Roses *with Vitazyme application—A Testimonial*

Rose growers: Eng. Esteban Garcia R.
Cooperating dealer: Paolo Parducci, Summer Zone, Quito, Ecuador
Location: Ecuador
Testimonial (with some transliteration): I want to make known the excellent results that we have had with Vitazyme in the cultivation of roses. The product has been used for a few years, and is applied through a drip irrigation system. We have used 2 liters/ha/month, which has resulted in a prolific root mass with a lot of white, active absorbent root hairs, which has translated into greater rose productivity and quality. We began some months ago to apply Vitazyme as a foliar spray at 0.3 to 0.5 cc per area, and this application has positively influenced the plant hormonal systems to reduce the number of undeveloped shoots and increase the number of flowers. Because of the better nutritional status of the plants, the roses have better resistance to disease. In my opinion, Vitazyme is the best organic product available, with a unique content of brassinosteroids which allows a natural hormonal balance in the plant.

After two months of treatment there were about 80% more absorbent roots. After three months of treatment there were about 150% more absorbent roots.

I am entirely convicted of the great value of Vitazyme for roses, especially for increasing absorbent roots.

Esteban Garcia R.

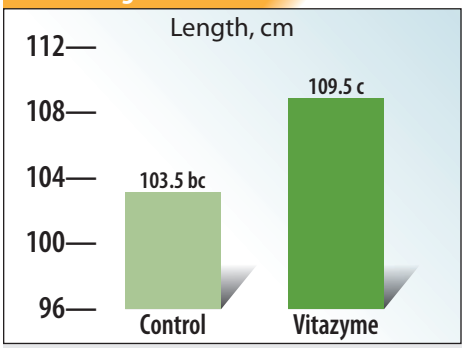
(above) The use of Vitazyme on roses in Ecuador has produced stronger plants and more prolific blossoming, with excellent flower quality.

(left) The improved plant vigor and flower quality is directly related to the promotion of vigorous rooting due to increased photosynthesis, stimulated by the brassinosteroids and other growth promotors in the product.

Roses *with Vitazyme application*

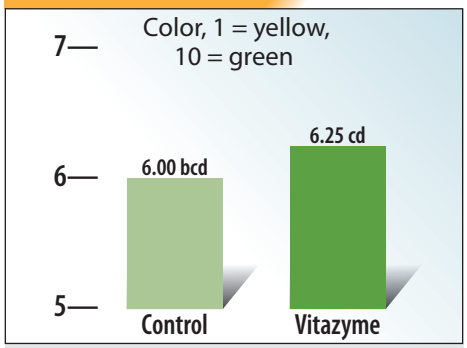
Researcher: Jan Ties Malda ***Research organization:*** Cebeco Mertstoffen B. V. and SPNA Kollumerwaard, the Netherlands
Location: SPNA Kollumerwaard, the Netherlands ***Variety:*** unknown
Experimental design: A replicated rose study was established for a number of products, including Vitazyme, to determine the effect of the products on a number of growth parameters and on plant composition. Only the control and Vitazyme data are available for this report. 1 ***Control*** 2 ***Vitazyme*** ***Fertilization:*** unknown ***Vitazyme application:*** unknown
Growth results:

Stem Length



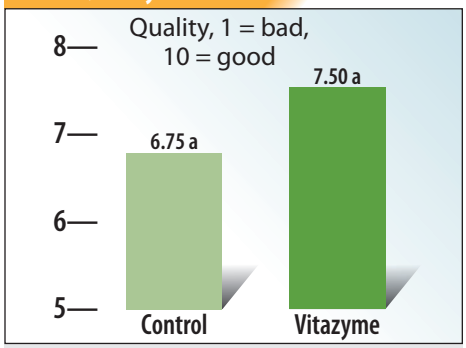
LSD = 9.33 cm

Leaf Color



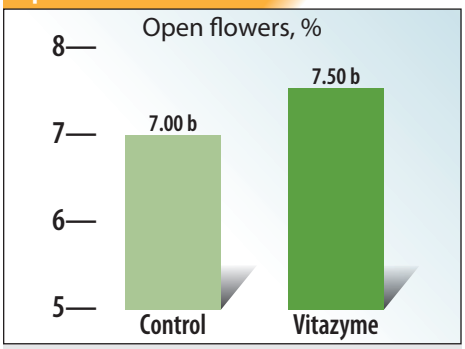
LSD = 0.81

Root Quality



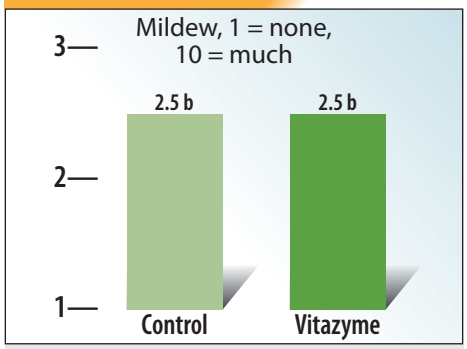
LSD = 0.98

Open Flowers



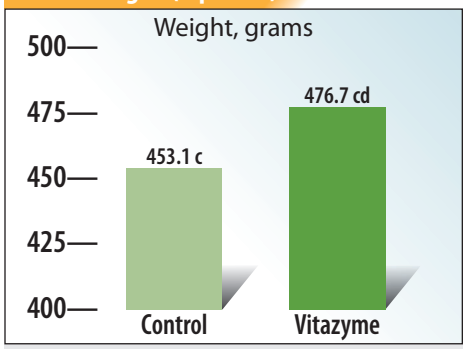
LSD = 5.95%

Mildew Incidence



LSD = 1.35

Fresh Weight (8 plants)



LSD = 47.71 grams

Increases with Vitazyme

Stem length ..... 6 %
Leaf color ..... 0.25 point
Root quality ..... 0.75 point
Open flowers ..... 0.50 %-point
Mildew incidence ..... no change
Fresh weight (8 plants) .... 5 %

Plant composition results: Leaf analyses were conducted on a number of elements. All data are presented on a dry weight basis.

