VITAZYME®

2008 Field Trial Results

A SUMMARY OF EXPERIMENTS USING VITAZYME SOIL AND PLANT BIOSTIMULANT ON FIELD, ORCHARD, AND GREENHOUSE CROPS

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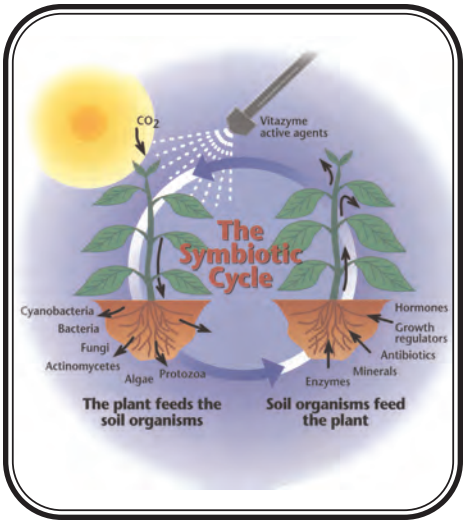
2008 Vitazyme Field Trial Results

For the thirteenth consecutive year a summary of Vitazyme field trials is presented to convey the great value of this crop biostimulant to enhance crop production. Over a wide variety of crops, soils, and climatic conditions, various production programs using Vitazyme have performed extremely well across the United States and in many foreign countries. The consistency of crop responses has been noteworthy.

For those unfamiliar with Vitazyme soil and plant biostimulant and its recommended program, please review the information given below to understand how the material works within the plant-soil system.

Improved Symbiosis: The Secret of Vitazyme's Action

All plants that grow in soils develop an intimate relationship between the roots and the organisms that populate the root zone. The teeming billions of bacteria, fungi, algae, cyanobacteria, protozoa, and other organisms



that grow along the root surfaces — the rhizosphere — are much more plentiful than in the bulk of the soil. This is because roots feed the organisms with dead root epidermal cells as well as compounds exuded from the roots themselves. The plant may inject up to 25% or more of its energy, fixed in the leaves as carbohydrates, amino acids, and other compounds, into the root zone to feed these organisms, for a very good purpose.

The microorganisms which feed on these exuded carbon compounds along the root surfaces benefit the plant in many ways creating a beautiful symbiotic relationship. The plant feeds the bacteria, fungi, algae, and other microbial species in the rhizosphere, which in turn secrete enzymes, organic acids, antibiotics, growth regulators, hormones, and other substances which are absorbed by the roots and transported to the leaves. The acids help dissolve essential minerals, and reduced iron releases anionic elements. Organism types include mycorrhizae, cyanobacteria and various other bacteria, fungi, and actinomycetes.

Vitazyme contains "metabolic triggers" that stimulate the plant to photosynthesize more efficiently, fixing more sunlight energy in the form of carbon compounds to increase the transfer of carbohydrates, proteins, and other growth substances into the root zone. These active agents may enter the plant through either the leaves or the roots. Root growth and exudation are both enhanced. This enhancement activates the metabolism of the teeming population of rhizosphere organisms to a higher level, triggering a greater synthesis of growth-benefiting compounds and a faster release of minerals for plant uptake. Thus the plant-microbial symbiosis is stimulated.

Very small amounts of these metabolic triggers in Vitazyme are needed to greatly improve plant and rhizosphere microbe response. This is because of the **enzyme cascade effect.** Successive tiers of enzymes are activated in plant and microbial tissues to give a large physiological response from very little activator.

In short, Vitazyme enables the plant to better express its genetic potential by reducing the stresses that repress that expression.

Vitazyme should be used within the context of a complete crop management system, never by itself. Vitazyme will optimize your existing program by enabling the plant to grow better, thus increasing productivity. Follow this easy-to-use five-point program.

1 If possible, analyze the soil at a reputable laboratory and correct mineral deficiencies and imbalances with expert consultation.

2 Reduce nitrogen fertilizer applications for non-legumes using this test:

Soil Organic Matter			Previous Crop		Compaction		Soil NO_3-N Test		
Low(<1.5%)	Medium(1.5-3%)	High(>3%)	Non-legume	Legume	Much	Little	Low	Medium	High
1	2	3	1	3	1	3	2	4	6

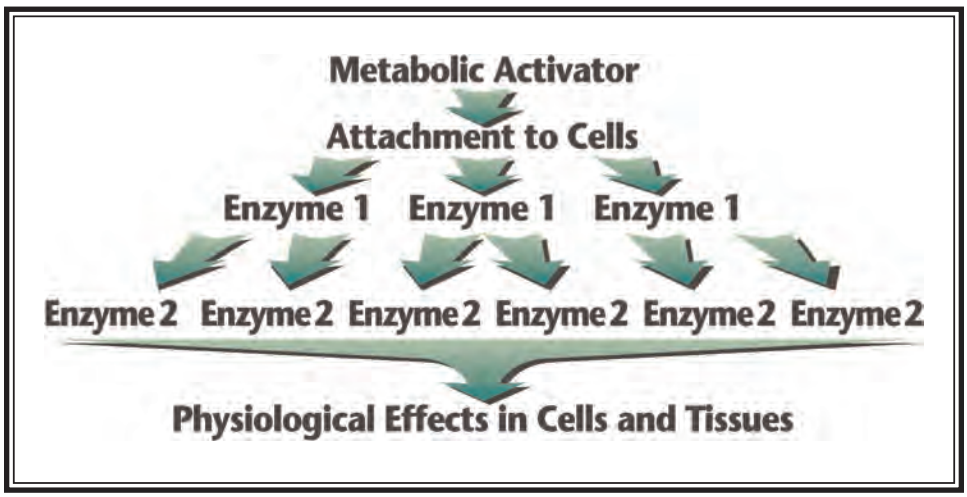
Total additive score:	15	14	13	12	11	10	9	8	7	6	5
Apply this % of optimum N:	←	50-60%		→	←	60-70%		→	←	70-80%	→

Reduce the application each time the fertilizer normally is applied. Legumes normally need no added nitrogen. Vitazyme will accelerate legume nitrogen fixation.

3 Treat the seeds or transplant roots, if possible at planting. Treat seeds with a dilute Vitazyme solution, such as 1 liter of a 5% solution for every 50 kg of seed. Mix the seeds thoroughly in a seed or cement mixer or on a tarp. **For excellent results apply the solution directly on the seed row with a planting attachment. Dip or spray transplant roots with a 1% or 2% solution.**

4 Apply Vitazyme to the soil and/or foliage. Follow instructions for each crop. In most cases from 10 to 20 oz/acre can be applied per application at one to three times during the cropping cycle. A fall application on stubble is effective to accelerate residue breakdown.

5 Integrate other sound, sustainable management practices into a total program. Use crop rotations, minimum tillage, soil conservation practices, and adapted plant varieties.



Vitazyme Highlights for 2008

Once again Vitazyme performed excellently across a wide range of soils and climates. Despite adverse weather conditions in some parts of the nation and overseas, the product once again boosted yields in trials on many crops. Note the following studies for 2008, and in particular these major highlights.

Some Highlights for 2008

1 Ukrainian studies on winter canola, winter wheat, spring barley, potatoes, and tomatoes showed consistent yield increases of 7 to 24%. Two applications at 1 liter/ha on canola doubled the 9% yield increase achieved from one application.

2 In Viet Nam, equally consistent yield increases of 11 to 13% were noted with rice, 8 to 10% increases with cabbage, and 12% increases with tea. These results followed excellent test data for rice during the 2007 growing season.

3 Grapes produced admirably in tests with Vitazyme in the California wine country, the San Jaoquin Valley of California, southwestern Michigan, and Ukraine. Of special note, in Michigan the brix level of grapes was raised by 1.8 percentage points with the program, while in Ukraine grape yields were boosted by 28%. Year six of a raisin grape study in California proved that Vitazyme plus an herbal fungal control agent, based on melaleuca, exceeded all other treatments.

4 A Master's Degree thesis was written at Tarleton State University concerning Vitazyme as a fertilizer supplement in establishing and maintaining turf grasses.

5 Results with winter wheat in west Texas and Ukraine were excellent. One Texas trial produced a 29% grain increase with two 13 oz/acre applications.

6 An oil palm study in Ecuador proved the utility of Vitazyme, alone or together with other products, to greatly stimulate tree root growth and yield potential. A high 0.196 root growth/treatment cost figure was obtained with the full program.

7 Of considerable interest is the fact that five Vitazyme users for bermudagrass in eastern Texas discovered that armyworm damage was virtually nonexistant wherever the product was applied to their fields; neighbors' fields alongside in many cases has serious losses from the larvae, but Vitazyme gave protection from the insect invasion. More research needs to be done on this observation, very likely a result of lower free amino acid levels and a higher sugar content of the treated leaves, .

8 Fruit results continue to be extremely positive. In New York, an apple study produced a 34% increase in yield and a $3,341/acre increase in income, with higher brix and fruit pressure as well.

Vitazyme Field Tests for 2008

Apples

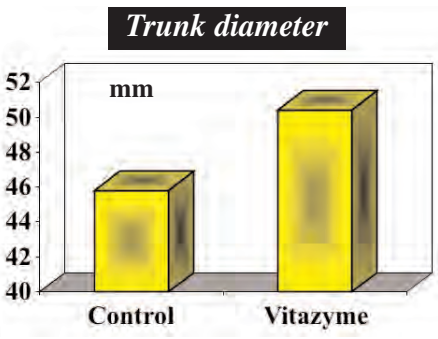
Researcher: Robert deBorst, Mantissa Corporation
Location: Cambridge, New Zealand *Variety*: unknown
Tree age: young bearing trees *Fertilization*: unknown
Experimental design: A second-year apple orchard was divided into Vitazyme treated and untreated areas to determine the effect of the product on tree devlopment, as measured by trunk diameter.

1. Control **2. Vitazyme**

Vitazyme application: 1 liter/ha on the leaves and over the root zone at (1) flowering, (2) fruit set, (3) fruitlets 2 to 3 cm., and (4) three weeks before harvest
Measurement time: post-harvest, after leaf fall

Treatment	Trunk diameter*	Change
	mm	mm
Control 1	45.75	
Control 2	45.19	
Control 3	45.23	
Control 4	47.12	
Mean	**45.82 b**	**—**
Vitazyme 1	48.94	
Vitazyme 2	49.24	
Vitazyme 3	53.86	
Vitazyme 4	49.63	
Mean	**50.42 a**	**4.6 (+10%)**
Main effects P	0.01	
CV	3.65%	
$LSD_{0.05}$	3.04	

*Measured at the same height for each tree. Data is treated as a completely randomized design. Means followed by the same letter are not significantly different at P=0.05, according to the Student-Newman-Keuls Test.



Conclusions: In this New Zealand apple study, four applications of Vitazyme markedly increased trunk diameter of these young trees by 10% above the control during a single growing season. The yield of fruit was not measured.

Untreated second-year apples in New Zealand produced the typical branching noted in this photo. See below.

Vitazyme treatment on an adjoining row of this orchard caused much better branching and a major improvement in trunk girth.

- ***Increase in trunk diameter in one season: 10%***

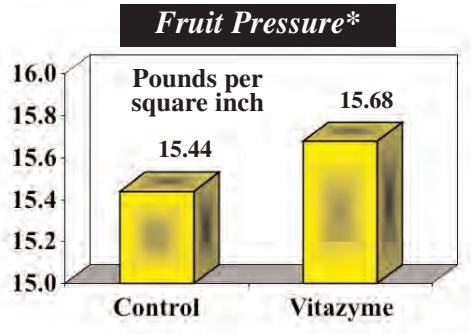
Apples

Year Three of a Continuing Study

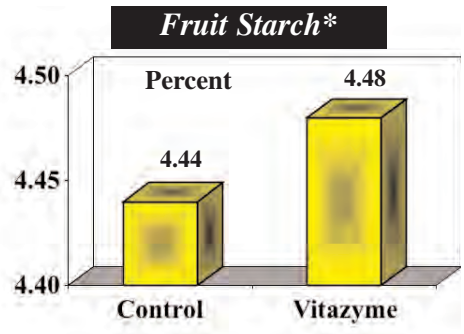
Researcher: Jim Misiti *Grower*: Oded Kalir *Location*: Albion, New York
Variety: Ida Red *Soil type*: unknown *Tree age*: mature grove
Experimental design: A 5-acre orchard was divided, and one part was treated with Vitazyme while the other part was left untreated. The purpose of the study was to evaluate the product's effects on apple yield and quality.

1. Control **2. Vitazyme**

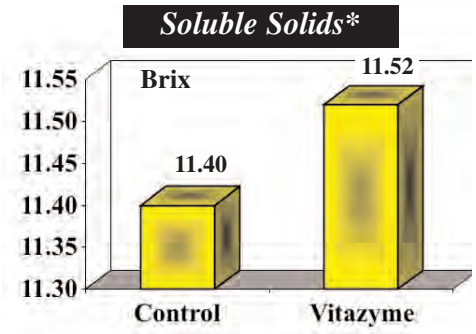
Fertilization: unknown
Vitazyme application: four foliar applications, each at 16 oz/acre; (1) pink bloom on May 1, (2) petal fall on May 21, (3) first cover on May 31, and (4) August 10.
Harvest date: November 18, 2008
Quality results: Each value is the average of analyses performed on 50 fruit selected for each treatment on October 14.



*Average of 50 fruit.



*Average of 50 fruit.



*Average of 50 fruit.

Vitazyme increased the strength of apple tissue cell walls to increase fruit pressure, while the starch content was also increased slightly. **Soluble solids were also increased with Vitazyme, quite remarkable since the much greater fruit load did not reduce sugars in the fruit tissues.** Thus, Vitazyme was apparently stimulating photosynthesis to fix more carbon from the air while enhancing root uptake of nutrients.

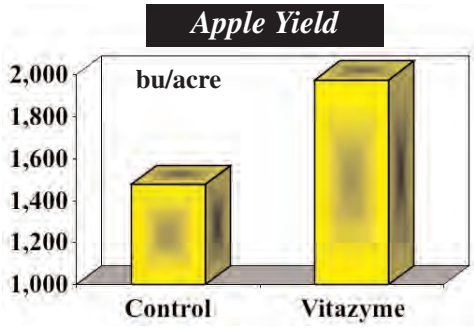

Notice the vigorous new growth for these Ida Red apple trees at Albion, New York, as a result of four foliar Vitazyme treatments.


With more chlorophyll production and sunlight and CO_2 fixation from Vitazyme, total apple tonnage increased a remarkable 34% in 2008.

Yield results:

Treatment	Total yield	Trees	Yield	Trees	Yield	Increase	Income*
	bu	number	bu/acre	trees/acre	bu/acre	bu/acre	$/acre
Control	1,560	211	7.39	200	1,478.67	——	9,936.68
Vitazyme	1.640	166	9.88	200	1,975.90	497.23 (+34%)	13,278.07

*Based on a value of $6.72/bu



Conclusions: This apple study in western New York proved that four applications of Vitazyme increased apple yield by 34%, producing $3,341.39/acre more income. At the same time there was an increase in sugars with Vitazyme despite a much heavier fruit load. The product also improved fruit pressure through the development of stronger cell walls, and increased fruit starch. These results show the very great value of Vitazyme to increase apple yield and quality in western New York.

- ***Increase in fruit pressure: 0.24 percentage point***
- ***Decrease in fruit starch: 0.04 percentage point***
- ***Increase in fruit brix: 0.12 percentage point***
- ***Increase in apple yield: 34%***
- ***Increase in income: $3,341.39/acre***

Bermudagrass

Effects on Army Worm Infestations — a Testimonial

Farmer: Mike Spencer *Location*: Gilmer, Texas Soil type: fine sandy loam

September 23, 2008

To whom it may concern,

I am using Forage Booster and Vitazyme on approximately 130 acres of hay land. I use 500 gallons of water per 2.5 gallons of Vitazyme and 125 lbs of Forage Booster per 25 acres, per application. We use two applications per cutting on a two week interval.

On the second cutting, we averaged three rolls of hay per acre. However, we did run 10 days to two weeks long on the cutting due to some late rains. The rolls were 5x5.5 feet.

The army worm issue seems to be another plus for the product. ***We saw no army worms in any of the pastures or meadows fertilized with the Forage Booster.*** However, on a 20 acre field that we did not fertilize often, the third cutting had many army worms. This field had about two week's regrowth and the worms ate about a third of it overnight.

Mike Spencer

The larvae of the fall armyworm can devastate a bermudagrass field overnight. Vitazyme on several fields virtually eliminated the problem.

Bermudagrass

A Thesis for the Degree of Master of Science: *Evaluation of Vitazyme As a Fertilizer Supplement in Establishing and Maintaining Bermudagrass*

Researcher: Jimmie Jackson Rose
Location: Tarleton State Turfgrass Field Laboratory, Tarleton State University, Stephenville, Texas
Varieties: Princess 77 bermudagrass, TifSport bermudagrass, common bermudagrass
Abstract: "Vitazyme has been demonstrated to increase yield in row crops. However, effects of Vitazyme in turfgrass have not been documented. Vitazyme was applied at 13 fl oz/acre and 26 fl oz/acre with and without complete fertilizer to seeded Princess 77 bermudagrass, established TifSport bermudagrass, established Princess bermudagrass at the Tarleton State Turfgrass Field Laboratory, and established common bermudagrass at a local golf course. In the seeded trial, Vitazyme in combination with fertilizer increased quality, percent cover, and density compared to the nontreated. Differences were noted between fertilized and non-fertilized treatments for quality in TifSport and established Princess 77 bermudagrass trials. Significant differences among most treatments were determined using a Field Scout 1000 Chlorophyll Meter."
Treatments: 1. Fertilizer (Lesco 18-24-12% N-P_2O_5-K_2O at seeding to apply 1 lb N/1,000 $ft.^2$; also applied at the same rate monthly from June to October)
2. Fertilizer + Vitazyme (13 oz/acre on June 14, July 25, August 2, September 18, and October 9)
3. Fertilizer + Vitazyme (26 oz/acre on the same dates as for 2)
4. Vitazyme only at 13 oz/acre (same dates as for 2)
5. Vitazyme only at 26 oz/acre (same dates as for 2)
6. No fertilizer or Vitazyme

Selected Data from the Thesis

- **Root mass (dry) of seeded Princess 77 bermudagrass (2005)**
  When the Vitazyme treatments were compared to fertilizer alone, bermudagrass treated with only fertilizer had statistically significantly less root biomass than all Vitazyme treatments except for Vitazyme alone at 26 oz/acre. Bermudagrass treated only with Vitazyme at 13

In this turf trial, bermudagrass treated with fertilizer (right) is shown to be greener and denser; Vitazyme has been applied to both.

Another plot comparison at Tarleton State shows the effect of Vitazyme on fertilized grass (right) versus no Vitazyme (left).

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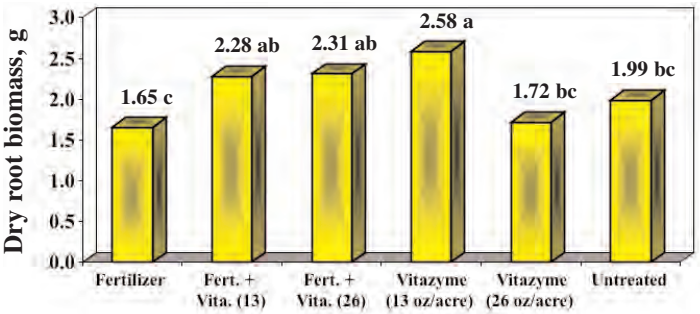
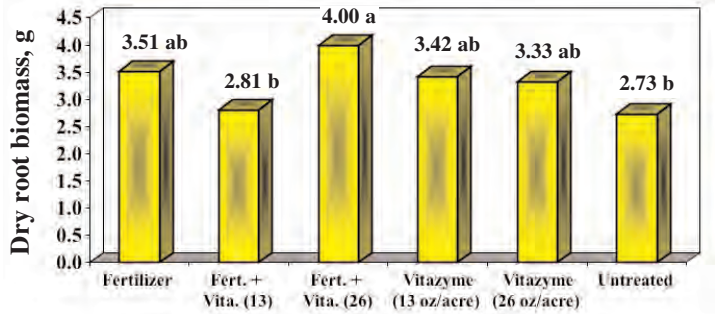
oz/acre had significantly higher mean root biomass than bermudagrass treated with Vitazyme at 26 oz/acre, the untreated, and fertilizer alone. The mean root weight for the fertilizer alone treatment was the lowest recorded value. In addition, roots from the Vitazyme treated plots were observed to be surrounded by a "tube" of soil, which suggests a rhizospheric support system emanating from the root; this tube was not observed in other treatment samples.



