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

2009 Crop Results

Vitazyme on Watermelons

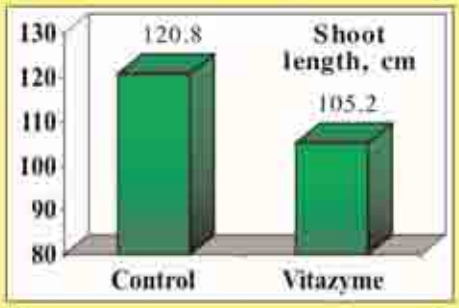
Researcher: Wang Zhongyang, Hunan Horticultural Research Institute, and Tao Chuanhui, Ningxian Xianzikou Watermelon Farm *Location*: Xiangzikou Watermelon Farm, Ningziang County, Hunan, China
Variety: Sugar Baby *Planting rate*: unknown *Planting date*: April 15
Experimental design: A watermelon field was divided into Vitazyme treated and untreated plots, arranged with three replications. Each plot was 0.4 hectare. The purpose of the study was to evaluate the effects of Vitazyme on watermelon yield and quality.

1. Control **2. Vitazyme**

Fertilization: unknown
Vitazyme application: (1) 24-hour seed soak with a 5% solution (April 14); (2) 1.0 liter/ha leaf spray 20 days after transplanting (May 5); (3) 1.0 liter/ha leaf spray 40 days after transplanting (May 25); (4) 1.0 liters/ha leaf spray 60 days after transplanting (June 15).
Harvest date: unknown
Growth results:

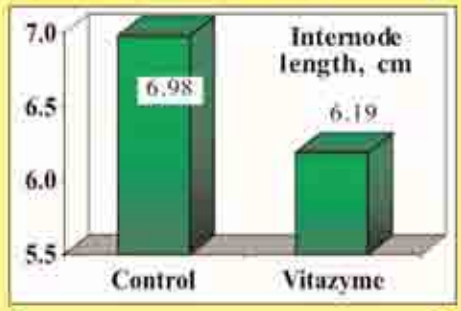
Seed germination: more rapid and uniform with Vitazyme
Overall plant growth: healthier with Vitazyme

Shoot Length



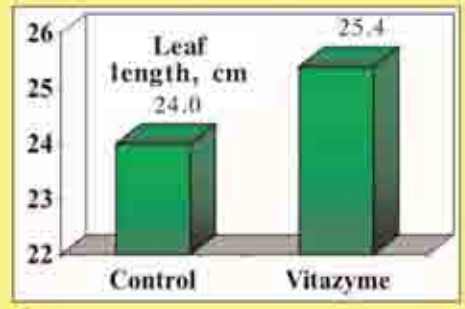
Decrease in shoot length with Vitazyme: -15%

Internode Length



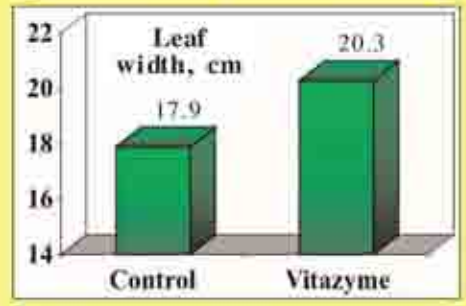
Decrease in internode length with Vitazyme: -13%

Leaf Length



Increase in leaf length with Vitazyme: 6%

Leaf Width

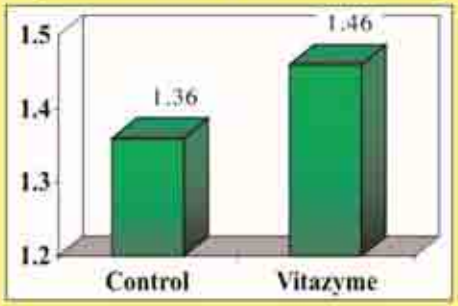


Increase in leaf width with Vitazyme: 13%

Although the shoot length was reduced with Vitazyme, the interlude length was also reduced so that leaf number was not reduced. Besides, the size of the leaves was increased with Vitazyme, with an estimated increase in leaf area of 19% (assuming a round leaf, and 344.5cm^2 per leaf for the control, and 409.9 cm^2 per leaf for the Vitazyme treatment).