Treatment	Potassium	Sodium	Calcium	Magnesium	Nitrogen	Sulfur	Phosphorus
	umol/kg. dm						
Control	815 bc	5.4 ab	260.8 bc	115.0 abc	1,677.5 de	55.3 bc	117.8 b
Vitazyme	865 cd	6.5 abc	283.0 d	119.3 bc	1,697.5 e	59.0 de	126.0 d
LSD	52	2.3	19.4	8.0	89.7	3.5	6.3
Change	**+6%**	**+20%**	**+9%**	**+4%**	**+1%**	**+7%**	**+7%**

	Iron	Manganese	Zinc	Boron	Copper	Molybdenum	Chloride	Silicon
	umol/kg. dm							
Control	1,450	1,270.0 b	453.8 cd	7,025 e	22.5 ab	48.8 a	48.8 a	301.5
Vitazyme	1,800	1,305.0 b	474.0 d	7,300 e	23.2 ab	46.4 a	46.6 a	345.3
LSD	1,092.5	188.2	46.3	422	22.9	7.2	8.5	72.2
Change	**+24%**	**+3%**	**+4%**	**+4%**	**+3%**	**-5%**	**-5%**	**+15%**

Conclusion: A rose trial in the Netherlands, which included several plant supplements including Vitazyme, revealed some good improvements in growth and plant composition compared to the control. Because no other product data was included, it was not possible to compare the various products. Stem length, leaf color, root quality, open flowers, and fresh plant weight were all improved with Vitazyme, and the levels of all nutrients were increased from 1 to 24%, except for molybdenum and chloride. Most comparisons were not significantly different, but the consistent improvement for all parameters and elements demonstrates the value of Vitazyme to facilitate rose growth in the Netherlands.

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2011 Crop Results

Vitazyme on Roses

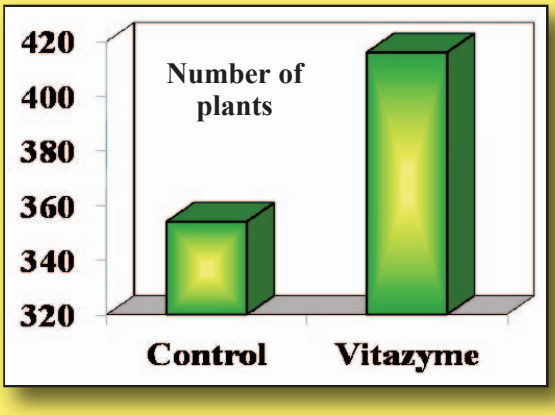
Researcher: Joe Tew and Eddie Pearson
Location: Tyler Rose Nursery, Tyler, Texas
Soil type: fine sandy loam
Planting date: February, 2011 (exact date unknown)
Experimental design: A field was planted to rose stems, spaced approximately 6 inches apart, in rows 4 feet apart. One row was treated with stems soaked in dilute Vitazyme and compared to the adjacent untreated row to determine growth and survival rate.

1. Control **2. Vitazyme**

Fertilization: none
Vitazyme application: The Vitazyme treated rose stems were about 7 inches inched long, and were soaked in a 0.1% solution for about 5 hours before planting.
Rose survival: Each live rose plant was counted in the two adjacent rows on May 31, 2011.

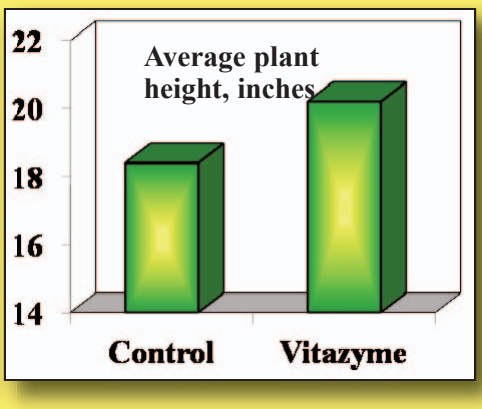
Treatment	Growing plants	Change
Control	354	—
Vitazyme	416	62 (+18%)

Increase in plants with Vitazyme: 18%



Rose height: On May 31, 2011, for typical 10-foot row sections directly across from one another in the two rows were measured, the plants for each section were counted, and the height of the longest branch from soil level to tip was measured. These values allowed a degree of replication to measure variability and statistical significance, although the plots were not randomized.

Treatment	Plant height	Change	Plant number	Change
	inches	inches		
Control	18.4 a	—	13.8 a	—
Vitazyme	20.2 a	3.8 (+21%)	16.8 a	3.0 (+22%)
Block F	0.139		0.759	
Error F	0.223		0.395	
Model F	0.158		0.715	
CV, %	8.38%		28.08%	
$LSD_{0.10}$	2.7 inches		7.1 inches	



Increase in plant height with Vitazyme: 21%

Increase in surviving plants with Vitazyme: 22%

Conclusion: In this rose trial in eastern Texas, newly planted stems survived considerably better with Vitazyme, with 18% more surviving by total row count, and by 22% using a four replicate analysis. These similar results show that the replicate selection was quite accurate. However, due to great variations in survival for different positions of the rows, the error value was high as the results are not statistically significant. Plants treated with Vitazyme were 21% taller, on average, than the untreated plants, a difference that was significant at the 22% level. These results show the large response of rose plants to Vitazyme application despite severe cold periods and drought, using only 0.1% product in the stem dip.

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2007 Crop Results

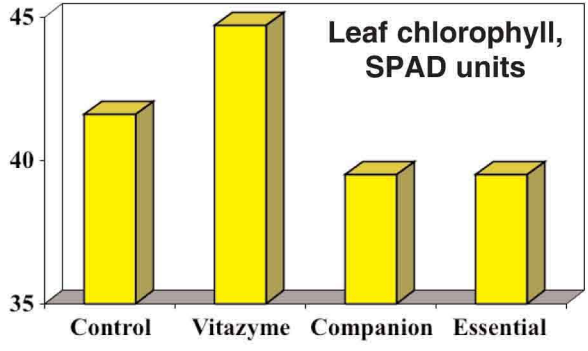
Vitazyme on Roses

Researcher: Ing. Hemerson Salazar
Location: Roma Verde, Machachi, Pichincha, Ecuador
Variety: Limbo
Watering: drip irrigation
Type of culture: greenhouse
Planting date: June 15, 2007
Experimental design: Rose beds (5) were treated with Vitazyme, another biostimulant, and a microbial inoculant to compare the response of the rose plants to the materials.

1. Control 2. Vitazyme 3. "Companion" biostimulant 4. "Essential" (*Bacillus subtilis*)

Fertilization: a nutrient solution containing N (200 ppm), P (30 ppm), K (220 ppm), Ca (80 ppm), Mg (40 ppm), B (2 ppm), Fe (3 ppm), Mn (2 ppm), and Mo (1 ppm), using 35,000 l/ha each day.
Vitazyme application: 2 ml/liter of water (0.2%) applied at certain undefined times
Other biostimulant applications: unknown
Leaf chorophyl results:

Treatment	Leaf chlorophyll	Change
	SPAD units	
Control	41.6	—
Vitazyme	44.7	+3.1
"Companion"	39.5	-2.1
"Essential"	39.5	-2.1



Growth and yield results: Vitazyme was observed to improve root growth and leaf chlorophyll of the plants, although the difference in top growth between treatments 2, 3, and 4 was hard to see visually.

