

Vital Earth Resources

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

2014 Crop Results

Vitazyme on Onions

Researcher: Waking Novembre

Research organization: Acra Industries, Haiti

Location: Mirebalais, Haiti

Variety: unknown

Planting date: unknown

Experimental design: This experiment was part of a multi-crop testing program that was established in December of 2011, to evaluate the efficacy of Vitazyme for increasing crop yields in Haiti. The test area was 1 hectare (10,000 m²) for the treated and control plots.

1. Control

2. Vitazyme

Fertilization: unknown

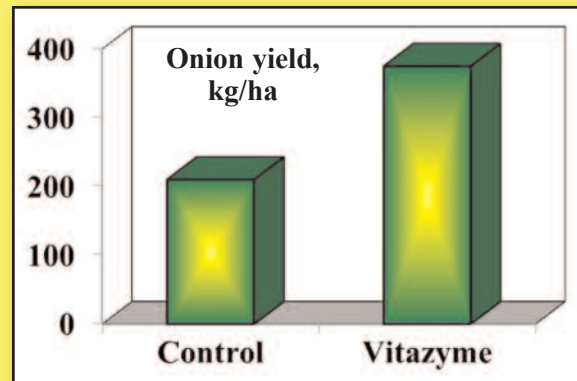
Vitazyme application: 1 liter/ha (13 oz/acre)

Harvest date: unknown

Yield results:

| Treatment | Yield kg/ha | Yield change kg/ha |
|-----------|----------------|-----------------------|
| Control | 210 | — |
| Vitazyme | 375 | 165 (+79%) |

**Increase in onion yield
with Vitazyme: 79%**



Conclusions: An onion study in Haiti revealed a great increase in yield with Vitazyme application, up 79% from the untreated control. This program is shown to hold great promise in helping to alleviate food production problems in this developing country.

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2011 Crop Results

Vitazyme on Onions

Researcher: Steven David

Farmer: LIM Produce

Soil type: sand

Planting date: August 5, 2010

Experimental design: An onion planting was divided into two treatments with three replicates (six plots), one treatment being the farmer's program and the other being Vitazyme plus MicroPlus. The purpose of the study was to evaluate the effects of this program on onion number, disease, weight, and yield.

Fertilization: normal farm program

Vitazyme application: See the table below.

MicroPlus application: See the table below. MicroPlus is an inoculum of *Streptomyces lydicus* WYEC 108 (0.0371%).

Research organization: Organic Farming Systems, Perth, Australia

Location: Wyalup, Western Australia

Variety: unknown

Irrigation: fixed overhead

Plot size: 2 m x 8.7 m

| Treatment | Aug. 7 | Aug. 26 | Sep. 24 | Nov. 4 | Dec. 2 |
|-----------|---|----------|----------|----------|----------|
| | ----- amount on the leaves and soil ----- | | | | |
| Vitazyme | 1.71 L/ha | — | 1.0 L/ha | 1.0 L/ha | 1.0 L/ha |
| MicroPlus | 854 g/ha | 500 g/ha | 500 g/ha | 500 g/ha | 500 g/ha |

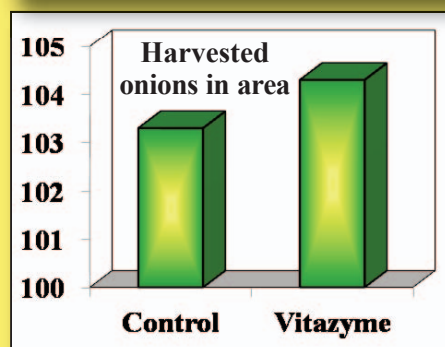
Note: MicroPlus was applied at 3.48 g in 6 L of water over the three beds; Vitazyme was applied at 5.25 ml in 6 L of water over the three beds.

Disease incidence: Both treatments were equally infected with a low incidence of pink root.

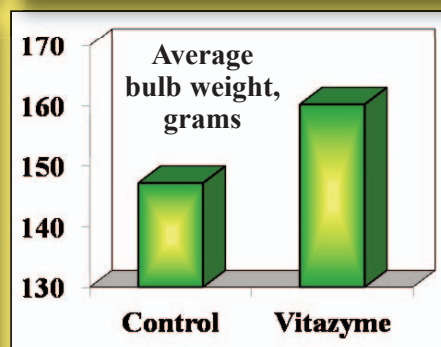
Yield results: The onions were harvested on January 13, 2011, by digging bulbs from two square meters of each plot.

| Treatment | Onion number | Average weight | Onion yield |
|----------------------|--------------|----------------|-------------|
| | number | grams/bulb | tons/ha |
| Control | 103.3 — | 147.2 — | 76.1 — |
| Vitazyme + MicroPlus | 104.3 (+1%) | 160.2 (+9%) | 83.6 (+10%) |

