Sweet Corn (for seed) *with Vitazyme application*

Seven corn plants from the Vitazyme treatment (left) and the control reveal a great improvement in leaf chlorophyll, stalk diameter, and plant health with Vitazyme.

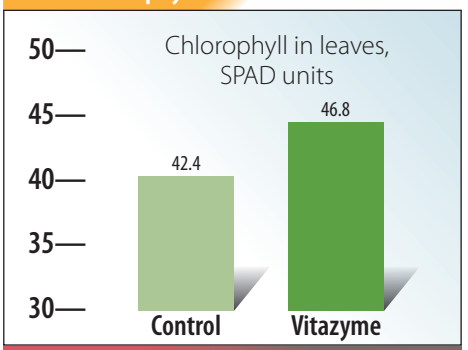
Note the vastly improved kernel development with Vitazyme, showing the ability of the product's brassinosteroids to expedite pollination under very hot and dry conditions.

Researchers: Jacob Hesseltine and Paul Syltie, Ph.D.
Research organizations: Vital Grow Distribution LLC, Waterville, Washington, and Vital Earth Resources, Gladewater, Texas
Farmer: Peter Dufault
Location: Mattawa, Washington
Variety: Syngenta sweet corn
Planting date: May 5 and 6, 2015
Seeding rate: 38,500 seeds/acre
Row spacing: 30 inches
Previous crop: wheat, with buckwheat after
Soil Type: sandy loam
Seedbed preparation: strip tillage into buckwheat; Roundup sprayed before planting
Experimental design: A 125-acre circle of sweet corn for seed was split into two parts, one half treated with Vitazyme and the other half left untreated, with the objective being to evaluate the effect of this product on seed corn yield.

1 ***Control*** **2** ***Vitazyme***

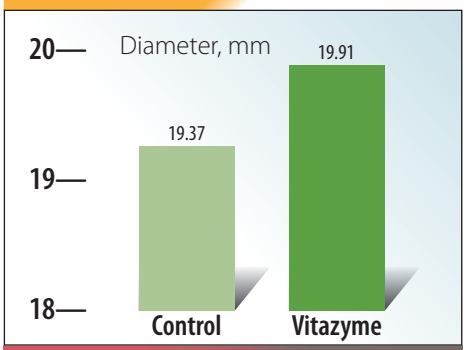
Fertilization: 4 tons/acre of dry manure, 37 lb/acre N in-furrow at planting, 265 lb/acre N through irrigation water
Vitazyme application: 13 oz/acre sprayed on the leaves and soil at the 3 to 4-leaf stage, along with Impact and Atrazine herbicides (sprayer gave 15 gal/acre, 5 mph, 30 psi)
Growing season weather: average spring weather but very hot summer temperatures, leading to poor pollination
Harvest date: August 20 and 21
Chlorophyll results: On August 5, chlorophyll evaluations were made using 35 ear leaves per treatment with a Minolta SPAD Chlorophyll Meter.
Plant and ear results: Ears and plants were evaluated on August 5, using seven plants for both treatments and averaging the values:
Insect pest results: Insect pressure, especially of earworms, was less in the treated part of the field.

Leaf Chlorophyll



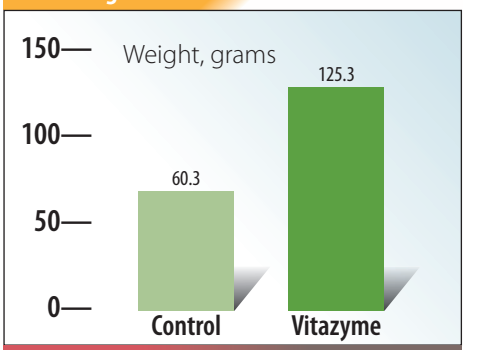
Increase in leaf chlorophyll with Vitazyme: 4.4 SPAD units