Conclusions: In the words of the researcher, "During the rehearsal we observed that there was no meaningful difference in the size of the plants between Vitazyme and the other two products, but Vitazyme showed a larger root development and higher index of chlorophyll in the leaves. Vitazyme is being used on a constant basis, and the crops have generally improved."

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2006 Crop Results

Vitazyme on Roses

Testimonials

1. *Researcher*: Ing. Ivan Coral *Location*: Flores de Napoles, near Quito, Ecuador
   Varieties: Versilia, Confeti, Rafaela
   Production regime: greenhouse for export flowers
   Observations, compared to untreated areas:
   Leaf area: 20% larger than usual
   Flower color: more intense for all three rose varieties
   New basal stems: 5 to 10% increase
   Disease incidence: reduced

1. *Researcher*: Ing. Jaime Garces *Location*: Pilones la Victoria Pilvicsa, near Quito, Ecuador
   Varieties: unknown
   Production regime: greenhouse for producing new plants
   Observations, compared to untreated areas:
   Root mass: a 30 to 38% increase, with increased root dry matter
   Utilization at fertilizers (especially phosphorus): improved
   Drought resistance: better
   General plant quality: increased

1. *Researcher*: Ing. Luis Lopez *Location*: Agriflora, near Quito, Ecuador
   Varieties: several
   Production regime: greenhouse-raised roses for export
   Observations, compared to untreated areas:
   Yield: a 12% increase in exportable roses
   Rhizosphere development: improved growth of the root section
   Drought resistance: the plants are kept active during times of water stress
   Nutrient utilization: better
   Resistance to pathogens and disease: improved

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2003 Crop Results

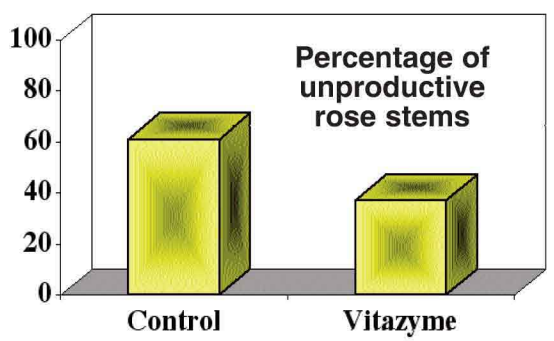
Vitazyme on Roses

Researcher: Ing. Grace Vimos *Location*: Florecal, Cayambe, Pichincha, Ecuador
Variety: "Latin Lady" *Soil type*: unknown
Treatment initiation: February 26, 2003, during active production
Experimental design: Vitazyme was applied to beds of roses in a production greenhouse to evaluate the product's ability to decrease the number of "blind" (nonflowering) stems on the plants. The total test area was 8 beds of 30 m^2 each, or a total of 240 m^2. The treated and control areas were each half of this total, or 4 beds of 30 m^2 each.

1. Control **2. Vitazyme**

Fertilizer treatment: unknown
Vitazyme application : 1.55 ml per bed of 30 m^2 each week
Growth results: The numbers of productive and "blind", nonflowering stems were counted after 8 weeks of Vitazyme application. Four areas of beds for each treatment were counted, and the results were tallied to give the percentage of "blind" stems.

Treatment	Area	Total stems	Productive stems	"Blind" stems	Proportion of "Blind" stems
		number			%
Control	1	54	22	32	59
	2	55	20	35	64
	3	59	24	35	59
	4	48	18	30	63
	Average				61
Vitazyme	1	84	68	16	19
	2	89	62	27	30
	3	66	44	22	33
	4	61	21	40	66
	Average				37



Reduction in unproductive rose stems with Vitazyme: 24 percentage points

Observations on root mass: Examination of the roots of the respective treatments revealed a decided advantage for the Vitazyme treated rose plants. **Roots were heavier with more root hairs** for treated plants.

Observations on growth: Visual examination of the various blocks of treated and untreated roses showed that Vitazyme caused an **increase in the number of productive stems**, and these stems were **more vigorous and uniform** than the untreated controls.

Conclusions: In this study of rose production (variety Latin Lady) in Ecuador, the objective of reducing the number of "blind", unproductive flower stems was achieved using Vitazyme biostimulant. Using weekly applications of 1.55 ml per 30 m^2 of bed, **the treated plants were more growthy, developed more root mass, and had 24 percentage points fewer unproductive stems than the untreated controls.** The results show that Vitazyme is a powerful tool for increasing the flowering potential of roses, especially for the varieties that have difficulty producing blossoms on some stems.

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2002 Crop Results

Vitazyme on Roses
a Testimonial

Researcher: Ing. Luis Lopez
Location: Tabacundo, Ecuador
Company: Agroflora
Variety: various types

Comments of Ing. Lopez:

Vitazyme increases root growth, making the plant to stay active during stress periods. When you have a better root volume this helps the plant to have better nutrition. Therefore, the resistance of the plants to pests is better, too.

The joint use of Vitazyme + Stimplex + Huma-K increased the productivity by 17% in our roses. The use of Vitazyme also increased the productivity by 12%.

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2002 Crop Results

Vitazyme on Roses

Researcher: Grace Vimos
Research Organization: Summer Zone, Quito, Ecuador
Research cooperator: Jorge Lopez
Location: Agroflora, Pichincha, Tabacundo, Ecuador
Variety: Peckcoubo
Soil type: clayey
Growth stage: mature

Experimental design: The products Vitazyme, Stimplex (seaweed), and Huma K (humic acid) were combined in a program to treat roses. An area in a greenhouse of 640 m^2 was divided into two parts of 340 m^2 (control) and 300 m^2 (treated). There were 10 beds of 34 m^2 each in the control area, and 10 beds of 30 m^2 in the treated area. Ten plants per bed were evaluated for growth parameters at both the initial date and 56 days later, while production was measure for the first four months after treatment.

1. Control **2. Vitazyme/Stimplex/Huma K**

Vitazyme/Stimplex/Huma K applications: For each 10 beds for a treatment the following formula was used:
Water – 160 liters Vitazyme – 15.5 ml Stimplex – 160 ml Huma K – 6.8 g

Fertilization: unknown

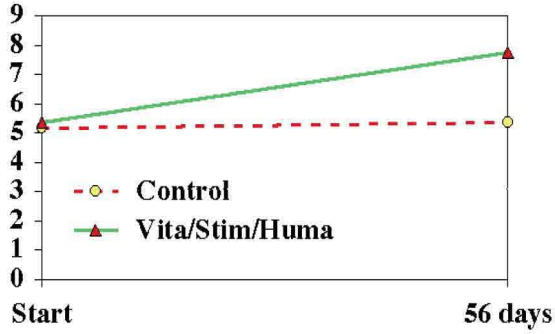
Growth results: The trial was initiated on February 13, 2002, at which time evaluations were made for basal stems, root growth, leaf area, plant health, bud length, and flower characteristics (stem length, and blossom length and width). Evaluations were again made 56 days later, on April 10, to note changes in these parameters. Basal stems showed no response, so that data is not included here.