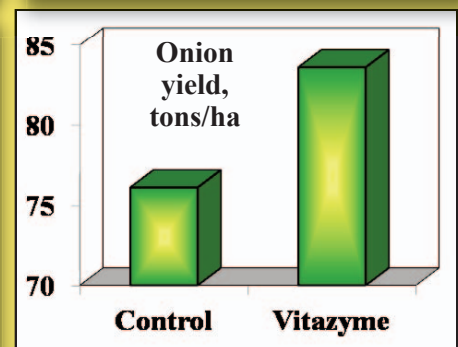
Onion Number



Onion Weight



Onion Yield



**Increase in onion
number: 1%**

**Increase in bulb
weight: 9%**

**Increase in onion
yield: 10%**

Income results:

Onion price: \$600/ton

Yield increase with Vitazyme and MicroPlus: 7.5 tons/ha

Increased gross income with Vitazyme and MicroPlus: \$4,500.00/ha

Cost of Vitazyme and MicroPlus: \$500.00/ha

Increased net income with Vitazyme and MicroPlus: \$4,000.00/ha

Return on investment with Vitazyme and MicroPlus: \$8.00 per \$1.00 invested

Conclusion: This onion trial in Western Australia proved that Vitazyme and MicroPlus, an actinomycete inoculum, produced an excellent increases in onion yield (10%), mostly because of larger bulbs (9%). An increase of 7.5 tons/ha in yield, minus product cost, gave a net income increase of \$4,000.00/ha, and a return on investment of \$8.00 per \$1.00 invested in product.

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2006 Crop Results

Vitazyme on Onions

Researchers: Eng. Wilberto Gonzalez, and Eng. Jorge Gonzalez, Camilo Cienfuegos, Agricultural Enterprise

Location: Villena Farm of Camilo Cienfuegos Agricultural Enterprise, Havana Province, Cuba

Variety: unknown

Soil type: red ferralitic

Planting date: late 2005 to early 2006

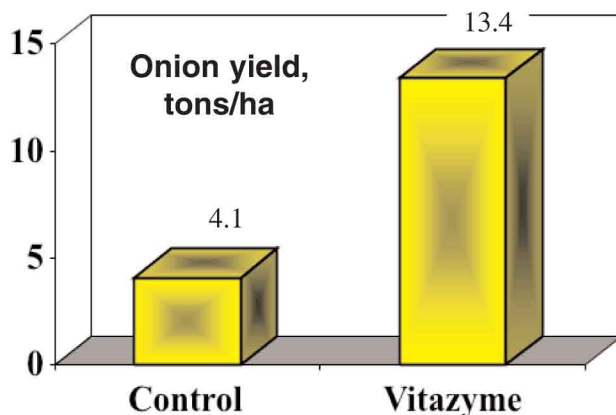
Experimental design: A commercial production trial involved a split field area of 0.013 ha treated and 1.0 ha untreated with Vitazyme at Villena Farm.

1. Control

2. Vitazyme

Fertilization: unknown

Vitazyme applications: 1.0 liter/ha on the leaves twice, separated by 30 days



Increase in onion yield: 227%

Conclusions: This commercial onion trial in Cuba revealed the remarkable ability of Vitazyme to increase onion production, with a 227% yield increase.

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2004 Crop Results

Vitazyme on Onions

Researchers: Isel Creach Rodriguez, Ph.D.

Location: Santiago de Cuba Experiment Station, Dos Rios, Palma Soriana, Santiago de Cuba

Variety: red bulb multiplying onion

Soil type: Leptic haplustert

Transplanting Date: January 13, 2004

Experimental design: Two areas of onions were used in two studies, one area in each study treated with Vitazyme and the other area left untreated. All other treatments were identical for both areas.

1. Control

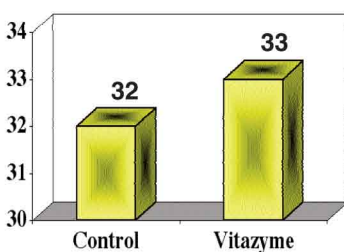
2. Vitazyme

Fertilization: unknown

Vitazyme application: 13 oz/acre on the leaves and soil on January 1, and again on February 17, 2004

