

Vital Earth Resources

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

2005 Crop Results

Vitazyme on Papaya

Researcher: Roberto Ramos

Location: Cuba, Fruit Research Station

Variety: unknown

Age of trees: first production

Experimental design: Papaya trees were planted in a plantation setting at the research station to evaluate the effects of Vitazyme on growth and production. The trees had been started from seedlings, and treated periodically with Vitazyme from the beginning. One portion of the plantation was treated with Vitazyme and another portion was left untreated.

1. Control

4. Vitazyme

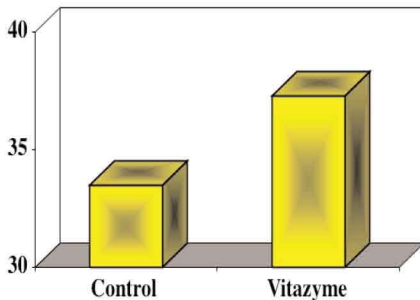
Fertilization: unknown

Vitazyme treatments: periodically at 1 liter/ha to the leaves and soil

Growth and production results: At an unknown date, evaluations were made for tree growth and fruit production based on the average of 15 trees per treatment.

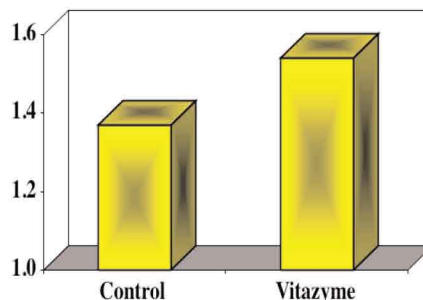
Treatment	Trunk diameter	Change	Tree height	Change	Fruit/tree	Change
	cm	cm	m	m	number	number
Control	33.50	—	1.37	—	20.0	—
Vitazyme	37.27	3.77 (+11%)	1.54	0.17 (+12%)	30.7	10.7 (+54%)

Trunk Diameter, cm



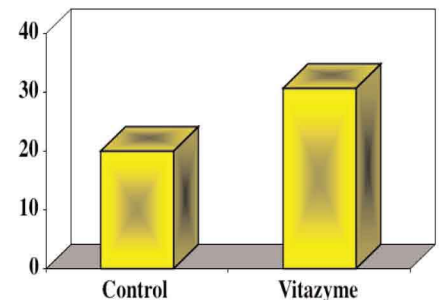
Increase in trunk diameter: 11%

Tree Height, m



Increase in tree height: 12%

Fruit Per Tree



Increase in fruit per tree: 54%

Conclusions: This papaya study in Cuba at a fruit research station revealed that Vitazyme greatly increased the number of fruit produced per tree, by 54% over the control. This increase resulted from trees that were larger and more vigorous, and which had more blossoms and bore more fruit than the controls. The treated trees fixed more sunlight energy and atmospheric CO₂ to produce greater tree growth and fruit.

Vital Earth Resources

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

2005 Crop Results

Vitazyme on Papaya (young plants)

Researchers: Gladys Borrego, Antonio Dopazo, and Yoel Miranda

Research organization: Tropical Fruit Culture Research Institute, Havana, Cuba

Location: Jaguey Grande Citrus Experiment Station, Cuba

Varieties: red Maradol and Solo Sunrise

Soil substitute: soil, citricompost, and zeolite (30-20 v/v)

Planting date: November, 2004

Experimental design: Vitazyme, mycorrhizae, and trichoderma were applied to pre-germinated papaya seedlings that were transplanted in 14x20 cm bags. The four treatments were applied to six replicates, with 10 plants per treatment, to determine effects of the treatments on various growth parameters.

1. Control 2. Mycorrhizae 3. Vitazyme 4. Mycorrhizae + Vitazyme + Trichoderma

Fertilization: unknown

Vitazyme application: 10 ml/liter of water, sprayed on the trees and soil at planting

Mycorrhizal application: A pool of strains from INCA; 20 grams/bag in the soil at planting

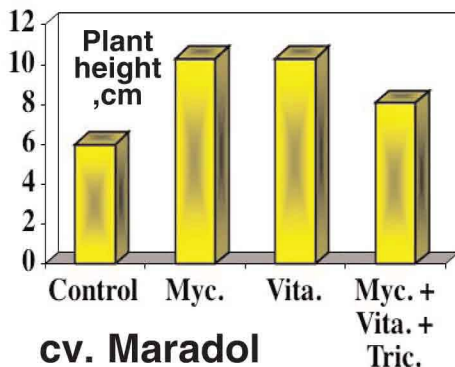
Trichoderma application: from IIFT labs; 20 grams of the full mixture per pot with a backpack sprayer

Watering: "Pyramidal water" was applied on alternate days.

Growth results: Every 10 days, measurements of plant height, stalk diameter, and leaf number were made. The values given below are at 30 days after treatment.

