

**Vital Earth Resources**

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

**2010 Crop Results**

# Vitazyme on Amaranth (Edible)

Researcher: unknown

Location: Hoc Mon District, Ho Chi Minh City, Viet Nam

Variety: Amaranth (*Amarantus mangosanus*)

Planting date: July 23, 2010

Preseeding treatment: seeds mixed with dry soil

Experimental design: A small plot trial, using 30 m<sup>2</sup> plots and three replicates, was conducted on edible amaranth to determine the effect of Vitazyme on crop yield. Three plots were treated with Vitazyme, and three were left untreated.

**1. Control (farmer normal practice)**

**2. Vitazyme**

Fertilization: For 30 m<sup>2</sup>, 48kg of chicken manure, 2 kg of “thermophosphate”, and 2 kg of organic fertilizer mixed with N-P<sub>2</sub>O<sub>5</sub>-K<sub>2</sub>O fertilizer.

Vitazyme application: (1) a seed treatment of 10% Vitazyme by wetting the seeds and drying, repeated three times; (2) soil and foliar treatment of 3 ml in 3 liters of water, 7 days after planting; (3) foliar treatment of 3 ml in 3 liters of water, 14 days after seeding.

Yield results:

Treatment	Yield kg/30m <sup>2</sup>	Yield kg/ha	Change kg/ha
1. Control	120.0	40,000	---
2. Vitazyme, seeds	130.5	43,500	3,500 (+9%)

**Increase in yield with  
Vitazyme: 9%**

Conclusion: This Viet Nam study with edible amaranth revealed that a seed treatment and two foliar treatments of Vitazyme increased yield by 9%, a very substantial gain.

## Vital Earth Resources

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

# 2010 Crop Results

## Vitazyme on Amaranth (Edible)

Researcher: unknown

Location: Hoc Mon District, Ho Chi Minh City, Viet Nam

Variety: Amaranth (*Amarantus mangosanus*)

Planting date: July 5, 2010

Preseeding treatment: seeds mixed with dry soil

Experimental design: A small plot trial, using 30 m<sup>2</sup> plots and three replicates, was conducted on edible amaranth to determine the effect of Vitazyme on crop yield. Three plots were treated with Vitazyme, and three were left untreated.

### 1. Control (farmer normal practice)

### 2. Vitazyme

Fertilization: For 30 m<sup>2</sup>, 48kg of chicken manure, 2 kg of “thermophosphate”, and 2 kg of organic fertilizer mixed with N-P<sub>2</sub>O<sub>5</sub>-K<sub>2</sub>O fertilizer.

Vitazyme application: (1) a seed treatment of 10% Vitazyme wetted on the seeds and dried, repeated three times; (2) soil and foliar treatment of 3 ml in 3 liters of water, 7 days after planting; (3) foliar treatment of 3 ml in 3 liters of water, 14 days after seeding.

Yield results:

Treatment	Yield kg/30m <sup>2</sup>	Yield kg/ha	Change kg/ha
1. Control	126	42,000	---
2. Vitazyme, seeds	129	43,000	1,000 (+2%)

**Increase in yield with  
Vitazyme: 2%**

Conclusion: This Viet Nam study with edible amaranth revealed that a seed treatment and two foliar treatments of Vitazyme increased yield by 2%.

**Vital Earth Resources**

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

**2010 Crop Results**

**Vitazyme on Apples**

**A Study On Return Bloom**

Researcher: Agr. Assistance

Location: Wayne County, New York

Variety: Golden Delicious

Tree density: 400 trees/acre

Tree age: 15+ years

Rootstock: M26

Experimental design: On a commercial apple orchard, Vitazyme was evaluated in a treated area for yield and quality parameters, as well as return bloom from 2009 applications, as compared to an untreated area alongside. Both the treated and control areas had the same management practices applied.

**1. Control**

**2. Vitazyme**

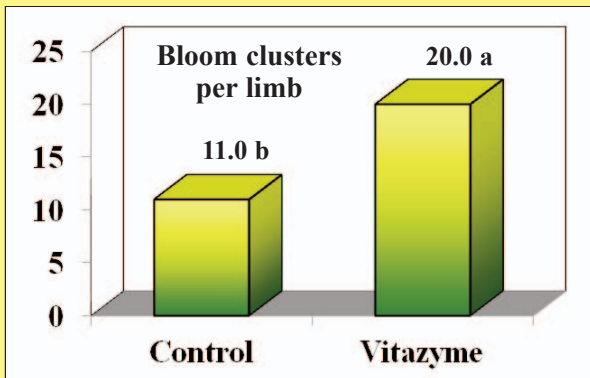
Fertilization: unknown

Vitazyme application: 2009 and 2010 applications were made with an airblast sprayer - applying 67 gallons/acre - at 13 oz/acre at pink, petal fall, and second cover.

Weather for 2010: 2010 was unusually warm and wet, giving excellent growing conditions that resulted in good fruit size, high soluble solids, and high yields. There were also widespread losses due to frost at late bloom.

Return bloom results: On April 29, 2010, flower clusters were counted on seven limbs (as replicates) for each treatment.

**Bloom Clusters Per Limb\***

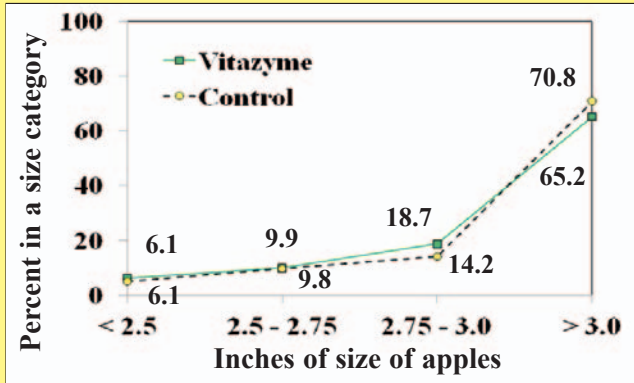


**Increase in bloom cluster with Vitazyme: 9.0 per limb (+82%)**

\*Means followed by the same letter are not significantly different at P=0.05.

Fruit quality results: The fruit was picked and graded on two scaffold limbs per replicate (seven reps per treatment). Due to widespread frost injury losses, limbs fairly high in each tree were used.

### Fruit Grade



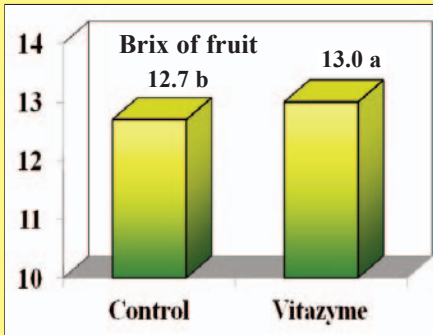
Because the Vitazyme treatment allowed many more apples to set, this average size was less than for the untreated control.

Mean fruit size:

Control - 6.8 oz

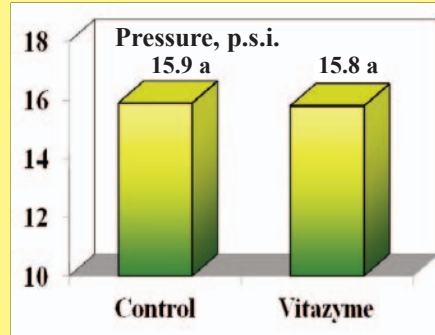
Vitazyme - 6.6 oz

### Fruit Brix\*



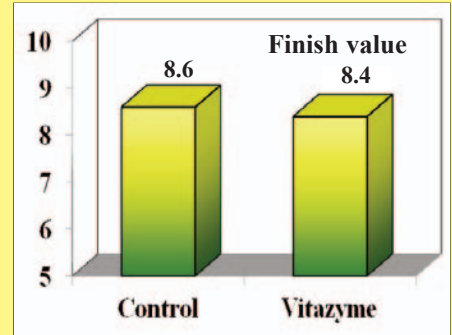
\*Means followed by the same letter are not significantly different at P = 0.05. Measured on 10 fruit per rep (tree).

### Fruit Pressure\*



\*Means followed by the same letter are not significantly different at P = 0.05. Measured on 10 fruit per rep (tree).

### Fruit Finish\*



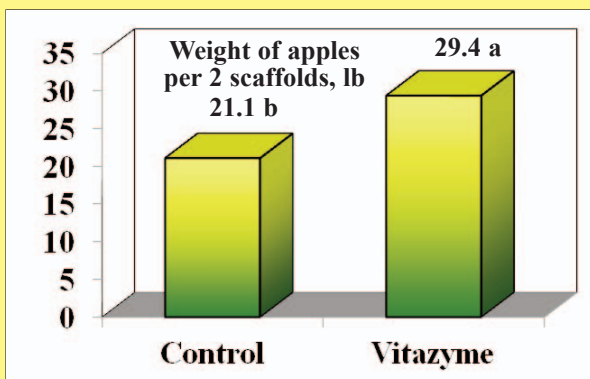
\*Means followed by the same letter are not significantly different at P = 0.05. Fruit finish at harvest was rated as 10 = perfect finish, 8-9 = good commercial fruit finish, and 3-4 = poor finish.

### Quality improvements with Vitazyme

- 65.2% > 3.0 inch fruit despite having a very heavy fruit load
- Fruit brix significantly greater than the control by 0.3 percentage point, despite a heavier fruit load

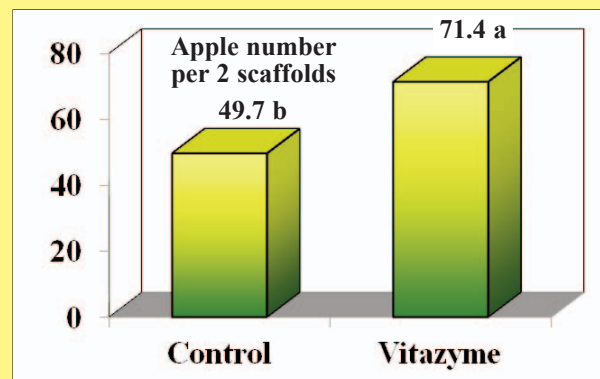
**Fruit yield results:** The fruit was picked on two scaffold limbs per replicate (seven reps per treatment). Due to widespread frost injury, limbs fairly high on each tree were used.

### Pounds Per Two Scaffolds\*



\*Means followed by the same letter are not significantly different at P=0.05.

### Number Per Two Scaffolds\*



\*Means followed by the same letter are not significantly different at P=0.05.



## Yield improvements with Vitazyme

- **Increased weight per 2 scaffolds ..... 8.3 lb (+39%)**
- **Increased apple number per 2 scaffolds .... 21.7 apples (+44%)**

Conclusion: This New York apple study, begun in 2009 to evaluate the return bloom, yield, and quality of apples grown the subsequent year, proved that Vitazyme greatly improved all parameters except apple size. The failure to increase apple size was due to the much heavier load of fruit for the Vitazyme treatment. According to the author of the study,

- 2010 return bloom. 2010 return bloom (flower clusters/limb) was significantly improved in the Vitazyme program.
- 2010 fruit set, yields, and fruit size. Fruit set (number of apples/limb) and yield were improved in the Vitazyme treatment compared to the untreated control, but not quite to the degree that return bloom had been increased. This was due to frost injury during bloom, and the Vitazyme treated rows were somewhat lower lying than the untreated control rows, and therefore suffered somewhat greater fruit losses. Fruit size was somewhat reduced in the Vitazyme treatment, as expected, since fruit size was very good in both treatments.
- Fruit pressure and soluble solid levels at harvest. Fruit firmness did not vary between the two treatments. The Vitazyme treatment showed an increase in soluble solid levels (Brix) despite the higher yields.
- Fruit finish and foliar phytotoxicity. Little difference in fruit finish was noted between the two treatments, and no foliar phytotoxicity was observed.
- Return blooms in 2011 will be evaluated this coming May.

**Vital Earth Resources**

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

**2010 Crop Results**

**Vitazyme on Apples**

Researcher: Agr. Assistance  
Tree density: 450 trees/acre  
Soil pH: 6.6

Location: Wayne County, New York  
Tree age: 25+ years

Variety: Empire  
Rootstock: M26 y-trellis

Experimental design: An apple orchard was divided into an untreated control, a TrophoMax treatment, and a treatment receiving both TrophoMax and Vitazyme. The objective of the study was to evaluate the effect of these treatments on apple yield and quality.

- 1. Control**
- 2. TrophoMax**
- 3. TrophoMax + Vitazyme**

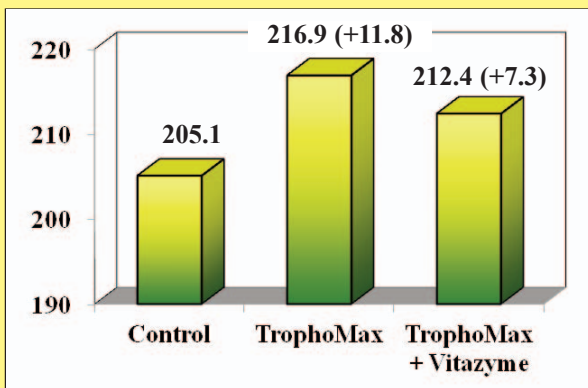
Fertilization: 250 lb/acre Ca(NO<sub>3</sub>)<sub>2</sub> (37 lb/acre N) pre-bloom to all treatments

TrophoMax application: TrophoMax is an inoculant for seeds and leaves that contains patented beneficial bacteria called pink-pigmented facultative methylotrophs (PPFMs). These bacteria are naturally present on the leaves, roots, and leaves of all plant species, and they secrete nitrogen, and the growth regulators cytokinins and axins. By applying these PPFM bacteria to exceed baseline levels, crop yields and biomass have been shown to increase, and resistance to heat, drought, insects, and microbial pathogens has been increased. Applications were 8 oz/acre at pink (April 23), petal fall (May 18), second cover (June 12), and fourth cover (July 19) using an airblast sprayer.

Vitazyme application: 16 oz/acre at pink (April 23), petal fall (May 18), second cover (June 12), and fourth cover (July 19), along with TrophoMax using an airblast sprayer.

Weather for 2010: 2010 was unusually warm and wet, giving excellent growing conditions that resulted in good fruit size, high soluble solids, and high yields. There were also widespread losses due to frost at late bloom.

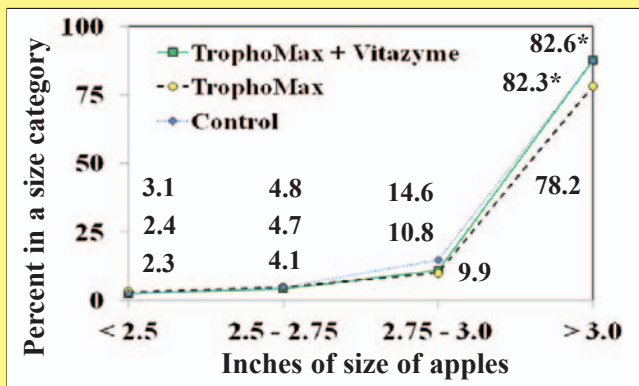
Tree growth: Seven trees from each treatment were evaluated.



Increase in tree growth	
TrophoMax .....	11.8
TrophoMax + Vitazyme .....	7.3

Fruit quality results: Seven trees were evaluated from each treatment. Brix, pressure, and finish were measured on 10 fruit per tree; 100 fruit per tree were used to determine color.

## Fruit Grade



Mean fruit size:

Control - 6.8 oz

TrophoMax - 6.9 oz

TrophoMax + Vitazyme - 6.8 oz

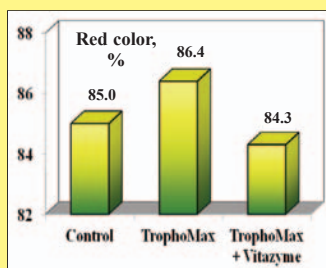
### Increase in >3-inch apples

TrophoMax ..... 4.1%

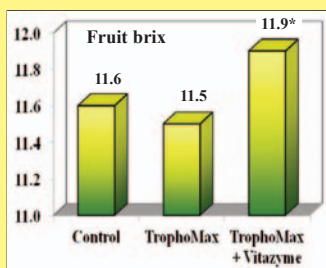
TrophoMax + Vitazyme ..... 4.4%

\*Significant increase over the control.

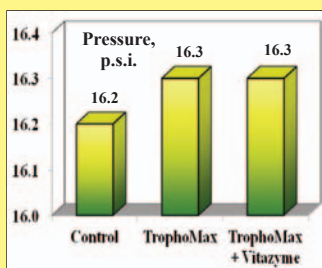
## Red Color



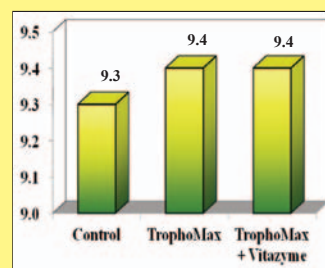
## Fruit Brix



## Fruit Pressure



## Fruit Finish\*



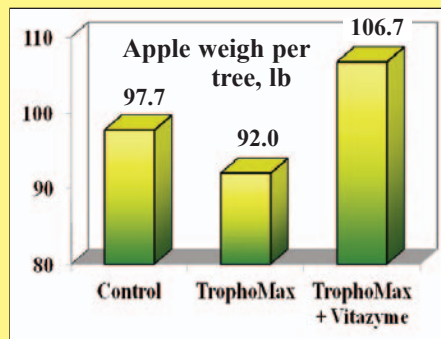
\*Significant increase over the control.

\*10 = perfect finish, 8-9 = good commercial fruit finish, and 3-4 = poor finish.

### Increase in brix with TrophoMax + Vitazyme: 0.3 percentage point

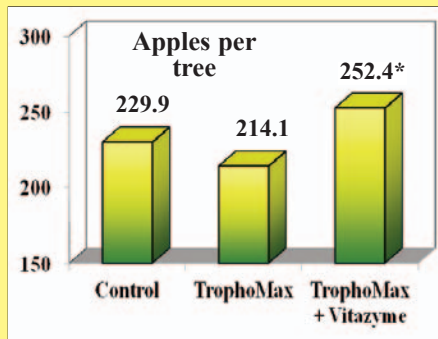
*Fruit yield results:* The fruit was picked on representative trees of each treatment.

## Apple Weight



**Increase in apple weight with TrophoMax + Vitazyme: 9%**

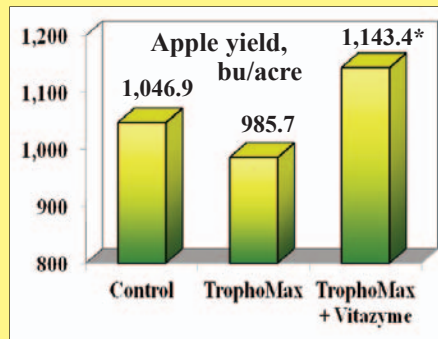
## Apple Number



\*Significant increase over the control.

**Increase in apple number with TrophoMax + Vitazyme: 10%**

## Calculated Yield



\*Significant increase over the control.

**Increase in apple yield with TrophoMax + Vitazyme: 9%**

**Conclusion:** This New York apple trial revealed some positive response for TrophoMax alone with the >3.0-inch apple size (+4.1%), but with no other parameters measured. However, along with Vitazyme the fruit load (+9%) and fruit number (10%) were noticeably improved, as were >3.0-inch fruit (+4.4%) and the brix level (+0.3 percentage point). The calculated yield was also increased by 96.5 bu/acre (+9%) above the con-

trol with the combined products. These results lend credence to the possibility that the improvements noted in apple yield and quality in this study were due to Vitazyme and not TrophoMax bacteria, although there was no treatment with Vitazyme alone to verify this possibility.

According to the researcher,

- Total vegetative growth was somewhat increased in both the TrophoMax and TrophoMax plus Vitazyme treatments compared to the untreated control, although growth was adequate in all trees.
- Fruit set (apples/tree) and total yield were highest in the TrophoMax plus Vitazyme program.
- Fruit size was very large in all three treatments, mostly 3.0 inch diameter-plus fruit.
- Percent red fruit color at harvest did not vary between treatments.
- Fruit firmness at harvest did not vary between the three treatments.
- The TrophoMax plus Vitazyme treatment showed an increase in soluble solid levels (Brix).
- No differences in fruit finish, or any signs of foliar or fruit phytotoxicity, were observed. TrophoMax applications did not result in any crop injury.

## Vital Earth Resources

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

# 2010 Crop Results

## Vitazyme on Apples

### New Planting

Grower: Rick Kime

Location: Kime's Cider Mill, Bendersville, Pennsylvania

Variety: Gala, new trees

Soil type: unknown

Experimental design: A new orchard was planted with young trees, with three rows treated with Vitazyme twice on the soil around the trees. The control trees were about 10 rows away from the treated trees.

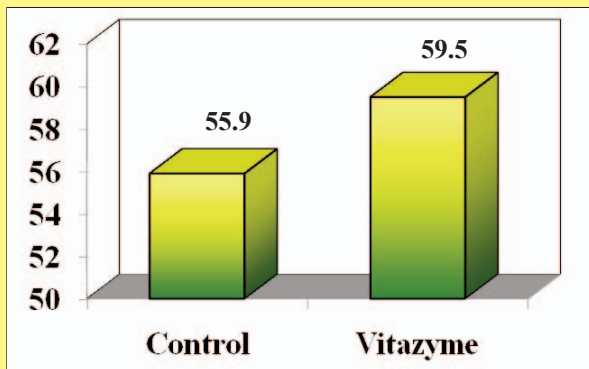
1. Control

2. Vitazyme

Fertilization: none

Vitazyme application: (1) 13/oz/acre (1 liter/ha) on the soil with a herbicide spray; (2) 13 oz/acre (1 liter/ha) on the soil later in the season

Chlorophyll determination: On August 17, 30 trees from each treatment were measured for chlorophyll using fully-opened, mature leaves, using a Minolta SPAD meter.



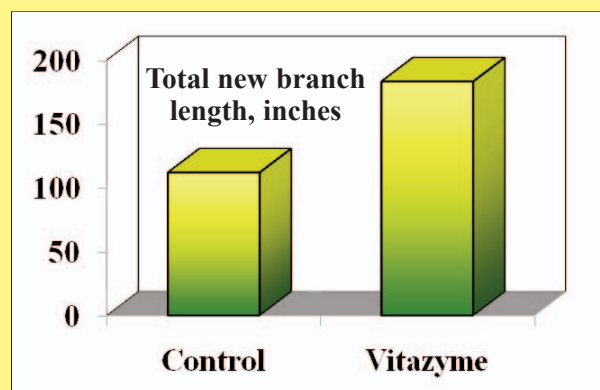
**Increase in leaf chlorophyll with Vitazyme: 3.6 SPAD units**

New growth determination: On August 17, 10 trees from the end of the middle row for each treatment were measured for branch numbers, as well as the new growth of each branch. These data were analyzed by a General Linear Model.

### Total New Branch Length Per Tree

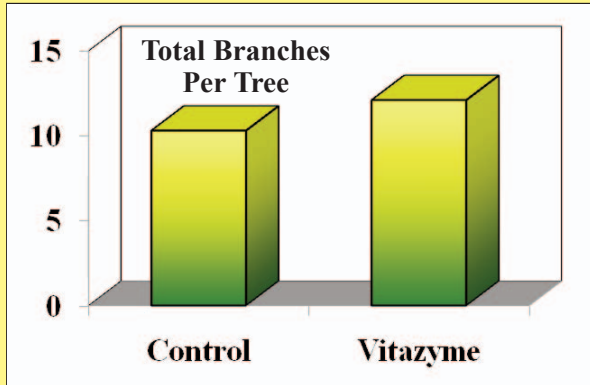
Treatment	Branch length <sup>1</sup> inches	Length change inches
Control	111.9 b	---
Vitazyme	183.2 a	71.1 (+64%)
Main effects	0.0006***	
Model	0.0006***	
CV <sub>0.05</sub>	26.1%	
LSD <sub>0.05</sub>	36.2 inches	

<sup>1</sup>Means are significantly different according to the Student-Newman-Keuls Test at P=0.05.



**Increase in new growth with Vitazyme: 64%**

### Total Branches Per Tree



Treatment	Branches <sup>1</sup>	Change
	number	number
Control	10.3	---
Vitazyme	12.1	1.8 (+17%)
Main effects	0.1897 <sup>ns</sup>	
Model	0.1897 <sup>ns</sup>	
CV <sub>0.05</sub>	26.4%	
LSD <sub>0.05</sub>	2.8	

<sup>1</sup>Means are not significantly different according to the Student-Newman-Keuls Test at P=0.05.

**Conclusion:** In this southeastern Pennsylvania new apple planting study, Vitazyme greatly increased leaf chlorophyll levels, by 3.6 SPAD units. This enhanced photosynthetic advantage resulted in a significantly increased total new branch growth of 64%, while increasing the total branches per tree by 17%; the branch number increase was not significant, since most new growth was on already existing branches at planting. The results of this study show the great value of Vitazyme for improving first-year growth of apple trees.

## Vital Earth Resources

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

# 2010 Crop Results

## Vitazyme on Barley, Spring

Researcher: V. V. Plotnikov Location: National Academy of Agrarian Sciences, Vinnytsia State Agricultural Research Station, Vinnytsia, Ukraine (Central Forest and Steppe Region)

Varieties: Skiff, Lofant, Nezabudka Soil type: gray podzolic (organic matter = 2.2%, hydrolyzed N = 8.4 mg/100 g soil, P = 15.8 mg/100 g soil, exchangeable K = 12.4 mg/100 g soil, pH = 5.5)

Previous crop: corn Planting date: April 7, 2010 Planting rate: 4 million seeds/ha

Soil preparation: disking to 6 to 8 cm, tillage to 22 cm, harrowing to 4 to 5 cm

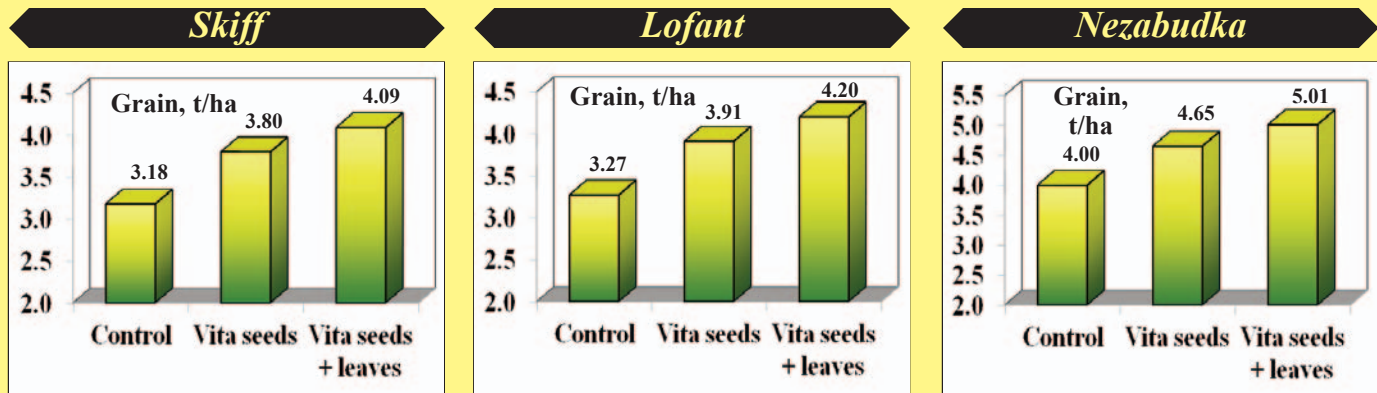
Experimental design: A spring barley plot area, using a total area of about 1.0 ha, with four replicates, was established using two Vitazyme regimes to determine the product's effect on barley yield and grain quality.

1. Control    2. Vitazyme on the seeds    3. Vitazyme on the seeds, and leaves and soil

Fertilization: 60 kg/ha N, 30 kg/ha P<sub>2</sub>O<sub>5</sub>, and 30 kg/ha K<sub>2</sub>O incorporated before planting

Vitazyme application: Treatments 2 and 3, a seed treatment at 1 liter/ha; Treatment 3, an additional foliar and soil treatment of 1 liter/ha on May 15, 2010

Yield results:



Treatment	Increase in grain yield with Vitazyme		
	Skiff	Lofant	Nezabudka
Vitazyme on seeds	0.62 (+19%)	0.64 (+20%)	0.65 (+16%)
Vitazyme on seeds + leaves	0.91 (+29%)	0.93 (+28%)	1.01 (+25%)

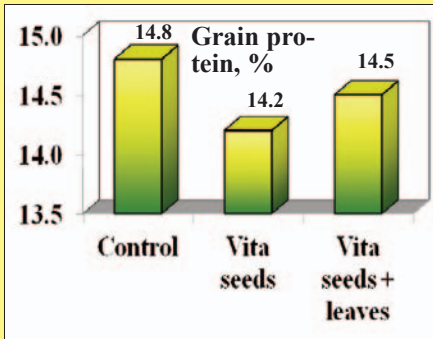
Profit results: All three varieties showed excellent profit increases with Vitazyme. For Skiff, the increases were 989 and 1,270 hrn/ha, for Lofant, 1,022 and 1,304 hrn/ha, and for Nezabudka, 1,022 and 1,436 hrn/ha for the seed treatment and seed treatment plus foliar treatment, respectively.



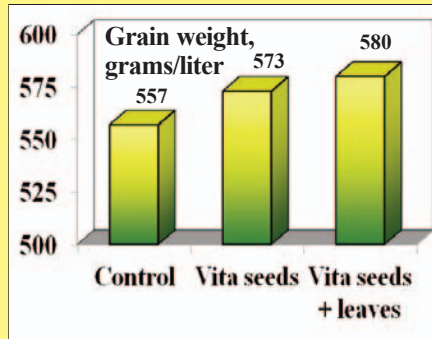
*Grain quality results:*

### Skiff

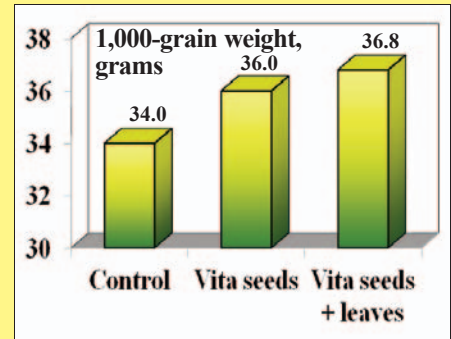
#### Crude Protein



#### Test Weight

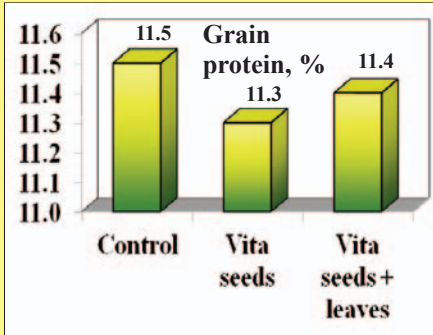


#### 1,000-Grain Weight

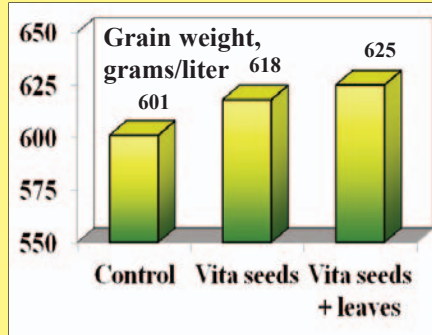


### Lofant

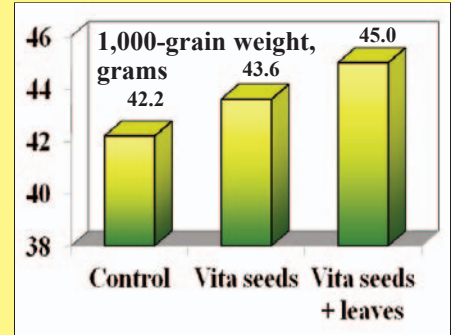
#### Crude Protein



#### Test Weight

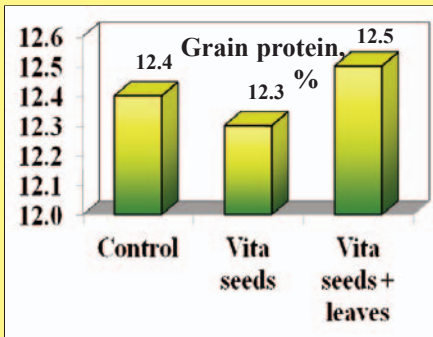


#### 1,000-Grain Weight

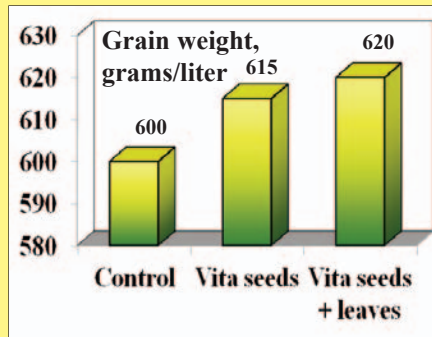


### Nezabudka

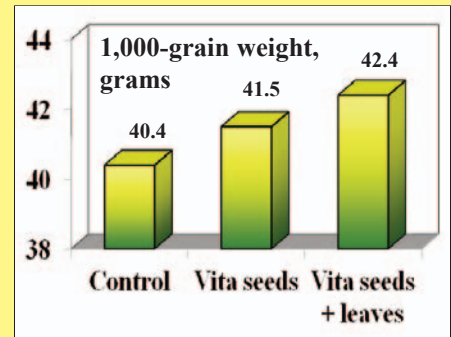
#### Crude Protein



#### Test Weight



#### 1,000-Grain Weight



**Conclusions:** This replicated Ukrainian Vitazyme trial with spring barley, using three barley varieties, showed that the product in all cases benefitted the yield, profitability, and quality of the grain. These results are given in the following table.

Parameter	Vitazyme effects on spring barley		
	Skiff	Lofant	Nezabudka
Grain yield	+19 to 29%	+20 to 28%	+16 to 25%
Income	+989 to 1,270 hrn/ha	+1,022 to 1,304 hrn	+1,022 to 1,436 hrn/ha
Crude protein	-0.3 to 0.6%-pt	-0.1 to 0.2%-pt	-0.1 to +0.1%-pt
Test weight	+16 to 23 g/liter	+17 to 24 g/liter	+ 15 to 20 g/liter
1,000-grain weight	+2.0 to 2.8 grams	+1.4 to 2.8 grams	+1.1 to 2.0 grams

Yields were increased by from 16 to 20% with the seed treatment, and by 25 to 29% by the seed plus foliar treatment. Crude protein was generally decreased — a favorable result — by from 0.1 to 0.6 percentage point, except in one instance, by Vitazyme, while test weight was improved by 15 to 17 grams/liter by the seed treatment, and by 20 to 24 grams/liter by the seed plus foliar treatments. Weight for 1,000 grains likewise was raised by both treatments, by from 1.1 to 2.8 grams, more with the two treatments than with just one. These results reveal how valuable Vitazyme is for malting barley production in Ukraine.

