

Vital Earth Resources

706 East Broadway, Gladewater, Texas 75647

(903) 845-2163 FAX: (903) 845-2262

2000 Crop Results

Vitazyme on Walnuts (New Planting) ***A testimonial***

Farmer: Cheryl Smith, Jack's Orchard Supply

Location: Chico, California

Planting date: May 17, 2000

We planted 176 walnut trees in May of 2000. This is late by 45 to 60 days of normal planting. At planting we added 6 oz. of Vitazyme to the root dip water. All trees were dipped.

We have received many comments about the vitality, deep green color, and growth of these young walnuts. The most significant hardship with late planted walnuts is getting a good stand. Death losses can be fairly high, so we were very pleased to have lost less than 2% of the total planted trees.

We are a dealer for Vitazyme in the 530 telephone area code, and we are hearing a lot of comment on this product. Growers like how it works. So do we. Try it on strawberries: wow!!!

**Death loss for a late
planting: < 2%**

Cheryl Smith
Jack's Orchard Supply

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2000 Crop Results

Vitazyme on Pistachios ***A testimonial***

Researcher: Al Simons

Location: Newberry Springs, California

Tree age: 10 years

Soil type: light blow sand with high levels of boron in subsoil

All areas of a 10-acre pistachio grove were treated with Vitazyme: (a) 13 oz/acre on the soil before bud initiation; (b) 13 oz/acre at bud breaks; (c) 13 oz/acre at early sizing; (d) 13 oz/acre at nut gel to white

Yield results: **The crop produced the largest size nuts in the Newberry Springs Pistachio Association, and also the largest crop harvest in the Newberry Springs Pistachio Association.**

Income results: Al Simons: **"I estimate that this crop returned 250 times the cost of the Vitazyme.** This is based on the data given by the grower when he reordered 4 gallons of Vitazyme for the year 2001."

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2000 Crop Results

Vitazyme on Almonds

Grower: Tom, Dan, and Chip Rogers

Location: Madera, California

Varieties: Non Pareil, Carmel, Butte, and Padre

Soil type: sandy loam

Tree age: blocks 1, 2, 3, and 4 – 20 years; blocks 5 and 6 – 8 years

Tree spacing: Blocks 1, 2, 3, and 4 – 22 ft x 22 ft; Blocks 5 and 6 – 22 ft x 18 ft

Experimental design: Six blocks of almond trees were selected for a comparative test, pitting three low yielding blocks against three higher-yielding blocks. The three low-yielding blocks were treated with Vitazyme, and the other three left untreated.

Block	Acreage	Variety	Yield potential	Treatment
1	10	Non Pareil/Carmel	higher	control
2	10	Non Pareil/Carmel	lower	Vitazyme
3	14	Non Pareil/Carmel	higher	control
4	12	Non Pareil/Carmel	lower	Vitazyme
5	11	Butte/Padre	higher	control
6	11	Butte/Padre	lower	Vitazyme

Fertility treatments: All areas of the grove were sprinkler irrigated beneath the leaf canopy with "REF water", an electronically treated water using a programmed electronic device that imprints the water with electrons. All areas received 75 lb/acre of N as "UN 32" in April, and again in June. An organism cocktail of "Ceres", plus "Liqui-Comp", a mixture of liquified compost plus microbes, was applied 2 to 3 weeks before both of the UN 32 applications through the sprinkler system. Two applications of 10 lb/acre K_2SO_4 were made in the spring to the leaves using an electrostatic sprayer.

Vitazyme treatments: Vitazyme at 6 oz/acre was sprayed to three blocks on the leaves in May, applied through the sprinkler system at 13 oz/acre in June, and sprayed on the leaves at 6 oz/acre in July.

Harvest date: Non Pareil–September 20; Padre–October 9; Butte–October 16; Carmel–October 30.

Harvest methods: The various blocks and varieties were not separated and weighed at harvest due to the threat of rain and the need to harvest quickly. A rain had fallen on the crop once, and the almonds had been lifted, cleaned, and dropped again for drying before another rainstorm arrived.

