

Vital Earth Resources

706 East Broadway, Gladewater, Texas 75647
(903) 845-2163 FAX: (903) 845-2262

2004 Crop Results

Vitazyme on Boston Ferns

Researcher: Paul W. Syltie, Ph.D. **Location:** Vital Earth Resources Research Greenhouse, Gladewater, Texas
Species: Boston fern [*Nephrolepis exaltata*, var. *Bostoniensis*]
Planting date: March 21, 2003; a fern root mass was divided into six equal-sized portions
Planting media: Vital Earth Ultra-Blend **Pot size:** 2 gallons
Experimental design: The potted ferns were placed in the greenhouse in a replicated pattern (3 reps); three pots treated with Vitazyme periodically during the duration of the study to investigate effects on fern growth.

1. Control

2. Vitazyme

Fertilization: 0.5 tsp of a 21-7-12 + micronutrients Carl Pool fertilizer, applied about every 4 months to each pot and watered in

Vitazyme application: (1) At planting, the pots were saturated with water, and the Vitazyme treated pots received 100 ml of a 1% solution. (2) Vitazyme was applied periodically during the test period, usually as a soil drench of 200 ml of a 0.1% solution every 3 to 4 months, but on March 5, 2004, as a 3% Vitazyme spray on the leaves of the appropriate plants.

Growth results: On August 11, 2004, measurements were taken of total plant and pot weight, plus young shoot growth, of each pot.

Plant and Pot Weight

Treatment	Plant/Pot weight*	
Change	lb	lb
Control	10.69a	—
Vitazyme	11.21a	0.52 (+5%)

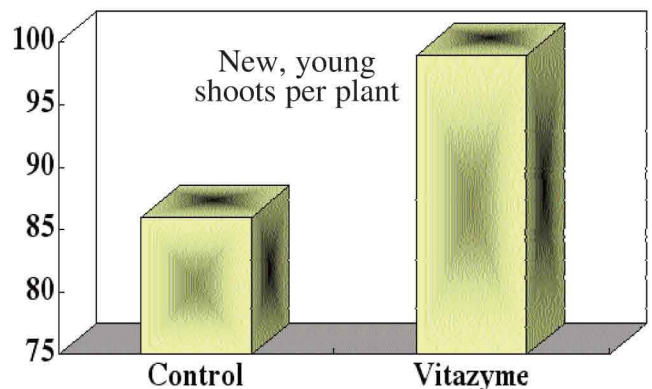
* The pots were saturated with water and allowed to drip until dripping ceased, insuring there were no differences in weight due to differences in evapotranspiration. Differences in soil volume for pots could not be accounted for by weighing the entire pot, but all pots were quite uniform, and differences were slight. Means followed by the same letter are not significantly different according to the Student-Newman-Keuls Test

(P = 0.1).

New Plant Growth

Treatment	New shoots*	Change
	number	number
Control	86.0b	—
Vitazyme	99.0a	13.0 (+15%)

*All shoots and leaves of whatever size (including newly emerging leaves) were counted for each pot that were above the horizontal plane, and were not hanging below it. Means followed by the same letter are not significantly different according to the Student-



Increase in new leaf growth: + 15%

Newman-Keuls Test ($P = 0.1$). $LSD_{0.1} = 6.1$ shoots.

Conclusions: This greenhouse fern study with Vitazyme revealed that the product caused a small (5%) but non-significant increase in total leaf and root mass, but the number of young leaves and emerging fronds was significantly greater (+15%) with the Vitazyme treatment. Not measured but noted visually in this study were the following items:

- (1) Vitazyme produced fuller leaves and a more attractive, balanced leaf canopy.
- (2) The leaves of Vitazyme treated ferns were, in general, darker green, containing more chlorophyll for greater growth potential.