## Vital Earth Resources

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

# 2010 Crop Results

## Vitazyme on Beans, Pinto A Greenhouse Trial With Aquatron Water

Researcher: Paul W. Syltie, Ph.D.      Location: Vital Earth Resources Research Greenhouse, Gladewater, Texas  
Variety: Pinto beans      Soil type: sandy loam  
Pot size: 1 gallon      Planting rate: 12 seeds per pot, thinned to three  
Planting date: March 19, 2010      Growth temperature: 65° to 85° F      Harvest date: April 22, 2010  
Experimental design: This greenhouse experiment, using Vitazyme and Aquatron treated water, was arranged with three treatments and five replications to evaluate the effects of each product alone, and in combination, on plant growth.

Treatment	Application
1	Control
2	Vitazyme at 100 ml/pot of a 0.02% solution
3	Aquatron water, applied at all waterings

Vitazyme application: 100 ml/pot of a 0.02% solution for Treatments 2, to approximate a 13 oz/acre (1 liters/ha) rate

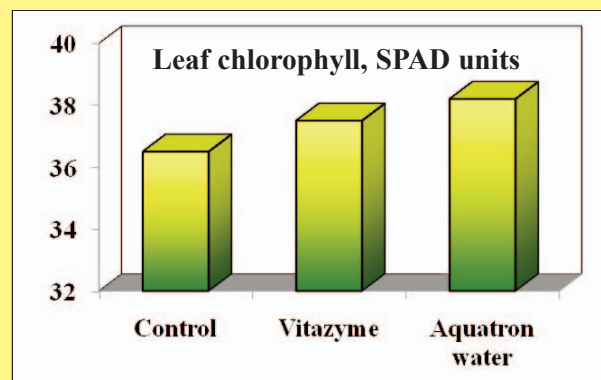
Aquatron water application: An Aquatron device was obtained from Advanced AquaTronics International, Inc., Pompano Beach, Florida, and all water used to treat Treatments 3 and 4 was run through this device during watering. This water is imprinted with electrons and frequencies that are designed to aid in crop production. Days of application: March 22, 23, 24, 25, 26, 29, 30, 31; April 1, 2, 6, 7, 8, 9, 12, 14, 15, 16 (twice), 21

Growth results: These beans were harvested by washing the soil from the corn roots. Leaf chlorophyll (eight measurements per pot) was measured, as was plant height and plant dry weight (125° F for 24 hours in a dryer). Weights were made to the nearest 0.01 gram.

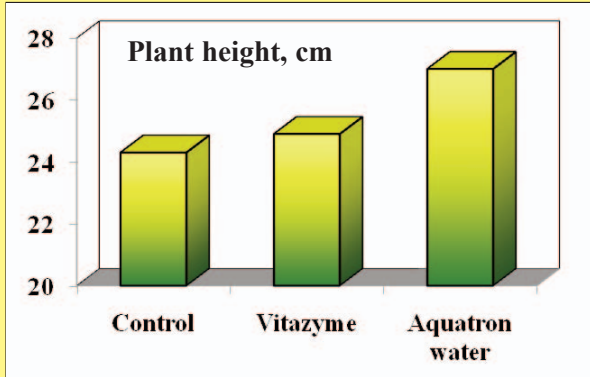
### Leaf Chlorophyll

Treatment	Chlorophyll*	Change
	SPAD units	SPAD units
3 (Aquatron)	38.2 a	1.7 (+5%)
2 (Vitazyme)	37.5 a	1.0 (+3%)
1 (Control)	36.5 a	---
Main effects	0.7506	
Model effects	0.7506	
CV <sub>0.05</sub>	9.41%	
LSD <sub>0.05</sub>	4.8 units	

\*Means are not significantly different at P=0.05 according to the Student-Newman-Kuels Test.



## Plant Height



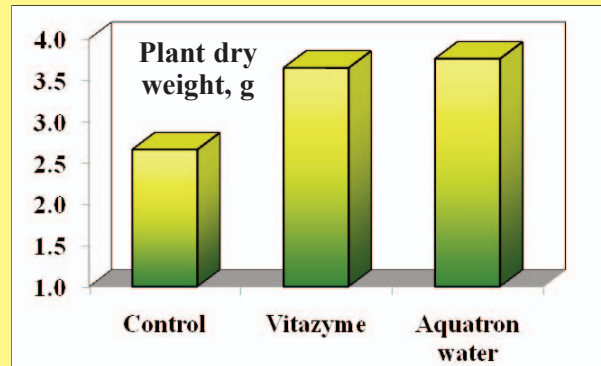
Treatment	Height*	Change
	cm	cm
4 (Aquatron)	27.0 a	2.7 (+11%)
2 (Vitazyme)	24.9 a	0.6 (+2%)
1 (Control)	24.3 a	---
Main effects	0.2604	
Model effects	0.2604	
CV <sub>0.10</sub>	10.12%	
LSD <sub>0.10</sub>	2.9 cm	

\*Means are not significantly different at P=0.10 according to the Student-Newman-Kuels Test..

## Plant Dry Weight

Treatment	Dry weight*	Change
	grams	grams
3 (Aquatron)	3.76 a	1.10 (+41%)
2 (Vitazyme)	3.65 a	0.99 (+37%)
1 (Control)	2.66 b	---
Main effects	0.0007	
Model effects	0.0007	
CV <sub>0.10</sub>	10.65%	
LSD <sub>0.10</sub>	0.40 gram	

\*Means with different letters are significantly different at P=0.10 according to the Student-Newman-Keuls Test.



Increase in plant dry weight with	
Vitazyme .....	37%
Aquatron water .....	41%

**Conclusion:** This greenhouse study with Vitazyme and Aquatron treated water applied to pinto beans revealed that both products dramatically increased dry weight yield above the control; 37 to 41%. Plant height and leaf chlorophyll were not significantly affected. A combined Vitazyme and Aquatron water treatment experienced poor bean germination, so could not be included in the analysis.

## Vital Earth Resources

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

# 2010 Crop Results

## Vitazyme on Fodder Beans

Researcher: V. V. Plotnikov

Research organization: National Academy of Agrarian Sciences

Location: Vinnytsia State Agricultural Research Station, Vinnytsia, Ukraine (Central Forest and Steppe Region)

Variety: Vizyr Super Elite

Soil type: gray podzolic (organic matter = 2.2%, hydrolyzed N = 8.4 mg/100 g soil, P = 15.8 mg/100 g soil, exchangeable K = 12.4 mg/100 g soil, pH = 5.5)

Previous crop: spring rape

Planting date: April 17, 2010

Planting rate: 1 million seeds/ha

Soil preparation: disking to 6 to 8 cm, tillage to 22 cm, cultivation to 5 to 6 cm

Experimental design: A fodder bean plot area was divided into four replicates with a control and two Vitazyme treatments, with the objective of determining the effects of the product on bean yield.

**1. Control**

**2. Vitazyme on seeds**

**3. Vitazyme on seeds and leaves**

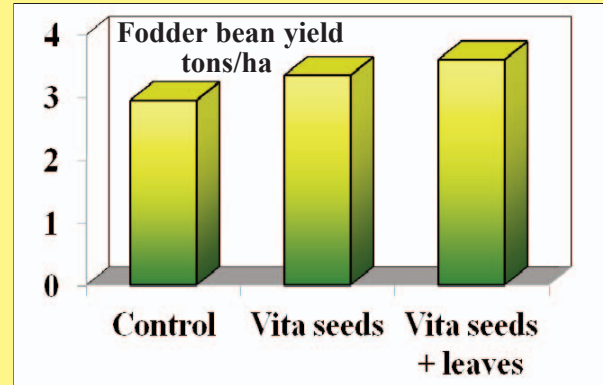
Fertilization: 45-45-45 kg/ha of N-P<sub>2</sub>O<sub>5</sub>-K<sub>2</sub>O, incorporated before planting

Vitazyme application: Treatments 2 and 3, 1 liter/ha on the seeds at planting on April 17; Treatment 3, 1 liter/ha on the leaves and soil at early bloom on June 9

Yield results:

Treatment	Yield tons/ha	Yield change tons/ha
1. Control	2.95	---
2. Vitazyme, seeds	3.35	0.40 (+14%)
3. Vitazyme, seeds + leaves	3.60	0.65 (+22%)

**Yield increase with Vitazyme:  
14 to 22%**



Income results: A single at-planting seed application of Vitazyme produced a 630 hrn/ha income increase; with two applications, at planting and at bloom, that increase was 855 hrn/ha.

Conclusion: A replicated fodder bean trial in Ukraine revealed that Vitazyme, at 1 liter/ha applied to the seeds at planting, produced a yield increase of 0.40 tons/ha (14%), that gave 630 hrn/ha more income. An additional 1 liter/ha at bloom produced a large 0.65 ton/ha (22%) yield increase, with 855 hrn/ha of added income. These results prove the great value of using Vitazyme for fodder bean production in Ukraine.

## Vital Earth Resources

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

# 2010 Crop Results

## Vitazyme on Buckwheat

Researcher: V. V. Plotnikov

Research organization: National Academy of Agrarian Sciences

Location: Vinnytsia State Agricultural Research Station, Vinnytsia, Ukraine (Central Forest and steppe Region)

Variety: Ukrainian Super Elite Soil type: gray podzolic (organic matter = 2.2%, hydrolyzed N = 8.4 mg/100 g soil, P = 15.8 mg/100 g soil, exchangeable K = 12.4 mg/100 g soil, pH = 5.5)

Previous crop: sugar beets

Planting date: May 7, 2010

Planting rate: 4.5 million seeds/ha

Soil preparation: tillage to 22 cm, harrowing to 3 to 4 cm

Experimental design: A buckwheat plot area was divided into four replicates with a control and two Vitazyme treatments, with the objective of determining the effects of the product on yield.

**1. Control**

**2. Vitazyme on seeds**

**3. Vitazyme on seeds and leaves**

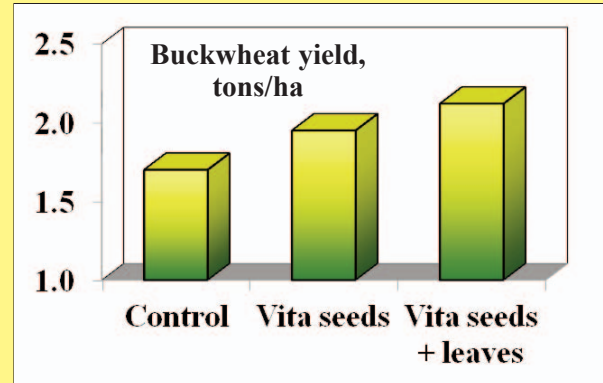
Fertilization: 30 kg/ha of N, incorporated before planting

Vitazyme application: Treatments 2 and 3, 1 liter/ha on the seeds at planting on May 7; Treatment 3, 1 liter/ha on the leaves and soil at early bloom on June 7

Yield results:

Treatment	Yield tons/ha	Yield change tons/ha
1. Control	1.70	---
2. Vitazyme, seeds	1.95	0.25 (+15%)
3. Vitazyme, seeds + leaves	2.12	0.42 (+25%)

**Yield increase with Vitazyme:  
15 to 25%**



Income results: Income was increased by 630 hrn/ha for one treatment, and 835 hrn/ha for two treatments.

Conclusions: This Ukrainian trial with buckwheat revealed that Vitazyme, applied either on the seeds or on the seeds plus the leaves, gave an excellent yield response: 15% for the seeds only, and 25% for the seeds plus the leaves. Income increases were from 630 to 855 hrn/ha. This program is an excellent management practice for buckwheat growers in Ukraine.



## Vital Earth Resources

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

# 2010 Crop Results

## Vitazyme on Canola, Winter Ukrainian Test on Three Varieties

Researcher: V. V. Plotnikov      Location: National Academy of Agrarian Sciences, Vinnytsia State Agricultural Research Station, Vinnytsia, Ukraine (Central Forest and Steppe Region)

Varieties: Black Giant, Antariya, Svitoch

Soil type: gray podzolic (organic matter = 2.2%, hydrolyzed N = 8.4 mg/100 g soil, P = 15.8 mg/100 g soil, exchangeable K = 12.4 mg/100 g soil, pH = 5.5)

Previous crop: tilled fallow      Planting date: August 25, 2009      Planting rate: 7 kg/ha

Soil preparation: disking to 6 to 8 cm, tillage to 22 cm, and harrowing to 3 to 4 cm

Experimental design: An experimental area of 1 ha was divided into smaller plots to place three canola varieties into four replicates for each. Each variety received a control treatment and two Vitazyme treatments, with the objective of determining the effect of the product on canola yield.

### 1. Control

### 2. Vitazyme once

### 3. Vitazyme twice

Fertilization: 30-60-90 kg/ha of N-P<sub>2</sub>O<sub>5</sub>-K<sub>2</sub>O tilled in; spring, 90 kg/ha N.

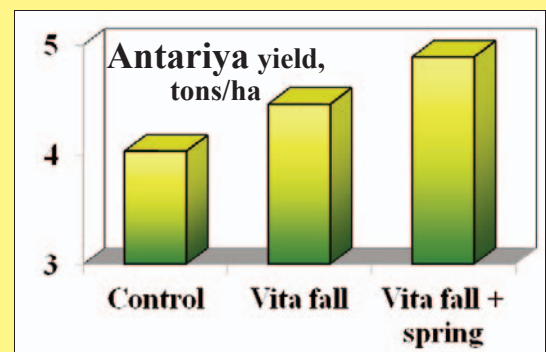
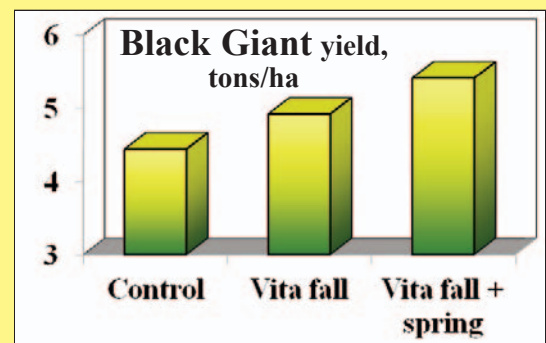
Vitazyme application: 1 liter/ha for Treatments 2 and 3 on November 24, 2009 (5 to 6 leaves); 1 liter/ha in addition for Treatment 3 on April 30, 2010 (budding). Sprayer output: 200 liters of water delivered per ha. Vitazyme was applied with the pesticide.

Pesticide application: Condor 12 AM

Weather conditions: Generally favorable, but somewhat warmer and dryer than normal

Yield results:

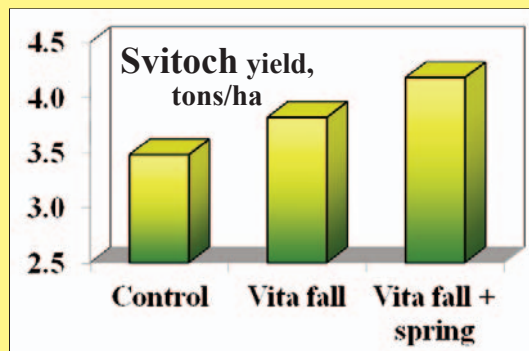
Treatment	Yield t/ha	Yield change t/ha	Income increase hrn/ha
<b>BLACK GIANT</b>			
1. Control	4.44	---	---
2. Vita fall	4.92	0.48 (+11%)	1,720
3. Vita fall + spring	5.41	0.97 (+22%)	3,480
<b>ANTARIYA</b>			
1. Control	4.03	---	---
2. Vita fall	4.46	0.43 (+11%)	1,520
3. Vita fall + spring	4.89	0.86 (+21%)	3,040
<b>SVITTOCH</b>			
1. Control	3.48	---	---
2. Vita fall	3.82	0.34 (+10%)	1,160
3. Vita fall + spring	4.18	0.70 (+20%)	2,400





### Increase in Canola yield with Vitazyme

	<u>Fall only</u>	<u>Fall + Spring</u>
<b>Black Giant</b>	<b>11%</b>	<b>22%</b>
<b>Antariya</b>	<b>11%</b>	<b>21%</b>
<b>Svitoch</b>	<b>10%</b>	<b>20%</b>



*Conclusion:* This Ukrainian replicated canola study proved that Vitazyme uniformly increased yields with a simple fall application of 1 liter/ha by 10 to 11%, while a fall plus a spring application about doubled that increase, to 20 to 22%. Income was also dramatically increased in all cases. These results show the great utility of the Vitazyme program to increase canola yields and profits in Ukraine.

## Vital Earth Resources

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

# 2010 Crop Results

## Vitazyme on Corn

### A Greenhouse Trial With Aquatron Water

**Researcher:** Paul W. Syltie, Ph.D.    **Location:** Vital Earth Resources Research Greenhouse, Gladewater, Texas  
**Variety:** Pioneer 34R67 Liberty Link Triple-Stack    **Soil type:** sandy loam  
**Pot size:** 1 gallon    **Planting rate:** 10 seeds per pot, thinned to three  
**Planting date:** March 19, 2010    **Growth temperature:** 65° to 85° F    **Harvest date:** April 22, 2010  
**Experimental design:** A greenhouse study was devised using four treatments and five replications to evaluate the effects of Vitazyme and Aquatron water on corn growth.

Treatment	Application
1	Control
2	Vitazyme at 100 ml/pot of a 0.02% solution
3	Aquatron water, applied at all waterings
4	Vitazyme (as in Treatment 2) + Aquatron water (as in Treatment 3)

**Vitazyme application:** 100 ml/pot of a 0.02% solution for Treatments 2 and 4, to approximate a 13 oz/acre (1 liter/ha) rate

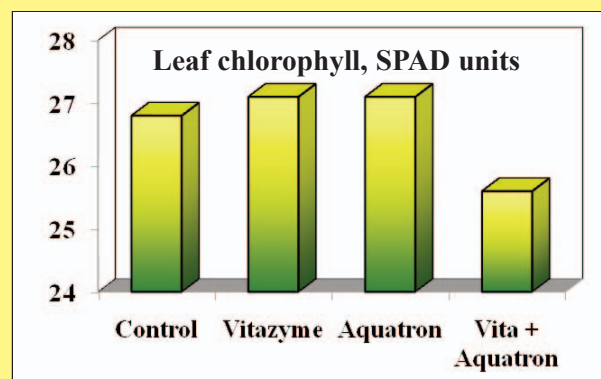
**Aquatron water application:** An Aquatron device was obtained from Advanced AquaTronics International, Inc., Pompano Beach, Florida, and all water used to treat Treatments 3 and 4 was run through this device during watering. This water is imprinted with electrons and frequencies that are designed to aid in crop production. Days of application: March 22, 23, 24, 25, 26, 29, 30, 31; April 1, 2, 6, 7, 8, 9, 12, 14, 15, 16 (twice), 21

**Growth results:** The crop was harvested by washing the soil from the corn roots. Leaf chlorophyll (eight measurements per pot) and leaf length were measured, and drying the plants in a dryer at 125° F was continued for 24 hours. Weights were taken to the nearest 0.01 gram.

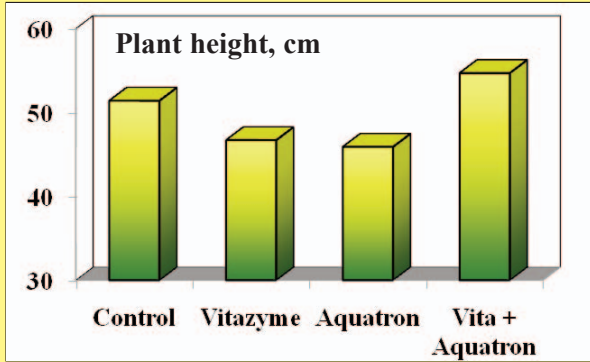
### Leaf Chlorophyll

Treatment	Chlorophyll*	Change
	SPAD units	SPAD units
3 (Aquatron)	27.1 a	0.3
2 (Vitazyme)	27.1 a	0.3
1 (Control)	26.8 a	---
4 (Vita + Aqua)	25.6 a	(-) 1.2
Main effects	0.589	
Model effects	0.589	
CV <sub>0.10</sub>	7.51%	
LSD <sub>0.10</sub>	2.2 units	

\*Means are not significantly different according to the Student-Newman-Kuels Text (P=0.10)



## Plant Height



**Increase in height with  
Vitazyme + Aquatron water: +6%**

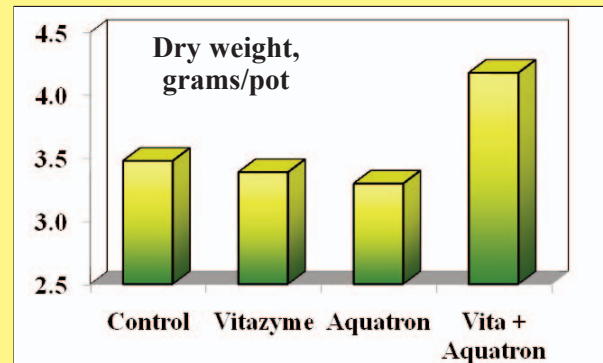
Treatment	Height*	Change
	cm	cm
4 (Vita + Aqua)	54.7 a	3.3 (+6%)
1 (Control)	51.4 a	---
2 (Vitazyme)	46.7 b	(-) 4.7 (9%)
3 (Aquatron)	45.9 b	(-) 5.5 (-11%)
Main effects	0.0009	
Model effects	0.0009	
CV <sub>0.10</sub>	6.14%	
LSD <sub>0.10</sub>	3.4 cm	

\*Means with different letters are significantly different at P=0.10 according to the Student-Newman-Keuls Test.

## Plant Dry Weight

Treatment	Dry weight*	Change
	grams	grams
4 (Vita + Aqua)	4.18 a	0.70 (+20%)
1 (Control)	3.48 b	---
2 (Vitazyme)	3.39 b	(-) 0.09 (-3%)
3 (Aquatron)	3.30 b	(-) 0.18 (-5%)
Main effects	0.0079	
Model effects	0.0079	
CV <sub>0.10</sub>	10.51%	
LSD <sub>0.10</sub>	0.42 gram	

\*Means with different letters are significantly different at P=0.10 according to the Student-Newman-Keuls Test.



**Increase in plant dry weight with  
Vitazyme + Aquatron water: +20%**

**Conclusion:** This greenhouse study, using corn with Vitazyme, Aquatron water, and their combination, revealed that leaf chlorophyll did not significantly vary with the four treatments. However, the combined Vitazyme and Aquatron water produced the tallest plants (+6% above the control), and by far the greatest plant dry weight (+20%). The control, Vitazyme, and Aquatron water treatments did not significantly vary from one another for plant height and dry weight. This study proves that the combination of Vitazyme and Aquatron treated water can greatly increase the growth of corn. The reason for neither Treatments 2 nor 3 not increasing yields by themselves in this study is not known.

**Vital Earth Resources**

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

**2010 Crop Results**

**Vitazyme on Corn**

**A Greenhouse Study**

Researcher: Paul W. Syltie, Ph.D.    Location: Vital Earth Resources Research Greenhouse, Gladewater, Texas

Variety: Pioneer 34R67 Liberty Link    Soil type: sandy loam

Pot size: 1 gallon    Planting rate: 10 seeds per pot, thinned to three

Planting date: December 16, 2009    Growth temperature: 50° to 80° F

Experimental design: In this greenhouse corn study, using eight replicates, three treatments were used to evaluate the effect of Vitazyme, with or without formic acid, on corn growth.

- 1. Control
- 2. Vitazyme
- 3. Vitazyme + Formic acid

Vitazyme application: 100 ml/pot of a 0.02% solution

Formic acid application: Vitazyme at 100 ml/pot of a 0.02% solution having 0.5% formic acid

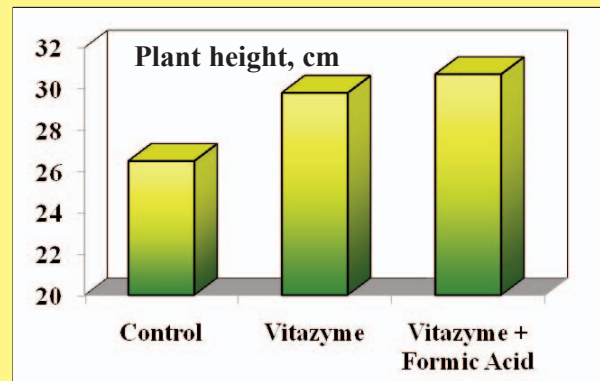
Harvest date: February 2, 2010

Growth results: The plants in each pot were washed free of soil, and the plant heights were measured. Then the plants were dried in a drying oven at 125° F for 24 hours.

**Plant Height**

Treatment	Height <sup>1</sup> cm	Change cm
3 (Vita + Formic acid)	30.7 a	4.2 (+16%)
2 (Vitazyme)	29.8 a	3.3 (+12%)
1 (Control)	26.5 b	---
Blocks	0.3505 ns	
Main effects	0.0054**	
Model	0.0480*	
CV <sub>0.10</sub>	7.76%	
LSD <sub>0.10</sub>	2.0 cm	

<sup>1</sup>Means followed by the same letter are not significantly different at P=0.10 according to the Student-Newman-Keuls Test.



**Increase in plant height**

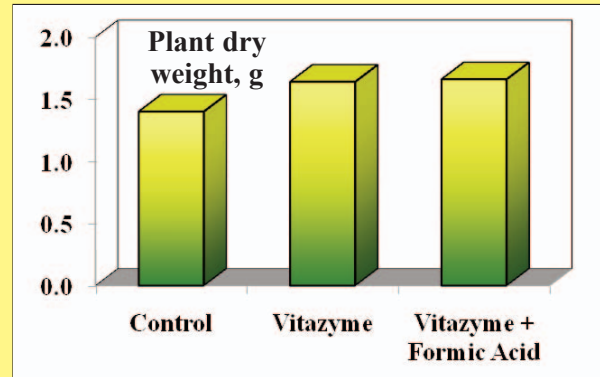
Vitazyme ..... 16%

Vitazyme + Formic Acid .... 12%

## Plant Dry Weight

Treatment	Dry weight <sup>1</sup>	Change
	grams	grams
3 (Vita + Formic Acid)	1.66 a	0.26 (+19%)
2 (Vitazyme)	1.64 a	0.24 (+17%)
1 (Control)	1.40 b	---
Blocks	0.0590 ns	
Main effects	0.0021**	
Model	0.0081**	
CV <sub>0.10</sub>	8.37%	
LSD <sub>0.10</sub>	0.12 gram	

\*Means followed by the same letter are not significantly different at P=0.10 according to the Student-Newman-Keuls Test..



### Increase in plant dry weight

**Vitazyme ..... 19%**  
**Vitazyme + Formic Acid .... 12%**

Conclusion: This greenhouse study with corn revealed that both Vitazyme alone, and Vitazyme plus formic acid, significantly increased plant height (12 to 16%) and plant dry weight (17 to 19%) above the control. These data indicate that, in spite of sterilization of the product, Vitazyme alone or with formic acid equally stimulated plant growth in this corn study.

## Vital Earth Resources

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

# 2010 Crop Results

## Vitazyme on Corn A Nitrogen Rate Study

Researcher: Manjula V. Nathan, Ph.D., and Tim Reinbott  
Extension Center, University of Missouri, Columbia, Missouri

Location: Bradford Research and

Variety: Mycogen 2H735

Planting date: May 28, 2010

Row spacing: 30 inches

Plant population: 32,000 seeds/acre

Soil values: pH = 6.0; cation exchange capacity = 13.4 meq/100 g; available N = 2 meq/100 g; Bray P1 = 24 lb/acre; Ca = 3,870 lb/acre; Mg = 350 lb/acre; K = 190 lb/acre

Previous crop: soybeans

Experimental design: A small plot study was conducted using plots that were 35 feet long and four rows wide, using three nitrogen rates, to determine if the product Vitazyme would have an effect on corn yield, leaf chlorophyll, and lodging. Six replications were used.

1. 0% nitrogen

2. 50% nitrogen

3. 100% nitrogen

4. 0% nitrogen + Vitazyme

5. 50% nitrogen + Vitazyme

6. 100% nitrogen + Vitazyme

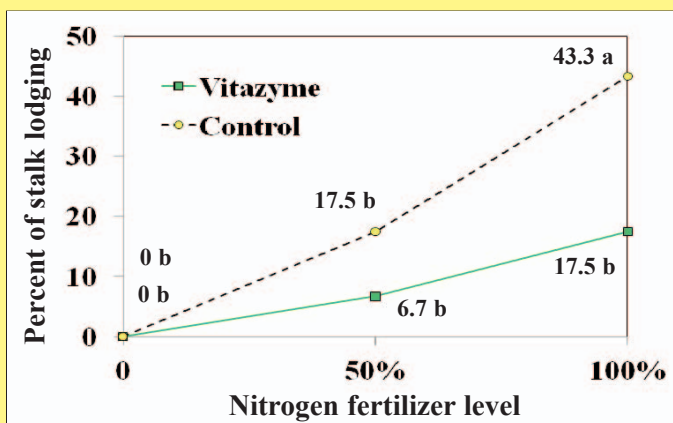
Fertilization: Pre-plant incorporated, 18-46-62 lb/acre N-P<sub>2</sub>O<sub>5</sub>-K<sub>2</sub>O; after planting, 0, 80 (50% N), or 160 (100% N) lb/acre nitrogen as SuperU Urea

Vitazyme application: (1) Seeds were wetted with a 10% solution before planting, and dried; (2) 13 oz/acre (1 liter/ha) were sprayed on the plants and soil at the 10-leaf stage (June 25).

Chlorophyll results: A Minolta SPAD meter was used to measure leaf chlorophyll on July 21, but no significant differences were noted for the same nitrogen level among the six treatments. Ten plants from each plot were measured, using the ear leaf.

Lodging results: On July 20, at the tassel stage, a severe windstorm struck, which blew down many of the plants. Evaluations of lodging at harvest showed much greater susceptibility to stalk breakage with higher nitrogen levels and no Vitazyme. The corn treated with the lower nitrogen levels, as well as those receiving

Vitazyme, had considerably less breakage from wind. This indicated stronger stalk structural tissues with these practices.

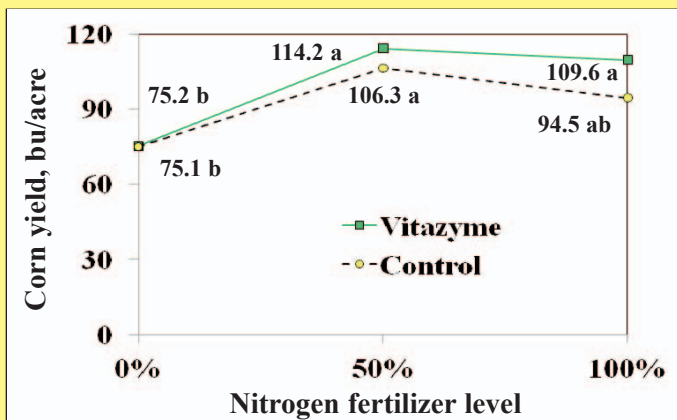


Means followed by the same letter are not significantly different at P=0.05. LSD<sub>0.05</sub>=21.4%; Prob > F=0.007.

### Reduction in lodging with Vitazyme

At 50% N ..... -10.8%-points  
At 100% N ..... -25.8%-points

Weather conditions: Rainfall was very high during the growing season, leading to nitrogen loss from leaching and denitrification. The temperatures were somewhat above normal.



Means followed by the same letter are not significantly different at  $P=0.05$ .  $LSD_{0.05}=24.1$  bu/acre; Prob > F=0.003.

*Yield results:* The plots were harvested on October 21, 2010, using the two center rows of each plot.

At every nitrogen level Vitazyme produced a higher corn grain yield, but because of high plot variability none of the differences were significant.

#### Increase in yield with Vitazyme

**At 50% N ..... 7.9 bu/acre (+7%)**

**At 100% N ... 15.1 bu/acre (+16%)**

*Conclusion:* A replicated corn trial at the University of Missouri in 2010, using three nitrogen levels, revealed that Vitazyme significantly reduced plant lodging from high winds at the high (100%) nitrogen level; there was also a large reduction (about 26 percentage points) at the 50% nitrogen level, but the effect was not significant. Grain yield was increased by 7.9 bu/acre (7%) at the 50% nitrogen level, and by 15.1 bu/acre (16%) at the 100% nitrogen level, but these increases were not significant. It is likely that the late planting date, coupled with heavy rains that reduced nitrogen availability, reduced the ability of Vitazyme to improve yield response at all three nitrogen levels.



## Vital Earth Resources

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

# 2010 Crop Results

## Vitazyme on Corn

Researcher: V. V. Plotnikov

Research organization: National Academy of Agrarian Sciences

Location: Vinnytsia State Agricultural Research Station, Vinnytsia, Ukraine (Central Forest and Steppe Region)

Variety: Saari, FAO 280

Soil type: gray podzolic (organic matter = 2.2%, hydrolyzed N = 8.4 mg/100 g soil, P = 15.8 mg/100 g soil, exchangeable K = 12.4 mg/100 g soil, pH = 5.5)

Previous crop: corn

Planting date: May 20, 2010

Planting rate: 22 kg/ha

Soil preparation: disking to 6 to 8 cm, tillage to 22 cm, cultivation to 5 to 6 cm

Experimental design: A corn plot area was divided into four replicates with a control and one Vitazyme treatment, with the objective of determining the effects of the product on corn yield.

### 1. Control

### 2. Vitazyme on the leaves and soil

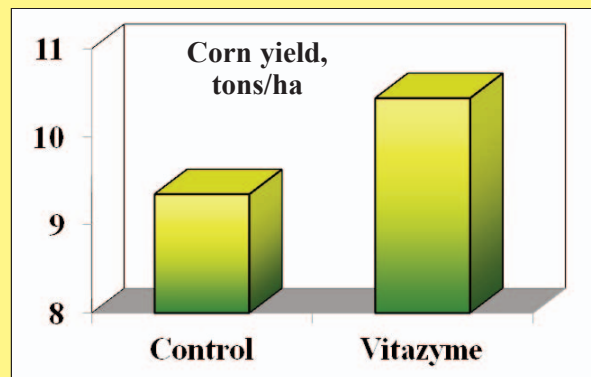
Fertilization: 100-60-60 kg/ha N-P<sub>2</sub>O<sub>5</sub>-K<sub>2</sub>O, incorporated before planting

Vitazyme application: 1 liter/ha to the leaves and soil at the 7 to 8-leaf stage on June 17

Yield results:

Treatment	Yield tons/ha	Yield change tons/ha
1. Control	9.35	---
2. Vitazyme	10.44	1.09 (+12%)

**Yield increase with Vitazyme:  
12%**



Income results: A single Vitazyme application at the 7 to 8-leaf stage increased corn grain income by 1,489 hrn/ha.

Conclusion: Corn raised with Vitazyme, applied at 1 liter/ha to the leaves and soil at the 7 to 8-leaf stage, increased yield by 1.09 tons/ha (12%), and income by 1,489 hrn/ha, in this Ukraine replicated research trial, showing the product's excellent effects upon this crop in Ukraine.