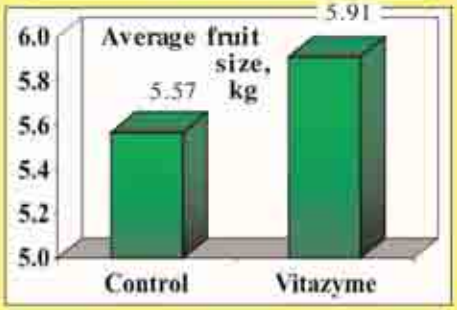
Yield results:

Fruit Per Vine



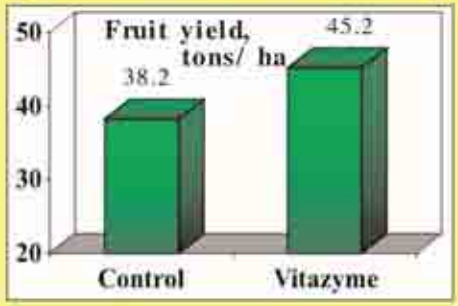
Increase in fruit per vine with Vitazyme: 7%

Fruit Size



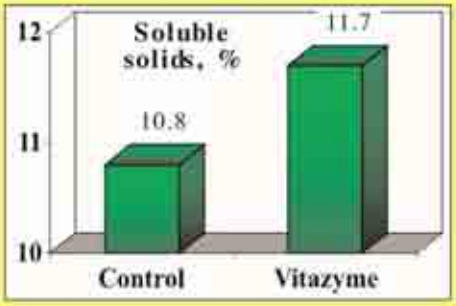
Increase in fruit size with Vitazyme: 6%

Fruit Yield



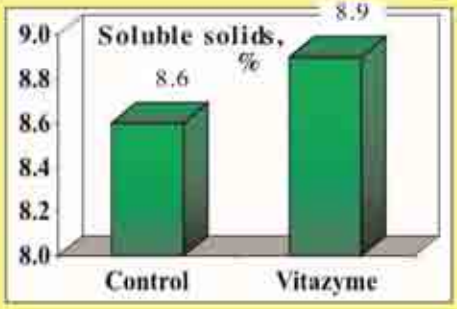
Increase in fruit yield with Vitazyme: 18%

Fruit Soluble Solids - Center



Increase in fruit soluble solids at fruit center with Vitazyme: 8.3%

Fruit Soluble Solids - Edge



Increase in fruit soluble solids at fruit edge with Vitazyme: 3.5%

Income results:

Treatment	Income	Change
	--------- RMB/ha ----------	
Control	38,200	—
Vitazyme	45,200	7,000 (+18%)

Increase in income with Vitazyme: 18%

Conclusions: This Chinese study on watermelons in 2009 showed that Vitazyme substantially improved crop performance, improving the speed and uniformity of germination, plus increasing leaf size and photosynthetic area; this occurred despite shorter vines with Vitazyme, but shorter internodes meant more leaves per length of vine. More fruit per vine (7%), and a larger fruit size (6%), led to an 18% yield increase with Vitazyme. Moreover, this greater yield was more flavorful, having 8.3% more soluble solids in the center of the melons and 3.5% more solids at the melon edges. Especially important was the income increase of 18%. This program has been shown to be an excellent adjunct to watermelon cultivation in China.

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2008 Crop Results

Vitazyme on Watermelons

State University Peninsula of Santa Elena, Ecuador

Researcher:
Location: Unit of Production and Research, Faculty of Agrarian Sciences, State University Peninsula of Santa Elena, Sinchal – Barcelona Commune, Manglaralto Parish, Peninsula of Santa Elena, Ecuador
Variety: Dona Flor (a type of Charleston Grey) *Soil type*: loamy sand, well-drained
Soil analysis: ph, 7.9; organic matter, 1.0%; nitrogen, 1 ppm; phosphorus, 44 ppm; potassium, 2.2 meq/100g; calcium, 21 meq/100g; magnesium, 4.2 meq/100 g
Planting spacing: unknown *Planting date*: November, 2004
Experimental design: A field of watermelons was planted using 45 plants for each plot. Each plot was 9 x 9 meters, or 81 m^2, but the "useful" area of each plot was 8 x 3 meters, or 24 m^2. A total of eight treatments, with four replications in a randomized complete block design, were used to evaluate the effect of Vitazyme on a stem length, female flowers, fruit number, fruit weight and size, yield, and economic factors.