Stalk Diameter



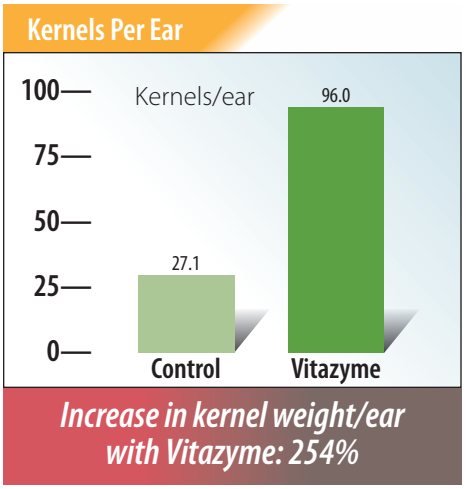
Increase in stalk diameter with Vitazyme: 3%

Ear Weight



Increase in ear weight with Vitazyme: 108%

Sweet Corn (for seed) *with Vitazyme application cont.*



Conclusions: A study in Washington on sweet corn for seed was severely affected by summer heat, which inhibited pollination and subsequent seed set. However, a single Vitazyme application of 13 oz/acre, applied at the 3 to 4-leaf stage greatly improved leaf chlorophyll and overall growth, resulting in a 3% greater stalk diameter. The brassinosteroids in the product greatly enhanced pollination of the treated area, resulting in a 108% increase in ear weight and a 254% increase in kernels per ear. There was less earworm damage in the treated areas, and of additional note is a neighboring field, where Vitazyme was applied together with herbicides, which produced a much better weed kill than the farmer had noted in previous years. It is hypothesized that Vitazyme's active agents trigger rapid metabolic processes, thereby opening the plant to an easier kill by a herbicide; i.e., a rapidly metabolizing plant is easier to kill than a stressed one. This program is excellent for promoting sweet corn yield for seed production, especially under heat-stressed conditions.

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2005 Crop Results

Vitazyme on Sweet Corn

Researcher: Esteban Marcias
Organization: Aguijares SPRL
Location: Santa Teresa, Tabla 1, Mexico
Variety: unknown
Soil type: unknown
Planting date: April, 2004

Experimental design: A sweet corn field was divided into two portions, one hectare treated with the usual fertilizer and the other treated with 30% less nitrogen and Vitazyme three times. Growth and yield parameters were evaluated to determine Vitazyme effects.

1. Control **2. Vitazyme (3 applications)**

Fertilization: Control, the "usual" N-P-K application; Vitazyme, 30% less nitrogen

Vitazyme application: 1 liter/ha on the soil at planting; 1 liter/ha on the leaves and soil twice during growth

Growth, quality, and yield results: Ten meter samples of the corn were harvested from each treatment for evaluations.

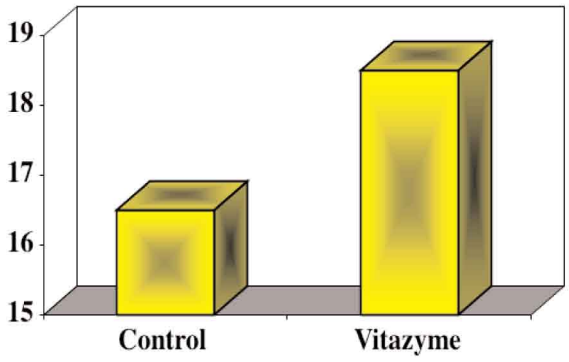
Corn Quality

Parameter	Control	Vitazyme
"Tender" corn	10.0	9.8
"Useful tender" corn	88	85
"Monlonco tender" corn	12	13
Length, cm	16.5	18.5
Diameter, cm	4.4	4.7

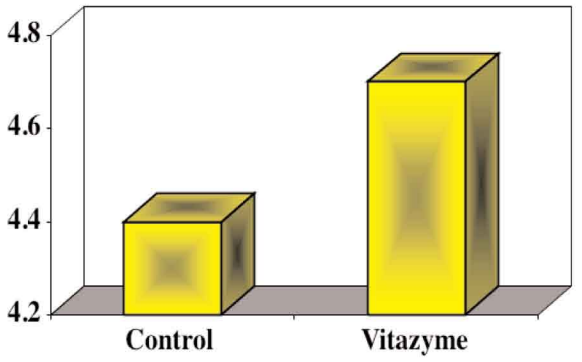
Increase in ear length: 12%

Increase in ear diameter: 7%

Ear Length, cm



Ear Diameter, cm



Corn Growth

Parameter	Control	Vitazyme
Stalk diameter, cm	1.81	2.03
Plant height, m	1.80	2.27