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2001 Crop Results

Vitazyme on Gypsophylla A Testimonial

Researcher: Blanca Alvarado, Summer Zone, Quito, Ecuador

Cooperator: Ing. Fernando Guerra

Company: Flor Eterna S.C.C., south of Quito Ecuador

Variety: Million Star

Location: outdoor field nursery

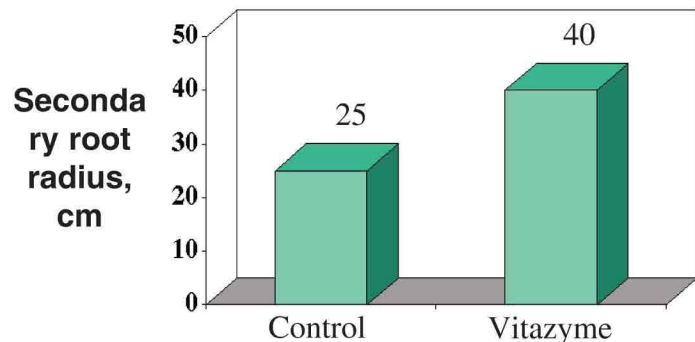
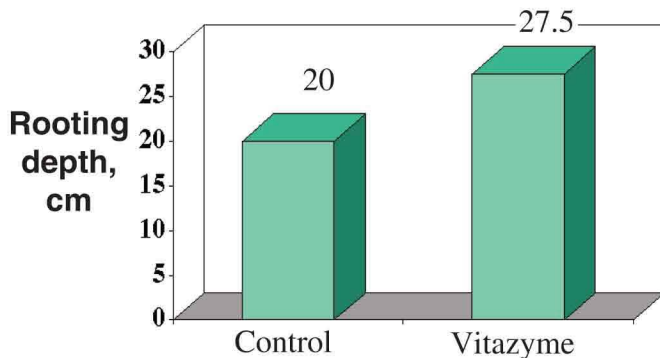
Growth environment: mountain soils with two extra hours of artificial light per day, to achieve a 14-hour day

Experimental design: Areas of the field were treated with Vitazyme in three ways:

1. Soil drench
2. Foliar spray
3. Combined soil drench and foliar spray

“From the experience we had with Vitazyme, we can certify the following:

- From the results we’ve obtained, we can assure that **the product helped the root area to grow in a better way, compared with the control, obtaining a depth of 25 to 30 cm, while the control got to 20 cm. It [also] increased the lateral root growth of the secondary roots, reaching a lateral cover of 40 cm in radius, different from the control that reached a 25 cm radius.**”



- “The foliar applications helped to increase the photosynthetic area, increasing the number of lateral stems and the number of leaves.”
- “It also had an effect in the **crop cycle, shortening it in one week**; this caused a **decrease in the final weight of the stems**, because it did not complete its normal cycle.”
- “As a conclusion of this test, we can assure that **the product behaved as expected, helping in the development of the root mass and increasing the photosynthetic area of the plants**”

Ing. Fernando Guerra
Flor Eterna S.C.C.

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2000 Crop Results

Vitazyme on Woody Ornamentals — Boxwood, Azalea, and Holly —

Grower: Floyd Trammel, TramTex Nursery

Location: Tyler, Texas

Researcher: Paul W. Syltie, Vital Earth Resources

Test initiation: September 16, 1999

Plants: Wintergreen Boxwood, "Fashion Azalea", Dwarf Burfordi Holly

Test termination: May 30, 2000

Experimental design: Twenty approximately equal-sized plants were selected for each of the plant types for the three trials. These plants were growing in one-gallon pots and placed in a greenhouse at TramTex Nursery. Ten pots for each plant type served as replicates for the Vitazyme treatment, and ten pots served as controls. Each pot was appropriately labeled. The design was completely randomized.

1. Control

2. Vitazyme

Fertilizer treatments: standard for the greenhouse

Pesticide treatments: standard for the greenhouse

Vitazyme applications: Vitazyme was applied three times during the course of the study: September 10, 1999 (16 oz of a 1% solution per pot), January 20, 2000 (4 oz of a 1% solution per pot), and March 24, 2000 (4 oz of a 1% solution per pot).

Growth results: Values for maximum branch length and number of branches were determined at the start of the study on September 10, 1999, to establish a baseline of data and permit a calculation of growth increases. Values were determined at the conclusion of the study on May 30, 2000. Increases in branch length and branch number were calculated for this time period.