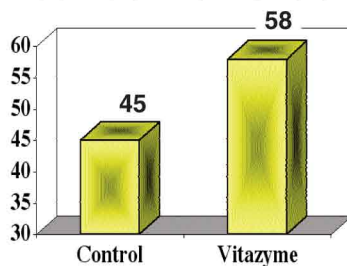
Trial 1

Height, cm



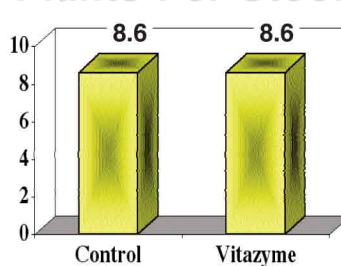
Height increase:
3%

Leaves Per Stool



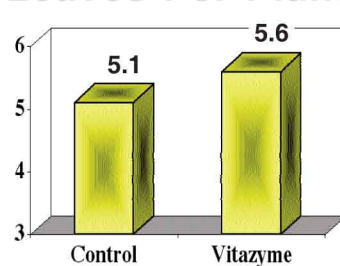
Leaves/stool
increase: 29%

Plants Per Stool



Plants/stool
increase: 0%

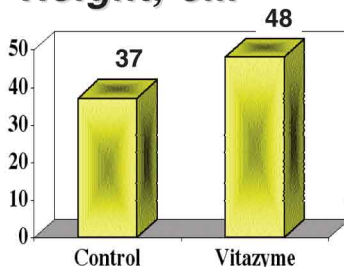
Leaves Per Plant



Leaves/plant
increase: 10%

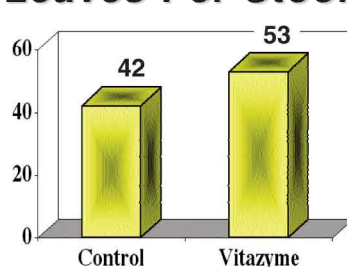
Trial 2

Height, cm



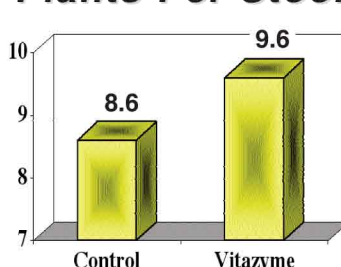
Height increase:
30%

Leaves Per Stool



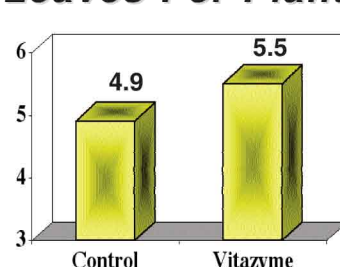
Leaves/stool
increase: 26%

Plants Per Stool



Plants/stool
increase: 12%

Leaves Per Plant



Leaves/plant
increase: 12%

Conclusions: In this Cuban onion study, both trials showed a clear advantage for Vitazyme on growth and yield potential in terms of plant height, leaves per stool, and leaves per plant.

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2004 Crop Results

Vitazyme on Onions

Researcher: unknown

Location: Granja MININT Jaguey Grande, Cuba

Variety: J-5

Soil type: Leptic haplustert

Planting date: unknown

Experimental design: An experimental area was divided into a Vitazyme treated and an untreated area to determine the product's effects on onion yield.

1. Control

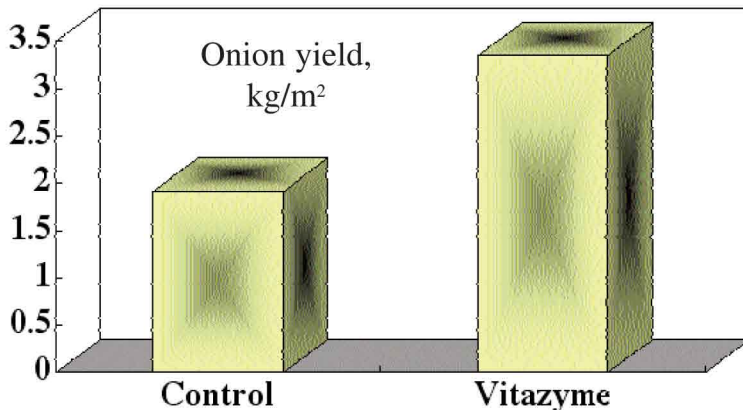
2. Vitazyme

Fertilization: unknown

Vitazyme application: 1 liter/ha on the seedlings at transplanting, and 1 liter/ha on the plants and soil at 35 and at 79 days after transplanting (total application = 2.4 liters/ha, or 0.0068 cc/plant)

Yield results:

| Treatment | Onion yield kg/m ² | Change kg/m ² | Weight/plant g/plant | Change g/plant | Value of production pecos | Change pecos |
|-----------|----------------------------------|-----------------------------|-------------------------|-------------------|------------------------------|-----------------|
| Control | 1.92 | — | 55.26 | — | 180.32 | — |
| Vitazyme | 3.35 | 1.43 (+74%) | 94.70 | 39.44 (+71%) | 315.56 | +135.24 |



Increase in onion yield: +74%

**Increase in weight per onion:
+71%**

Conclusions: Onions in this Cuban study responded very well to Vitazyme by increasing yield 74%, and average onion weight by 71%. The increase in value of this production was 135.24 pecos; the field area for this increase was not defined in the study report.

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2001 Crop Results

Vitazyme on Onions

Research coordinator: H.W. Chung

Researcher: unknown

Variety: Manina

Location: Kunwe-Kun, Kyungbuk, Korea

Soil type: clay loam

Transplanting date: unknown

Experimental design: A field area for the onions was selected in an established plot to evaluate growth parameters.