Treatment	Nitrogen	Phosphorus	Potassium	Vitazyme
	kg/ha			
(Control)	0	0	0	0
2	150	80	200	0
3	200	80	200	0
4	250	80	200	0
5	0	0	0	X
6	150	80	200	X
7	200	80	200	X
8	250	80	200	X

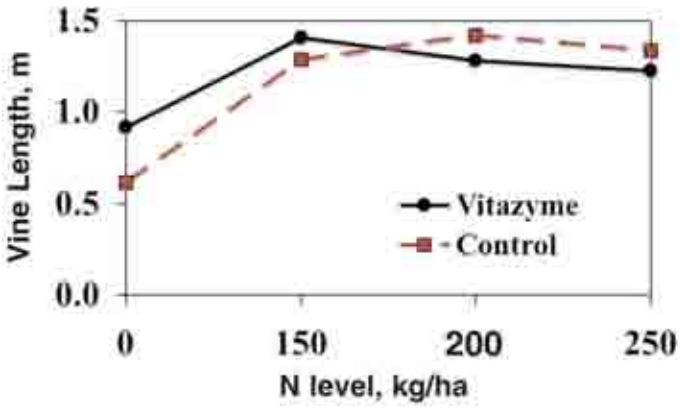
Fertilization: Nitrogen (N) and phosphorus (P) were applied as DAP [$(NH_4)_2SO_4$], and potassium (K) was applied as K_2SO_4. Distribution: 20% of N, P, and K 15 days after planting; 40% of N and P, and 30% of K before flowering; 40% of N and P, and 50% of K at fruit development.
Vitazyme application: (1) Soaking of seeds in a 10% Vitazyme solution for 10 minutes, then planting 24 hours later; (2) 40 cc of Vitazyme in 20 liters of water sprayed to the leaves 20 days after planting; (3) same as (2) 40 days after planting; (4) same as (2) 60 days after planting.

Harvest date: All harvest data and yield results were obtained by 100 days after planting.
Growth results:

Vine Length At 40 Days

Treatment	Vine Length*	Change**
	m	m
3 (200 N)	1.42 a	—
6 (150 N + Vita)	1.41 a	0.12 (+9%)
4 (250 N)	1.34 a	—
2 (150 N)	1.29 a	—
7 (200 N + Vita)	1.28 a	(-) 0.14 (-10%)
8 (250 N +Vita)	1.23 a	(-) 0.11 (-8%)
5 (0 N + Vita)	0.92 b	0.30 (+48%)
1 (0 N)	0.62 b	—

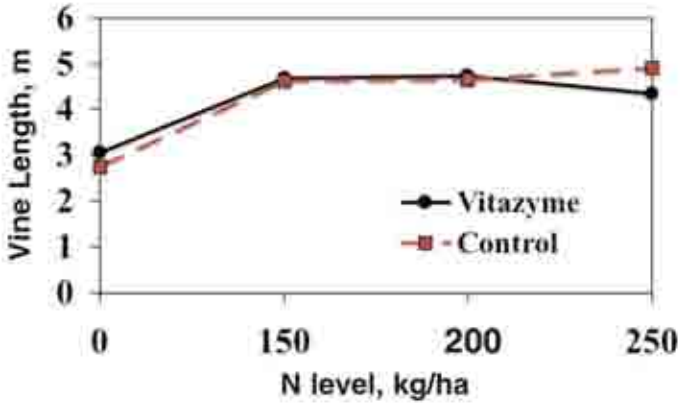
*Means followed by the same letter are not significantly different at P-0.05. CV=14.7%.
**Comparisons are made at the same N level: Treatments 1 vs. 5, 2 vs. 6, 3 vs. 7, and 4 vs. 8.



