

## Vital Earth Resources

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

# 2006 Crop Results

## Vitazyme on Sweet Potatoes

### Ministry of Sugar, Cuban Ministry of Agriculture

**Researchers:** Wilberto G. Marrero and Jorge G. Acosta

**Location:** Juan Abrahantes Farm, Madruga, Havana Province, Cuba

**Soil type:** yellow ferralitic of low fertility

**Planting rate:** unknown

**Planting date:** June 1, 2006

**Experimental design:** A split field study was designed to evaluate the effects of Vitazyme on the yield of sweet potatoes. A 1.0 hectare area was treated with the product, while the rest of the field was left untreated.

**Variety:** INIVIT 98-2

**Row spacing:** unknown

**Watering:** rain-fed

#### 1. Control

#### 2. Vitazyme

**Fertilization:** unknown

**Vitazyme application:** 1 liter/ha on the leaves and soil on June 21, 20 days after planting, and 1 liter/ha on the leaves and soil on July 1, 10 days after the first application

**Harvest date:** October 10, 2006, after 101 days of growth

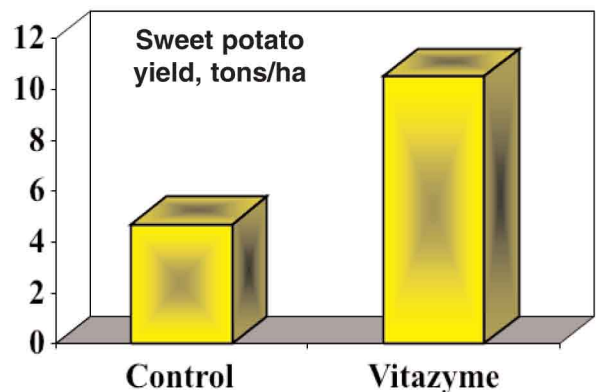
**Growth observations:** Vitazyme applications produced the effects versus the control:

1. Greater vegetative and foliar growth
2. Increased resistance to water stress
3. More uniform tubers

**Yield results:**

Treatment	Yield tons/ha	Increase tons/ha
Control	4.7	—
Vitazyme	10.5	5.8 (+123%)
Historical yield	4.2	

**Increase in sweet potato yield:  
123%**



**Conclusions:** This Cuban sweet potato test proved that two 1 liter/ha applications of Vitazyme, separated by only 10 days, increased the yield by a massive 123%. This increase also exceeded the historical average by 150%. One of the reasons for such a large yield improvement was due to improved drought tolerance due to better water and fertility utilization from Vitazyme application. According to the researchers, "In spite of the great drought, yields were significant for this type of yellowish ferralitic soil with concretions, of low fertility."

## Vital Earth Resources

706 East Broadway, Gladewater, Texas 75647

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

# 2006 Crop Results

## Vitazyme on Sweet Potatoes

### Ministry of Sugar, Cuban Ministry of Agriculture

Researchers: Wilberto G. Marrero and Jorge G. Acosta

Location: Juan Abrahantes Farm, Havana Province, Cuba

Soil type: red ferralitic of low fertility

Planting rate: unknown

Planting date: June 1, 2006

Experimental design: A split field study was designed to evaluate the effects of Vitazyme on the yield of sweet potatoes. A 1.0 hectare area was treated with the product, while the rest of the field was left untreated.

Variety: INIVIT 98-2

Row spacing: unknown

Watering: rain-fed

#### 1. Control

#### 2. Vitazyme

Fertilization: unknown

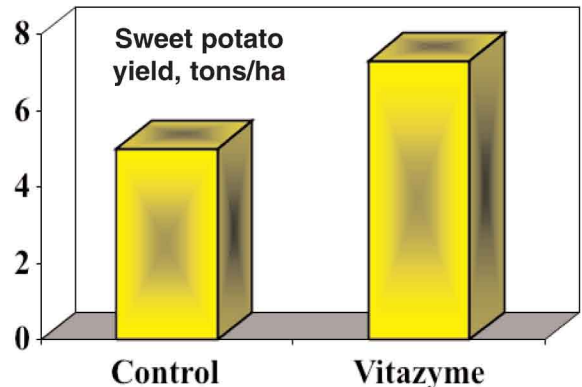
Vitazyme application: 1 liter/ha on the leaves and soil on June 20, 19 days after planting, and 1 liter/ha on leaves and soil on July 22, 32 days after the first application