Yield results: **During harvest (by the farmers themselves), Blocks 2, 4, and 6 produced as many or slightly more almonds than the untreated Blocks 1, 3, and 5, as determined by load counts for each area. This proved that Vitazyme increased almond yield significantly above the normal in these less productive blocks.**

Yields for 2000:

Non Pareil and Carmel – 2,875 lb/acre (normal bloom and pollination)

Butte and Padre – 1, 805 lb/acre (two week later bloom, and poor pollination due to very rainy weather)

State average yield – 1,292 lb/acre (based on 620,000,000 lb over 480,000 acres)

Quality results: *Turnout* (percent of meats of the entire crop hauled in) for the two major varieties raised was very

high in spite of generally thicker hulls than in 1999. These turnout values were higher than for the usual turnout for 2000.

Non Pareil – 29.56 %

Carmel – 29.69 %

Conclusions: In spite of poor pollination of the 2000 crop and adversities during the growing season – and very low statewide average yields (1,292 lb/acre) – the Rogers' yields were far above this average: 121% for Non Pareils and Carmels, and 40% for Buttes and Padres. **Vitazyme played a significant role in this high yield by boosting yields significantly in the three less productive blocks of the farm. Vitazyme also played a part in maintaining high quality and treatment of the nuts.**

Some comments of Tom Rogers regarding Vitazyme effects on his almonds are as follows:

- "I am very pleased with how Vitazyme performed on our almonds this year."
- "Vitazyme caused Blocks 2, 4, and 6 to produce as well as – or a little better than – the higher producing Blocks 1, 3, and 5."
- "The effects of Vitazyme caught our eye."
- "We plan to use Vitazyme on all of our acres next year."

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1997 Crop Results

Vitazyme on Almonds

Researcher: Chip Rogers

Location: Madera, California

Variety: Non Pareil and Carmel

Tree age: mature

Soil type: sandy loam

Tree spacing: 22 ft x 22 ft

Experimental design: Ten acres of a 45-acre mature almond grove were treated with Vitazyme, with all areas of the grove otherwise being treated the same. This ten acres constituted 15 rows of trees.

1. Control
2. Vitazyme, applied twice

Two varieties of almonds were present in both treated and untreated areas, and were harvested separately.

Fertility treatments: All areas of the grove were sprinkler irrigated with "REF water". This water is directly from a deep well and run through a pipe fitting to which is attached a programmed electronic device that imprints the water with electrons. All areas received 50 lb of N/acre as "un 32" in April, and 50 lb of N/acre as "can 17" in early October. The same applications had been made the previous year. "Rhizone", an organism cocktail, was applied foliar to all trees, as well as 10 lb/acre of K_2SO_4 using an electrostatic sprayer.

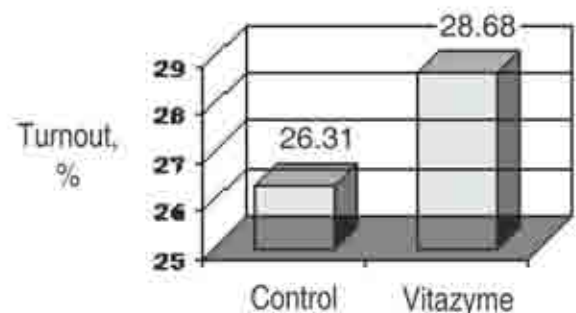
Vitazyme treatments: Vitazyme at 13 oz/acre was applied by injector through the sprinkler irrigation system for the treated area in mid-April, and again at 13 oz/acre in mid-July. Bloom was from late January through early March, an unusually long period.

Harvest date and method: August 20, 1997. For the treated and control areas a harvester loaded a full trailer, and the area for this harvest was calculated. Weights of these nuts were obtained, and quality evaluations of "turnout" (the percent of nut meat of the entire weight) and "rejects" (the percent of nuts damaged by worms) were determined for both trailer loads.

