more growth at 4# dolomitic lime while Sizzling Pink and Zhuzhou produced more growth at 8# dolomitic lime. In past trials, Sizzling Pink Loropetalum produced more growth at 4# dolomitic lime than 8#. However, these were different sources of lime. These difference is probably due to differences in lime products. All lime is not created equal.