Vine Length At 60 Days

Treatment	Vine Length*	Change**
	m	m
4 (250 N)	4.91 a	—
7 (200 N + Vita)	4.73 a	0.08 (+2%)
6 (150 N + Vita)	4.67 a	0.04 (+1%)
3 (200 N)	4.65 a	—
2 (150 N)	4.63 ab	—
8 (250 N +Vita)	4.34 b	(-) 0.57 (-12%)
5 (0 N + Vita)	3.06 c	0.31 (+11%)
1 (0 N)	2.75 c	—

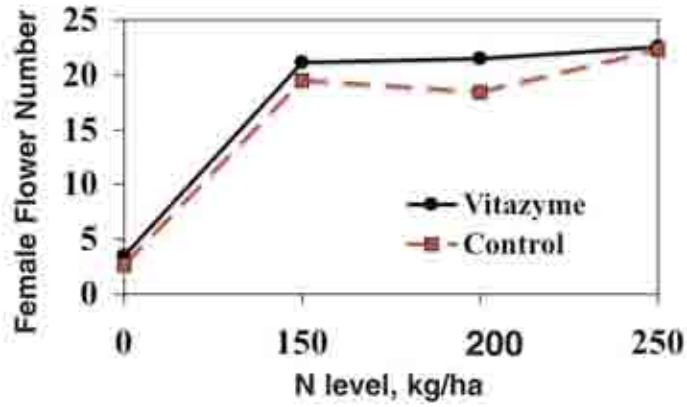
*Means followed by the same letter are not significantly different at P-0.05. CV=6.1%.
**Comparisons are made at the same N level: Treatments 1 vs. 5, 2 vs. 6, 3 vs. 7, and 4 vs. 8.



Female Flower Number At 60 Days

Treatment	Flower Number*	Change**
	number	number
8 (250 N +Vita)	22.55 a	0.20 (+1%)
4 (250 N)	22.35 a	—
7 (200 N + Vita)	21.50 a	3.05 (+17%)
6 (150 N + Vita)	21.10 a	1.60 (+8%)
2 (150 N)	19.50 a	—
3 (200 N)	18.45 a	—
5 (0 N + Vita)	3.55 b	0.85 (+31%)
1 (0 N)	2.70 c	—

*Means followed by the same letter are not significantly different at P-0.05. CV=13.7%.
**Comparisons are made at the same N level: Treatments 1 vs. 5, 2 vs. 6, 3 vs. 7, and 4 vs. 8.

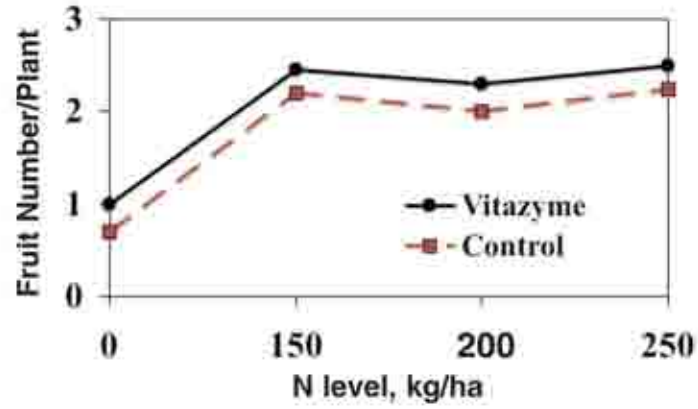


Commercial Fruit Number

Treatment	Fruit Per Plant*	Change**
	fruit/plant	fruit/plant
8 (250 N +Vita)	2.50 a	0.25 (+11%)
6 (150 N + Vita)	2.45 a	0.25 (+11%)
7 (200 N + Vita)	2.30 a	0.30 (+15%)
4 (250 N)	2.25a	—
2 (150 N)	2.20 a	—
3 (200 N)	2.00 a	—
5 (0 N + Vita)	1.00 b	0.30 (+43%)
1 (0 N)	0.70 b	—

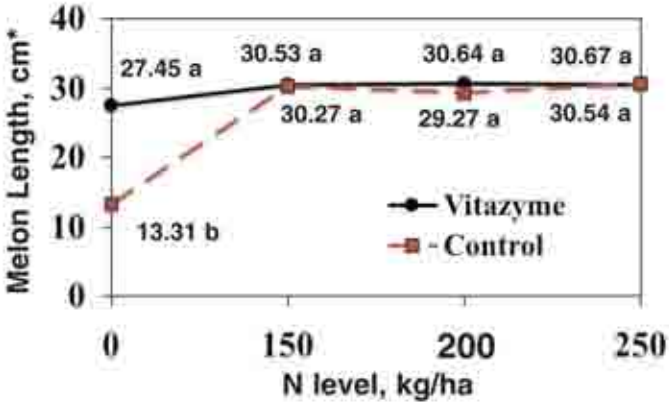
*Means followed by the same letter are not significantly different at P-0.05. CV=16.4%.