Harvest date: October 10, 2006, after 101 days of growth

Yield results:

Treatment	Yield tons/ha	Increase tons/ha
Control	5.0	—
Vitazyme	7.3	2.3 (+46%)
Historical yield	4.2	

**Increase in sweet potato yield:  
46%**



Conclusions: This sweet potato study in Cuba revealed that two 1 liter/ha Vitazyme applications produced a remarkable 46% yield increase above the untreated control. This yield exceeded the historical yield average by 73%.

## Vital Earth Resources

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

# 2003 Crop Results

## Vitazyme on Sweet Potatoes

### Ministry of Agriculture, Soils Institute — Republic of Cuba

**Researchers:** Dr. C. Olegario Muniz, T.M. Benjamin Gonzalez, and T.M. Miguel Mullins

**Research organization:** Republic of Cuba, Ministry of Agriculture, Soils Institute, Central Registry of Fertilizers

**Variety:** CEMSA 78-354

**Location:** Experimental Station “La Renee”, Quivican, Havana Province, Cuba

**Soil analysis:** near neutral pH, 2.5% organic matter, 32 mg/100 g P<sub>2</sub>O<sub>5</sub>, 35 mg/100g K<sub>2</sub>O

**Soil type:** rhodic ferralsol

**Row spacing:** 1.6 meters

**Planting date:** April 3, 2003

**Experimental design:** The objective of this study was to evaluate the effect of Vitazyme on the yield and quality of sweet potatoes in Cuba. Four treatments were utilized in this study that evaluated Vitazyme’s ability to make fertilizers more available. Several replicates were made using plots that were 50 meters long, having five rows per plot. Statistical analyses were made using Duncan’s Multiple Range Test.

1. 100% fertilizer only

3. 75% fertilizer plus Vitazyme

2. 100% fertilizer plus Vitazyme

4. 50% fertilizer plus Vitazyme

**Fertilization:** The 100% fertilizer rate received 100 kg/ha N, 45 kg/ha P<sub>2</sub>O<sub>5</sub>, and 75 kg/ha K<sub>2</sub>O as a “complete formula” and urea. This is the “optimum economic dosage” for chemical fertilization according to the Cultivation Technical Institute.

**Vitazyme application:** (1) Sweet potato plants were submerged in a 1% solution at planting; (2) Vitazyme was sprayed on the leaves and soil at 1 l/ha at 25 days; (3) Vitazyme was sprayed on the leaves and soil at 50 days.

**Irrigation:** according to the Technical Instructive for Cultivation

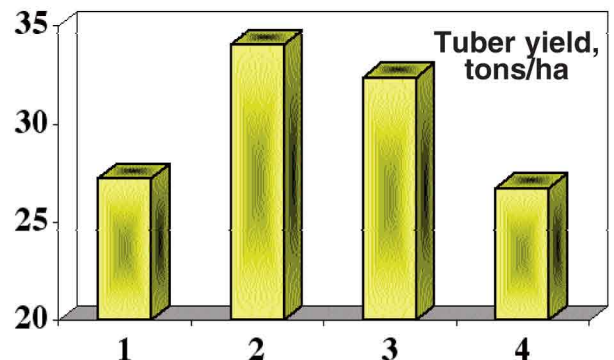
**Harvest date:** September 8, 2003, just over 5 months after planting

#### Yield results:

### Sweet Potato Yield

Treatment	Tuber yield*	Change
	----- tons/ha -----	
1 (100% fertilizer)	27.20 b	—
2 (100% fert. + Vita.)	34.00 a	+6.80 (+25%)
3 (75% fert. + Vita.)	32.33 a	+5.13 (+19%)
4 (50% fert. + Vita.)	26.73 b	-0.47 (-2%)

\*Means followed by the same letter are not significantly different according to Duncan’s Multiple Range Test (P=0.10).  
Standard error=1.11 tons/ha.