The areas were divided into treatments using the following:

1. Control 2. Vitazyme 3. Product A 4. Product B 5. Product D

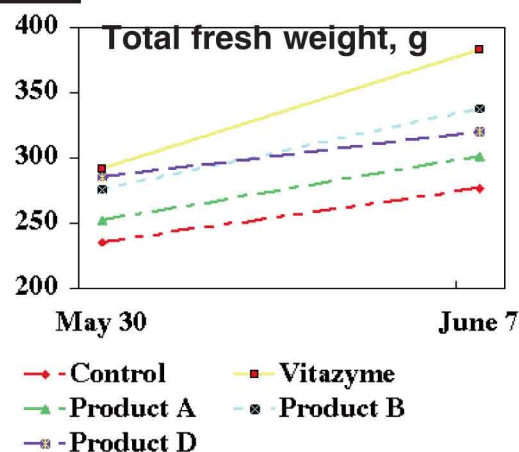
Vitazyme application: A 1:1,000 dilution (0.1%) solution was sprayed on the leaves and soil on April 19, April 26, and May 3, 2001.

Fertilization: unknown

Data collection: Results on growth and bulb weight were collected on May 30 and June 7, 2001.

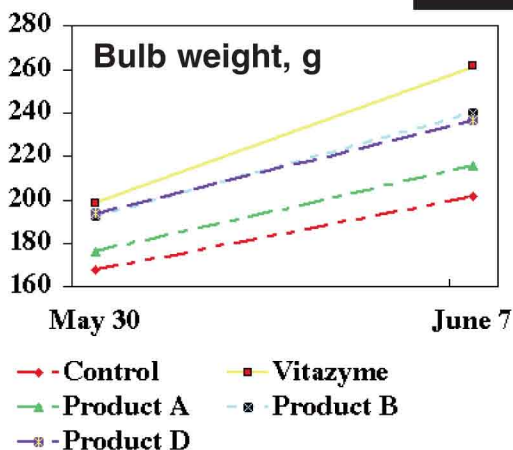
Total plant weight

| Treatment | Fresh weight, Change May 30 | | Fresh weight, Change June 7 | |
|----------------|--------------------------------|--------------|--------------------------------|--------------|
| | g | | | |
| 1. (Control) | 236.0 | — | 276.7 | — |
| 2. (Vitazyme) | 291.8 | +55.8 (+24%) | 383.3 | +106 (+39%) |
| 3. (Product A) | 252.5 | +16.5 (+7%) | 301.6 | +24.9 (+9%) |
| 4. (Product B) | 276.1 | +40.1 (+17%) | 338.0 | +61.3 (+22%) |
| 5. (Product D) | 286.1 | +50.1 (+21%) | 320.7 | +44.0 (+16%) |



Increase in plant weight with Vitazyme:
First evaluation: 24% Second evaluation: 39%

Bulb weight



| Treatment | Bulb weight, Change May 30 | | Bulb weight, Change June 7 | |
|----------------|-------------------------------|--------------|-------------------------------|--------------|
| | g | | | |
| 1. (Control) | 167.7 | — | 201.6 | — |
| 2. (Vitazyme) | 198.6 | +30.9 (+18%) | 261.5 | +59.9 (+30%) |
| 3. (Product A) | 176.1 | +8.4 (+5%) | 215.7 | +14.1 (+7%) |
| 4. (Product B) | 192.3 | +24.6 (+15%) | 240.2 | +38.6 (+19%) |
| 5. (Product D) | 193.9 | +26.2 (+16%) | 236.9 | +35.3 (+18%) |

Increase in bulb weight with Vitazyme:
First evaluation: 18% Second evaluation: 39%

Conclusions: Vitazyme gave excellent growth stimulation to these onions, increasing total plant weight by 24% on May 30, and by 39% on June 7. The increase in growth was accelerating above the control as time passed. The same was true with bulb weight, where an 18% yield increase on May 30 gave way to a 30% bulb increase on June 7. Vitazyme outperformed the other three products in all situations.

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2001 Crop Results

Vitazyme on Onions

Farmer: Larry Karas, Wm. Karas and Sons

Variety: Benchmark

Planting date: April 30 and May 1, 2001

Experimental design: Six side-by-side fields of 3.33 acres each, with very uniform muck soils across all fields, were divided into two parts: three fields treated with Vitazyme and three fields left untreated.