Increase in stalk diameter: 12%

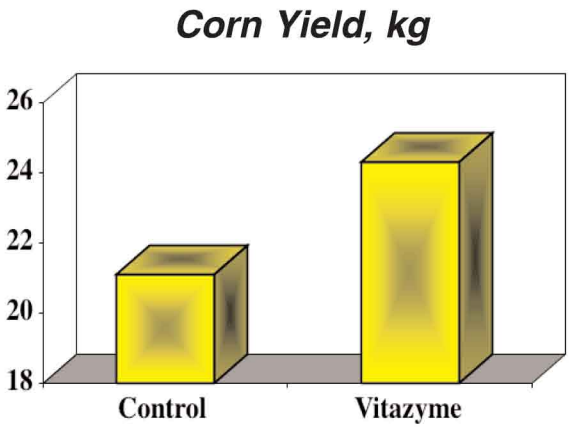
Increase in plant height: 26%

Corn Yield

Parameter	Control	Vitazyme
Gross weight, kg	21.1	24.3
"Trashed" weight, kg	15.95	18.40

Increase in gross weight: 15%

Increase in "trashed" weight: 15%



Income results: The yield increase was 3,200 kg/ha, at 1,300 pesos/ton.

Increased income from the extra yield:	3,439 pesos/ha
Savings in nitrogen fertilizer:	1,000 pesos/ha
Total benefit of Vitazyme:	4, 438 pesos/ha
Product cost:	722 pesos/ha
Net increase in income:	3,716 pesos/ha

Conclusions: Vitazyme applied to sweet corn in this Mexican study produced a 12% increase of higher quality corn. The ears were longer and thicker, on taller and stronger stalks despite a 30% reduction in nitrogen fertilizer application. The economic benefit to the farmer was 3,716 pesos/ha, even without any consideration of the improved corn quality.

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2003 Crop Results

Vitazyme on Sweet Corn

New York Crop Research Facility – A.C.D.S. Research

Researcher: Jeremiah Smith *Location*: Byron, New York
Variety: Sure Gold Super Sweet *Planting depth*: 1.5 inches *Row spacing*: 30 inches
Soil type: Galen very fine sandy loam (pH 6.6, CEC 10.0, P 67 ppm, K 326 ppm, Mg 226 ppm, Ca 1,553 ppm)
Seeding rate: 19,900 seeds/acre (drilled) *Tillage*: conventional *Planting date*: June 28, 2003
Experimental design: A non-replicated field test was established on a production field. Four rows (10 feet wide) were treated with Vitazyme, and adjoining untreated rows served as the control, the rows being 160 feet long. Various parameters were measured during the growing season including plant height, ear count, ear weight, ear length, filled length, and yield.

1. Control **2. Vitazyme**

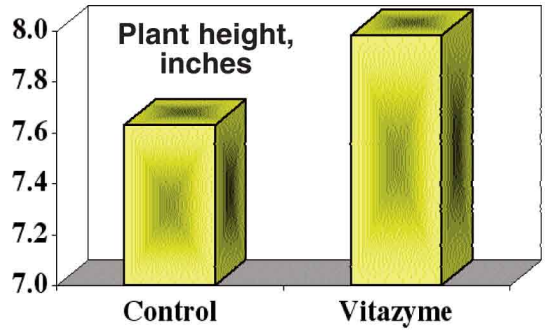
Fertilization: Both areas received 300 lb/acre of 15-15-15% N-P_2O_5-K_2O, sidedressed on July 21.
Vitazyme application: 13 oz/acre on the seeds at planting
Weed control and pesticides: Guardsman, Permit, Tilt, Quadris, Banvel, Warrior
Harvest date: September 29, 2003
Growth results: On July 26, measurements were made of plant height.

Plant Height At 28 Days

Treatment	Plant height*	Change
	inches	inches
Control	7.63	—
Vitazyme	7.98	0.35 (+5%)

*15 plants from each plot were measured and averaged.