Yield and quality results: Non Pareil almonds:

	<u>Control</u>	<u>Vitazyme</u>	<u>Change</u>
Area harvested for one trailer load	2.64 acre	1.98 acre	
Total nut production, less hulls	2,777.2 lb/acre	3,207.1 lb/acre	429.9 lb/acre (+15.5%)
Turnout (nut meat percentage of nuts and hulls)	26.31%	28.68%	+2.37%

Increase in turnout: 2.37
percentage points



Control**Vitazyme****Change**

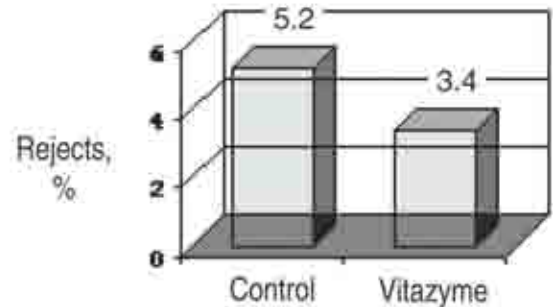
Rejects (worm damage)

5.2%

3.4%

- 1.8 percentage points

Reduction in rejects: 1.8
percentage points

**Control****Vitazyme****Change**

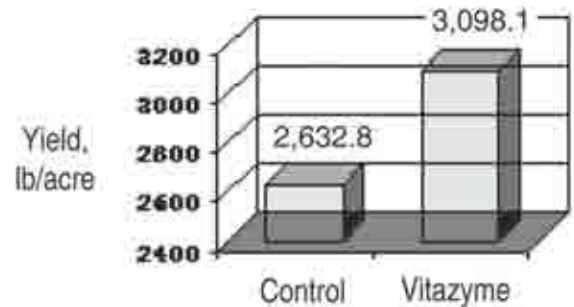
Net nut production (total less rejects)

2,632.8 lb/acre

3,098.1 lb/acre

465.3 lb/acre (+17.7%)

Yield increase:
17.7 %



Income results: The estimated price for the almonds is \$1.50/lb.

Control**Vitazyme****Increase**

Total income

\$3,949.20/acre

\$4,647.15/acre

\$697.95/acre

Income increase:

\$697.95/acre

Comments: (1) The percent turnout was improved for Vitazyme due to fuller nut meats.

(2) The percent rejects was reduced for Vitazyme due to less insect (worm) damage, even though a neighboring almond grove was not well tended and in past seasons would increase worm damage on this side of the grove. Thus, Vitazyme provided some insect protection.

(3) In spite of a nitrogen application of only 100 lb of N/acre, versus the usual recommended 200 to 300 lb/acre, yields were maintained at high levels.

(4) The Carmel variety, though not analyzed in this study, provided about the same yield increase as the Non Pareil variety.

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2010 Crop Results

Vitazyme on Peanuts

Researcher: unknown

Location: Phu Cat, Binh Dinh Province, Viet Nam

Variety: local variety

Planting date: December 20, 2009

Experimental design: A trial was set up with peanuts using three treatments in separate areas of a field. The purpose of the study was to evaluate the effect of Vitazyme and Rhizobium bacteria on peanut growth and yield.

1. Control

2. Rhizobium

3 Rhizobium + Vitazyme

Vitazyme application: 5% seed treatment before planting

Vitazyme + Rhizobium applications: 5% Vitazyme plus 1 kg/liter of water, on the seeds

Rhizobium application: 1 kg/ha of inoculant in 1 liter of water, on the seeds

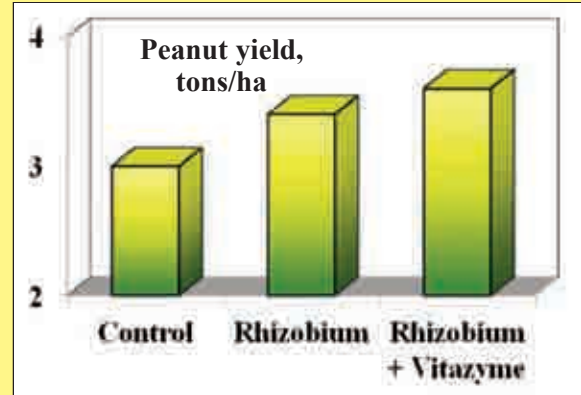
Germination results: Vitazyme accelerated germination by 1 to 2 days.