Location: Elba, New York

Soil type: muck (organic)

Watering: sprinkler irrigated

1. Control

2. Vitazyme

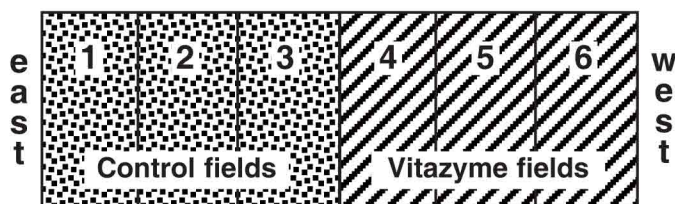
Fertilization: the same for all six fields: 1,000 lb/acre 10-8-28 at planting, and 100 lb/acre of urea (46-0-0) midseason.

Vitazyme treatment: 13 oz/acre on the seeds at planting; 13 oz/acre on the leaves and soil at the 6 to 7 leaf stage.

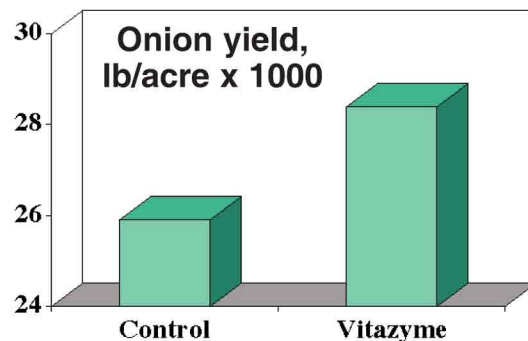
Growing season observations: On August 14, 2001, shortly before harvest, the Vitazyme treated onions were noticeably larger on average, and the leaves were much greener compared to the senescing control leaves. Thus, the treated plants were continuing to photosynthesize later and add more bulk to the bulbs.

Harvest date: late August, 2001

Yield results: All six fields were harvested at the same time, and the onions were placed in 1,000 lb boxes in the field. These boxes were counted for the different fields and totaled for each treatment.

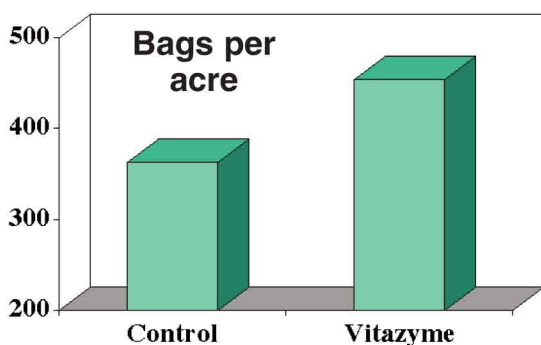


| | Control | Vitazyme | Change |
|--------------------------|---------|----------|---------------|
| Onion yield | 259 | 284 | 25 (+10%) |
| Total weight, lb | 259,000 | 284,000 | 25,000 (+10%) |
| Per acre weight, lb/acre | 25,900 | 28,400 | 2,500 (+10%) |



Onion yield increase: 10%

Onion packout results: The onions were graded and packed into 50-lb bags. Only the bulbs that were 2 inches in diameter and larger were packed, and are included in these figures.



| | Control | Vitazyme | Increase |
|------------------------------------|-----------------|-----------------|--------------|
| ----- onions >2" in diameter ----- | | | |
| Bags per acre | 362.6 bags/acre | 454.4 bags/acre | 91.8 (+25%) |
| Total weight | 18,130 lb/acre | 22,720 lb/acre | 4,590 (+25%) |

Marketable onion yield increase: 25%

Percent marketable yield of total harvest:

| | Total yield | Marketable yield | Percent of total |
|-----------------|---------------------|------------------|------------------|
| | ----- lb/acre ----- | | |
| Control | 25,900 | 18,130 | 70% |
| Vitazyme | 28,400 | 22,720 | 80% |

Control % of marketable: 70%
Vitazyme % of marketable: 80%

Income results: Average market price of onions: \$0.10/lb.

| | Control | Vitazyme | Change |
|---------------------|---------------------|----------|--------|
| | ----- \$/acre ----- | | |
| Onion income | 1,813 | 2,272 | +459 |

Income increase: \$459/acre

Return per dollar invested with Vitazyme: \$51.00

Conclusions: Vitazyme substantially improved the yield and size of onions in this New York muck soil field trial. While Vitazyme improved the overall yield by 10%, it increased the packout (onions > 2" in diameter) by an additional amount over the control so that the overall marketable weight was 25% greater than for the control. This extra weight amounted to \$459/acre more income, as Vitazyme returned \$51 for every dollar invested in the product.

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2000 Crop Results

Vitazyme on Onions ***A testimonial***

Farmer: Troy Shuknecht, Lee Shuknecht and Sons

Location: Elba, New York

Fertility program: a balanced program with regular use of cover sprays and foliar sprays

Vitazyme application: (1) 13 oz/acre in the furrow at planting, with starter fertilizer and fungicide; (2) 13 oz/acre over the leaves and soil at the 3 to 4-leaf stage; (3) 13 oz/acre over the leaves and soil at bulb initiation.