Root Growth

Treatment	At initiation*	At 56 days*	Change
	Average root rating per plant		
Control	5.16	5.36	+0.20
Vita/Stim/Hum	5.38	7.74	+2.36

*Root ratings: 1 to 10, 1 being worst and 10 being best; average of 50 plants.

Increase in root rating: 2.16



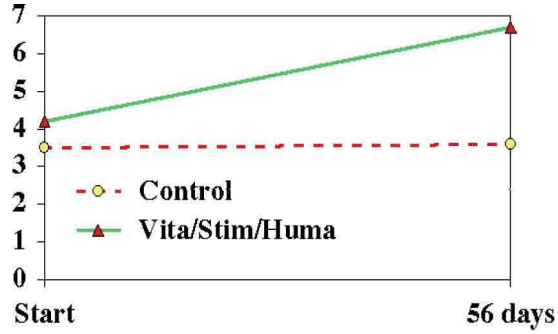
Despite less irrigation water for the treated portion of the test, root growth was considerably greater than the better watered control. **The treated roses also developed better secondary roots and root hairs.**

Leaf Area

Treatment	At initiation*	At 56 days*	Change
	Average leaf area rating per plant		
Control	3.5	3.6	+0.1
Vita/Stim/Hum	4.2	6.7	+2.5

*Leaf area ratings: 1 to 10, 1 being worst and 10 being best; average of 50 plants.

Increase in leaf rating: 2.4

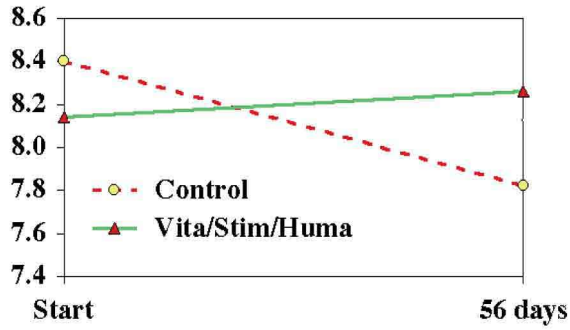


Vitazyme Treatment greatly increased leaf area of the roses, and caused them to be **noticeably greener and shinier.**

Plant Health

Treatment	At initiation*	At 56 days*	Change
	Average health rating per plant		
Control	8.40	7.82	– 0.58
Vita/Stim/Hum	8.14	8.26	+0.12

*Plant health ratings: 1 to 10, 1 being worst and 10 being best; average of 50 plants.



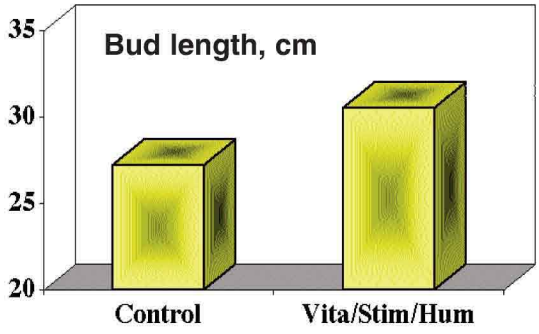
Increase in plant health rating: 0.70

While the control roses decreased somewhat in health status, the Vitazyme treated plants were slightly healthier, showing less disease incidence that at the beginning of the test.

Bud Length

Treatment	At initiation*	At 56 days	Change
		cm	
Control	—	27.2	—
Vita/Stim/Hum	—	30.5	+3.3 (+12%)

*No data were collected



Increase in bud length: 12%

Measurements of bud length were made only at 56 days after treatment. At this time the treated roses had longer buds than the control plants.

Flower Stem Length

Treatment	At 56 days*	Change
	cm	
Control	80	—
Vita/Stim/Hum	80	0

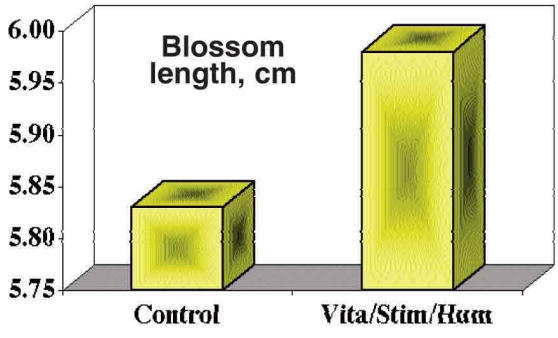
*Average of 15 plants for each treatment

No changes in stem length were observed with Vitazyme treatment.

Blossom Length

Treatment	At 56 days*	Change
	cm	
Control	5.83	—
Vita/Stim/Hum	5.98	+0.15 (+3%)

*Average of 15 plants for each treatment



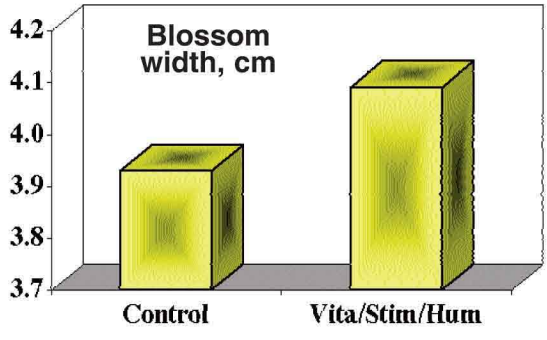
Increase in blossom length: 3%

The blossom length was increased by 3% over the control with Vitazyme application.

Blossom Width

Treatment	At 56 days*	Change
	cm	
Control	3.93	—
Vita/Stim/Hum	4.09	+0.16 (+4%)

*Average of 15 plants for each treatment



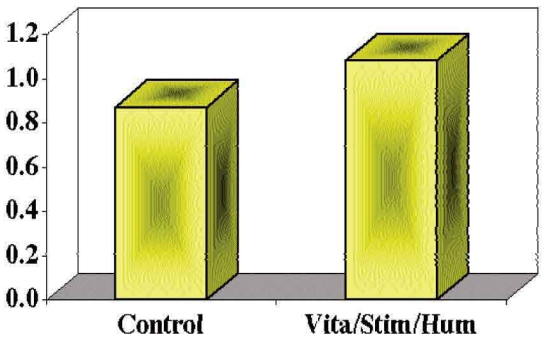
Increase in blossom width: 4%

Vitazyme increased the width of the rose blossoms by 4%, about the same as for the blossom length.