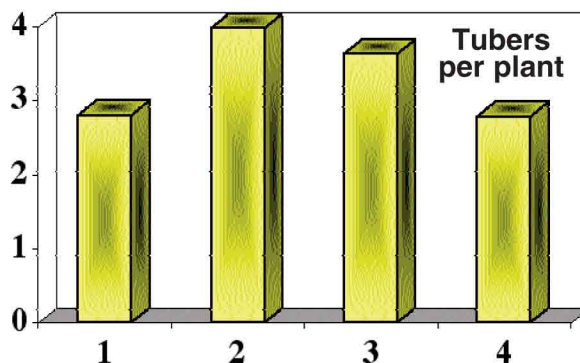
**Increase with Vitazyme, 100% fertilizer: 25%**  
**Increase with Vitazyme, 75% fertilizer: 19%**

Vitazyme significantly increased tuber yield above the 100% fertilizer control at both 100% fertilizer (+25%) and 75% fertilizer levels (+19%). It is also highly interesting to note that only 50% of the recommended fertilizer plus Vitazyme produced a statistically equal yield to the 100% fertilizer control.

### Sweet Potato Number

Treatment	Tubers per plant*	Change
	----- tubers -----	
1 (100% fertilizer)	2.80 b	—
2 100% fert. + Vita.)	3.98 a	+1.18 (+42%)
3 (75% fert. + Vita.)	3.63 a	+0.83 (+30%)
4 (50% fert. + Vita.)	2.78 b	-0.02 (-1%)

\*Means followed by the same letter are not significantly different according to Duncan's Multiple Range Test (P=0.10). Standard error=0.21 tubers/plant.



**Increase with Vitazyme, 100% fertilizer: 42%**  
**Increase with Vitazyme, 75% fertilizer: 30%**

Tuber number values closely parallel the yield values, but are even more dramatic. Vitazyme plus 100% fertilizer greatly increased tuber set (+42%), as it did at 75% fertilizer (+30%). At 50% fertilizer the tuber number was nearly identical with the 100% fertilizer untreated control.

#### Quality results:

### Tuber Dry Matter and Starch Content

Treatment	Dry matter*	Change	Starch**	Change
	----- % of tubers -----		----- % of tubers -----	
1 (100% fertilizer)	29.25 a	—	22.33 a	—
2 100% fert. + Vita.)	30.30 a	+1.05 (+4%)	22.21 a	-0.12 (-1%)
3 (75% fert. + Vita.)	30.35 a	+1.10 (+4%)	23.42 a	+1.09 (+5%)
4 (50% fert. + Vita.)	30.40 a	+1.15 (+4%)	23.55 a	+1.22 (+5%)

\*Means followed by the same letter are not significantly different according to Duncan's Multiple Range Test (P=0.10). Standard error=0.95% dry matter in the tubers..

\*\*Means followed by the same letter are not significantly different according to Duncan's Multiple Range Test (P=0.10). Standard error=0.87% starch in the tubers.

Although Vitazyme increased the dry matter and starch contents slightly in all three treatments, the increase was not significant.

**Economic results:** The following formula was used in computing the economic value of using Vitazyme in Treatment 3 (with 75% fertilizer):

$$\text{Economic effect} = (\text{Value, Trt. 3} - \text{Cost, Trt. 3}) - (\text{Value, Trt. 1} - \text{Cost, Trt. 1})$$

Value of sweet potatoes: 264 Ps/ton

Costs: Fertilizer (mixed) ..... 250 Ps/ton

Urea ..... 273 Ps/ton

Vitazyme ..... 30 Ps/gallon

Vitazyme application .....148 Ps/Cab

$$\text{Economic effect} = 8,535 - 1,490 - 234 - 148 - (7,181 - 1,986) = 1,468 \text{ Ps/cab} = 109 \text{ Ps/ha}$$

**Income increase with Vitazyme: 109 Ps/ha**

**Conclusions:** According to the researchers, "It is proposed that Vitazyme, which is a biostimulant synthesized from vegetable matter, intensifies the activity of the soil-plant system, which makes possible an increase in photosynthesis so that more carbon becomes affixed to the texture of

**the plant.”**

“Besides the noted Vitazyme economic residual effect, the beneficial residual effect of Vitazyme upon the physical and biological properties of the soil must be included, even though it was not evaluated in this trial.”