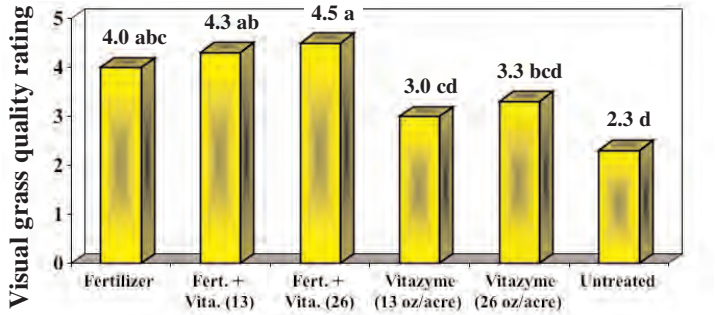
Means followed by the same letter are not significantly different at P=0.10.

- **Root mass (dry) of seeded Princess 77 bermudagrass (2006)**
  In the seeded Princes 77 bermudagrass trial for 2006, dry root biomass for cores from plots treated with fertilizer in combination with Vitazyme at 6 oz/acre were statistically greater than fertilizer in combination with Vitazyme at 13 oz/acre and the control plots.



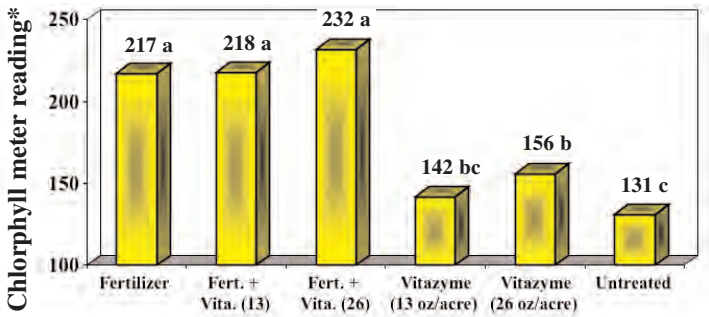
Means followed by the same letter are not significantly different at P=0.10.

- **Visual quality of seeded Princess 77 bermudagrass (11/16/2006)**
  Vitazyme at both 13 and 26 oz.acre increased the visual quality of the Princess 77 bermudagrass above the fertilizer alone or the untreated turf.



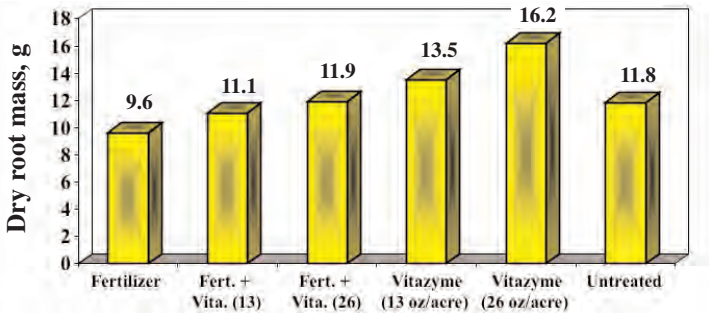
Means followed by the same letter are not significantly different at P=0.10.

- **Chlorophyll indices of Princess 77 bermudagrass treatments (11/17/2006)**
  These data are for one day of evaluation in November of 2006. During all times of evaluation, from August 31 to December 1, significant differences occurred among the six treatments.

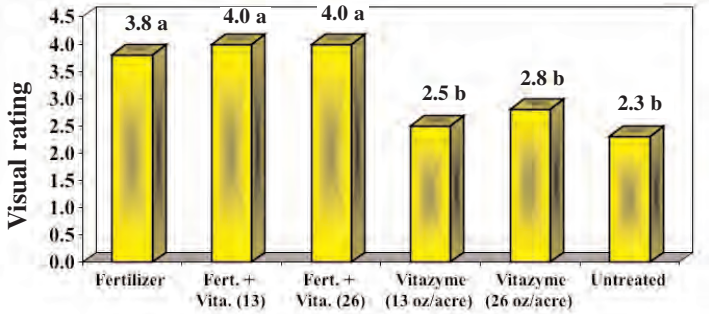


Means followed by the same letter are not significantly different at P=0.10.
*0 = no green light reflectance; 999 = complete green light reflectance

- **Root mass (dry) of established TifSport bermudagrass (2006)**
  Although the dry root mass of the various TifSport bermudagrass treatments did not show significant differences, the differences were sizable, the Vitazyme treatments alone showing the greatest root masses.

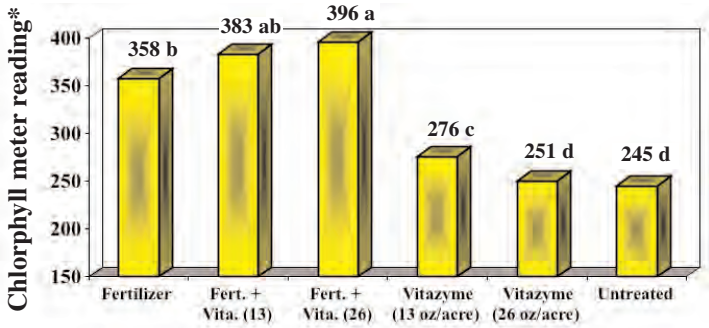


- **Visual quality of TifSport bermudagrass (11/16/2006)**
  In this trial, Vitazyme increased the visual quality of TifSport bermudagrass for both the fertilized and unfertilized plots. One date has been selected to show here.



Means followed by the same letter are not significantly different at P=0.10.
*Rating of 1 for dead or absent turf; 10 for ideal turf.

- **Chlorophyll indices of TifSport bermudagrass (11/27/2006)**
  With or without fertilizer, Vitazyme at both levels increased — sometimes significantly — the chlorophyll content of the leaves compared to the controls.



Means followed by the same letter are not significantly different at P=0.10.
*0 = no green light reflectance; 999 = complete green light reflectance

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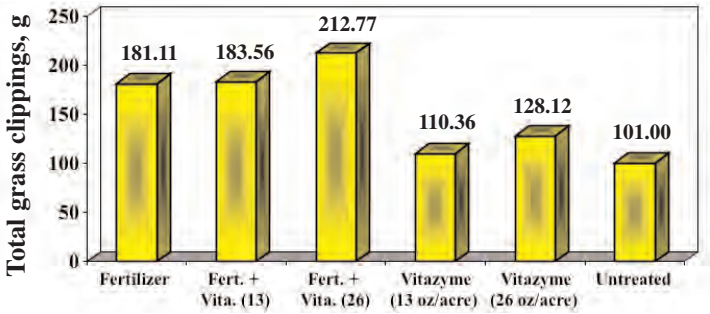
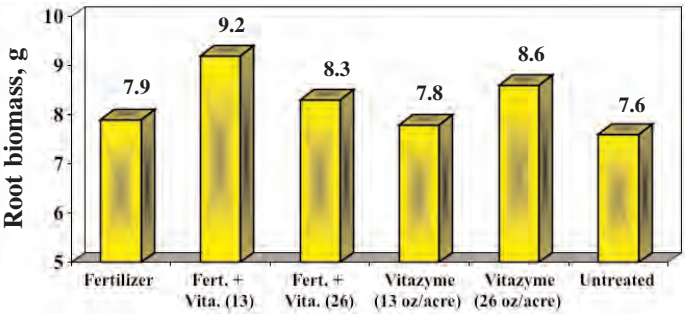
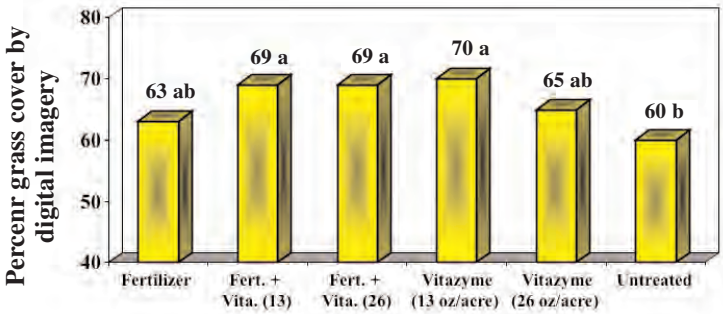
- **Clipping weights of established TifSport bermudagrass (2006)**
  The values given below are the totals of all 19 readings of grass clippings taken from June 19 to October 16, showing that Vitazyme increased the total grass growth versus the untreated controls.



- **Root mass (dry) of established Princess 77 bermudagrass (2006)**
  The treatment with the greatest mean root mass was fertilizer plus Vitazyme at 13 oz/acre, and the lowest was with the untreated grass. Vitazyme always increased root mass above the controls.

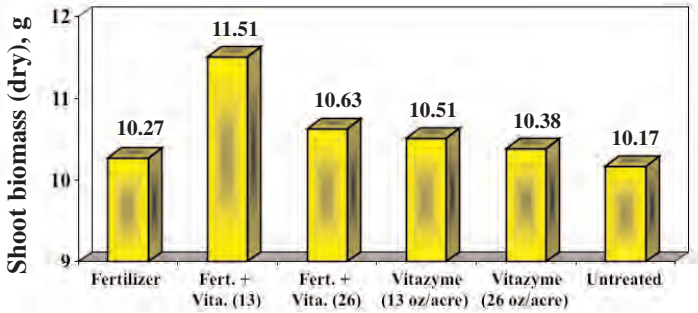


- **Percent turf cover by digital image analysis of seeded Princess 77 bermudagrass (12/2/2006)**
  At the end of the growing season the percent leaf cover, as determined by digital image analysis, revealed that Vitazyme, both with and without fertilizer, increased the grass cover. This increase in grass cover with Vitazyme appeared to be accentuated as the season progressed.

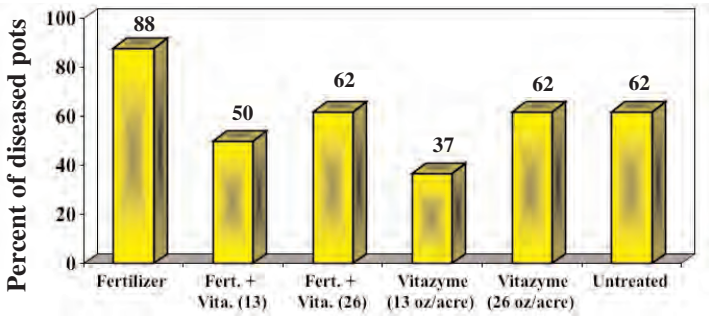


Means followed by the same letter are not significantly different at P=0.10.

- **Shoot biomass (dry) for seeded Princess 77 bermudagrass, greenhouse trial (2006)**
  While differences in means were not significant due to high experimental error, yet Vitazyme at both rates, and in both the fertilized and unfertilized Princess 77 treatments, increased dry shoot biomass.



- **Percent of diseased pots in a seeded Princess 77 greenhouse trial (2006)**
  Of great interest in this trial was the fact that the 13 oz/acre rate of Vitazyme caused by far the lowest incidence of plant disease for both the fertilized and unfertilized Princess 77 bermudagrass.



Disease incidence decrease in percentage points with 13 oz/acre of Vitazyme

With fertilizer	*38*
Without fertilizer	*25*

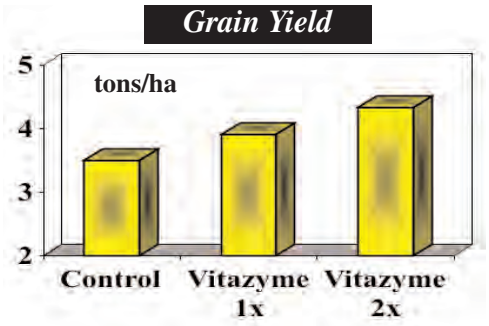
Vitazyme application to bermudagrass stimulates both roots and tops, from an initial increase in photosynthetic capacity of the leaves.

<u>*Conclusions, quoted from the thesis*</u>: Fertilizer treatments significantly improved color and percentage cover visually, percentage cover by digital image analysis (DIA), shoot clipping biomass, and chlorophyll indices compared to treatments not containing fertilizer. Fertilized plots had higher quality ratings later into the growing season than non-fertilized plots. Vitazyme in combination with a complete fertilizer significantly improved color, percentage cover, and density of Princess 77 seeded bermudagrass. However, the effects of Vitazyme in combination with a complete fertilizer were not significantly different from fertilizer alone in many instances. Vitazyme at the label rate alone did not significantly increase root biomass compared to the nontreated and fertilizer alone; however, Vitazyme treatments had greater root biomass than the non-treated in the 2005 seeded Princess 77 bermudagrass and the 2006 established Princess 77 bermudagrass. Use of DIA did not show many significant differences between fertilizer in combination with Vitazyme and fertilizer alone when other methods could not.

Spring Barley

Notice the much better rooting, and consequently denser leaf growth and heading, for this barley comparison. Better nutrient utilization is apparent from this test.

Researchers: O.V. Kornijchuk, V. V. Plotnikov, and agronomic scientists
Organization: Vinnytsia State Agricultural Experiment Station of Forage Institute, Ukraine Academy of Agrarian Sciences, Vinnytsia, Ukraine
Location: Ukraine central forest – steppe area near Vinnytsia
Variety: Vinnytsia 28 *Seeding rate*: 6 mil/ha *Planting date*: unknown
Soil Type: gray forest steppe soil; in the 0-30 cm layer, 2.2% organic matter, 8.4 mg/100 g of soil "hydrolyzed nitrogen", 15.8 mg/100 g of soil phosphorus, 12.4 mg/100 g of soil exchangeable potassium, and pH = 5.5.
Previous crop: spring vetch *Tillage*: tilled to 4-5 cm.
Experimental design: A uniform field area was selected to place 1.0 ha plots, replicated four times, over the test area. The objective was to determine if Vitazyme could favorably influence crop yields for this gray forest soil area of Ukraine.
1. Control 2. Vitazyme applied once 3. Vitazyme applied twice
Fertilization: In the fall of 2007 a broadcast application of 30-60-90 kg/ha N-P_2O_5-K_2O was made. In the spring, 120 kg/ha of nitrogen was applied at two times (50 and 70 kg/ha).



Treatment	Grain yield	Yield change	
	tons/ha	tons/ha	%
1. Control	3.50	—	—
2. Vitazyme once	3.90	+0.40	+11%
3. Vitazyme twice	4.33	+0.83	+24%

Increase in barley yield
Vitazyme once ..... +11%
Vitazyme twice ..... +24%

Vitazyme application: 1 liter/ha applied on June 12 for Treatment 2, and on May 29 and June 12, 2008, for Treatment 3
Harvest date: unknown
Yield results: Vitazyme applied once provided a sizable 11% yield increase, whereas two applications gave a 24% increase.
Quality results: Vitazyme improved both the "hatypa" and test weight of barley grain, especially with two applications.

Treatment	"Hatypa"	Change	Weight of 100 grains	Change
	r/n	r/n	grams	grams
1. Control	649	—	47	—
2. Vitazyme once	659	+10	48	+1
3. Vitazyme twice	662	+13	51	+4

Increase in "hatypa" with Vitazyme
Vitazyme once ..... +10
Vitazyme twice ..... +23

Income results: Based on the current grain price, the increases in income from Vitazyme for the two treatments were as follows:
Vitazyme once ..... 234 hrn/ha
Vitazyme twice ..... 495 hrn/ha

Increase in grain weight with Vitazyme
Vitazyme once ..... +1
Vitazyme twice ..... +4

Conclusions: In this Ukraine barley test, conducted on a gray forest-steppe soil, Vitazyme increased grain yield by 11% for one application and 24% for two applications. Likewise, grain quality was substantially improved by Vitazyme application, considering both "hatypa" and grain weight, especially with two applications. Income was likewise improved substantially, by 234 hrn/ha with one application and by 495 hrn/ha with two. These results show that Vitazyme is a highly viable crop input for barley farmers in Ukraine.

Bush Beans

A Greenhouse Study

Researcher: Paul W. Syltie, Ph.D.
Location: Vital Earth Resources Research Greenhouse, Gladewater, Texas *Variety*: Blue Lake
Planting date: January 31, 2008 *Soil type*: silt loam
Pot size: 1 gallon
Planting rate: 10 seeds/pot, thinned to three plants
Watering: on-demand *Temperature*: 55 to 85°F
Planting depth: 0.5 inch
Experimental design: A replicated greenhouse pot study was designed to evaluate the effect of Vitazyme, Cold Start, and a seawater concentrate on the growth and development of bush beans. Ten treatments with six replicates were utilized, with different propor-

Treatment	Vitazyme	Seawater	Cold Start
	% of solution		
1	0	0	0
2 (13 oz/acre)	100	0	0
3 (13 oz/acre)	90	10	0
4 (13 oz/acre)	70	30	0
5 (13 oz/acre)	50	50	0
6 (13 oz/acre)	30	70	0
7 (13 oz/acre)	10	90	0
8 (13 oz/acre)	0	100	0
9 (26 oz/acre)	50	50	0
10 (13 oz/acre)	0	0	100

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tions of Vitazyme and seawater concentrate for eight of the treatments. The data were analyzed using Analysis of Variance with CoHort software.

Vitazyme and Seawater applications: Both products were applied at 13 oz/acre total (1 liter/ha), with the exception of Treatment 9 which received twice this amount. The applications were made using 100 ml of a 0.0016% solution to achieve the 13 oz/acre rate, applied to the soil surface of the pots after planting.

Harvest date: On March 5, 33 days after planting, the roots of the plants were washed free of soil, the maximum height of each plant was measured, and the three plants from each pot were placed in a drying oven at about 50°C.

Plant height results:

Treatment	Plant height	Height change*
	cm	cm
2 (100% Vitazyme)	41.0 a	1.5 (+4%)
5 (50:50 Vita:Sea)	40.7 a	1.2 (+3%)
8 (100% Seawater)	40.6 a	1.1 (+3%)
10 (100% Cold Start)	39.8 ab	0.3 (+1%)
1 (Control)	39.5 ab	——
9 (2x 50:50 Vita:Sea)	39.1 ab	(-) 0.4 (-1%)
3 (90:10 Vita:Sea)	38.9 ab	(-) 0.6 (-2%)
4 (70:30 Vita:Sea)	38.4 ab	(-) 1.1 (-3%)
6 (30:70 Vita:Sea)	37.7 b	(-) 1.8 (-5%)
7 (10:90 Vita:Sea)	37.4 b	(-) 2.1 (5%)
Statistical analysis		
Replicate P	0.0613	
Treatment P	0.3548	
Coefficient of variation	7.33%	
$LSD_{0.10}$	2.8 cm	

*Compared to the control treatment.

Only the 30:70% and 10:90% Vitazyme:Seawater treatments were significantly less than the 100% Vitazyme, 50:50% Vitazyme:Seawater, and 100% Seawater treatments. The 100% Vitazyme treatment produced the tallest plants, but these were only 4 % taller than the control plants.

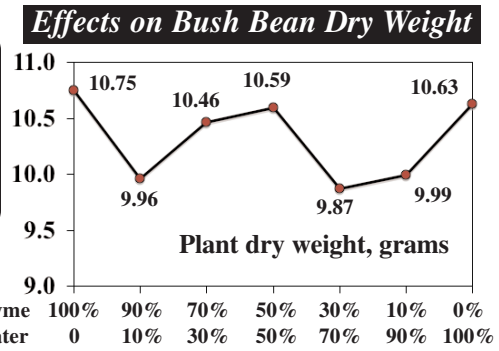
Dry weight results: The 100% Vitazyme treatment produced the greatest increase in plant dry weight, 17% above the control, with 100% Seawater concentrate 16% above the control. These two treatments significantly exceeded the control. There appeared to be no consistent pattern of plant response to different proportions of Vitazyme to Seawater. Cold Start produced a moderate 9% dry weight increase, while doubling the rate of Vitazyme did not increase yield.

Treatment	Dry weight	Dry weight change*
	grams	grams
2 (100% Vitazyme)	10.75 a	1.57 (+17%)
8 (100% Seawater)	10.63 a	1.45 (+16%)
5 (50:50 Vita:Sea)	10.59 a	1.41 (+15%)
4 (70:30 Vita:Sea)	10.46 a	1.28 (+14%)
10 (100% Cold Start)	10.03 ab	0.85 (+9%)
7 (10:90 Vita:Sea)	9.99 ab	0.81 (+9%)
3 (90:10 Vita:Sea)	9.96 ab	0.78 (+8%)
6 (30:70 Vita:Sea)	9.87 ab	0.69 (+8%)
1 (Control)	9.18 b	——
9 (2x 50:50 Vita:Sea)	9.13 b	(-) 0.05 (-1%)
Statistical analysis		
Replicate P	0.6.075	
Treatment P	0.1143	
Coefficient of variation	10.64%	
$LSD_{0.10}$	1.04 grams	

*Compared to the control treatment.