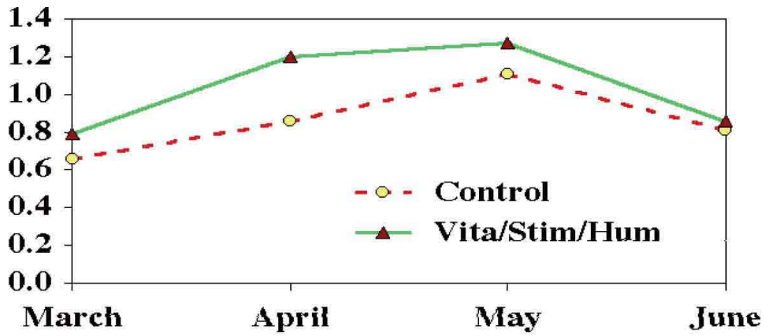
Production results: A record was made of the cut flowers harvested for a period of three months, starting in mid-March and continuing through mid-June. The harvested totals for the four months were divided by the number of plants for the two harvested areas: 354 plants for the treated area and 446 plants for the control area. These values were then divided by 4 to give the harvested flowers per month per plant.

Treatment	Flower production per plant				Total flowers for 3 months
	March	April	May	June	
	flower number/plant				flower number/plant/month
Control	0.66	0.86	1.11	0.81	0.87
Vita/Stim/Hum	0.79	1.20	1.27	0.86	1.08
Change	+0.13	+0.34	+0.16	+0.05	+0.21 (+24%)

Average Flowers Per Plant Per Month



Flowers Per Plant Per Month



Increase in flowers per plant: 24%

Vitazyme plus Stimplex and Huma K increased the production of flowers for each plant each month by 24% above the control over the three-month period of this trial.

Product Costs Per Application

Item applied	Total cost
	U.S. $/ha
Vitazyme (1.55 ml/cama 30 m)	7.37
Stimplex (1 ml/liter of water)	20.16
Huma K (227 g/ha)	4.35
Total	31.88

Income results:

Rose stems per day increase: 0.21 more stems per month/30 days per month = 0.007 more stems per day x 354 plants per bed = 2.47 more stems per bed per day x 180 beds per hectare = 446 more flowers per day per hectare x 30 days per month = 13,381 more flowers per hectare per month.

Average flower price = $0.25 (U.S.) x 13,381 flowers per hectare per month = $3,345.25 per hectare per month.
Cost of 4 applications = $31.88 per hectare x 4 applications per month = $127.52 per hectare per month.
Net extra return from Vitazyme + Stimplex + Huma K = $3.345.25 – $127.52 = $3,217.73.

Conclusions: In this Ecuadorian study, Vitazyme, Stimplex, and Huma K improved growth parameters such as

Increased flower income: $3,217.73 per hectare per month

root growth, leaf area, plant health, bud length, stem length, and blossom length and width such that overall production during that period was increased by 24%. This yield increase translates to added income of $3,217.73 per hectare per month.

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2001 Crop Results

Vitazyme and Mycorrhizae on Roses

Researcher: Blanca Alvarado, Summer Zone, Quito, Ecuador

Cooperators: Harold Zuniga and Emerson Salazar, Jumbo Roses, Pichincha, Tabacundo, Ecuador

Variety: Forever Young *Stage*: Mature *Soil type*: clayey

Trial initiation: March 1, 2001 *Growth pattern*: raised beds in a production greenhouse

Experimental design: Six treatments were selected, and each placed on four adjoining beds in the greenhouse. Each bed comprised 41.7 m^2, so each treatment was 167 m^2. For the five Vitazyme and mycorrhiza treatments the total area was 835 m^2; the control treatment comprised the area on either side of the five treatments.

Treatment	Fertilizer[a]	Vitazyme[b]	Mycorrhiza[c]
		ml/bed/week	
1	X	0	0
2	X	0	X
3	X	1.55	X
4	0	1.55	X
5	X	1.55	0
6	X	10	X

[a] Nitrofoska Perfect (15-5-20-2-20-2% N, P, K, Mg, S, and Ca) was applied at 2 kg/bed at the start of the experiment.

[b] The 1.55 ml/bed/week rate is equivalent to 1.5 l/ha/month, applied as a spray on the leaves and soil surface; the 10 ml application for treatment 6 was 6.5 times the normal rate.

[c] Mycorrhizal fungi were applied at 2.25 kg/bed at the beginning of the crop cycle.

Fertilization : Nitrofoska at 2 kg/bed at the start of the experiment

Vitazyme application: 1.5 l/ha/month every week (1.55 ml/bed/wk) for Treatments 3, 4, and 5, and 9.75 ml/ha/month (10 ml/ha/week) for Treatment 6, applied by a sprayer

Mycorrhiza application: applied to the beds at 2.25 kg/bed at the start of the experiment

Growth results: Root growth, blossoms, basal stems, leaf area, and leaf color were reported previously.

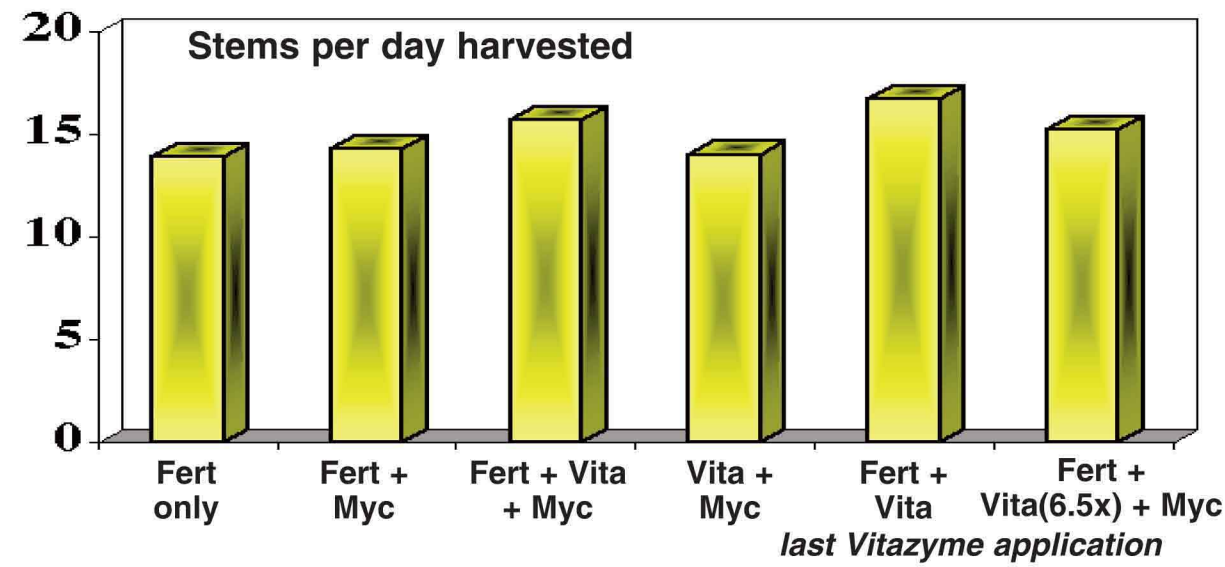
Production results: Data were collected on rose stems harvested at about 80 days and 171 days after the last Vitazyme application. The total number of stems harvested was recorded for each block of four beds each (167 m^2) for the six treatments. The stems harvested per day for each treatment and the stems harvested per plant per month (with 1,248 plants per treatment) were calculated along with treatment differences.