Improvement in time to germination with Vitazyme: 1 to 2 days

Yield results:

Treatment	Yield tons/ha	Yield change tons/ha
Control	3.0	---
Rhizobium	3.4	0.4 (+13%)
Rhizobium + Vitazyme	3.6	0.6 (+20%)

**Increase in yield with Vitazyme +
Rhizobium bacteria: 20%**



Conclusion: This peanut trial in Viet Nam, using Rhizobium bacterial inoculant with and without Vitazyme as a seed treatment, proved that Vitazyme + Rhizobium alone boosted yield by 13% above the control, while Vitazyme plus the Rhizobium increased yield by 20%, another 7% above the Rhizobium alone. These results prove not only the efficacy of Rhizobium bacteria to improve peanut yields, but of Vitazyme to further enhance Rhizobium activity. No treatment with Vitazyme alone was used in this study.



Peanuts Crop Report Directory

Recommended Application Rates For Peanuts

2006	Unknown variety Cuba
2005	TamSpan 90 Whitheral, Texas
2003	TamSpan 90 Whitheral, Texas
2002	Spanish, Tam-Span 90 Whitherral, Texas
1998	AK62 Ebini region, Guyana
1997	Valencia Brownfield, Texas



Crop recommendations for Peanuts

Apply Vitazyme at planting with one of the following methods:

Dry Planters:

With herbicide either before or after planting (either before or shortly after emergence) at the rate of 1 liter/hectare (13-16 oz/acre).

or

Liquid Planters:

In furrow or 2x2 through liquid attachment on the planter. For small plots spray a 1% solution directly on the seeds in furrow before the row is closed at the rate of 1 liter/hectare (13-16 oz/acre).

Apply again at the rate of 1 liter/hectare (13-16 oz/acre) at early bloom or approximately 30 days after planting.

Vitazyme can be tank mixed with all farm chemicals, including herbicides, insecticides, fungicides, and fertilizers.

Added benefit: when mixed with herbicide, Vitazyme will stimulate weed growth, thereby enhancing herbicide efficacy.

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2006 Crop Results

Vitazyme on Peanuts

Ministry of Sugar, Cuban Ministry of Agriculture

Researchers: Wilberto G. Marrero and Jorge G. Acosta

Location: Pedro Gonzalez Credit and Service Cooperative, Havana Province, Cuba

Soil type: red ferralitic (Eustrtox) of low fertility

Variety: unknown

Planting rate: unknown

Row spacing: unknown

Planting date: June 6, 2006

Watering: rain-fed

Experimental design: A field was split with one part treated with Vitazyme and the other portion left untreated. The objective of the study was to discover the effect of Vitazyme on peanut yield.

1. Control

2. Vitazyme

Fertilization: unknown

Vitazyme application: 1 liter/ha on June 21, 15 days after planting; 1 liter/ha on July 17, 31 days after planting

Growth observations:

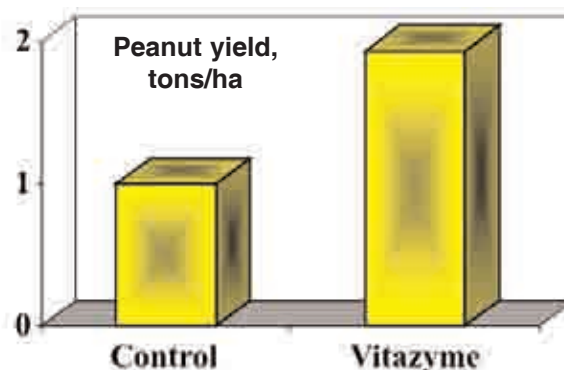
Parameter	Control	Vitazyme
Pod number	Fewer: 15 to 18/plant	Many more: 30 to 33/plant
Foliage development	Smaller leaves, slower growth	Larger leaves, faster growth
Flower development	Less	Greater
Canopy closure	Slower	Faster
Root growth	Smaller	Greater