***Vital Earth Resources***

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

**2010 Crop Results**

**Vitazyme on Corn**  
***A Greenhouse Trial***

Researcher: Paul W. Syltie, Ph.D.      Location: Vital Earth Resources Research Greenhouse, Gladewater, Texas  
Variety: Pioneer 34R67 Liberty Link Triple-Stack      Soil type: Sandy loam  
Pot size: 1 gallon      Planting rate: 10 seeds per pot, thinned to three  
Planting date: March 19, 2010      Growth temperature: 65° to 85° F  
Experimental design: This greenhouse study utilized seven replicates and five treatments, to evaluate the effects of Vitazyme and another growth stimulant on corn growth.

Treatment	Vitazyme 1	Vitazyme 2	Root stimulator
1	O	O	O
2	X	O	O
3	O	X	O
4	O	O	X
5	X	O	X

Vitazyme application: Both Vitazyme 1 and Vitazyme 2 were applied at 100 ml per pot of a 0.02% solution for Treatments 2, 3, and 5. Vitazyme 1 was the regular product; Vitazyme 2 was produced without certain intermediate steps.

Root stimulator application: A 4 gallon/acre root stimulator treatment was applied in 100 ml of water for each pot of Treatments 4 and 5. The root stimulator dilution was 0.07 ml/100 ml of solution (for one pot).

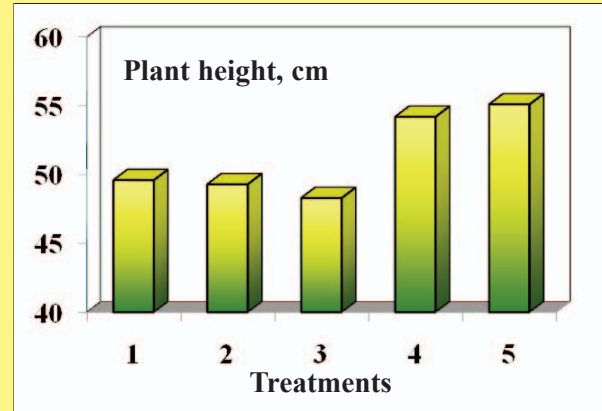
Harvest date: April 22, 2010

Growth results: Roots were washed free of soil, heights were measured, and the plants were dried in a drying oven at 125° F for 24 hours.

## Plant Height

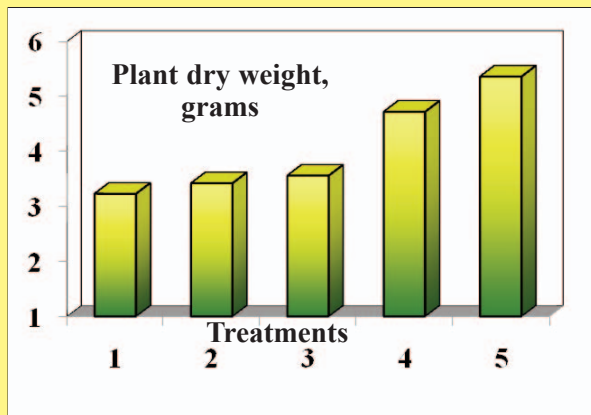
Treatment	Height <sup>1</sup> cm	Change cm
5 (Vita 1 + Growth Stim)	55.1 a	5.5 (+11%)
4 (Growth Stim)	54.2 a	4.6 (+9%)
1 (Control)	49.6 b	—
2 (Vita 1)	49.3 b	(-) 0.3 (-1%)
3 (Vita 2)	48.3 b	(-) 1.3 (-3%)
Main effects	0.0193*	
Model effects	0.0193*	
CV <sub>0.10</sub>	8.61%	
LSD <sub>0.10</sub>	4.0 cm	

\*Means followed by the same letter are not significantly different according to the Student-Newman-Keuls Test (P=0.10).



**Increase in plant height with Vitazyme + Growth stimulator ... 11%**  
**Increase in plant height with Growth Stimulator ..... 9%**

## Plant Dry Weight



Treatment	Dry weight <sup>1</sup> grams	Change grams
5 (Vita 1 + Growth Stim)	5.36 a	2.13 (+66%)
4 (Growth Stim)	4.72 b	1.49 (+46%)
3 (Vita 2)	3.56 c	0.33 (+10%)
2 (Vita 1)	3.42 c	0.19 (+6%)
1 (Control)	3.23 c	—
Main effects	0.0000***	
Model effects	0.0000***	
CV <sub>0.10</sub>	26.47%	
LSD <sub>0.10</sub>	0.61 gram	

\*Means followed by the same letter are not significantly different according to the Student-Newman-Keuls Test (P=0.10).

### Increase in dry weight

**Vitazyme 1 + Growth stimulator ... 66%**  
**Growth Stimulator ..... 46%**  
**Vitazyme 2 ..... 10%**

**Conclusion:** This greenhouse study with corn revealed that Vitazyme 1 plus a root stimulator greatly increased both plant height (+11%) and dry weight (66%) above the control. The root stimulator alone increased height by 9%, and dry weight by 46%. Vitazyme 1 and Vitazyme 2 did not differ significantly in their effects on plant height and dry weight, but they exceeded the control dry weight by from 6 to 10%.

## Vital Earth Resources

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

# 2010 Crop Results

## Vitazyme on Corn A Yield and Quality Study

Researcher: Bert Schou, Ph.D.      Research Organization: Agricultural Custom Research and Education Services (ACRES)

Location: Cedar Falls, Iowa

Variety: Pioneer 36W66 (non-GMO)      Soil type: Aredale loam (36% sand, 42% silt, 22% clay, 4.8% organic matter, pH = 6.4, C.E.C. = 1.7 meg/100 g, fertility level = fair, drainage = fair)

Planting depth: 1 inch

Row spacing: 30 inches

Planting rate: 34,000 seeds/acre

Seedbed at planting: fine

Planting date: April 29, 2010

Tillage: conventional

Previous crop: soybeans (with glyphosate)

Experimental design: A small plot study with corn, using plots 15 ft X 40 ft (six rows per plot), was set up with six treatments and six replicates in a Latin Square design. The purpose of the study was to evaluate two Vitazyme formulations and another seed treatment on the yield and quality of non-GMO corn.

Treatment	Nitrogen lb/acre	Vitazyme A <sup>1</sup> oz/acre	Vitazyme B <sup>2</sup> oz/acre	NERS <sup>3</sup> oz/acre
1	120	0	0	0
2	120	13 (2x)	0	0
3	120	0	13 (2x)	0
4	120	0	0	13 (1x)
5	120	13 (2x)	0	13 (1x)
6	60	13 (2x)	0	0

<sup>1,2,3</sup>2x = two applications; 1x = one application.  
<sup>3</sup>NERS = New Era Soil Treatment, applied at planting.

Fertilization: Nitrogen was applied to the appropriate plots pre-plant at 60 or 120 lb/acre of N.

Weed control: Harness Xtra at 1.2 quarts/acre, giving good weed control

Vitazyme application: For Vitazyme A and B, 13 oz/acre on the seeds at planting on April 29, and as a foliar spray at 13 oz/acre on June 17, when the corn was at the V-8 stage (20 inches). The sprayer had a flat fan nozzle using 30 psi.

New Era Root Stimulator application: This liquid has a guaranteed analysis of 0.21% N, 0.01% P<sub>2</sub>O<sub>5</sub>, and other materials derived from compost, humic acids, seaweed extract, yucca, and bentonite. It is normally applied at 3 to 5 gallons/acre three to four times per growing season, but was applied at 13 oz/acre on the seeds at planting time for Treatments 4 and 5 of this experiment.

Weather during the growing season: The season was very wet, and temperatures were slightly above normal.

Harvest date: October 7, 2010. A Massey-Ferguson 8 plot combine harvested the middle two rows of each plot, and the corn was weighed with an electronic scale.

Grain moisture: There were no significant differences among the six treatments in grain moisture at harvest.

The range was 15.6 to 16.2%.

Grain test weight: No significant differences in grain test weight were found. They ranged from 54.7 to 55.0 lb/bu.

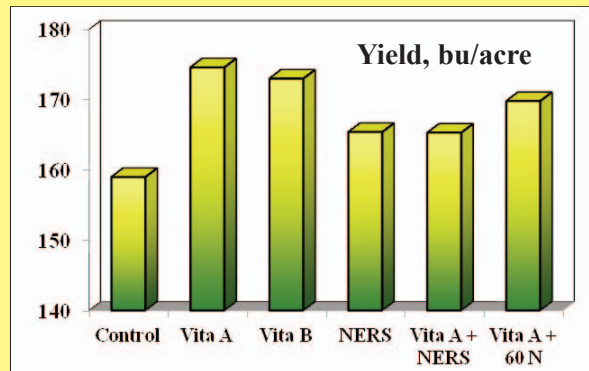
Plant population: All treatments had similar population, with no significant differences detected.

Yield results:

### Corn Yield

Treatment	Yield <sup>1</sup> bu/acre	Change bu/acre
1. Control	159.0 b	---
2. Vita A, 120 N	174.6 a	15.6 (+10%)
3. Vita B, 120 N	173.0 a	13.0 (+8%)
4. NERS, 120 N	165.4 b	6.4 (+4%)
5. Vita A + NERS, 120 N	165.3 b	6.3 (+4%)
6. Vita A, 60 N	169.8 b	10.8 (+7%)
LSD	12.4 bu/acre	
Standard deviation	9.4 bu/acre	
Replicate F	13.11	
Treatment F	1.89	
CV	5.61%	

<sup>1</sup>Means followed by the same letter are not significantly different at P = 0.05 according to the Student-Newman-Keuls Test.



#### Increase in corn yield

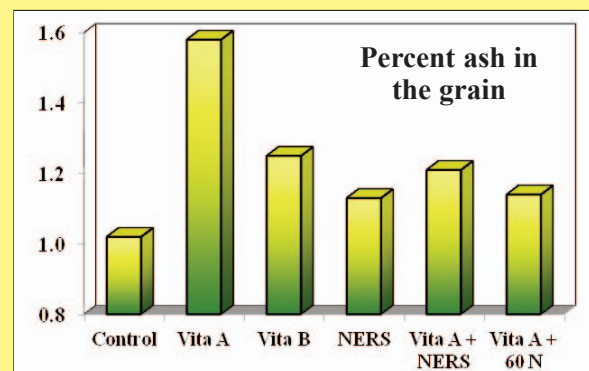
Vitazyme A + 100% N .....	10%
Vitazyme B + 100% N .....	8%
Vitazyme A + 50% N .....	7%
New Era + 100% N .....	4%
Vitazyme A + New Era + 100% N ...	4%

Grain quality results: Composite samples of corn from each treatment (all six replicates) were sent to Midwest Laboratories, Inc., in Omaha, Nebraska, for component analyses. The ash content shown below is calculated on a dry weight basis.

### Ash

Treatment	Ash %	Change <sup>1</sup> %-pts
1. Control	1.02	---
2. Vita A, 120 N	1.58	+0.56
3. Vita B, 120 N	1.25	+0.23
4. NERS, 120 N	1.13	+0.11
5. Vita A + NERS, 120 N	1.21	+0.19
6. Vita A, 60 N	1.14	+0.12

<sup>1</sup>Only the actual percentage point increase is shown

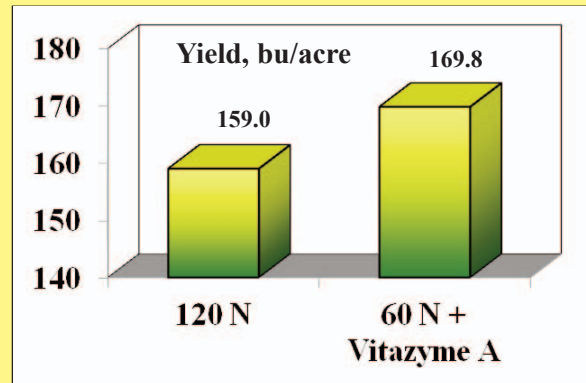


#### Increase in grain ash

Vitazyme A + 100% N .....	0.56
Vitazyme B + 100% N .....	0.23
Vitazyme A + New Era + 100% N .....	0.19
Vitazyme A + 50% N .....	0.12
New Era + 100% N .....	0.11

**Conclusion:** This non-GMO replicated corn trial from eastern Iowa proved that Vitazyme A and Vitazyme B formulations both substantially and statistically increased grain yield, by 15.6 bu/acre (10%) and 13.0 bu/acre (8%), respectively. Both of these treatments, applied at planting and at the V8 stage at 13 oz/acre, also increased the ash level of the grain. The increases were 0.56 and 0.23 percentage points, respectively, great increases in the minerals essential for plant growth. Thus, the growth and health-imparting values of these treatments should be apparent. All other treatments also increased crop yield by 4 to 7%, and grain ash in these treatments was raised by 0.11 to 0.19 percentage point.

Of special interest is the fact that a 50% nitrogen application, along with two Vitazyme A applications, improved yield by 10.8 bu/acre over the 100% nitrogen control without Vitazyme. **This result shows the nitrogen utilization improvement usually noted with Vitazyme.**



## Vital Earth Resources

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

# 2010 Crop Results

## Vitazyme on Corn

Researcher: Bert Schou, Ph.D.  
Services (ACRES)

Research Organization: Agricultural Custom Research and Education

Location: Cedar Falls, Iowa

Variety: Pioneer PO916 (GMO)

Soil type: Aredale loam (36% sand, 42% silt, 22% clay, 4.8% organic matter, pH = 6.4, C.E.C. = 1.7 meq/100 g, fertility level = fair, drainage = fair)

Planting depth: 2 inches

Row spacing: 30 inches

Planting rate: 34,000 seeds/acre

Seedbed at planting: fine

Planting date: April 29, 2010

Tillage: conventional

Previous crop: soybeans (with glyphosate)

Experimental design: A small plot study with corn, using plots 15 ft x 40 ft (six rows per plot), was set up with six treatments and six replicates in a Latin Square design. The purpose of the study was to evaluate two Vitazyme formulations and another seed treatment on the yield and quality of GMO corn.

Treatment	Nitrogen lb/acre	Vitazyme A <sup>1</sup> oz/acre	Vitazyme B <sup>2</sup> oz/acre	NERS <sup>3</sup> oz/acre
1	120	0	0	0
2	120	13 (2x)	0	0
3	120	0	13 (2x)	0
4	120	0	0	13 (1x)
5	120	13 (2x)	0	13 (1x)
6	60	13 (2x)	0	0

<sup>1,2,3</sup>2x = two applications; 1x = one application.  
<sup>3</sup>NERS = New Era Soil Treatment, applied at planting.

Fertilization: Nitrogen was applied to the appropriate plots pre-plant at 60 or 120 lb/acre of N.

Weed control: glyphosate

Vitazyme application: For Vitazyme A and B, 13 oz/acre on the seeds at planting on April 29, and as a foliar spray at 13 oz/acre on June 17, when the corn was at the V-8 stage (20 inches). The sprayer had a flat fan nozzle, and a 30 psi delivery rate.

New Era Root Stimulator application: This liquid has a guaranteed analysis of 0.21% N, 0.01% P<sub>2</sub>O<sub>5</sub>, and other materials derived from compost, humic acids, seaweed extract, yucca, and bentonite. It is normally applied at 3 to 5 gallons/acre three to four times per growing season, but was applied at 13 oz/acre on the seeds at planting only for Treatments 4 and 5 of this experiment.

Weather during the growing season: The season was very wet, and temperatures were slightly above normal.

Harvest date: October 8, 2010. A Massey-Ferguson 8 plot combine harvested the middle two rows of each plot, and the corn was weighed with an electronic scale.

Plant population: All treatments had similar populations, with no significant differences detected.

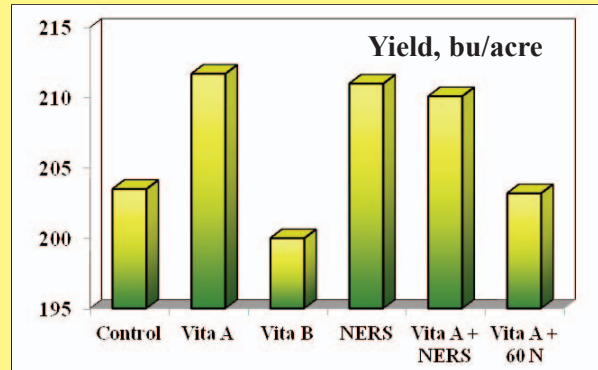


Yield results:

**Corn Yield**

Treatment	Yield <sup>1</sup> bu/acre	Change bu/acre
1. Control	203.5 a	---
2. Vita A, 120 N	211.7 a	8.2 (+4%)
3. Vita B, 120 N	200.0 a	(-) 3.5 (-2%)
4. NERS, 120 N	211.0 a	7.5 (+4%)
5. Vita A + NERS, 120 N	210.1 a	6.6 (+3%)
6. Vita A, 60 N	203.2 a	(-) 0.3 (0%)
LSD	11.4 bu/acre	
Standard deviation	9.6 bu/acre	
Replicate F	0.505	
Treatment F	1.590	
CV	4.65%	

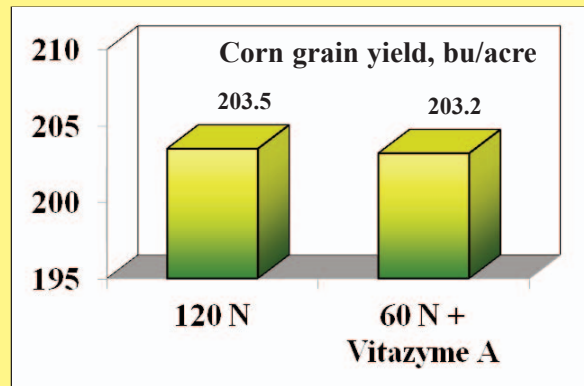
<sup>1</sup>Means followed by the same letter are not significantly different at P = 0.05 according to the Student-Newman-Keuls Test.



**Increase in corn yield**

**Vitazyme A + 100% N ..... 4%**  
**New Era + 100% N ..... 4%**  
**Vitazyme A + New Era + 100% N ... 3%**

Conclusion: This replicated corn study of a genetically modified variety in eastern Iowa revealed that Vitazyme A and New Era Root Stimulator increased grain yield by 4%. The two together increased yield by 3%. Vitazyme A alone, plus 50% of the optimum nitrogen (60 lb/acre), provided a yield equal to the control. However, it should be understood that none of these yield differences were significant at P=0.05.



## Vital Earth Resources

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

# 2010 Crop Results

## Vitazyme on Corn

### A Long-Term Crop and Soil Study: Year 3

Researcher: Bert Schou, Ph.D.  
Services (ACRES)

Research Organization: Agricultural Custom Research and Education  
Location: Cedar Falls, Iowa

Variety: Pioneer PO916XR (GMO)

Soil type: Kenyon loam (34% sand, 46% silt, 20% clay, 4.5% organic matter, pH = 7.3, C.E.C = 17.8 meq/100 g, fertility level = excellent, drainage = excellent)

Planting depth: 2 inches

Row spacing: 30 inches

Planting rate: 32,000 seeds/acre

Seedbed at planting: fine

Planting date: April 22, 2010

Tillage: conventional

Previous crop: soybeans (with glyphosate)

Experimental design: The third year of research on the long-term effects of Vitazyme on crop yield and quality, and on soil conditions, was conducted on the same plots as the previous two years. Two treatments were utilized, as during previous years, with plots 15 x 50 feet, and with five replicates.

#### 1. Control

#### 2. Vitazyme

Fertilization: Nitrogen was applied to all areas at 120 lb N/acre pre-plant.

Weed control: glyphosate

Vitazyme application: (1) 13 oz/acre on the seeds at planting (April 22), and (2) 13 oz/acre sprayed on the leaves and soil at the V8 stage (20 inches tall) on June 16

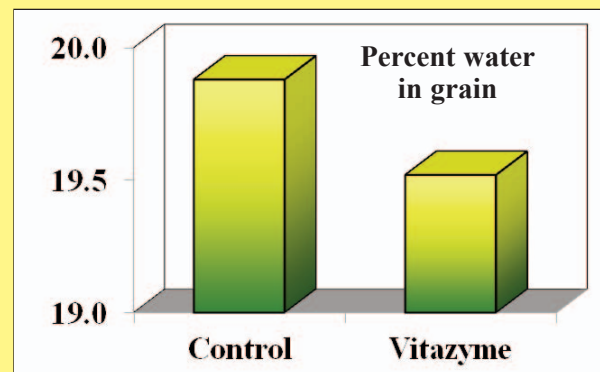
Weather during the growing season: The season was very wet, and temperatures were slightly above normal.

Harvest date: October 6, 2010. A Massey-Ferguson 8 plot combine harvested the middle two rows of each plot, and the corn was weighed with an electronic scale.

Grain moisture: There was a nonsignificant lower moisture content of the Vitazyme treated corn grain versus the control grain.

Treatment	Grain moisture <sup>1</sup>	Change
	%	%
1. Control	19.88 a	---
2. Vitazyme	19.52 a	(-) 0.36
LSD (P=0.05)	1.19%	
Standard deviation	0.68%	
CV	3.44%	
Replicate F	0.385	
Treatment F	0.719	

<sup>1</sup>Means followed by the same letter are not significantly different according to the Student-Newman-Keuls Test (P=0.05).



**Reduced moisture in grain with Vitazyme: 0.36 percentage points**

Grain test weight: There was little difference between the treatments in grain test weight.

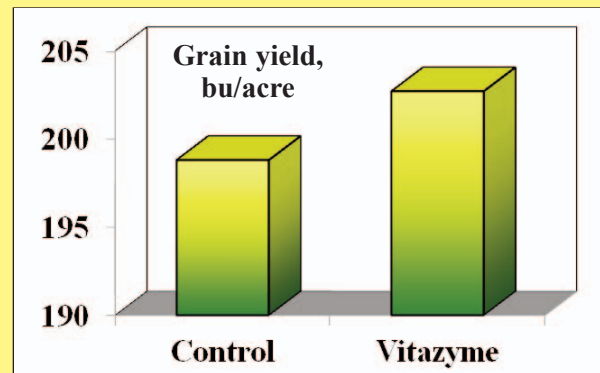
Plant population: The populations of both treatments were very close.

Yield results:

Treatment	Grain yield <sup>1</sup> bu/acre	Change bu/acre
1. Control	198.8 a	---
2. Vitazyme	202.7 a	3.9 (+2%)
LSD (P=0.05)	11.3 bu/are	
Standard deviation	6.4 bu/acre	
CV	3.2%	
Replicate F	0.066	
Treatment F	0.895	

<sup>1</sup>Means followed by the same letter are not significantly different according to the Student-Newman-Keuls Test (P=0.05).

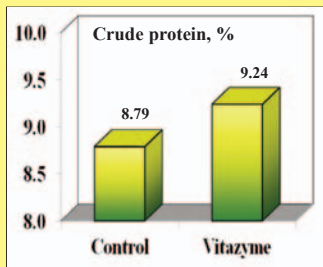
### Grain Yield



**Increase in grain yield with Vitazyme: 2%**

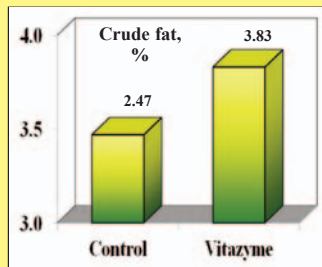
Grain quality results: Composite grain samples for each treatments (five treatments combined) were sent to Midwest Laboratories, Inc., Omaha, Nebraska, for an evaluation of several quality parameters.

### Crude Protein



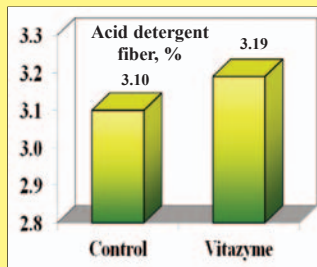
**Percentage point increase: 0.45**

### Crude Fat



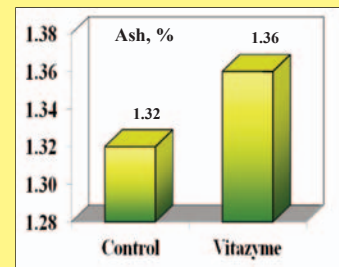
**Percentage point increase: 0.36**

### Acid Detergent Fiber



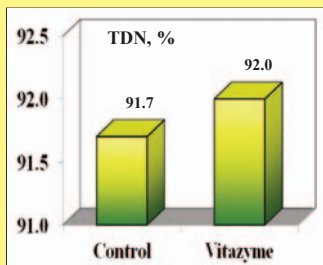
**Percentage point increase: 0.09**

### Ash



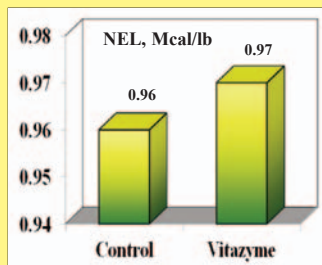
**Percentage point increase: 0.04**

### Total Digestible Nutrients



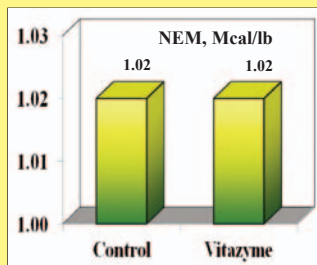
**Percentage point increase: 0.30**

### Net Energy - Lactation

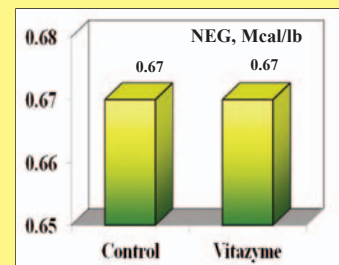


**Mcal/lb increase: 0.01**

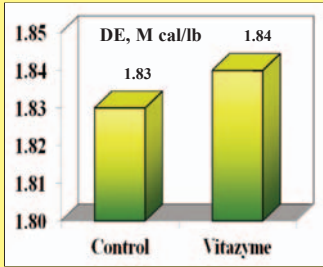
### Net Energy - Maintenance



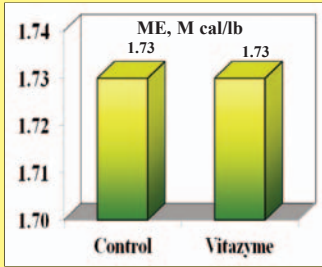
### Net Energy - Gain



### Digestible Energy



### Metabolizable Energy



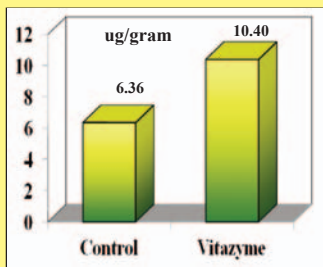
### Grain quality increases with Vitazyme

Crude protein .....	0.45 percentage point
Crude fat .....	0.36 percentage point
Acid detergent fiber .....	0.09 percentage point
Ash .....	0.04 percentage point
Total digestible nutrients ...	0.30 percentage point
Net energy - lactation .....	0.01 Mcal/lb
Digestible energy .....	0.01 Mcal/lb

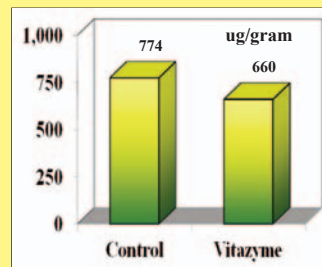
**Mcal/lb  
increase:  
0.01**

*Soil microorganism results:* A composite soil sample from each rep of both treatments was collected and sent to the Soilfoodweb laboratory in Corvallis, Oregon, for microorganism analyses.

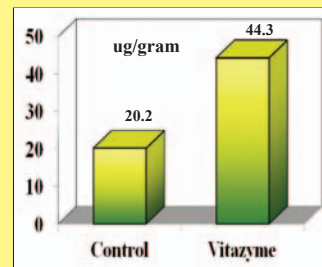
### Active Bacteria



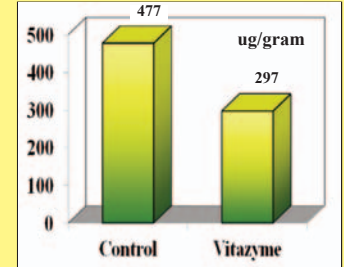
### Total Bacteria



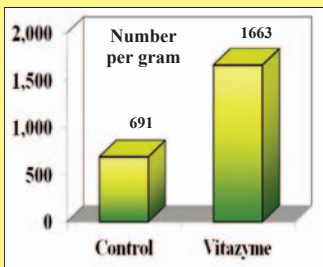
### Active Fungi



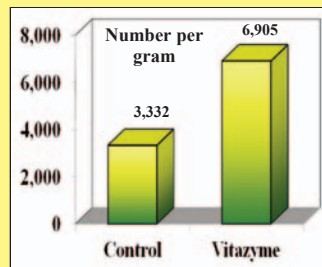
### Total Fungi



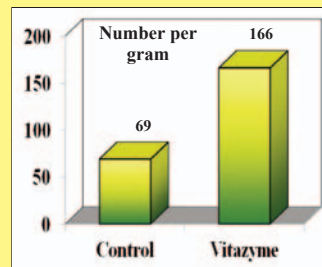
### Flagellate Protozoa



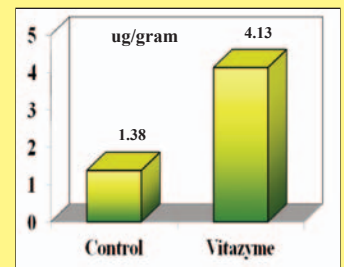
### Amoebic Protozoa



### Ciliate Protozoa



### Actinomycetes



### Nematode Populations

Treatment	Bacterial feeders*	Fungal feeders*	Root/Fungal feeders*	Predatory*	Root feeders*	Total
----- number per gram -----						
Control	0.60 (5)	0.02 (1)	0.12 (3)	0	0.04 (1)	0.95
2. Vitazyme	0.39 (6)	0.04 (1)	1.99 (5)	0.06 (1)	0.12 (2)	3.14

\*The number in parenthesis after the population number indicates the number of species detected.

There were more active bacteria and fungi with Vitazyme, but a bit fewer total bacteria and fungi. Much higher levels of flagellate, amoebic, and ciliate protozoa were found, as well as considerably more actinomycetes in the Vitazyme treated soil. There were more nematodes with Vitazyme, especially fungal and root-feeding species, plus some beneficial predaceous ones, and a greater total variety than in the control.

Bacteria and fungal ratios were as follows:

<b>Treatment</b>	<b><u>Total fungi</u> Total bacteria</b>	<b><u>Active fungi</u> Total fungi</b>	<b><u>Active bacteria</u> Total bacteria</b>	<b><u>Active fungi</u> Active bacteria</b>
Control	0.62	0.04	0.008	3.18
Vitazyme	0.45	0.15	0.02	4.24

<b>Improvements in microbial populations with Vitazyme</b>	
<b>Active bacteria .....</b>	<b>+64%</b>
<b>Active fungi .....</b>	<b>+119%</b>
<b>Flagellate protozoa .....</b>	<b>+141%</b>
<b>Amoebic protozoa .....</b>	<b>+107%</b>
<b>Ciliate protozoa .....</b>	<b>+141%</b>
<b>Actinomycetes .....</b>	<b>+199%</b>

*Conclusions:* This Iowa long-term study revealed that Vitazyme, in the third year, increased the yield of corn by 3.9 bu/acre, while improving the quality of the corn considerably, especially the crude protein (0.45%-point), crude fat (0.36%-point), and ash (0.04%-point). Moreover, soil microbial populations were benefited considerably with the product. These results continue to illustrate the positive effects of this product on both the yield and quality of corn grain, and on soil quality, in the U.S. Corn Belt.

**Vital Earth Resources**

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

**2010 Crop Results**

**Vitazyme on Corn**  
**A Greenhouse Study**

Researcher: Paul W. Syltie, Ph.D.      Location: Vital Earth Resources Research Greenhouse, Gladewater, Texas  
Variety: Pioneer 34R67 Liberty Link      Soil type: Sandy loam, mixed with 10% compost  
Pot size: 1 gallon      Planting rate: 10 seeds per pot, thinned to three  
Planting date: December 16, 2009      Growth temperature: 50° to 80° F  
Experimental design: Three treatments and seven replications were employed in a greenhouse study to evaluate the effect of two Vitazyme formulations on the growth of corn.

**1. Control**

**2. Vitazyme 1**

**3. Vitazyme 2**

Vitazyme application: Vitazyme 1 and Vitazyme 2 were applied at 100 ml per pot of a 0.01% solution.

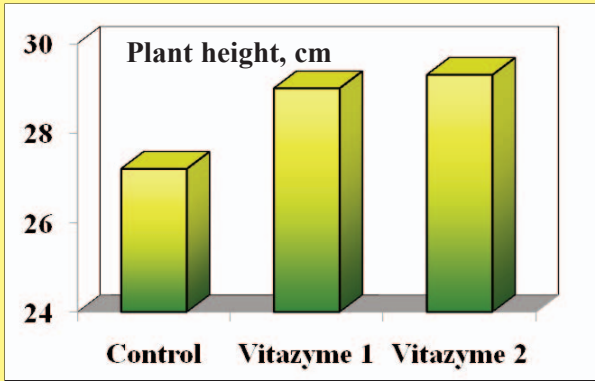
Harvest date: February 1, 2010.

Growth results: Roots were washed free of soil, leaf lengths were measured, and the plants were dried in a drying oven at 125° F for 24 hours.

**Plant Height**

Treatment	Height <sup>1</sup>	Change
	cm	cm
3 (Vita 2)	29.3 a	2.1 (+8%)
2 (Vita 1)	29.0 a	1.9 (+7%)
1 (Control)	27.2 b	---
Blocks	0.1652 ns	
Main effects	0.0406*	
Model	0.0765 ns	
CV <sub>0.10</sub>	5.09%	
LSD <sub>0.10</sub>	1.4 cm	

\*Means followed by the same letter are not significantly different at P=0.10 according to the Student-Newman-Keuls Test.

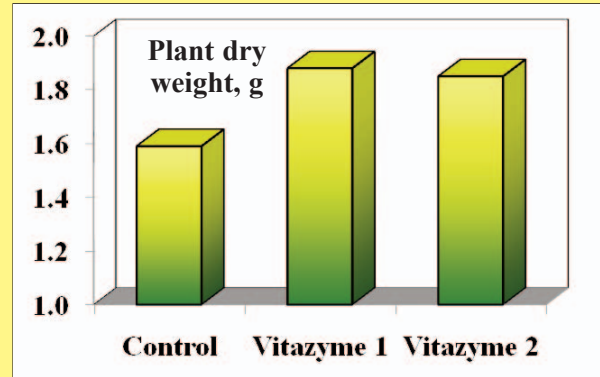


Increase in plant height	
Vitazyme 1 .....	8%
Vitazyme 2 .....	7%

## Plant Dry Weight

Treatment	Dry weight <sup>1</sup>	Change
	grams	grams
3 (Vita 1)	1.88 a	0.29 (+18%)
2 (Vita 2)	1.85 a	0.26 (+16%)
1 (Control)	1.59 b	---
Blocks	0.6091 ns	
Main effects	0.0997*	
Model	0.338 ns	
CV <sub>0.10</sub>	14.4%	
LSD <sub>0.10</sub>	0.24 g	

\*Means followed by the same letter are not significantly different at P=0.10 according to the Student-Newman-Keuls Test..



