Sugar Beets *with Vitazyme Bio application*

Researcher: V. V. Plotnikov
Research organization: Agro Expert International, Kaharlyk, Ukraine, and Plant Designs International, Rochester, New York
Location: LLC "PC Zoria Podillia," Ohiivka Village, Haisyn District, Vinnytsia Region, Ukraine
Variety: BTS 2730
Planting date: April 15, 2025
Seeding rate: 110,000 seeds/ha
Tillage: disking to 6-8 cm, subsoiling to 25 cm, harrowing to 2-3 cm with a Europak Combined Unit
Previous crop: winter wheat
Soil type: gray podzolic (2.2% organic matter)
Experimental design: A commercial sugar beet field was divided into an untreated control area and a Vitazyme Bio treated area, all other practices being the same for the entire area. The purpose of the trial was to evaluate the effect of a biostimulant on sugar beet yield and sugar content.

Ukraine 2025. Sugar beet harvest is in full swing for this trial field in the Vinnytsia Region in 2025. The yield increase was 25%.

❶ *Control* ❷ *Vitazyme Bio*

Fertilization: 110-0-72 kg/ha of N-P_2O_5-K_2O applied the previous fall before subsoiling, and 4-12-17 kg/ha of N-P_2O_5-K_2O applied in-furrow at planting
Vitazyme Bio application: 1.0 liter/ha (13 oz acre) sprayed on the leaves and soil at row closure (BBCH 34) on June 13, 2005

Yield results:

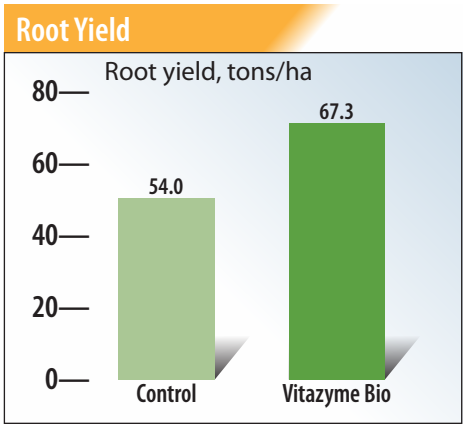
Treatment	Root yield	Yield change	Sugar content	Sugar yield	Yield change
	tons/ha	tons/ha	%	tons/ha	tons/ha
1. Control	54.0	—	17.8	9.6	—
2. Vitazyme Bio	67.3	13.3 (+25%)	17.8	12.0	2.4 (+25%)

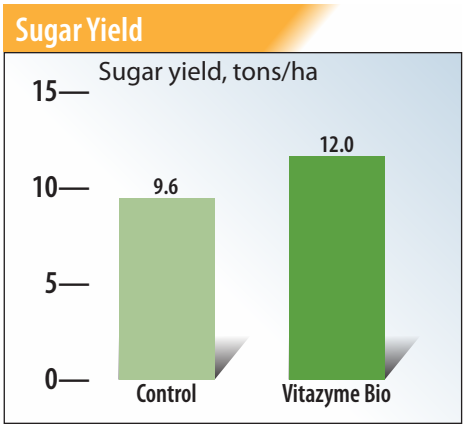
Increase in root yield with Vitazyme Bio: 25%

Increase in sugar yield with Vitazyme Bio: 25%

Here are three of the research workers for the sugar beet harvest for the 2025 Vitazyme Bio trial at Ohiivka Village. Paul Ivanicky, representative for Plant Designs International, is on the left.

The researcher is standing at the boundary of the Vitazyme Bio treatment, which increased the yield of both total root weight as well as sugar by 25%. The yield increase did not produce a drop in sugar content.





Income results: The extra 25% increase in sugar production produced $680/ha extra income for the farmer.

Conclusions: A field-scale sugar beet trial in Ukraine involved the use of Vitazyme Bio, at 1.0 liter/ha (13 oz/acre) sprayed on the leaves and soil at row closure (BBCH 34), with Vitazyme Bio being the only variable across the field. The biostimulant improved both root yield and total sugar yield, by 25% in both cases since the sugar content of both treatments was 17.8%. An additional $680/ha was gained by the farmer for this application, showing that adding Vitazyme Bio to sugar beet programs in Ukraine is a highly profitable practice.

Sugar Beets *with Vitazyme Bio application*

Researcher: V. V. Plotnikov
Research organization: Agro Expert International, Kaharlyk, Ukraine, and Plant Designs International, Rochester, New York
Location: SE DG Oleksandrivske, Haisyn District, Vinnytsia Region, Oleksandrivka Village, Ukraine; central Ukraine (440-590 mm of precipitation per year)
Variety: LaGioconda
Planting date: March 29, 2023
Planting rate: 120,000 seeds/ha
Previous crop: winter wheat
Tillage: disking to 6-8 cm, plowing to 30-32 cm, harrowing, pre-plant tillage to 2-3 cm with a combined Europack unit
Soil type: Mollisol (4.0% organic matter)

The Vitazyme Bio treated sugar beets are clearly larger at this stage of the growth cycle, which ultimately gave a sugar yield increase of 23% above the untreated control.

The Vitazyme Bio treated sugar beets on the right are darker green and leafier that the control sugar beets on the left, after severe hail damage in July.

Experimental design: A sugar beet field was divided into an untreated control area and a Vitazyme Bio area to evaluate the effects of this biostimulant on the yield of beets and sugar. Because of hail damage in July, crop recovery was also evaluated.

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

Fertilization: Manure at 60 tons/gas was applied the fall of 2022, giving about 300-150-360 kg/ha of N-P_2O_5-K_2O. Also, 140 kg/ha of N was applied pre-plant.

Vitazyme Bio application: 1 liter/ha sprayed on the leaves and soil at BBCH 34, on June 16, 2023

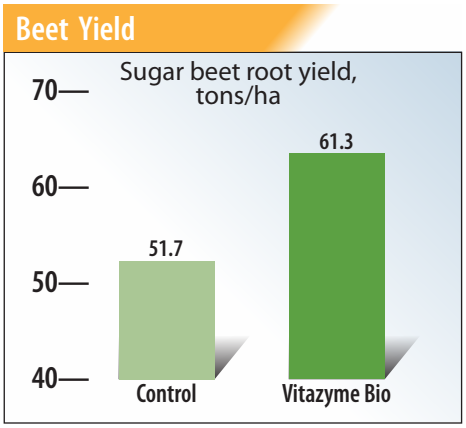
Yield results:

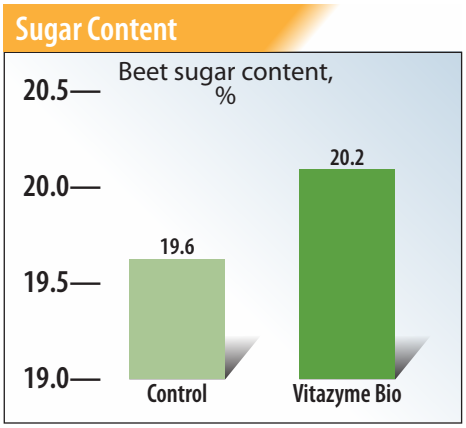
Treatment	Root yield	Yield change	Sugar content	Sugar yield	Yield change
	tons/ha	tons/ha	%	tons/ha	tons/ha
1. Control	51.7	—	19.6	10.1	—
2.Vitazyme	61.3	9.6 (+19%)	20.2	12.4	2.3 (+23%)

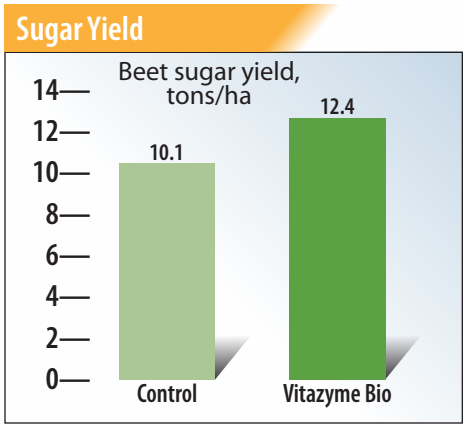
Increase in beet root yield with Vitazyme Bio: 19%

Increase in sugar content with Vitazyme Bio: 0.6 percentage-point

Increase in sugar yield with Vitazyme Bio: 23%







Income results: The 2.3 ton/ha (+23%) sugar yield increase netted the farmer $628/ha more income.

Plant recovery after hail damage: On July 26, 40 days after Vitazyme Bio Application, a severe hail storm destroyed 40% of the leaf surfaces of the plants. An inspection of the plants on August 4, 9 days after the storm, revealed that the Vitazyme Bio treated plants had recovered much better than had the untreated control plants.

Conclusions: A field-scale sugar beet trial in central Ukraine compared an untreated control with Vitazyme Bio applied at the BBCH 34 growth stage at 1 liter/ha. The resulting beet yield was increased by 19% with Vitazyme Bio. Beet sugar and total sugar yield were also increased by Vitazyme Bio (0.6 percentage-point and 23%, respectively.These excellent increases were indicative of the rapid recovery of the hail damaged plants with Vitazyme Bio compared to the untreated plants, showing the great value of this program for sugar beet farmers in central Ukraine.

Sugar Beets *with Vitazyme application*

Researcher: V.V. Plotnikov
Research organizations: Plant Designs International, Rochester, New York, and Agro Expert International, Kaharlyk, Ukraine
Location: PE "Zakhidnyy Buh", Zolochiv District, Lviv Region, Rozvoryany Village, Ukraine; central Ukraine (440 to 590 mm of rain per year)
Variety: Pitbull
Planting date: April 26, 2019
Planting rate: 130,000 seeds/ha
Previous crop: winter wheat
Tillage: disking to 10-12 cm, deep tillage to 28-30 cm (Horsch Tiger without reservoir turnover), pre-sowing tillage (Europak combined unit)
Experimental design: A sugar beet field in central Ukraine was divided into an untreated control portion and Vitazyme treated portion of the field, using two foliar spays, to determine the effect of the product on sugar beet yield and sugar content.

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

There is no question in this photo from Ukraine of the effects of Vitazyme to increase leaf area, and dramatically increase root volume, usually without reducing the sugar content ot the beets.