**Comparisons are made at the same N level: Treatments 1 vs. 5, 2 vs. 6, 3 vs. 7, and 4 vs. 8.

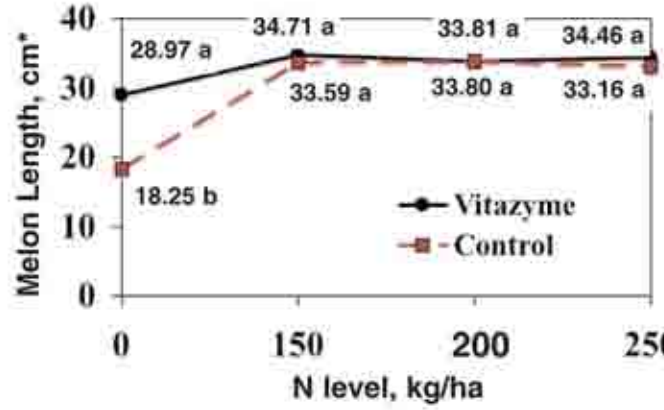


Melon Length for Four

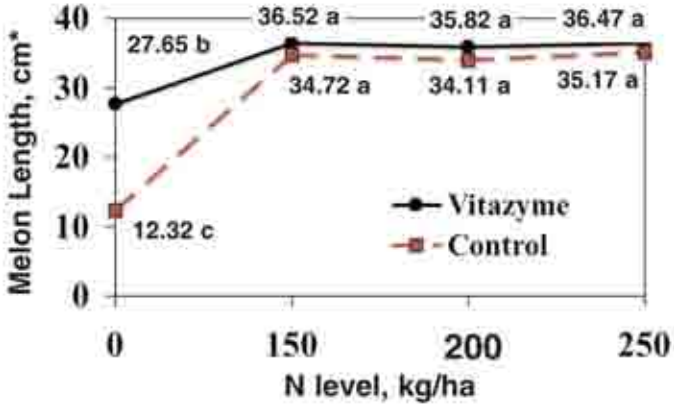
Harvest 1



Harvest 2

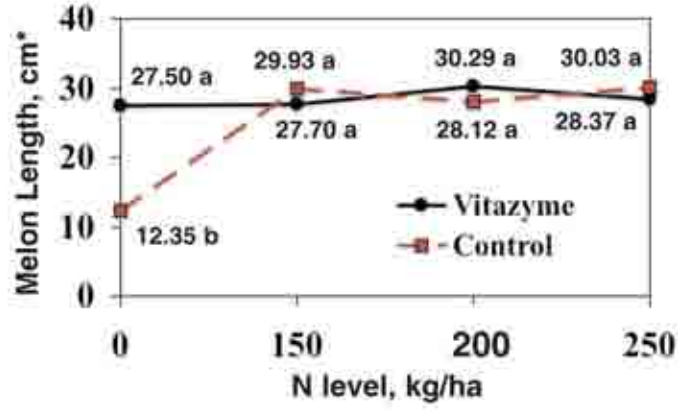


Harvest 3



*Means followed by the same letter are

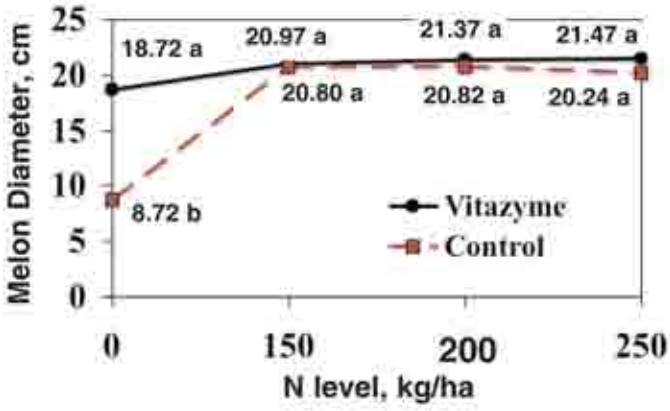
Harvest 4



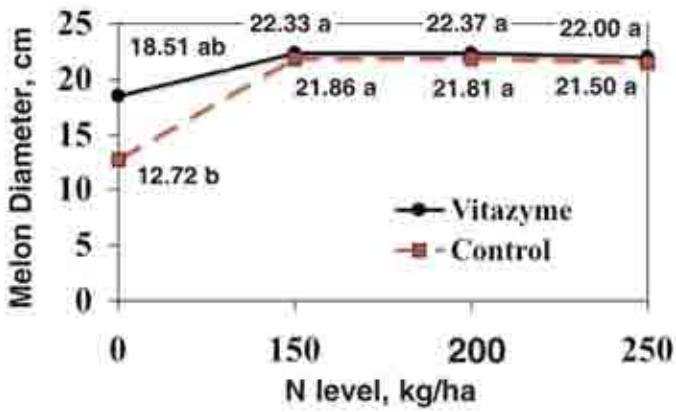
not significantly different at P-0.05.

Melon Diameter for Four Harvest