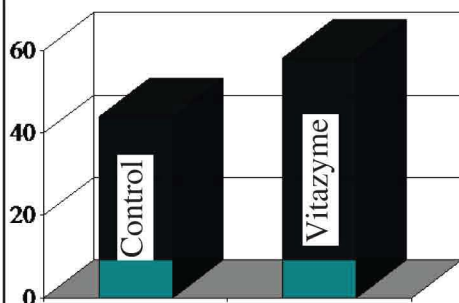
Wintergreen Boxwood

Treatment	Initial (9/16/99)		Final 5/30/00		Change	
	Length ¹ inches	Branches	Length inches	Branches ²	Length ³ inches	Branches ⁴
Control	4.88 a	19.0 a	11.88 a	44.1 b	7.00 b	25.1 b
Vitazyme	4.34 b	21.6 a	12.98 a	58.2 a	8.65 a	36.7 a

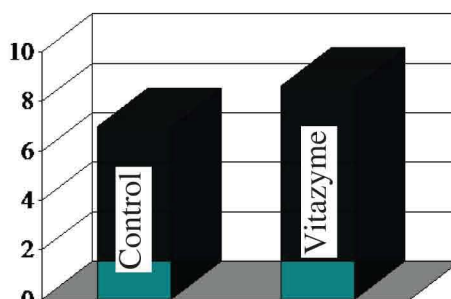
In all cases means followed by the same letter are not significantly different at $P = 0.1$

¹ $P = 0.051$; $LSD_{0.1} = 0.44$. ² $P = 0.005$; $LSD_{0.1} = 7.5$. ³ $P = 0.046$; $LSD_{0.1} = 1.32$. ⁴ $P = 0.013$; $LSD_{0.1} = 7.2$.

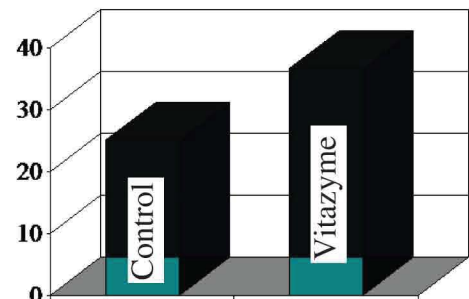
Final Branch Number



Change in Branch Length, in.



Change in Branch Number



**Final branch
number
increase: 32%**

**Branch length
change: 23%**

**Branch number
change: 46%**

In spite of a significantly greater height for the control plants at the beginning of the study, the Vitazyme treated plants surpassed the controls by 9% by May of 2000. The change in branch length was significantly greater than the control ($P = 0.046$) by 23% at the end of the study. The big change due to Vitazyme was an increase in the number of branches, which was 32% greater than the control on May 30, 2000, while the change over the testing period was 46%.

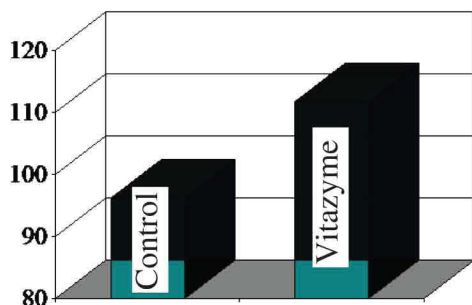
Azalea, var. "Fashion"

<u>Treatment</u>	<u>Initial (9/16/99)</u>		<u>Final 5/30/00)</u>		<u>Change</u>	
	<u>Length</u> inches	<u>Branches</u>	<u>Length</u> inches	<u>Branches</u> ¹	<u>Length</u> inches	<u>Branches</u> ²
Control	8.97 a	27.0 a	19.90 a	96.2 b	10.93 a	69.2 b
Vitazyme	8.64 a	27.9 a	19.43 a	111.8	10.79 a	83.9 a

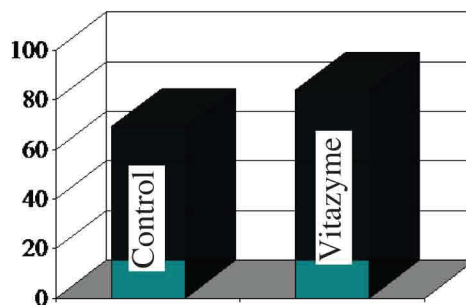
In all cases means followed by the same letter are not significantly different at $P = 0.1$

¹ $P = 0.019$; $LSD_{0.1} = 10.4$. ² $P = 0.0008$; $LSD_{0.1} = 8.5$.

Final Branch Number



Change in Branch Number



**Branch number
change: 21%**

**Final branch number
increase: 16%**

While the maximum height of the azaleas did not change with Vitazyme application, the number of branches was markedly increased – by 21% – over the course of the study.