Harvest date: September 20, 2006, after 104 days of growth

Yield results:

Treatment	Yield	Increase
	tons/ha	tons/ha
Control	1.00	—
Vitazyme	1.93	0.93 (+93%)
Historical yield	1.00	

Increase in peanut yield: 93%



Conclusions: In this Cuban peanut study conducted on red ferralitic soils, two applications of Vitazyme at 1 liter/ha each time greatly increased the yield of peanuts (+93%) above the control and also over the historical yield average.

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2005 Crop Results

Vitazyme on Peanuts

Researcher/Farmer: George Nickelson Location: Whitheral, Texas Variety: TamSpan 90
Row spacing: 40 inches to middles, 8 inches on berm Population: 100 lb/acre
Soil type: medium sandy loam Planting date: May 15, 2004 Previous crop: cotton
Experimental design: A center-pivot field was divided into two 33.5-acre areas, with one part receiving Vitazyme and the other no product. All other treatments were the same for both areas.

1. Control

2. Vitazyme

Fertilizer: 11-52-0% N-P₂O₅-K₂O applied pre-plant, with some liquid calcium and nitrogen applied through the irrigation system

Vitazyme application: 13 oz/acre at planting, sprayed on the soil in a 10-inch band behind the planter; 13 oz/acre sprayed on the leaves and soil at early bloom

Irrigation: about one inch per week during the primary growing period

Weather: a fairly cool summer with good rainfall all year

Harvest date: dug in early October, and picked up November 1 to 6

Yield results: Results were affected by excessive weed growth from considerable rainfall, the Vitazyme area more so because it was on the outside of the circle. The Vitazyme area was also lower, on part of an old lake bottom.

Treatment	Peanut yield	Change
	lb/acre	lb/acre
Control	3,329	—
Vitazyme	3,521	192 (+6%)

Yield increase: 6%

Quality and income results: Based on payment reports, the average prices for the peanuts were as follows:

Control: \$0.1861/lb, or \$372.20/ton

Vitazyme: \$0.1869/lb, or \$373.80/ton

Treatment	Peanut yield	Peanut value*	Value change
	lb/acre	\$/acre	\$/acre
Control	3,329	619.53	—
Vitazyme*	3,521	658.07	38.54

*See the prices above.

Conclusions: This west Texas field-scale peanut study revealed that Vitazyme produced a small (6%) but highly profitable yield increase, which was of slightly higher quality and produced \$38.54/acre more income. This increase came despite the Vitazyme treatment having a more serious weed problem than the control, and being located on an old lake bed which, during this wet year, hindered maximum yields.

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2003 Crop Results

Vitazyme on Peanuts

Farmer: George Nickelson

Variety: TamSpan 90

Soil type: medium sandy loam

Previous crop: cotton

Experimental design: A center pivot field was divided into two 33.5-acre areas, one receiving Vitazyme and the other none. All other treatments were the same for both parcels.

Location: Whitheral, Texas

Row spacing: 40 inches to middles, 8 inches on berm

Population: 100 lb/acre

Planting date: May 15, 2003

1. Control

2. Vitazyme

Fertilizers: 11-52-0 fertilizer applied preplant

Vitazyme application: 13 oz/acre at planting, 13 oz/acre about July 20 on the leaves and soil

Irrigation: as needed, but one period of about 2 weeks received none due to the loss of the irrigation rig from a tornado.

Weather: a hot, extremely dry summer; 8.5 inches of rain for the year, with no rain for August and September

Harvest date: November 18, 2003 (dug several weeks earlier)

Yield results:

<u>Treatment</u>	<u>Yield</u>	<u>Change</u>
	lb/acre	lb/acre
Control	3,515	—
Vitazyme	3,582	67 (+2%)

Yield increase: 2%

Income results: The sale price of the peanuts was \$370/ton, or \$0.185/lb.

