Evaluation of *Abelia grandifolia* ›Edward Goucher= Foliage Yellowing

Dr. James T. Midcap
Department of Horticulture
The University of Georgia
Athens, GA 30602

Nature of Work:

Edward Goucher Abelia frequently become yellow and unsalable during the production season. Attempts to identify the problem by evaluating the leaf tissue and potting mix nutrient levels have been unsuccessful. Solution attempts by applying lime, fertilizer and foliar sprays of micro nutrients have not worked.

Abelia H grandiflora ›Edward Goucher= cutting were stuck on May 9, 2000 in trade gallons filled with bark and sand (6:1). The potting mix was amended with Micromax at 0 #, 0.75# and 1.5# per cubic yard and with dolomitic lime at 0#, 4# and 8# per cubic yard. Osmocote Pro 23-4-8 was incorporated at 14# (medium rate) per cubic yard. Twenty replicates of each treatment were rooted and moved on to the production bed. Plants were grown under standard nursery conditions and maintained healthy and weed free.

A complete nutrient analysis of the potting mix was done in late October at the end of the trial. A combined sample from three pots in each treatment were collected for the potting mix. This analysis should show the nutritional status of the media at seasons end.

The ten abelia plants were measured (height and width) from each treatment using the smallest plants produced. Height was measured from the top of the potting media to the tip of the tallest branch. Width was the average of two measurements across the width of the plant.

The crop was harvested in late October with ten replicates for each treatment of the largest plants produced. 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 dry and were weighed to record the plant 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.
A second study was started on August 10, 2000. Trade gallons of very yellow Edward Goucher Abelia were moved to CANR from a nursery. Ten plants each were top dressed with 1/4 teaspoon of iron chelate (13.2% Fe), manganese sulfate (29% Mn), zinc sulfate (36% Zn) or left untreated (Control). Plants were maintained under standard nursery conditions.

Results and Discussion:

The potting mix nutrient analysis was sampled on October 31, 2000 for Edward Goucher Abelia. The mix pH was low for the 0# and 4# Lime treatments, but increased with each increase in the

lime rate (Table 1). The 0# Lime treatment had acceptable levels for NO_3 and NH_4 nitrogen, phosphorous while it was low for all other elements.

Table 1. *Abelia H grandiflora* ›Edward Goucher= Potting Mix Nutrient Analysis B October 2000						
Treatments	**0# Lime 0# Micromax**	**0# Lime 0.75# Micromax**	**0# Lime 1.5# Micromax**	**4# Lime 0# Micromax**	**4# Lime 0.75# Micromax**	**4# Lime 1.5# Micromax**
pH	3.9	3.5	3.9	4.1	4.5	4.4
SS *(mmhos)*	0.6	0.6	0.5	0.9	1.2	0.4
NO_3 (*ppm*)	39	43	31	66	81	23
NH_4 (*ppm*)	39	31	26	42	51	13
P (*ppm*)	8.9	6.4	4.1	8.9	9.3	2.8
K (*ppm*)	37	33	25	45	65	18
Ca *(ppm)*	7.4	13.3	6.8	35	43	16
Mg *(ppm)*	2.4	3.9	2.2	15	20	8

Table 1. Continued			
Treatments	**8# Lime 0# Micromax**	**8# Lime 0.75# Micromax**	**8# Lime 1.5# Micromax**
pH	5.9	6.1	5.5
SS *(mmhos)*	1.0	1.0	1.2
NO_3 (*ppm*)	70	63	83
NH_4 (*ppm*)	16	15	34
P (*ppm*)	6.5	5.4	6.4
K (*ppm*)	44	44	43
Ca *(ppm)*	58	58	56
Mg *(ppm)*	38	39	34

The 4# Lime treatment with 1.5# Micromax was low for all elements. The 0# and 0.75# Micromax treatment levels were acceptable for soluble salts, NO_3 and NH_4 nitrogen, phosphorous and potassium. The calcium and magnesium levels were low. The 8# Lime treatment levels were acceptable for soluble salts, NO_3 and NH_4 nitrogen, phosphorous and magnesium. Potassium was slightly low and calcium was low.

The height and width of the Abelia plants showed significant effects from the Lime and Micromax treatments. The 4# and 8# Lime treatments produced the largest plants (height and width) and were not different, while the 0# Lime treatment produced the smallest plants. The 0# and 0.75# Micromax treatments produced the largest plants, while the 1.5# Micromax treatment produced the smallest plants (Table 2).

Table 2. Edward Goucher Abelia Height & Width Statistical Analysis

Treatments Lime & Micromax	Mean Height (in)	Non-Significant Range*	Mean Width (in)	Non-Significant Range*
0# Lime	1.7	a	1.6	a
4# Lime	7.3	b	11.6	b
8# Lime	7.4	b	14.0	b
0# Micromax	6.4	a	11.3	a
0.75# Micromax	6.8	a	10.7	a
1.5# Micromax	3.2	b	5.1	b

*Treatments means sharing the same letter are not significantly different using the Student-Newman-Keuls test.

The dry weight of the treatments showed that the 4# and 8# Lime treatments produced significantly more growth than the 0# Lime treatment (Table 3). There was no significant differences between the Micromax treatments, although the 1.5# Micromax treatment produced the lowest dry weight.

Results of the cutting study show an apparent lack of rooting and growth when the lime rate was zero. The 4# and 8# Lime treatments were significantly better. The 0# and 0.75# Micromax treatment produced better plants than the 1.5# Micromax treatment. The 0# Lime and 1.5# Micromax treatments

were the poorest by far. Further study is needed to confirm that the normal rate, 1.5# of Micromax, may interfere with rooting and future growth of Edward Goucher Abelia.

Table 3. Edward Goucher Abelia Dry Weight Statistical Analysis

Treatments Lime & Micromax	Mean Dry Weight (grams)	Non-Significant Range*
0# Lime	4.6	a
4# Lime	24.1	b
8# Lime	26.1	b

*Treatments means sharing the same letter are not significantly different using the Student-Newman-Keuls test.

In the second study, yellow Edward Goucher Abelia were moved to CANR and treated with the 1/4 teaspoon iron chelate showed an increase in green foliage within one week. Six weeks later the iron treated plants were dark green with significant new growth. The control plants were beginning to show some green probably due to the lower temperatures of fall and an increase in natural rainfall. The manganese and zinc treated plants were still bright yellow with little new growth. High levels of manganese or zinc can cause iron deficiencies. The topdress of iron chelate was effective in overcoming the summer chlorosis almost immediately.

Summary:

The addition of 4# and 8# Lime increased the October potting mix nutrient levels of NO_3, potassium, calcium and magnesium over the 0# Lime rate. There was no benefit of applying the 8# Lime rate, which would be more expensive. The 1.5# Micromax treatment reduced the available nutrient levels for the 4# Lime treatment.

Plant growth represented by height, width and top dry weight, was significantly greater at the 4# and 8# Lime treatments. The 0# Lime rate was very poor. Some lime is necessary in the propagation mix for proper rooting and growth of Edward Goucher Abelia.. The 1.5# Micromax treatment reduced plant height and width, but did not affect plant dry weight. The 1.5# Micromax rate may affect cutting size and growth, or it may not. Further study is necessary to determine if it interferes with rooting.

Chlorotic yellow Abelias did respond to top dressing with iron chelate at the 1.2 teaspoon (3 g) rate. Heavily deficient plants may not respond to foliar sprays due to the severe deficiency. Tissue analysis may not help identify this problem as an iron deficiency.