### Increase in plant dry weight

Vitazyme 1 .....	18%
Vitazyme 2 .....	16%

**Conclusion:** This greenhouse study revealed that Vitazyme 1 and Vitazyme 2 did not differ significantly in their effect on corn height and dry weight, both producing significantly greater values than the untreated control: height increases were 7 to 8%, and dry weight increases were 16 to 18%.



## Vital Earth Resources

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

# 2010 Crop Results

## Vitazyme on Corn

Researcher: unknown

Research organization: Krasnodar Lukyanenko NIICX

Location: Krasnodar Region, Russia

Variety: Krasnodar 385MB

Seeding rate: 18 kg/ha

Planting date: May 5, 2010

Tillage: disking

Previous crop: winter barley

Soil type: Chernozem (2.6 to 3.2% organic matter, pH = 5.1, available P<sub>2</sub>O<sub>5</sub> = 45.0 to 48.4, available K<sub>2</sub>O = 341 to 385 mg/kg, exchangeable bases = 28.9 to 31.8 mg/100 g of soil, saturation with Ca and Mg = 85.0 to 88.6%, texture = 66% clay and 34% silt), highly fertile

Experimental design: A corn field was divided into untreated and Vitazyme treated plots, 40 m<sup>2</sup>, using four replicates, with the objective of evaluating its effects on corn growth and yield.

### 1. Control

### 2. Vitazyme

Fertilization: a fall application of 16-60-40 kg/ha N-P<sub>2</sub>O<sub>5</sub>-K<sub>2</sub>O as NH<sub>4</sub>H<sub>2</sub>PO<sub>4</sub> and KCl, plus 50 kg/ha of NH<sub>3</sub> in April; 50 kg/ha more NH<sub>3</sub> before planting

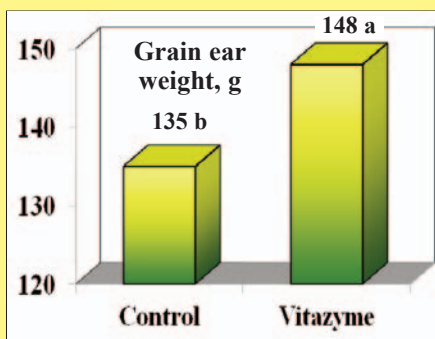
Weed control: Harness KE, 2 liters/ha in April, 2010

Vitazyme application: (1) 1 liter/ha on the leaves and soil sprayed at the 3 to 4-leaf stage on May 18, 2010, and (2) 1 liter/ha foliar sprayed at the 6 to 8-leaf stage on June 1, 2010

Weather conditions: The climate is moderate continental, warm temperature, and humid. Hot and dry weather during early growth in May prolonged the early grand period of growth, but rain (7.39 cm) in later June helped crop development. July was hot and dry, which reduced crop productivity.

Yield results:

### Grain Per Ear\*



\*Means followed by the same letter are not significantly different at P = 0.05.  
LSD<sub>0.05</sub> = 11.8 g

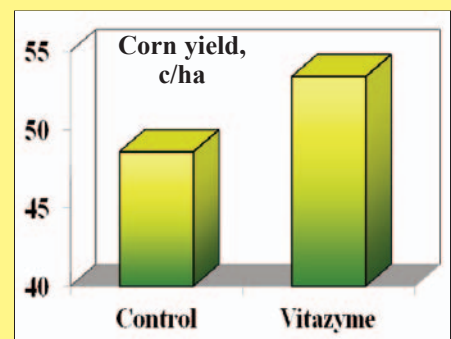
**Increase in grain per ear with Vitazyme:  
13 g (+ 10%)**

### Corn Yield

Treatment	Yield* c/ha	Change c/ha
Control	48.6 b	---
Vitazyme	53.4 a	4.8 (+10%)

\*Means followed by the same letter are not significantly different at P = 0.05.  
LSD<sub>0.05</sub> = 3.8 c/ha.

**Increase in grain yield with Vitazyme:  
10%**



Grain quality results: The protein content of the two treatments was nearly identical, the control being 9.53% and the Vitazyme treatment being 9.56%.

Conclusion: This Russian corn trial from the Krasnodar Region revealed that Vitazyme improved ear size (10% more corn per ear), and increased the yield significantly ( $P = 0.05$ ) over the control, also by 10% (4.8 c/ha). This increase was a result of using only two 1 liter/ha applications, at the 3 to 4-leaf stage. Even with the yield increase the protein content of the grain was not diminished, but was slightly improved. These results show the great utility of using Vitazyme as a yield and profit enhancer for corn in Russia.

## Vital Earth Resources

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

# 2010 Crop Results

## Vitazyme on Cotton

Farmer: Richard Schweers

Test cooperater: Clyde Muennink

Location: Hondo, Texas

Variety: unknown

Planting date: unknown

Experimental design: A cotton field had two 6-acre areas separated for a test to compare Vitazyme treatment with an untreated control. The purpose of the test was to evaluate the effects of the product on cotton growth parameters.

### 1. Control

### 2. Vitazyme

Fertilization: unknown

Vitazyme application: 13 oz/acre at mid-bloom

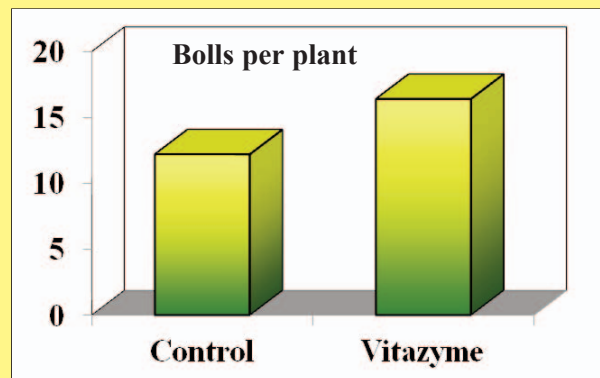
Harvest date: unknown

Growth parameters: Near harvest, the county agricultural extension agent assisted in evaluating the number of bolls per plant. After harvest, the roots from 19 plants of each treatment were dug and cut off at the soil level, then dried and weighed.

### Bolls Per Plant

Treatment	Bolls	Change
	bolls/plant	bolls/plant
Control	12.2	---
Vitazyme	16.4	4.2 (+34%)

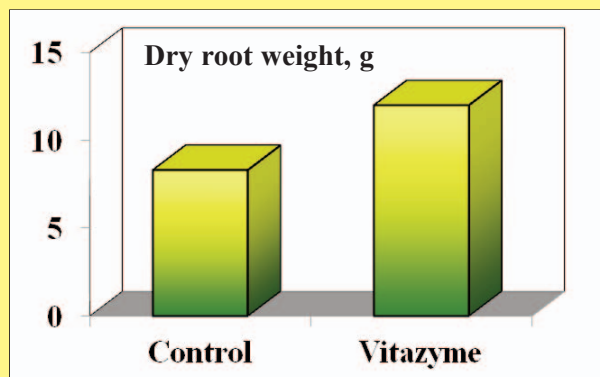
**Increased in bolls with  
Vitazyme: 34%**



### Dry Root Weight

Treatment	Weight	Change
	grams	grams
Control	8.31	---
Vitazyme	12.00	3.69 (+44%)
Main effects P	0.0223*	
Model P	0.0223*	
CV	46.9%	
LSD <sub>0.05</sub>	3.13g	

**Increase in root weight with  
Vitazyme: 44%**



Conclusion: This cotton trial in south central Texas revealed that Vitazyme substantially improved the boll number per plant (34%), a direct reflection of a much greater root system (44%) as evidenced by dry root weight. The yield of the cotton could not be evaluated due to harvesting limitations. Vitazyme is shown by this study to have great potential in improving cotton yields for Texas farmers.

## Vital Earth Resources

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

# 2010 Crop Results

## Vitazyme on Grapes, Table

Grower: Agricola Bauza

Researcher: Syngenta

Location: Parcel 26 of Agricola

Bauza, Punta Peuco, Metropolitan Region, Chile

Variety: Crimson Seedless

Sprayer rate: 1,000 liters/ha (nebulizer sprayer)

Experimental design: A vineyard of Crimson Seedless grapes was divided into a Vitazyme treated area as well as an Ethrel treated control. The purpose of the study was to evaluate the effects of the product on grape yield, maturity, and advancement of coloration of the crop, and grape quality parameters versus the control.

**1. Vitazyme, 2.0 liters/ha twice**

**2. Ethrel**

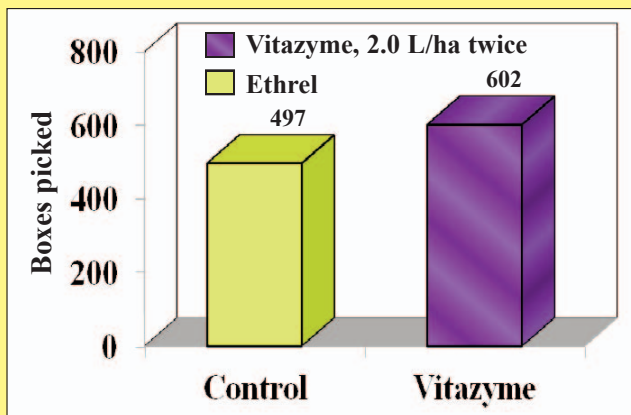
Fertilization: as recommended

Ethrel application: as recommended

Vitazyme application: 2.0 liters/ha applied 15 days before veraison, and 2.0 liters/ha applied at veraison

Grape sugar: Both treatments produced a Brix value about the same: Vitazyme, 19.9; Control, 20.1.

Grape yield: One picking was made, on March 3 and 4, 2010.



**Increase in grape yield  
with Vitazyme: 105 boxes  
(21%)**

Conclusion: The researchers concluded the following:

- The Vitazyme treatment produced 21% more boxes than did the Ethrel treated control.
- The color of the Vitazyme treated berries was much more homogenous within the clusters than for the control, which facilitated the harvest. There were also few green berries in the treated area.
- There were real differences between the two treatments in terms of Brix, despite the increased yield of the Vitazyme treatment.
- The differences between the treatments were marked 15 days before harvest, but near the end of harvest these differences were diminishing.

Vitazyme is shown by this trial to produce superior yields, more than Ethrel, without diminishing quality parameters.

## Vital Earth Resources

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

# 2010 Crop Results

## Vitazyme on Grapes, Table

Grower: Agricola La Cabana      Researcher: Syngenta      Location: Coltauco, Region VI, Chile  
Variety: Thompson Seedless      Spacing: 4.0 x 2.0 meters      Sprayer rate: 70 liters/ha (EES sprayer)  
Experimental design: A vineyard of Thompson Seedless grapes was divided into a Vitazyme treated parcel, along with an untreated area alongside to evaluate the effects of the product on grape yield and maturity.

**1. Vitazyme, 2.0 liters/ha twice**

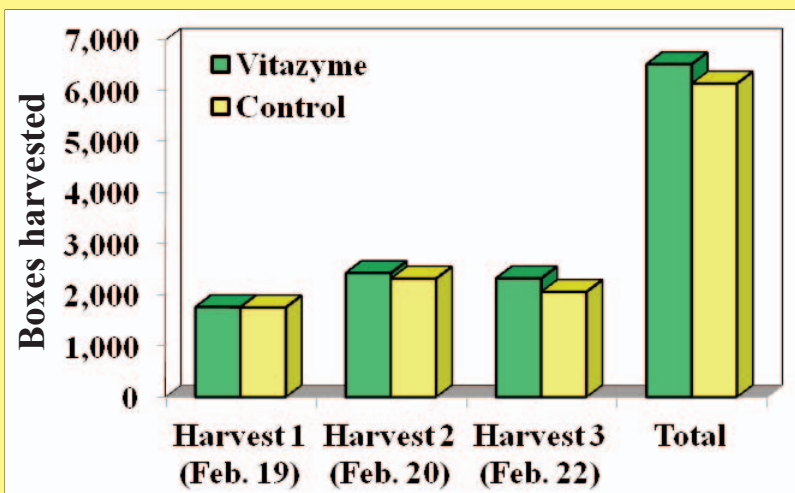
**2. Control**

Fertilization: as recommended

Vitazyme application: 2.0 liters/ha applied 15 days before veraison (December 7, 2009), and 2.0 liters/ha applied at veraison (December 12, 2009)

Grape yield: Three harvests were made, on February 19, 20, and 22, 2010.

Treatment	Harvests							
	Feb. 19	%	Feb. 20	%	Feb. 22	%	Total	Change
1. Vitazyme, 2 L/ha twice	1,765	0%	2,433	+5	2,329	+13	6,527	381 (+6%)
2. Control	1,758	---	2,324	---	2,064	---	6,146	---



**Grape harvest increase  
with Vitazyme: 6%**

Conclusion: This Chilean table grape study revealed that Vitazyme, applied at 2.0 liters/ha twice, resulted in a 6% yield increase across three harvests. A 1.5 liters/ha rate would likely have given a greater yield response.

**Vital Earth Resources**

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

**2010 Crop Results**

**Vitazyme on Grapes, Table**

Grower: Fundo Santa Marta      Researcher: Syngenta      Location: Santa Marta, Metropolitan Region, Chile  
Variety: Flame Seedless

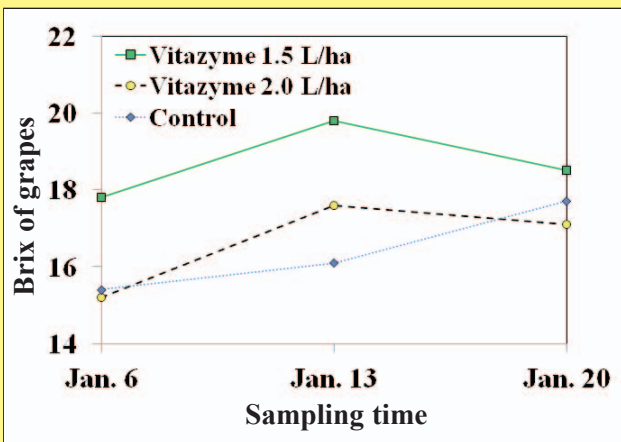
Experimental design: A vineyard was divided into two Vitazyme treatments, plus an untreated control, to evaluate the effects of the product on grape maturity and coloration, yield, and sugar content.

Treatment	Rates and timing	
	15 days before verasion	At verasion
	----- liters/ha -----	
1. Vitazyme	1.5	1.5
2. Vitazyme	2.0	2.0
3. Control	0	0

Fertilization: as recommended

Vitazyme application: 1.5 liters/ha both times for Treatment 1; 2.0 liters/ha both times for Treatment 2

Grape sugar results: Sugar was measured at three times, before and during harvest.



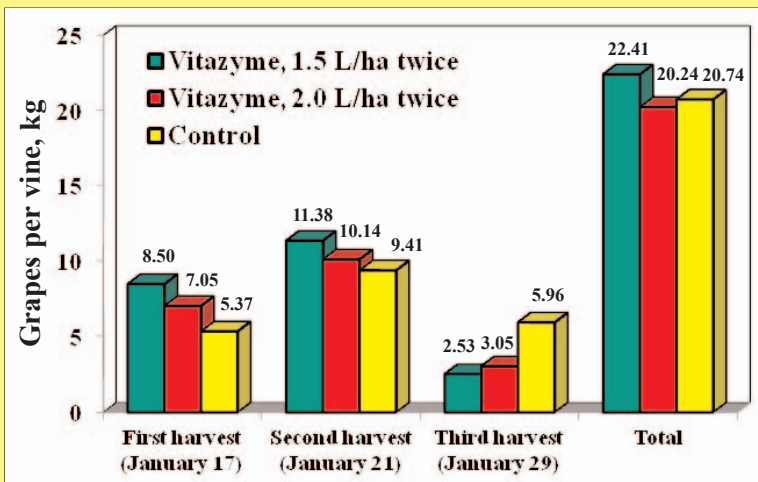
Treatment	Brix values				
	1-6	1-13	1-20	Ave	Change
1. Vitazyme, 1.5 L/ha	17.8	19.8	18.5	18.7	2.3 (+14%)
2. Vitazyme, 2.0 L/ha	15.2	17.6	17.1	16.6	0.2 (+1%)
3. Control	15.4	16.1	17.7	16.4	---

**Increase in Brix with Vitazyme**  
**1.5 L/ha twice ..... 2.3 Brix**  
**2.0 L/ha twice ..... 0.2 Brix**

Yield results: Three pickings were made.

Treatment	Grape pickings				
	Jan. 17	Jan. 21	Jan. 29	Total	Change
	----- kg/vine -----				
1. Vitazyme, 1.5 L/ha	8.50	11.38	2.53	22.41	1.67 (+8%)
2. Vitazyme, 2.0 L/ha	7.05	10.14	3.05	20.24	(-) 0.50 (-2%)
3. Control	5.37	9.41	5.96	20.74	---





### Increased yield with Vitazyme

#### First Picking

1.5 L/ha .... 3.13 kg/vine (+58%)

2.0 L/ha .... 1.68 kg/vine (+31%)

#### Second picking

1.5 L/ha .... 1.97 kg/vine (+21%)

2.0 L/ha .... 0.73 kg/vine (+8%)

#### Total pickings

1.5 L/ha ..... 1.67/vine (+8%)

**Conclusion:** This fresh grape trial in Chile, using Vitazyme twice at either 1.5 or 2.0 liters/ha, revealed that the product improves early coloration and maturity of Thompson Seedless grapes. Not only was the time to harvest improved (by 58% for 1.5 liters/ha, and 31% for 2.0 liters/ha for the first, more profitable harvest), but the total yield was increased by the 1.5 liters/ha treatment (+8%). In addition, grape sugar was improved with Vitazyme, by an average of 2.3 Brix for the 1.5 liters/ha rate, and by 0.2 Brix for the 2.0 liters/ha rate. According to Syngenta, “The T1 [1.5 liters/ha] treatment represents a real breakthrough and increased crop yield compared with the control and T2 [2.0 liters/ha]”.

## Vital Earth Resources

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

# 2010 Crop Results

## Vitazyme on Grapes, Table

*Grower:* Fundo Santa Marta      *Researcher:* Syngenta      *Location:* Santa Marta, Metropolitan Region, Chile  
*Variety:* Thompson Seedless

*Experimental design:* This trial utilized a vineyard that was divided into two Vitazyme treatments besides a control. The purpose of the trial was to evaluate the product's ability to enhance the coloration and maturity of grapes, while increasing yield and quality.

Treatment	Rates and timing	
	15 days before veraison	At veraison
	----- liters/ha -----	
1. Vitazyme	1.5	1.5
2. Vitazyme	2.0	2.0
3. Control	0	0

*Fertilization:* as recommended

*Vitazyme application:* 1.5 liters/ha for Treatment 1 at both times, and 2.0 liters/ha for Treatment 2 at both times

*Grape sugar results:* Sugar was measured at four times during February.

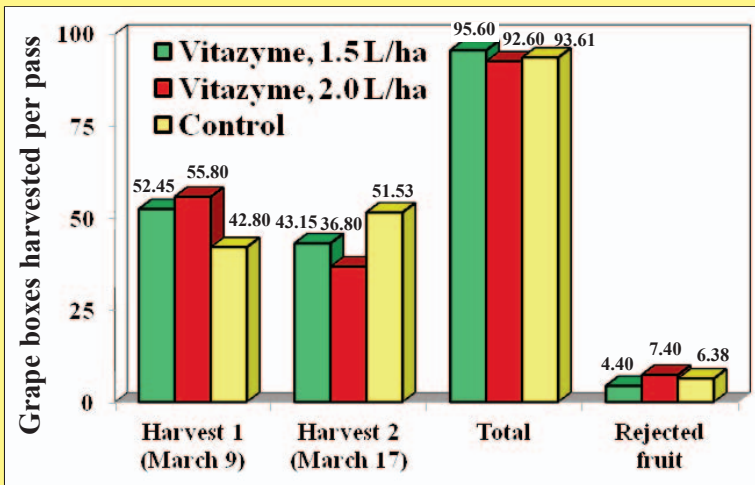
Treatment	Brix values			
	2-10	2-19	2-25	3-4
1. Vitazyme, 1.5 L/ha	12.8	14.1	15.1	15.7
2. Vitazyme, 2.0 L/ha	13.3	14.1	15.1	15.7
3. Control	13.1	14.3	15.4	15.7

The Brix values varied little for the three treatments from February 10 to March 4, and on the last sampling day the values all converged at 15.7 Brix.

*Grape yield results:* Two pickings were made.

Treatment	Picking yields				Total	Change	Rejected fruit
	March 9	%	March 17	%			
	----- boxes/picking -----				---- total boxes ----		boxes
1. Vitazyme, 1.5 L/ha	52.45	(+25%)	43.15	(-16%)	95.60	1.99 (+2%)	4.40
2. Vitazyme, 2.0 L/ha	55.80	(+33%)	36.80	(-29%)	92.60	(-) 1.01 (-1%)	7.40
3. Control	42.08	---	51.53	---	93.61	---	6.38

## Grape Yield



### Increased yield with Vitazyme

#### First picking

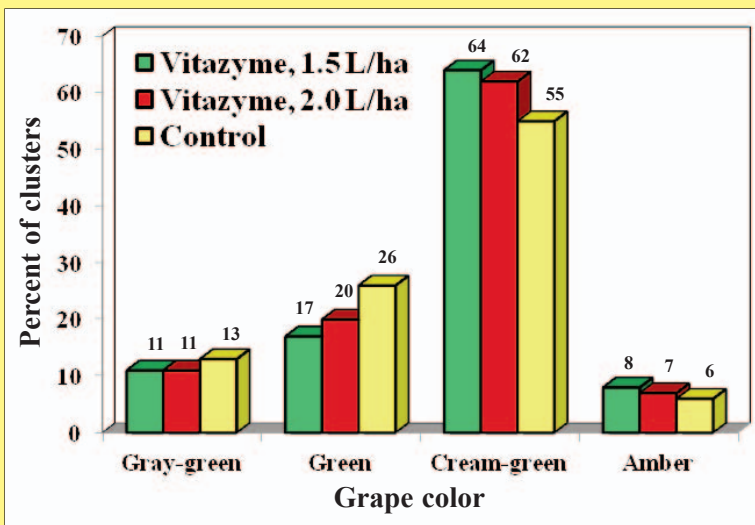
1.5 L/ha .....	+25%
2.0 L/ha .....	+33%

#### Total pickings

1.5 L/ha .....	+2%
----------------	-----

**Refused fruit reduced at  
1.5 liters/ha: -31%**

## Distribution of Fruit Color (ASOEX)



*Grape color results:* For the grapes harvested, a color evaluation was made.

Vitazyme increased the percentage of grapes in the cream-green category, which fetches a much greater price than does the green category, often twice as much.

**Conclusion:** This Chilean fresh grape trial, using 1.5 and 2.0 liters/ha of Vitazyme applied twice, revealed that the yield of first-picked grapes was increased by 25% and 33% by the 1.5 and 2.0 liters/ha rates, respectively, compared to the control. This allowed the farmer to sell more of his grapes at a higher price. Besides, the amount of refused fruit at the 1.5 liters/ha rate was reduced by 31%. According to Syngenta, “Vitazyme in doses of 1.5 and 2.0 L/ha were harvested earlier. This advance [in maturity] allowed a harvest of about 20% more fruit 10 days earlier.” The color of the fruit was also positively influenced by Vitazyme: both rates increased the percentage of the cream-green clusters, which sell for a much higher price than the gray-green, green, or amber fruit. Fruit sugar was not affected by any treatments in this study. These results confirm the great utility of Vitazyme to enhance grape yield, quality, and color in Chile.

**Vital Earth Resources**

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

**2010 Crop Results**

**Vitazyme on Grapes, Table**

Grower: Fundo El Retiro, DDC

Researcher: Syngenta

Location: Pudahuel, Metropolitano Region, Chile

Variety: Thompson Seedless

Spacing: 3.75 X 2.5 meters

Sprayer: vineyard micron sprayer delivering 1,000 liters/ha

Experimental design: A vineyard of Thompson Seedless table grapes was divided into four treatments, three of them Vitazyme and the fourth the control. The purpose of the trial was to evaluate the product's effects on grape yield and maturity at specific dates.

Treatment	Applications	
	Initial	Final
	----- liters/ha -----	
1. Vitazyme	1.5	0
2. Vitazyme	0	1.5
3. Vitazyme	1.5	1.5
4. Control	0	0

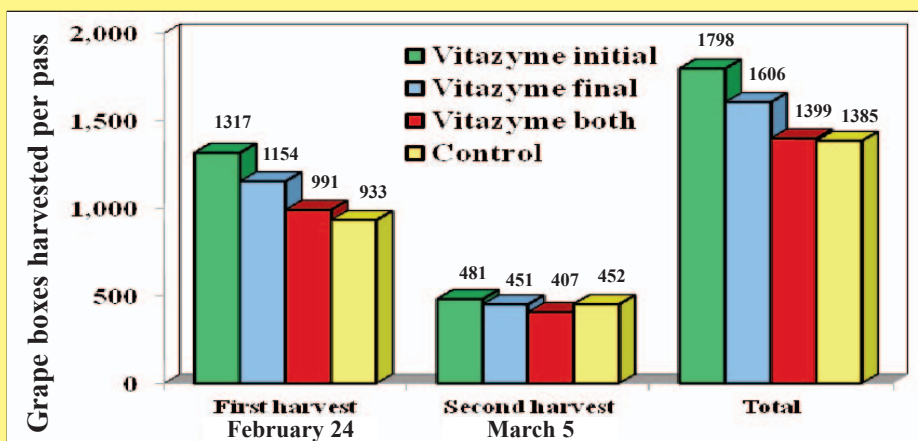
\*The "Inicial" and "Final" application times were not specified in the research document, but probably were "15 days before veraison" for "Initial", and "At veraison" for "Final."

Fertilization: as recommended

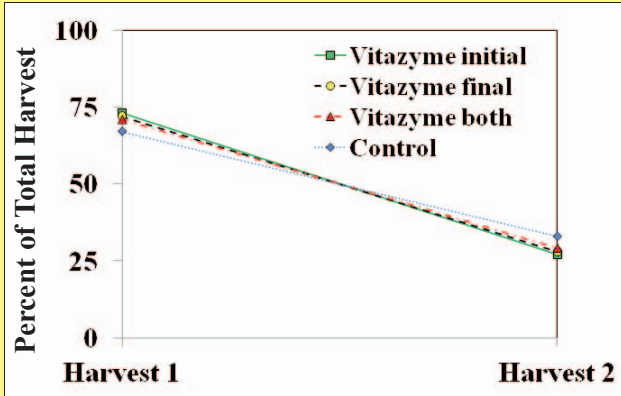
Vitazyme application: 1.5 liters/ha at the specified times in Treatments 1, 2, and 3

Grape yield results:

Treatment	Harvest 1	Percent	Harvest 2	Percent	Total
	boxes	%	boxes	%	boxes
1. Vitazyme (initial)	1,317	73	481	27	1,798 (+30%)
2. Vitazyme (final)	1,154	72	451	28	1,606 (+16%)
3. Vitazyme (both)	991	71	407	29	1,399 (+1%)
4. Control	933	67	452	33	1,385 ---



### Percent of Grapes Per Picking



### Percent of First Harvest Grapes

Vitazyme initial	73
Vitazyme final	72
Vitazyme both	71
Control	67

### Yield Increase With Vitazyme

Vitazyme initial	30%
Vitazyme final	16%
Vitazyme both	1%

**Conclusion:** In this Thompson Seedless grape trial in Chile, Vitazyme applied at the “initial” time caused a remarkable 30% yield increase, while marginally improving the maturity and coloration of the grapes, by 6% more than the control (73% vs. 67%) on February 24. The “final” Vitazyme treatment gave an excellent 16% yield increase on February 24, advancing fruit color development, while also improving the percentage of the initial picking by 5 percentage points more than the control. The Vitazyme applications did not improve the maturity and yield of the grapes by much, showing that, in this situation, only one application was required to achieve excellent early coloration and high final yield.

## Vital Earth Resources

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

# 2010 Crop Results

## Vitazyme on Grapes, Table

Grower: Felipe Guerra, Del Monte Fresh Produce

Researcher: Syngenta

Location: Region V, Chile (Metropolitana)

Variety: Flame Seedless Spacing: 3.5 x 1.75 meters

Sprayer: ESS, 75 liters/ha

Experimental design: A vineyard of Flame Seedless grapes for fresh market was treated with Vitazyme in two areas; the other areas received conventional programs. The purpose of the trial was to evaluate the effect of the treatments on color and quality parameters of the grapes, as well as the time to maturity of the harvested fruit relative to exportation requirements.

Treatment	Application rate		Application time	
	liters/ha	15 days before verison	At verison	
1. Ethrel	0.5	0	X	
2. Vitazyme	2.0	X	X	
3. Control	2.0	0	0	

Fertilization: as recommended

Vitazyme application: 2.0 liters/ha each time for Treatment 2

Ethrel application: 0.5 liters/ha for Treatment 1

Grape quality results: Brix results are at harvest.

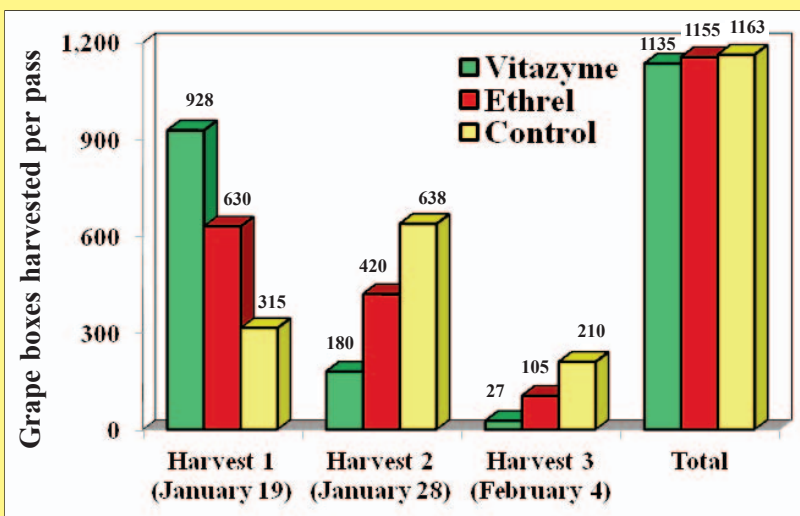
Treatment	Brix values
Ethrel and Control	15.5 to 16.5 (x=16.00)
Vitazyme	16.5 to 18.0 (x=17.25)

**Increase in Brix with Vitazyme**

**Average of 1.25 Brix**

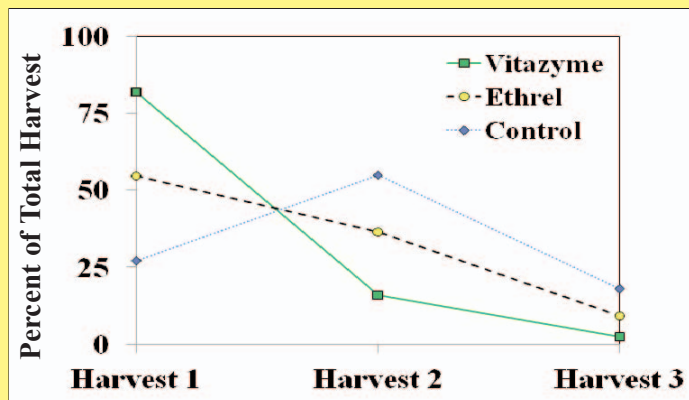
Splitting of the grapes was less with the Vitazyme treatment than with the other two.

Grape harvest results: Grapes were harvested when the color was acceptable for table use, meaning they had achieved a red color. Three harvests were recorded.



Treatment	Harvest 1	Percent	Harvest 2	Percent	Harvest 3	Percent	Total
	boxes	%	boxes	%	boxes	%	boxes
2. Vitazyme	928	81.8	180	15.9	27	2.3	1135
1. Ethrel	630	54.5	420	36.4	105	9.1	1155
3. Control	315	27.1	638	54.9	210	18.0	1163

### Percent of Grapes Per Picking



### Percent of First Harvest Grapes

Vitazyme .....	81.8
Ethrel .....	54.5
Control .....	27.1

**Conclusion:** This Flame Seedless table grape study in Chile revealed that Vitazyme greatly increased the percentage of grapes harvested on the January, 2010, first harvest; the percentages of Ethrel and untreated grapes harvested on the first harvest were 54.5 and 27.1%, respectively, while the Vitazyme treatment produced 81.8% of the yield for the first harvest. The product greatly advanced coloration of the skins. This early maturity with Vitazyme markedly improved the income of the farmer by allowing him to market more grapes earlier, to reach the more lucrative early market. Besides, the Vitazyme treated grapes had more sugar — thus tasted better — and there were fewer split grapes with the treatment. Ethrel was the second best treatment in terms of earlier maturity, followed by the control. The total harvest was about the same for all three treatments.



**Vital Earth Resources**

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

**2010 Crop Results**

**Vitazyme on Grapes, Table**

Grower: Prohens

Researcher: Syngenta

Location: Apacheta, Copiapo, Chile

Variety: Flame Seedless

Experimental design: A grape vineyard was separated into two Vitazyme treatments with Ethrel, and Ethrel alone, to evaluate the effect of the products and combinations on sugar content, berry size, yield, and maturity of the crop.

Treatment	Vitazyme applications		Ethrel*
	15 days before veraison	At veraison	
	----- liters/ha -----		
1, Vitazyme + Ethrel	1.5	1.5	0.7
2, Vitazyme + Ethrel	2.0	2.0	0.7
3, Ethrel only	0	0	0.7

\*Applied 15 days before coloration.

Fertilization: as recommended

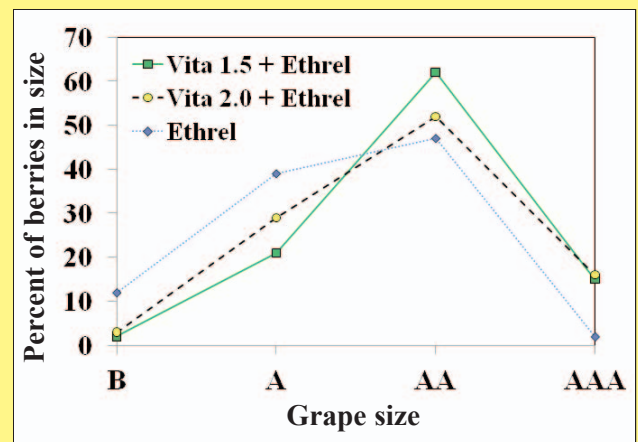
Vitazyme application: 1.5 liters/ha twice for Treatment 1, and 2.0 liters/ha twice for Treatment 2

Grape sugar results: Five dates were selected to determine grape sugar: November 19 and 26, and December 3, 10, and 17, 2009. There were no major differences in Brix for the three treatments during the one-month period, as the sugar for all three increased from about 13.5 to 14.0, 15.0, 16.1, and 17.1 brix.