Increase in plant height: 5%



Harvest Parameters

Parameter	Treatment	Value	Change	Improvement with Vitazyme
Ears per 40 ft of row[1]	Control	68.0 ears	—	**Ear per row: +1.5%**
	Vitazyme	69.0 ears	+1.0 ear	
Ear weight per 40 ft row[1]	Control	51.90 lb	—	**Ear weight per row: +7%**
	Vitazyme	55.60 lb	+3.70 lb	
Bare ear weight per 40 ft of row[1]	Control	36.05 lb	—	**Bare ear weight per row: +7%**
	Vitazyme	38.45 lb	+2.40 lb	

[1]Measured from the two inside rows of the four plots.

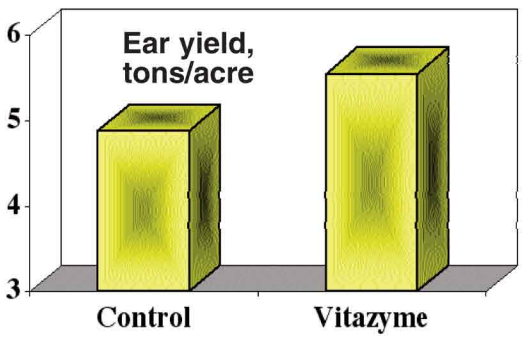
Parameter	Treatment	Value	Change	Improvement with Vitazyme
Weight of husks per 40 ft of row[1]	Control	15.85 lb	—	**Husk weight per row: +8%**
	Vitazyme	17.15 lb	+1.30 lb	
Husk weight per ear[2]	Control	0.23 lb	—	**Husk weight per ear: +9%**
	Vitazyme	0.25 lb	+0.02 lb	
Ear weight[3]	Control	0.53 lb	—	**Ear weight: +6%**
	Vitazyme	0.56 lb	+0.03 lb	
Ear length[4]	Control	7.36 in	—	**Ear length: +2%**
	Vitazyme	7.51 in	+0.15 in	
Filled ear length[5]	Control	6.95 in	—	**Filled ear length: +5%**
	Vitazyme	7.28 in	+0.33 in	
Unfilled ear length[6]	Control	0.41 in	—	**Unfilled ear length: –44%**
	Vitazyme	0.23 in	–0.18 in	

[1]Measured from the two inside rows of the four plots.
[2]Husk weight/Ear number.
[3]Bare ear weight/Ear number.
[4]The average length of 11 randomly selected husked ears.
[5]The length of the ear containing filled kernels.
[6]The blank space of unfilled kernels of 4 above, determined by subtracting 5 from 4.

Ear Yield

Treatment	Yield*	Change
	tons/acre	tons/acre
Control	4.87	—
Vitazyme	5.54	+0.67 (+14%)

*Yields are adjusted to 72% moisture.



Yield increase: 14%

Income results: The value of this variety was $56.64/ton, since all of the ears were 0 to 35 ear count range. Besides, the Sure Gold variety gets a $6.00/ton premium.

Treatment	Crop income	Product cost	Net income increase
	$/acre	$/acre	$/acre
Vitazyme	37.95	4.57	33.38

Income increase: $33.38/acre

Conclusions: This in-field sweet corn study in New York revealed that Vitazyme, applied at planting, significantly improved the early growth of the plants which resulted in a 14% yield increase, as well as an improvement in several growth characteristics: heavier ears (+6%), larger ears (+2%), and better filled ears (+5%). The unfilled ear length was only about half as long (0.18 inch less) for the Vitazyme treated ears than for the control ears.

The income increase with a single Vitazyme application was $33.38/acre, showing the product's economic viability for sweet corn growers. Another product tested along with Vitazyme in this study produced a higher yield, but the net income increase was less.

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2001 Crop Results

Vitazyme on Sweet Corn (for seed)

Researcher: Maurice Soper
Variety: proprietary
Soil type: sandy loam
Location: near Norfolk, Nebraska
Planting date: unknown
Irrigation: center pivot

Experimental design: Some rows of the large seed production field were sprayed with Vitazyme and the remainder of the field was left untreated. In this field one inbred line was left with tassels while th other inbred line was detasseled; these rows were regularly spaced and alternated.