Increase in dry weight

Vitazyme, 100% ... 17%
Seawater, 100% ... 16%
50% Vitazyme +
50% Seawater 15%



Superior root growth for beans is a usual consequence of Vitazyme application. Note the longer, sturdier roots on the treated beans on the right, and also the deeper green color.

Conclusions: This greenhouse bush bean study using various proportions of Vitazyme and Seawater concentrate revealed that the 100% concentration of each product produced the greatest dry matter increase. Plant height showed a similar response. There was no consistent pattern of various product proportions producing higher or lower plant heights or dry weights, and doubling the 50:50% Vitazyme:Seawater rate did not result in better plant response; rather, the height and dry weight were slightly, though not significantly, below the control for both parameters. Cold Start instigated a 9% dry weight increase. Most height and dry weight changes were not significantly different from other treatments even though plant height varied by up to 9%, and plant dry weight by up to 18%.

Cabbage

Researcher: unknown *Location*: Hoai Duc, Ha Tay, Viet Nam *Variety*: KK cross
Planting density: unknow *Soil Type*: alluvial soils of the Red River *Planting date*: spring, 2008

Experimental design: A field of cabbage was divided into Vitazyme treated and untreated areas for the purpose of evaluating the effect of the product on cabbage yield.

1. Control **2. Vitazyme**

Fertilization: unknown
Vitazyme application: two applications of 1 liter/ha each time (times unknown)
Harvest date: unknown, in 2008

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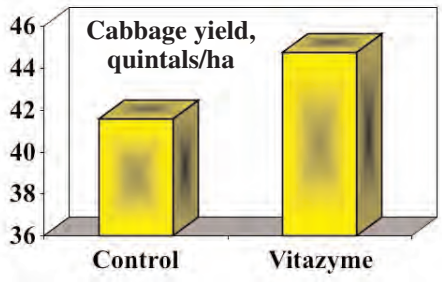
Cabbage yield

Treatment	Yield	Change
	quintals/ha	quintals/ha
Control	41.58	——
Vitazyme	44.75	3.17 (+8%)



Income results: an income increase of 4,140,000 Vnd/ha
Conclusions: Vitazyme in this Viet Nam trial increased cabbage yield by 8%, a very profitable increase on this alluvial river bottom soil. Note also the good increase in income from just two Vitazyme applications.

• Increase in cabbage yield: 8%

Cabbage treated with Vitazyme in this field show the typical vigor and color noted with all brassica crops that utilize this program.

Cabbage

Researcher: unknown
Variety: KK cross
Planting date: spring, 2008
Location: Thanh Xuan, Soc, Viet Nam
Soil Type: gray, "exhausted" soil
Planting density: unknown
Experimental design: A field of cabbage was divided into Vitazyme treated and untreated areas for the purpose of evaluating the effect of the product on cabbage yield.

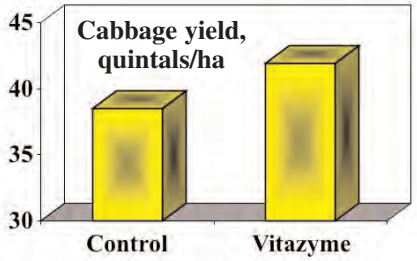
1. Control **2. Vitazyme**

Fertilization: unknown
Vitazyme application: two applications of 1 liter/ha each time (times unknown)
Harvest date: unknown, in 2008
Income results: an income increase of 4,530,000 Vnd/ha
Conclusions: Vitazyme in this Viet Nam trial increased cabbage yield by 9%, a very good increase on this highly farmed, exhausted soil. Besides, income was increased substantially.

• Increase in cabbage yield: 9%

Cabbage yield

Treatment	Yield	Change
	quintals/ha	quintals/ha
Control	38.50	——
Vitazyme	41.93	3.43 (+9%)



Cabbage

In this cabbage comparison the rhizosphere was so intense that exudates caused soil to cling to the entire root area.

Researcher: unknown *Location*: Minh Khai and Tu Liem, Viet Nam
Variety: Dong Du *Planting date*: spring, 2008 *Planting density*: unknown
Soil Type: alluvial soils of the Red River
Experimental design: A field of cabbage was divided into Vitazyme treated and untreated areas for the purpose of evaluating the effect of the product on cabbage yield.

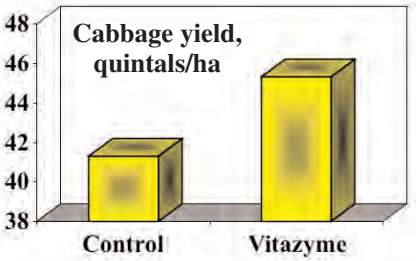
1. Control **2. Vitazyme**

Fertilization: unknown
Vitazyme application: two applications of 1 liter/ha each time (times unknown)
Harvest date: unknown, in 2008
Income results: an income increase of 5,445,000 Vnd/ha
Conclusions: Vitazyme in this Viet Nam trial increased cabbage yield by 10%, a very profitable increase on this alluvial river bottom soil.

• Increase in cabbage yield: 10%

Cabbage yield

Treatment	Yield	Change
	quintals/ha	quintals/ha
Control	41.30	——
Vitazyme	45.34	4.04 (+10%)



Winter Canola

Researchers: O.V. Kornijchuk, V. V. Plotnikov, and agronomic scientists
Organization: Vinnytsia State Agricultural Experiment Station of Forage Institute, Ukraine Academy of Agrarian Sciences, Vinnytsia, Ukraine
Location: Ukraine central forest – steppe area of Ukraine near Vinnytsia
Variety: Black Giant Super – Elite *Seeding rate*: 6 kg/ha *Planting date*: August 18, 2007
Soil Type: gray forest steppe soil; in the 0-30 cm layer, 2.2% organic matter, 8.4 mg/100 g of soil "hydrolyzed nitrogen", 15.8 mg/100 g of soil phosphorus, 12.4 mg/100 g of soil exchangeable potasium, and pH = 5.5.

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Tillage: plowing to 22 cm, and cultivation to 3-4 cm
Previous crop: winter wheat
Experimental design: A uniform field area was selected to place 1.0 ha plots, replicated four times, over the test area. The objective was to determine if Vitazyme could favorably influence crop yields for this gray forest soil area of Ukraine.

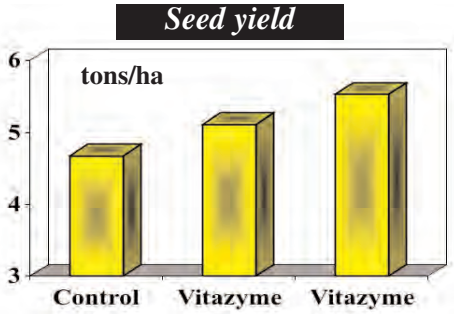
1. Control
2. Vitazyme applied in the fall
3. Vitazyme applied both fall and spring

In Ukraine, the control treatment displayed typical growth and yield for this soil type in 2008; the yield was 4.67 tons/ha.

Only one application of Vitazyme in the fall caused a 9% yield increase. Note the darker green, more lush leaf canopy.

Fertilization: In the fall of 2007 a broadcast application of 30-60-90 kg/ha N-P_2O_5-K_2O was made. In the spring, 90 kg/ha of nitrogen was applied.
Vitazyme application: For Treatment 2, 1 liter/ha over the leaves and soil on October 5, 2007 (8 to 10 leaves), and for Treatment 3, 1 liter/ha on October 5, 2007, and also 1 liter/ha on May 15, 2008 (bloom).
Harvest date: unknown
Yield results:

Treatment	Seed yield	Change
	tons/ha	tons/ha
Control	4.67	——
Vitazyme 1x	5.11	0.44 (+9%)
Vitazyme 2x	5.53	0.86 (+18%)



The full treatment of both fall and spring applications doubled the yield of the fall application alone, to 5.53 tons/ha.

Income results: Based on current canola prices, the increase in income from Vitazyme for the two treatments is as follows:

Fall application ..... 952 hrn/ha
Fall and spring application ..... 1,855 hrn/ha

• Increase in yield with fall application: 9%

• Increase in yield with fall and spring applications: 18%

Conclusions: A fall application of Vitazyme (1 liter/ha) after planting resulted in a sizeable 9% increase in canola yield in Ukraine. Applying a second 1 liter/ha application in the spring doubled this yield increase to 18%, showing how effective this fertility supplement is to improve yields and profits on canola in Eastern Europe. Income increases were substantial for the two treatments: 952 and 1,855 hrn/ha, respectively.

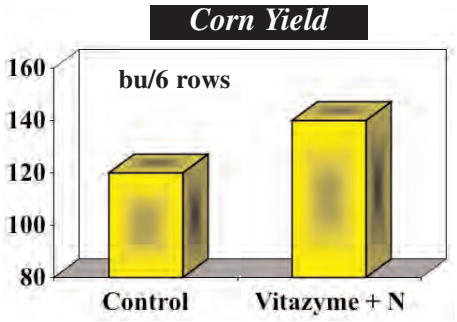
Corn

Researcher/Farmer: Rick Nichols
Location: Hebron, Indiana
Variety: Pioneer 34Y88 (non-GMO)
Soil type: silty clay "gumbo"
Row spacing: 30 inches
Population: 34,000 seeds/acre
Planting date: May 4, 2008
Previous crop: soybeans

Experimental design: A field was divided into a control area receiving no sidedressed nitrogen or Vitazyme, and a treated area receiving both. The objective of the test was to evaluate the effect of combined sidedressed nitrogen plus Vitazyme on crop yield.

1. Control **2. Vitazyme + sidedressed nitrogen**

Fertilization: Before planting: 140 lb/acre nitrogen, as urea. At planting: 300 lb/acre 18-46-60% N-P_2O_5-K_2O placed 4 inches to the side of the seeds. At sidedressing, in June (corn about 2 feet tall): 40 lb/acre nitrogen as a 28% solution
Vitazyme application: 13 oz/acre with sidedressed nitrogen on the treated area, applied in June at the 2-foot height
Harvest date: October 7, 2008
Yield results: Six rows of field length were harvested and weighed from each treatment in passes near one another. However, no row length was measured, so per acre yields were not obtained.

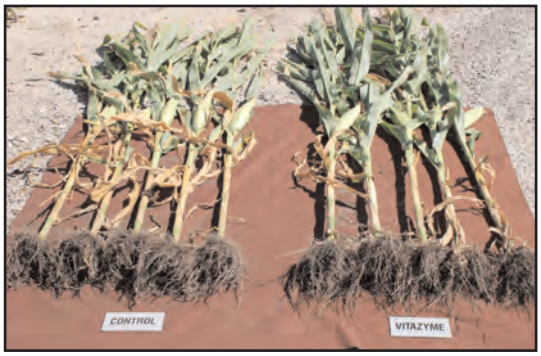


Treatment	Yield	Increase
	bu/6 rows	bu/6 rows
1. Control	120	——
2. Vitazyme + Sidedressed N	149	20 (+17%)

• Increase in corn yield: 17%

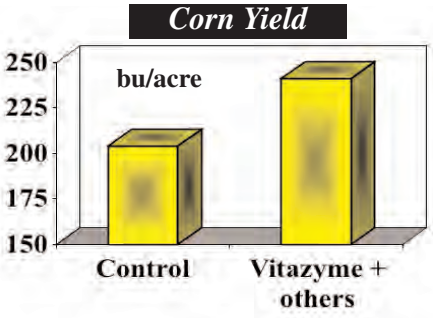
Conclusions: In this northern Indiana corn trial, Vitazyme side-dressed with 40 lb/acre of nitrogen as a 28% solution increased the yield by 17% above the control. It was not possible to separate the effects of the nitrogen and the Vitazyme, but it is well documented that Vitazyme enhances the utilization of soil and fertilizer applied nutrients, especially nitrogen.

Corn



This Indiana corn responded excellently to Vitazyme when applied to the seeds, but especially when added with foliar nutrients.

During an especially dry summer the single Vitazyme application produced good ears, but two applications did even better.



• Increase in corn yield: 18%

Researcher/Farmer: Gary Burkey
Variety: Flexseed 4918 non-GMO
Row spacing: 30 inches
Planting date: May 6, 2008
Location: Couts, Indiana
Soil type: silty clay loam "gumbo"
Population: 29,500 seeds/acre

Soil test: pH, 6.6; cation exchange capacity, 24.6 meq/100g; organic matter, 3.6%; base saturations, Ca = 65.6%, Mg = 21.8%, K = 1.4%, Na = 0.3%, other bases = 4.8%, H = 6.0%; estimated N release, 86 lb/acre; S, 9 ppm; P_2O_5, 175 lb/acre; Ca, 6,468 lb/acre; Mg, 1,290 lb/acre; K. 274 lb/acre; Na, 38 lb/acre; B, 0.9 ppm; Fe, 1,842 ppm; Mn, 77 ppm; Cu, 1.1 ppm; Zn, 26.7 ppm

Experimental design: A corn field was treated entirely on the seeds with Vitazyme, and part of the field received a foliar Vitazyme treatment as well, along with two other products in the sprayer tank. The objective of the study was to evaluate the effect of an additional Vitazyme application and these other foliar products on corn yield.

1. Vitazyme on the seeds
2. Vitazyme on the seeds, plus Vitazyme and two other products on the leaves

Fertilization: *Before planting*: 150 lb/acre potassium chloride (0-0-60% N-P_2O_5-K_2O); 100 lb/acre diammonium phosphate (18-46-0% N-P_2O_5-K_2O); 70 lb/acre N from dry urea. *At planting*: 4 gallons/acre 3-18-18% N-P_2O_5-K_2O on the seeds. *At knee-height*: 70 lb/acre N (28% N) side-dressed with a row-crop cultivator. *Foliar spray on July 6*: Tricert K (1 quart/acre of a 50-0-20 N-P_2O_5-K_2O material), manganese (1.5 lb/acre). with Vitazyme.

Vitazyme application: (1) 13 oz/acre on the seeds at planting, along with 3-18-18 fertilizer; (2) 13 oz/acre sprayed foliar with Tricert K and manganese on July 6

Weather results: a wet spring and late planting, few rains in July, and a very dry late July and August, followed by a 12-inch flooding rain in mid-October

Harvest date: November 10, 2008

Yield results: Eight -row swatchs were combined and weighed for both treatments.

Treatment	Yield	Change
	bu/acre	bu/acre
1. Control	204	——
2. Vitazyme on seeds + Mn + K	241	37 (+18%)

Due to an extreme rain event in mid-October, water rose so high in the field that the ears were covered for two to three days. In spite of that problem the corn grade was not affected, although untreated corn from neighbors' fields suffered water damage to their grain.

Conclusions: In this Indiana in-field corn trial, Vitazyme plus Tricert K and manganese boosted the yield by 18% (37 bu/acre), though it was not possible to separate the individual effects of these products. Vitazyme works in synergism with native soil and applied nutrients to boost utilization, so this great yield increase is not uncommon. **Of great interest is the fact that submersion of the ears before harvest for up to three days did not reduce the grain quality, indicating that cell wall integrity and anti-pathogen properties of the grain were likely enhanced by Vitazyme throughout the field.**

Corn

During this drought year the filling of ears was inhibited, but Vitazyme enabled plants to forage better for water and nutrients.

Researcher/Farmer: Gary Burkey
Variety: Flexseed 303 Triple-Stack
Row spacing: 30 inches
Planting date: May 18, 2008
Location: Couts, Indiana
Soil type: mucky sand
Population: 31,000 seeds/acre

Soil test: pH, 7.2; cation exchange capacity, 22.53 meq/100g; organic matter, 6.0%; base saturations, Ca = 70.8%, Mg = 20.5%, K = 4.2%, Na = 0.3%, others = 4.2%, H = 0%; estimated N release, 105 lb/acre; S, 10 ppm; P_2O_5, 468 lb/acre; Ca, 6,376 lb/acre; Mg, 1,110 lb/acre; K. 739 lb/acre; Na, 31 lb/acre; B, 0.9 ppm; Fe, 277 ppm; Mn, 29 ppm;Cu, 0.4 ppm; Zn, 6.6 ppm

Experimental design: A field was treated entirely with Vitazyme on the seeds at planting, and a portion of the field was foliar treated to determine the effect of this later application on crop yield.

1. Vitazyme on the seeds **2. Vitazyme on the seeds + leaves**

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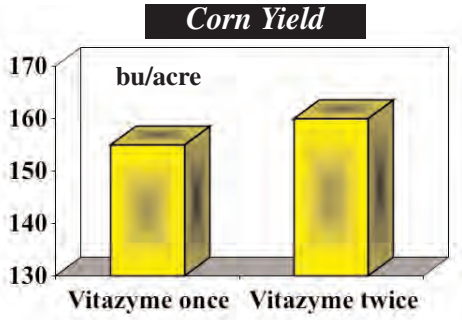
The roots treated with Vitazyme on the right display the typical response to the program, such as in this Indiana study. Greater carbon fixation leads to a larger root mass.

Fertilization: Before planting: 150 lb/acre potassium chloride (0-0-60% N-P_2O_5-K_2O); 100 lb/acre diammonium phosphate (18-46-0% N-P_2O_5-K_2O). At planting: 4 gallons/acre 3-18-18% N-P_2O5-K_2O on the seeds at planting. Sidedressed on June 18, at 5-feet plant height: 40 gallons/acre 28% N.
Vitazyme application: (1) 13 oz/acre on the seeds at planting, with 3-18-18% N-P_2O_5-K_2O over all areas; (2) 13 oz/acre foliar over one portion of the field, on June 18
Weather results: a wet spring and late planting, few rains in July, and very dry in late July and August, with a flooding rain (12 inches) in mid-October
Harvest date: December 12, 2008
Yield results: Eight-row swaths were combined and weighed for both treatments.



Conclusions: Vitazyme applied foliar in this northern Indiana corn trial resulted in a substantial 5 bu/acre increase in yield above the treatment receiving only a seed treatment.

• Increase in corn yield: 3%

Treatment	Yield	Change
	bu/acre	bu/acre
1. Control	155	——
2. Vitazyme + Sidedressed N	160	5 (+3%)

Corn

A Greenhouse Study

Researcher: Paul W. Syltie, Ph.D.
Location: Vital Earth Resources Research Greenhouse, Gladewater, Texas
Variety: yellow dent
Planting date: January 31, 2008
Soil type: silt loam
Pot size: 1 gallon
Planting rate: 10 seeds/pot, thinned to three plants
Watering: on-demand
Temperature: 55 to 85°F
Planting depth: 0.5 inch

Treatment	Vitazyme	Seawater	Cold Start
	--------	% of solution	--------
1	0	0	0
2 (13 oz/acre)	100	0	0
3 (13 oz/acre)	90	10	0
4 (13 oz/acre)	70	30	0
5 (13 oz/acre)	50	50	0
6 (13 oz/acre)	30	70	0
7 (13 oz/acre)	10	90	0
8 (13 oz/acre)	0	100	0
9 (26 oz/acre)	50	50	0
10 (13 oz/acre)	0	0	100

Experimental design: A replicated greenhouse pot study was designed to evaluate the effect of various rates of Vitazyme, Cold Start, and a seawater concentrate on the growth and development of field corn. Six replicates were utilized with ten treatments, using different proportions of combinations of the two materials. The data were analyzed using Analysis of Variance with CoHort software.
Vitazyme and Seawater applications: Both products were applied at 13 oz/acre total (1 liter/ha), with the exception of Treatment 9 which received twice this amount. The applications were made using 100 ml of a 0.0016% solution to achieve the 13 oz/acre rate, applied to the soil surface of the pots after planting.
Harvest date: On March 5, 33 days after planting, the roots of the plants were washed free of soil, the maximum height of each plant was measured, and the three plants from each pot were placed in a drying oven at about 50°C.

Plant height results: None of the differences in treatment height are significant, but even so the height changes have been calculated. The control treatment had the shortest plants, whereas the combined products produced the tallest plants.

Treatment	Plant height	Height change*
	cm	cm
6 (30:70 Vita:Sea)	83.2 a	4.4 (+6%)
5 (50:50 Vita:Sea)	82.8 a	4.0 (+5%)
4 (70:30 Vita:Sea)	82.0 a	3.2 (+4%)
7 (10:90 Vita:Sea)	81.4 a	2.6 (+3%)
8 (100% Seawater)	81.3 a	2.5 (+3%)
10 (100% Cold Start)	81.1 a	2.3 (+3%)
9 (2x 50:50 Vita:Sea)	80.4 a	1.6 (+2%)
2 (100% Vitazyme)	80.4 a	1.6 (+2%)
3 (90:10 Vita:Sea)	79.5 a	0.7 (+1%)
1 (Control)	78.8 a	——
Statistical analysis		
Replicate P	0.0003***	
Treatment P	0.9459	
Coefficient of variation	6.91%	
$LSD_{0.10}$	5.4 gram	

*Compared to the control treatment.