Grape size results: The size of the grapes was measured near harvest.

Treatment	Grape size*			
	B	A	AA	AAA
	----- % of berries -----			
1. Vita (1.5 L/ha) + Ethrel	2	21	62	15
2. Vita (2.0 L/ha) + Ethrel	3	29	52	16
3. Ethrel	12	39	47	2

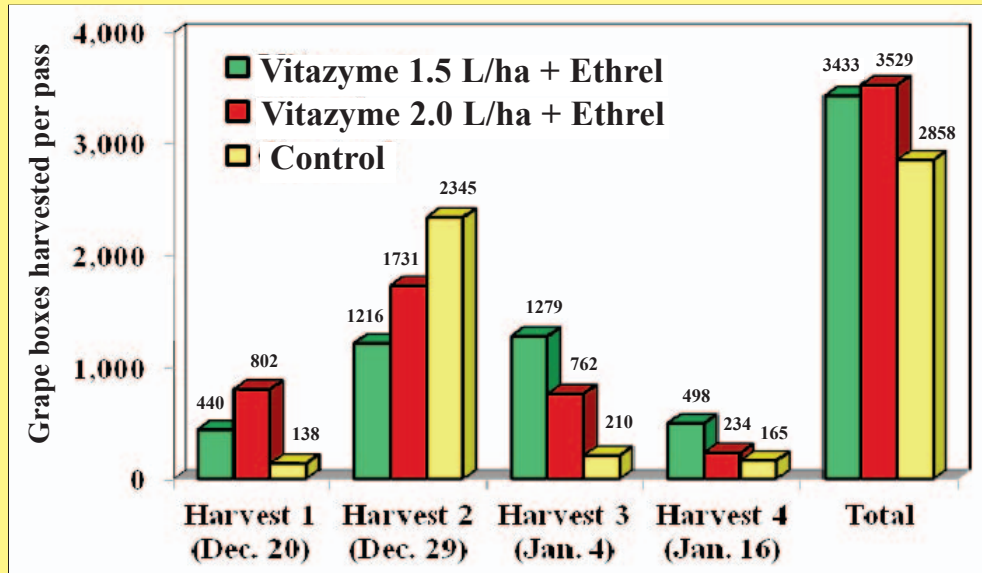
\*B=16.0 to 17.5 mm; A=17.5 to 19.0 mm; AA=19 to 21 mm; AAA>21 mm.



Grape size	
<b>Size AA</b>	
Vita 1.5 + Ethrel .....	<b>62%</b>
Vita 2.0 + Ethrel .....	<b>52%</b>
<b>Size AAA</b>	
Vita 1.5 + Ethrel .....	<b>15%</b>
Vita 2.0 + Ethrel .....	<b>16%</b>

*Yield results:* Four harvests were made, on December 20 and 29, 2009, and on January 4 and 16, 2010.

Treatment	Picking yields								Total	Change
	Dec. 20	%	Dec. 29	%	Jan. 4	%	Jan. 16	%		
	----- boxes/picking -----								----- total boxes -----	
1. Vita (1.5 L/ha) + Ethrel	440	+219	1,216	-48	1,279	+509	498	+202	3,433	575 (+20%)
2. Vita (2.0 L/ha) + Ethrel	802	+481	1,731	-26	762	+263	234	+42	3,529	671 (+23%)
3. Ethrel	138	---	2,345	---	210	---	165	---	2,858	---



*Conclusion:* This table grape study in Chile in 2009 and 2010 revealed that Vitazyme plus Ethrel proved to be superior to Ethrel treatment alone. Although grape sugar was not improved by Vitazyme, the AA size of the fruit was increased substantially by either the 1.5 liters/ha treatment twice (+62%), or by the 2.0 liters/ha treatment twice (+52%). Size AAA grapes were increased as well by both treatments, by 15% to 16%. Harvested yield was dramatically improved with Vitazyme, by 20% with the 1.5 liters/ha rate and by 23% with the 2.0 liters/ha rate. The early harvest percentage when Vitazyme was added with Ethrel was increased greatly as well by 440 to 802%. According to the researchers, “Vitazyme improved harvest of grapes 9 days earlier, and increased the boxes harvested per hectare. This was due to an early harvest of many boxes, and the treatment helped reduce the number of clusters that were not harvested.”

## Vital Earth Resources

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

# 2010 Crop Results

## Vitazyme on Lettuce

**Researcher:** Adoracion Torres-Guy      **Institution:** Soils and Agro-Ecosystem Division, Agricultural Systems Cluster, College of Agriculture, U.P. Los Banos

**Location:** Los Banos, Lagune, The Philippines

**Variety:** Grand Rapids

**Planting rate:** one seedling per hill

**Growth period:** wet season

**Seedling growth:** seeds planted in seed boxes, and transplanted at 15 days

**Plot size:** 5 m<sup>2</sup>

**Spacing:** 132 plants per plot, at 15 cm between hills and 20 cm between rows

**Experimental design:** A small plot replicated study (three reps) was set up to determine the effect of Vitazyme as a foliar treatment for lettuce, and to generate field data to register the product with the Fertilizer and Pesticide Authority in The Philippines. The plots were arranged in a randomized complete block design.

Treatment	Fertilizer	Vitazyme
1	0	0
2	100%	0
3	50%	0
4	0	Yes
5	50%	Yes
6	100%	Yes

**Fertilization:** 100% fertilizer: basal application per plot of 25 g of KCl (0-0-60% N-P<sub>2</sub>O<sub>5</sub>-K<sub>2</sub>O), 50 g of 16-20-0, and 60.6 g of 46-0-0, plus 85 g of 46-0-0 side-dressed 10 days after transplanting. 50% fertilizer: half of the foregoing applications

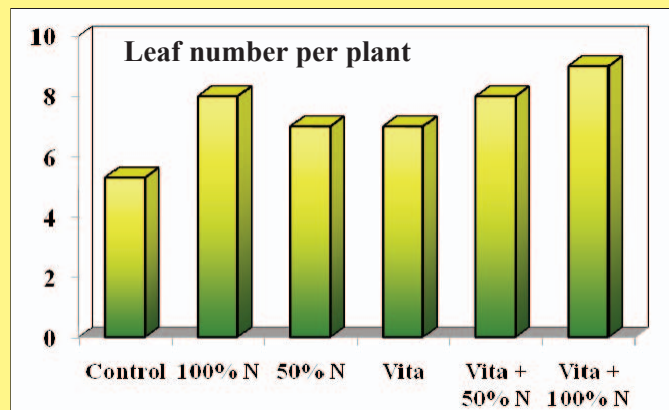
**Vitazyme application:** 1 liter/ha (13 oz/acre) sprayed on the leaves to the dripping point at 5, 10, and 15 days after transplanting

**Yield and growth results:** The lettuce was harvested 26 days after transplanting, at which time marketable yield, plant height, leaf number, and leaf width were determined. Ten representative plants from each plot were used for determining height, leaf number, and leaf width.

### Leaf Number

Treatment	Leaves*	Change
	number	number
1. Control	5.3 d	---
2. 100% N	8.0 b	2.7 (+51%)
3. 50% N	7.0 c	1.7 (+32%)
4. Vitazyme only	7.0 c	1.7 (+32%)
5. Vitazyme + 50% N	8.0 b	2.7 (+51%)
6. Vitazyme at 100% N	9.0 a	3.7 (+70%)

\*Means followed by the same letter are not significantly different at P=0.05. Fully expanded leaves were measured for 10 plants.



### Increase in leaf number

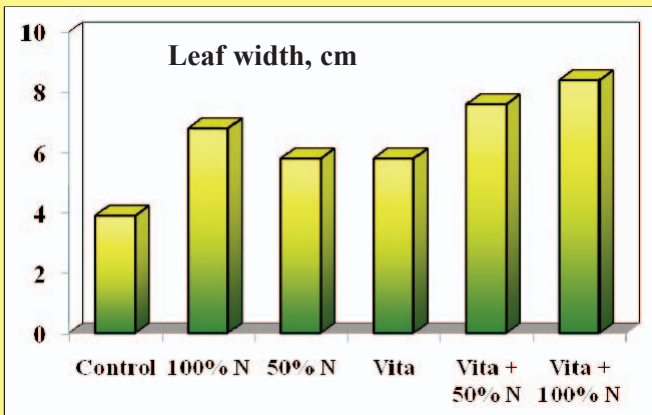
#### No Vitazyme

100% Nitrogen..... 51%  
 50% Nitrogen..... 32%

#### With Vitazyme

0% Nitrogen..... 32%  
 50% Nitrogen..... 51%  
 100% Nitrogen..... 70%

### Leaf Width



Treatment	Leaf width*	Change
	cm	cm
1. Control	3.9 e	---
2. 100% N	6.8 c	2.9 (+74%)
3. 50% N	5.8 d	1.9 (+49%)
4. Vitazyme only	5.8 d	1.9 (+49%)
5. Vitazyme + 50% N	7.6 b	3.7 (+95%)
6. Vitazyme at 100% N	8.4 a	4.5 (+115%)

\*Means followed by the same letter are not significantly different at P=0.05. The width of 10 fully expanded leaves per plot were measured.

### Increase in leaf width

#### No Vitazyme

100% Nitrogen..... 74%  
 50% Nitrogen..... 49%

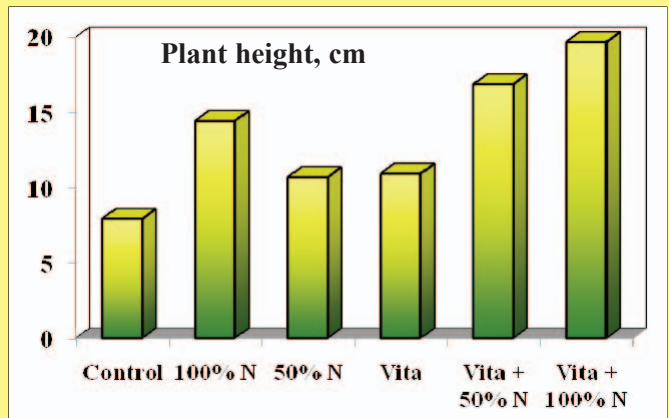
#### With Vitazyme

0% Nitrogen..... 49%  
 50% Nitrogen..... 95%  
 100% Nitrogen..... 115%

### Plant Height

Treatment	Height*	Change
	cm	cm
1. Control	7.93 c	---
2. 100% N	14.43 c	6.50 (+82%)
3. 50% N	10.70 d	2.77 (+35%)
4. Vitazyme only	10.93 d	3.00 (+38%)
5. Vitazyme + 50% N	16.87 b	8.94 (+113%)
6. Vitazyme at 100% N	19.67 a	11.74 (+148%)

\*Means followed by the same letter are not significantly different at P=0.05. The longest leaf was measured from the base to the leaf tip of 10 randomly selected plants of each plot.



### Increase in plant height

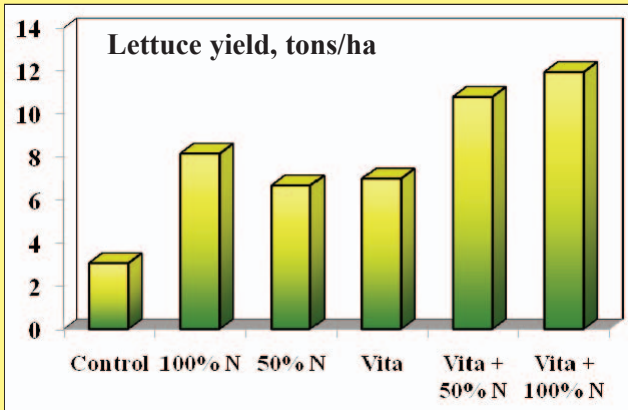
#### No Vitazyme

100% Nitrogen..... 82%  
 50% Nitrogen..... 35%

#### With Vitazyme

0% Nitrogen..... 38%  
 50% Nitrogen..... 113%  
 100% Nitrogen..... 148%

### Crop Yield



Treatment	Plot weight* grams/plot	Yield* tons/ha	Change tons/ha
1. Control	150.0 e	3.07 e	---
2. 100% N	369.3 c	8.16 c	5.09 (+166%)
3. 50% N	340.0 d	6.68 d	3.61 (+118%)
4. Vitazyme only	343.3 d	7.00 d	3.93 (+128%)
5. Vitazyme + 50% N	443.3 b	10.80 b	7.73 (+252%)
6. Vitazyme at 100% N	550.0 a	11.95 a	8.88 (+289%)

\*Means followed by the same letter are not significantly different at P=0.05.

### Increase in crop yield

#### No Vitazyme

100% Nitrogen..... 166%  
 50% Nitrogen..... 118%

#### With Vitazyme

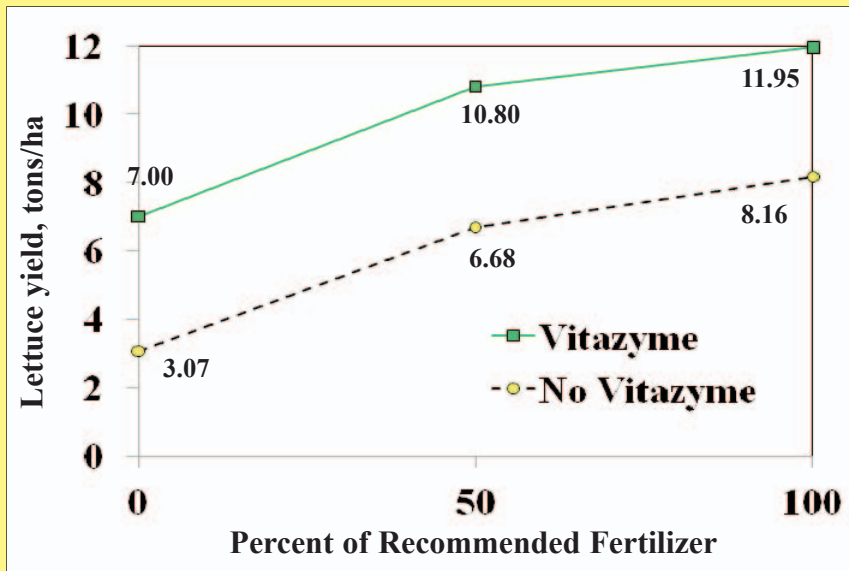
0% Nitrogen..... 128%  
 50% Nitrogen..... 252%  
 100% Nitrogen..... 289%

**Conclusion:** According to the official report on the Philippine lettuce study,

“The different treatments influenced significantly the plant height, number and width of leaves, weight of plant, and yield of lettuce at harvest. The recommended rate of Vitazyme increased significantly the number of leaves, but the increment was higher with the conventional fertilizer. All treatments increased all parameters significantly over the control. The performance of Vitazyme in combination with 50% of the recommended rate of conventional fertilizer was significantly better than the performance of either Vitazyme alone or 50% of the recommended rate of conventional fertilizer, indicating a positive interaction between Vitazyme and 50% of the recommended rate of conventional fertilizer.

A much better positive interaction was noted between Vitazyme alone and the recommended rate of conventional fertilizer. However, for economic reasons it would be better to recommend to the farmers a combination of the recommended rate of Vitazyme with 50% the recommended rate of conventional fertilizer. This approach will definitely result in much higher cost savings. The new product, Vitazyme, may qualify for provisional registration by the Fertilizer and Pesticide Authority as long as it is applied together with conventional fertilizer at 50% of the recommended rate.”

## Note the improvement in nitrogen utilization with Vitazyme.



- *No added fertilizer* plus Vitazyme yielded 3.93 tons/ha (28%) more than no fertilizer alone.
- *With 50% added fertilizer*, Vitazyme increased the yield by 4.12 tons/ha (62%) more than 50% fertilizer alone.
- *With 100% added fertilizer*, Vitazyme increased lettuce yield by 3.79 tons/ha (46%) more than 100% fertilizer alone.

Note also that Vitazyme with no fertilizer added exceeded the 50% fertilizer rate without Vitazyme by 0.32 tons/ha (5%), while the 50% fertilizer rate plus Vitazyme exceeded the 100% fertilizer rate without Vitazyme by 2.64 tons/ha (32%), showing a great nitrogen efficiency improvement with this product.



## Vital Earth Resources

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

# 2010 Crop Results

## Vitazyme on Chinese Mustard

Researcher: unknown

Location: Hoc Mon District, Ho Chi Minh City, Viet Nam

Variety: Chinese mustard (*Brassica juncea*)

Planting date: July 25, 2010

Preseeding treatment: seeds mixed with dry soil

Experimental design: A field of Chinese mustard was divided into the usual farmer practice and a Vitazyme treated area. The test had three replications, with 30m<sup>2</sup> per plot, in an effort to evaluate the effect of this product on crop growth..

### 1. Control (farmer normal practice)

### 2. Vitazyme

Fertilization: For 30 m<sup>2</sup>, 48 kg of chicken manure, 2 kg of “thermophosphate”, and 2 kg of organic fertilizer mixed with N-P<sub>2</sub>O<sub>5</sub>-K<sub>2</sub>O fertilizer.

Vitazyme application: (1) Seeds were mixed with a 10% Vitazyme solution until wet, then dried, and repeated twice more; (2) soil and leaf spray of 3 ml of Vitazyme in 3 liters of water for 30 m<sup>2</sup>, seven days after planting; (3) leaf spray of 3 ml of Vitazyme in 3 liters of water for 30 m<sup>2</sup>, 14 days after planting.

Time to harvest results: The Vitazyme treated mustard was harvested two days earlier than the untreated plots.

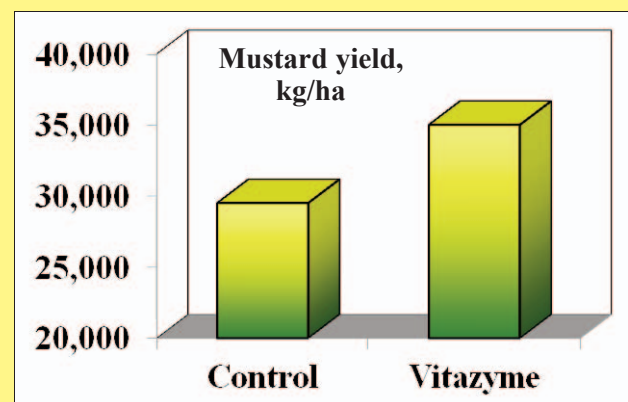
Treatment	Harvest date	Days after planting
Control	August 22,2010	28 days
Vitazyme	August 20,2010	26 days

**Reduced time to harvest  
with Vitazyme: 2 days**

Yield results:

Treatment	Yield kg/30m <sup>2</sup>	Yield kg/ha	Change kg/ha
1. Control	88.5	29,500	---
2. Vitazyme	105.0	35,000	5,500 (+19%)

**Yield increase with Vitazyme: 19%**



Conclusion: This Chinese mustard trial in VietNam

proved that Vitazyme, applied on the seeds and two times later during growth, reduced the time to harvest by two days and increased mustard yield by 19%. This improvement in crop maturity and yield is highly attractive for increasing productivity and profits for Vietnamese farmers.



**Vital Earth Resources**

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

**2010 Crop Results**

# Vitazyme on Chinese Mustard

Researcher: unknown

Location: Hoc Mon District, Ho Chi Minh City, Viet Nam

Variety: Chinese mustard (*Brassica juncea*)

Planting date: December, 2009

Preseeding treatment: seeds mixed with dry soil

Experimental design: A field of Chinese mustard was divided into the usual farmer practice and a Vitazyme treated area. The test had three replications, with 30m<sup>2</sup> per plot, in an effort to evaluate the effect of this product on crop growth..

**1. Control (farmer normal practice)**

**2. Vitazyme**

Fertilization: For 30 m<sup>2</sup>, 48 kg of chicken manure, 2 kg of “thermophosphate”, and 2 kg of organic fertilizer mixed with N-P<sub>2</sub>O<sub>5</sub>-K<sub>2</sub>O fertilizer.

Vitazyme application: (1) A spray of Vitazyme on the soil and leaves at 3 ml in 3 liters of water, at 7 days after planting; (2) foliar spray of 3 ml in 3 liters of water, at 21 days after planting.

Time to harvest results: The Vitazyme treated mustard was harvested 1 to 3 days earlier than the untreated plots.

**Reduced time to harvest with Vitazyme: 1 to 3 days**

Yield results: The original plot data was lost, but the increase in yield was 7,000 kg/ha.

**Yield increase with Vitazyme: 7,000 kg/ha**

Conclusion: This Viet Nam test with Vitazyme, during the wet season, revealed that the product, when applied three times during the growth cycle, increased yield by 7,000 kg/ha. The farmers who observed this study also noted the following:

- **Vitazyme treated plants had more chlorophyll in the leaves.**
- **Vitazyme treated plants were stronger.**
- **Treated plants matured 1 to 3 days before the control plants.**
- **The product may have been more effective during the wet season than the dry season, making fertilizer more effective while some of the fertilizer was lost due to leaching or denitrification.**

*Vital Earth Resources*

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

**2010 Crop Results**

**Vitazyme on Oil Palm**  
*A Testimonial*

MARIA PIEDAD ESTATE  
MP1 Oil Palm, Fattening Cattle - Matamba  
MP2 Maracuyá – Monterrey

Santo Domingo, February 16, 2010

Gentlemen  
Summer Zone  
Quito, Ecuador

From my consideration:

For your knowledge I submit the results obtained after the applications made with the following products: Pacha Mama, Novaplex, Nitro30, Caltec, TKO, Vitazyme, Essential, and Companion in the conditions, regulations and amounts agreed for the oil palm and passion fruit crops, during the period Feb-2008 and Feb-2010.

**Oil Palm:**

The immediate result was that the plants visually changed in a positive way in about 5 weeks, especially their color, from a light yellowish green to a dark, glossy green. The long-term result has been sustained color and a 20% increase in production. Plants show significant energy.

The soil has maintained a stable level of elements, the natural balance of micro-organisms and bacteria has allowed an almost total reduction of insecticides, the pH has remained stable and has improved to a very efficient level of 6.3. Chemical fertilization has not been necessary.

The use of these products is positive; for the production, the economic part, but above all the recovery of the soil to a more friendly and natural state with the environment.

Sincerely, Rodrigo H. Yépez, Proprietor

*Vital Earth Resources*

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

**2010 Crop Results**

**Vitazyme on Oil Palm**  
*A Testimonial*

MARIA PIEDAD ESTATE  
MP1 Oil Palm, Fattening Cattle - Matamba  
MP2 Maracuyá – Monterrey

Santo Domingo, February 16, 2010

Gentlemen  
Summer Zone  
Quito, Ecuador

From my consideration:

For your knowledge I submit the results obtained after the applications made with the following products: Pacha Mama, Novaplex, Nitro30, Caltec, TKO, Vitazyme, Essential, and Companion in the conditions, regulations and amounts agreed for the oil palm and passion fruit crops, during the period Feb-2008 and Feb-2010.

**Passion fruit:**

The results here have been similar to that of oil palm, further emphasizing that it is more immediate and noticeable, because the vegetation is denser and therefore more physically verifiable. The production in this crop increased by 30%, but the useful life of the plants increased by about six months.

The use of these products is positive; for the production, the economic part, but above all the recovery of the soil to a more friendly and natural state with the environment.

Sincerely,  
Rodrigo H. Yépez, Proprietor

## Vital Earth Resources

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

# 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

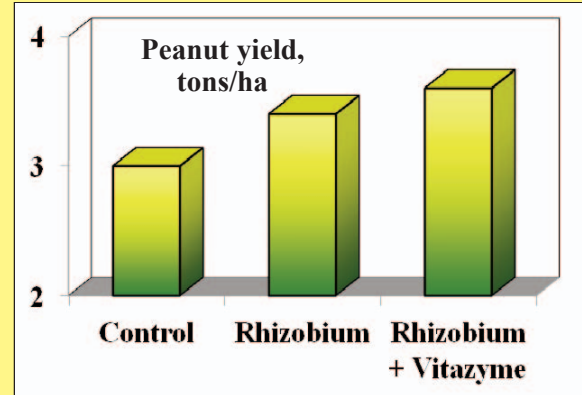
Germination results: Vitazyme accelerated germination by 1 to 2 days.

**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.

## Vital Earth Resources

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

# 2010 Crop Results

## Vitazyme on Potatoes

Researcher: V. V. Plotnikov

Research organization: National Academy of Agrarian Sciences

Location: Vinnytsia State Agricultural Research Station, Vinnytsia, Ukraine (Central Forest and Steppe Region)

Variety: Fantaziya Elite

Soil type: gray podzolic (organic matter = 2.2%, hydrolyzed N = 8.4 mg/100 g soil, P = 15.8 mg/100 g soil, exchangeable K = 12.4 mg/100 g soil, pH = 5.5)

Previous crop: spring barley

Planting date: May 12, 2010

Planting rate: 2.8 tons/ha

Soil preparation: disking to 6 to 8 cm, tillage to 22 cm, cultivation to 10 to 12 cm

Experimental design: A potato plot area was divided into four replicates with a control and two Vitazyme treatments, with the objectives of determining the effects of the product on potato tuber yield.

**1. Control**

**2. Vitazyme after emergence**

**3. Vitazyme after emergence and at flowering**

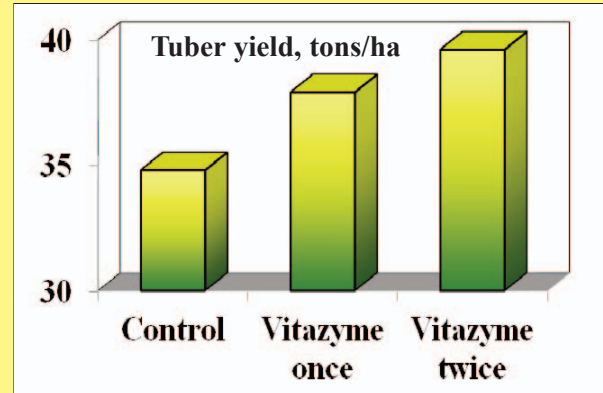
Fertilization: 120-60-60 kg/ha of N-P<sub>2</sub>O<sub>5</sub>-K<sub>2</sub>O, incorporated before planting

Vitazyme application: Treatments 2 and 3, 1 liter/ha on the young plants and soil on June 17; Treatment 3, 1 liter/ha on the leaves and soil at flowering on July 5

Yield results:

Treatment	Yield tons/ha	Yield change tons/ha
1. Control	34.8	---
2. Vitazyme, once	37.9	3.1 (+9%)
3. Vitazyme, twice	39.6	4.8 (+14%)

**Yield increase with Vitazyme:  
9 to 14%**



Income results: The result of an early application was a 7,550 hrn/ha income increase, whereas two applications increased income by 11,600 hrn/ha.

Conclusion: The yield and income for potatoes in this Ukrainian replicated potato trial increased substantially. For a single 1 liter/ha Vitazyme application not long after emergence, yield increased by 3.1 tons/ha (9%), and income by 7,550 hrn/ha, while with an additional 1 liter/ha application at bloom the yield jumped by 4.8 tons/ha (14%) above the control. Income increased by 11,600 hrn/ha for two applications. The Vitazyme program works very well for potatoes in Ukraine.

## Vital Earth Resources

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

# 2010 Crop Results

## Vitazyme on Pumpkins

Researcher: V. V. Plotnikov

Research organization: National Academy of Agrarian Sciences

Location: Vinnytsia State Agricultural Research Station, Vinnytsia, Ukraine (Central Forest and Steppe Region)

Variety: unknown

Soil type: gray podzolic (organic matter = 2.2%, hydrolyzed N = 8.4 mg/100 g soil, P = 15.8 mg/100 g soil, exchangeable K = 12.4 mg/100 g soil, pH = 5.5)

Previous crop: spring barley

Planting date: May 15, 2010

Planting rate: 5 kg/ha

Soil preparation: disking to 6 to 8 cm, tillage to 22 cm, cultivation to 5 to 6 cm

Experimental design: Pumpkins were planted in a plot area that was divided into four replicates, with a control and one Vitazyme treatment, with the objective of determining the effects of the product on yield.

### 1. Control

### 2. Vitazyme at early flowering

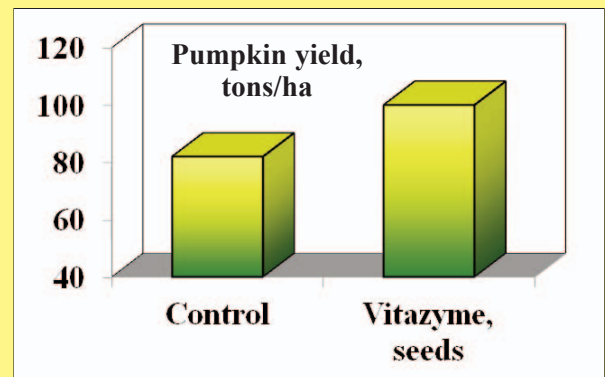
Fertilization: 45-45-45 kg/ha N-P<sub>2</sub>O<sub>5</sub>-K<sub>2</sub>O, incorporated before planting

Vitazyme application: 1 liter/ha to the leaves and soil at early flowering, on July 9

Yield results:

Treatment	Yield tons/ha	Yield change tons/ha
1. Control	82	---
2. Vitazyme, seeds	100	18 (+22%)

**Yield increase with Vitazyme:  
22%**



Conclusion: A pumpkin trial in Ukraine showed that Vitazyme, applied once at early bloom, increased the tonnage of pumpkins by 18 tons/ha (22%) above the untreated control. This was a great increase in yield, and it shows the great utility of this product for pumpkin producers.

## Vital Earth Resources

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

# 2010 Crop Results

## Vitazyme on Soybeans

Researcher: V. V. Plotnikov

Research organization: National Academy of Agrarian Sciences

Location: Vinnytsia State Agricultural Research Station, Vinnytsia, Ukraine (Central Forest and Steppe Region)

Variety: Vinnychanka

Soil type: gray podzolic (organic matter = 2.2%, hydrolyzed N = 8.4 mg/100 g soil, P = 15.8 mg/100 g soil, exchangeable K = 12.4 mg/100 g soil, pH = 5.5)

Previous crop: winter wheat

Planting date: April 30, 2010

Planting rate: 0.8 million seeds/ha

Soil preparation: disking to 6 to 8 cm, tillage to 22 cm, cultivation to 5 to 6 cm

Experimental design: A soybean plot area was divided into four replicates with a control and two Vitazyme treatments, with the objective of determining the effects of the product on soybean yield.

**1. Control**

**2. Vitazyme on seeds**

**3. Vitazyme on seeds and leaves**

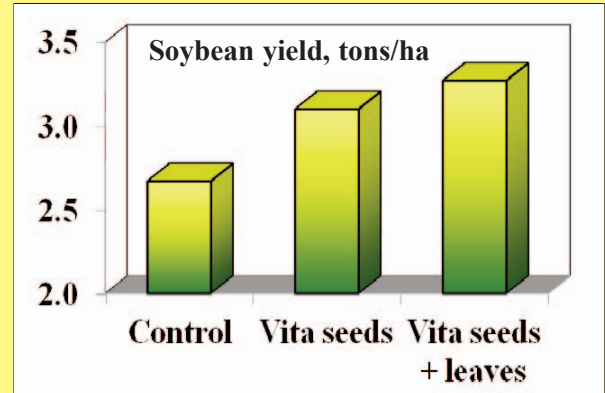
Fertilization: 45-30-30 kg/ha of N-P<sub>2</sub>O<sub>5</sub>-K<sub>2</sub>O, incorporated before planting

Vitazyme application: Treatments 2 and 3, 1 liter/ha on the seeds at planting on April 30; Treatment 3, 1 liter/ha on the leaves and soil at early bloom on June 9

Yield results:

Treatment	Yield tons/ha	Yield change tons/ha
1. Control	2.67	---
2. Vitazyme, seeds	3.10	0.43 (+16%)
3. Vitazyme, seeds + leaves	3.27	0.60 (+23%)

**Yield increase with Vitazyme:  
16 to 23%**



Income results: A single treatment on the soybean seeds produced 1,346 hrn/ha more income, while a seed plus foliar and soil treatment increased income by 1,700 hrn/ha.

Conclusion: A Ukrainian soybean study revealed that Vitazyme, applied on the seeds at 1 liter/ha at planting, increased yield by 16% (0.43 ton/ha). A seed plus foliar treatment at 1 liter/ha at early bloom increased yield by 23% (0.60 ton/ha). Both treatments were highly profitable, increasing income by 1,356 to 1,700 hrn/ha, showing the great utility of this agricultural program for soybeans in Ukraine.



## Vital Earth Resources

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

# 2010 Crop Results

## Vitazyme on Sugar Beets

Researcher: Unknown

Company testing: Astarta

Location: Khmilnyk raion, Vinnytsia oblast, Zhdanivka, Ukraine

Variety: Ukrainian ChS-70

Planting date: April 20, 2010

Planting rate: 150,000 seeds/ha

Seedbed preparation: disking 6 to 8 cm deep and tilling 25 to 27 cm deep in the fall, and harrowing twice at 3 to 4 cm deep in the spring

Previous crop: winter wheat

Experimental design: A sugar beet field was divided into three treatments, two of which were Vitazyme treatments, in an effort to evaluate the product's effects on beet yield and sugar yield.

### 1. Control

### 2. Vitazyme once

### 3. Vitazyme twice

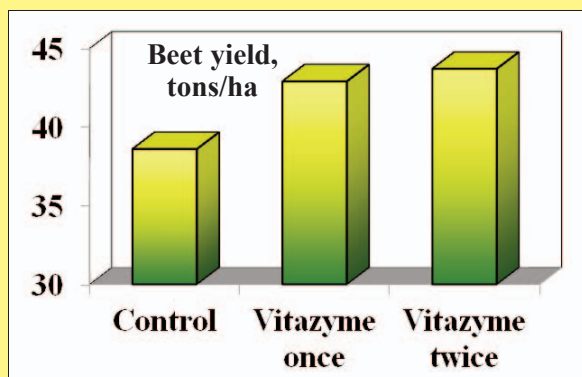
Fertilization: 45 kg/ha P<sub>2</sub>O<sub>5</sub> and 45 kg/ha K<sub>2</sub>O in the fall, and 100 kg/ha N in the spring

Vitazyme applications: Treatments 2 and 3 both received 1 liter/ha sprayed on the leaves and soil on June 20, and Treatment 3 received an additional 2 liter/ha on July 10, 2010.