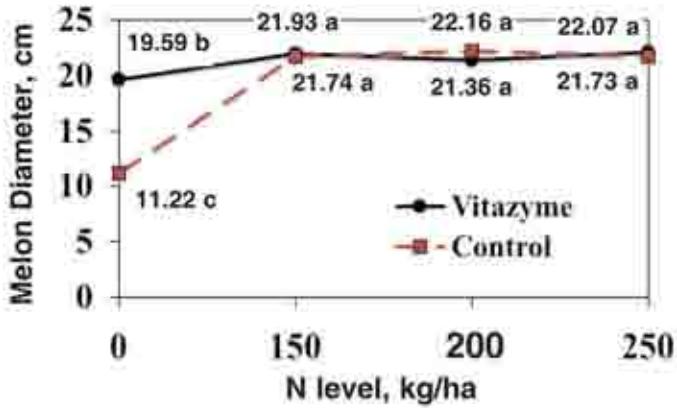
Harvest 1



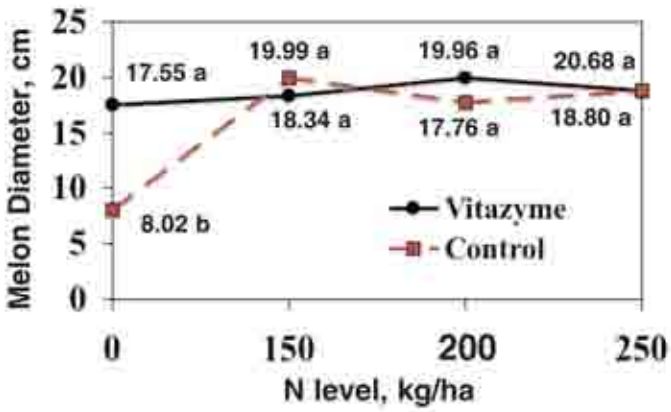
Harvest 2



Harvest 3



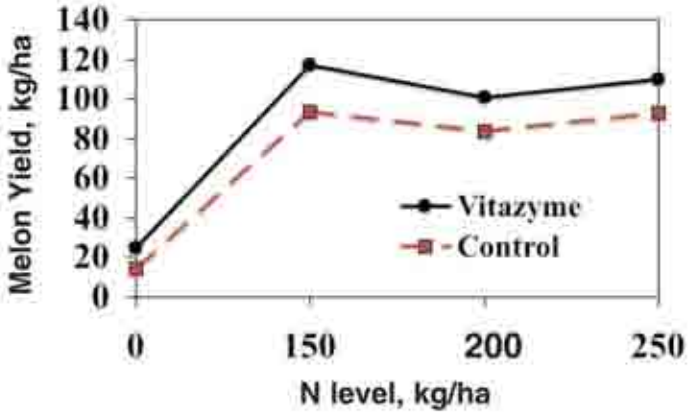
Harvest 4



Vine length at 40 and 60 days was actually less with Vitazyme at the 250 kg/ha N rate, but at the 0 and 150 kg/ha N rates Vitazyme produced somewhat longer vines. As expected, the lowest N level (0 kg/ha) produced significantly shorter vines, though Vitazyme significantly boosted vine length at 40 days after planting.