Dry weight results: Statistical differences in plant dry weight were noted in this study, with the Cold Start treatment giving the greatest increase (+26%). Combinations of Vitazyme and Seawater increased dry weight

Treatment	Dry weight	Dry weight change*
	cm	cm
10 (100% Cold Start)	9.52 a	1.95 (+26%)
6 (30:70 Vita:Sea)	8.72 ab	1.15 (+15%)
4 (70:30 Vita:Sea)	8.71 ab	1.14 (+15%)
7 (10:90 Vita:Sea)	8.60 abc	1.03 (+14%)
3 (90:10 Vita:Sea)	8.60 abc	1.03 (+14%)
2 (100% Vitazyme)	8.42 abc	0.85 (+11%)
9 (2x 50:50 Vita:Sea)	8.26 bc	0.69 (+9%)
8 (100% Seawater)	8.25 bc	0.68 (+9%)
5 (50:50 Vita:Sea)	8.14 bc	0.57 (+8%)
1 (Control)	7.57 c	——
Statistical analysis		
Replicate P	0.0002***	
Treatment P	0.3636	
Coefficient of variation	13.61%	
$LSD_{0.10}$	1.12 gram	

*Compared to the control treatment.

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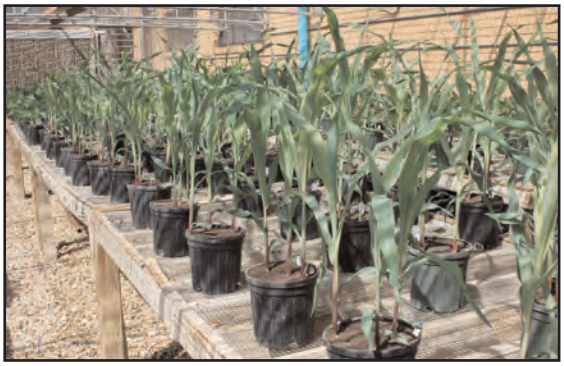
by 8 to 15%, including the double rate of the 50:50 combination (+9%).

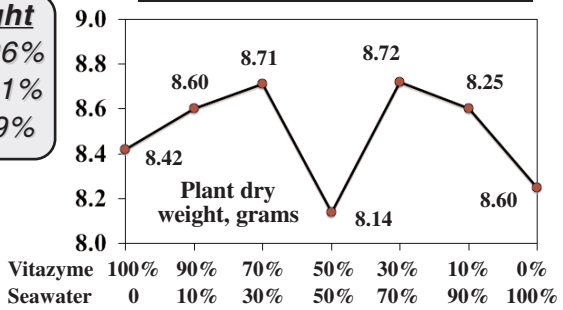


In this greenhouse trial, Cold Start increased plant dry weight more than regular Vitazyme or Seawater. Normally both Vitazyme products give similar results under wearm conditions.

Increase in dry weight

Cold Start, 100% ... 26%
Vitazyme 11%
Seawater, 100% 9%

Effects on Corn Dry Weight



Conclusions: In this greenhouse corn study, both Vitazyme and concentrated seawater, alone or in combination, boosted plant dry weight above the control, though only the 30:70 and 70:30 combinations did so significantly (+15%). While the 50:50 Vitazyme:Seawater treatment gave an unexpected reduction in increase in dry weight, this value was not significantly different than any of the other Vitazyme and seawater treatments. The double rate at 50:50 Vitazyme:Seawater increased yield by 9%, but Cold Start at 13 oz/acre gave the highest yield increase of all: 26%. Though all Vitazyme, seawater, and Cold Start treatments produced taller corn plants than did the control, none of these increases were significant.

Corn

A Greenhouse Study

Researcher: Paul W. Syltie, Ph.D. *Location*: Vital Earth Resources Research Greenhouse, Gladewater, Texas
Variety: yellow dent *Planting date*: January 31, 2008 *Soil type*: silt loam
Pot size: 1 gallon *Planting rate*: 10 seeds/pot, thinned to three plants
Watering: on-demand *Temperature*: 55 to 85°F *Planting depth*: 0.5 inch

Experimental design: A replicated greenhouse pot study was designed to evaluate the effect of various rates of Vitazyme on the growth of corn. Six replicates were included with six treatments, and the data were analyzed using Analysis of Variance with CoHort software.

1. **Control**
2. **Vitazyme at 7.5 oz/acre**
3. **Vitazyme at 13 .0 oz/acre**
4. **Vitazyme at 26.0 oz/acre**
5. **Vitazyme at 39.0 oz/acre**
6. **Vitazyme at 52.0 oz/acre**

Vitazyme applications: The 13.0 oz/acre application was made immediately after planting to the soil surface of the pot, using 100 ml of a 0.0016% solution. Other treatments were multiples of this rate.

Harvest date: On March 5, 35 days after planting, the soil was washed from the roots of the plants, and measurements were made of the height of each plant. The plants were then placed in a drying oven at about 50°C for 48 hours.

Plant height results: The highest (4 times normal) rate, as well as the untreated control, gave significantly shorter plants than all of the other Vitazyme treatments. There was no statistical difference among the 0.5 to 3 times normal treatments, but the greatest heights were for the 3 times normal and normal treatments.

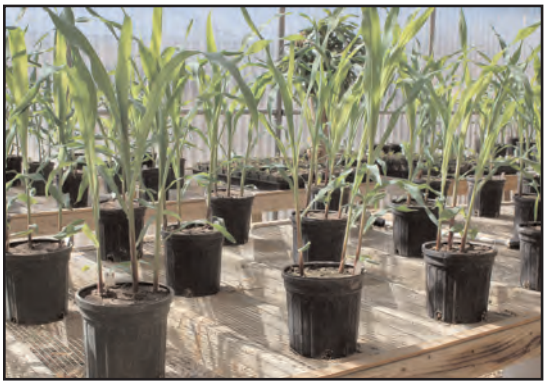
Treatment	Plant height	Height change*
	cm	cm
5 (Vitazyme, 3x)	85.3 a	5.5 (+7%)
3 Vitazyme, 1x)	84.6 a	4.8 (+6%)
4 (Vitazyme, 2x)	83.8 a	4.0 (+5%)
2 (Vitazyme, 0.5x)	83.4 a	3.6 (+5%)
6 (Vitazyme, 4x)	80.0 b	0.2 (+0%)
1 (Control)	79.8 b	—
Statistical analysis		
Replicate P	0.0245	
Treatment P	0.0040	
Model P	0.0029	
Coefficient of variation	3.24%	
$LSD_{0.10}$	2.6 cm	

*Compared to the untreated control, Treatment 1.

Increase in plant height

3x Vitazyme 7%
1x Vitazyme 6%
2x Vitazyme 5%
0.5x Vitazyme 5%

Dry weight results: All of the Vitazyme applications gave increases in dry plant weight of from 10 to 14%, the highest increases being with the 0.5x, 2x, and 4x rates. None of these differences were statistically significant, and all exceeded the control.



This greenhouse study proved that Vitazyme at several rates increased both plant height and dry weight accumulation.

Treatment	Dry weight	Dry weight change*
	cm	cm
2 (Vitazyme, 0.5x)	9.30 a	1.11 (+14%)
4 Vitazyme, 2x)	9.30 a	1.11 (+14%)
6 (Vitazyme, 4x)	9.22 a	1.03 (+13%)
5 (Vitazyme, 3x)	9.01 a	0.82 (+10%)
3 (Vitazyme, 1x)	9.00 a	0.81 (+10%)
1 (Control)	8.19 b	—
Statistical analysis		
Replicate P	0.0092	
Treatment P	0.0192	
Model P	0.0043	
Coefficient of variation	6.23%	
$LSD_{0.10}$	0.55 gram	

*Compared to the untreated control, Treatment 1.

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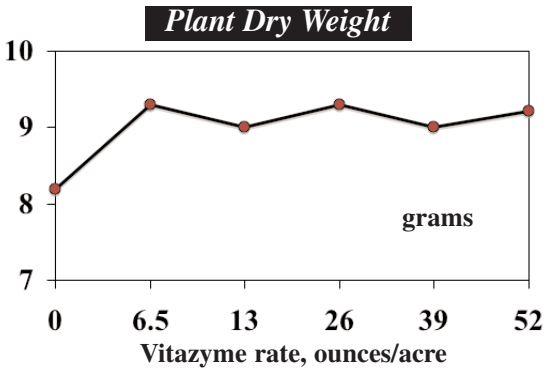
Conclusions: In this greenhouse study to evaluate the effects of progressively higher rates of Vitazyme to stimulate corn height and dry weight accumulation, the product proved to significantly increase plant height by 5 to 7% at all but the 4x (52 oz/acre) rate, whereas dry weight significantly increased from 10 to 14% for all of the Vitazyme rates. These data prove that more than just the standard 13 oz/acre rate can be effective in stimulating crop growth, but higher rates do not produce a linear yield or growth increase.

Increase in plant dry weight	
0.5x Vitazyme	14%
2x Vitazyme	14%
4x Vitazyme	13%
3x Vitazyme	10%
1x Vitazyme	10%



Corn

A Long-Term Study: Year 1

Researcher: Bertel Schou, Ph.D. *Research organization*: ACRES (Agricultural Custom Research and Environmental Services), Cedar Falls, Iowa
Variety: Pioneer 34R67 (BBCH Scale:BCOR)
Planting rate: 29,900 seeds/acre *Planting depth*: 2 inches *Planting date*: May 21, 2008
Tillage: conventional (cultivated and harrowed on May 21) *Row spacing*: 30 inches *Previous crop*: corn
Soil type: Kenyon loam (34% sand, 46% silt, 20% clay, 3.6% organic matter, 15.0 meq/100 grams cation exchange capacity, pH 7.2, good fertility)
Soil test results, initial for all plots (analyzed May 15, 2008): pH, 7.2; organic matter, 3.90%; N, 89 lb/acre; SO_4-S, 6 lb/acre; P_2O_5, 1,076 lb/acre; Ca, 5,407 lb/acre; Mg, 916 lb/acre; K, 298 lb/acre; Na, 52 lb/acre; B, 1.76 lb/acre; Fe, 460 lb/acre; Mn, 176 lb/acre; Cu, 3.4 lb/acre; Zn, 12.6 lb/acre; base saturations: Ca, 72.6%, Mg, 20.5%, K, 2.1%, Na, 0.6%, others, 4.2%
Experimental design: A field was selected to place plots (15 x 40 feet) in a randomized complete block design (five replicates), using two treatments for a long-term field study. These plots are designed to assess the long-term effects of Vitazyme on the yield and growth of corn and soybeans in rotation, but moreover the effects on the physical, chemical, and microbial characteristics of the soil.

1. Control **2. Vitazyme**

Fertilization: 120 lb/acre of N as 28% N applied postemergence in 20-inch spaced bands, using drop nozzles from a shielded sprayer
Vitazyme application: 13 oz/acre (1 liter/ha) in the seed furrow at planting (May 21), and 13 oz/acre sprayed over the leaves and soil on July 6, 2008, at the V6 stage
Weed control: Harness Extra preemergent, and Accent postemergent
Microorganism analyses: Soil biological activity was evaluated in the spring and fall to determine product effects on a number of parameters. Soil samples were collected from the root zones of plants from each of the five replicates, and then combined for each treatment and sent to the Soilfoodweb Laboratory in Corvallis, Oregon, for analysis.

May 29 analysis (baseline values for future comparisons)

Treatment	Organism biomass	Active bacteria	Total bacteria	Active fungi	Total fungi	Protozoa			Total nematodes	Total fungi to bacteria
						Flagellates	Amoebae	Ciliates		
		ug/g	ug/g	ug/g	ug/g	no./g	no./g	no./g	no./g	
Control	0.81	28.4	1,853	20.4	244	5,718	17,211	34	2.33	0.13
Vitazyme	0.80	24.7	2,324	13.3	282	3,454	5,738	72	1.84	0.12

Treatment	Active fungi to total fungi	Active bacteria to total bacteria	Active fungi to active bacteria	Plant-available nitrogen
				lb/acre
Control	0.08	0.02	0.72	75 to 100
Vitazyme	0.05	0.01	0.54	50 to 75

September 10 analysis

Treatment	Organism biomass	Active bacteria	Total bacteria	Active fungi	Total fungi	Protozoa			Total nematodes	Va mycorrhizae
						Flagellates	Amoebae	Ciliates		
		ug/g	ug/g	ug/g	ug/g	no./g	no./g	no./g	no./g	% infection
Control	0.82	41.6	929	18.7	352	1,690	5,618	169	2.73	0
Vitazyme	0.81	3.4	1,033	13.4	240	8,594	7,103	103	0.57	0

Treatment	Total fungi to bacteria	Active fungi to total fungi	Active bacteria to total bacteria	Active fungi to active bacteria	Plant-available nitrogen
				lb/acre	
Control	0.38	0.05	0.04	0.45	50 to 75
Vitazyme	0.05	0.01	0.54	50 to 75	75 to 100

Differences in microbes between the two treatments are not pronounced, although there was a distinctly greater number of protozoa with the Vitazyme

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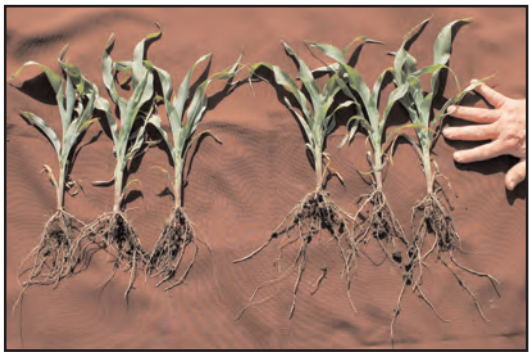
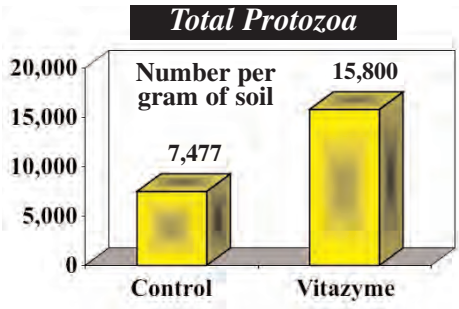
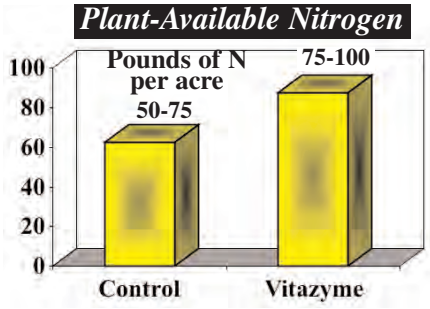


The comparison of Vitazyme treated corn, on the right, with untreated control corn reveals the typical seedling growth advantage with the product.

treatment, especially flagellates. There was no VAM mycorrhizal root infection for either treatment. Fungal and bacterial ratios were not very different, but plant-available nitrogen was decideably greater with the Vitazyme treatment.



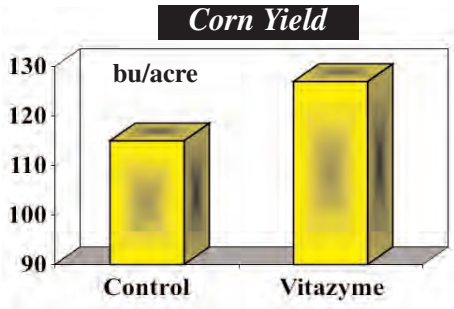


Harvest date: The crop was harvested on November 1, 2008, using a Massy-Ferguson 8 plot combine. Two rows 40 feet long were harvested from each plot.

Plant populations: The populations of the two treatments were very similar: 21,414 plants/acre for the control, and 21,235 plants/acre for the Vitazyme treatment. This difference was not significant (P=0.871).

Yield results: Vitazyme significantly increased the yield of corn, by 12.06 bu/acre, a full 10% above the control yield.

Treatment	Corn yield	Yield increase
	bu/acre	bu/acre
Control	114.96 b	——
Vitazyme	127.02 a	12.06 (+10%)
LSD (0.05)	8.53	
Standard deviation	4.86	
Coeff. of variation	4.02	
Replicate F	4.4	
Replicate probability	0.090	
Treatment F	15.4	
Treatment probability	0.017	



Conclusions: In this first year of a long-term trial to evaluate the effects of Vitazyme on the physical, chemical, and microbiological effects of the soil, and on crop response, Vitazyme greatly boosted grain yield (12.06 bu/acre, or 10%) above the control. Baseline soil chemical analyses were completed, as were baseline microbiological analyses. A September 10 microbial analysis revealed that, while both treatments showed minimal differences in most parameters measured, there was a marked 111% increase in total protozoa with Vitazyme. In addition, **the supply of plant-available nitrogen was improved by about 25 lb/acre with Vitazyme**, a significant factor in the current climate of high and volatile fertilizer prices. Work will continue during the coming years on monitoring the changes brought about by Vitazyme on an array of soil and plant characteristics.

• Increase in protozoa: 111%

• Increase in N availability: 25 lb/acre

• Increase in corn yield: 10%

Sweet Corn

Farmer: Andrew Jones
Researcher: John McKendry, Mantissa Corp. Ltd.
Location: Marlborough, New Zealand
Soil type: Sedden silt loam
Variety: Syngenta 2684
Plant population: 69,000 seeds/ha
Planting date: December 12, 2007
Experimental design: A sweet corn field was divided into Vitazyme treated and control sections to determine if this product would affect sweet corn yield.
1. Control 2. Vitazyme
Fertilization: 300 kg/ha of 15-10-10% N-P_2O_5-K_2O

The Vitazyme treated corn in this New Zealand study was obviously greener with better developed roots and leaves.

Notice that the ears from this New Zealand sweet corn are fuller and more mature when treated with Vitazyme.

Vitazyme application: 1 liter/ha with Atrazine on January 9, 2008, at 6 to 8 inches high
Harvest date: April 11, 2008
Yield results: Five different sections of row on both the treated and untreated sides of the field were analyzed for plant number, primary ears, secondary ears, and usable ears in terms of number and weight.

Treatment*	Primary ear wt.*	Change	Secondary ear wt.	Change	Usable ear wt.	Change
	grams					
Control	263	——	70	——	159	——
Vitazyme	294	32 (+12 %)	74	4 (+6%)	284	25 (+10%)

*The control plants had an average of 20.5% greater population for some unknown reason.

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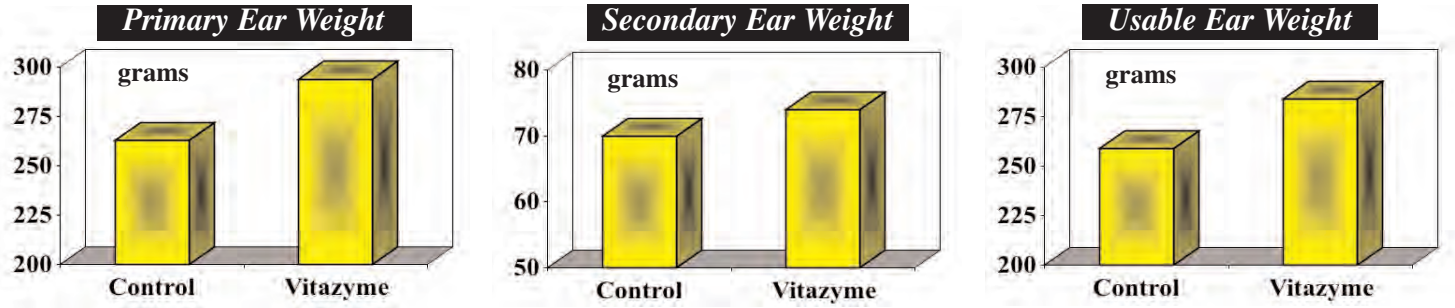


Conclusions: In this New Zealand sweet corn study, Vitazyme improved the average ear size of both primary and secondary ears, and increased the weight of usable ears by a very respectable 10%. This product, when incorporated into a total fertility management system, has proven under New Zealand conditions to produce excellent sweet corn yield increases.

Grapes

Researcher: Jeff Bergeron
Location: Sunny Mecca, California (Coachella Valley)
Varieties: Flame, Perlette, and Sugraone (table varieties)
Grower organization: Richard Bagdasarian, Inc.
Soil type: unknown
Vine spacing: unknown

Experimental design: Three vineyards were selected to evaluate the effect of Vitazyme on table grape quality. The Flame variety was treated on 2.2 acres at the Mecca Star Ranch, the Perlette variety on 4.7 acres at the Sultan Ranch, and the Sugaraone variety on 2.7 acres at the Pasha 3 Ranch.

1. Control **2. Vitazyme**

Fertilization: unknown
Vitazyme application: See the table to the right.