Fertilization: 140-120-160 kg/ha of N-P_2O_5-K_2O in the fall of 2018; 40 kg/ha of N before planting
Vitazyme application: 0.5 liter/ha sprayed on the leaves and soil two times; June 6 and June 26, 2019

Yield and sugar results:

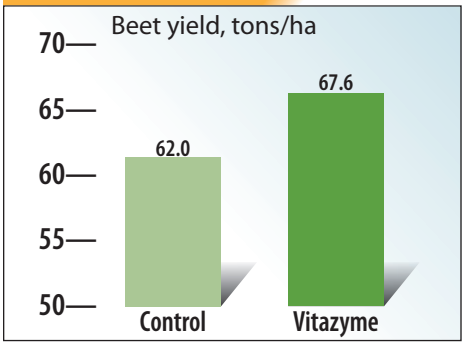
Treatment	Beet yield	Yield change	Sugar content	Content change	Sugar yield	Yield change
	tons/ha	tons/ha	%	%	tons/ha	tons/ha
1. Control	62.0	—	18.8	—	11.7	—
2. Vitazyme	67.6	5.6 (+9%)	19.8	1.0 (+5%)	13.4	1.7 (+15%)

Increase in beet yield with Vitazyme: 9%

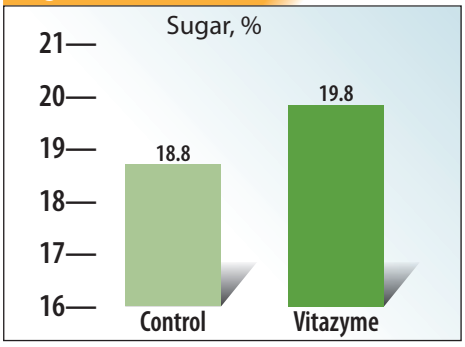
Increase in sugar content with Vitazyme: 5% (1.0 percentage point)

Increase in sugar yield with Vitazyme: 15 %

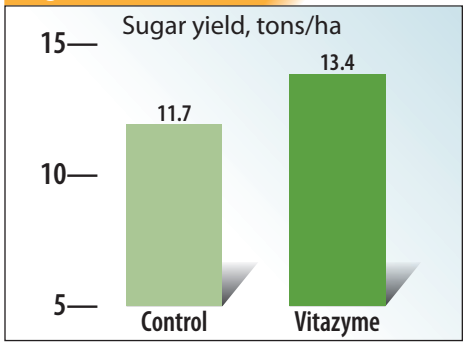
Beet Yield



Sugar Content



Sugar Yield



Income results: The extra beet sugar increase of 1.7 ton/ha produced an extra net income of $194/ha.
Conclusions: This field-scale sugar beet trial in Ukraine, using two 0.5 liter/ha foliar/soil sprays, produced 9% beet weight, 1.0 percentage-point, and 15% sugar yield increases in central Ukraine in 2019. These improvements resulted in a $194/ha increase in net income, illustrating the viability of Vitazyme for sugar beet production.

Sugar Beets *with Vitazyme application*

Sugar beets treated with Vitazyme in-furrow, and then twice more along with fungicide applications (on the right), produced a small yield increase but a sizable 0.84% increase in sugar.

The Vitazyme treated sugar beets show greater leaf and root development at this stage of growth, which led to a 0.84% sugar increase, giving a 0.278 ton/acre sugar yield increase, which was 6% greater than the control.

Researcher: Matthew Huhnerkoch ***Location:*** Huhnerkoch Farms, Belview, Minnesota
Variety: Beta 9475 ***Planting date:*** May 15 and 16, 2019 ***Soil type:*** unknown
Experimental design: A sugar beet field was partially treated with Vitazyme, the rest of the field left untreated to serve as a control, to determine the effect of the product on beet yield and sugar content.

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

Fertilization: fall of 2018, 50-0-0-24 lb/acre of N-$P_2 0_5$-$K_2 0$-S, plus hog manure at 3,200 gallons/acre to give 65-20-80 lb/acre of N-$P_2 0_5$-$K_2 0$.
Vitazyme application: (1) in-furrow at 12.8 oz/acre at planting; (2) with a fungicide application at 12.8 oz/acre in late July; (3) with a fungicide application at 12.8/acre in mid-August
Weather for 2019: extremely wet spring delayed planting, a wet June inhibited growth, and July, August, and September were fairly normal in terms of rainfall and temperature
Harvest dates: October 14 to 19, 2019
Yield results: A load of sugar beets from each treatment was harvested and weighed, and the sugar content was determined.

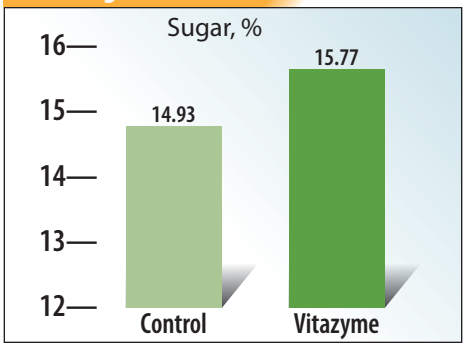
Treatment	Beet yield	Yield change	Sugar content	Sugar change	Sugar yield	Sugar change
	tons/acre	tons/acre	%	%	tons/acre	tons/acre
1. Control	30.06	—	14.93	—	4.488	—
2. Vitazyme	30.22	0.16 (+1%)	15.77	+ 0.84	4.766	0.278 (+6%)

Increase in sugar yield with Vitazyme: 6%

Increase in beet sugar content with Vitazyme: 84 %-points

Conclusions: As a result of Vitazyme use on a sugar beet field in southern Minnesota, the best yield was nominally increased, but the sugar content of the beets was improved by 0.84 percentage points. This led to a total sugar yield increase of 6% revealing the great value of this program to improve the sugar yield of beets.

Beet Sugar Content

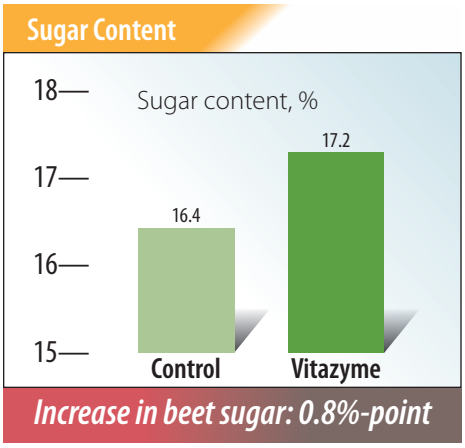


Sugar Beets *with Vitazyme application*

Researcher: V. V. Plotnikov
Research institution: Agro Expert International, Vinnytsya, Ukraine
Location: Farming Enterprise Shyrokostup, Subivka Village, Kaharlyk District, Kyiv Region, Ukraine
Variety: Daria KWS
Planting date: October 2, 2015
Seeding rate: 100,000 seeds/ha
Soil type: podzolized Chernozem (3.2% organic matter)
Cultivation: disking to 6-8 cm, plowing to 25-27 cm, harrowing, and cultivation to 4-5 cm
Rainfall: 500-550 mm
Experimental design: A sugar beet field was divided into Vitazyme treated and untreated areas, with the objective of determining the effect of this product on the yield and quality (sugar content) of the beets.

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

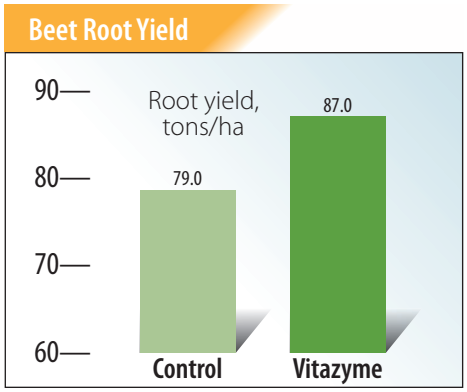
Fertilization: 100 tons/ha of manure the fall of 2015; 60-60-60 kg/ha of N-P_2O_5-K_2O pre-plant; 120 kg/ha at N sidedressed
Vitazyme application: 1.0 liter/ha sprayed on the leaves and soil on June 21, 2016
Quality results:

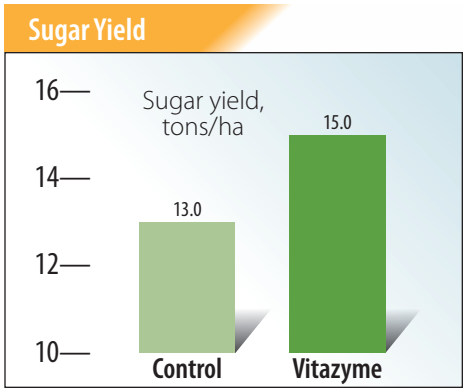


Sugar beets growth in Ukraine have consistently shown superb responses to Vitazyme, as shown in this sampling.

Yield results:

Treatment	Beet yield	Yield change	Sugar yield	Yield change
	tons/ha	tons/ha	tons/ha	tons/ha
Control	79.0	—	13.0	—
Vitazyme	87.0	8.0 (+10%)	15.0	2.0 (+15%)





Income results: Vitazyme increased net profit by 258 USD/ha.

Increase with Vitazyme
Beet yield.....+10%
Sugar yield.....+15%

Conclusions: A sugar beet trial in Ukraine, using 1.0 liter/ha of Vitazyme applied mid-season, revealed excellent responses in terms of beet yield (10%), sugar content of the beets (+ 0.8 %-point), and consequently total sugar yield (+ 15%). These results point towards the great value of this program for benefitting sugar beet growers in Ukraine, in particular in terms of increased net profit.

VitaEarth 2015 Crop Results

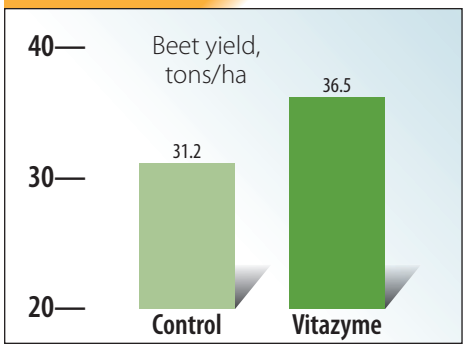
Sugar Beets *A Summary of two Field Trials in Ukraine*

Both trials were organized by V.V. Plotnikov, Ph.D., to determine the yield and profit-improving potential of Vitazyme. Fields were divided into Vitazyme treated and control areas.

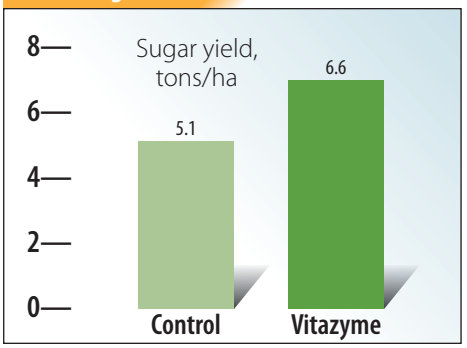
1. Conducted by Agricultural LLC "Nyva" at Ulianivs'kyi District, Kirovohrad Region, Kamianyi Brid Village, Ukraine, on a podzolized chernozem soil (3.3% organic matter).