Time of Vitazyme use: 5 years

Troy: **“We’re very satisfied with Vitazyme. We farm mostly mineral soils, and they are easier to work and have better drainage than when we first started the program. We have had good crops in two difficult years when others didn’t. We grow mostly jumbo-sized onions and Vitazyme really helps them obtain that size. It’s a big benefit.”**

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2000 Crop Results

Vitazyme on Onions

Farmer: John Dunsmoor

Location: Fulton, New York

Variety: New York Early

Soil type: muck

In-row spacing: 9 plants/foot (seeded)

Planting date: May 5, 2000

Row spacing: 15.5 inches between double rows

Experimental design: Four small onion fields in muck were selected for this study. Three of the fields received Vitazyme and one (the control) was left untreated.

Field 1

1.06 acres
Vitazyme

Field 2

1.40 acres
Vitazyme

Field 3

1.15 acres
Vitazyme

Field 4

1.27 acres
Control

1. Control

2. Vitazyme

Fertility treatments: 100 lb/acre N, 80 lb/acre P₂O₅, 120 lb/acre K₂O, plus micronutrients pre-plant; 34 lb/acre N topdressed during growth

Vitazyme treatment: 13 oz/acre in the furrow at planting, along with a fungicide and insecticide

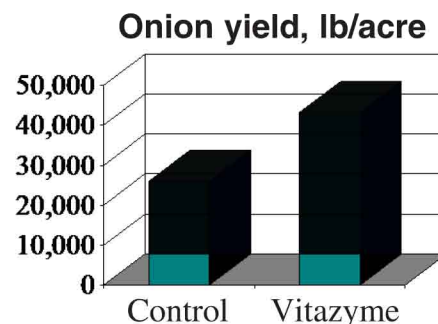
Harvest date: September 8, 2000

Yield results:

| Treatment | Field 1 | Field 2 | Field 3 | Average | Control |
|-------------------|---------|---------|---------|---------|--------------|
| Yield, bags*/acre | 905.70 | 714.29 | 973.91 | 864.63 | 519.67 |
| Yield, lb/acre | 45,285 | 35,715 | 48,696 | 43,232 | 25,984(+66%) |

* One bag = 50 lb.

Onion yield increase: 66%



Income results: The onion value is about \$4.00/50lb bag, or \$0.08/lb.

| | Control | Vitazyme | Change |
|--------------|----------|----------|-------------|
| | | \$/acre | |
| Gross income | 2,078.72 | 3,458.56 | (+)1,379.84 |

Income increase: \$1,379.84/acre

Conclusions and observations: During the growing season in other fields it was noted that Vitazyme, when applied with other fertility products at planting in the seed row, improved emergence and the resulting plant population. These fields, however, averaged 746.56 cwt/acre, somewhat less than when Vitazyme was used alone.

Vitazyme in the onion test, used one time at planting on the seeds, produced an average yield increase that was 66% above the control fields. This increase translated into a very large income increase of nearly \$1,380/acre.

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1999 Crop Results

Vitazyme on Onions

Farmer: Fred Strano

Location: Fulton, New York

Variety: Prince (yellow)

Seeding rate: 8 plants/foot (seed)

Planting date: May 5, 1999

Harvest date: October 15, 1999

Soil type: organic (muck)

Previous crop: onions

Row spacing: two rows 6 inches apart, spaced every 15 inches

Experimental design: An onion field was treated with Vitazyme on several rows the length of the field.

1. Control

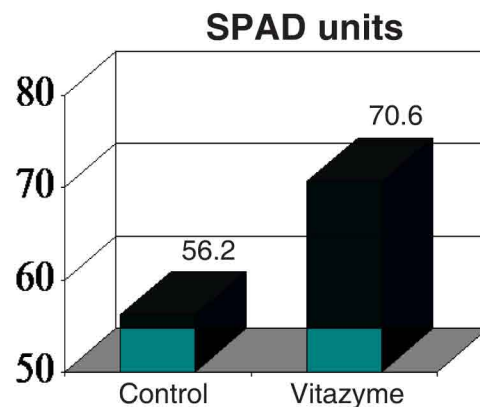
2. Vitazyme

Fertilizer treatments: Preplant: 100-60-250 lb/acre actual N-P-K, plus 75 lb/acre Ca-Mg-micronutrients
Sidedressed in July: 70 lb/acre 34-0-0 (NH₄NO₃)

Vitazyme applications: 13 oz/acre at planting on the seeds

Chlorophyll results: On August 16, 1999, evaluations were made with a Minolta SPAD meter of several Vitazyme treated and untreated onion leaves from adjoining rows at the treatment boundary.

| | <u>Control</u> | <u>Vitazyme</u> | <u>Increase</u> |
|--------------------------|----------------|-----------------|-----------------|
| Chlorophyll, SPAD values | 56.2 | 70.6 | 14.4 (+26%) |



Chlorophyll increase: 26%

Yield results: Although evaluations of the field on August 16 revealed a decided advantage for the Vitazyme treatment (see the chlorophyll data above), the final harvest weights did not reveal a significant yield difference. There was a decided difference in onion quality, however, which is shown on the next page.