Holly, Dwarf Burfordi

<u>Treatment</u>	<u>Initial (9/16/99)</u>		<u>Final 5/30/00)</u>		<u>Change</u>	
	<u>Length</u> ¹ inches	<u>Branches</u>	<u>Length</u> inches	<u>Branches</u>	<u>Length</u> inches	<u>Branches</u>
Control	11.80 b	20.9 a	15.66 a	44.3 a	3.58 a	23.4 a
Vitazyme	13.21 a	20.1 a	16.79 a	40.6 a	3.86 a	20.6 a

In all cases means followed by the same letter are not significantly different at P = 0.1

¹ P = 0.039; LSD_{0.1} = 1.10.

No significant differences in branch length or branch number as a result of Vitazyme application occurred in this study. It is not known why the holly did not respond like the other two plant species.

Conclusions: Vitazyme significantly improved plant height and branch number for Wintergreen Boxwood plants, by up to 46% for branch number. Branching was likewise stimulated for azaleas ... by 21%. The holly plants, however, did not respond much to Vitazyme in this study, likely because of applications spaced too far apart.

Results for this study would very likely have been much better had Vitazyme been applied more frequently and consistently during the period from September, 1999, to May, 2000. A rose study performed concurrently at the Tyler Rose Nursery revealed a 61% stem length increase when Vitazyme was applied at 21-day intervals. In this study the intervals were 132 and 64 days. In spite of these erratic and widely spaced applications all but the Burfordi Holly responded well. It is apparent that Vitazyme stimulates the formation of new growing points (primordia) at the nodes of woody ornamentals, as it does for other types of plants, and thus improves their appearance to potential customers.

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2000 Crop Results

Vitazyme on Nursery Crops **Fruit and Ornamental Trees and Shrubs**

Farmers: Bernhardt Lang, Lang Nurseries

Location: Dansville, New York

Mr. Lang grows a number of different species and varieties of fruit and ornamental tree crops. He sells about 300,000 trees per year. He has used Vitazyme for foliar and dipping applications for some time, and has noted excellent results as revealed below.

Sugar Maples

Mr. Lang purchased 300 three to five-year-old branched, bare-root sugar maple trees the spring of 2000. These 1.5-inch caliper trees are notoriously hard to transplant, and **expected losses are 15 to 20%**. These trees were dipped in a 1% Vitazyme solution and dried, and stored for several days before planting. **At the end of the 2000 growing season there were no tree losses after Vitazyme treatment.**

Normal tree loss: 15 to 20%

Tree loss with Vitazyme: 0%

Budded Crops: Apples, Plums, Ornamentals

Responses of budded crops were exceptional. These trees are planted and budded in April, and foliar sprayed with Rapid Gro and Vitazyme (0.5 oz/acre) beginning in mid-June. Ten applications were made during the summer and early fall.

Future intentions: Next year Mr. Lang will dip the budded stock as well as the ornamentals in Vitazyme, and will continue to foliar feed as in 2000. **He will give a gallon of Vitazyme in 2001 to each of his customers in order that the vigor and survival of the trees will be insured.**

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2000 Crop Results

Vitazyme on Mondo Grass

Researcher: Paul Syltie

Greenhouse manager: Carroll Lee, Lee Tree Farm and Nursery

Location: Grand Saline, Texas

Planting date: Sometime during 1999

Experimental design: In a greenhouse where many flats of mondo grass were planted, five flats of 20 four-inch pots each were treated with Vitazyme; others alongside served as controls.

1. Control

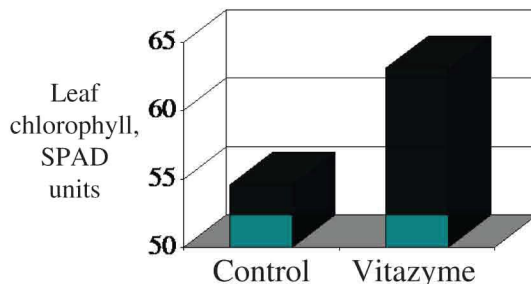
2. Vitazyme

Fertility treatments: unknown

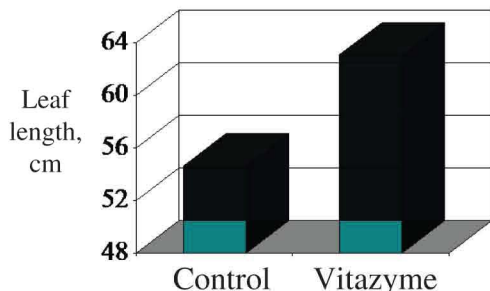
Vitazyme treatments: 0.5% Vitazyme on the leaves and soil on September 20, 1999; 1% Vitazyme on January 20, 2000; 1% Vitazyme on March 24, 2000