Variety: Olimpiada hybrid
Seeding rate: 100,000 seeds/ha
Planting date: April 25, 2015
Previous crop: winter wheat
Cultivation methods: disking to 8 cm, plowing to 27 cm, cultivation to 4 cm
Fertilization: 45 kg/ha N, 45 kg/ha $P_2 0_5$, 45 kg/ha $K_2 0$ in the fall of 2014; 70 kg/ha pre-plant incorporated in 2015
Vitazyme application: 1 liter/ha sprayed on the leaves and soil on June 18, 2015, together with 2 liters/ha of Wuxal Boron
Results: *(See bar charts to the right)*

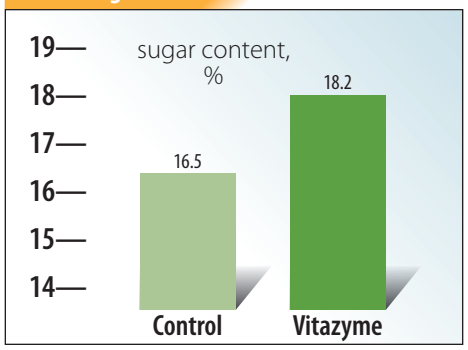
Beet Root Yield trial #1



Total Sugar Yield trial #1



Beet Sugar Content trial #1



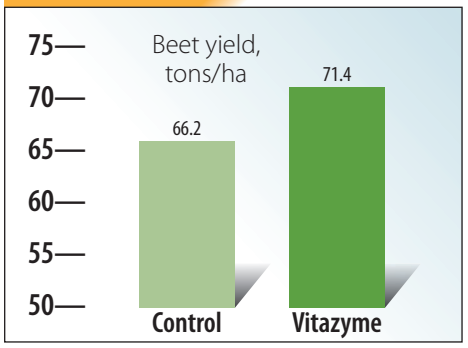
Increase with Vitazyme

Beet root yield....5.3 tons/ha (+17%)
Sugar content.....1.7 %-points
Sugar yield.....1.5 tons/ha (+29%)
Profit.....3,359 UAH/ha

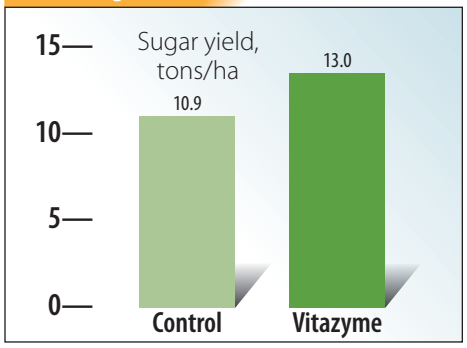
2. Conducted by Agricultural LLC "Romaniv" at Luts'kyi District, Volyn' Region, Romaniv Village, Ukraine, on a gray podzolic soil (1.8% organic matter).

Variety: Boruta hybrid
Seeding rate: 100,000 seeds/ha
Planting date: April 28, 2015
Previous crop: winter wheat
Cultivation methods: disking to 8 cm, plowing to 27 cm, cultivation to 4 cm
Fertilization: 40 tons/ha of manure the fall of 2014 and plowed in; 60 kg/ha N, 60 kg/ha $P_2 0_5$, 60 kg/ha $K_2 0$ the spring of 2015 and incorporated
Vitazyme application: 1 liter/ha sprayed on the leaves and soil on June 21, 2015
Results: *(See bar charts to the right)*

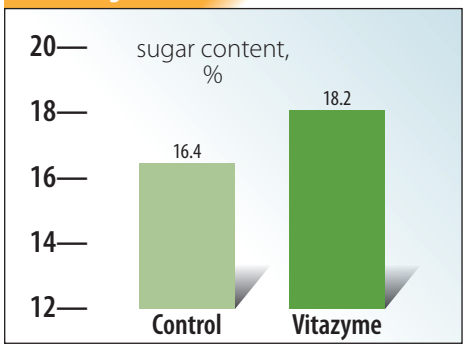
Beet Root Yield trial #2



Total Sugar Yield trial #2



Beet Sugar Content trial #2



Increase with Vitazyme

Beet root yield.....5.2 tons/ha (+8%)
Sugar content.....1.8 %-points
Sugar yield.....2.1 tons/ha (+19%)
Profit.....3,670 UAH/ha

Sugar Beets *A Summary of two Field Trials in Ukraine cont.*

Conclusion: This pair of Ukranian Vitazyme studies, using 1liter/ha applications, proved that both beet root yield and sugar content were increased, and thus total sugar yield. Average increases were 12.5% for beet yield, 1.75 percentage-points for sugar content, and 24% for sugar yield. Profit improved an average of 3,515 UAH/ha, to show the great viability of this program for Ukrainian agriculture.

Location	Beet yield	Sugar content	Sugar yield	Profit
	%	%-points	%	UAH/ha
Central Ukraine (500-550 mm ppt.)				
"Nyva" — Kamianyi Brid	17	1.7	29	3,359
Western Ukraine (650-700 mm ppt.)				
"Romaniv" — Romaniv	8	1.8	19	3,670
Mean	12.5	1.75	24	3,515

Sugar Beets *with Vitazyme application*

Researchers: James Anderson and Paul W. Syltie, Ph.D.
Farmer cooperator: Mike Stamer, Stamer Farms, Inc., Willmar, Minnesota
Location: Barrett, Minnesota
Variety: Crystal 018
Planting date: April 15, 2015
Seeding rate: 58,800 seeds/acre
Soil type: silty clay loam, but variable
Experimental design: A 250-acre sugar beet field in western Minnesota was divided into Vitazyme treated and untreated areas in an effort to evaluate the effects of this product on sugar beet and sugar yield.

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

Fertilization: nitrogen balanced to 200 lb/acre across the field according to soil organic matter level: sulfur balanced to 16 to 36 lb/acre, also according to soil organic matter level
Vitazyme application: 13oz/acre applied in-furrow at planting.
Harvest date: October 10 to 20, 2015

The treated beets produced from 8 to 11% more sugar per acre, while having only a slightly reduced sugar content; beet nitrate was reduced.

Sugar beets in a split-field trial in Minnesota showed that Vitazyme (right) produced bigger beets and more sugar yield.

Sugar Beets *with Vitazyme application cont.*

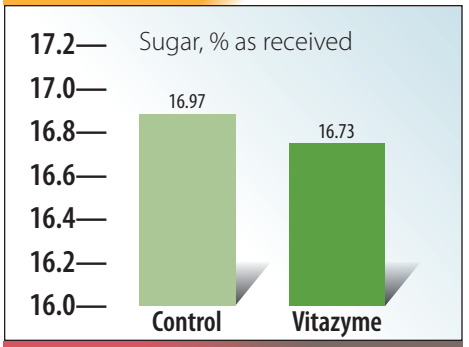
Yield results: Eleven samples of beets were dug from 10-foot row lengths on each side of the treatment dividing line, giving 22 total samples, on September 22, 2015. Three control and three treated samples were sent to Minnesota Valley Testing Laboratories, Inc., in New Ulm, Minnesota, and the remaining 16 samples, half control and half treated, were sent to the Southern Minnesota Sugar Beet Coop laboratory at Belview, Minnesota.

Barrett Field, Minnesota Valley Testing labs							
Treatment		Moisture (as received)	Sugar content[a] (as received)	Sugar content (dry)	Beet weight[a] (as received)	Sugar yield	Sugar yield[a]
		%	g/100g	g/100g	lb/10ft	lb/10ft	lb/acre
Control	1	78.5	16.80	78.14	27.96	4.70	8,190
	2	77.4	16.90	74.78	25.44	4.30	7,493
	3	78.0	17.20	78.18	29.60	5.09	8,869
	Mean	77.9	16.97 a	77.03	27.67 a	4.70	8,184 b
Vitazyme	1	78.5	17.40	80.93	29.04	5.05	8,799
	2	78.3	15.80	72.81	30.06	4.75	8,277
	3	78.6	17.00	79.44	31.84	5.41	9,427
	Mean	78.5	16.73 a	77.73	30.31 a	5.07	8,834 a
Change			-0.24%	+0.70%	+2.64 lb/10ft (+10%)		+650 lb/acre (+8%)

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

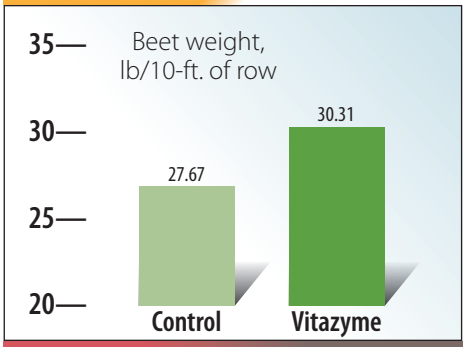
Beet weight: F-value=6.45; Probability>F=0.1263: Standard error=1.033
Sugar content: F-value=0.23; Probability>F=0.6815; Standard error=0.350
Sugar yield: F-value=90.3; Probability>F=0.0109; Standard error=366.3

Sugar Content



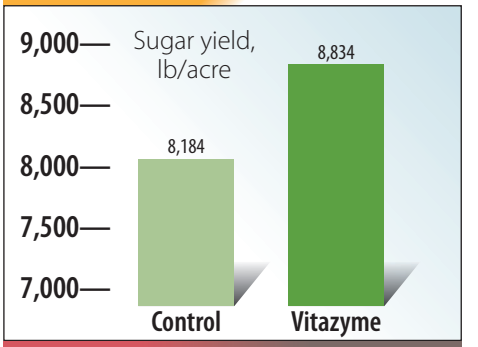
Decrease in sugar-% with Vitazyme: (-) 0.24%

Beet Weight



Increase in beet weight with Vitazyme: 10%

Sugar Yield



Increase in sugar yield with Vitazyme: 8%

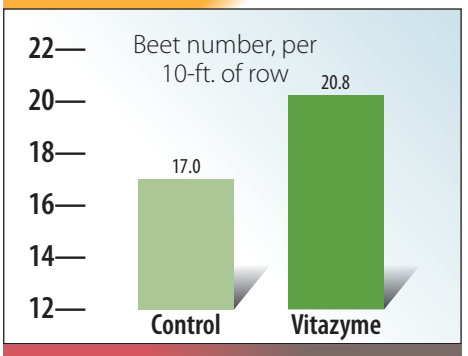
Sugar Beets *with Vitazyme application cont.*