Female flower number was the greatest for Vitazyme at each nitrogen level, though these increases, up to 17%, were not statistically significant (P=0.05). The number of commercially viable fruit was also higher with Vitazyme, from 11 to 43 greater, than the control. Due to variability between plots, however, these differences were not significant. Melon dimensions in general were increased with Vitazyme, both melon length and diameter, but these differences were not significant except at the 0 kg/ha N rate. The fourth harvest produced less advantage for Vitazyme, the control slightly exceeding Vitazyme at the 150 and 250 kg/ha N rates.

Yield results:



Treatment	Melon yield*	Change**
	tons/ha	tons/ha
6 (150 N + Vita)	117.08 a	23.72 (+25%)
8 (250 N +Vita)	109.85 a	17.09 (+18%)
7 (200 N + Vita)	100.87 a	17.14 (+20%)
2 (150 N)	93.36 a	—
4 (250 N)	92.76 ab	—
3 (200 N)	83.73 b	—
5 (0 N + Vita)	24.55 c	10.17 (+71%)
1 (0 N)	14.38 c	—

*Means followed by the same letter are not significantly different at P-0.05. CV=22.1%. **Comparisons at the same N level.

As can be clearly seen from these data, Vitazyme produced much higher yields of watermelons than the untreated controls at the same N levels. While these differences were not significant due to the fairly high experimental error, they were consistently in favor of Vitazyme by from 18 to 71%, the highest being the no nitrogen control. Of considerable interest is the fact that increasing N levels reduced crop response slightly, as has been experienced in trials with other crops: as fertility reaches a maximum, the crop response to Vitazyme diminishes because one is approaching the maximum yield potential under the environmental conditions present.

Yield increase with Vitazyme

No N	**71%**
150 kg/ha N	**25%**
200 kg/ha N	**20%**
250 kg/ha N	**18%**

Economic analyses: The following table uses values generated by the researcher in Ecuador, in terms of U.S. dollars.

Treatment	Initial inputs	Fert. + Vita.	Total	12% F.C.*	Total	Yield	Income	Cost/Benefit
	$	$	$	$	$	tons/ha	$	
1 (0 N)	1,595.02	0	1,595.02	79.62	1,674.64	14.38	1,150.40	0.69
2 (150 N)	1,595.02	450.38	2,045.40	102.11	2,147.51	93.36	7,468.80	3.48
3 (200 N)	1,595.02	514.40	3,109.42	105.30	2,214.72	83.73	6,698.40	3.02
4 (250 N)	1,595.02	568.54	2,163.56	108.00	2,271.56	92.76	7,420.80	3.27
5 (0 N + Vita)	1,595.02	27.50	1,622.52	81.00	1,703.52	24.55	1,964.00	1.15
6 (150 N + Vita)	1,595.02	477.80	2,072.90	103.48	2,176.38	117.08	9,366.40	4.30
7 (200 N + Vita)	1,595.02	541.90	2,136.92	106.68	2,243.60	100.87	8,069.60	3.60
8 (250 N +Vita)	1,595.02	596.04	2,191.06	109.38	2,300.44	109.85	8,788.00	3.82

*Finance cost

Improvement of Income with Vitazyme At the Same N Level

No N ..... $813.60/ha (Treatment 1 vs. 5)
150 kg/ha N ..... $1,897.60/ha (Treatment 2 vs. 6)
200 kg/ha N ..... $1,371.20/ha (Treatment 3 vs. 7)
250 kg/ha N ..... $1,367.20/ha (Treatment 4 vs. 8)

Conclusions: Vitazyme in this Ecuador university study produced great increases in melon yield and income compared to the untreated controls at all nitrogen levels. Yield increases ranged from 18 to 71%, a response to better nutrient utilization with Vitazyme as evidenced by greater fruit numbers and female flowers, and generally greater melon dimensions. Vine length at 40 and 60 days after planting did not reflect these increases in yield. Income was greatly boosted by Vitazyme, especially at the 150 kg/ha nitrogen application, where the increase was $1,897.60/ha above the control, with a cost/benefit of 4.30. All cost/benefits with Vitazyme were substantially enhanced above the control, proving that Vitazyme use with watermelons in Ecuador is a highly viable practice for farmers.