Flower production for 78 to 81 days after the last Vitazyme application

Treatment	Days of harvest since the last application	Stems harvested	Stems/Day harvested	Stems/Plant/ Month	Stems/Plant/ Month increase
1. Fert only	78	1,084	13.90	0.33	—
2. Fert + Myc	79	1,128	14.28 (+3%)	0.34	0.01
3. Fert + Vita + Myc	81	1,271	15.69 (+13%)	0.38	0.05
4. Vita + Myc	78	1,093	14.01 (+1%)	0.34	0.01
5. Fert + Vita	78	1,304	16.72 (+20%)	0.40	0.07
6. Fert + Vita (6.5x) + Myc	78	1,189	15.24 (+10%)	0.37	0.04

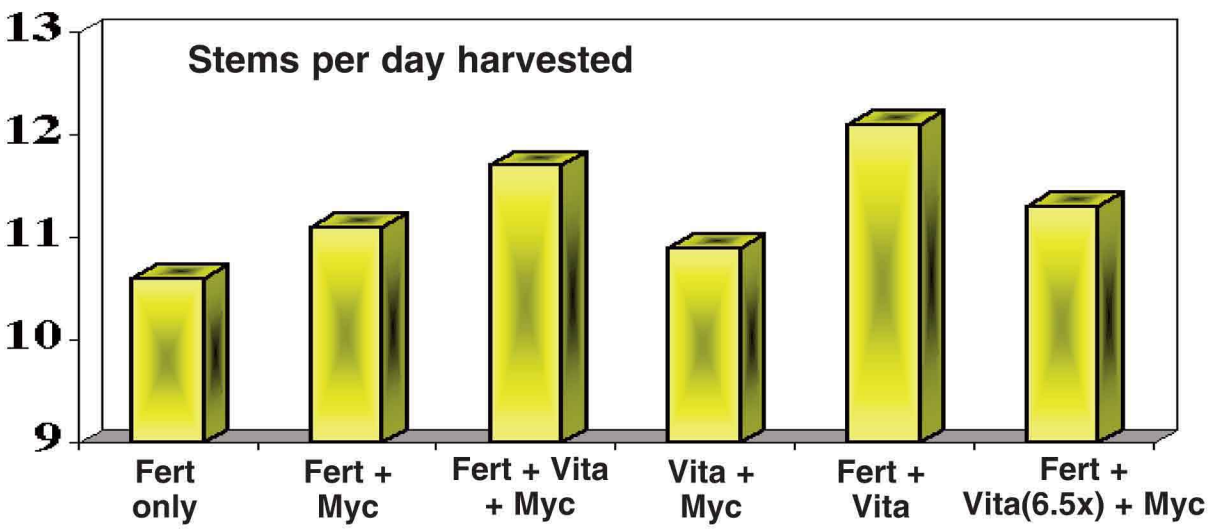
Increased harvest with Vitazyme + Fertilizer: 20%

Flower pro-duc-tion for 170 to 173 days after the last Vitazyme application



Treatment	Days of harvest since the last application	Stems harvested	Stems/Day harvested	Stems/Plant/ Month	Stems/Plant/ Month increase
1. Fert only	170	1,808	10.6	0.26	—
2. Fert + Myc	172	1,911	11.1 (+5%)	0.27	0.01
3. Fert + Vita + Myc	173	2,018	11.7 (+10%)	0.28	0.02
4. Vita + Myc	171	1,868	10.9 (+3%)	0.26	0
5. Fert + Vita	171	2,069	12.1 (+14%)	0.29	0.03
6. Fert + Vita (6.5x) + Myc	172	1,941	11.3 (+7%)	0.27	0.01

Increased harvest with Vitazyme + Fertilizer: 14%



Conclusions: It is apparent from this rose production study that Vitazyme and fertilizer alone produced the highest number of harvested flower stems of all treatments at both 2.6 and 5.7 months after the last Vitazyme treatment. These increases were 20% and 14% above the control values, respectively. Other treatments also increased flower production. The second-best treatment was Vitazyme plus both fertilizer and mycorrhizae, which gave 13% and 10% yield increases for the first and second harvest periods, respectively, whereas the high Vitazyme application with fertilizer and mycorrhizae gave respective 10% and 7% yield increases. The least responsive treatments were fertilizer plus mycorrhizae and Vitazyme plus mycorrhizae.

These studies show that Vitazyme alone with the basal fertilizer treatment can improve rose yields best over a long time period, even several months after cessation of Vitazyme applications. It is a highly effective rose production supplement.

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2001 Crop Results

Vitazyme on Roses

A Testimonial

Grower/researcher: Patricio Martinez, Gift Flowers
Research coordinator: Blanca Alvarado
Location: Tabacundo, Ecuador
Variety: Helio

Experimental design: A production field of roses raise in the typical program for Gift Flowers was treated with Vitazyme, and compared to untreated areas.

Vitazyme application: Vitazyme was applied in a drench with 30 liters of water per bed (30 m), with 1.55 cc of Vitazyme per bed each week.

Results:

"A test was done on a rose variety, Helio in the Gift Flowers field. The results in the growth of the root system after 50 days was amazing versus the control!"

Ing. Patricio Martinez
Gift Flowers

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2001 Crop Results

Vitazyme on Roses

Researcher: Blanca Alvarado, Summer Zone, Quito, Ecuador
Cooperator: Ing. Juan Pineida
Company: Florecal, S.A., Cayambe, Ecuador
Variety: Emma
Location: production greenhouse

Experimental design and results:

"Vitazyme was applied at Florecal S.A., located in Cayambe at 2847m above sea level. The temperature in the greenhouse during the application was 18°C with a relative humidity of 45%.

The product was applied in a drench with 30 liters of water per bed {30 m), with 1.55 cc of Vitazyme per bed each week.