Barrett Field, Southern Minnesota Sugar Beet Coop						
Treatment	**Beet number[a]**	**Beet weight**	**Sugar Content**	**Nitrate**	**Sugar yield**	**Sugar yield**
		lb/10ft	%	ppm	lb/10ft	lb/acre
Control-1	17	23.57	16.32	33	3.85	6,708
Control-2	13	26.67	15.77	36	4.21	7,336
Control-3	18	26.59	16.68	27	4.44	7,736
Control-4	16	23.65	16.92	22	4.00	6,970
Control-5	18	27.73	16.87	29	4.68	8,154
Control-6	16	28.25	16.66	98	4.71	8,207
Control-7	16	25.68	16.45	109	4.22	7,353
Control-8	22	28.84	16.37	29	4.72	8,224
Mean	17.0 a	26.37 b	16.51 a	47.9 a	4.35 a	7,586 b
Vitazyme-1	22	32.32	16.20	24	5.22	9,095
Vitazyme-2	24	31.28	15.90	35	4.97	8,660
Vitazyme-3	22	31.64	15.96	34	5.05	8,799
Vitazyme-4	19	28.34	16.08	33	4.56	7,945
Vitazyme-5	16	31.59	15.77	55	4.98	8,677
Vitazyme-6	20	29.69	16.11	25	4.78	8,329
Vitazyme-7	24	30.11	16.00	31	4.82	8,398
Vitazyme-8	19	27.30	16.03	36	4.38	7,632
Mean	20.8 a	30.28 a	16.01 b	34.1 a	4.85 a	8,442 a
Change	(+22%)	(+15%)	(-3%)	(-29%)	(+11%)	(+11%)

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

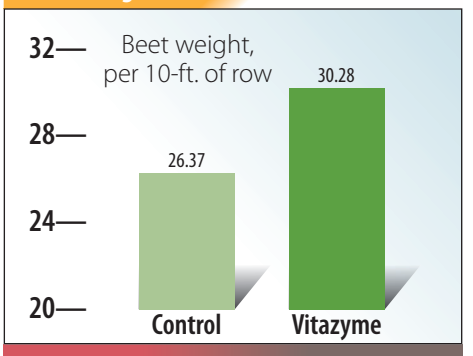
Beet number: F-value=7.91; Probability>F=0.0138; Standard error=0.9425
Beet weight: F-value=17.48; Probability>F=0.0009: Standard error=0.6593
Sugar content: F-value=12.91; Probability>F=0.0029; Standard error=0.0982
Nitrate: F-value=0.25; Probability>F=0.6234; Standard error=0.3098
Sugar yield: F-value=10.31 Probability>F=0.0063; Standard error=188.49

Beet Number



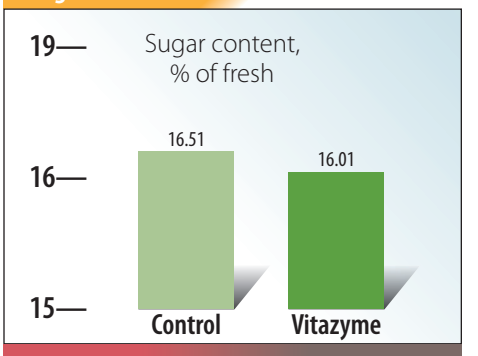
Increase in beet number with Vitazyme: 22%

Beet Weight



Increase in beet weight with Vitazyme: 15%

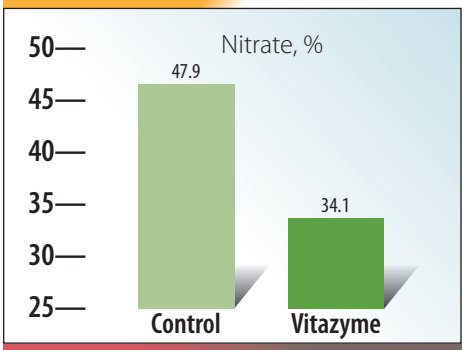
Sugar Content



Decrease in sugar content with Vitazyme: (-) 3%

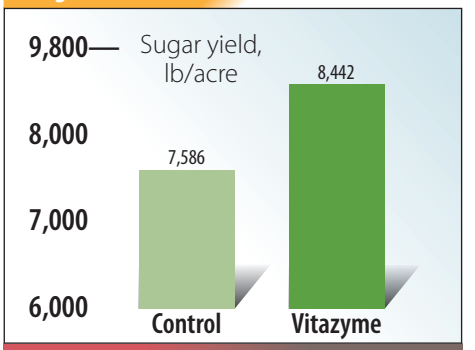
Sugar Beets *with Vitazyme application cont.*

Beet Nitrate



Decrease in beet nitrate with Vitazyme: (-) 29%

Sugar Yield



Increase in sugar yield with Vitazyme: 11%

Conclusions: A sugar beet trial near Barrett, Minnesota, using only an in-furrow Vitazyme treatment of 1 liter/ha, produced excellent and significant increases in beet number (22%), root weight (10 to 15%), and sugar yield (8 to 11%), depending upon whether Southern Minnesota Sugar Beet Coop or Minnesota Valley Testing Lab data are used. Beet nitrate content was less with Vitazyme, though not significantly, but the sugar content of the beets was significantly less with Vitazyme at the Sugar Beet Coop lab (-3%), though not at the Minnesota Valley Lab. A sugar yield increase of 8 to 11% is a great boost in production for only a single 13 oz/acre application, and shows the efficacy of this program for sugar beet growers in Minnesota.

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2014 Crop Results

Vitazyme on Sugar Beets

Farmer: Michael Stamer, and Darrel Ike (consultant)
Researchers: James Anderson and Darrol Ike *Location*: Gilsrud-Mandt Farm, Benson, Minnesota
Variety: Beta 90RR54 *Planting date*: May 16, 2014
Population: 57,000 seeds/acre *Soil type*: silt loam *Row spacing*: 30 inches
Experimental design: A uniform sugar beet field was divided into untreated and Vitazyme treated portions, with all other practices the same across the field. The objective of the study was to determine the effect of the product on the total yield and sugar yield of the beets.

1. Control **2. Vitazyme**

Fertilization: 3 gallons/acre of APP starter in-furrow at planting
Vitazyme application: 13 oz/acre at planting with the starter, on May 16
Weather during the growing season: very wet spring followed by favorable rain and temperatures
Weed control: herbicides
Fungicides: unknown
Harvest date: October 16
Yield and sugar results: Several 10-foot row sections were dug in late September for both treatments, a few rows away from the dividing line of the trial, and at each end of the field. Each row section was 0.0005739 acre. Most samples were sent to the Southern Minnesota Sugar Beet Cooperative Laboratory, but two samples from each treatment were sent to Minnesota Valley Testing Laboratories, Inc., in New Ulm, Minnesota.

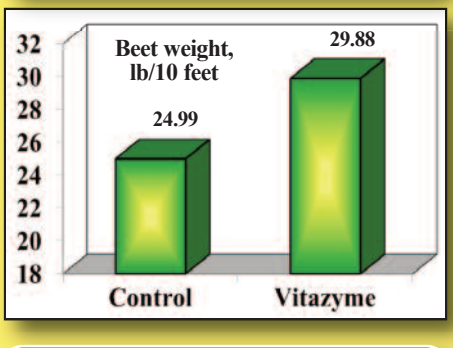
Southern Minnesota Sugar Beet Cooperative

Treatment		Clean weight	Beet number	Weight per beet	Sugar content	Sugar weight	Sugar yield[1]
		lb/10 ft	number/10 ft	lb	%	lb/10 ft	lb/acre
Control	1	21.44	16	1.34	15.50	3.32	5,785
	2	29.86	15	1.99	14.45	4.31	7,510
	3	25.36	19	1.33	15.49	3.93	6,848
	4	17.50	16	1.09	15.57	2.72	4,740
	5	29.64	18	1.65	15.11	4.48	7.806
	6	28.61	17	1.68	14.84	4.25	7,406
	7	23.61	13	1.82	15.96	3.77	6,569
	8	20.63	18	1.15	15.00	4.59	7,998
	9	25.60	17	1.51	15.47	3.96	6,900
	10	27.66	18	1.54	15.77	4.36	7,597
	Mean	24.99	16.7	1.51	15.32	3.92	6,916
Vitazyme	1	30.30	18	1.68	13.95	4.23	7,371
	2	30.79	20	1.54	13.56	4.18	7,284
	3	28.31	18	1.57	15.79	4.47	7,789
	4	29.80	20	1.48	14.06	4.19	7,301
	5	26.87	12	2.49	13.98	3.76	6,552
	6	33.95	24	1.41	14.34	4.86	8,469
	7	30.45	15	2.03	13.68	4.17	7,266
	8	28.56	14	2.04	13.86	3.96	6,900
	Mean	29.88	17.6	1.78	14.15	4.23	7,367
	F-value	11.57	0.58	3.82	22.80	2.16	2.16
	P-value	0.0032*	0.4572	0.0662*	0.0002*	0.1587	0.1587

[1]A row 10 x 2.5 ft = 0.0005739 acre. Statistical analyses were performed using a completely randomized design.

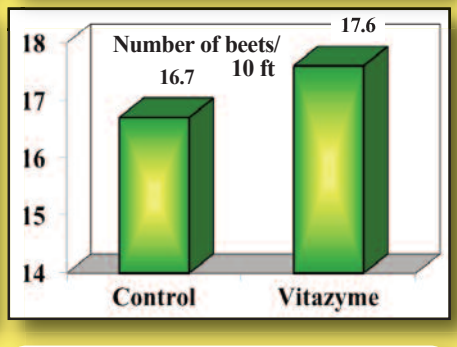
These results show a significant increase in clean beet weight with Vitazyme. Beet number increased with Vitazyme as well, but not significantly. Weight per beet was increased at P = 0.66, and the sugar content was significantly less with Vitazyme; this result conflicted with sugar analyses performed at Minnesota Valley Testing Laboratories in New Ulm (see below). Sugar production per acre was increased at P = 0.159.