1. Control **2. Vitazyme**

Fertility treatments : 5-20-20% N-P2O5-K2O + minerals (S, Mg, B, Zn, Mn, Cu) dry, preplant banded on either side of the rows; liquid starter; N applied periodically through the sprinkler system

Vitazyme treatments: 13 oz/acre with the herbicide at planting time (on the soil surface); 13 oz/acre later after emergence

Chlorophyll content: On August 1, 2001, ten random leaves from the treated area, and ten leaves from a nearby untreated area, were sampled for chlorophyll using a Minolta SPAD meter.

	Control	Vitazyme	Change
		tons/acre	
Leaf chlorophyll	52.1	53.8	(+) 1.7

Increase in leaf chlorophyll: 1.7 SPAD units

Growth and yield results: Sampling on August 1, 2001, revealed **many more root hairs and larger roots** with Vitazyme treated plants. Also, **the ears of the Vitazyme treated plants were somewhat larger than the control ears.** Unfortunately, yield estimates of treated and control areas could not be made because yield sample bags were inadvertently mixed up.

Disease results: Stalk rot was a serious problem throughout the field, affecting the lowest portion of perhaps 10% of the plants. **Vitazyme appeared to reduce the incidence of stalk rot somewhat**, as determined by an informal tally of plants before harvest.

Conclusions: In spite of a lack of actual seed yield data, Vitazyme appears to be a highly beneficial treatment for sweet corn inbreds to . . .

- Increase seed yield
- Increase leaf chlorophyll
- Reduce stalk rot incidence

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2001 Crop Results

Vitazyme on Sweet Corn

Grower: David Kast _Location_: Albion, New York _Variety_: Bonus
Soil type: unknown _Row spacing_: 30 inches _Population_: 18,000 seeds/acre
Planting date: June 28, 2001 _Previous crop_: field corn

Experimental design: A sweet corn field was divided into two parts, untreated and with Vitazyme preplant incorporated.

1. Control **2. Vitazyme**

Fertilization: 200 lb/acre of 11-22-22% N-P_2O_5-K_2O + Zn + B at planting; 125 lb/acre N (as a 32% N solution) preplant incorporated with the Vitazyme and the herbicide

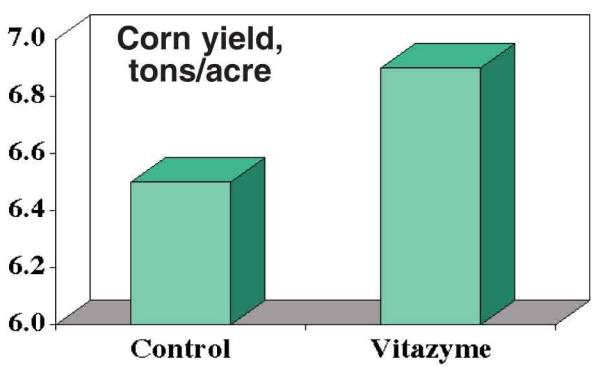
Vitazyme treatment: 13 oz/acre preplant incorporated with the fertilizer and herbicide

Herbicide treatment: Atrazine (1 qt/acre) + Partner (3.5 lb/acre) preplant incorporated

Harvest date: October 14, 2001

Yield results: Weights were made from custom harvesting trucks for the treatments.

Treatment	Corn Yield	Increase
	tons/acre	
1. Control	6.5	—
2. Vitazyme	6.9	0.4 (+6%)



Yield increase with Vitazyme: 6%

Income increase: Sweet corn sold for about $50/ton.

Income increase with Vitazyme: $20/acre

Conclusions: Vitazyme caused a sizable yield and income increase in this New York study when applied and incorporated before planting. This reveals that the product's effects are not diminished by the proximity of fertilizers and herbicides in the cultural system.