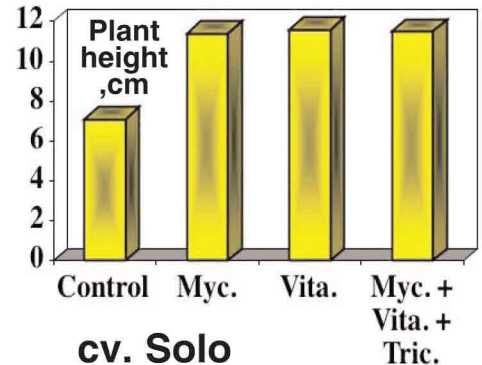
Plant Height

Treatment	Plant height	Change	Plant height	Change
	cm	cm	cm	cm
	cv. Maradol		cv. Solo	
1. (Control)	6.0	—	7.1	—
2. (Mycorr.)	10.3	4.3 (+72%)	11.4	4.3 (+61%)
3. (Vitazyme)	10.3	4.3 (+72%)	11.6	4.5 (+63%)
4. (Mycorr. + Vita. + Trico.)	8.1	2.1 (+35%)	11.5	4.4 (+62%)



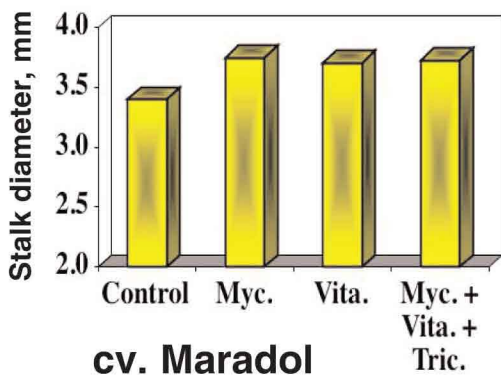
cv. Maradol
Increase in plant
height: 72%

cv. Solo
Increase in plant
height: 63%



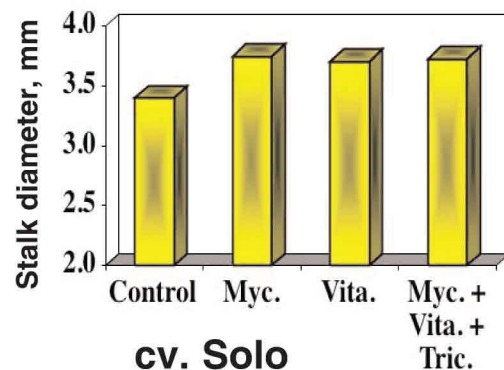
Stalk Diameter

Treatment	Stalk diameter mm	Change mm	Stalk diameter mm	Change mm
cv. Maradol			cv. Solo	
1. (Control)	3.40	—	3.43	—
2. (Mycorr.)	3.75	0.35 (+10%)	3.81	0.38 (+11%)
3. (Vitazyme)	3.71	0.31 (+9%)	3.52	0.09 (+3%)
4. (Mycorr. + Vita. + Trico.)	3.73	0.33 (+10%)	4.00	0.57 (+17%)



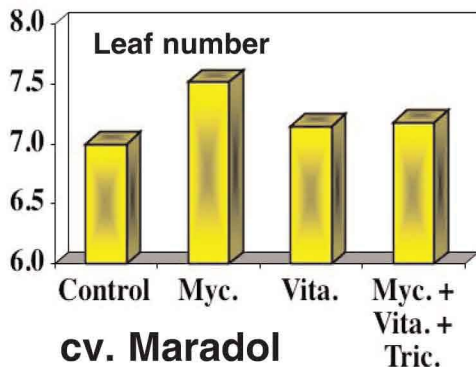
cv. Maradol
Increase in stalk diameter
(Vitazyme): 9%

cv. Solo
Increase in stalk diameter (Mycorr.
+ Vitazyme + Tricho.): 17%



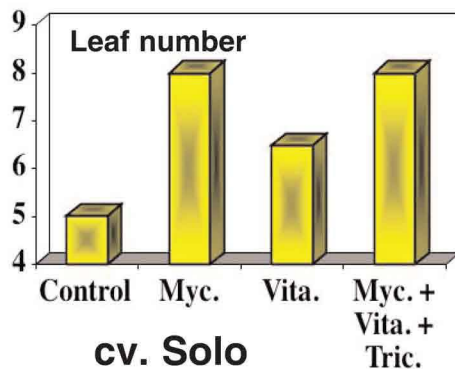
Leaf Number

Treatment	Leaf number	Change	Leaf number	Change
cv. Maradol			cv. Solo	
1. (Control)	7.00	—	5.01	—
2. (Mycorr.)	7.52	0.52 (+7%)	8.00	2.99 (+60%)
3. (Vitazyme)	7.15	0.15 (+2%)	6.48	1.47 (+29%)
4. (Mycorr. + Vita. + Trico.)	7.18	0.18 (+3%)	8.02	3.01 (+60%)



cv. Maradol
Increase in leaf number
(Vitazyme): 2%

cv. Solo
Increase in leaf number
(Vitazyme): 29%



Conclusions: According to the Cuban researchers,

- Under semi-controlled conditions, best results in the Maradol variety were found in mycorrhizae and Vitazyme treatments, with more than 10 cm in 30 days. The combined mycorrhizae + Vitazyme + trichoderma treatment was also higher than the control.
- In the Solo variety inoculation with mycorrhizae, Vitazyme application, and the combined mycorrhizae

+ Vitazyme + trichoderma treatments favored most seedling growth, showing values above 10 cm, and were also higher than those of the Maradol variety.