Clean Beet Weight



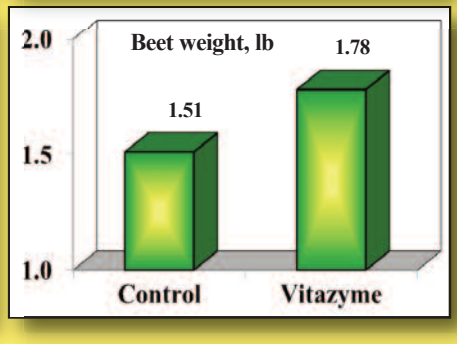
Increase in beet weight with Vitazyme: 20%

Beet Number



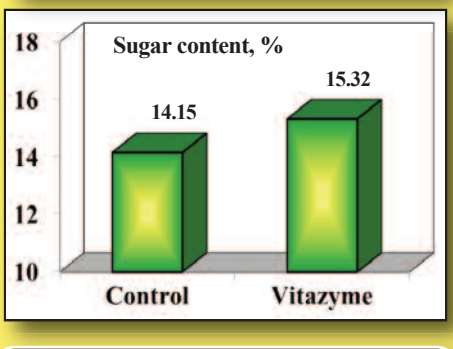
Increase in beet number with Vitazyme: 5%

Weight Per Beet

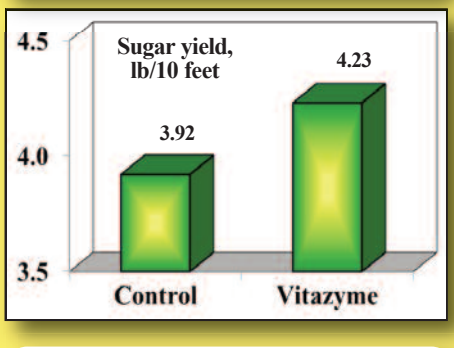


Increase in beet weight with Vitazyme: 18%

Beet Sugar Content



Beet Sugar Yield



Decrease in beet sugar with Vitazyme: (-) 1.17 %-pts

Increase in sugar yield with Vitazyme: 8%

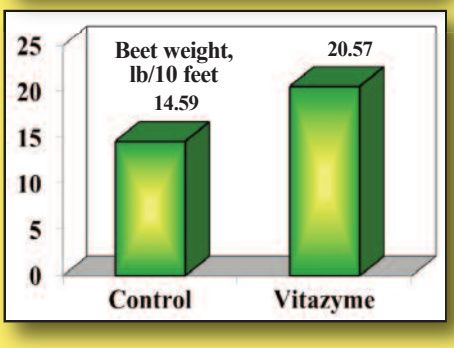
Minnesota Valley Testing Laboratories, Inc. New Ulm, Minnesota (analyzed October 13, 2014)

Treatment		Moisture (as received)	Sugar content (as received)	Sugar content (dry)	Beet weight (as received)	Sugar yield	Sugar yield[1]
		%	%	g/100 g	lb/10 ft	lb/10 ft	lb/acre
Control	1 (south)	78.5	16.58	77.12	13.04	2.16	3,764
	2 (north)	80.1	14.94	75.08	16.44	2.46	4,286
	Mean	79.3	15.76	76.1	14.59	2.31	4,025
Vitazyme	1 (south)	78.9	15.70	74.41	23.12	3.63	6,325
	2 (north)	80.2	15.07	76.11	18.02	2.72	4,739
	Mean	79.6	15.39	75.26	20.57	3.18	5,532

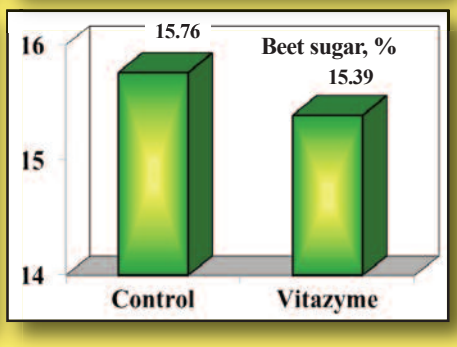
[1]A row 10 x 2.5 ft = 0.0005739 acre. Statistical analyses were performed using a completely randomized design.

According to this analysis, the sugar output from Vitazyme treatment was considerably greater than the control as compared with the Southern Minnesota Sugar Beet Cooperative results. This was due to a higher sugar content in the Vitazyme treated beets than detected in the MSBC lab, and an even greater weight differential.

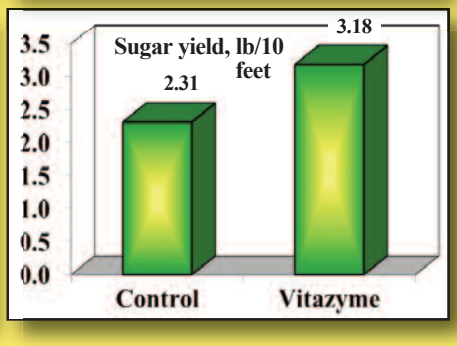
Sugar Beet Weight



Beet Sugar Content



Sugar Yield



Increase in beet weight with Vitazyme: 41%

Decrease in sugar content with Vitazyme: (-) 0.37 %-pts

Increase in sugar yield with Vitazyme: 38%

Conclusions: A split-field sugar beet study in south-central Minnesota revealed that a single 13 oz/acre Vitazyme application in-furrow at planting increased the yield of sugar considerably. The amount of increase depended upon the laboratory which performed the analyses, which values are summarized below.

	Change with Vitazyme				
	Beet weight	Beet number	Weight/Beet	Sugar content	Sugar yield
Sugar beet coop lab	+20%	+5%	+18%	-1.17 %-point	+8%
Minnesota Valley lab	+41%	—			

Based on these results, the sugar content of the beets was marginally reduced with Vitazyme, but the yield was greatly increased (20 to 41%), giving a net sugar yield increase of between 8 and 38%. These increases should be of major interest for those farmers wishing to improve the production and profitability of sugar beets.

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2014 Crop Results

Vitazyme on Sugar Beets (for seed)

Researchers: Allen Smith, Wilbur Ellis crop consultant, and Jacob Hesseltine, Vital Grow Distribution LLC, Waterville, Washington
Farmer: Bill Worth, Precision Seed Production
Location: Quincy, Washington
Variety: sugar beets for seed
Planting date: early March
Planting rate: unknown
Seedbed preparation: conventional
Previous crop: fallow
Soil type: black loamy sand
Irrigation: center pivot

Experimental design: A 65-acre beet field was divided into sectors of 44 acres treated with Vitazyme early, and 21 acres untreated, using a center-pivot irrigation system for application. A later Vitazyme application was made to the entire field, with the objective of evaluating the effect of this product on the yield of beet seed.

1. Vitazyme early **2. Vitazyme early + late**

Fertilization: 50-75-100 lb/acre of N-P_2O_5-K_2O, 1 lb/acre boron, 5 lb/acre magnesium, and 1 lb/acre copper

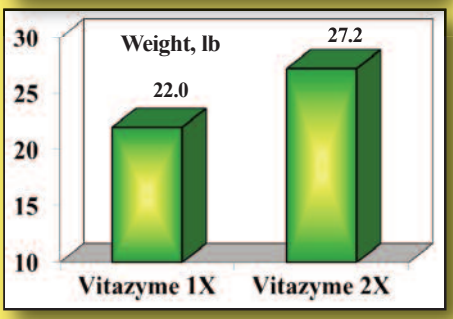
Vitazyme application: (1) 13 oz/acre in late March after emergence on 44 acres; (2) 13 oz/acre over all areas on July 14, well after seed-set, along with insectiside, fungicide, and nutrients

Weather during the growing season: a very dry and hot year

Sampling date: August 11, shortly before harvest

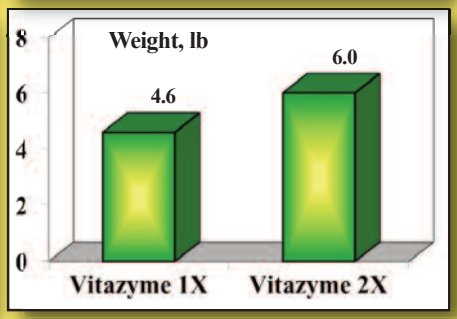
Growth results:

Total Plant Weight



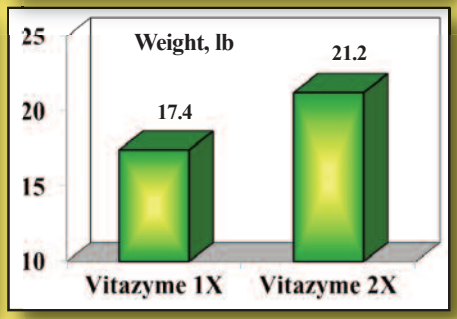
Increase in total weight with Vitazyme: 24%

Root Weight



Increase in root weight with Vitazyme: 30%

Top Weight



Increase in top weight with Vitazyme: 22%

Conclusions: A beet seed trial in central Washington, using Vitazyme applied shortly after plant emergence and again after seed formation in July, compared with only the later application, revealed through plant sampling that the two applications improved total plant, root, and top weights by 24, 30, and 22% respectively. There was no way to determine actual seed yields for either treatment, but observations in the field indicated that the seed yield was proportional to vegetative growth. However, due to a late second Vitazyme application it is unlikely that this additional product increased seed yield, unless the addition plant vigor reduced seed loss due to disease and insect damage.

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2012 Crop Results

Vitazyme on Sugar Beets

Researcher: James Anderson
Location: Belview, Minnesota
Population: 45,000 to 50,000 seeds/acre
Planting date: April 19, 2012
Farmers: Matt and Brian Huhnerkoch
Variety: Beta
Soil type: clay loam
Irrigation: center pivot

Experimental design: A 60-acre sugar beet field was divided into Vitazyme treated and untreated areas, to determine the effects of this product on beet yield and sugar content.

1. Control **2. Vitazyme**

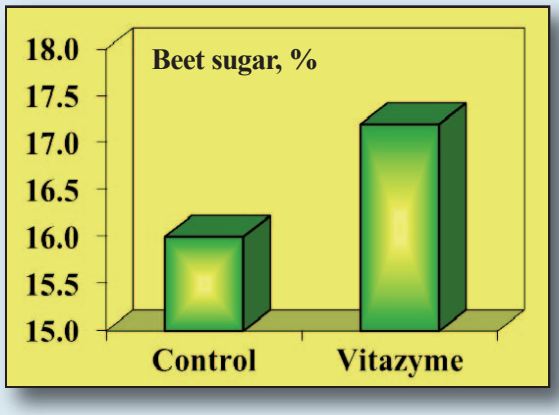
Fertilization: unknown
Vitazyme application: 13 oz/acre on the seeds at planting
Rainfall: Only about 6 inches fell during the growing season.
Yield results: Due to harvest restrictions it was impossible to measure exact yields of the two areas, but the farmers estimated that the Vitazyme treatment produced 1.0 ton/acre more beets.

Increase in beet yield with Vitazyme: 1.0 ton/acre

Sugar results: Evaluations of sugar were made for the two treatments.

Treatment	Sugar content	Sugar change
	%	%
Control	16.0	—
Vitazyme	17.2	+1.2

Increase in sugar with Vitazyme: 1.2 percentage points



Conclusions: A sugar beet trial with Vitazyme produced an excellent 1.2 percentage-point increase in beet sugar compared with the control. The yield increase was estimated at 1.0 ton/acre. These results are similar to those observed during the previous two years at Huhnerkoch Farms.