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2007 Crop Results

Vitazyme on Watermelons

A Testimonial

Farmer: Michael Prochko *Location*: Jefferson, Ohio
Varieties: red seeded, red unseeded, and yellow unseeded types ("personal-sized")
Soil type: silt loam, poorly drained, tiled at 20-foot centers
Spacing: unknown *Mulching*: plastic
Fertility level: good
Experimental design: The farmer applied a special fertility program plus Vitazyme over the entire watermelon area. He compared this program to previous years' results with the same cropping system.
Fertilization: added sulfur, high-calcium lime, boron, zinc, manganese, and copper
Vitazyme application: 13 oz/acre to the leaves at intervals
Weather: erratic, with a drought until late July, and then good moisture
Yield and quality results: These small, "personal-sized" watermelons were very sweet and highly prolific during the production season. According to the farmer, "The melons developed a real following, and people got very upset when their production shut down."
Conclusions: Vitazyme was shown in this Ohio watermelon program to be an integral part of the farmer's highly successful production system.

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2004 Crop Results

Vitazyme on Watermelons

Vegetable Trial of the Cuban Ministry of Sugar

Researcher: unknown
Farm: Aracelio Iglesias Diaz Agricultural Enterprise
Location: Majajigua, Sancti Spiritus, Cuba
Soil type: "gleyish" Vertisol
Plant spacing: unknown
Variety: unknown
Planting date: unknown

Experimental design: A 1 hectare (2.5 acre) field of watermelons was equally divided into two parts, one treated with Vitazyme and the other left untreated, with the objective to quantify affects on yield and fruit size. All other cultural operations were the same for both treatments.

1. Control **2. Vitazyme**

Fertilization: compost only

Vitazyme application: (1) 1 liter/ha on the seeds and soil at planting; (2) 1 liter/ha to the plants and soil after plant emergence; (3) 1 liter/ha to the plants at flowering

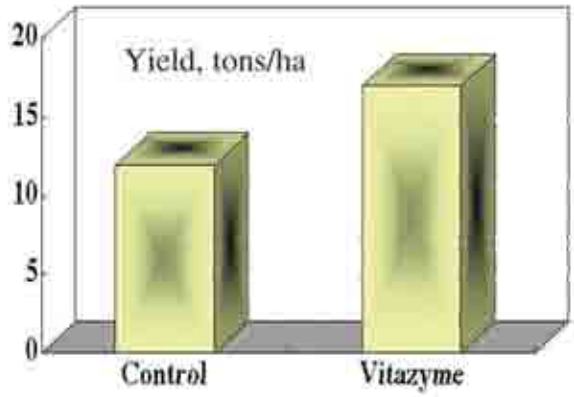
Harvest date: unknown

Yield results: Both yield and melon weights were determined.

Melon Yield

Treatment	Melon yield	Change
	tons/ha	tons/ha
Control	12	—
Vitazyme	17	5 (+42%)

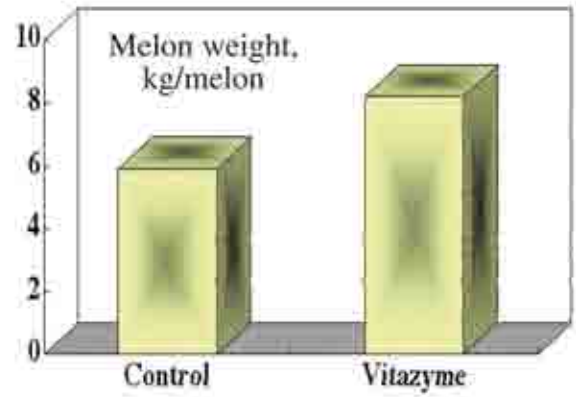
Increase in melon yield: + 42%



Melon Weight

Treatment	Melon weight	Change
	kg/melon	kg/melon
Control	5.9	—
Vitazyme	8.2	2.3 (+39%)

Increase in melon weight: + 39%



Conclusions: Vitazyme, applied three times during the crop cycle, increased crop yield by 42% and average melon weight by 39%. In addition...

- The treated crop showed greater foliage.
- Plants from treated seeds were more vigorous.
- Fruit and plant color were darker green.