The yield was 72,500 lb/acre for this field. Samples of onions for the two treatments were sized, and the various sizes were multiplied by the price for those sizes to give a total value for the crop. As size increases, so does the price.

Control

| Onion size | Onion value | Proportion of crop | Amount of crop | Onion value |
|------------|-------------|--------------------|----------------|-------------|
| inches | \$/lb | % | lb/acre | \$/acre |
| 2.0 | 0.06 | 8.83 | 6,401.8 | 384.11 |
| 2.5 | 0.14 | 31.39 | 22,757.8 | 3,186.09 |
| 2.75 | 0.16 | 31.25 | 22,656.3 | 3,625.01 |
| 3.0 | 0.18 | 28.53 | 20,684.3 | 3,723.17 |
| | | 100.00 | 72,500.0 | 10,918.38 |

Vitazyme

| Onion size | Onion value | Proportion of crop | Amount of crop | Onion value |
|------------|-------------|--------------------|----------------|-------------|
| inches | \$/lb | % | lb/acre | \$/acre |
| 2.0 | 0.06 | 7.16 | 5,191.0 | 311.46 |
| 2.5 | 0.14 | 24.26 | 17,588.5 | 2,462.39 |
| 2.75 | 0.16 | 33.36 | 24,186.0 | 3,869.76 |
| 3.0 | 0.18 | 35.22 | 25,534.5 | 4,596.12 |
| | | 100.00 | 72,500.0 | 11,239.73 |

Control

Vitazyme

Increase

Onion value

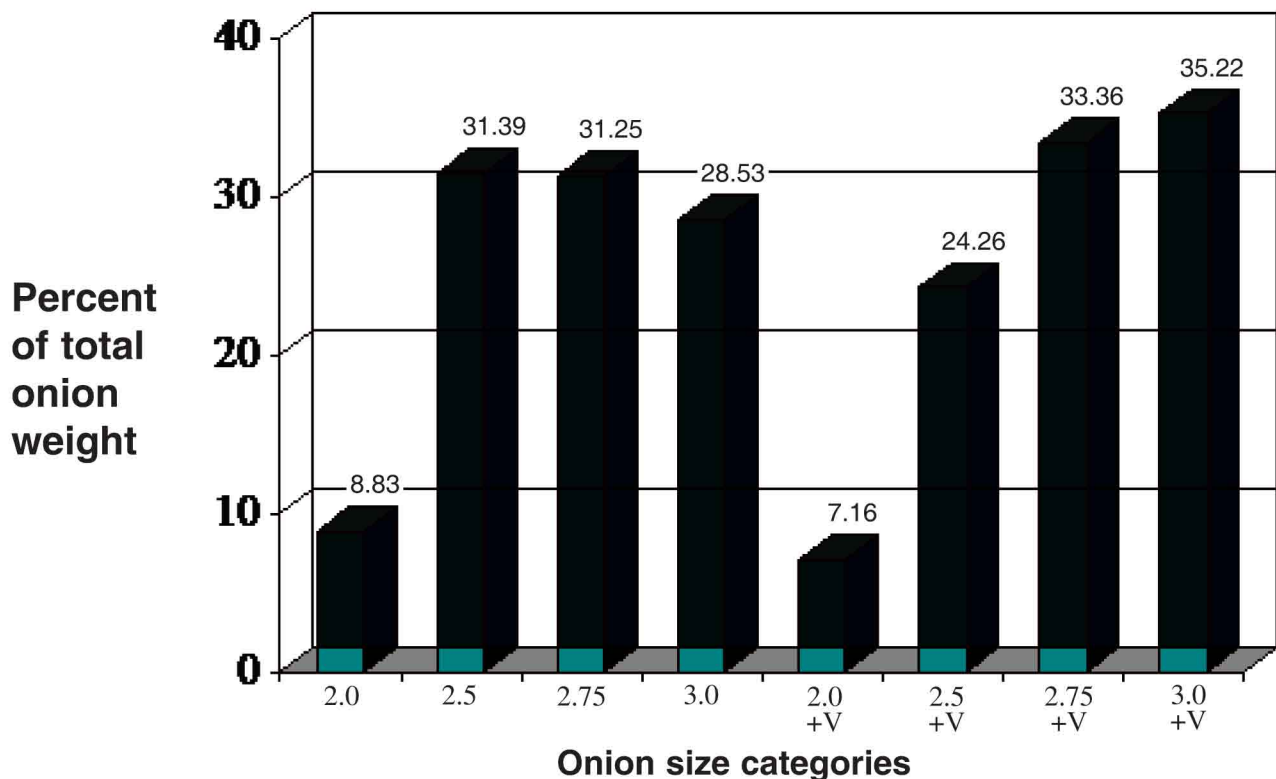
\$ 10,918.38/acre

\$11,239.73

\$321.35/acre

**Income increase: \$321.35/acre
(from quality improvement only)**

Effect of Vitazyme on Onion Size



Vitazyme clearly increases onion size, resulting in greater income per acre.