3. In both the Maradol and Solo Sunrise varieties, treatments of mycorrhizae and mycorrhizae + Vitazyme + trichoderma showed best results in stalk diameter, with values close to 4 mm, followed by Vitazyme that reached a diameter above 3.5 mm. Similar results were found in number of leaves in both varieties.

Vital Earth Resources

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

2005 Crop Results

Vitazyme on Papaya (Seedlings)

Researchers: Gladys Borrego, Antonio Dopazo, and Yoel Miranda

Research organization: Tropical Fruit Culture Research Institute, Havana, Cuba

Location: Jaguey Grande Citrus Experiment Station, Cuba

Variety: red Maradol **Soil substitute:** 35% cattle manure, 15% rice husk, and 50% topsoil

Planting date: November, 2004

Experimental design: Vitazyme and mycorrhizae were applied to newly planted papaya seeds in trays containing the substrate mix. The seeds had been soaked for 48 hours in “pyramidal water” before planting. Also, seeds for all but the control treatment came from “energetically treated” fruits. The study was completely randomized with five replications.

1. Mycorrhizae

2. Mycorrhizae + Vitazyme

3. Control

4. Vitazyme

Fertilization: Leaf yellowing was corrected by application of earthworm castings during vigorous tree growth.

Vitazyme application: Method, time, and amount of treatment are unknown.

Mycorrhizae application: a pool of strains from INCA; method, rate, and timing of applications are unknown

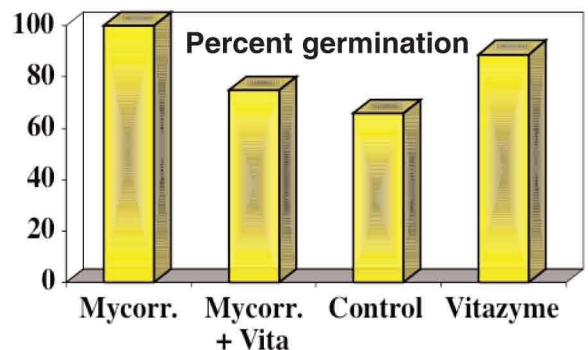
Watering: Irrigation water was applied every other day initially, and daily after the trees had gained some size.

Growth results:

Germination

All treatments had germinating seeds by eight days after planting, and all viable seeds had germinated by 12 days after planting.

Treatment	Plant germination
	%
1. (Mycorr.)	100
2. (Mycorr. + Vita)	75
3. (Control)	66
4. (Vitazyme)	89

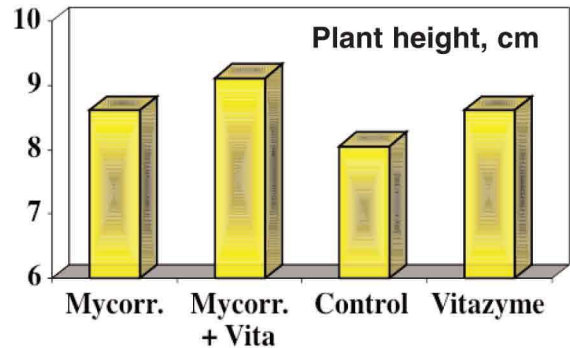


The mycorrhizal inoculation provided the greatest germination percentage, followed by Vitazyme, and then mycorrhizae + Vitazyme. The control provided the lowest germination rate.

Plant Height

The height of the trees was measured seven times from December 8, 2004, to January 29, 2005. Only the final measurement values for January 29 are given on the next page.

Treatment	Plant height cm	Change cm
1. (Mycorr.)	8.62 ab	0.56 (+7%)
2. (Mycorr. + Vita)	9.12 a	1.06 (+13%)
3. (Control)	8.06 b	—
4. (Vitazyme)	8.62 ab	0.56 (+7%)



Mycorrhizae + Vitazyme produced the greatest plant height increase of all treatments, which was 13% more than the control. Each ingredient alone produced a 7% plant height increase.

Increase in plant height (Vitazyme): 7%

Increase in plant height (Vitazyme + Mycorrhizae): 13%

Conclusions: According to the Cuban researchers,

1. The inoculation of Maradol papaya seeds with a mycorrhizal pool was the most effective treatment on germination, followed by Vitazyme application. The control showed the lowest germination percentage.
2. Under controlled conditions, the combination mycorrhizae + Vitazyme favored seedling growth. The inoculation with mycorrhizae and Vitazyme application, independently, showed similar values, while the control showed the shortest plants.