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2011 Crop Results

Vitazyme on Sugar Beets

Researcher: James Anderson
Location: Belview, Minnesota
Soil type: clay loam
Farmer: Bob, Brian, and Matt Huhnerkoch
Variety: Crystal 265
Previous crop: corn

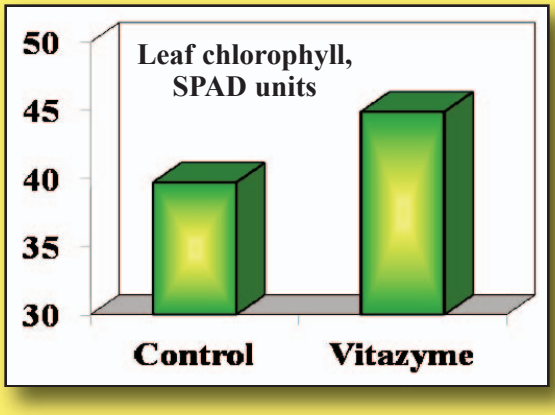
Experimental design: A sugar beet field was divided into a Vitazyme treated and untreated portion to evaluate the effects of the product on sugar beet yield.

1. Control **2. Vitazyme**

Fertilization: unknown
Vitazyme application: 13 oz/acre (1 liter/ha) applied after planting, and half ways through the growing season
Weed control: glyphosate
Weather for 2010: very wet all season
Chlorophyll results: On July 26, 2010, 30 random leaves from each treatment were measured for chlorophyll using a Minolta SPAD Meter; the values were then averaged for each treatment.

Treatment	Leaf chlorophyll	Change
	SPAD units	
Control	39.7	—
Vitazyme	44.9	+5.2

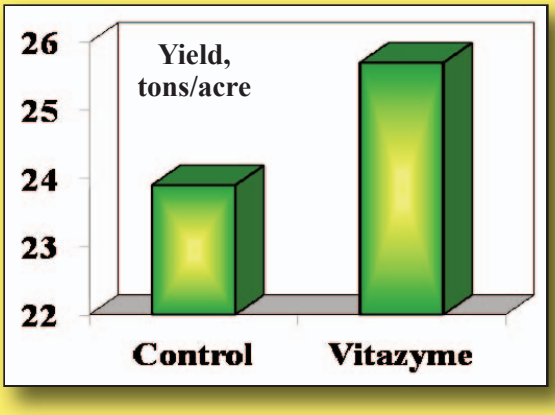
Increase in leaf chlorophyll with Vitazyme: +5.2 SPAD units



Disease susceptibility: **Vitazyme reduced the succeptibility of the roots the beet rot.**
Yield results:

Treatment	Beet yield	Yield change
	tons/acre	
Control	23.9	—
Vitazyme	25.7	+1.8 (+8%)

Increase in yield with Vitazyme: 8%



Conclusion: An on-farm sugar beet trial in southern Minnesota in 2010 revealed that Vitazyme increased sugar beet growth, disease resistance, and yield. The 1.8 tons/acre yield increase represented an 8% boost in yield, resulting from considerably more leaf area and chlorophyll (+5.2 SPAD units), showing this program to be highly productive for sugar beet growers in Minnesota.

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Average Values for 2009 to 2011 in Ukraine

Vitazyme on Sugar Beets

Three-Year Averages With Four Fertilizer Levels

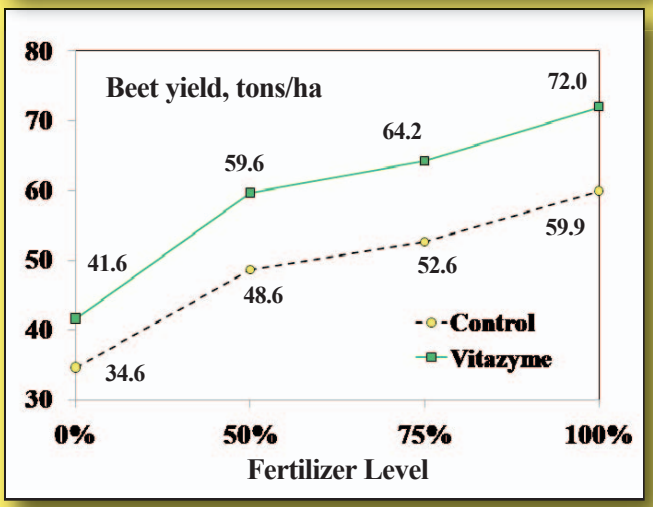
Researcher: V.V. Plotnikov *Location*: National Academy of Agrarian Sciences, Vinnytsia State Agricultural Research Station, Vinnytsia, Ukraine (Central Forest and Steppe Region)

Treatment	Fertilizer N	Fertilizer P_2O_5	Fertilizer K_2O	Vitazyme[1]
		kg/ha		liter/ha
1. No Vita + 0% fert.	0	0	0	0
2. Vita + 0% fert.	0	0	0	1+1
3. No Vita + 50% fert.	80	60	80	0
4. Vita + 50% fert.	80	60	80	1+1
5. No Vita + 75% fert.	120	90	120	0
6. Vita + 75% fert.	120	90	120	1+1
7. No Vita + 100% fert.	160	120	160	0
8. Vita + 100% fert.	160	120	160	1+1

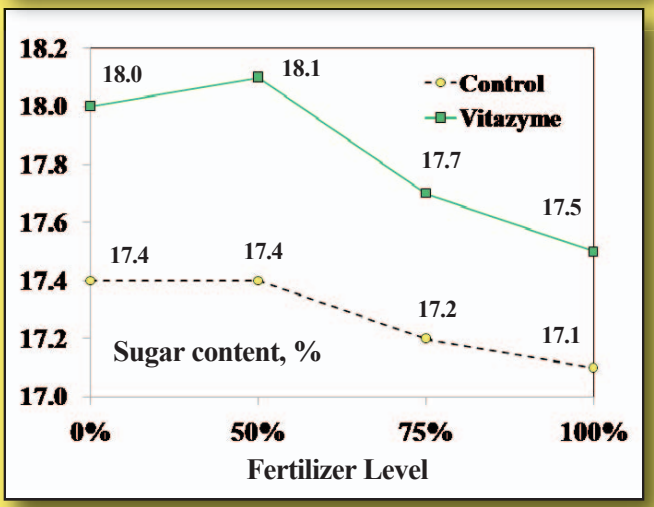
[1]Applied at 1 liter/ha twice, in mid-June and early July.

Average Values Over Three Years 2009 to 2011

Beet Yield



Sugar Content



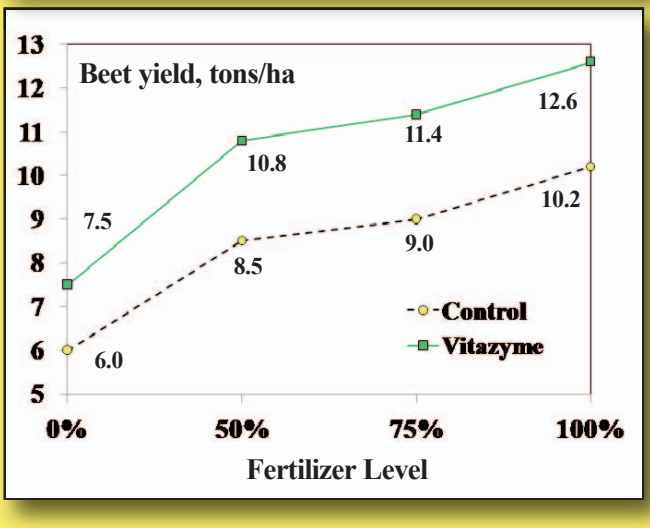
Increase in beet yield with Vitazyme

No fert ..... +20%
50% fert ..... +23%
75% fert ..... +22%
100% fert ..... +20%

Increase in beet sugar with Vitazyme

No fert ..... +0.6 percentage point
50% fert ..... +0.7 percentage point
75% fert ..... +0.5 percentage point
100% fert .... +0.4 percentage point

Sugar Yield



Increase in sugar yield with Vitazyme

No fert ..... +25%
50% fert ..... +27%
75% fert ..... +27%
100% fert ..... +24%

Increased income with Vitazyme

No fert ..... +3,180 hrn/ha
50% fert ..... +5,180 hrn/ha
75% fert ..... +5,480 hrn/ha
100% fert ..... +5,730 hrn/ha

Conclusion: Three years of sugar beet trials in Ukraine have revealed that two applications of 1.0 liter/ha greatly increased yield, sugar content, and sugar yield at each of four fertilizer levels. The extra income at the four levels ranged from 3,180 to 5,730 hrn/ha. These results prove the great efficacy of this program for sugar beet production in Ukraine.

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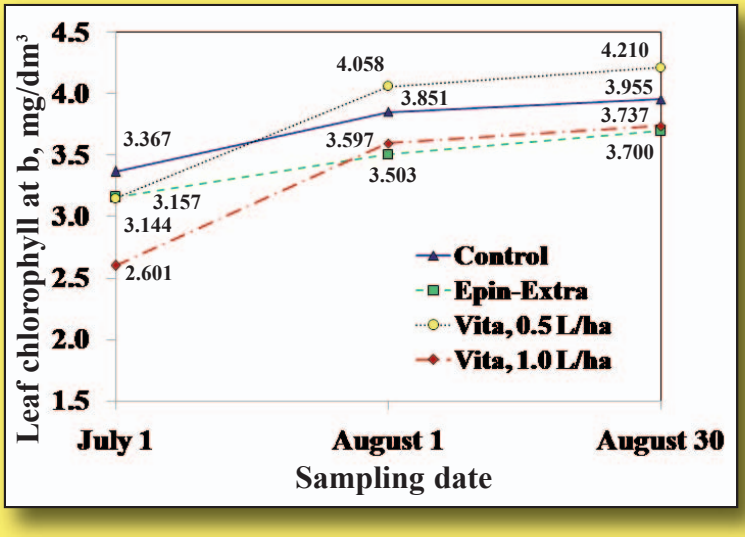
2011 Crop Results

Vitazyme on Sugar Beets

Researcher: V.D. Strelkov, Ph.D., and D.Y. Nazarenko *Research organization*: State Research Institution, All-Russian Research Institute of Biological Plant Protection, Russian Agricultural Academy
Location: Russia *Variety*: Leopard *Previous crop*: winter wheat
Planting rate: 6 to 7 seeds/meter *Planting depth*: 3 to 4 cm *Planting date*: April 25, 2011
Experimental design: A sugar beet test area of 100 m^2 was divided into four replicates with four treatments: a control, a standard stimulant product (Epin-Extra), and two Vitazyme treatments. The objective of the study was to measure the effects of these products on the growth, yield, and sugar production of the beets.