$67 \text{ lb/acre} \times \$0.185/\text{lb} = \$12.40/\text{acre}$ more income from Vitazyme

Conclusions: This peanut trial in west Texas produced a small but profitable yield increase with Vitazyme application. The peanut grade was similar for both treatments (about 77). The yield difference would have been greater if the treated areas had not included low areas that produced less yield due to more weed competition and poorer water relations. In 2002, a similar test on this same farm with peanuts produced a 30% yield increase with Vitazyme.

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2002 Crop Results

Vitazyme on Peanuts

Farmer: George Nickelson, Jr.
double row with 8 in spacing

Location: Whitherral, Texas

Row spacing: 40 inches,

Variety: Spanish, "Tam-Span 90"

Planting date: May 18, 2002

Soil type: fine sandy loam

Harvest date: dug October 21, picked up about November 15

Experimental design: A center pivot area was divided into halves, one half treated with Vitazyme and the other half left untreated.

Fertilization: 20 lb/acre N preplant, 11-50-0 postplant

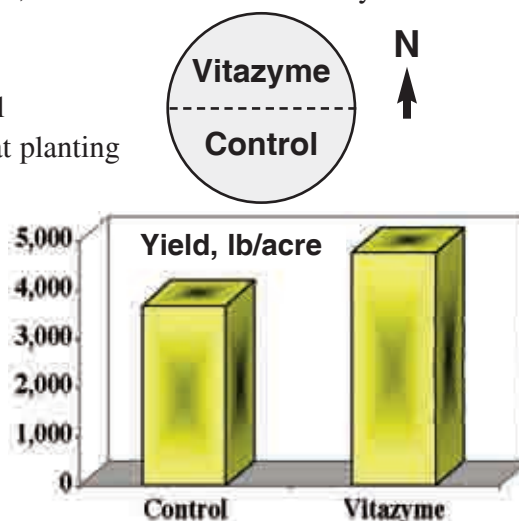
Vitazyme application: 13 oz/acre June 18, on the leaves and soil

Seed inoculation: all seeds inoculated with rhizobium bacteria at planting

Yield results:

Treatment	Total for 33 acres	Area yield	Yield change
	lb	lb/acre	lb/acre
Control	121,484	3,681	—
Vitazyme	157,398	4,770	+1,089 (+30%)

Yield increase: 30%



Quality results: All of the peanuts graded at 77, a very high grade.

Income results: A price of \$382/ton was received for the peanuts.

Increase in income with Vitazyme: \$208.00/acre

Cost:Benefit ratio of Vitazyme: 52:1

Quality observations: Peanuts that were collected from both treatments on August 21, and stored in plastic bags, revealed that the control peanuts developed a coating of white fungus over all pod surfaces; the Vitazyme treated peanuts developed very little fungus coating. This difference may imply the ability of Vitazyme to help the peanut plant deter fungal diseases.

Conclusions: One application of Vitazyme on the irrigated peanut field increased the yield by 30%, giving a very high return ratio of 52:1, which translated to an increase of \$208/acre. This great increase in yield and return with Vitazyme is likely due in part to the synergism of Vitazyme's active agents with the rhizobium bacteria in the rhizosphere to encourage natural symbiotic nitrogen fixation.

1998 Crop Results

Vitazyme on Peanuts Caribbean Agricultural Research and Development Institute (CARDI)

Researcher: Leslie Simpson, Ph.D.