Variety	Pre-bloom 1		Pre-bloom 2		BB-shot		Final	
	Date	Rate*	Date	Rate*	Date	Rate*	Date	Rate*
Flame	March 5	14.8	March 27	13.9	April 14	13.9	April 29	13.9
Sugraone	March 7	14.9	April 11	13.4	April 18	13.4	April 29	13.4
Perlette	March 4	11.7	April 7	13.0	April 18	13.0	April 29	13.0

*Rate in ounces/acre

Quality results: Observations on grape quality are as follows.

Grape Quality Results, Vitazyme vs. Control

Flame grapes (Mecca Star Ranch)
Fuller, deeper red color
More even coloring of grapes in bunches
One size larger

Sugraone grapes (Pasha 3 Ranch)
Firmer, crisper fruit
Greener color
One size larger

Perlette grapes (Sultan Ranch)
Somewhat crispier fruit
[Note: This was an old vineyard that was pulled out after harvest.]

Conclusions: Vitazyme applied to three table grape varieties in the Coachella Valley of California, using four applications, improved the quality markedly with the Flame and Sugraone varieties. These grapes were deeper and more evenly colored than the control treatments alongside, amd were a size larger. The Perlette grapes showed a bit more crispness of the fruit, but were produced on old vines that were removed after harvest; the unthrifty growth of this old stock is likely the reason for a less intensive response from Vitazyme. This test has shown that Vitazyme will improve table grape quality significantly.

Grapes (first year)

Crimea National Institute of Grape and Vine Research

Researcher: staff personnel
Location: Crimea National Institute of Grape and Vine Research, Ukraine
Variety: unknown
Soil type: south blacktop (Mollisol)
Planting date: May 24, 2007
Soil characteristics: 1 to 2% organic matter; pH 7.0 to 8.5

Experimental design: A nursery area of the research station was selected to treat certain rows of grape plants — either new cuttings or transplants — with Vitazyme at the rates given below.

Cuttings
1. Control (untreated)
2. Vitazyme soak and a foliar application

Transplants
1. Control (untreated)
2. Vitazyme soil drench and a foliar application

Fertilization: unknown
Pesticide applications: standard for the station
Vitazyme applications:

Treatment	May 24, 2007	August 9, 2007
Cuttings	5% soak, 1 hour	1 liter/ha on leaves
Transplants	2% drench on roots	1 liter/ha on leaves

Grape plants grown in a Ukraine nursery responded well to Vitazyme, having larger root systems and better developed growing points. Untreated plants are on the right.

Observations: The Vitazyme treated plants had larger root systems and better development of the growing points.

Conclusions: Vitazyme treatment has proven to increase root and shoot development of both new cuttings and transplants in Crimea, Ukraine, as compared to untreated controls.

Grapes

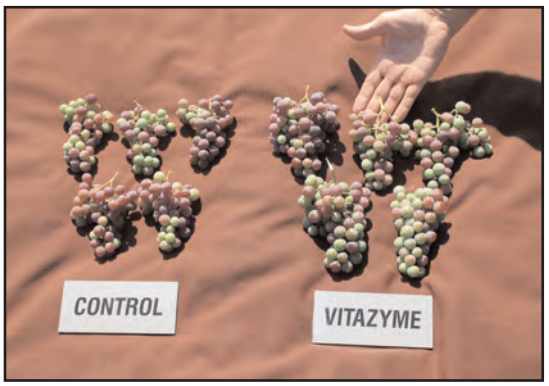
Researcher: Bob Dongvillo
Location: Dongvillo Vineyards, Inc., St. Joseph, Michigan
Variety: Concord
Plant age: 40 years
Plant density: 605 vines/acre
Plant spacing: 9 ft between rows, 8 ft in the rows
Soil type: clay loam
Experimental design: A grape vineyard was divided into four sections, with three areas treated with different products to evaluate the effects on grape sugar content at harvest. Four rows separated treatments to avoid drift. Yield determinations were not made in this study.

1. Control 2. Goemar MZ63 3. Ridge Bio-Stim 4. Vitazyme

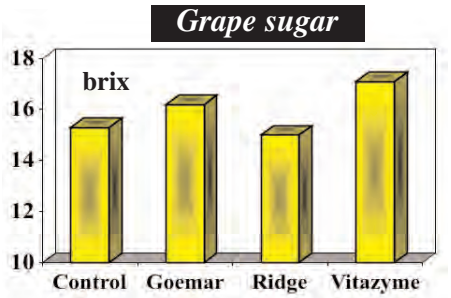
Fertilization: 28% nitrogen at 60 lb/acre before bud break, and 15 lb/acre after bloom and fruit set
Vitazyme and other product applications: One liter/ha of Vitazyme was applied twice with an air-blast sprayer, using 50 gallons of water per acre and a travel speed of 5 mph: foliar spray on June 22 (post bloom), and August 16 (verasion). The other two products were applied at the recommended times and rates.
Grape sugar results: Grapes from each treatment were sampled for brix, with the following results:
Conclusions: This southwestern Michigan study with Vitazyme and two other products on grapes proved that Vitazyme was by far the superior product in increasing grape sugar. Its increase of 1.8 percentage points above the control exceeded the next closest rival, Goemar MZ63, by 200%, while the other product, Ridge Bio-Stim reduced the grape sugar slightly. Vitazyme is shown to improve grape sugar significantly, which is a considerable help to growers of grapes for juice, wine, or raisins, since sugars are a key to grape quality.

Treatment	Grape sugar	Change
	brix	brix
1. Control	15.3	——
2. Goemar MZ63	16.2	0.9
3. Ridge Bio-Stim	15.0	(–) 0.3
4. Vitazyme	17.1	1.8

- ***Increase in grape sugar: 1.8 percentage points***



Note the superiority of the Vitazyme treated Concord grapes on the right. Bunch size and individual grape diameter are both noticably larger than the controls.



Grapes

An Organism Response Evaluation

In 2001 an evaluation of grape roots was made on Kliewer Farms, near Reedley, California, to determine the effects of several products on various rhizosphere organisms. The samples were evaluated by Elaine Ingham at the Soil Food Web,Corvallis, Oregon, and by BBC Laboratories, Tempe, Arizona.
Soil type: clay loam
Trellis system: standard T-bar
Variety: Ruby seedless
Age: established
Spacing: 12 ft between rows, 8 ft in the row
Vitazyme applications: The end of the drip line was disconnected and attached to a hose from a sprayer tank. Then 100 gallons of Vitazyme solution were applied in the row under 50 psi. A 13 oz/acre rate was applied, or 1.6 oz in the 100 gallons, on April 23, 2001.
Other product application: according to the manufacturers' recommendations

Grape row number	Material	BBC Labs Yeasts and Molds	SoilFoodWeb Active Fungal Biomass
		CFU/gdw	ug/gram
29 (1)	Control	4.5×10^4	22.1
30 (2)	Compost tea concentrate	3.4×10^4	15.0
31 (3)	Awaken	1.4×10^4	28.2
32 (4)	ZAP	3.0×10^4	17.1
33 (5)	Vitazyme	4.1×10^4	61.5
34 (6)	Super Bio	2.5×10^4	50.6
35 (7)	Metazyme Extra	3.0×10^4	34.1
36 (8)	ZAP FFS #1	3.0×10^4	22.4
37 (9)	Jenner 8 Plus	3.5×10^4	35.0
38 (10)	ZAP FFS #2	5.1×10^4	19.4
39 (11)	Soilweb.com Product A	3.5×10^4	29.8
40 (12)	Soilweb.com Product B	4.6×10^4	20.0

These young grapes in California show the type of response to be expected when Vitazyme is applied in the drip system.

Organism population results: The soil and roots of all treatments were sampled on June 18, 2001, 56 days after product application, and submitted to the laboratories on June 20, 2001. Sampling was performed by obtaining a soil core to 6 inches on the outer edge of the drip zone of 25 sites (every third plant), along with the treated row. Care was taken to clean and sterilize the probe between core samplings, and the collection bucket was cleaned and sterilized between product samplings.

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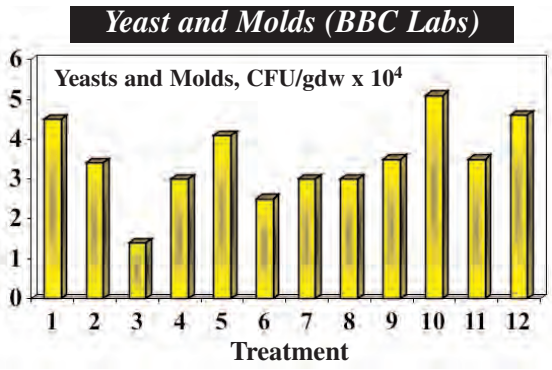
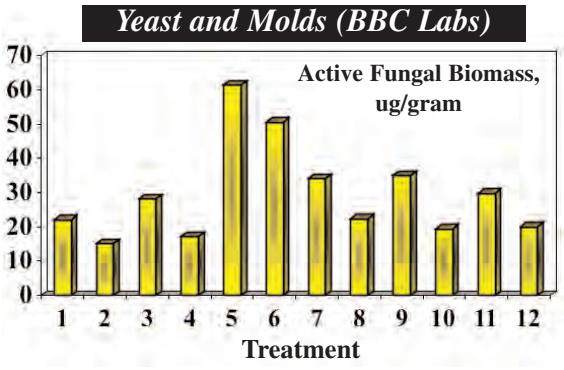
Conclusions: ZAP FFS #2, the control, and Soilweb.com Product B had the highest rhizosphere yeast and mold levels, from 4.5 to 5.1 x 10^4 CFU/gdw, but Vitazyme had nearly as high levels: 4.1 x 10^4 CFU/gdw. On the other hand, Vitazyme had by far the highest rhizospheric active fungal biomass of 61.5 ug/gram; the next highest level was 50.6 for Super Bio, and all other values are considerably less. These results show that Vitazyme performed the best of all eleven treatments in this California grape root zone microorganism stimulation study.





Grapes

Crimea National Institute of Grape and Vine Research

Researcher: staff personnel
Location: Crimea National Institute of Grape and Vine Research, Ukraine
Variety: Aligote
Soil type: south blacktop (Mollisol)
Soil characteristics: 1 to 2% organic matter; pH 7.0 to 8.5
Experimental design: A vineyard of table grapes was divided into two Vitazyme treatments besides the standard (control) applications of fertility and pesticide treatments. The treatments were as follows:

1. **Control**
2. **Vitazyme, three applications at 1 liter/ha**
3. **Vitazyme, three applications at 2 liters/ha (first two), and 1 liter/ha (last one)**

Fertilization: unknown
Pesticide applications: standard for the station
Vitazyme applications:

Treatment	Vitazyme application rate		
	Pre-flower[a]	BB-size grapes[b]	Verasion[c]
	liters/ha		
1	0	0	0
2	1	1	1
3	2	2	1

[a]May 30, 2007
[b]June 25, 2007
[c]August 20, 2007

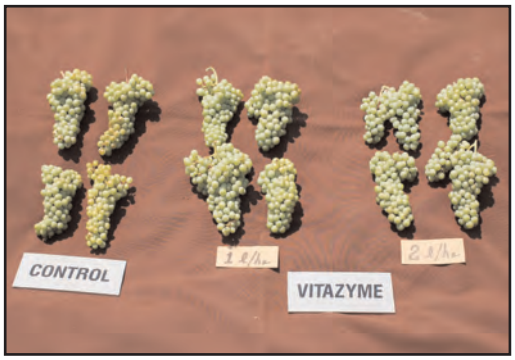
In Crimea, Ukraine, these table grapes with Vitazyme produced a greater tonnage of larger and much sweeter fruit.

Fruit sugar results: No actual sugar values for the grapes were given, but the difference between the control and the treated grapes are as follows:

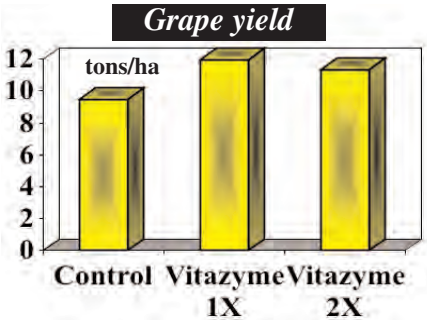
- ***Increase in grape sugar,Treatment 1: 4.3 percentage points***
- ***Increase in grape sugar, Treatment 2: 5.8 percentage points***

Treatment	Yield	Yield change
	tons/ha	tons/ha
1. Control	9.48	——
2. Vitazyme, 1 liter/ha three times	11.97	2.49 (+26%)
3. Vitazyme, 2 liters/ha + 1 liter/ha	11.35	1.87 (+20%)

Yield results: see table to the left
Conclusions: This southern Ukraine study at the Crimea National Institute of Grape and Wine Research showed that Vitazyme, applied at either 1 liter/ha three times, or 2 liters/ha twice with a last application of 1 liter/ha, significantly increased both grape yield and sugars. The sugars increased by 4.3 to 5.8 percentage points, while the yield was boosted by 20 to 26%, the highest increase with the 1 liter/ha rate applied three times. The grape program using Vitazyme has proven to be a highly effective means by which both yields and sugar content can be raised at a minimal input cost. The increased photosynthesis and nutrient uptake triggered by the product's active agents were able to fill the extra yield of grapes with abundant sugars so that they were sweeter than the lower yielding control.



Both 1 and 2 liter/ha Vitazyme applications with these grapes in Crimea, Ukraine, produced outstanding results.



Yield increase with Vitazyme

Vitazyme, 1 liter/ha 26%
Vitazyme, 2 liters/ha 20%

Grapes (for raisins)

Crimea National Institute of Grape and Vine Research

Researcher: staff personnel
Location: Crimea National Institute of Grape and Vine Research, Ukraine
Variety: Ranniy Magaracha (table grape)
Soil type: south blacktop (Mollisol)
Soil characteristics: 1 to 2% organic matter; pH 7.0 to 8.5
Experimental design: A vineyard of table grapes was divided into two Vitazyme treatments besides the standard (control) applications of fertility and pesticide treatments. The treatments were as follows:

1. **Control**
2. **Vitazyme, three applications at 1 liter/ha**
2. **Vitazyme, three applications at 2 liters/ha (first two), and 1 liter/ha (last one)**

Fertilization: unknown
Pesticide applications: standard for the station
Vitazyme applications:

Treatment	Vitazyme application rate		
	Pre-flower[a]	BB-size grapes[b]	Verasion[c]
	liters/ha		
1	0	0	0
2	1	1	1
3	2	2	1

[a]May 30, 2007
[b]June 25, 2007
[c]July 19, 2007

Note the excellent vine growth of these table grapes in Crimea; they have plenty of vigor to fill a heavy grape load.

Fruit sugar results: No actual sugar values for the grapes were given, but the difference between the control and the treated grapes are as follows:

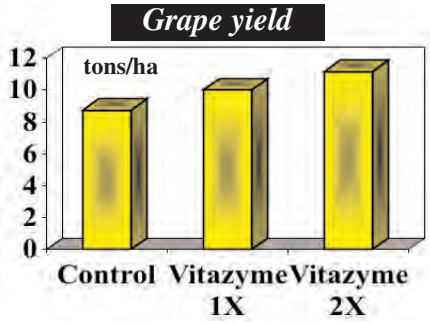
• Increase in grape sugar,Treatment 1: 2.5 percentage points

• Increase in grape sugar, Treatment 2: 4.3 percentage points

Yield results:

Treatment	Yield	Yield change
	tons/ha	tons/ha
1. Control	8.72	——
2. Vitazyme, 1 liter/ha three times	10.00	1.28 (+15%)
3. Vitazyme, 2 liters/ha + 1 liter/ha	11.15	2.43 (+28%)

Conclusions: In this Ukrainian table grape study, Vitazyme was shown to produce much greater yields and a higher sugar content when applied at either 1 liter/ha three times, or at 2 liters/ha twice and 1 liter/ha once ... but especially in the latter case, where the grape sugar and yield were nearly doubled compared to the 1 liter/ha rate. Yield increases were from 15 to 28%, while grape sugar also rose – by from 2.5 to 4.3 percentage points – showing that despite higher yields the plants were still able to produce more sugars to further fortify the heavier load with additional soluble solids. This study proves the great viability of Vitazyme to aid in table grape production in Ukraine.



Yield increase with Vitazyme

Vitazyme, 1 liter/ha 15%
Vitazyme, 2 liters/ha 28%

The bunches of table grapes in this Crimea test were much bigger than for the control, and also were sweeter.

Grapes (for wine)

Year Five of a Continuing study

Researcher: John Broeker, and Richard Sauret, Vineyard Consultant
Location: San Miguel, California
Plants/acre: 605
Variety: Cabernet Sauvignon
Vineyard: Mondello Vineyards
Yield goal: 3.5 tons/acre
Grafting: none (self-rooted)
Irrigation: drip
Grape plant age: 8 years (fifth harvest)
Bunch thinning: no
Row spacing: 12 x 6 feet
Shoot trimming: yes
Pruning: spur
Soil type: loam, high-calcium subsoil, low organic matter
Experimental design: A vineyard of grapes of equal age was partially treated with Vitazyme during the growing season to evaluate effects on grape yield and winemaking quality; all other treatments were identical. The same rows were treated as in previous years. Both treatments were to be evaluated for overall effects on grape and wine quality by following through the preharvest period, and on to the actual wine itself after fermentation and aging.

Continued on the next page

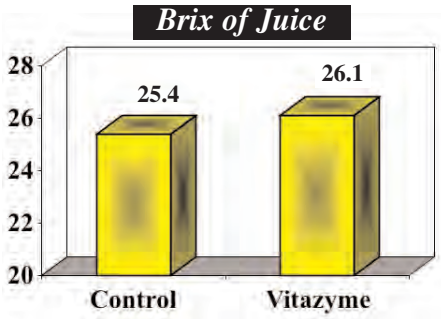
Irrigation: semi-dryland system: four times of deep irrigation (18 to 20 hours of drip irrigation) from mid-June to late August
Fungicides: applied as needed
Fertilization: No $(NH_4)_2 SO_4$ was used in 2007, but urea (low biuret) was added to the foliar spray. A 9-18-9 or 3-18-18 (+ micronutrients) was applied with urea every two to three weeks at 2 to 3 gallons/acre during much of the growing season, usually with sulfur after verasion. A blue-green algae solution was applied in the irrigation water periodically
Tillage: cover crop disked in
Vitazyme application: (1) 13 oz/acre with 9-18-9 fertilizer sprayed at bud break; (2) 13 oz/acre with 9-18-9 fertilizer + sulfur sprayed at BB-sized fruit; (3) 13 oz/acre with 9-18-9 fertilizer + sulfur sprayed at verasion; (4) 13 oz/acre 8 weeks before harvest (the end of August)
Harvest date: October 21, 2008
Weather conditions: A severe frost occurred during flowering, which seriously affected pollination and berry set. In addition, heat and high winds during bloom further damaged berry set so that the yield was seriously reduced for both treatments, but more so with the Vitazyme treatment than with the control. In the Vitazyme treated area 61 plants had some form of burn, whereas the control area had 13 affected plants.

Notice the pronounced Vitazyme effect on vine growth behind the person; shorter untreated control vines are in the foreground.

Vine growth: The researchers noted that there was more leaf and vine growth for the Vitazyme treated grapes, perhaps 30% more total leaf mass than for the control plants. An analysis of canes for the plants of the two treatments revealed more cane growth with Vitazyme application as well.
Grape juice quality at harvest: The grapes were harvested on October 21, 2008, and the juice was evaluated for chemical factors. Quality parameters were similar for both treatments.
Note that the brix level for the Vitazyme treated grapes is 0.7 percentage point higher than for the control, indicating a higher quality juice from these treated grapes.

Treatment	GF	Brix	Total acidity	pH	Lactic acid	VA	Ammonia (NH_3)	Amino acid	Yeast active nitrogen	Malic acid	Tartaric acid	Potassium
	g/100 ml		gtar/ml		grams/liter	g acet/ 100 ml	ppm	ppm	ppm	grams/liter	grams/liter	ppm
Control	20	25.4	0.50	4.02	0.1	0.047	108	141	249	1.74	4.47	2,551
Vitazyme	24	26.1	0.49	4.20	0.1	0.050	132	175	307	2.06	4.58	3,288

Yield results: Grape yields were recorded for both treatments on the eastern end of the vineyard where soil characteristics were uniform. A border area between the treatments was avoided to remove possible product drift effects. Because there was severe pollination disruption from a severe frost, followed by high winds and hot temperatures at bloom, during which the Vitazyme treatment was more severely affected than the control, the bunches had many aborted berries and a greatly reduced yield from previous years. Thus, the yield data have little value for 2008.