Yield results:

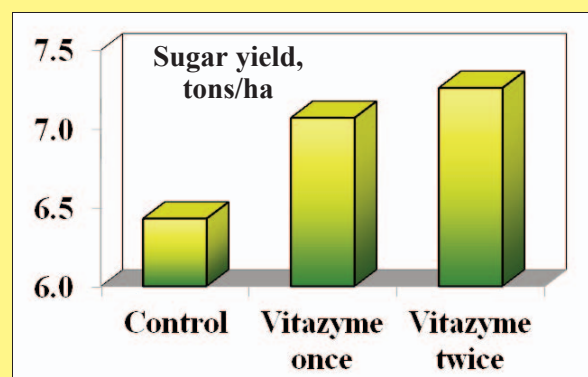
Treatment	Beet yield tons/ha	Change tons/ha	Sugar content %	Sugar yield tons/ha	Change tons/ha
1. Control	38.6	---	16.6	6.43	---
2. Vitazyme once	42.9	4.3 (+11%)	16.5	7.07	0.64 (+10%)
3. Vitazyme twice	43.7	5.1 (+13%)	16.6	7.26	0.83 (+13%)

### Beet Yield



Increase in beet yield with  
Vitazyme: 11 to 13%

### Sugar Yield



Increase in sugar yield with  
Vitazyme: 10 to 13%

Sugar content results: All three treatments produced nearly the same sugar content.

*Income results:* The single Vitazyme application increased income by 1,305 hrn/ha, while two applications improved income by 1,385 hrn/ha.

*Conclusion:* This sugar trial, conducted by Astarta in Ukraine, showed excellent beet and sugar yield increases with Vitazyme: 11 to 13% for beet yield, and 10 to 13% for sugar yield. The sugar content of the beets did not drop below the control for both Vitazyme treatments, despite big yield increases, and the income increased noticeably. These results show the great value of using Vitazyme for sugar beet production in Ukraine.

**Vital Earth Resources**

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

**2010 Crop Results**

**Vitazyme on Sugar Beets**

Researcher: N. M. Domanov, Ph.D.    Location: Plant Protection Laboratory, Russian Academy of Agricultural Sciences, Belgorod Agricultural Research Institute, Belgorod, Russia    Variety: Lgovska one-seeded 52  
Planting date: April 26, 2010    Disease resistance: moderate    Previous crop: winter wheat  
Soil type: Chernozem (4.4% organic matter, CEC = 36.8 meq/100 g, hydrolytic soil acidity = 1.6 - 2.0 mg/100 g, pH = 5.8, exchangeable P<sub>2</sub>O<sub>5</sub> = 26 mg/100 g, exchangeable K<sub>2</sub>O = 126 mg/100 g)  
Experimental design: A replicated field trial with sugar beets was conducted with four replicates and five treatments to determine the effect of Vitazyme on sugar beet growth and sugar yield. Plots were 100 m<sup>2</sup>.

Treatment	Procedures
1	Control: no treatment
2	Standard: Epin-Extra preplant seed treatment (4 ml/ton in 10 liters of water/ton) Foliar spray at 2 to 3 full leaves (40 ml/ha in 250 liters of water/ha)
3	Vitazyme on leaves at 2 to 3 leaves, and at 6 to 8 leaves (0.1 liter/ha in 250 liters of water/ha)
4	Vitazyme on leaves at 2 to 3 leaves, and at 6 to 8 leaves (0.5 liter/ha in 250 liters of water/ha)
5	Vitazyme on leaves at 2 to 3 leaves, and at 6 to 8 leaves (1.0 liter/ha in 250 liters of water/ha)

Fertilization: 16-16-16% N-P<sub>2</sub>O<sub>5</sub>-K<sub>2</sub>O (rate unknown)

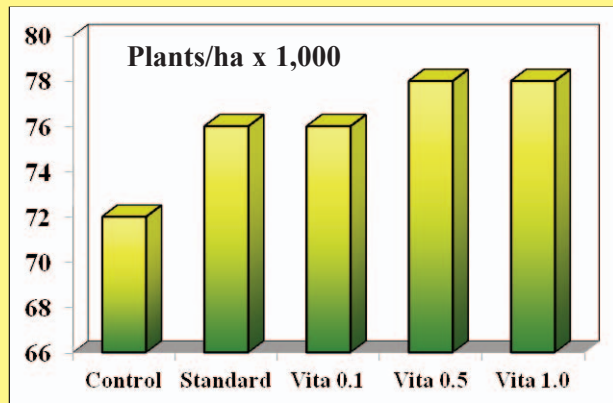
Vitazyme application: 0.1, 0.5. or 1.0 liter/ha applications to the leaves at 2 to 3 leaves, and at 6 to 8 leaves  
Growing conditions: Growth of the beets was affected by very warm temperatures throughout the main growing season — from 5 to 7° C above normal from April through July — and by well-below-normal precipitation. The March through July rainfall was only 116 mm, or 45.5% of normal; these rains were also irregular.

Growth stages:

- Planting ..... April 26**
- Germination ..... May 23 - 25**
- First pair of the true leaves ..... June 1 - 3**
- Third pair of true leaves ..... June 7 - 10**
- Closing in rows ..... July 14 - 16**
- Closing between rows ..... July 28 - 30**
- Harvest ..... September 20**

**Plant density:** Just before harvest, a population count was made.

Treatment	Plant density	Change
	1,000/ha	1,000/ha
1. Control	72	---
2. Standard	76	4 (+6%)
3. Vita 0.1 L/ha	76	4 (+6%)
4. Vita 0.5 L/ha	78	6 (+8%)
5. Vita 1.0 L/ha	78	6 (+8%)



**increase in plant density with Vitazyme: 6 to 8%**

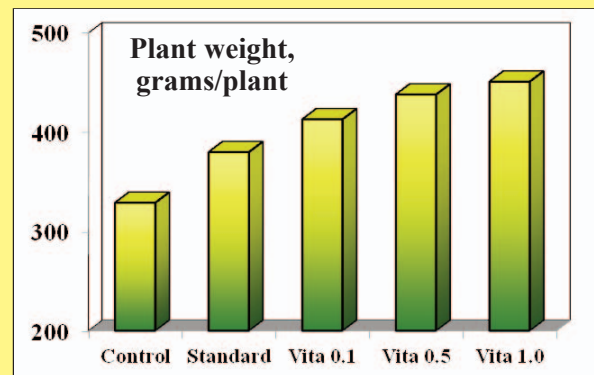
The highly abnormal weather — dry and warm — caused great stress on the beets, resulting in considerably fewer plants for the untreated control. **Vitazyme reduced the stress of Treatments 3, 4, and 5, which was evident 5 to 6 days after treatment. The treated plants were noted to have improved foliar development and less wilting from the hot, dry conditions.** Some days reached 35 to 38° C.

**Plant weight:** An average weight of roots, leaves, and total plants was determined for each plot.

Treatment	Root wt	Change	Leaf wt	Change	Total wt	Change	Leaves + Root ratio
----- grams -----							
1. Control	242	---	97	---	339	---	0.4
2. Standard	253	11 (+5%)	127	30 (+31%)	380	41 (+12%)	0.5
3. Vita 0.1 L/ha	258	16 (+7%)	155	58 (+60%)	413	74 (+22%)	0.6
4. Vita 0.5 L/ha	274	32 (+13%)	164	67 (+69%)	438	99 (+29%)	0.6
5. Vita 1.0 L/ha	282	40 (+17%)	169	72 (+74%)	451	112 (+33%)	0.6

**Increase in plant weight with Vitazyme**

	Roots	Leaves	Total
0.1 liter/ha	7%	60%	22%
0.5 liter/ha	13%	69%	29%
1.0 liter/ha	17%	74%	33%



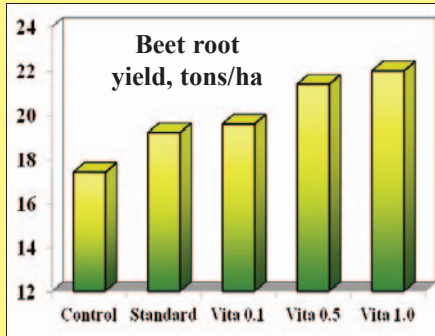
**Yield results:**

Treatment	Root yield*	Change	Sugar content	Change	Sugar yield*	Change
	tons/ha	tons/ha	%	%-points	tons/ha	tons/ha
1. Control	17.4 c	---	17.8	---	3.1 c	---
2. Standard	19.2 b	1.8 (+10%)	18.1	0.3	3.5 b	0.4 (+13%)
3. Vita 0.1 L/ha	19.6 b	2.2 (+13%)	18.4	0.6	3.6 b	0.5 (+16%)
4. Vita 0.5 L/ha	21.4 a	4.0 (+23%)	18.6	0.8	4.0 a	0.9 (+29%)
5. Vita 1.0 L/ha	22.0 a	4.6 (+26%)	18.6	0.8	4.1 a	1.0 (+32%)

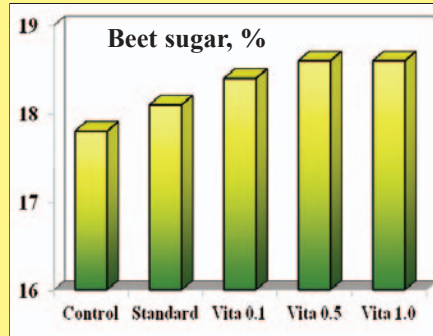
\*Means followed by the same letter are not significantly different at P=0.05.

LSD<sub>0.05</sub>=1.4 tons/ha.

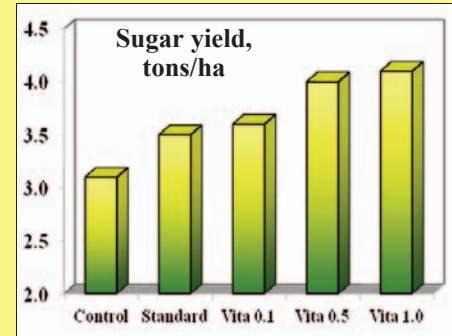
### Beet Yield



### Sugar Content



### Sugar Yield



#### Increase in beet yield with Vitazyme

0.1 liter/ha	13%
0.5 liter/ha	23%
1.0 liter/ha	26%

#### Increase in sugar content with Vitazyme

0.1 liter/ha	0.6%-pt
0.5 liter/ha	0.8%-pt
1.0 liter/ha	0.8%-pt

#### Increase in sugar yield with Vitazyme

0.1 liter/ha	16%
0.5 liter/ha	29%
1.0 liter/ha	32%

**Conclusion:** This sugar beet study in Russia, conducted during a very stressful year with high temperatures and low rainfall, revealed that under such stress Vitazyme treatments, applied twice (at 2 to 3 leaves and at 6 to 8 leaves), far exceeded the control for all parameters measured, and also exceeded the standard treatment using Epin-Extra. Vitazyme increased plant survival through stressful weather by 4,000 to 6,000 plants/ha (6 to 8%), while increasing plant weight by 22 to 33%; the leaf plus root ratios were also increased by 0.2 over the control treatment. Yield from Vitazyme application showed a significant increase of from 13 to 26%, the size of increase following the Vitazyme application rate increase. The standard Epin-Extra yield was 10% greater than the control. Sugar content of the beets was boosted by 0.6 to 0.8 percentage points with Vitazyme, with a final sugar yield increase of from 16 to 32%. Only the 0.1% Vitazyme rate was significantly equal to the Epin-Extra treatment in terms of final sugar yield. These results prove the great utility of using Vitazyme for sugar beet production in Russia.

## Vital Earth Resources

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

# 2010 Crop Results

## Vitazyme on Sugar Beets

Researcher: V. V. Plotnikov Location: National Academy of Agrarian Sciences, Vinnytsia State Agricultural Research Station, Vinnytsia, Ukraine (Central Forest and Steppe Region)

Varieties: Olexandria, Lenora, Merak Soil type: gray podzolic (organic matter = 2.2%, hydrolyzed N = 8.4 mg/100 g soil, P = 15.8 mg/100 g soil, exchangeable K = 12.4 mg/100 g soil, pH = 5.5)

Previous crop: spring vetch Planting date: April 24, 2010 Planting rate: 100,000 seeds/ha

Soil preparation: disking to 6 to 8 cm, tillage to 25 to 27 cm, cultivation twice to 3 to 4 cm

Experimental design: A plot area of sugar beets was sown to three varieties, using four replications, and two Vitazyme treatments for each variety. Each variety also had its own untreated control. The purpose of the study was to determine the effect of the product on beet yield, sugar content, and sugar yield.

### 1. Control

### 2. Vitazyme

Fertilization: 45 kg/ha P<sub>2</sub>O<sub>5</sub>, and 45 kg/ha K<sub>2</sub>O applied in the fall, and 80 kg/ha of N applied and incorporated in the spring before planting

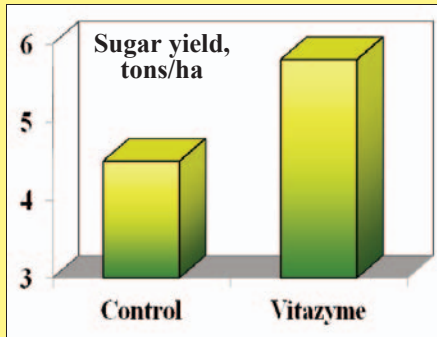
Vitazyme application: (1) 1 liter/ha on the leaves and soil on June 17, 2010; (2) 1 liter/ha on the leaves and soil on July 9, 2010

Yield and sugar results:

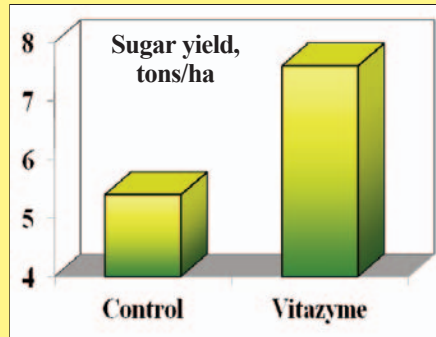
Treatment	Beet yield tons/ha	Yield change tons/ha	Sugar content %	Content change %-points	Sugar yield tons/ha	Yield change tons/ha
<b>Olexandria</b>						
1. Control	31.2	---	14.4	---	4.5	---
2. Vitazyme	38.8	7.6 (+24%)	15.0	+0.6	5.8	1.3 (+29%)
<b>Lenora</b>						
1. Control	38.9	---	14.0	---	5.4	---
2. Vitazyme	52.7	13.8 (+36%)	14.5	+0.5	7.6	2.2 (+41%)
<b>Merak</b>						
1. Control	39.3	---	14.2	---	5.6	---
2. Vitazyme	48.5	9.2 (+23%)	15.2	+1.0	7.4	1.8 (+32%)

## Sugar Yield

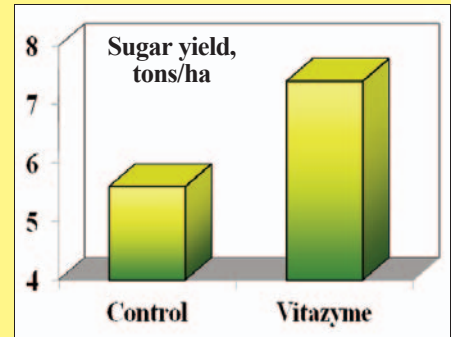
### Olexandria



### Lenora



### Merak



### Increases with Vitazyme

	<u>Beet yield</u>	<u>Sugar content</u>	<u>Sugar yield</u>
<b>Olexandria</b>	<b>24%</b>	<b>0.6 %-point</b>	<b>29%</b>
<b>Lemora</b>	<b>36%</b>	<b>0.5 %-point</b>	<b>41%</b>
<b>Merak</b>	<b>23%</b>	<b>1.0 %-point</b>	<b>32%</b>

**Income increase:** The added income from Vitazyme application was significant for all three varieties: 2,093 hrn/ha for Olexandria, 4,388 hrn/ha for Lenora, and 3,054 hrn/ha for Merak.

**Conclusion:** This sugar beet study in Ukraine revealed that Vitazyme, applied twice at 1 liter/ha during the growing period, dramatically increased the beet yield and sugar yield for all three beet varieties. Increases in beet yield ranged from 23 to 36%, and increases in sugar yield were from 29 to 41%. The sugar content of the beets was also increased, from 0.5 to 1.0 percentage point. Income increases were improved by from 2,093 to 4,388 hrn/ha. These truly excellent yield and income results show the great value of Vitazyme for sugar beet production in Ukraine.



## Vital Earth Resources

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

# 2010 Crop Results

## Vitazyme on Sugar Beets

Researcher: V. V. Plotnikov Location: National Academy of Agrarian Sciences, Vinnytsia State Agricultural Research Station, Vinnytsia, Ukraine (Central Forest and Steppe Region)

Variety: Karmelita Soil type: gray podzolic (organic matter = 2.2%, hydrolyzed N = 8.4 mg/100 g soil, P = 15.8 mg/100 g soil, exchangeable K = 12.4 mg/100 g soil, pH = 5.5)

Previous crop: winter wheat Planting date: April 24, 2010 Planting rate: 100,000 seeds/ha

Soil preparation: disking to 6 to 8 cm, tillage to 22 cm, harrowing to 4 to 5 cm

Experimental design: A plot area of about 1 ha was planted to sugar beets, and a trial with four replicates using one Vitazyme treatment and four levels of fertilization was placed upon it. The objective of the test was to evaluate the effect of Vitazyme and fertilizer level on the yield of sugar for the beets.

- |                                   |                                     |
|-----------------------------------|-------------------------------------|
| 1. No fertilizer, no Vitazyme     | 2. No fertilizer, plus Vitazyme     |
| 3. Low fertilizer, no Vitazyme    | 4. Low fertilizer, plus Vitazyme    |
| 5. Medium fertilizer, no Vitazyme | 6. Medium fertilizer, plus Vitazyme |
| 7. High fertilizer, no Vitazyme   | 8. High fertilizer, plus Vitazyme   |

Fertilization: Phosphorus and potassium were applied in the fall during the main tillage operation, and nitrogen was spring applied, and incorporated before planting.

Treatments 3 and 4: 80-60-80 kg/ha N-P<sub>2</sub>O<sub>5</sub>-K<sub>2</sub>O

Treatments 5 and 6: 120-90-120 kg/ha N-P<sub>2</sub>O<sub>5</sub>-K<sub>2</sub>O

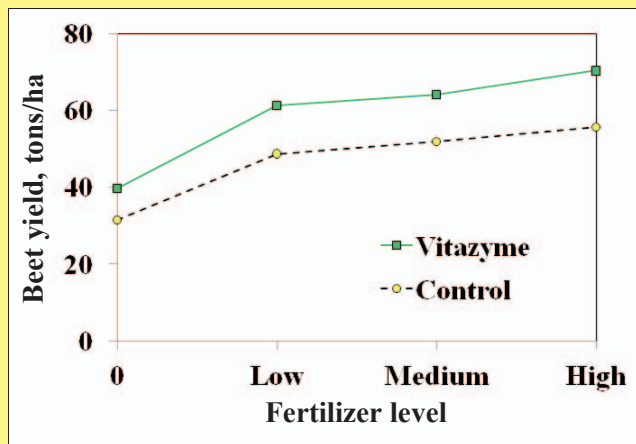
Treatments 7 and 8: 160-120-160 kg/ha N-P<sub>2</sub>O<sub>5</sub>-K<sub>2</sub>O

Vitazyme application: 1 liter/ha sprayed on the leaves and soil (1) June 17, 2010, and (2) July 9, 2010

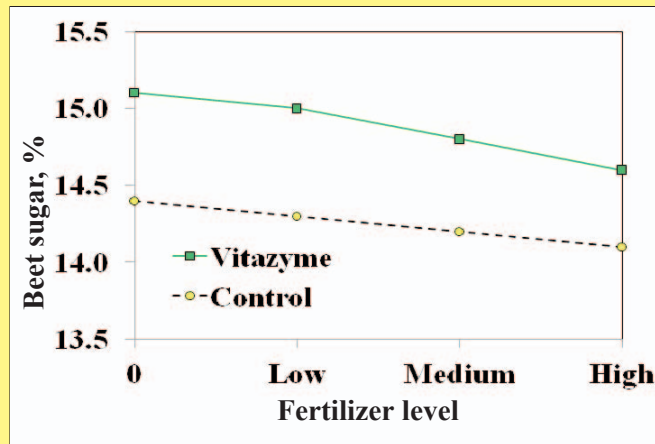
Sugar and beet yield results:

Treatment	Beet yield	Change	Sugar content	Change	Sugar yield	Change
	tons/ha	tons/ha	%	%-points	tons/ha	tons/ha
1. No fert, no Vita	31.5	---	14.4	---	4.5	---
2. No fert, + Vita	39.7	8.2 (+26%)	15.1	+0.7	6.0	1.5 (+33%)
3. Low fert, no Vita	48.7	---	14.3	---	7.0	---
4. Low fert, + Vita	61.2	12.5 (+26%)	15.0	+0.7	9.2	2.2 (+31%)
5. Medium fert, no Vita	51.9	---	14.2	---	7.4	---
6. Medium fert, + Vita	64.1	12.2 (+24%)	14.8	+0.6	9.5	2.1 (+28%)
7. High fert, no Vita	55.6	---	14.1	---	7.8	---
8. High fert, + Vita	70.3	14.7 (+25%)	14.6	+0.5	10.2	2.4 (+31%)

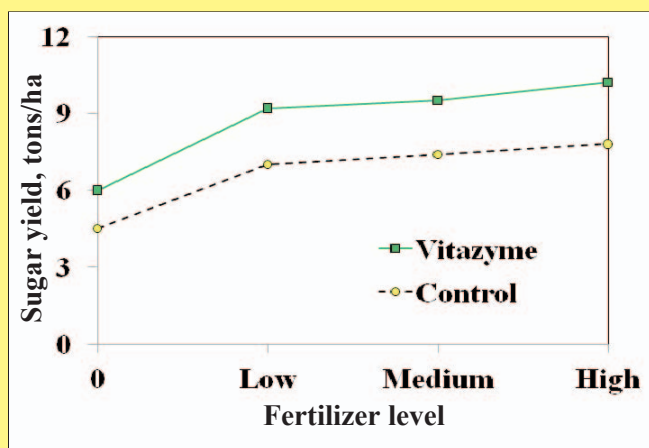
### Sugar Beet Yield



### Beet Sugar Content



### Sugar Yield



Vitazyme gave uniform increases in yield (24 to 26%) at all four fertility levels, and also increased sugar content of the beets (by 0.5 to 0.7 percentage points) despite higher yields, though sugar content increased a bit less as the fertilizer levels and yields increased. Final sugar yield for all four fertilizer levels was markedly improved by Vitazyme (28 to 33%).

**Income results:** Profits with Vitazyme were improved markedly at all four fertilizer levels, from 2,306 hrn/ha for none added, to 3,700 hrn/ha at the low level, to 3,553 hrn/ha for the medium level, and to 4,289 hrn/ha for the high fertilizer level.

**Conclusion:** This sugar study in Ukraine, using four fertilizer levels and one Vitazyme regime (1 liter/ha applied twice to the leaves and soil), showed that beet and sugar yields were markedly and uniformly improved at all fertilizer levels. Besides, the sugar content of the beets was increased by 0.5 percentage point or more, the increase decreasing slightly as the fertilizer rate increased. These results are summarized below. The Vitazyme program is shown to be an excellent practice to incorporate into sugar beet production in Ukraine.

#### Increases with Vitazyme

	No fert	Low fert	Medium fert	High fert
Beet Yield	26%	26%	24%	25%
Sugar content	0.7 %-pt	0.7 %-pt	0.6 %-pt	0.5 %-pt
Sugar yield	33%	31%	28%	31%
Profit	2.306 hrn/ha	3,700 hrn/ha	3,553 hrn/ha	4,289 hrn/ha

**Vital Earth Resources**

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

**2010 Crop Results**

**Vitazyme on Sunflowers**

Researcher: N. M. Domanov, Ph.D.      Location: Plant Protection Laboratory, Russian Academy of Agricultural Sciences, Belgorod Agricultural Research Institute, Belgorod, Russia      Variety: unknown

Planting date: May 10, 2010      Previous crop: winter wheat

Soil type: Chernozem (4.4% organic matter, CEC = 36.8 meq/100 g, hydrolytic soil acidity = 1.6 - 2.0 mg/100 g, pH = 5.8, exchangeable P<sub>2</sub>O<sub>5</sub> = 26 mg/100 g, exchangeable K<sub>2</sub>O = 126 mg/100 g)

Experimental design: A replicated field trial with sunflowers was conducted with four replicates and five treatments to determine the effect of Vitazyme on sunflower growth and production. Plots were 100 m<sup>2</sup>.

Treatment	Procedures
1	<b>Control: no treatment</b>
2	<b>Standard: Epin-Extra preplant seed treatment (4 ml/ton in 10 liters of water/ton) Foliar spray at 2 to 3 full leaves (40 ml/ha in 250 liters of water/ha)</b>
3	<b>Vitazyme on leaves at 2 to 3 leaves, and at head formation (0.1 L/ha in 250 L/ha of water)</b>
4	<b>Vitazyme on leaves at 2 to 3 leaves, and at head formation (0.5 L/ha in 250 L/ha of water)</b>
5	<b>Vitazyme on leaves at 2 to 3 leaves, and at head formation (1.0 L/ha in 250 L/ha of water)</b>

Fertilization: 16-16-16% N-P<sub>2</sub>O<sub>5</sub>-K<sub>2</sub>O (rate unknown)

Vitazyme application: 0.1, 0.5. or 1.0 liter/ha application to the leaves at 2 to 3 leaves, and at head formation

Growing conditions: Growth of the sunflowers was affected by very warm temperatures throughout the main growing season — from 5 to 7° C above normal from April through July — and by well-below-normal precipitation. The March through July rainfall was only 116 mm, or 45.5% of normal; these rains were also irregular.

Growth stages:

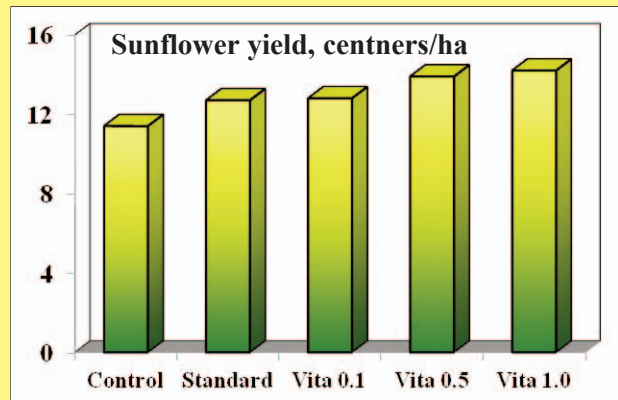
- Planting ..... May 10**
- Germination ..... May 25**
- 2 - 3 leaves ..... June 14**
- Head formation ..... July 9**
- Harvest ..... September 10**

Plant density: Just before harvest, a population count was made. There was no difference in population for the five treatments, all of them being about 48,000/ha.

*Yield results:*

Treatment	Yield*	Change
	----- centners/ha -----	
1. Control	11.4 c	---
2. Standard	12.7 b	1.3 (+11%)
3. Vita 0.1 L/ha	12.8 b	1.4 (+12%)
4. Vita 0.5 L/ha	13.9 ab	2.5 (+22%)
5. Vita 1.0 L/ha	14.2 a	2.8 (+25%)

\*Means followed by the same letter are not significantly different at P=0.05. LSD<sub>0.05</sub>=1.2 centners/ha.



**Increase in yield with Vitazyme**

<b>0.1 liter/ha</b> .....	<b>12%</b>
<b>0.5 liter/ha</b> .....	<b>22%</b>
<b>1.0 liter/ha</b> .....	<b>25%</b>

**Conclusion:** This sunflower study in Russia revealed that Vitazyme, applied twice at 2 to 3 leaves and at heading, increased the yield significantly above the control for all three application levels: 0.1, 0.5, and 1.0 liter/ha. The 1.0 liter/ha standard Vitazyme rate significantly increased the yield above the standard Epin-Extra treatment as well, 25% versus 11%. These results show the utility of Vitazyme to boost sunflower performance in Russia, especially during an unusually hot and dry year.

## Vital Earth Resources

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

# 2010 Crop Results

## Vitazyme on Sunflowers

Researcher: V. V. Plotnikov

Research organization: National Academy of Agrarian Sciences

Location: Vinnytsia State Agricultural Research Station, Vinnytsia, Ukraine (Central Forest and Steppe Region)

Variety: PF-10

Soil type: gray podzolic (organic matter = 2.2%, hydrolyzed N = 8.4 mg/100 g soil, P = 15.8 mg/100 g soil, exchangeable K = 12.4 mg/100 g soil, pH = 5.5)

Previous crop: corn

Planting date: May 20, 2010

Planting rate: 5 kg/ha

Soil preparation: disking to 6 to 8 cm, tillage to 22 cm, cultivation to 5 to 6 cm

Experimental design: A sunflower area of a research farm was divided into four replicates with a control and one Vitazyme treatment, the objective being to determine the effects of the product on sunflower yield.

### 1. Control

### 2. Vitazyme at early head formation

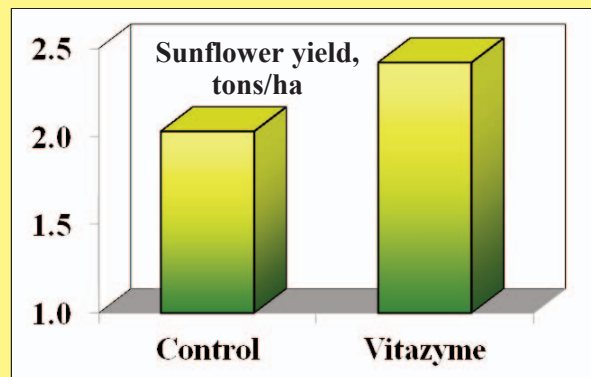
Fertilization: 45-30-30 kg/ha N-P<sub>2</sub>O<sub>5</sub>-K<sub>2</sub>O, incorporated before planting

Vitazyme application: 1 liter/ha to the leaves at early head formation, on July 4

Yield results:

Treatment	Yield tons/ha	Yield change tons/ha
1. Control	2.03	---
2. Vitazyme	2.42	0.39 (+19%)

**Yield increase with Vitazyme:  
19%**



Income results: A single Vitazyme application increased income by 1,379 hrn/ha above the untreated control.

Conclusion: In this Ukrainian replicated sunflower trial, Vitazyme increased the yield by 0.39 ton/ha (19%) above the control, and increased income by 1,379 hrn/ha. This crop and soil amendment is shown to be an excellent addition for sunflower production programs in Ukraine.

## Vital Earth Resources

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

# 2010 Crop Results

## Vitazyme on Vetch, Spring

Researcher: V. V. Plotnikov

Research organization: National Academy of Agrarian Sciences

Location: Vinnytsia State Agricultural Research Station, Vinnytsia, Ukraine (Central Forest and Steppe Region)

Variety: Liliana

Soil type: gray podzolic (organic matter = 2.2%, hydrolyzed N = 8.4 mg/100 g soil, P = 15.8 mg/100 g soil, exchangeable K = 12.4 mg/100 g soil, pH = 5.5)

Previous crop: spring barley

Planting date: April 17, 2010

Planting rate: 1.8 million seeds/ha

Soil preparation: disking to 6 to 8 cm, tillage to 22 cm, cultivation to 4 to 5 cm

Experimental design: A spring vetch plot area was divided into four replicates with a control and two Vitazyme treatments, with the objective of determining the effects of the product on vetch yield.

**1. Control**

**2. Vitazyme on seeds**

**3. Vitazyme on seeds and leaves**

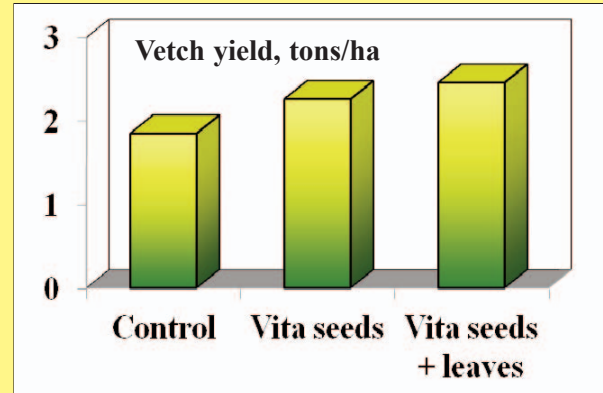
Fertilization: 15-15-15 kg/ha of N-P<sub>2</sub>O<sub>5</sub>-K<sub>2</sub>O, incorporated before planting

Vitazyme application: Treatments 2 and 3, 1 liter/ha on the seeds at planting on April 17; Treatment 3, 1 liter/ha on the leaves and soil at early bloom on June 9

Yield results:

Treatment	Yield tons/ha	Yield change tons/ha
1. Control	1.85	---
2. Vitazyme, seeds	2.26	0.41 (+22%)
3. Vitazyme, seeds + leaves	2.46	0.61 (+33%)

**Yield increase with Vitazyme:  
22 to 33%**



Income results: The single seed treatment produced 1,005 hrn/ha more increase, whereas the seed plus foliar treatment increased yield by 1,305 hrn/ha.

Conclusion: Vitazyme in this replicated Ukrainian spring vetch trial produced excellent yield increases using both a seed treatment (22%), and a seed plus foliar treatment (33%). Income increases were commensurate with yield increases: 1,005 and 1,305 hrn/ha, respectively. These results illustrate how effective this bio-stimulant is to improve the yields and income for vetch in Ukraine.

**Vital Earth Resources**

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

**2010 Crop Results**

**Vitazyme on Wheat**

*Farmer:* Enrique Babyleck

*Research organization:* Syngenta

*Location:* Pitrufulquen, Chile

*Variety:* Kumpa

*Previous crop:* oats

*Planting date:* May 2, 2009

*Experimental design:* Plots in a wheat field were marked with stakes, and seven treatments of Vitazyme, applied early and/or late, and with or without reduced N fertilizer, were added to determine the effects of these treatments on wheat growth parameters and grain yield.

Treatment	Vitazyme rate*		Nitrogen % of optimum
	Preemergence	BBCH32	
	liters/ha	liters/ha	
1	1.0	0	100
2	1.5	0	100
3	1.0	1.0	100
4	1.5	1.5	100
5	1.5	0	50
6	1.5	1.5	50
7	0	0	100

\*Triacontanol concentration: 0.0022 g/liter; brassinosteroid concentration: 0.013 g/liter.