Location: Ebini region, Guyana

Seeding date: unknown

Variety: AK62

Seeding rate: unknown

Row spacing: unknown

Experimental design: A randomized complete block design with four replications was established on a uniform soil area. Each plot was 2.7X10.0 meters (0.0027 ha). Treatments were as follows:

1. Control (no Vitazyme)
2. Vitazyme applied twice
3. Vitazyme applied once

Fertility treatments: unknown

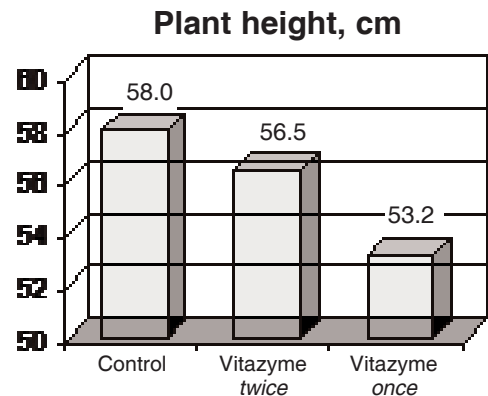
Vitazyme applications: For Treatment 2, Vitazyme was applied at 1 liter/ha (13 oz/acre) to the soil after planting but before emergence, and at the same rate at pegging. For Treatment 3, only the pegging treatment was applied.

Harvest date: unknown

Yield results: Several parameters were determined at harvest, as indicated below.

PLANT HEIGHT

Treatment	Plant height, cm	Decrease, cm
1. Control	58.0	--
2. Vitazyme twice	56.5	1.5 (-3 %)
3. Vitazyme once	53.2	4.8 (-8 %)

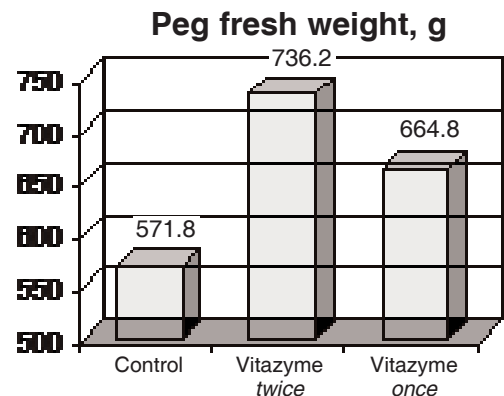


**Dry weight decrease:
 8% Vitazyme twice: + 8.5%**

PEG FRESH WEIGHT

Treatment	Peg Fresh weight, g	Increase, g
1. Control	571.8	--
2. Vitazyme twice	736.2 *	164.4 (+29 %)
3. Vitazyme once	664.8	93.0 (+16 %)

*Significantly greater than the control at P=0.06. LSD_{0.05} =177.6.



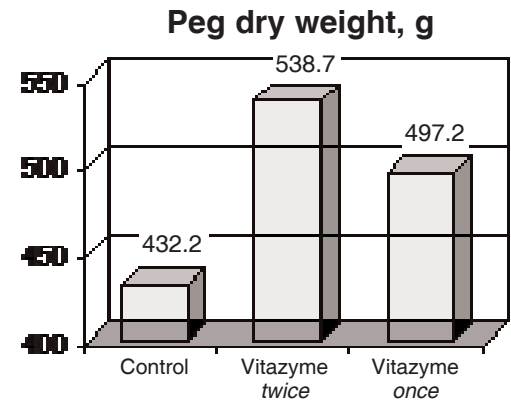
Peg fresh weight increase: 29%

PEG DRY WEIGHT

Treatment	Peg dry weight, g	Increase, g
1. Control	432.2	--
2. Vitazyme twice	538.7 *	106.5 (+25 %)
3. Vitazyme once	497.2	65.0 (+15 %)

*Significantly greater than the control at P=0.07. $LSD_{0.05}=113.6$.