Treatment	Grape yield per vine	Grape yield per acre*		Yield change
	lb/vine	lb/acre	tons/acre	lb/acre
Control	5.17	3,127	1.564	——
Vitazyme	4.80	2,904	1.452	(-)223
*Based on 605 plants per acre				

At the end of the growing season, towards the first frost, there was more total foliage and more actively synthesizing leaves for the Vitazyme treatment. See the table to the left. With more green, photosynthesizing leaves remaining on the treated plants, they were able to fix more energy for growth the following year.

Treatment	Total leaves	Green leaves
Control	Fewer leaves	Fewer leaves
Vitazyme	33% more leaves	About 20% more

Wine making: On October 21, 2008, a half ton of grapes from both treatments was picked and crushed, and that day the winemaking process began. See the schedule on the next page for details.

October 21 The grapes were destemmed and cold soaked for 48 hours. During this time tartaric acid was added to raise the acidity to 0.7.

October 23. Yeast was added to the destemmed grapes, as well as yeast nutrient (diammonium phosphate, yeast cell walls, and other items), and Color Pro (an enzyme material to extract more color from the skins, and stabilize the color).

October 31. After 8 days of fermentation, the juice was pressed from the mash. At this point there was 3% sugar left. Malic acid bacteria were added at this point to convert the malic acid to lactic acid. The fermenting wine was then placed in stainless steel barrels. Each barrel yielded 148 gallons of juice per ton of grapes.

November 4. After 4 more days, half of the wine from each treatment was put in an identical oak barrel; the remaining wine was retained in a stainless steel barrel.

Conclusions for the fifth year: The fifth year of this California wine grape study was very unlike the previous four years, in which the yield increase averaged 29% per year. In 2008 the highly unfavorable weather conditions at blossom time resulted in a poor berry set, especially with the Vitazyme treatment, that gave yields for both treatments about 50% lower than the previous year. Thus, the yield data for 2008 is not relevant to true treatment effects. Juice quality, however, was superior for the Vitazyme treatment in 2008, with a brix level 0.7 percentage point higher for the Vitazyme treatment. A view of the vineyard during the entire year showed superior vine and

Continued on the next page

leaf growth for Vitazyme compared to the control.

The yields for the first four years of the study are as follows:

	2004 (Yr 1)		2005 (Yr 2)		2006 (Yr 3)		2007 (Yr 4)		Average	
Treatment	**Yield**	**Change**	**Yield**	**Change**	**Yield**	**Change**	**Yield**	**Change**	**Yield**	**Change**
	tons/acre									
Control	1.565	—	2.994	—	2.980	—	4,628	—	3.042	—
Vitazyme	2.287	0.722 (+46%)	3.588	0.644 (+22%)	3.869	0.889 (+30%)	5.869	1.241 (+27%)	3.903	0.888 (+29%)

The first four years of this Cabernet Sauvignon vineyard study produced an average of 29% more grapes with Vitazyme applied four times during the growing season. With the wine from these two treatments being equivalent each year — by some opinions even favoring Vitazyme — there is every reason for the grape grower to utilize Vitazyme in his production system to greatly increase yield without decreasing wine quality.

Grapes (for raisins)

Year Six of a Continuing Raisin Study

Researcher: Jamie Hansen *Cooperating party*: David Morgan, Tulare Ag Products, Tulare, California
Location: LDS Fresno Raisin Vineyard, Madera, California *Variety*: Thompson seedless
Soil type: Very sandy to light clay *Irrigation*: drip
Experimental design: This test is in its sixth year of a continuing raisin study that began in 2003. The study was designed initially to evaluate the effects of Ethrel and Vitazyme (plus other Tulare Ag products), alone or in combination, on the yield and quality of raisin grapes. In 2006, however, the study was modified to evaluate the best possible combinations of Ethrel and seaweed treatments on top of a background application of Vitazyme, potassium (Finisher 21), calcium (Cal Ocho 8%), and fulvic acid. Then, in 2007 the treatments were again modified to include a seaweed product (Excite), with or without Vitazyme. The 2008 study was in most ways a repeat of the 2007 work, but with an additional product added with Vitazyme in one treatment. An 80-acre, 112-row raisin vineyard was divided into seven treatments on a replicated basis throughout the vineyard, with each treatment applied to rows in different areas of the vineyard to produce accurate results. Each treatment covered about 11 acres. All treatments had vines pruned to five or six canes.

Treatment	**Excite 2-18-36**	**Excite 1-1-17**	**Excite 17-17-17**	**Vitazyme**	**AZ41**	**Finisher 21**	**Zinc, Boron**	**Cal Ocho 8%**
lb/acre	lb/acre	lb/acre	lb/acre	oz/acre				
1 (same as 2007)	4.5	0	0	16	0	X	X	X
2 (same as 2007)	4.5	0	0	0	0	X	X	X
3	0	0.5	4.5	0	0	X	X	X
4 (same as 2007)	0	2.0	0	0	0	X	X	X
5	0	0	0	16	10	X	X	X
6 (same as 2007)	0	1.0	0	16	0	X	X	X
7 (same as 2007)	0	1.0	0	0	0	X	X	X
Dates applied (see below for details)	four times	four times	four times	three times	every 10-14 days	verasion	1 week pre-bloom	verasion

Fertilization: The whole vineyard received adequate N, P, and K in the irrigation well water.
Vitazyme application: Vitazyme was applied foliar at 16 oz/acre two weeks bloom, two weeks after bloom, and at verasion.
Excite application: Various seaweed formulations with analyses of 2-18-36% N-P_2O_5-K_2O (Excite 2-18-36), 1-1-17 (Excite 1-1-17), or 17-17-17 (Excite 17-17-17) were applied at 1, 2, or 4.5 lb/acre for the indicated treatments four weeks before bloom, at bloom, four weeks after bloom, and two weeks before verasion.
AZ41: This is a formulation of Australian melaleuca, aloe vera, and orange peel oil used to help control leaf fungal diseases. It was applied every 10 to 14 days from late April to July 1. For this treatment (5) there were no fungicides applied all growing season. The product is reputed to impart SAR (System Acquired Resistance) to plants.
Finisher 21 application: Finisher 21 is a 21% potassium (K_2O) formulation that was applied foliar at the recommended rate, along with other materials to all treatments at verasion in late June.
Cal Ocho 8% application: Cal Ocho 8% is an 8% calcium formulation, with CaO and carbohydrates. It was applied foliar at the recommended rate with other agents to all treatments at verasion in late June.
Zinc, boron, calcium, and potassium application: These were applied one week before bloom.
Gibberellin application: A single gibberellic acid application was made to the leaves at the recommended rate at the bloom stage, about May 10, along with Pristine.
Fungicide applications: Standard fungicides were applied at typical rates and dates for all but Treatment 5, which received AZ41.
Weather conditions: The year was dryer than normal, and especially hot around blossom and verasion time; the remainder of the year was mild. This weather led to poor raisin quality.
Harvest date: unknown
Yield results: The grapes were harvested by volunteer labor and placed on paper trays between

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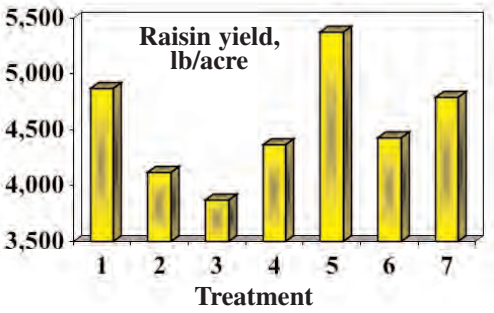
the rows. After 3 to 4 weeks of drying they were picked up and delivered to the Sunmaid raisin packing plant. Because some of the raisins were not picked up at the proper time there was sunburn damage to them, requiring reworking at the Sunmaid plant. The raisins were graded at the Sunmaid raisin plant, and all light and inferior raisins were removed. Those retained for yield results were grade B or better.

Vitazyme + AZ41 gave by far the highest yield, fully 10% higher than the next highest yielding treatment (Treatment 1: Vitazyme + Excite 2-18-36 at 4.5 lb/acre). Vitazyme + Excite 2-18-36 (4.5 lb/acre) gave the second highest yield which slightly exceeded Excite 1-1-7 at 1 lb/acre. This was closely followed by Excite 1-1-17 at 2 lb/acre, and the Excite -18-36 at 4.5 lb/acre. The yield of Excite 17-17-17 at 4.5 lb/acre was considerably lower than any other treatments, at 3,872.4 lb/acre.

Raisin Yield

Treatment	Raisin yield[1]	Raisin yield[2]	Yield change[3]	
	lb/row	lb/acre	lb/acre	%
1. Vitazyme + Excite 2-18-36 (4.5 lb)	1,740.0	4,872.0	+756.0 (vs. 2)	+18
2. Excite 2-18-36 (4.5 lb)	1,470.0	4,116.0	——	——
3. Excite 17-17-17 (4.5 lb)	1,383.0	3,872.4	——	——
4. Excite 1-1-17 (2.0 lb)	1,558.7	4,364.4	——	——
5. Vitazyme + AZ41 (10 oz)	1,920.2	5,376.6	+504.6 (vs. 1)	+10
6. Vitazyme + Excite 1-1-17 (1.0 lb)	1,581.8	4,429.0	—-	---
7. Excite 1-1-17 (1.0 lb)	1,710.4	4,789.1	+424.7 (vs. 4)	+10
			+360.1 (vs. 6)	+8

[1]One row contained about 180 vines.
[2]One acre contained 2.8 rows.
[3]Compared to a control that is treated the same except for one variable.



The highest B and B turnout was for Excite 1-1-17 at 2 and 1 lb/acre (Treatments 4 and 7), at about 44%. Values for all of the other treatments were between about 36 and 41%, with Vitazyme + Excite 1-1-17 at 1 lb/acre giving the lowest B and B grade of 35.7%. Substandards were within a fairly narrow range for all treatments, between 9.2 and 12.4%, the lowest for Excite 1-1-17 (1 lb/acre) and Excite 17-17-17 (4.5 lb/acre), and the highest for Excite 2-18-36 (4.5 lb/acre).

Raisin Quality

Treatment	Substandards	Substand. change	B and B	B and B change
	% of total	percentage points	% of total	percentage points
1. Vitazyme + Excite 2-18-36 (4.5 lb)	11.2	——	38.6	+0.7 (vs. 2)
2. Excite 2-18-36 (4.5 lb)	12.4	+1.2 (vs. 1)	37.9	——
3. Excite 17-17-17 (4.5 lb)	9.3	——	40.8	——
4. Excite 1-1-17 (2.0 lb)	11.5	+2.3 (vs. 7)	44.1	+0.1 (vs. 7)
5. Vitazyme + AZ41 (10 oz)	11.3	——	36.5	——
6. Vitazyme + Excite 1-1-17 (1.0 lb)	11.8	+2.6 (vs. 7)	35.7	——
7. Excite 1-1-17 (1.0 lb)	9.2	——	44.0	+8.3 (vs. 6)

Conclusion: The results of year six with this raisin vineyard trial near Madera, California, are most interesting due to the following reasons:

1. The best yielding treatment by far was the Vitazyme + AZ41 (Melaleuca + Aloe vera + orange peel) treatment, producing 10% more raisins than the next highest treatment. This treatment used no conventional fungicides, yet had excellent fungal control throughout the season and no powdery mildew whatsoever. All other treatments received conventional fungicides.
2. Excite 17-17-17 alone at 4.5 lb/acre produced the lowest yield (3,872.4 lb/acre), being 6% lower than the next lowest yield (Excite 2-18-36 alone at 4.5 lb/acre).
3. Vitazyme + Excite 2-18-36 at 4.5 lb/acre gave the second highest yield, which exceeded Excite 2-18-36 alone by 18%.
4. On the other hand (see point 3), Vitazyme + Excite 1-1-17 at 1 lb/acre gave an 8% lower yield than Excite 1-1-17 alone at 1 lb/acre.
5. Excite 1-1-17 at 1 lb/acre gave a 10% higher yield increase than Excite 1-1-17 at 2 lb/acre; more was not better.
6. Quality of the raisin crop for 2008 was much reduced from previous years due to very hot weather at blossom and verasion. The substandards and B and B yields varied within a fairly narrow range, with Excite 1-1-17 at both rates producing the highest B and B turnouts.

These results are quite different than those experienced in 2007, when the Excite 1-1-17 at both 1 and 2 lb/acre gave the best yields. This year the 1-1-17 Excite formulation at 1 lb/acre performed better than at 2 lb/acre, but was still below the yield of Vitazyme + Excite 2-18-36 at 4.5 lb/acre, and far below Vitazyme + AZ41. The separation of the sprays of Vitazyme + Excite by 10 to 14 days this year may have helped the activity of both products, since there may be an overabundance of growth regulating substances when both are applied at the same time, confusing the plants' metabolism.

Vitazyme with Excite 2-18-36 performed much better than Excite 2-18-36 alone (+18%), but Vitazyme with Excite 1-1-17 performed less well than Excite 1-1-17 alone (-8%). The reasons for this reversal are unclear, but the extra nutrients applied with the Excite 2-18-36 may have helped Vitazyme trigger added growth, a nutrient interaction effect well-documented with many crops. It would have been interesting to note the effect Vitazyme would have along with Excite 17-17-17.

Differences in response to Vitazyme for 2008 are likely due to (a) a reduction in carryover effects of Vitazyme for the 2007 cropping years, (b) a separation of the application of Vitazyme and Excite by 10 to 14 days, and (c) a particularly stressful year for grapes, during which Vitazyme effects tend to be more emphasized. Above all other results for 2008, the Vitazyme + AZ41 treatment holds excellent promise for producing the highest yields of raisins grapes without the use of conventional fungicides, making organic raisin production at this location a true possibility.

• Yield increase with Vitazyme: 10 to 18%

Oil Palm

Researchers: Paolo Parducci (Summer Zone, Quito, Ecuador), and Alain Durand (Olepsa, Ecuador)
Location: an oil palm plantation at Las Golondrinas in Canton Rosa Zarate, Province of Esmeraldes
Sponsoring organization: Summer Zone, Quito, Ecuador
Age of plantation: 10 years
Crop: African oil palm (*Elais guinensis* Jacq)
Population: 1,200 trees/ha
Area treated: An area of 8.8 ha was selected in the plantation to distribute five treatments with five replicates; the adjoining trees were used as a control.

Objectives of the study:

1. Evaluate the root development of African oil palms treated with Vitazyme and other products of Summer Zone
2. Determine the effectiveness of the various Summer Zone products when fertilizer is reduced by 30% of normal
3. Calculate the economic viability of the various treatments and Summer Zone products

Treatment	Products used	Soil application[1]		Foliar application[2]		Fertilization
		liter or kg/ha	grams	liter or kg/ha	grams	% of control
1	None (normal program)	0	0	0	0	100
2	Pacha Mama	5.0	35	0	0	30
	Vitazyme	0.4	2.5	0.4	2.5	
	SZ Calcio	0	0	1.0	7	
	TKO Phosphite	0	0	1.0	7	
3	Vitazyme	0.4	2.5	0.4	2.5	30
	Companion	2.0	14	0	0	
	Essential	0	0	1.0	7	
4	Pacha Mama	3.0	21	0	0	30
	Novaplex	1.4	10	1.4	10	
	SZ Calcio	0	0	0.7	5	
5	Pacha Mama	2.0	14	0	0	30
	Vitazyme	0.4	2.5	0	0	
	Nitro 30	1.0	7	0	0	
	TKO Phosphite	1.0	7	0	0	
	Novaplex	0	0	1.4	10	
6	Vitazyme	0.7	5	0.7	5	30

[1]Applied to the soil in April, 2008, before the main fertilizer.
[2]Applied to the leaves in April, 2008, using a 600 liter tank sprayer.

Products used in the study:

Vitazyme. A natural biostimulant containing various growth regulators, vitamins, glycosides, and other growth agents, registered by OMRI (Organic Materials Review Institute)

Pacha Mama. A natural humic, fulvic, and ulmic acid concentrate containing 88% or more humic acids and 12% essential minerals, registered by Control Union Skal and Organic Farming U.S.A.

Novaplex. A complete nutritional combination of minerals, carbohydrates, amino acids, vitamins, and growth regulators derived from marine kelp, and registered by OMRI, Control Union Skal, and the U.S.E.P.A.

Nitro 30. A water-soluble fertilizer containing 25.5% nitrogen, of which 4.5% is ammonium-N

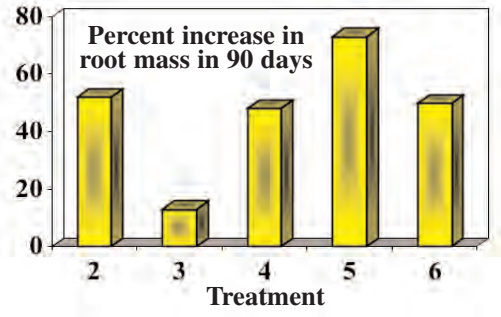
TKO Phosphite. A true water-soluble phosphite for fungal control of plants, containing 29% P_2O_5 and 26% K_2O

SZ Calcio. A calcium nitrate product containing 9% calcium, 3.2% nitrate nitrogen, and 2.8% ammonium nitrogen

Root growth results: Root growth of the oil palms was evaluated both at the beginning of the study and in July, three months after application. Olepsa personnel collected samples of new roots in the radicular area of trees for each treatment, and quantified them by the number of new roots.

Treatment	Root number – April*			Root number – July*			Root number increase in 90 days
	Mean	Min	Max	Mean	Min	Max	
1	5.4	—	—	5.4	—	—	0
2	5.4	2.0	9.0	8.2	3.0	14.0	2.8 (+52%)
3	5.4	2.0	10.0	6.1	4.0	12.0	0.7 (+13%)
4	5.4	2.0	16.0	8.0	4.0	12.0	2.6 (+48%)
5	5.9	1.0	14.0	10.2	4.0	16.0	4.3 (+73%)
6	4.8	2.0	8.0	7.2	2.0	12.0	2.4 (+50%)

*The Min and Max represent the high and low values of data from the five replicates sampled for that treatment.



All of the treatments caused sizable increases in root mass above the control, but especially Treatment 5, which incorporated five of the six materials, including Vitazyme. Treatments 2, 4, and 6 all increased root mass by about 50%; 2 and 6 included Vitazyme.

Economic evaluation: Please see the next page.

Product performance: A calculation is made on the next page of the product performance in terms of root growth increase versus program cost (root growth increase/program cost).

Conclusions: In this Ecuadorian oil palm rooting study, all treatments provided root mass increases over the three-month test period, of from 13 to 73%, the greatest value with Treatment 5 (all products except SZ Calcio). Product costs, with the 30% fertilizer reduction, were below the 100% fertilizer control, the lowest cost being for Treatment 6 (Vitazyme only). In terms of total product performance, Treatment 5 did the best, giving a ratio of 0.196, followed by Treatment 6 (Vitazyme only), giving a ratio of 0.159. These data confirm

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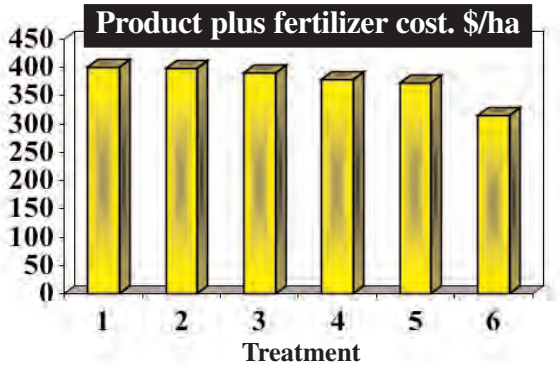
Treatment	Product	Amount	Price each	Total cost	Cost with fertilizer
		liter or kg/ha	$	$/ha	$/ha
1	None	0	0	0	400.00
2	Pacha Mama	5.0	14.50	72.60	
	Vitazyme	0.4	24.20	9.70	
	SZ Calcio	1.0	17.00	17.00	
	TKO Phosphite	1.0	19.00	19.00	
	Total			118.30	398.30
3	Vitazyme	0.4	24.20	9.70	
	Companion	2.0	35.00	70.10	
	Essential	1.0	30.00	30.00	
	Total			109.80	389.80
4	Pacha Mama	3.0	14.50	43.50	
	Novaplex	2.9	15.00	42.90	
	SZ Calcio	0.7	17.00	12.20	
	Total			98.60	378.60
5	Pacha Mama	2.0	14.50	29.00	
	Vitazyme	0.4	24.20	8.60	
	Novaplex	1.4	15.00	21.50	
	Nitro30	1.0	15.00	15.00	
	TKO Phosphite	1.0	19.00	19.00	
	Total			93.20	373.20
6	Vitazyme	1.4	24.20	34.60	
	Total			34.60	314.60



Treatment	Root mass increase	Program cost	Performance
	%	$/ha	root growth/cost
1	0	400.00	0
2	52	398.30	0.131
3	13	389.80	0.033
4	48	378.60	0.127
5	73	373.20	0.196
6	50	314.60	0.159

the long-noted observations that Vitazyme works best when combined with various nutrients and organic materials, such as the humic and fulvic acids of Pacha Mama, the nitrogen and the other nutrients of Novaplex and Nitro 30, and other growth stimulants and plant protectants in TKO Phosphite and Novaplex. Oil palm yields should parallel these root growth results, so it is safe to conclude that the combination of products in Treatment 5 — Pacha Mama, Vitazyme, Novaplex, Nitro 30, and TKO Phosphite — will provide the best economic returns for oil palm growers in Ecuador of the treatments tested.