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1999 Crop Results

Vitazyme on Sweet Corn (Organic)

Grower: Klaas Martens
Location: Penn Yan, New York
Seeding date: June 2, 1999
Variety: Ice Queen (SH2)
Seeding rate: 20,000 seeds/acre
Soil type: Honeoye fine sandy loam
Previous crop: alfalfa
Soil fertility levels: Soil test date: April, 1998 (A&L Labs)

pH	6.3	Mg	184 lb/acre	S	11 ppm
Organic matter	2.4%	Ca	1,800 lb/acre	Percent base saturation:	
P1	382 lb/acre	K_2O	228 lb/acre	Ca	73.0%
P2	566 lb/acre	Zn	1.8 ppm	Mg	12.4%
Cation exchange cap.	6.2 meq/100g	B	0.5 ppm	K	4.0%

Experimental design: A sweet corn field, that had been previously farmed intensively by conventional methods, received five strip treatments of several rows each along one side of the field. They were as follows:

Strip 1.....Control
Strip 2.....Fish
Strip 3.....Control
Strip 4.....Vitazyme + Fish
Strip 5.....Vitazyme + Fish + Homeopathic treatment

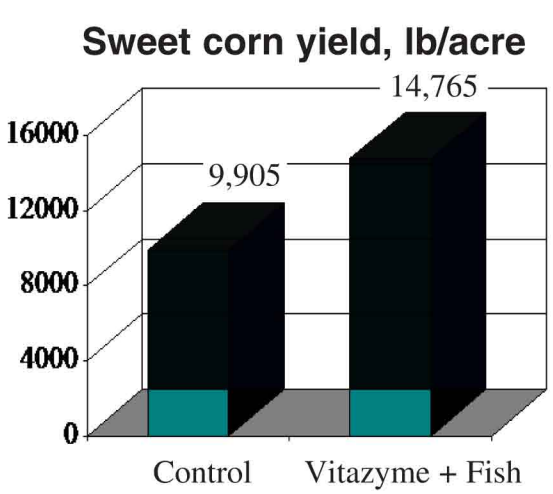
Fertility treatments: A 1,000 lb/acre application of chicken manure (quite salty), with a 2-4-3% N-P_2O_5-K_2O analysis, was made on the alfalfa field in August of 1998. The field was treated with 350 lb/acre of a custom blended Fertrell product having 4-4-4% N-P_2O_5-K_2O, comprised of one-third gypsum and two-thirds compost and various minerals, especially zinc and boron. The alfalfa regrowth and fertilizers were then plowed down on May 3, 1999.

Vitazyme and fish applications: Vitazyme at 13 oz/acre was foliar applied to Treatments 4 and 5 on July 7, about 35 days after planting. Liquified fish at 2 qt/acre was applied to Treatments 2, 4, and 5 at the same time and with Vitazyme in the foliar spray, while a homeopathic treatment at 2 oz/acre was added to the fish and Vitazyme of Treatment 5 on the same date.

Harvest date: August 27, 1999

Yield results: All treatments yielded corn from 16 to 17% moisture.

Treatment	Grain yield, lb/acre	Yield increase
1. Strip 1 (no Vitazyme)	10,307*	--
2. Strip 2 (fish)	10,438**	Unknown
3. Strip 3 (no Vitazyme)	9,503*	--
4. Strip 4 (Vitazyme + fish)	14,765	+49%
5. Strip 5 (4 + homeopathic)	10,471	+5%



* Average control: 9,905 lb/acre.
** This yield was seriously underestimated because of low air pressure in the wagon tires, which caused the tires to rest somewhat on the ground next to the scale. The estimated weight is 500 to 1,000 lb/acre higher than shown here.

Yield increase: 49%

Income results: The sweet corn price is estimated at $100.00/ton.

Treatment	Total income	Increase over control
Control (average)	$495.25/acre	--
Fish	Unknown	Unknown
Vitazyme + Fish	$738.25/acre	+ $487.87/acre
Vitazyme + Fish + Homeopathic	$523.55/acre	+ $28.30/acre

Income increase: $487.87/acre

Comments: Weather during the study was very dry and hot, with only 3 inches of rain for all of May, June, and July. Two crop-saving rains fell on August 8 and 20. Temperatures were oftentimes from 90 to 95 °F during July and August.

The Vitazyme plus fish treatment gave by far the heaviest yield of the five treatments. The harvester operator stopped while in this treatment and asked what had been done to that strip. The average of the entire field was 10,400 lb/acre of sweet corn delivered to the plant.