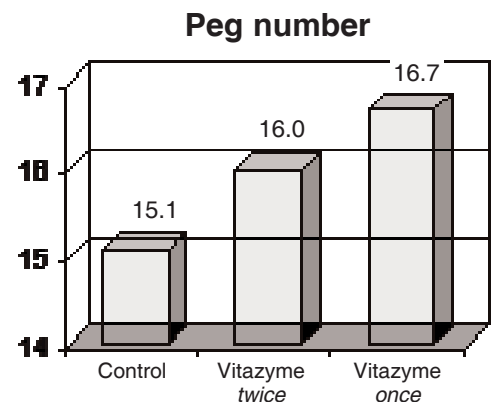
**Peg dry weight increase:
25%**



PEG NUMBER

Treatment	Peg number	Increase
1. Control	15.1	--
2. Vitazyme twice	16.0	0.9 (+6 %)
3. Vitazyme once	16.7	1.6 (+11 %)

**Peg number increase:
11%**

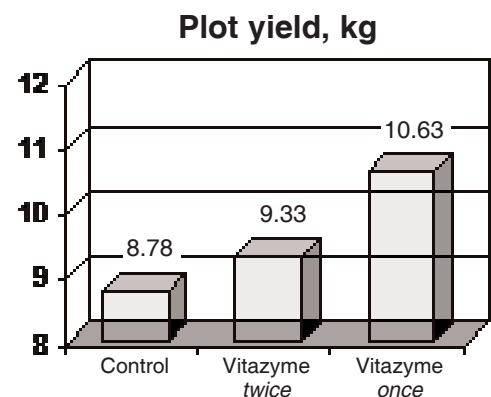


PLOT YIELD

Treatment	Plot yield, kg	Increase, kg
1. Control	8.78	--
2. Vitazyme twice	9.33 *	0.55 (+6 %)
3. Vitazyme once	10.63 **	1.85 (+21 %)

*Significantly greater than the control at P=0.14; **significantly greater than the control at P=0.01. $LSD_{0.10}=0.74$; $LSD_{0.01}=1.29$.

Yield increase: 21%



Comments: Vitazyme applied to peanuts at the initiation of pegging greatly and significantly stimulated peanut growth and yield (by 21%). Peg fresh and dry weights were improved by two applications of Vitazyme, but the yield effect showed through primarily with a single 1 liter/ha (13 oz/acre) application at pegging. Plant height was negatively correlated with yield. It appears that one application of Vitazyme at pegging may be sufficient in this tropical environment to elicit the maximum yield potential of peanuts.

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1997 Crop Results

Vitazyme on Organic Peanuts

— Irrigated —

Researcher: Cliff Bingham

Location: Brownfield, Texas

Seeding rate: 57 lb/acre

Variety: Valencia

Experimental design: A production field was divided into two sections: an untreated control and a Vitazyme treated area. A live *Rhizobium* seed inoculant was added on the seed along with Vitazyme.

Seeding date: May 6 (check) and May 8 and 12 (Vitazyme)

Row width: 40 inches

1. Control (no Vitazyme)

2. Vitazyme plus *Rhizobium*

Fertility treatments: manure at 10 tons/acre, applied in February of 1996

Vitazyme application: 13 oz/acre on the seed at planting, along with a live *Rhizobium* inoculant; 10 oz/acre sprayed on the foliage and soil at early bloom

Soil: Brownfield sandy loam

Weed control: cultivation

Harvest date: Vitazyme treatment: dug on September 18 and 19, and threshed September 25. Control treatment: dug on September 30, and threshed October 5

Yield results:

	<u>Control</u>	<u>Vitazyme</u>	<u>Increase with Vitazyme</u>
Peanut weights	2,981 lb/acre	3,155 lb/acre	174 lb/acre

Yield Increase:

6%

*Note: This yield increase should have been higher due to a breakdown of the irrigation system, resulting in less water delivered to the Vitazyme rows later in the season.

Income results: The price paid for the Vitazyme-treated peanuts was \$0.225/lb, and \$0.219/lb for the control peanuts. The reduced price for the control was in part due to greater shelling caused by excessive drying of the peanuts before threshing.

	<u>Control</u>	<u>Vitazyme</u>
Peanut income	\$652.84/acre	\$709.88/acre

Income Increase:

\$57.04/acre

Comments: The Vitazyme treated peanuts had much better growth and a darker green color than the control throughout the season. The Vitazyme and *Rhizobium* effects are unable to be determined individually by this test.