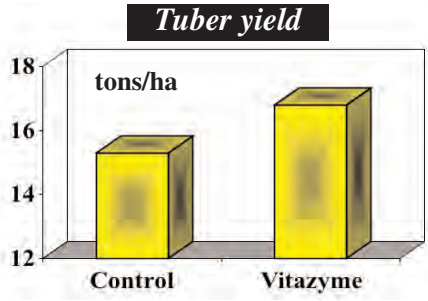
Potatoes

Researchers: O.V. Kornijchuk, V. V. Plotnikov, and agronomic scientists
Organization: Vinnytsia State Agricultural Experiment Station of Forage Institute, Ukraine Academy of Agrarian Sciences, Vinnytsia, Ukraine
Location: Ukraine central forest – steppe area near Vinnytsia *Variety*: Finka Elite
Seeding rate: 2.8 tons/ha *Planting date*: May 12, 2008 *Previous crop*: winter wheat
Soil Type: gray forest steppe soil; in the 0-30 cm layer, 2.2% organic matter, 8.4 mg/100 g of soil "hydrolyzed nitrogen", 15.8 mg/100 g of soil phosphorus, 12.4 mg/100 g of soil exchangeable potassium, and pH = 5.5.
Tillage: plowed to 22-24 cm, and harrowed to 10-12 cm
Experimental design: A uniform field area was selected to place 1.0 ha plots, replicated four times, over the test area. The objective was to determine if Vitazyme could favorably influence crop yields for this gray forest soil area of Ukraine.

1. Control **2. Vitazyme applied once**

Fertilization: In the fall of 2007 a broadcast application of 30-60-90 kg/ha N-P_2O_5-K_2O was made.
Vitazyme application: 1 liter/ha applied on July 8, 2008, at bloom
Harvest date: unknown
Yield results: See the table (right).
Income results: Based on current potato prices, the increase in income with Vitazyme was 1,674 hrn/ha.

Treatment	Tuber yield	Yield increase	
	tons/ha	tons/ha	%
1. Control	15.3	—	—
2. Vitazyme	16.8	1.5	10



The white potatoes tested in Ukraine show the great effect Vitazyme had on both tuber number and size. The product enabled the plants to better utilize soil nutrients.

Conclusions: In this Ukraine potato study on a gray forest-steppe soil, Vitazyme at only 1 liter/ha at blossom prompted an excellent 10% yield increase, and a great income improvement of 1,674 hrs/ha. Had Vitazyme been applied at least once more — especially at planting — and preferably three to four times total, the yield increase would likely have been much greater.

- ***Increase in tuber yield: 10%***

Rice

Researcher: unknown
Variety: Khang Dan
Planting date: spring, 2008
Location: Tan lap and Dan Phurong, Viet Nam
Soil Type: alluvial soils of the Red River
Planting rate: unknown
Experimental design: Two rice fields were divided into Vitazyme treated and untreated areas to determine effects of the product on rice yield.

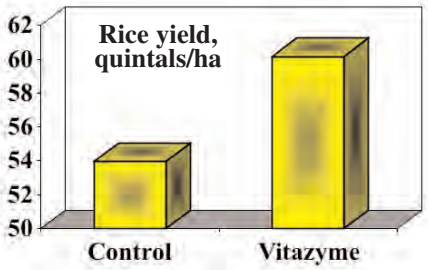
1. Control **2. Vitazyme**

Fertilization: unknown
Vitazyme application: two applications of 1 liter/ha each time (times unknown)
Harvest date: unknown, in 2008
Yield results: see tables and graphs at right

This photo needs little explanation. Vitazyme on rice in Viet Nam triggered considerably better root growth, plus longer leaves having more chlorophyll.

Field 1

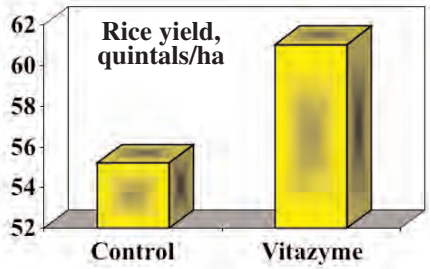
Treatment	Rice Yield	Change
	quintals/ha	quintals/ha
Control	53.95	——
Vitazyme	60.15	6.20 (+11%)



• Increase in rice yield: 11%

Field 2

Treatment	Rice Yield	Change
	quintals/ha	quintals/ha
Control	55.20	——
Vitazyme	61.05	5.85 (+11%)



• Increase in rice yield: 11%

Income results: an income increase of 3,150,000 Vnd/ha for Field 1, and of 2,895,000 Vnd/ha for Field 2
Conclusions: In 2008 on an alluvial soil, this Vietnamese rice study with Vitazyme showed an excellent 11% grain yield increase for both fields investigated. The yields brought an excellent income increase in both cases as well. The nearly identical results for the studies shows that the product performs consistently, as it did in similar studies in Nhur Quynh, Hung Yen, Heip Hoa, and Bac Giang in 2007, where 11% and 13% yield increases on this same variety of rice were achieved.

Rice

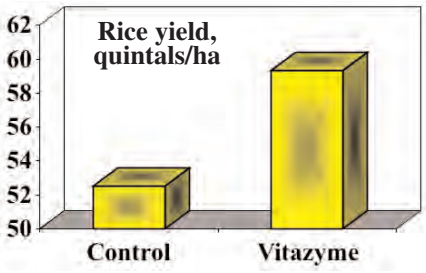
Researcher: unknown
Variety: Khang Dan
Planting date: in 2007
Location: Heip Hoa and Bac Giang, Viet Nam
Soil Type: "exhausted" soil
Planting rate: unknown
Experimental design: A field of rice was divided into a Vitazyme treated area and an untreated control alongside to evaluate the product's effects on rice yield.

1. Control **2. Vitazyme**

Fertilization: unknown
Vitazyme application: two applications of 1 liter/ha each time (times unknown)
Harvest date: unknown
Yield results: See the results to the right.
Income results: an increase of 2,105,000 Vnd/ha with Vitazyme
Conclusions: Despite the fact that few details on the conduct of this Vietnamese study are available, Vitazyme increased the yield of rice on this "exhausted" soil by 13%, an excellent improvement. The income increase was likewise very good.

Rice Yield

Treatment	Rice Yield	Change
	quintals/ha	quintals/ha
Control	52.53	——
Vitazyme	59.33	6.80 (+13%)



• Increase in rice yield: 13%

Rice

Researcher: unknown
Variety: Khang Dan
Planting date: in 2007
Location: Nhur Quynh and Hung Yen, Viet Nam
Soil Type: alluvial soils of the Red River
Planting rate: unknown
Experimental design: A field of rice was divided into a Vitazyme treated area and an untreated control alongside to determine the effect of the product on yield.

1. Control **2. Vitazyme**

Fertilization: unknown
Vitazyme application: two applications of 1 liter/ha each time (times unknown)

Rice Yield

Treatment	Rice Yield	Change
	quintals/ha	quintals/ha
Control	54.88	——
Vitazyme	60.90	6.02 (+11%)

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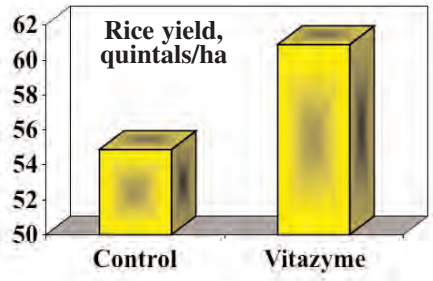


Harvest date: unknown
Yield results: See results on the previous page.
Income results: an increase of 1,793,000 Vnd/ha with Vitazyme
Conclusions: Despite the fact that few details on the conduct of this Vietnamese study are available, Vitazyme increased the yield of rice on this alluvial soil by 11%, an excellent improvement. The income increase was likewise very good.

• Increase in rice yield: 11%

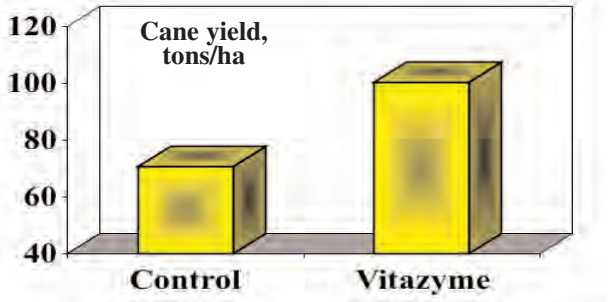
With only 60% of normal nitrogen this Vitazyme treated rice made much better use of the available fertility.

Sugar Cane

Researcher: Unknown
Variety: Melones
Location: Sancti-Spiritus, Cuba
Soil Type: unknown
Experimental design: A sugar cane field was divided into a control area of 4.7 ha, and a Vitazyme treated area of 4.7 ha to determine the effect of the product on crop production. **1. Control** **2. Vitazyme**

Cane Yield

Treatment	Total cane yield	Area yield	Change
	tons/4.7 ha	tons/ha	tons/ha
Control	332.2	70.7	——
Vitazyme	471.8	100.4	29.7 (+42%)



Fertilization: unknown
Vitazyme application: unknown
Yield results: See the results on the left.
Conclusions: This commercial sugar cane trial in Cuba, despite having few details of the test, revealed an amazing 42% yield increase with Vitazyme. The product continues to display excellent results in this tropical country, following several years of highly positive research on sugar cane.

Sugar cane continues to respond remarkably well to Vitazyme in sugar cane trials in Cuba. In this study the effect of the product is clearly seen by height and leaf area.

• Increase in sugar cane yield: 42%

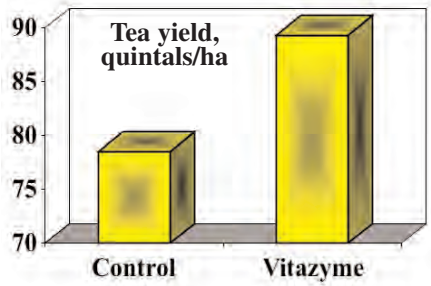
Tea

Researcher: unknown
Variety: unknown
Planting date: established plantation
Experimental design: A portion of a tea plantation was treated with Vitazyme, and the remainder was left untreated, to determine the effect of the product on tea leaf yield.
1. Control **2. Vitazyme**
Fertilization: unknown
Vitazyme application: unknown, but likely two 1 liter/ha applications by foliar spray, at unknown times
Harvest dates: cumulative yield over time
Yield results: Seethe results on the right.
Income increase: Plantation 1 gave an income increase of 1,187,000 Vnd/ha.
Conclusions: These two tea trials with Vitazyme in Viet Nam gave excellent increases: 14% and 12% above the untreated controls. The 14% increase gave an excellent income increase of 1,187,000 Vnd/ha, showing that Vitazyme is a highly viable tea amendment for Viet Nam.

Location: Dong Hy, Thai Nguyen, Viet Nam
Soil type: gray soil of the midlands
Planting density: unknown

Plantation 1

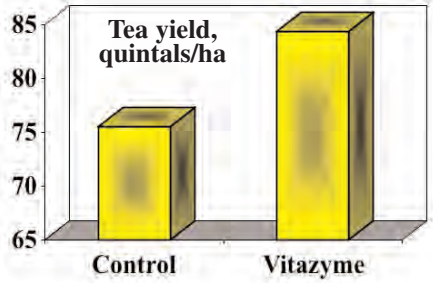
Treatment	Leaf Yield	Change
	quintals/ha	quintals/ha
Control	78.59	——
Vitazyme	89.34	10.75 (+14%)



• Increase in tea yield: 14%

Plantation 2

Treatment	Leaf Yield	Change
	quintals/ha	quintals/ha
Control	75.55	——
Vitazyme	84.40	8.85 (+12%)



• Increase in tea yield: 12%

Tomatoes

Researcher: unknown
Soil type: unknown
Planting date: May 10, 2007
Location: Zaporizge, Tavriya Skif, Ukraine
Watering: sprinkler irrigation
Variety: Volium
Seeding rate: unknown

Experimental design: A tomato field was divided into a Vitazyme treated portion and a control (untreated) portion to evaluate the effect of the product on tomato production.

1. Control

These Ukraine tomatoes gave an excellent yield of high quality from Vitazyme application. The two applications used in this study are fewer than recommended.

- ***Increase in tomato yield: 7%***

2. Vitazyme

Fertilization: Soil application, preplant: 300 kg/ha 16-16-16% N-P_2O_5-K_2O; twice during vegetative growth 200 kg/ha 16-16-16% N-P_2O_5-K_2O. Foliar application: urea (45% N) twice at 7 kg/ha, and "rossasol" twice at 7 kg/ha.

Vitazyme application: 1 liter/ha on the leaves and soil June 20, 2007, and again the first part of July, 2007

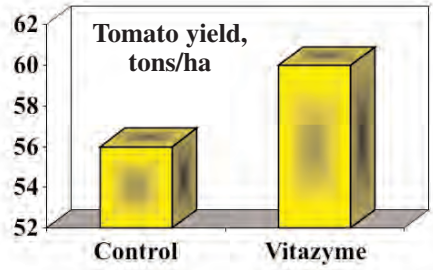
Harvest date: Harvest began August 1, 2007, and proceeded for several weeks.

Yield results: See the results (right).

Conclusions: This Ukrainian study on tomatoes proved that Vitazyme can significantly increase the yield of tomatoes, using two foliar applications of the product during production. A root drench at planting using a dilute solution would likely have improved the yield even more.

Tomato Yield

Treatment	Fruit yield	Change
	tons/ha	tons/ha
Control	56	——
Vitazyme	60	4 (+7%)



Watermelons

State University Peninsula of Santa Elena, Ecuador

Location: Unit of Production and Research, Faculty of Agrarian Sciences, State University Peninsula of Santa Elena, Sinchal – Barcelona Commune, Manglaralto Parish, Peninsula of Santa Elena, Ecuador

Variety: Dona Flor (a type of Charleston Grey) *Soil type*: loamy sand, well-drained *Planting spacing*: unknown

Soil analysis: ph, 7.9; organic matter, 1.0%; nitrogen, 1 ppm; phosphorus, 44 ppm; potassium, 2.2 meq/100g; calcium, 21 meq/100g; magnesium, 4.2 meq/100 g *Planting date*: November, 2004

Experimental design: A field of watermelons was planted using 45 plants for each plot. Each plot was 9 x 9 meters, or 81 m^2, but the "useful" area of each plot was 8 x 3 meters, or 24 m^2. A total of eight treatments, with four replications in a randomized complete block design, were used to evaluate the effect of Vitazyme on a stem length, female flowers, fruit number, fruit weight and size, yield, and economic factors.

Fertilization: Nitrogen (N) and phosphorus (P) were applied as DAP [$(NH_4)_2SO_4$], and potassium (K) was applied as K_2SO_4. Distribution: 20% of N, P, and K 15 days after planting; 40% of N and P, and 30% of K before flowering; 40% of N and P, and 50% of K at fruit development.

Vitazyme application: (1) Soaking of seeds in a 10% Vitazyme solution for 10 minutes, then planting 24 hours later; (2) 40 cc of Vitazyme in 20 liters of water sprayed to the leaves 20 days after planting; (3) same as (2) 40 days after planting; (4) same as (2) 60 days after planting.

Harvest date: All harvest data and yield results were obtained by 100 days after planting.

Treatment	Nitrogen	Phosphorus	Potassium	Vitazyme
		kg/ha		
(Control)	0	0	0	0
2	150	80	200	0
3	200	80	200	0
4	250	80	200	0
5	0	0	0	X
6	150	80	200	X
7	200	80	200	X
8	250	80	200	X

Growth results: See the results on the next two pages. Vine length at 40 and 60 days was actually less with Vitazyme at the 250 kg/ha N rate, but at the 0 and 150 kg/ha N rates Vitazyme produced somewhat longer vines. As expected, the lowest N level (0 kg/ha) produced significantly shorter vines, though Vitazyme significantly boosted vine length at 40 days after planting.

Female flower number was the greatest for Vitazyme at each nitrogen level, though these increases, up to 17%, were not statistically significant (P=0.05). The number of commercially viable fruit was also higher with Vitazyme, from 11 to 43 greater, than the control. Due to variability between plots, however, these differences were not significant. Melon dimensions in general were increased with Vitazyme, both melon length and diameter, but these differences were not significant except at the 0 kg/ha N rate. The fourth harvest produced less advantage for Vitazyme, the control slightly exceeding Vitazyme at the 150 and 250 kg/ha N rates.

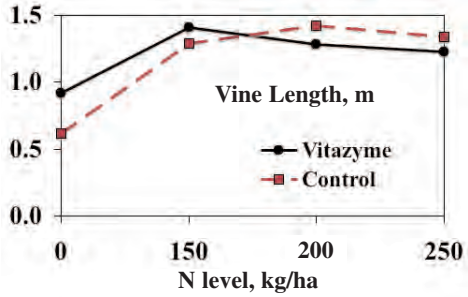
Yield results: These results are on the next two pages. As can be clearly seen from this data, Vitazyme produced much higher yields of watermelons than the untreated controls at the same N levels. While these

Continued on the next page

Vine Length At 40 Days

Treatment	Vine Length*	Change**
	m	m
3 (200 N)	1.42 a	——
6 (150 N + Vita)	1.41 a	0.12 (+9%)
4 (250 N)	1.34 a	——
2 (150 N)	1.29 a	——
7 (200 N + Vita)	1.28 a	(-) 0.14 (-10%)
8 (250 N +Vita)	1.23 a	(-) 0.11 (-8%)
5 (0 N + Vita)	0.92 b	0.30 (+48%)
1 (0 N)	0.62 b	——

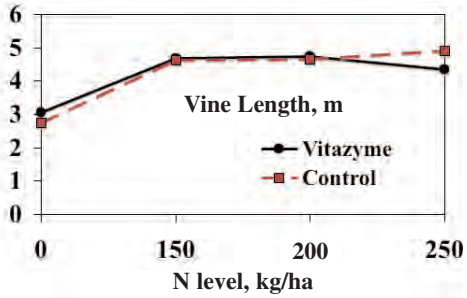
*Means followed by the same letter are not significantly different at P-0.05. CV=14.7%.
**Comparisons are made at the same N level: Treatments 1 vs. 5, 2 vs. 6, 3 vs. 7, and 4 vs. 8.



Vine Length At 60 Days

Treatment	Vine Length*	Change**
	m	m
4 (250 N)	4.91 a	——
7 (200 N + Vita)	4.73 a	0.08 (+2%)
6 (150 N + Vita)	4.67 a	0.04 (+1%)
3 (200 N)	4.65 a	——
2 (150 N)	4.63 ab	——
8 (250 N +Vita)	4.34 b	(-) 0.57 (-12%)
5 (0 N + Vita)	3.06 c	0.31 (+11%)
1 (0 N)	2.75 c	——

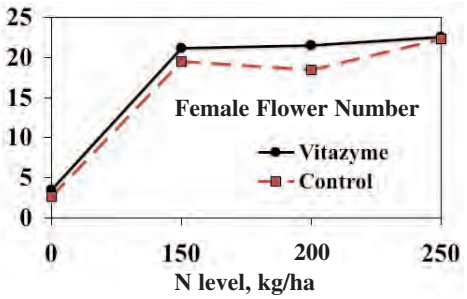
*Means followed by the same letter are not significantly different at P-0.05. CV=6.1%.
**Comparisons are made at the same N level: Treatments 1 vs. 5, 2 vs. 6, 3 vs. 7, and 4 vs. 8.



Female Flower Number at 60 Days

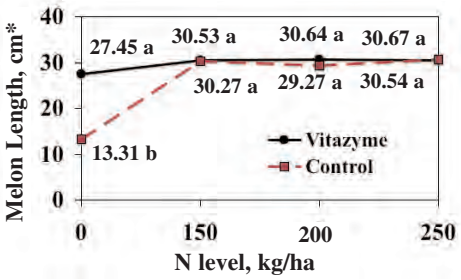
Treatment	Flower Number*	Change**
	number	number
8 (250 N +Vita)	22.55 a	0.20 (+1%)
4 (250 N)	22.35 a	——
7 (200 N + Vita)	21.50 a	3.05 (+17%)
6 (150 N + Vita)	21.10 a	1.60 (+8%)
2 (150 N)	19.50 a	——
3 (200 N)	18.45 a	——
5 (0 N + Vita)	3.55 b	0.85 (+31%)
1 (0 N)	2.70 c	——

*Means followed by the same letter are not significantly different at P-0.05. CV=13.7%.
**Comparisons are made at the same N level: Treatments 1 vs. 5, 2 vs. 6, 3 vs. 7, and 4 vs. 8.