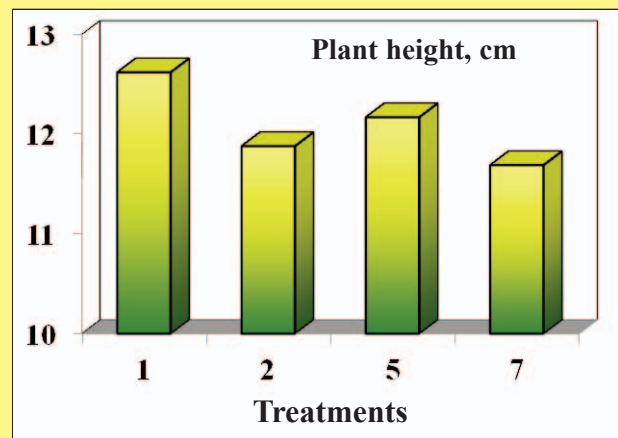
*Fertilization:* according to recommendations

*Vitazyme application:* (1) 1.0 or 1.5 liters/ha on the leaves and soil at BBCH14, on June 26, 2009; (2) 1.0 or 1.5 liters/ha on the leaves and soil at stage BBCH 31, on October 5, 2009.

*Growth results:*

**Plant Height At 54 Days After Planting**

Treatment					
No.	Vita early	Vita late	N	Height	Change
	liters/ha		%	cm	
1	1.0	0	100	12.62	0.93 (+8%)
2	1.5	0	100	11.88	0.19 (+2%)
5	1.5	0	50	12.17	0.48 (+4%)
7	0	0	100	11.69	---



**Increase in plant height with Vitazyme**

1.0 L/ha at BBCH14, 100% N .... 8%  
 1.5 L/ha at BBCH14, 100% N .... 2%  
 1.5 L/ha at BBCH14, 50% N ..... 4%



### Tillers Per Plant At 54 Days After Planting

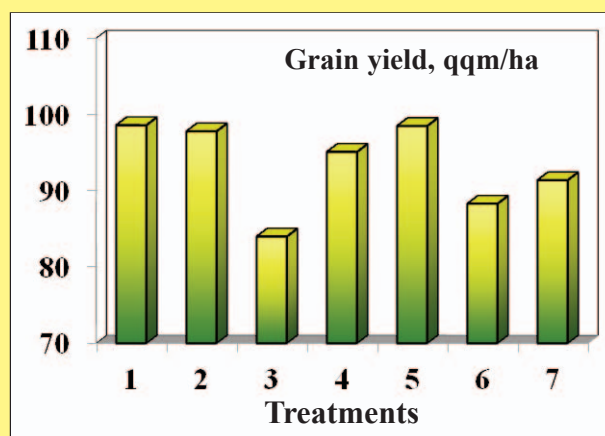
No.	Treatment			Tillers	Change
	Vita early	Vita late	N		
	-----	liters/ha	-----	%	-----
				number	-----
1	1.0	0	100	1.70	(-) 0.35 (-17%)
2	1.5	0	100	1.50	(-) 0.55 (-27%)
3	1.0	1.0	100	1.85	(-) 0.20 (-10%)
4	1.5	1.5	100	1.75	(-) 0.30 (-15%)
5	1.5	0	50	1.95	(-) 0.10 (-5%)
6	1.5	1.5	50	1.85	(-) 0.20 (-10%)
7	0	0	100	2.05	---

All Vitazyme treatments reduced the number of tillers per plant.

Yield results:

### Wheat Grain Yield

No.	Treatment			Yield	Change
	Vita early	Vita late	N		
	-----	liters/ha	-----	%	-----
				number	-----
1	1.0	0	100	98.6	7.2 (+8%)
2	1.5	0	100	97.8	6.4 (+7%)
3	1.0	1.0	100	84.0	(-) 7.4 (-8%)
4	1.5	1.5	100	95.1	3.7 (+4%)
5	1.5	0	50	98.5	7.1 (+8%)
6	1.5	1.5	50	88.3	(-) 3.1 (13%)
7	0	0	100	91.4	---



Conclusion: In this Vitazyme study in Chile, evaluating the effects of the product on wheat treated with 1.0 and/or 1.5 liters/ha applied once or twice - with either 50% or 100% of the recommended N, the 1.0 and 1.5 liter/ha rates applied at the BBCH14 stage produced 7 to 8% yield increases. The 1.5 liters/ha rate applied twice (100% N) produced a 4% yield improvement, while a 50% fertilizer N

reduction increased the yield by 8%; this was the most profitable treatment of all seven. Interestingly, these yield responses were not a reflection of tillers per plant, since all Vitazyme treatments reduced tillering. The yield improvement must have been due to larger heads and greater grain weight from Vitazyme application. This study proves the effectiveness of Vitazyme use on wheat in Chile.

#### Yield increase with Vitazyme

<b>1.0 L/ha at BBCH14</b> .....	<b>8%</b>
<b>1.5 L/ha at BBCH14</b> .....	<b>7%</b>
<b>1.5 L/ha twice</b> .....	<b>4%</b>
<b>1.5 L/ha at BBCH14 + 50% N</b> .....	<b>8%</b>

## Vital Earth Resources

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

# 2010 Crop Results

## Vitazyme on Wheat

Test farm: CIA

Research organization: Syngenta

Location: Pua, Chile

Variety: Otto

Previous crop: barley

Planting date: July 14, 2009

Experimental design: A series of four strips in a uniform field were planted to wheat, the strips separated by spaces about one meter wide. The purpose of the study was to evaluate the effect of Vitazyme applications, with and without a "Take-All Pack" fertilizer mix, on wheat yield.

Treatment	Vitazyme		Take-All Pack (TAP)
	Early	Late	
	liters/ha	liters/ha	
1	0	0	0
2	0	0	X
3	1.5	0	X
4	1.5	1.5	X

Fertilizer: according to recommendations, plus a Take-All Pack for Treatments 2, 3, and 4

Vitazyme application: (1) For Treatments 3 and 4, 1.5 liters/ha at the BBCH 14-21 stage on September 14; for Treatments 4, 1.5 liters/ha at the BBCH 31 stage on October 30.

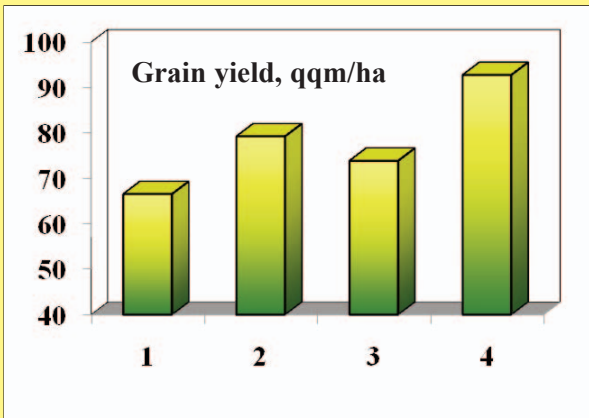
Yield results:

### Wheat Grain Yield

No.	Treatment			Yield	Change <sup>1</sup> (control=Trt. 1)	Change <sup>2</sup> (control=Trt. 2)
	Vita early	Vita late	TAP			
	liters/ha	liters/ha		qqm/ha	qqm/ha	qqm/ha
1	0	0	0	66.56	---	---
2	0	0	X	79.25	12.69 (+19%)	---
3	1.5	0	X	73.88	7.32 (+11%)	(-) 5.37 (+7%)
4	1.5	1.5	X	92.75	26.19 (+39%)	13.50 (+17%)

<sup>1</sup>Yields are compared to the control (Treatment 1).

<sup>2</sup>Yields of Treatments 3 and 4 are compared to Treatment 2.



### Change in wheat yield with Vitazyme

#### *Using the untreated treatment as control*

TAP only .....	+19%
TAP + Vitazyme early .....	+11%
TAP + Vitazyme twice .....	+39%

#### *Using the TAP only treatment as control*

TAP + Vitazyme early .....	-7%
TAP + Vitazyme twice .....	+17%

**Conclusions:** In this Chilean wheat demonstration at Pua, the Take-All Pack increased grain yield above the control by 19%. By adding Vitazyme to the crop in a single early application, the yield dropped slightly by 7%. However, when two applications were made, one early plus one later, the grain yield improved by a remarkable 17% (13.50 qqm/ha) compared to the TAP treatment only. It is possible that, in this study situation, a later application alone would have given the full increase noted, since an early application gave a decrease for some unknown reason. The demonstration lends support to the fact that Vitazyme, in the combination with a nutrient package designed to combat Take-All of wheat, is able, when applied at the proper time, to greatly increase wheat yield.

**Vital Earth Resources**

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

**2010 Crop Results**

**Vitazyme on Wheat**

Farmer: Marcel Jakob

Research organization: Syngenta

Location: Curacautin, Chile

Variety: Otto

Previous crop: wheat

Planting date: August 5, 2009

Experimental design: A wheat field was divided into several strips to place Vitazyme treatments having one or two applications, plus some with reduced N applications. The objective of the study was to evaluate the product's effects on plant growth and crop yield.

Treatment	Vitazyme rate*		Nitrogen % of optimum
	Preemergence liters/ha	BBCH32 liters/ha	
1	1.0	0	100
2	1.5	0	100
3	1.0	1.0	100
4	1.5	1.5	100
5	1.5	0	50
6	1.5	1.5	50
7	0	0	100

\*Triacontanol concentration: 0.0022 g/liter; brassinosteroid concentration: 0.013 g/liter

Fertilization: according to recommendations

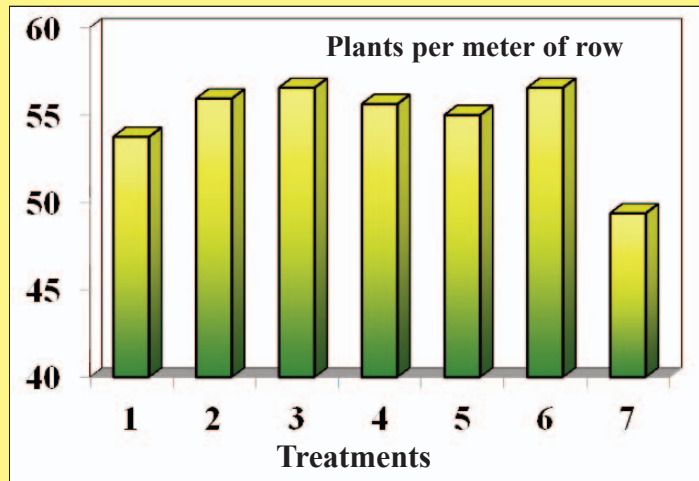
Vitazyme application: (1) 1.0 or 1.5 liters/ha on the leaves and soil at BBCH14, on September 9, 2009; (2) 1.0 or 1.5 liters/ha on the leaves and soil at stage BBCH 32, on November 11, 2009.

Growth results:

**Plant Population 19 Days After Planting**

No.	Treatment			Population	Change
	Vita early liters/ha	Vita late liters/ha	N %		
1	1.0	0	100	53.75	4.37 (+9%)
2	1.5	0	100	55.94	6.56 (+13%)
3	1.0	1.0	100	56.56	7.18 (+15%)
4	1.5	1.5	100	55.63	6.25 (+13%)
5	1.5	0	50	55.00	5.62 (+11%)
6	1.5	1.5	50	56.56	7.18 (+15%)
7	0	0	100	49.38	---

Increase in plants per meter of row with Vitazyme	
<b>100% N</b>	
1.0 liter/ha early .....	9%
1.5 liters/ha early .....	13%
1.0 liter/ha twice .....	15%
1.5 liters/ha twice .....	13%
<b>50% N</b>	
1.5 liters/ha early .....	11%
1.5 liters/ha twice .....	15%



Yield results: No yield results are available from this study.

Conclusion: In this wheat study in Chile to evaluate Vitazyme effects on wheat growth, for all treatments, at both 50% and 100% N levels, the population of plants per meter of row was increased, from 9 to 15%. Unfortunately, no yield results are available for the study.

## Vital Earth Resources

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

# 2010 Crop Results

## Vitazyme on Wheat, Winter

Researcher: unknown

Research organization: Krasnodar Lukyanenko NIICX

Location: Krasnodar Region, Russia

Variety: Moskvich

Seeding rate: 5 million seeds/ha

Planting date: October 12, 2009

Tillage: disking

Previous crop: sunflowers

Soil type: Chernozem (2.6 to 3.2% organic matter, pH = 5.1, available  $P_2O_5$  = 45.0 to 48.4, available  $K_2O$  = 341 to 385 mg/kg, exchangeable bases = 28.9 to 31.8 mg/100 g of soil, saturation with Ca and Mg = 85.0 to 88.6%, texture = 66% clay and 34% silt), highly fertile

Experimental design: A wheat field was divided into untreated and Vitazyme treated plots, 40 m<sup>2</sup>, using four replicates, with the objective of evaluating the product's effects on winter wheat growth and yield.

### 1. Control

### 2. Vitazyme

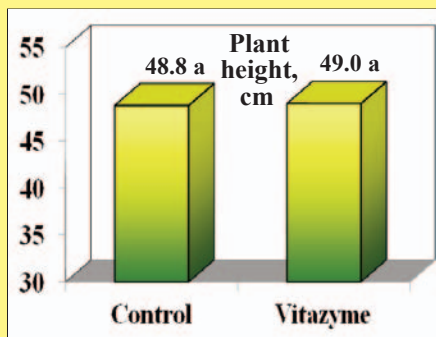
Fertilization: a fall application of 16-60-40 kg/ha N- $P_2O_5$ - $K_2O$  as  $NH_4H_2PO_4$  and KCl; a spring application of 2 c/ha

Vitazyme application: (1) 1 liter/ha foliar sprayed at early heading and flowering on May 18, 2010, and (2) 1 liter/ha foliar sprayed at early ripening on May 28, 2010

Weather conditions: The climate is moderate continental, warm temperate, and humid. At planting and thereafter, conditions were warm and dry, but by freezeup rainfall and temperatures favored excellent hardening of the newly emerged plants. Springtime growth was hampered by dry and hot weather, which persisted into flowering and ripening of the grain. During harvest, excessive rain fell to negatively influence grain quality.

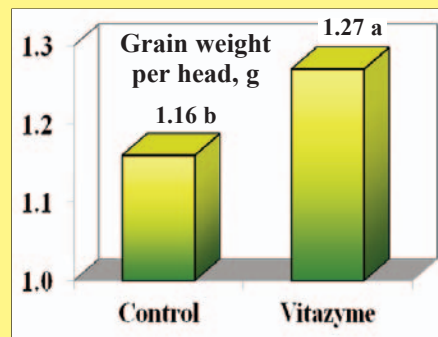
Yield results:

### Stalk Height\*



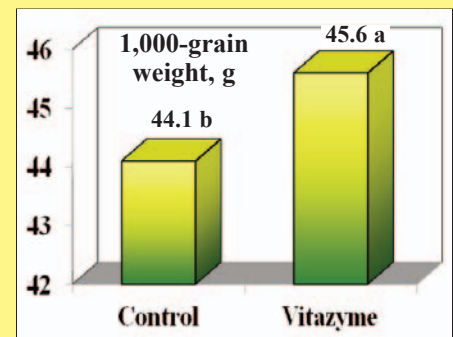
\*Means followed by the same letter are not significantly different at P = 0.05.  
LSD<sub>0.05</sub> = 1.2 cm.

### Grain Weight Per Head\*



\*Means followed by the same letter are not significantly different at P = 0.05.  
LSD<sub>0.05</sub> = 0.06 g.

### 1,000-Grain Weight\*



\*Means followed by the same letter are not significantly different at P = 0.05.  
LSD<sub>0.05</sub> = 0.5 g.

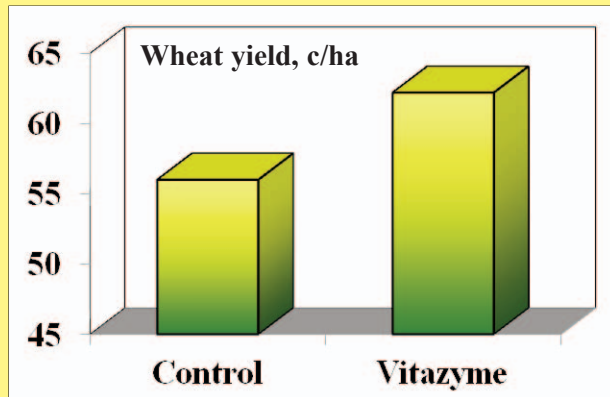
**Increase in grain per head with Vitazyme:  
0.11 gram (+9%)**

**Increase in 1,000-grain weight with Vitazyme:  
1.5 gram (+3%)**

## Grain Yield

Treatment	Yield*	Yield change
	c/ha	c/ha
Control	56.0 b	---
Vitazyme	62.2 a	6.2 (+11%)

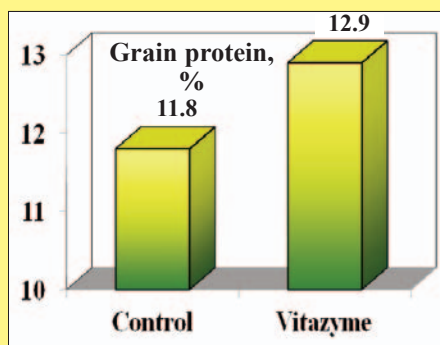
\*Means followed by the same letter are not significantly different at P = 0.05. LSD<sub>0.05</sub> = 2.8 c/ha.



**Increase in wheat yield with Vitazyme: 11%**

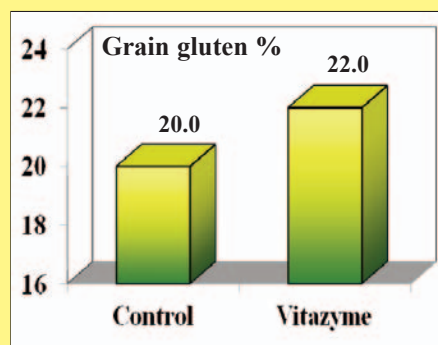
### Grain quality results:

#### Protein



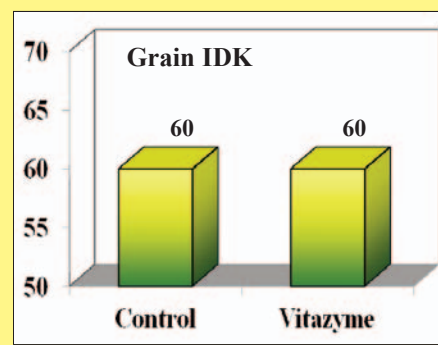
**Increase in protein with Vitazyme: 1.1 %-points**

#### Gluten



**Increase in gluten with Vitazyme: 2.0 %-points**

#### IDK



**Conclusions:** A winter wheat study, conducted in 40 m<sup>2</sup> plots in Russia, revealed that Vitazyme improved wheat growth and yield, as well as wheat grain quality, in nearly every case. These improvements are summarized below.

Parameter	Increase with Vitazyme
Grain weight per head .....	0.11 gram (9%)
1,000-grain weight .....	1.5 gram (3%)
Grain yield .....	6.2 c/ha (11%)
Protein of grain .....	1.1 %-points
Gluten of grain .....	2.0 %-points

Vitazyme for this study in Russia improved both winter wheat yield and quality. It is an excellent amendment for wheat growers.



## Vital Earth Resources

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

# 2010 Crop Results

## Vitazyme on Wheat

Farmer: Syngenta

Location: Pua, Chile

Variety: Orvantis

Previous crop: barley

Planting date: May 28, 2009

Experimental design: In this trial, a series of wheat plots was laid out in a field using seven treatments. The purpose of the study was to evaluate the effect of Vitazyme, with and without reduced fertilizer N, on wheat growth and yield.

Treatment	Vitazyme rate*		Nitrogen % of optimum
	Preemergence	BBCH31	
	liters/ha	liters/ha	
1	1.0	0	100
2	1.5	0	100
3	1.0	1.0	100
4	1.5	1.5	100
5	1.5	0	50
6	1.5	1.5	50
7	0	0	100

\*Triacontanol concentration: 0.0022 g/liter; brassinosteroid concentration: 0.013 g/liter

Fertilization: according to recommendations

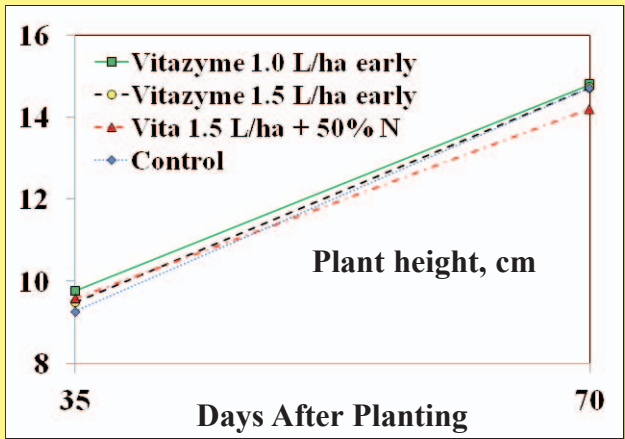
Vitazyme application: (1) 1.0 or 1.5 liters/ha on the leaves and soil shortly after emergence, on June 9, 2009; (2) 1.0 or 1.5 liters/ha on the leaves and soil at stage BBCH31, on October 9, 2009.

Growth results:

### Plant Height At 35 and 70 Days After Planting

No.	Treatment			Height	Change	Height	Change
	Vita early	Vita late	N				
	liters/ha		%	cm		cm	
1	1.0	0	100	9.77	0.51 (+6%)	14.79	0.09 (+1%)
2	1.5	0	100	9.48	0.22 (+2%)	14.72	0.02 (0%)
5	1.5	0	50	9.58	0.32 (+3%)	14.19	(-) 0.51 (-3%)
7	0	0	100	9.26	---	14.70	---

### Tillers At 70 Days After Planting



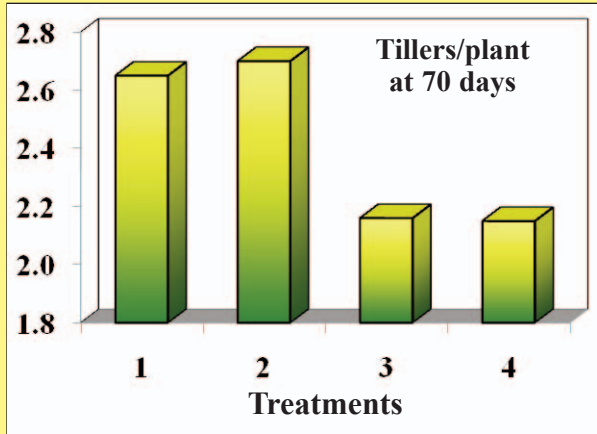
No.	Treatment		N	Tillers	Change
	Vita early	Vita late			
	----- liters/ha -----	-----	%	----- number -----	
1	1.0	0	100	2.65	0.50 (+23%)
2	1.5	0	100	2.70	0.55 (+26%)
5	1.5	0	50	2.16	0.01 (0%)
7	0	0	100	2.15	---

Yield results:

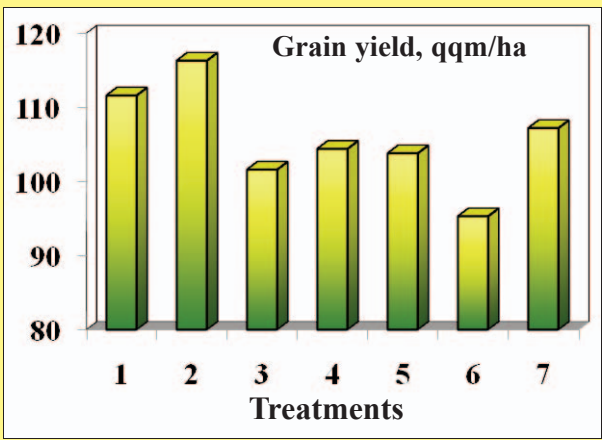
### Grain Yield

Increase in tillers with Vitazyme	
1.0 liter/ha early .....	<b>23%</b>
1.5 liter/ha early .....	<b>26%</b>

No.	Treatment		N	Yield	Change
	Vita early	Vita late			
	----- liters/ha -----	-----	%	qqm/ha	qqm/ha
1	1.0	0	100	111.6	4.4 (+4%)
2	1.5	0	100	116.3	9.1 (+8%)
3	1.0	1.0	100	101.6	(-) 5.6 (-5%)
4	1.5	1.5	100	104.4	(-) 2.8 (-3%)
5	1.5	0	50	103.8	(-) 3.4 (-3%)
6	1.5	1.5	50	95.3	(-) 11.9 (-11%)
7	0	0	100	107.2	---



Increase in wheat yield with Vitazyme	
1.0 liter/ha early .....	<b>+4%</b>
1.5 liter/ha early .....	<b>+8%</b>



**Conclusion:** In this wheat study in Chile, using Vitazyme at 1.0 or 1.5 liters/ha shortly after emergence and/or about 18 weeks later, and with or without nitrogen fertilizer, Vitazyme at 1.0 or 1.5 liters/ha, applied shortly after emergence, stimulated tillering by 23 to 26%, and increased yield of the grain by 4 to 8%. Other treatments did not cause increases in growth parameters or yield, especially Treatment 6 which received two 1.5 liter/ha Vitazyme applications. It appears that N fertilizer applications need to be maintained at optimum levels under Chilean conditions for Vitazyme to work best, and a second application later in the season does not add to yield responses. A single Vitazyme application early in the growth period gives the best results, and shows the product's excellent utility for Chile's agriculture.

## Vital Earth Resources

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

# 2010 Crop Results

## Vitazyme on Wheat, Winter

Researcher: V. V. Plotnikov Location: National Academy of Agrarian Sciences, Vinnytsia State Agricultural Research Station, Vinnytsia, Ukraine (Central Forest and Steppe Region)

Variety: Liona Super Elite Planting date: October 7, 2009 Planting rate: 6 million seeds/ha

Soil type: gray podzolic (organic matter = 2.2%, hydrolyzed N = 8.4 mg/100 g soil, P = 15.8 mg/100 g soil, exchangeable K = 12.4 mg/100 g soil, pH = 5.5)

Previous crop: winter canola

Soil preparation: disking 6 to 8 cm, tillage to 22 cm, and harrowing to 3 to 4 cm

Experimental design: An experimental area was divided into smaller plots, with four replicates for the Liona wheat variety. Three Vitazyme treatments were utilized to determine the effect of this product on winter wheat yield and quality.

### 1. Control

### 2. Vitazyme (unknown treatment)

### 3. Vitazyme on seeds

### 4. Vitazyme on seeds, and foliar in spring

Fertilization: fall, 30-30-30 kg/ha N-P<sub>2</sub>O<sub>5</sub>-K<sub>2</sub>O tilled in: in the spring, 60 kg/ha N.

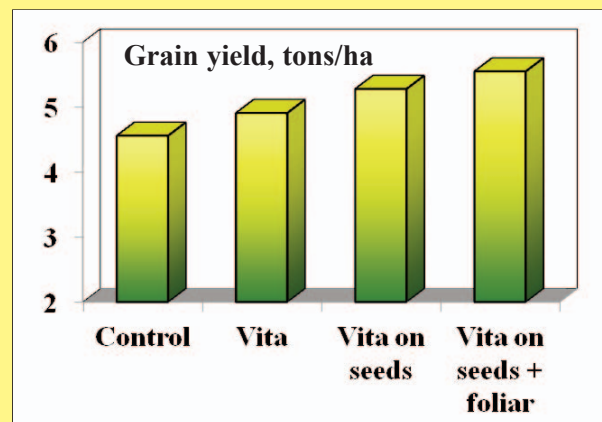
Vitazyme application: Treatment 2, an unknown Vitazyme treatment; Treatment 3, a Vitazyme seed treatment to give 1 liter/ha; Treatment 4, a Vitazyme seed treatment to give 1 liter/ha plus a foliar spray at 1 liter/ha on April 30, 2010.

Yield results:

### Grain Yield

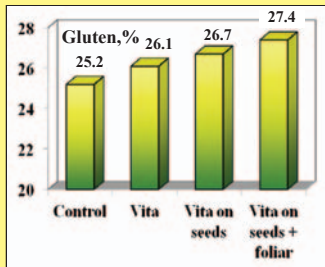
Treatment	Grain yield tons/ha	Change tons/ha
1. Control	4.56	---
2. Vita (unknown)	4.91	0.35 (+8%)
3. Vita on seeds	5.28	0.72 (+16%)
4. Vita on seeds + leaves	5.55	0.99 (+22%)

**Increase in grain with Vitazyme:  
8 to 22%**



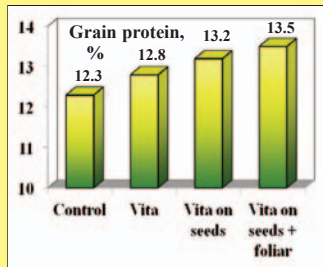
*Quality results:*

**Gluten Content**



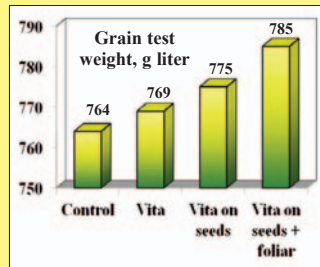
**Gluten increase with Vitazyme: 0.9 to 2.2%-points**

**Crude Protein**



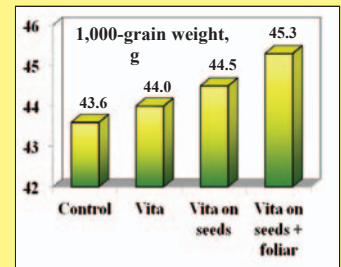
**Crude protein increase with Vitazyme: 0.5 to 1.2%-points**

**Test Weight**



**Test weight increase with Vitazyme: 5 to 21 grams/liter**

**1,000-Grain Weight**



**1,000-grain weight increase with Vitazyme: 0.4 to 1.7 grams**

*Income results:* Profits were increased for the three Vitazyme treatments by 577 hrn/ha (Treatment 1), 1,123 hrn/ha (Treatment 2), and 1,368 hrn/ha (Treatment 3).

*Conclusion:* A winter wheat trial in Ukraine, using a replicated plot design, revealed that Vitazyme increased grain yield by 8 to 22%, gluten content by 0.9 to 2.2 percentage points, crude protein by 0.5 to 1.2 percentage points, test weight by 5 to 21 grams/liter, and 1,000-grain weight by 0.4 to 1.7 grams. In all cases the smallest increase for each parameter was with an undefined Vitazyme treatment, the next highest increase was for a seed treatment, and the highest values were in all cases for Vitazyme applied as a seed treatment and again in the spring as a foliar treatment. This management regime is shown to be a great benefit for Ukrainian wheat farmers.

## Vital Earth Resources

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

# 2010 Crop Results

## Vitazyme on Wheat, Spring

Researcher: V. V. Plotnikov

Location: National Academy of Agrarian Sciences, Vinnytsia State Agricultural Research Station, Vinnytsia, Ukraine (Central Forest and Steppe Region)

Variety: Pecherianka, Super Elite Soil type: gray podzolic (organic matter = 2.2%, hydrolyzed N = 8.4 mg/100 g soil, P = 15.8 mg/100 g soil, exchangeable K = 12.4 mg/100 g soil, pH = 5.5)

Previous crop: soybeans

Planting date: April 16, 2010

Planting rate: 6 million seeds/ha

Soil preparation: disking to 6 to 8 cm, tillage to 22 cm, harrowing to 4 to 5 cm

Experimental design: A wheat plot area, using a total area of about 1.0 ha, with four replicates, was established using two Vitazyme regimes to determine the product's effect on crop yield, grain quality, and plant growth characteristics.

### 1. Control

### 2. Vitazyme on the seeds

### 3. Vitazyme on the seeds, and leaves and soil

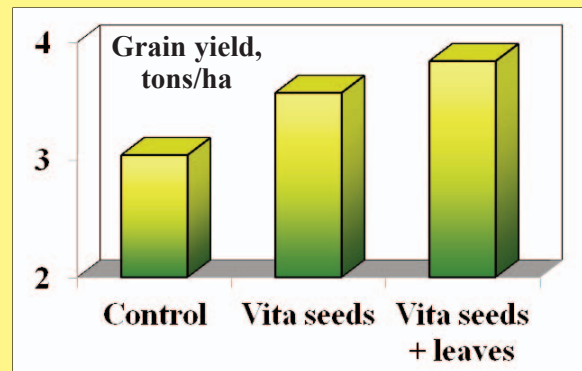
Fertilization: 30 kg/ha N, 30 kg/ha P<sub>2</sub>O<sub>5</sub>, and 30 kg/ha K<sub>2</sub>O incorporated before planting

Vitazyme application: Treatments 2 and 3, a seed treatment at 1 liter/ha; Treatment 3, an additional foliar and soil treatment of 1 liter/ha on May 21, 2010

Yield results:

### Grain Yield

Treatment	Yield t/ha	Yield change t/ha
1. Control	3.04	---
2. Vita on seeds	3.57	0.53 (+17%)
3. Vita on seed + leaves	3.84	0.80 (+26%)



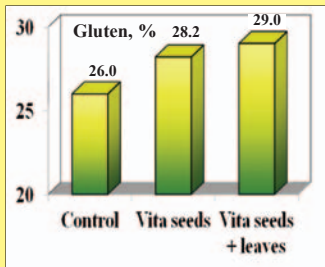
### Increase in grain yield with Vitazyme

**Vitazyme on the seeds ..... 17%**  
**Vitazyme on seeds + leaves ..... 26%**

Income results: Vitazyme improved crop income by 843 hrn/ha for the seed treatment alone, and by 1,098 hrn/ha for both the seed and foliar treatments.

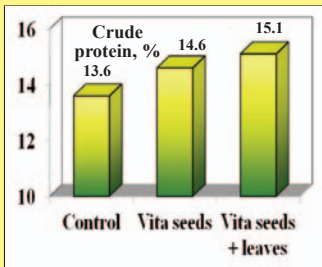
Grain quality results:

**Grain Gluten**



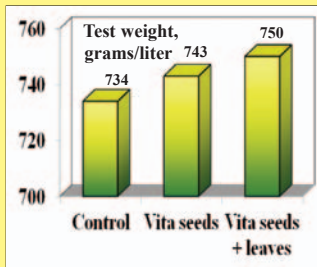
Vitazyme on the seeds enhanced grain gluten by 2.2%-points, while an additional foliar treatment raised gluten by 3.0%-points.

**Crude Protein**



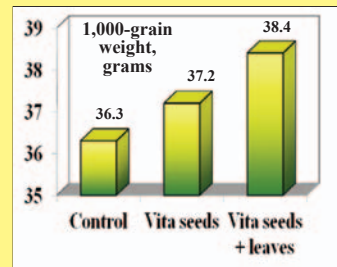
A seed treatment alone raised crude protein by 1.0%-point, while an additional foliar treatment boosted protein by 1.5%-points.

**Test Weight**



A single seed treatment increased grain density by 9 grams/liter, while an additional foliar treatment boosted it by 6 grams/liter.