The test was done on the rose variety Emma. These plants presented leaf yellowing. After 45 days from the beginning of the test we could find the following:

- **Increase of the basal stem number**
- **More resistance to stress (temperature and chemical products)**
- **Increase of the root mass**

Ing. Juan Pineida
Florecal, S.A.

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2000 Crop Results

Vitazyme on Roses

Researchers: Paul Syltie and Newt Cross *Grower*: Otis Tate, Tate Rose Nursery
Location: Tyler, Texas *Budding date*: grafted in May of 1999 on multiform rose stock that had been planted December and January, 1998/1999
Varieties: Gold Glow (yellow) and Mr. Lincoln (red)
Experimental design: A rose field of 17 acres was selected for this test. In one strip having two rose varieties, an area was selected that received no Vitazyme.

1. Control **2. Vitazyme**

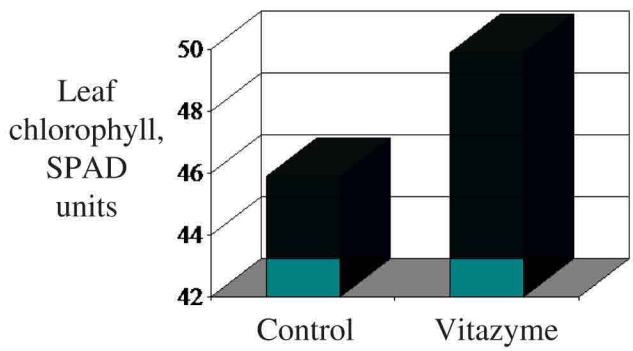
Fertility treatments: minimal
Vitazyme treatments: two 13 oz/acre spray applications on the leaves and soil, on May 3, 2000, and on June 3, 2000.

Yellow Roses ["Gold Glow"]

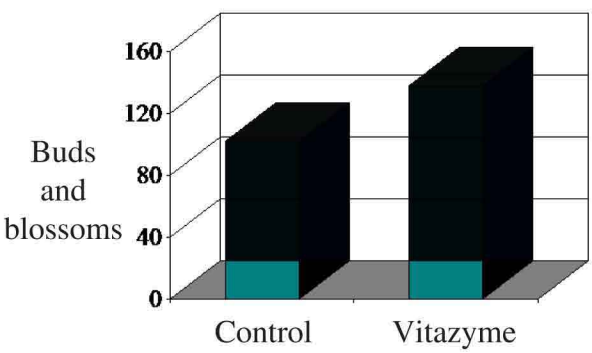
On July 11, 2000, chlorophyll measurements were taken with a Minolta SPAD meter, using 30 leaves from each treatment. Then three replicates of the number of buds and blossoms were counted for each treatment, using the same number of plants per ten feet of row for each replicate.

Leaf Chlorophyll

	Control	Vitazyme	Increase
	----------SPAD units ----------		
Leaf chlorophyll	45.9	49.9	4.0



Buds and Blossoms



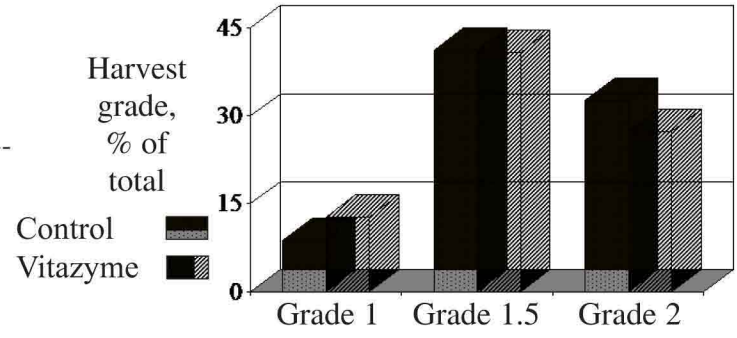
	Control	Vitazyme	Increase
Number	101.7 b	137.7 a	36.0

Means followed by the same letter are not significantly different at P = 0.11, according to Tukey's Honestly Significant Difference Test.

Grades at Harvest

On October 27, a few weeks before harvest, the rose grower evaluated the grades of the plants in three representative 50-foot strips for the treated and untreated areas.

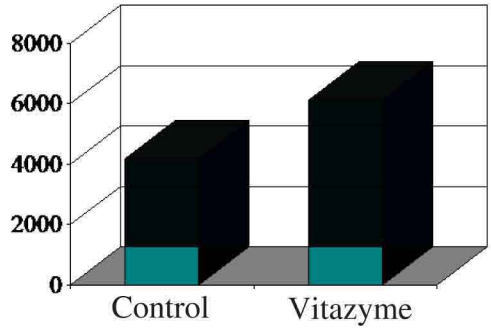
	Control	Vitazyme	Change
	---------- % ----------		
Grade 1	8.70	12.75	(+)4.05
Grade 1.5	41.28	40.93	(-)0.35
Grade 2	32.58	27.29	(-)5.29



Total Income

Wholesale nursery prices for rose grades, in lots of 100 to 290 plants: #1-$3.20; #1.5-$2.70; #2-$2.10.

	Control	Vitazyme	Change
	---------- $/acre ----------		
Grade 1	4,176.00	6,120.00	(+)1,944.00
Grade 1.5	16,718.40	16,576.65	(-)141.75
Grade 2	10,262.70	8,596.35	(-)1,666.35
Total	31,157.10	31,293.00	(+)135.90

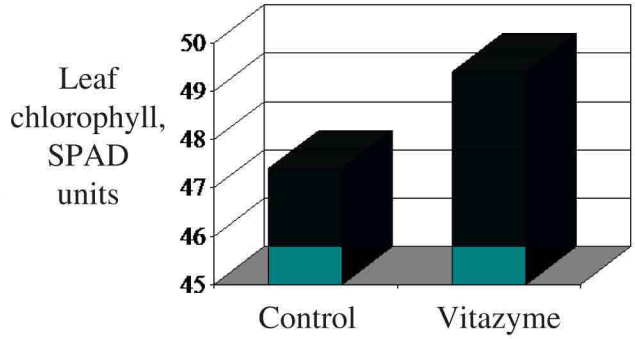


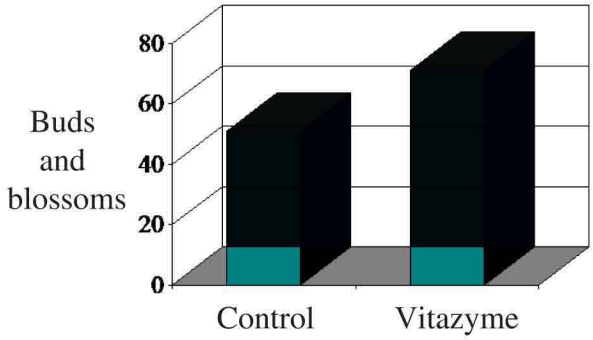
Red Roses ["Mr. Lincoln"]

On July 11, 2000, chlorophyll measurements were taken with a Minolta SPAD meter, using 30 leaves from each treatment. Then three replicates of the number of buds and blossoms were counted for each treatment, using the same number of plants per ten feet of row for each replicate.