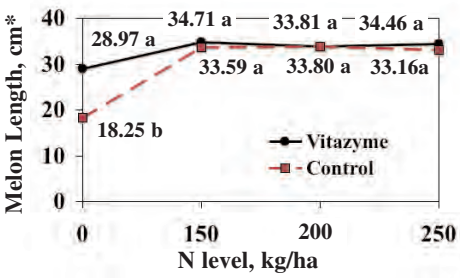


Melon Length for Four Harvests

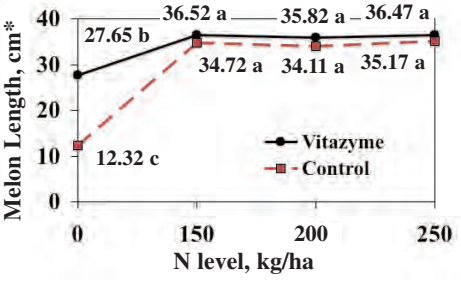
Harvest 1



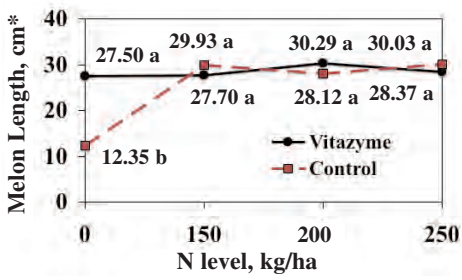
Harvest 2



Harvest 3



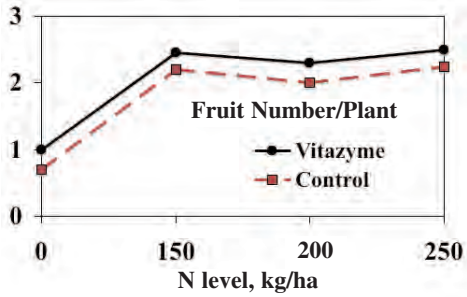
Harvest 4



Commercial Fruit Number

Treatment	Fruit Per Plant*	Change**
	fruit/plant	fruit/plant
8 (250 N +Vita)	2.50 a	0.25 (+11%)
6 (150 N + Vita)	2.45 a	0.25 (+11%)
7 (200 N + Vita)	2.30 a	0.30 (+15%)
4 (250 N)	2.25a	——
2 (150 N)	2.20 a	——
3 (200 N)	2.00 a	——
5 (0 N + Vita)	1.00 b	0.30 (+43%)
1 (0 N)	0.70 b	——

*Means followed by the same letter are not significantly different at P-0.05. CV=16.4%.
**Comparisons are made at the same N level: Treatments 1 vs. 5, 2 vs. 6, 3 vs. 7, and 4 vs. 8.



differences were not significant due to the fairly high experimental error, they were consistently in favor of Vitazyme by from 18 to 71%, the highest being the no nitrogen control. Of considerable interest is the fact that increasing N levels reduced crop response slightly, as has been experienced in trials with other crops: as fertility reaches a maximum, the crop response to Vitazyme diminishes because one is approaching the maximum yield potential under the environmental conditions present.

Treatment	Melon yield*	Change**
	tons/ha	tons/ha
6 (150 N + Vita)	117.08 a	23.72 (+25%)
8 (250 N +Vita)	109.85 a	17.09 (+18%)
7 (200 N + Vita)	100.87 a	17.14 (+20%)
2 (150 N)	93.36 a	——
4 (250 N)	92.76 ab	——
3 (200 N)	83.73 b	——
5 (0 N + Vita)	24.55 c	10.17 (+71%)
1 (0 N)	14.38 c	——

*Means followed by the same letter are not significantly different at P-0.05. CV=22.1%.
**Comparisons at the same N level.

Yield increase with Vitazyme

No N 71%
150 kg/ha N 25%
200 kg/ha N 20%
250 kg/ha N 18%

Economic analyses: The following table uses values generated by the researcher in Ecuador, in terms of U.S. dollars.

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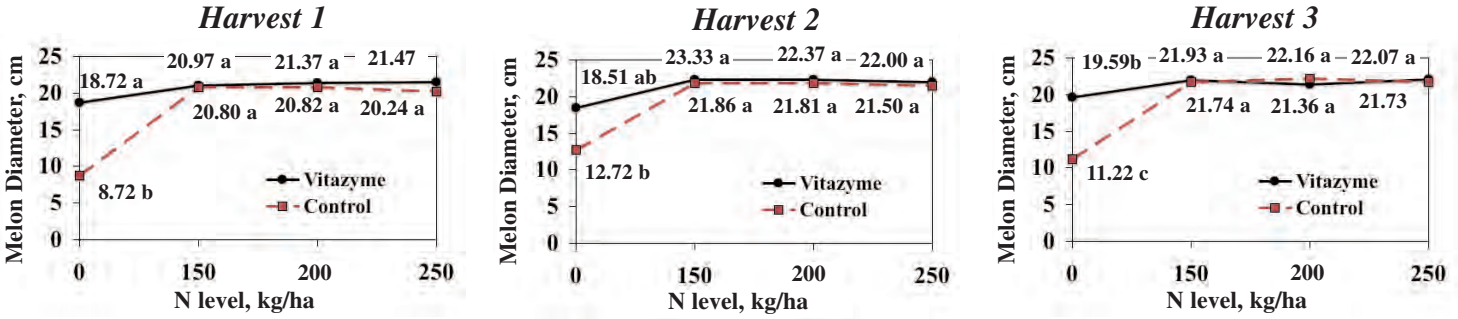
Melon Diameter for Four Harvests



Conclusions: Vitazyme in this Ecuador university study produced great increases in melon yield and income compared to the untreated controls at all nitrogen levels. Yield increases ranged from 18 to 71%, a response to better nutrient utilization with Vitazyme as evidenced by greater fruit numbers and female flowers, and generally greater melon dimensions. Vine length at 40 and 60 days after planting did not reflect these increases in yield. Income was greatly boosted by Vitazyme, especially at the 150 kg/ha nitrogen application, where the increase was $1,897.60/ha above the control, with a cost/benefit of 4.30. All cost/benefits with Vitazyme were substantially enhanced above the control, proving that Vitazyme use with watermelons in Ecuador is a highly viable practice for farmers.

Improvement of Income with Vitazyme At the Same N Level

No N	$813.60/ha	(Treatment 1 vs. 5)
150 kg/ha N	$1,897.60/ha	(Treatment 2 vs. 6)
200 kg/ha N	$1,371.20/ha	(Treatment 3 vs. 7)
250 kg/ha N	$1,367.20/ha	(Treatment 4 vs. 8)

Treatment	Initial inputs	Fert. + Vita.	Total	12% F.C.*	Total	Yield	Income	Cost/Benefit
	$	$	$	$	$	tons/ha	$	
1 (0 N)	1,595.02	0	1,595.02	79.62	1,674.64	14.38	1,150.40	0.69
2 (150 N)	1,595.02	450.38	2,045.40	102.11	2,147,51	93.36	7,468.80	3.48
3 (200 N)	1,595.02	514.40	3,109.42	105.30	2,214.72	83.73	6,698.40	3.02
4 (250 N)	1,595.02	568.54	2,163.56	108.00	2,271.56	92.76	7,420.80	3.27
5 (0 N + Vita)	1,595.02	27.50	1,622.52	81.00	1,703.52	24.55	1,964.00	1.15
6 (150 N + Vita)	1,595.02	477.80	2,072.90	103.48	2,176.38	117.08	9,366.40	4.30
7 (200 N + Vita)	1,595.02	541.90	2,136.92	106.68	2,243.60	100.87	8,069.60	3.60
8 (250 N +Vita)	1,595.02	596.04	2,191.06	109.38	2,300.44	109.85	8,788.00	3.82

*Finance cost

Wheat

Researcher: Richard Stonewigg
Research Organization: Lachian Kenya Limited
Location: near Nairobi, Kenya
Variety: unknown
Soil type: unknown
Planting date: unknown

Experimental design: An area of winter wheat was divided into small plots, with soil treatments in the main plots and foliar treatments in the sub-plots. The treatments were as follows:

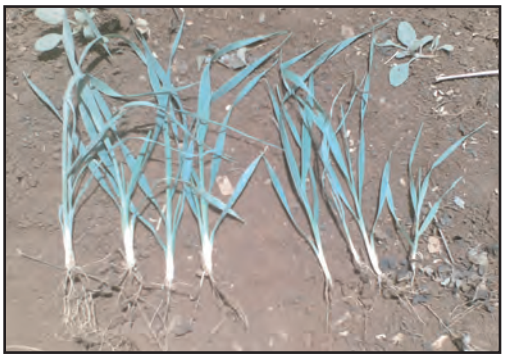
Main Plot Treatments (soil applications at planting)	Sub-Plot Treatments (foliar applications)
1. Control	Twin N
2. Control	Impact Ca
3. Vitazyme + Turbo-Seed +Zn	Twin N
4. Vitazyme + Turbo-Seed + Zn	Impact Ca
5. Urea + DAP (Diammonium P)	Twin N
6. Urea + DAP (Diammonium P)	Impact Ca
7. Vitazyme	Twin N
8. Vitazyme	Impact Ca

Fertilization: *Turbo-Seed* is soluble phosphorus + zinc, copper, and magnesium EDTA + humic acid (to help prevent scorching); this was sprayed into the seed row at 15 kg/ha. *Trade Corp Zn* is a zinc formulation, applied to the soil at 100 g/ha. *Diammonium phosphate* (DAP) and *urea* were both applied to the soil at 150 kg/ha each.

Foliar feeding: *Twin-N* is nitrogen-fixing microbes, applied to the leaves at 1 vial/ha. *Impact Ca* is a calcium + nitrogen formulation sprayed on the leaves at 5 liters/ha.

Vitazyme application: 1 liter/ha sprayed in the seed row at planting

Yield results: See the results on the next page.



The Vitazyme treatment in this Kenya test is on the left. Note the larger and longer leaves, and roots which are much more extensive than the control. More total photosynthesis means greater plant development.

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Wheat Yield

Treatment	Yield	Yield change*
	kg/ha	kg/ha
1. Control + Twin N	1,218	——
2. Control + Impact Ca	1,212	——
3. Vitazyme+Turbo-Seed+Zn+Twin N	1,526	308 (+25%)
4. Vitazyme+Turbo-Seed+Zn+Impact Ca	1,294	82 (+7%)
5. Urea + DAP + Twin N	1,629	417 (+34%)
6. Urea + DAP + Impact Ca	1,094	(-) 118 (-10%)
7. Vitazyme + Twin N	1,704	486 (+40%)
8. Vitazyme + Impact Ca	1,475	263 (+22%)

*Comparisons are made with the appropriate control treatment: Treatments 3, 5, and 7 versus Treatment 1, and Treatments 4, 6, and 8 versus Treatment 2.

Vitazyme worked very well with Turbo-Seed and zinc to increase the yield by 25% with Twin N, and by 7% with Impact Ca. ***The highest average yield, however, was with Vitazyme alone with Twin N or impact Ca***, as shown in the table above.

Conclusions: In this Kenyan study using various soil and foliar products, all soil applied products stimulated yield, but to different degrees, and with considerable interaction with other products (which effects could not be interpretated due to a lack of replication). The interaction of soil applied products was highest, by far, with Twin N, and the lowest with Impact Ca, giving the following average yields:

Twin N (Treatments 3, 5, and 7): 1,620 kg/ha
Impact Ca (Treatments 4, 6, and 8): 1,288 kg/ha
Increase with Twin N vs. Impact Ca: 322 kg/ha (+26%)

Average of the Twin-N and Impact Ca treatments for all four main-plot treatments

Treatment	Yield	Increase in yield
	kg/ha	kg/ha
Control	1,215	——
Vitazyme+Turbo-Seed+Zn	1,410	195 (+16%)
Urea + DAP	1,362	147 (+12%)
Vitazyme	1,590	375 (+31%)

- ***Increase in wheat yield with Vitazyme only: 31%***

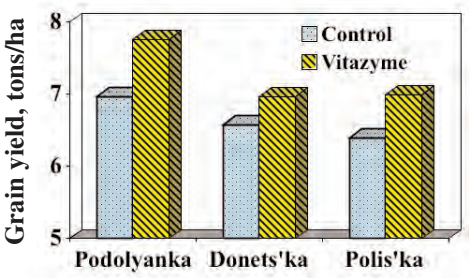
Wheat

Researchers: O.V. Kornijchuk, V. V. Plotnikov, and agronomic scientists *Organization*: Vinnytsia State Agricultural Experiment Station of Forage Institute, Ukraine Academy of Agrarian Sciences, Vinnytsia, Ukraine
Location: Ukraine central forest – steppe area near Vinnytsia *Seeding rate*: 6 mil/ha
Variety: Podolyanka, Donets'ka 48, and Polis'ka 90 *Soil Type*: gray forest steppe soil; in the 0-30 cm layer, 2.2% organic matter, 8.4 mg/100 g of soil "hydrolyzed nitrogen", 15.8 mg/100 g of soil phosphorus, 12.4 mg/100 g of soil exchangeable potassium, and pH = 5.5.
Previous crop: spring vetch *Tillage*: tilled to 4-5 cm. *Planting date*: October 1, 2007
Experimental design: A uniform field area was selected to place 1.0 ha plots, replicated four times, over the test area. The objective was to determine if Vitazyme could favorably influence crop yields for this gray forest soil area of Ukraine.

1. Control **2. Vitazyme applied two times**

Fertilization: In the fall of 2007 a broadcast application of 30-60-90 kg/ha N-P_2O_5-K_2O was made. In the spring, 120 kg/ha of nitrogen was applied at two times (50 and 70 kg/ha).
Vitazyme application: 1 liter/ha applied on April 22, and again on May 13, 2008
Yield and quality results: Vitazyme increased wheat grain yield by 6 to 11% for the three varieties, and improved the gluten and protein levels for all three varieties.

Treatment	Grain yield	Yield change	
	tons/ha	tons/ha	%
1. Control			
Podolyanka	6.97	——	——
Donets'ka 48	6.58	——	——
Polis'ka 90	6.39	——	——
2. Vitazyme twice			
Podolyanka	7.76	+0.79	+11
Donets'ka 48	6.97	+0.39	+6
Polis'ka 90	6.99	+0.60	+9



Treatment	Gluten content	Gluten change	Crude protein	Protein change
	%	%-points	%	%-points
1. Control				
Podolyanka	22.5	——	11.5	——
Donets'ka 48	21.9	——	11.5	——
Polis'ka 90	23.4	——	12.0	——
2. Vitazyme twice				
Podolyanka	23.2	+0.7	12.3	+0.8
Donets'ka 48	22.4	+0.5	12.1	+0.6
Polis'ka 90	24.4	+1.0	12.5	+0.5

Increase in wheat yield with Vitazyme
Podolyanka ..... +11%
Donets'ka 48 ..... +6%
Polis'ka 90 ..... +9%

Increase in gluten with Vitazyme
Podolyanka..... 0.7%-pts
Donets'ka 48 .... 0.5%-pts
Polis'ka 90 ..... 1.0%-pts

Increase in protein with Vitazyme
Podolyanka 0.8%-pts
Donets'ka 48 ... 0.6%-pts
Polis'ka 90 ..... 0.5%-pts

Income results: Based on current grain prices, the increase in income from Vitazyme for the three varieties was as follows:

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Podolyank ..... 747 hrn/ha Donets'ka ..... 218 hrn/ha Polis'ka ..... 507 hrn/ha

Conclusions: Vitazyme applied twice during during the spring growth period resulted in a substantial 6 to 11% increase in yield; Podolyanka variety gave the highest increase, that resulted in a 747 hrn/ha income increase. The quality of the grain was also improved with Vitazyme, the gluten content increasing from 0.5 to 1.0 percentage points, and crude protein from 0.5 to 0.8%. These results prove that this crop treatment is highly effective for improving the yield, quality, and income of winter wheat in Ukraine on these gray forest-steppe soils. Had Vitazyme been applied to the seeds in the fall, or to the newly emerged plants, it is likely that the results would have been even more favorable than with only spring applications.

Wheat

Researcher/Farmer: Blaine Middleton
Location: Lamesa, Texas ["East Home" Farm]
Variety: TAM 111 hard red winter wheat
Soil type: sandy loam
Planting date: November 14, 2007
Planting rate: 75 lb lb/acre
Row width: 9.5 inches
Planting depth: 2 inches
Watering: center-pivot irrigation with electronic treatment
Experimental design: An irrigated circle was divided into treated and untreated sections. A 30-acre area was treated by irrigation water with Vitazyme, while the remaining area under the circle was left untreated. An adjacent 30-acre area of wheat served as the control.

1. Control **2. Vitazyme**

Fertilization: (1) 270 lb/acre of 9-21-21-5% N-P_2O_5-K_2O-S spread dry at planting; (2) 30 gal/acre of 32% N through the center pivot system during March 8 to 15, 2008.
Vitazyme application: (2) 13 oz/acre (1 liter/ha) after emergence, on December 7, 2007; (2) 13 oz/acre at spring greenup, on February 20.
Irrigation, rainfall, and weather: The summer was hotter than normal, and rainfall was very limited, only 2.4 inches of rain. Irrigations: 19 in all, totaling 14.3 inches.
Harvest date: June 5, 2005
Yield results: Results are shown on the right.
Income results: A value of $8.00/bu is used in this table.
Conclusions: In this hard red winter wheat study in western Texas, Vitazyme applied twice through the irrigation water during a hot, dry summer provided a superb yield increase of 29%. This increase resulted in an income increase of $163.20/acre, showing the great ability of Vitazyme to assist wheat growers in semi-arid regions. Presumably the product is enabling the crop to make a better use of fertilizer nitrogen and other nutrients, as demonstrated in several other studies.

Treatment	Total yield, 30 acres		Yield	Change
	lb	bu*	bu/acre	bu/acre
Control	124,600	2,077	69.2	——
Vitazyme	161,220	2,687	89.6	20.4 (+29%)

*Based on 60 lb/bu for wheat.

Treatment	Yield	Income	Change
	bu/acre	$/acre	$/acre
Control	69.2	553.60	——
Vitazyme	89.6	716.80	163.20

• Increase in income: $163.20/acre

• Increase in wheat yield: 29%

Wheat

Researcher/Farmer: Blaine Middleton
Location: Lamesa, Texas ["West Home" Farm]
Variety: TAM 111 hard red winter wheat
Soil type: sandy loam
Planting date: November 14, 2007
Planting rate: 75 lb/acre
Row width: 9.5 inches
Planting depth: 2 inches
Watering: center-pivot irrigation with electronic treatment
Experimental design: An irrigated circle was divided into treated and untreated sections. A 30-acre area was treated by irrigation water with Vitazyme, while an adjacent untreated 30-acre area of wheat served as the control.

1. Control **2. Vitazyme**

Fertilization: (1) 270 lb/acre of 9-21-21-5% N-P_2O_5-K_2O-S spread dry at planting; (2) 30 gal/acre of 32% N through the center pivot system during March 8 to 15, 2008.
Vitazyme application: (2) 13 oz/acre (1 liter/ha) after emergence, on December 7, 2007; (2) 13 oz/acre at spring greenup, on February 20.
Irrigation, rainfall, and weather: The summer was hotter than normal, and rainfall was very limited, only 2.4 inches of rain. Irrigations: 19 in all, totalling 14.6 inches.
Harvest date: June 4, 2008
Yield results:
Income results: A value of $8.00/bu is used in this table.
Conclusions: In this hard red winter wheat study in western Texas, Vitazyme applied twice through the irrigation water during a hot, dry summer provided a very large yield increase of 16%. This increase resulted in an income increase of $96.80/acre, showing the great utility of Vitazyme for wheat production in western Texas. Presumably the product is enabling the crop to make a better use of fertilizer nitrogen, as demonstrated in several other studies

Treatment	Total yield, 30 acres		Yield	Change
	lb	bu*	bu/acre	bu/acre
Control	140,020	2,334	77.8	——
Vitazyme	161,860	2,698	89.9	12.1 (+16%)

*Based on 60 lb/bu for wheat.

Treatment	Yield	Income	Change
	bu/acre	$/acre	$/acre
Control	77.8	622.40	——
Vitazyme	89.9	719.20	96.80

• Increase in wheat yield: 16%

• Increase in income: $96.80/acre