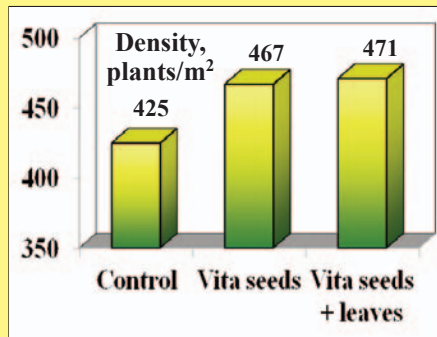
**1,000-Grain Weight**



Vitazyme on the seeds boosted 1,000-grain weight by 0.9 grams, and an added foliar spray further boosted this weight by 2.1 grams.

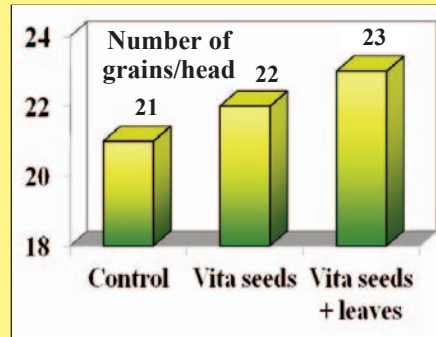
Plant structure results:

**Plant Density**



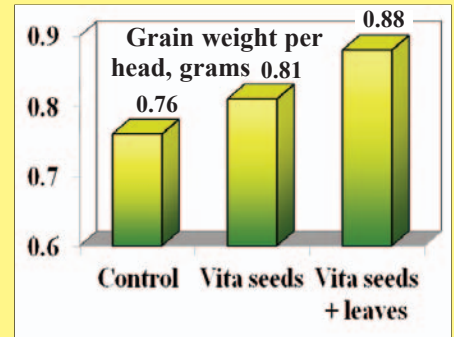
The seed treatment alone increased plant survival and density by 42 plants/m², while an additional foliar spray increased density by 46 plants/m².

**Grains Per Head**



There was an increase in seeds per head of 1 grain going from the control, to the single seed treatment, to the seed treatment plus foliar spray.

**Grain Weight Per Head**

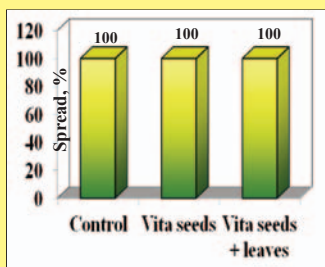


Grain weight per head was improved by a Vitazyme seed treatment alone by 0.05 gram, whereas an additional foliar spray raised that grain weight by 0.12 gram/head.

Disease results: Both oidium and septoriosis fungal diseases were evaluated.

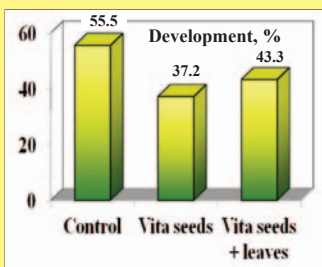
**Oidium Disease**

**Oidium Spread**



All plants for all three treatments were infected with oidium disease.

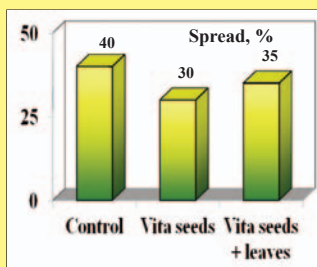
**Oidium Development**



The development of Oidium was somewhat less with both Vitazyme treatments, by 18.3% less for the seed treatment and by 12.2% less for the two treatments.

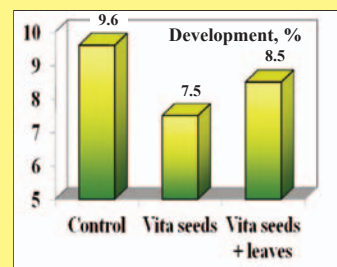
**Septoriosis Disease**

**Septoriosis Spread**



Septoriosis spread a bit less among the Vitazyme treated plants, being 10% fewer affected plants for the seed treatment alone, and 5% fewer for the two treatments.

**Septoriosis Development**



As for Oidium, septoriosis spread a bit less in the infected plant sites with Vitazyme, being 2.1% less for the seed treatment and 1.1% less for the seed plus foliar treatment.



**Conclusion:** A replicated spring wheat study at Vinnytsia, Ukraine, revealed that Vitazyme, whether applied at 1 liter/ha on the seeds, or with this treatment plus a 1 liter/ha foliar treatment in addition, greatly improved most parameters measured. These results are summarized below.

<b>Parameter</b>	<b>Vitazyme effect</b>	<b>Parameter</b>	<b>Vitazyme effect</b>
<b>Grain yield</b>	<b>+17 to 26%</b>	<b>Grains per head</b>	<b>+1 to 2 grains/head</b>
<b>Income</b>	<b>+843 to 1,098 hrn/ha</b>	<b>Grain weight per head</b>	<b>+0.05 to 0.12 g/head</b>
<b>Grain Gluten</b>	<b>+2.2 to 3.0 %-points</b>	<b>Oidium spread</b>	<b>none</b>
<b>Crude protein</b>	<b>+1.0 to 1.5 %-points</b>	<b>Oidium development</b>	<b>-12.2 to 18.3%</b>
<b>Test weight</b>	<b>+9 to 16 grams/liter</b>	<b>Septoriosiis spread</b>	<b>-5 to 10%</b>
<b>1,000-grain weight</b>	<b>+0.9 to 2.1 grams</b>	<b>Septoriosiis development</b>	<b>-1.1 to 2.1%</b>
<b>Plant density</b>	<b>+42 to 46 plants/m<sup>2</sup></b>		

Vitazyme is shown by this study to be a highly effective product for improving spring wheat yield, quality, and growth traits, and reducing disease susceptibility in Ukraine.



## Vital Earth Resources

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

# 2010 Crop Results

## Vitazyme on Wheat, Winter A Ukrainian Fertilizer Rate Trial

Researcher: V. V. Plotnikov

Location: National Academy of Agrarian Sciences, Vinnytsia State Agricultural Research Station, Vinnytsia, Ukraine (Central Forest and Steppe Region)

Variety: Liona, Super Elite

Soil type: gray podzolic (organic matter = 2.2%, hydrolyzed N = 8.4 mg/100 g soil, P = 15.8 mg/100 g soil, exchangeable K = 12.4 mg/100 g soil, pH = 5.5)

Previous crop: summer vetch

Planting date: October 9, 2009

Planting rate: 6 million seeds/ha

Soil preparation: disking to 6 to 8 cm, tillage to 22 cm, harrowing to 3 to 4 cm

Experimental design: A replicated field trial with Liona winter wheat was established using four rates of fertilizer and one Vitazyme treatment, to determine the yield, grain quality, and disease susceptibility of the crop in response to these treatments.

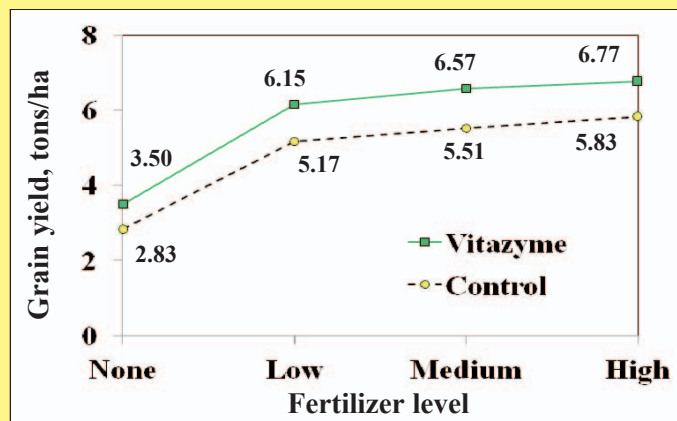
Treatment	Fertilizer	Vitazyme	Treatment	Fertilizer	Vitazyme
	kg/ha			kg/ha N-P <sub>2</sub> O <sub>5</sub> -K <sub>2</sub> O	
1	0	no	5	0	yes
2	65-30-45	no	6	65-30-45	yes
3	100-45-70	no	7	100-45-70	yes
4	130-60-90	no	8	130-60-90	yes

Fertilization: fall, 30-30-30 kg/ha N-P<sub>2</sub>O<sub>5</sub>-K<sub>2</sub>O tilled in; spring, 60 kg/ha N

Vitazyme application: (1) 1 liter/ha on the seeds at planting; (2) 1 liter/ha on the leaves in the spring

Yield results:

### Grain Yield



Note that at all fertilizer levels the Vitazyme addition markedly increased grain yield, especially at the zero rate, where a 24% yield increase resulted. The increase dropped a bit to a 16% yield increase at the highest fertilization rate. In all cases, fertilizer efficiency was improved with Vitazyme.

### Increase in grain yield with Vitazyme with fertilizers\*

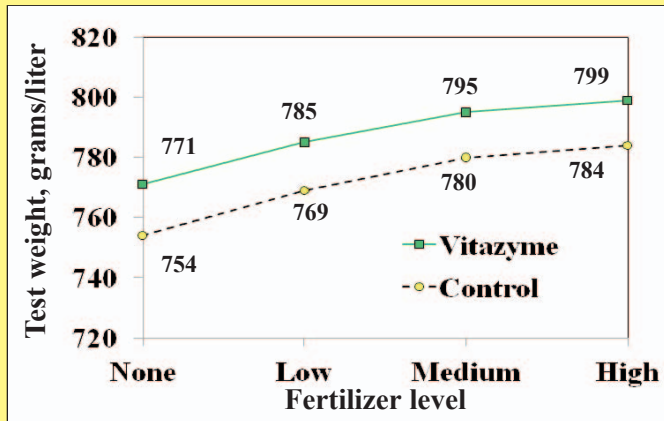
No fertilizer.....	0.67 ton/ha (+24%)
65-30-45 .....	0.98 ton/ha (+19%)
100-45-70 .....	1.01 tons/ha (+18%)
130-60-90 .....	0.94 ton/ha (+16%)

\*Comparisons are made at the same fertility level.

*Income results:* Using yields given above, the income was increased with Vitazyme by 817, 1,352, 1,401, and 1,286 hrn/ha from the lowest to the highest fertilizer rates, respectively, at the same fertilizer level.

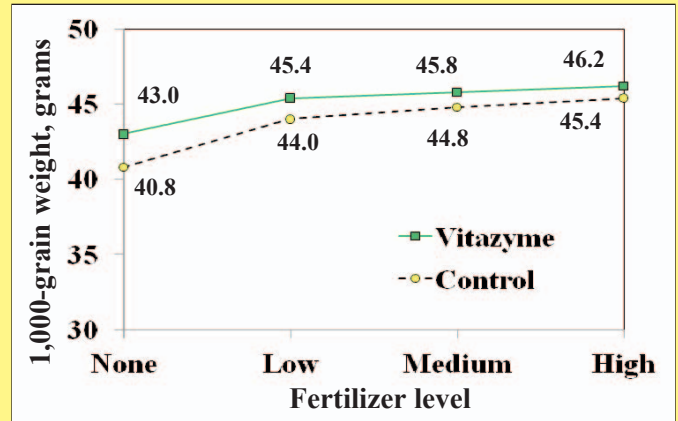
*Quality results:*

### Test Weight



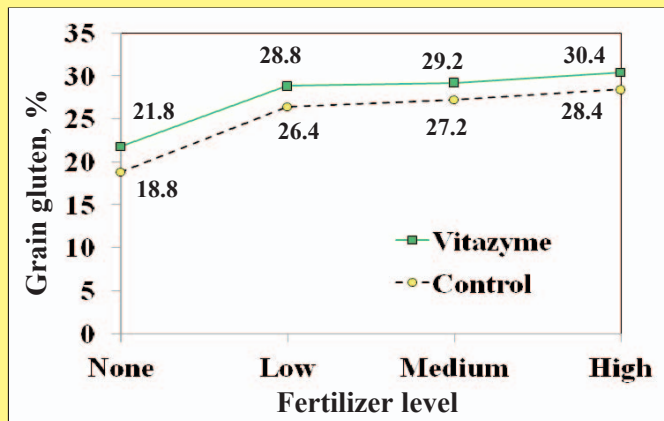
Vitazyme increased the grain density (grams/liter) successively above the untreated controls, at each fertilizer level, from 17 grams/liter at no fertilizer to 15 grams/liter at high fertilizer.

### 1,000-Grain Weight



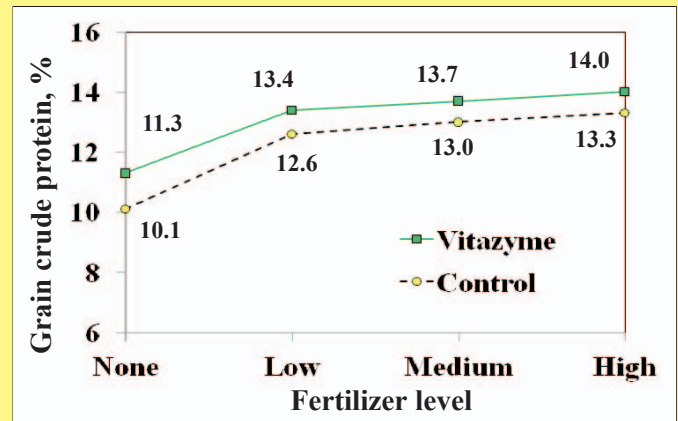
At each fertilizer level, Vitazyme improved the 1,000-grain weight, by from 2.2 grams at zero fertilizer to 0.8 gram at high fertilizer.

### Gluten



The gluten content of the grain increased by 3.0 percentage points at zero fertilizer, and by 2.0 percentage points at the high fertilizer level in response to Vitazyme.

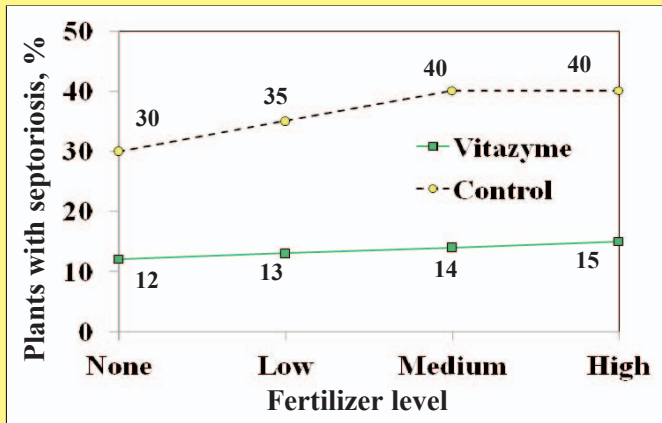
### Crude Protein



Vitazyme increased crude protein of the grain at each fertilizer level, by 1.2 percentage points at zero fertilizer to 0.7 percentage point at the highest fertilizer level.

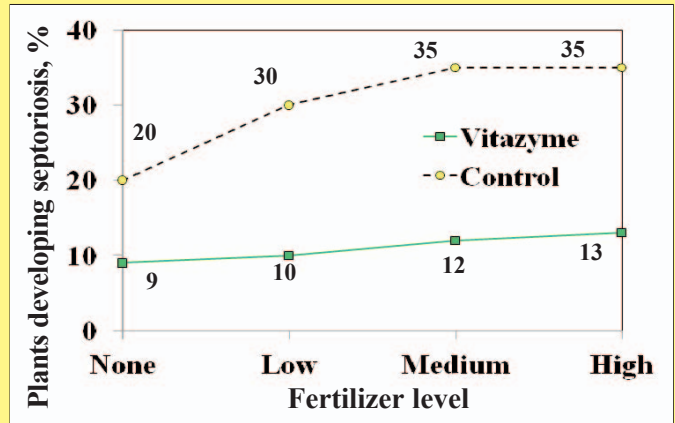
*Disease results:* Only septoriosi fungal disease was evaluated.

### Spike Septoriosi Spread



The spread of spike septoriosi was much higher with untreated wheat plants; Vitazyme had 18% fewer plants affected at zero fertilizer, but 25% fewer affected plants at high fertilizer levels.

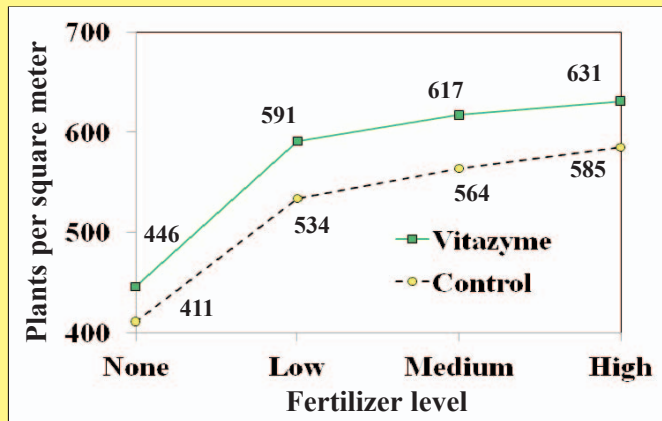
### Spike Septoriosi Development



Vitazyme greatly reduced the development of spike septoriosi at all fertilizer levels, by 11% less with no fertilizer to 23% less with the most fertilizer applied.

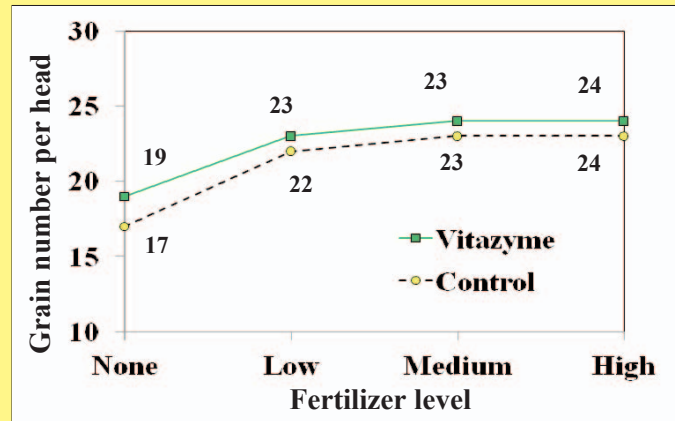
*Wheat structure results:*

### Plant Density



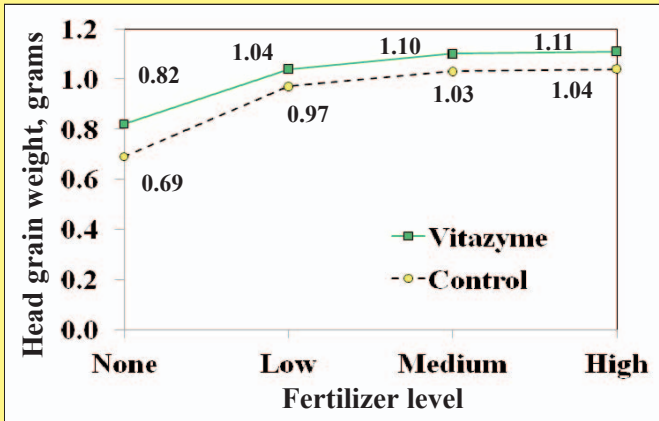
The seed and foliar treatments with Vitazyme increased the plant population at all fertilizer levels, by 35 plants/m<sup>2</sup> at no fertilizer and by 46 plants/m<sup>2</sup> at high fertilizer.

### Grains Per Head



The number of grains per head was slightly favored by Vitazyme at each fertilizer level, by about one grain per head.

## Grain Weight Per Head



Vitazyme consistently increased the weight of grain per head at each fertilizer level, from 0.13 gram/head at zero fertilizer to 0.07 gram/head at high fertilizer. This result came from more grains/head plus a higher grain weight with Vitazyme.

**Conclusion:** Vitazyme in this Ukrainian winter wheat trial significantly improved the yield, profitably, quality, fungal infection, and growth characteristics at four fertilizer levels. The improvements were consistent for all parameters, and are summarized below.

Parameter	Vitazyme effect	Parameter	Vitazyme effect
Grain yield	+16 to 24%	Septoriosis spread	-18 to 25%
Income	+817 to 1,401 hrn/ha	Septoriosis development	-11 to 23%
Grain test weight	+15 to 17 g/liter	Plant density	+ 35 to 46 plants/m <sup>2</sup>
1,000-grain weight	+0.8 to 2.2 g	Grains per head	+1 to 2 grains/head
Grain gluten	+2.0 to 3.0 %-points	Grain weight per head	+0.07 to 0.13 g/head
Crude protein	+0.7 to 1.2 %-points		

The data for this test show clearly that Vitazyme tends to improve crop yield, quality, and structural characteristics the most at the lower fertility levels (zero and 65-30-45 kg/ha N-P<sub>2</sub>O<sub>5</sub>-K<sub>2</sub>O), while reducing the development and spread of the head fungal disease septoriosis the most at higher fertilizer levels (100-45-70 and 130-60-90 kg/ha N-P<sub>2</sub>O<sub>5</sub>-K<sub>2</sub>O). These results display the great value of Vitazyme as a highly profitable crop amendment for Ukrainian winter wheat production.

**Vital Earth Resources**

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

**2010 Crop Results**

**Vitazyme on Wheat**

Farmer: Felipe Schmidt

Research organization: Syngenta

Location: Pailahueque, Chile

Variety: Caluga

Previous crop: oats

Planting date: June 5, 2009

Experimental design: A wheat field was divided into plots having Vitazyme treatment and no treatment for the purpose of evaluating the product's effects on wheat growth and yield, at both 100% and 50% nitrogen fertilization.

Treatment	Vitazyme rate*		Nitrogen % of optimum
	Preemergence	BBCH32	
	liters/ha	liters/ha	
1	1.0	0	100
2	1.5	0	100
3	1.0	1.0	100
4	1.5	1.5	100
5	1.5	0	50
6	1.5	1.5	50
7	0	0	100

\*Triacontanol concentration: 0.0022 g/liter; brassinosteroid concentration: 0.013 g/liter

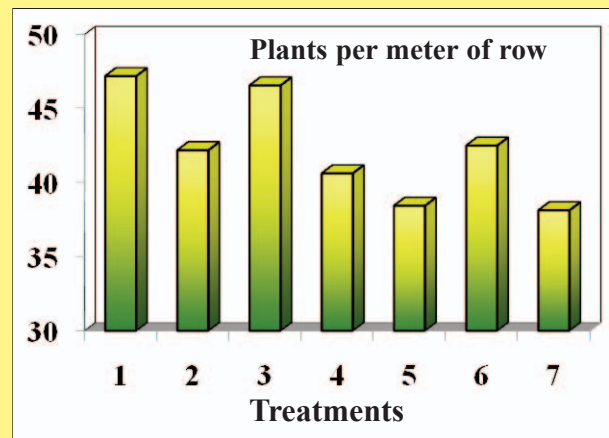
Fertilization: according to recommendations

Vitazyme application: (1) 1.0 or 1.5 liters/ha on the soil before emergence, on June 9, 2009; (2) 1.0 or 1.5 liters/ha on the leaves and soil at stage BBCH32, on October 5, 2009

Growth results:

**Plant Population At 35 Days After Planting**

No.	Treatment		N	Population	Change
	Vita early	Vita late			
	liters/ha		%	plants per meter	
1	1.0	0	100	47.19	9.06 (+24%)
2	1.5	0	100	42.19	4.06 (+11%)
3	1.0	1.0	100	46.56	8.43 (+22%)
4	1.5	1.5	100	40.63	2.50 (+7%)
5	1.5	0	50	38.44	0.31 (+1%)
6	1.5	1.5	50	42.50	4.37 (+11%)
7	0	0	100	38.13	---



### Increase in plant population with Vitazyme

#### 100% N

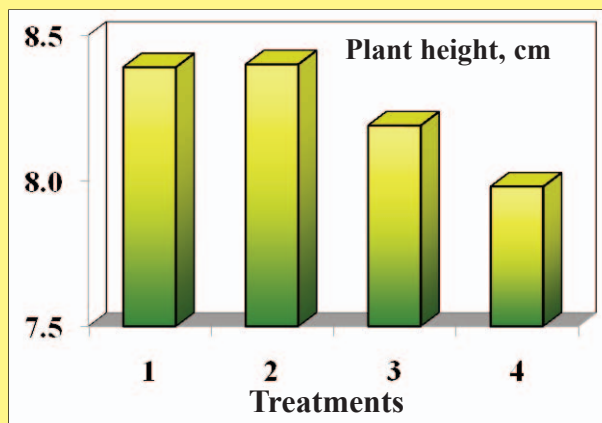
1.0 liter/ha early .....	24%
1.5 liter/ha early .....	11%
1.0 liter/ha twice .....	22%
1.5 liter/ha twice .....	7%

#### 50% N

1.5 liter/ha twice .....	11%
--------------------------	-----

### Plant Height At 59 Days After Planting

No.	Treatment		N %	Height cm	Change
	Vita early liters/ha	Vita late liters/ha			
1	1.0	0	100	8.39	0.41 (+5%)
2	1.5	0	100	8.40	0.42 (+5%)
5	1.5	0	50	8.19	0.21 (+3%)
7	0	0	100	7.98	---

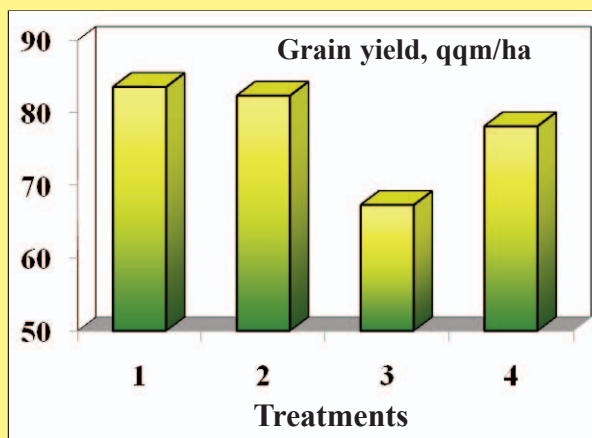


**Increase in plant height with Vitazyme: 3 to 5%**

### Yield results:

### Grain Yield

No.	Treatment		N %	Yield qqm/ha	Change qqm/ha
	Vita early liters/ha	Vita late liters/ha			
1	1.0	0	100	83.58	5.41 (+7%)
4	1.5	1.5	100	82.38	4.21 (+5%)
5	1.5	0	50	67.33	(-) 10.84 (-14%)
7	0	0	100	78.17	---



### Increase in wheat yield with Vitazyme

1.0 L/ha early .....	7%
1.5 L/ha twice .....	5%

**Conclusion:** In this wheat study with Vitazyme in Chile, using various 1.0 and 1.5 liter/ha applications, with a 50% fertilizer N application rate in some cases, all treatments improved plant population, by up to 24% with the 1 liter/ha spray before emergence. At 59 days after planting, the height of the plants was improved by 3 to 5% above the control, while the harvested yield increased by 7% (5.41 qqm/ha) for the 1 liter/ha application preemergent; the 1.5 liter/ha rate before emergence gave a similar yield increase. A fertilizer N reduction of 50%, with a 1.5 liters/ha application before emergence, produced a yield below the control; apparently the available N in the soil was not sufficient for a yield increase despite Vitazyme's ability to improve N efficiency. These results show the great utility of using this product to improve wheat production

**Vital Earth Resources**

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

**2010 Crop Results**

**Vitazyme on Wheat**  
*A Summary of Four Trials*

Research organization: Syngenta, Santiago, Chile

Experimental design: Four wheat field trials were set up in various locations across Chile, and are reported elsewhere. The purpose of the studies was to evaluate the effect of Vitazyme, applied at 1.0 or 1.5 liters/ha once or twice, with 50% or 100% fertilizer, on wheat yield.

Treatment	Vitazyme rate*		Nitrogen
	Preemergence	BBCH32	% of optimum
	liters/ha	liters/ha	
1	1.0	0	100
2	1.5	0	100
3	1.0	1.0	100
4	1.5	1.5	100
5	1.5	0	50
6	1.5	1.5	50
7	0	0	100

\*Triacontanol concentration: 0.0022 g/liter; brassinosteroid concentration: 0.013 g/liter

Fertilization: according to recommendations

Vitazyme application: (1) 1.0 or 1.5 liters/ha on the soil before emergence, on June 9, 2009; (2) 1.0 or 1.5 liters/ha on the leaves and soil at stage BBCH 32, on October 5, 2009.

Yield results: The following table summarizes the results of the four trials.

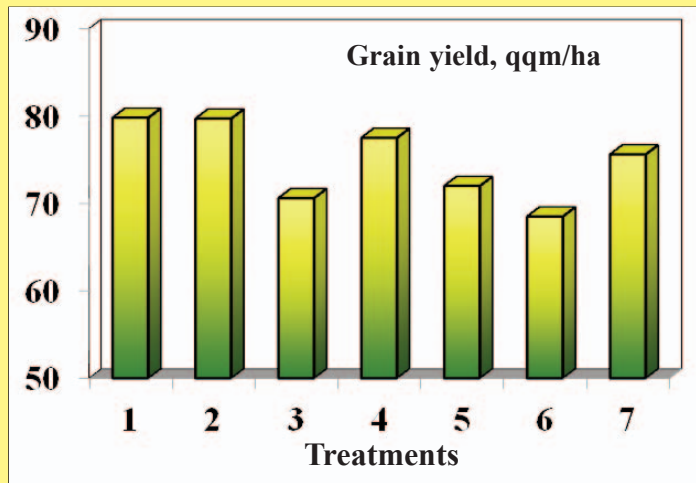
**Wheat Grain Yield**

No.	Treatment			Yield	Change
	Vita early	Vita late	N		
	cm	cm			
1	1.0	0	100	79.8	4.2 (+6%)
2	1.5	0	100	79.7	4.1 (+5%)
3	1.0	1.0	100	70.6	(-) 5.0 (-7%)
4	1.5	1.5	100	77.5	1.9 (+3%)
5	1.5	0	50	72.0	(-) 3.6 (-5%)
6	1.5	1.5	50	68.5	(-) 7.1 (-9%)
7	0	0	100	75.6	---

**Increase in wheat grain yield with Vitazyme**

**1.0 liter/ha early ..... 6%**  
**1.5 liters/ha early ..... 5%**  
**1.5 liters/ha twice ..... 3%**





Conclusion: These four Chilean wheat trials proved that only one Vitazyme application, at either 1.0 or 1.5 liters/ha, applied early in the growing season, was necessary to provoke yield increases (5 to 6%). Two 1.5 liter/ha applications, one early and one later, also increased the yield (3%). On average, reducing fertilizer N also brought a yield reduction, so under these Chilean conditions the ability of Vitazyme to improve N efficacy was inhibited by certain soil factors. These factors could relate to soil microbiology, soil organic matter, compaction, or other factors.

## Vital Earth Resources

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

# 2010 Crop Results

## Vitazyme on Wheat, Winter

Researcher: unknown  
Vinnitsia oblast, Kleban, Ukraine

Company testing: Ukrzernoprom AGRO

Location: Tulchin raion,

Variety: Zolotokolosa

Planting date: October 7, 2009

Planting rate: 6 million seeds/ha

Seedbed preparation: disking 6 to 8 cm deep, tillage 20 to 22 cm deep, and harrowing 4 to 5 cm deep (twice)

Previous crop: winter rape

Experimental design: A winter wheat field was divided into an untreated control plus two Vitazyme treatments to evaluate the product's effects on wheat yield, quality, and profitability.

**1. Control**

**2. Vitazyme, fall only**

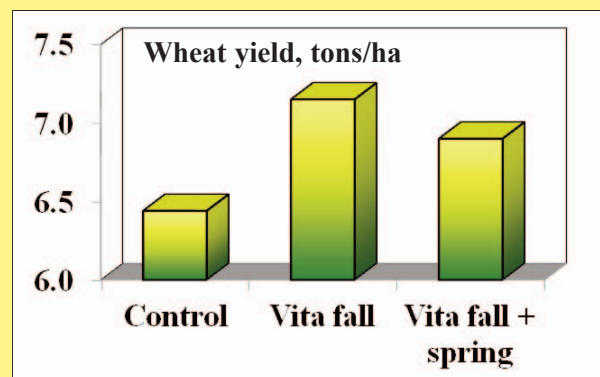
**3. Vitazyme, fall and spring**

Fertilization: in the spring, 20-60-80 kg/ha of N-P<sub>2</sub>O<sub>5</sub>-K<sub>2</sub>O

Vitazyme application: Treatments 2 and 3 received 1 liter/ha in the fall on September 9, 2009, and Treatment 3 received an additional 1 liter/ha on the leaves and soil on June 5, 2010.

Yield results:

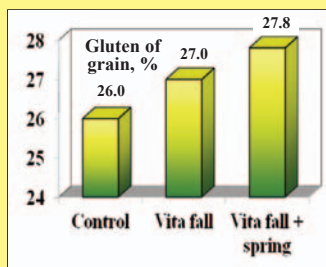
Treatment	Grain yield tons/ha	Change tons/ha
1. Control	6.44	---
2. Vitazyme, fall	7.15	0.71 (+11%)
3. Vitazyme, fall + spring	6.90	0.46 (+7%)



**Increase in yield with Vitazyme:  
7 to 11%**

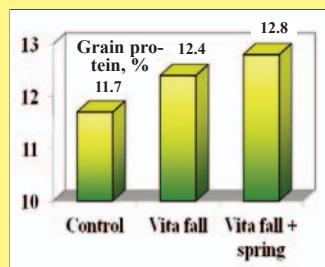
Grain quality results:

### Gluten Content



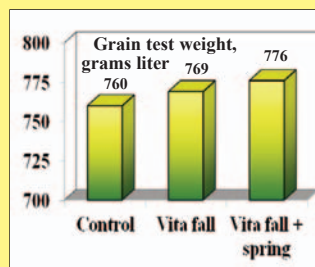
**Increase with Vitazyme**  
Vitazyme once ...1.0%-point  
Vitazyme twice ..1.8%-point

### Crude Protein



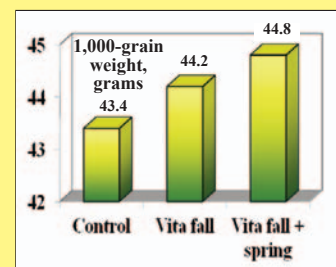
**Increase with Vitazyme**  
Vitazyme once ... 0.7%-point  
Vitazyme twice ...1.1%-point

### Test Weight



**Increase with Vitazyme**  
Vitazyme once ..... 9 grams/l  
Vitazyme twice ... 16 grams/l

### 1,000-Grain Weight



**Increase with Vitazyme**  
Vitazyme once ..... 0.8 gram  
Vitazyme twice ... 1.4 grams

*Income results:* A single Vitazyme application increased income by 1,106 hrn/ha, while two applications increased income by 494 hrn/ha.

*Conclusion:* A winter wheat trial in Ukraine, using Vitazyme at 1 liter/ha in the fall or 1 liter/ha in the fall as well as in the spring, proved that the yield was increased by 11% with one application, but 7% with two. The income was increased by 1,106 hrn/ha for one application, and by 494 hrn/ha with the two treatments. Grain quality was improved the most with two Vitazyme applications, up to 1.8%-points for gluten, 1.1%-points for protein, 16 grams/liter for test weight, and 1.4 grams for 1,000-grain weight; a single application provided consistent increases in quality parameters, only slightly less than those from two applications.