Treatment	Seed treatment	2-4 leaves	6-8 leaves
1. Control	0	0	0
2. Epin-Extra	0.012 L/ton	0.1 L/ha	0
3. Vitazyme	0	0.5 L/ha	0.5 L/ha
4. Vitazyme	0	1.0 L/ha	1.0 L/ha

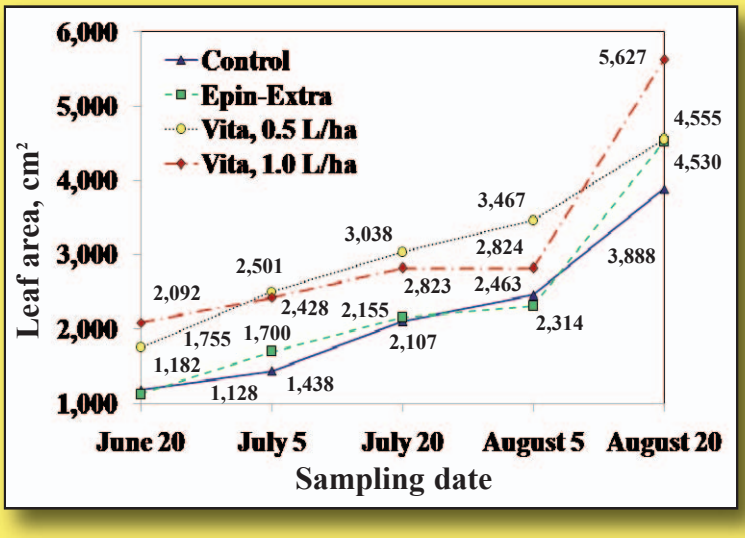
Fertilization: 120 kg/ha N, 120 kg/ha P_2O_5, and 120 kg/ha K_2O dry fertilizer in September of 2010
Vitazyme application: either 0.5 or 1.0 liter/ha sprayed on the leaves and soil with 300 liters/ha of water (see the table) at 2 to 4 leaves on May 30, and at 6 to 8 leaves on June 9, 2011
Epin-Extra application: 0.012 liter in 10 liters of water applied to 1 ton of seed on April 25, 2011; 0.1 liter/ha in 300 liters/ha at 2 to 4 leaves on May 30, 2011
Weed control: Vector (1liter/ha) + Caribou (30 g/ha) + Lontrel (100 g/ha) at the second leaf pair; 30 days later, Fusilad Forte at 1 liter/ha



The highest chlorophyll levels of the leaves as the season progressed were with the 0.5 liter/ha Vitazyme treatment. The was followed by the control, and then the 1.0 liter/ha Vitazyme treatment. The Epin-Extra values were lowest.

Highest leaf chlorophyll density: Vitazyme at 0.5 liter/ha

Leaf area results: On five days during the growing season – June 20, July 5 and 20, and August 5 and 20 – the leaf area was measured using an AAC-100 meter.



Both Vitazyme treatments caused the greatest leaf areas of the four treatments.

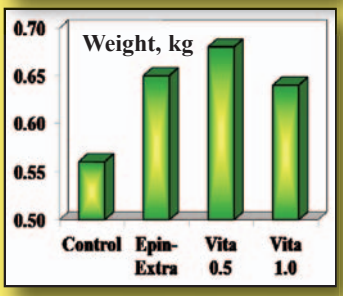
Increase in leaf area with Vitazyme (August 20)

0.5 liter/ha ..... +17%
1.0 liter/ha ..... +45%

Yield results: The beets were harvest on August 30 by hand. Plant density at this time was 93,000 plants/ha.

Treatment	Tuber weight	Weight change	Tuber yield	Yield change	Beet sugar	Sugar change	Sugar yield	Yield change
	kg	kg	centners/ha	centners/ha	%	% point	centners/ha	centners/ha
1. Control	0.56	—	520.8 c	—	16.2 c	—	84.4 c	—
2. Epin-Extra	0.65	0.09 (+16%)	604.5 b	83.7 (+16%)	16.6 c	+0.4	100.3 b	15.9 (+19%)
3. Vitazyme, 0.5 L/ha	0.68	0.12 (+21%)	632.4 a	111.6 (+21%)	17.4 b	+1.2	110.0 a	25.6 (+30%)
4. Vitazyme, 1.0 L/ha	0.64	0.08 (+14%)	595.2 b	74.4 (+14%)	18.4 a	+2.2	109.5 a	25.1 (+30%)
$HCP_{0.05}$			17.0		0.6			

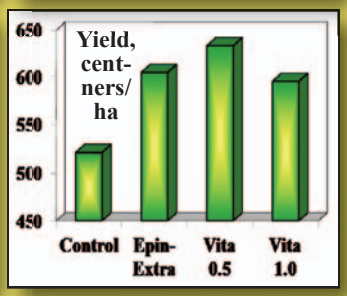
Tuber Weight



Increase in tuber weight with Vitazyme

0.5 liter/ha 21%
1.0 liter/ha 14%

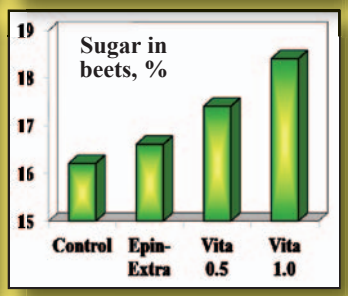
Tuber Yield



Increase in tuber yield with Vitazyme

0.5 liter/ha 21%
1.0 liter/ha 14%

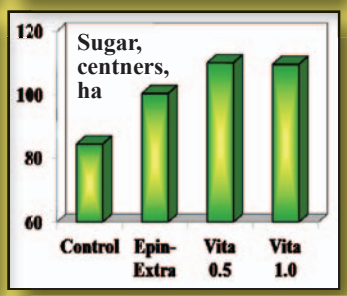
Sugar Content



Increase in sugar content with Vitazyme

0.5 liter/ha 1.2%-pts
1.0 liter/ha 2.2%-pts

Sugar Yield



Increase in sugar yield with Vitazyme

0.5 liter/ha 30%
1.0 liter/ha 30%

Conclusion: This sugar beet trial in Russia revealed that Vitazyme, especially at 0.5 liter/ha applied twice, but also the 1.0 liter/ha rate, greatly improved weight (14 to 21%), root yield (14 to 21%), sugar content of the roots (1.2 to 2.2%-points), and total sugar yield (30%). These improvements were a reflection of a greater leaf area to photosynthesize and fix carbon, as well as improvements in the chlorophyll content of the leaf tissue as measured by a meter. The usual seed and foliar treatment, Epin-Extra, increased all growth and yield parameters but resulted in a much smaller sugar increase than did either Vitazyme treatment.

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2011 Crop Results

Vitazyme on Sugar Beets

Researcher: Unknown *Location*: National Academy of Agrarian Sciences, Vinnytsia State Agricultural Research Station, Vinnytsia, Ukraine (Central Forest and Steppe Region)
Variety: Leonora *Soil type*: gray podzolic (organic matter = 2.2%, hydrolyzed N = 8.4 mg/100 g soil, P = 15.8 mg/100 g soil, exchangeable K = 12.4 mg/100 g soil, pH = 5.5)
Experimental design: A plot area of about 1 ha was planted to sugar beets, and a trial with four replicates using one Vitazyme treatment and four levels of fertilization was placed upon it. The objective of the test was to evaluate the effect of Vitazyme and fertilizer level on the yield of sugar for the beets.

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

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

Treatments 3 and 4: 80-60-80 kg/ha N-P_2O_5-K_2O

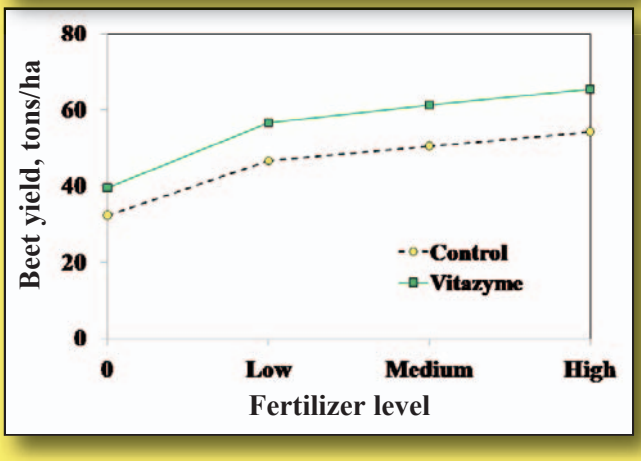
Treatments 5 and 6: 120-90-120 kg/ha N-P_2O_5-K_2O

Treatments 7 and 8: 160-120-160 kg/ha N-P_2O_5-K_2O

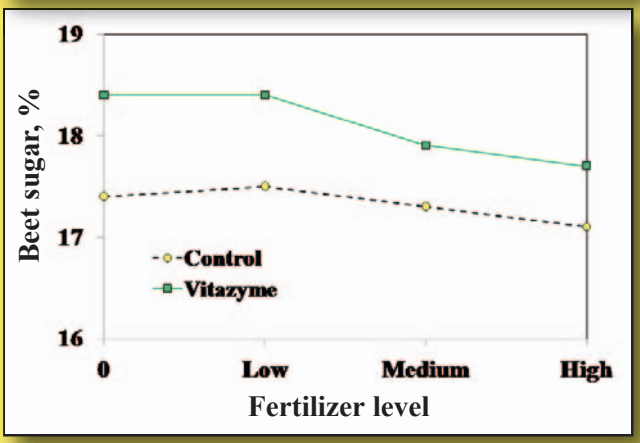
Vitazyme application: 1 liter/ha sprayed on the leaves and soil (1) June 21, 2011, and (2) July 10, 2011
Sugar and beet yield results:

Treatment	Beet yield	Change	Sugar content	Change	Sugar yield	Change
	tons/ha	tons/ha	%	%-points	tons/ha	tons/ha
1. No fert, no Vita	32.3	—	17.4	—	5.6	—
2. No fert, + Vita	39.5	7.2 (+22%)	18.4	+1.0	7.3	1.7 (+30%)
3. Low fert, no Vita	46.5	—	17.5	—	8.1	—
4. Low fert, + Vita	56.5	10.0 (+22%)	18.4	+0.9	10.4	2.3 (+28%)
5. Medium fert, no Vita	50.4	—	17.3	—	8.7	—
6. Medium fert, + Vita	61.1	10.7 (+21%)	17.9	+0.6	10.9	2.2 (+25%)
7. High fert, no Vita	54.1	—	17.1	—	9.2	—
8. High fert, + Vita	65.3	11.2 (+21%)	17.7	+0.6	11.6	2.4 (+26%)

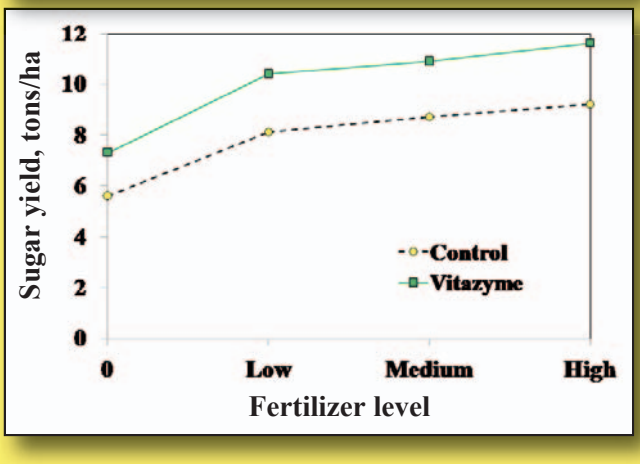
Sugar Beet Yield



Beet Sugar Content



Sugar Beet Yield



Vitazyme gave uniform increases in yield (21 to 22%) at all four fertility levels, and also increased sugar content of the beets (by 0.6 to 1 percentage point) despite higher yields, though sugar content increased a bit less as the fertilizer levels and yields increased. Final sugar yield for all four fertilizer levels was markedly improved by Vitazyme (25 to 30%).