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1997 Crop Results

Vitazyme on Onions

Researchers: Williams Farms (Douglas, Steve, and John Williams)

Location: Marion, New York

Variety: Hamlet (a white onion)

Planting arrangement: wide beds

Planting date: May 2, 1997

Soil type: muck

Experimental design: Two field areas of an onion field were selected that were similar in soils and past treatment. One area received Vitazyme, and the other area nothing besides normal fertilizer.

1. Control

2. Vitazyme

Fertility treatments: The control area received 1,300 lb/acre 10-10-15 dry fertilizer before planting. The Vitazyme area received 750 lb/acre 10-10-15 dry fertilizer before planting, plus 250 lb/acre high-calcium pelleted lime. One gallon/acre of liquid-Ca was applied with a herbicide near planting time, and then six foliar applications of liquid-Ca were applied with a fungicide spray. At planting, 5 gal/acre of 9-18-9 and Nutrapathic Soil Conditioner were applied.

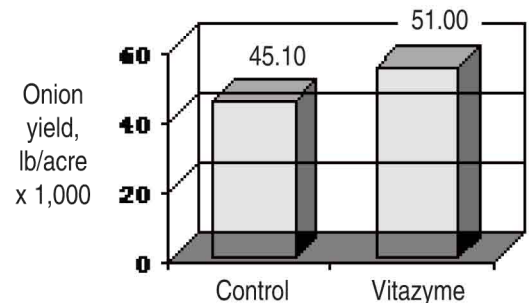
Vitazyme treatments: (1) 13 oz/acre with the starter fertilizer; (2) 13 oz/acre with the second fungicide spray (about the third leaf); (3) 13 oz/acre at bulb initiation.

Harvest date: early October

Yield results:

| | Boxes/acre* | Weight (lb)/acre |
|----------|-------------|------------------|
| Control | 41 | 45,100 |
| Vitazyme | 50 | 55,000 (+22%) |

*Each box weighed about 1,100 lb.



Yield increase: 22%

Income results: Onions are valued at about \$10.00/cut (100 lb)

| | Income | Increase |
|----------|--------------|------------|
| Control | \$4,510/acre | — |
| Vitazyme | \$5,500/acre | \$990/acre |

Income increase: \$990/acre

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1997 Crop Results

Vitazyme on Onions

Researchers: Williams Farms (Douglas, Steve, and John Williams)

Location: Marion, New York

Variety: Hamlet (a white onion)

Planting arrangement: wide beds

Planting date: May 2, 1997

Soil type: muck

Experimental design: Two field areas of an onion field were selected that were similar in soils and past treatment. One area received Vitazyme, and the other area nothing besides normal fertilizer.

1. Control

2. Vitazyme

Fertility treatments: The control area received 1,300 lb/acre 10-10-15 dry fertilizer before planting. The Vitazyme area received 750 lb/acre 10-10-15 dry fertilizer before planting, plus 250 lb/acre high-calcium pelleted lime. One gallon/acre of liquid-Ca was applied with a herbicide near planting time, and then six foliar applications of liquid-Ca were applied with a fungicide spray. At planting, 5 gal/acre of 9-18-9 and Nutrapathic Soil Conditioner were applied.

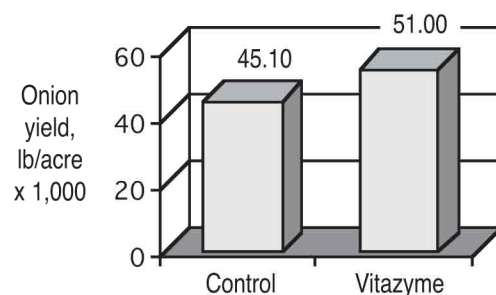
Vitazyme treatments: (1) 13 oz/acre with the starter fertilizer; (2) 13 oz/acre with the second fungicide spray (about the third leaf); (3) 13 oz/acre at bulb initiation.

Harvest date: early October

Yield results:

| | Boxes/acre* | Weight (lb)/acre |
|----------|-------------|------------------|
| Control | 41 | 45,100 |
| Vitazyme | 50 | 55,000 (+22%) |

*Each box weighed about 1,100 lb.



Yield increase: 22%

Income results: Onions are valued at about \$10.00/cut (100 lb)

| | Income | Increase |
|----------|--------------|------------|
| Control | \$4,510/acre | — |
| Vitazyme | \$5,500/acre | \$990/acre |

Income increase: \$990/acre