Leaf Chlorophyll

	Control	Vitazyme	Increase
	----------SPAD units ----------		
-			
Leaf chlorophyll	47.4	49.4	2.0





Buds and Blossoms

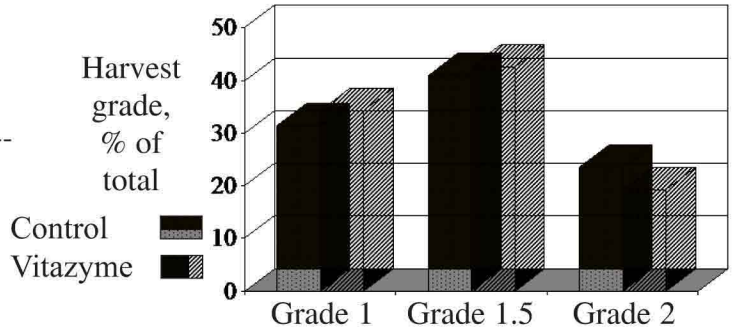
	Control	Vitazyme	Increase
Number	51.0 b	71.0 a	20.0

Means followed by the same letter are not significantly different at P = 0.18, according to Tukey's Honestly Significant Difference Test.

Grades at Harvest

On October 27, a few weeks before harvest, the rose grower evaluated the grades of the plants in three representative 50-foot strips for the treated and untreated areas.

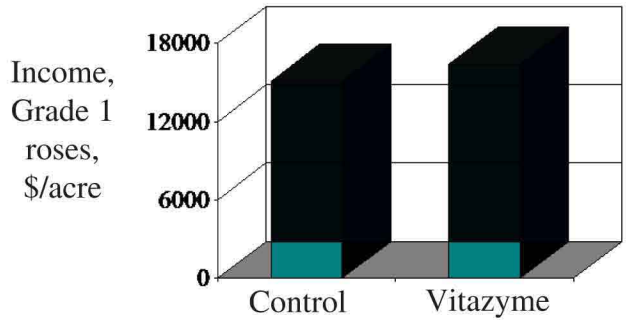
	Control	Vitazyme	Change
	---------- % ----------		
Grade 1	31.45	34.22	(+)2.77
Grade 1.5	40.86	42.58	(+)1.72
Grade 2	23.44	19.16	(-)4.28



Total Income

Wholesale nursery prices for rose grades, in lots of 100 to 290 plants: #1-$3.20; #1.5-$2.70; #2-$2.10.

	Control	Vitazyme	Change
	---------- $/acre ----------		
Grade 1	15,096.00	16,425.60	(+)1,329.60
Grade 1.5	16,548.30	17,244.90	(+)696.60
Grade 2	7,383.60	6,035.40	(-)1,348.20
Total	39,027.90	39,705.90	(+)678.00



Conclusions: On July 11, both rose varieties showed enhanced leaf chlorophyll with Vitazyme, indicating that overall photosynthesis, and thus carbon fixation and growth rate, were being enhanced. While total leaf area and dry weight were not evaluated, the treated plants were notably taller and more full in appearance in the field. The number of buds and blossoms were counted and showed a decided, significant increase over the untreated control plants. All of these factors should relate to better grades of the harvested stock at selling time, and higher returns to the grower.

Vitazyme applied twice during the final year of the growth cycle increased the percentage yield of the highest grades showing that the enhanced growth from Vitazyme—revealed by greater photosynthesis and number of buds and blossoms detected earlier in the season—translated to stronger and larger stems at harvest time. Because of this improvement in grade at harvest, Vitazyme boosted total income somewhat for both varieties. If Vitazyme had been applied throughout the two-year growing cycle it is likely that the income response would have been much greater than revealed in this trial.

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2000 Crop Results

Vitazyme on Roses

Grower: Joe Tew, Tyler Rose Nursery, Tyler, Texas; Doug Evans, greenhouse supervisor
Location: Lindale, Texas *Variety*: Marquis Bocella
Planting date: Cuttings were rooted in small pots about December 24, 1999, and transplanted to one-gallon pots about February 4, 2000.
Experimental design: A production greenhouse for repotted rose cuttings was divided into two parts: one half to the north was treated with Vitazyme and the other half left untreated. Both sides of the center walkway contained the same rose variety of the same maturity. All treatments were the same for both sides except for Vitazyme on half of the plants.

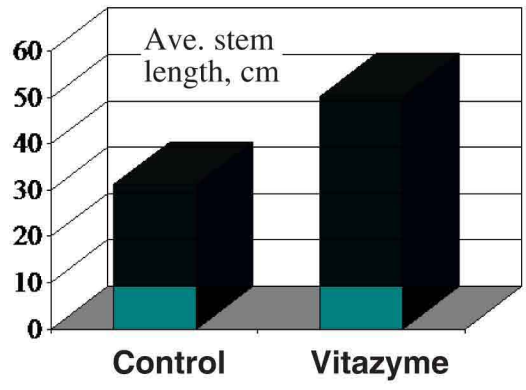
1. Control **2. Vitazyme**

Fertility treatments: A mixed fertilizer was occasionally applied to both treatments, and the potting soil contained slow-release fertilizers.
Vitazyme treatments: Vitazyme was applied at approximately a 13 oz/acre rate by itself every 21 days, beginning shortly after repotting. Thus, during the 6 weeks of the test the roses received three treatments, but only the first two were involved in the growth stimulation for this study; the last treatment was at the very end.
Fungicide treatments: Fungicides were applied every 5 to 7 days for black spot control.
Growth results: Seven representative plants from each treatment were selected at random, and the number of stems and the length of each stem were determined. There was no significant difference in the number of stems per plant, so these were not analyzed and are not reported here.

Treatment	Stem Length, cm	Change, cm
Control	31.2	--
Vitazyme	50.3***	19.1 (+61%)

*** Significantly greater than the control at P = 0.0002.
$LSD_{0.05}$ = 7.8.

Increase in stem length: 61%



Conclusions: Vitazyme applied at three-week intervals greatly increased the growth of these Marquis Bocella roses, as measured by the increase in stem length (+61%) for the 3 to 6-month period after the cuttings were repotted. Such an increase in stem length directly translates to customer appeal and sale value of the plants.