Chlorophyll levels: On July 11, 2000, the leaves of each treatment were analyzed for chlorophyll using a Minolta SPAD meter. One average leaf from each of several pots of an average flat from the Vitazyme and control treatments were analyzed, and the values were averaged for each treatment.

	<u>Control</u>	<u>Vitazyme</u>	<u>Increase</u>
Leaf chlorophyll	54.6	63.1	8.5



Growth results: On July 11, 2000, the longest leaf from each of the 20 pots of the treated and control treatments was measured, and the results were averaged.



	<u>Control</u>	<u>Vitazyme</u>	<u>Increase</u>
Leaf length	15.3 b	17.8 a	2.5

Means followed by the same letter are not significantly different at $P = 0.0001$, according to Tukey's Honestly Significant Difference Test.

Growth results: Vitazyme greatly increased the leaf chlorophyll content of these Mondo grass plants, resulting in increased overall leaf and root growth. This growth increase was easily visible to the naked eye, and was measured as a highly significant increase ($P = 0.0001$) in leaf length. The treated plants were more growthy, darker green, and attractive for sale.

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2000 Crop Results

Vitazyme on Indian Hawthorne

Researcher: Paul Syltie

Greenhouse manager: Carroll Lee, Lee Tree Farm and Nursery

Location: Grand Saline, Texas

Planting date: Sometime during 1999

Variety: Clara

Pot size: 3 gallons

Experimental design: Sixty hawthorn shrubs in a greenhouse, approximately equal in size, were selected for the study. Half were treated with Vitazyme and half were left untreated.

1. Control

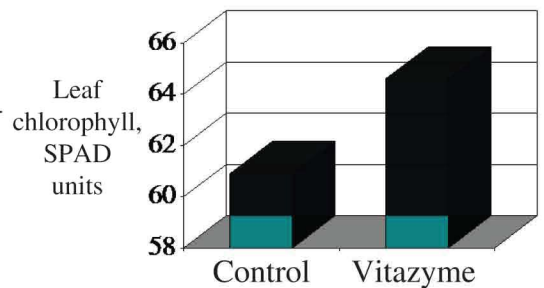
2. Vitazyme

Fertility treatments: unknown

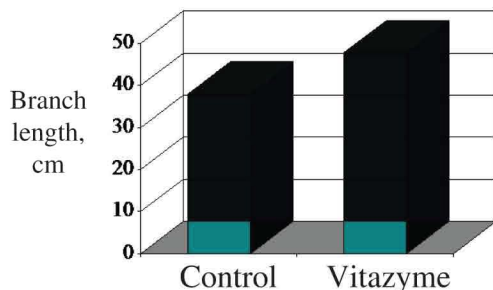
Vitazyme treatments: 1% Vitazyme at 2 cups per pot on September 20, 1999; 1% Vitazyme at 100ml per pot on January 20, 2000, and on March 24, 2000.

Chlorophyll levels: On July 11, 2000, the leaves of each treatment were analyzed for chlorophyll using a Minolta SPAD meter. One average leaf from each of 20 plants for each treatment were sampled and analyzed.

	<u>Control</u>	<u>Vitazyme</u>	<u>Increase</u>
Leaf chlorophyll	60.9	64.6	3.7



Growth results: On July 11, 2000, the length of the longest branch of each plant was measured.



	<u>Control</u>	<u>Vitazyme</u>	<u>Increase</u>
Branch length	38.0 b	47.8 a	9.8

Means followed by the same letter are not significantly different at P = 0.001, according to Tukey's Honestly Significant Difference Test.

Conclusions: These Indian Hawthorne shrubs responded very well to Vitazyme in spite of the fact that the applications were made rather sporadically and infrequently. Ideally the treatments should have been made 30 to 60 days apart. Even so the results of increased growth, plant size, greenness of the leaves, and health were easily visible, and the statistical analysis showed a highly significant improvement in branch length for the treated plants.