- “1. The application of the biostimulant Vitazyme plus 75% dosage of the recommended chemical fertilizer for this type of soil and cultivation allows for a significant and economical increase of the agriculture yield of sweet potatoes in comparison with the application of a 100% dosage. Nevertheless, with the application of Vitazyme similar yield results are achieved as the control treatment with only 50% chemical fertilizing.
2. The combined use of the biostimulant Vitazyme, plus a dosage of 50 to 100% of the recommended chemical fertilizer, did not affect the quality (percentage of dry matter and starch) of the sweet potato.”

# Vital Earth Resources

706 East Broadway, Gladewater, Texas 75647

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

## 1997 Crop Results

# Vitazyme on Sweet Potatoes

Caribbean Agricultural Research and Development Institute (CARDI)

Researcher: Sherman Weeks

Location: St. Kitts, West Indies

Variety: "Carib" sweet potato

Row spacing: 30 in. row spacing, 12 in. in-row

Planting rate: 17,400 plants/acre

Planting date: early November, 1996

Experimental design: Ten rows of sweet potatoes were planted side-by-side. Half were control rows, and half were treated with Vitazyme. Cuttings (plants) were planted each foot along the rows.

### 1. Control

### 2. Vitazyme

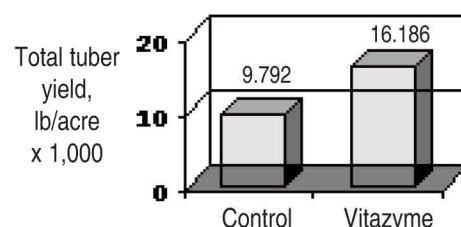
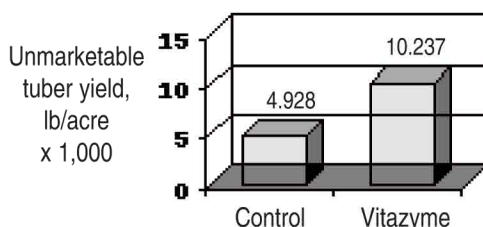
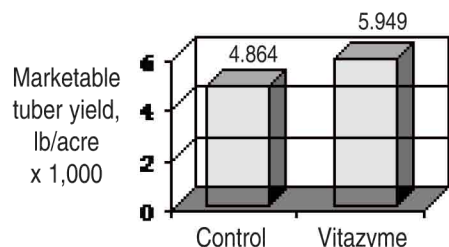
Fertility treatments: none

Vitazyme treatments: About 7 days after planting, a solution of Vitazyme (15 cc/gal) was applied over the plants and soil.

Harvest date: February 7, 1997 (about 12 weeks of growth)

Yield results: These figures show the average value per acre of the several rows grown.

Treatment	Plants	Marketable tubers		Unmarketable tubers		Total tubers
	per row	(human food)		(animal food)		
	number/acre	number/acre	lb/acre	number/acre	lb/acre	lb/acre
Control	16,947	12,178	4,864	39,965	4,928	9,792
Vitazyme	16,938	13,875	5,949	69,998	10,237	16,186
<b>Increase with Vitazyme</b>		<b>1,697</b>	<b>1,085</b>	<b>30,033</b>	<b>5,309</b>	<b>6,394</b>
		<b>(+14%)</b>	<b>(+22%)</b>	<b>(+75%)</b>	<b>(+108%)</b>	<b>(+65%)</b>



Income results: The value for sweet potatoes in St. Kitts is \$0.56/lb (U.S.) for marketable tubers (human food), and \$0.24/lb (U.S.) unmarketable tubers (animal food).

	<u>Control</u>	<u>Vitazyme</u>	<u>Increase</u>
Gross income	\$3,906.050/acre	\$5,788.14/acre	\$1,881.64/acre (+48%)

**Income increase:  
\$1,881.64/acre (+48%)**

Comments: Besides improving yield and income, Vitazyme application resulted in considerably less worm borer damage to the tubers in the treated rows. These damage data were not quantified thoroughly enough to present in this report.