Income results: Profits with Vitazyme were improved markedly at all four fertilizer levels, from 3,280 hrn/ha for none added, to 4,680 hrn/ha at the low level, to 5,030 hrn/ha for the medium level, and to 5,280 hrn/ha for the high fertilizer level.

Conclusion: This sugar study in Ukraine, using four fertilizer levels and one Vitazyme regime (1 liter/ha applied twice to the leaves and soil), showed that beet and sugar yields were markedly and uniformly improved at all fertilizer levels. Besides, the sugar content of the beets was increased by 0.6 percentage point or more, the increase decreasing slightly as the fertilizer rate increased. These results are summarized below. The Vitazyme program is shown to be an excellent practice to incorporate into sugar beet production in Ukraine.

Increases with Vitazyme

	No fert	Low fert	Medium fert	High fert
Beet Yield	22%	22%	21%	21%
Sugar content	1.0 %-pt	0.9 %-pt	0.6 %-pt	0.6 %-pt
Sugar yield	30%	28%	25%	26%
Profit	3,280 hrn/ha	4,680 hrn/ha	5,030 hrn/ha	5,280 hrn/ha

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2009 Crop Results

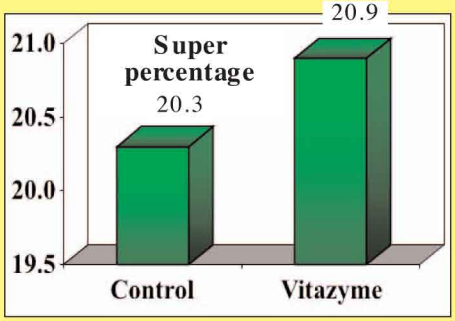
Vitazyme on Sugar Beets

Researcher: O.V. Kornijchuk, V.V. Plotnikov, and agronomic scientists
Organization: Vinnytsia State Agricultural Experiment Station, Ukraine Academy of Agrarian Sciences, Vinnytsia, Ukraine
Location: Ukraine central forest-steppe area near Vinnytsia
Planting date: April 14, 2009 *Seeding rate*: 100.000 seeds/ha
Varieties: Oleksandria, Karmelita, and Yustina *Tillage*: plowing, harrowing, and cultivating
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/100g of soil phosphorus, 12.4 mg/100 g of soil exchangeable potassium, and pH=5.5.
Experimental design: A series of replicated plots (two reps) at the experiment station was established to grow three varieties of sugar beets, using two applications of Vitazyme on the treated area. The objective was to determine the effect of Vitazyme on the crop's yield, sugar content, and total sugar production.

1. Control **2. Vitazyme**

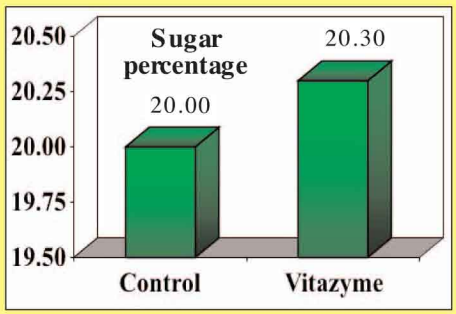
Fertilization: 60 kg/ha N, 30 kg/ha P_2O_5, and 60 kg/ha K_2O; N applied in the spring, P and K in the fall
Vitazyme application: (1) 1 liter/ha on the plants and soil on June 20, 2009; (2) 1 liter/ha on the plants and soil on July 10, 2009
Harvest: unknown
Sugar conent results: At harvest time, the sugar percentage of each variety was determined.

Oleksandria



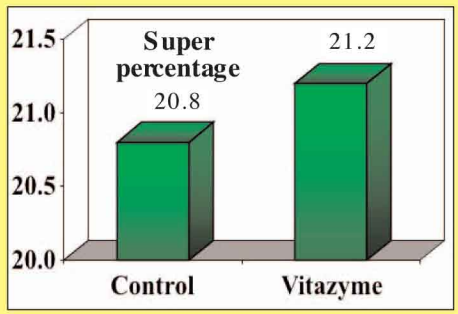
Increase in sugar
0.6 percentage point

Karmelita



Increase in sugar
0.3 percentage point

Yustina

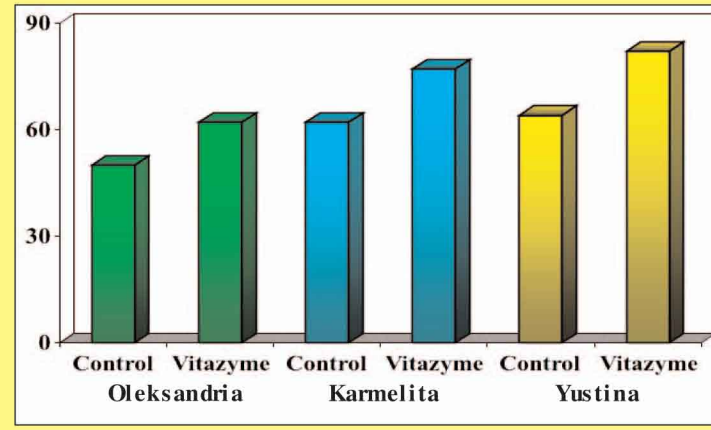


Increase in sugar
0.4 percentage point

Yield results: The crop was harvested the fall of 2009, with the following results.

Treatment	Beet yield	Yield change
	tons/ha	tons/ha
Oleksandria		
Control	50.0	—
Vitazyme	62.0	12.0 (+24%)
Karmelita		
Control	62.0	—
Vitazyme	77.0	15.0 (+24%)
Yustina		
Control	64.0	—
Vitazyme	82.0	18.0 (+28%)

Beet yield, tons/ha



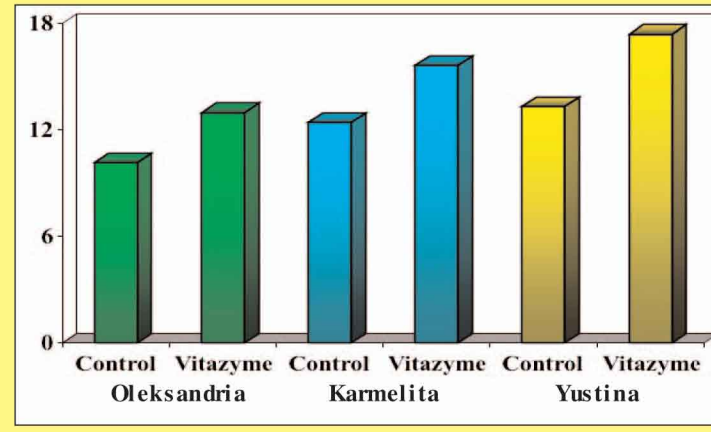
Increase in sugar yield

Oleksandria 24%
Karmelita 24%
Yustina 28%

Sugar yield results:

Treatment	Sugar yield	Yield change
	tons/ha	tons/ha
Oleksandria		
Control	10.15	—
Vitazyme	12.96	2.81 (+28%)
Karmelita		
Control	12.40	—
Vitazyme	15.63	3.23 (+26%)
Yustina		
Control	13.31	—
Vitazyme	17.38	4.07 (+31%)

Sugar yield, tons/ha



Increase in sugar yield

Oleksandria 28%
Karmelita 26%
Yustina 31%

Conclusions: This Vitazyme study on three sugar beet varieties in Ukraine proved that only two applications of Vitazyme can markedly increase beet yield — from 24 to 28% — while at the same time increase the sugar content of the beets, from 0.3 to 0.6 percentage points. These improvements brought about total sugar yield increases of from 26 to 31%, huge enhancements of total sugar output with these very low application levels of active agents. These highly profitable results show that Vitazyme is a very viable option for sugar beet growers in Ukraine, and in other countries of Eastern Europe.

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2009 Crop Results

Vitazyme on Sugar Beets

Researcher: O.V. Kornijchuk, V.V. Plotnikov, and agronomic scientists
Organization: Vinnytsia State Agricultural Experiment Station, Ukraine Academy of Agrarian Sciences, Vinnytsia, Ukraine *Location*: Ukraine central forest-steppe area near Vinnytsia
Planting date: April 14, 2009 *Seeding rate*: 100.000 seeds/ha *Variety*: Snizhana
Tillage: plowing, harrowing, and cultivation *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/100g of soil phosphorus, 12.4 mg/100 g of soil exchangeable potassium, and pH=5.5.
Experimental design: A sugar beet field was established having two replications, using four fertility levels, to determine the effectiveness of Vitazyme in affecting beet yield, sugar content, and sugar yield.

Treatment	Vitazyme	Fertilizer[1]		
		Nitrogen	P_2O_5	K_2O
		kg/ha		
1. No fertilizer	0	0	0	0
2. No fert + Vitaz	Yes	0	0	0
3. 50% fertilizer	0	80	60	80
4. 50% fert + Vita	Yes	80	60	80
5. 75% fertilizer	0	120	90	120
6. 75% fert + Vita	Yes	120	90	120
7. 100% fertilizer	0	160	120	160
8. 100% fert + Vita	Yes	160	120	160

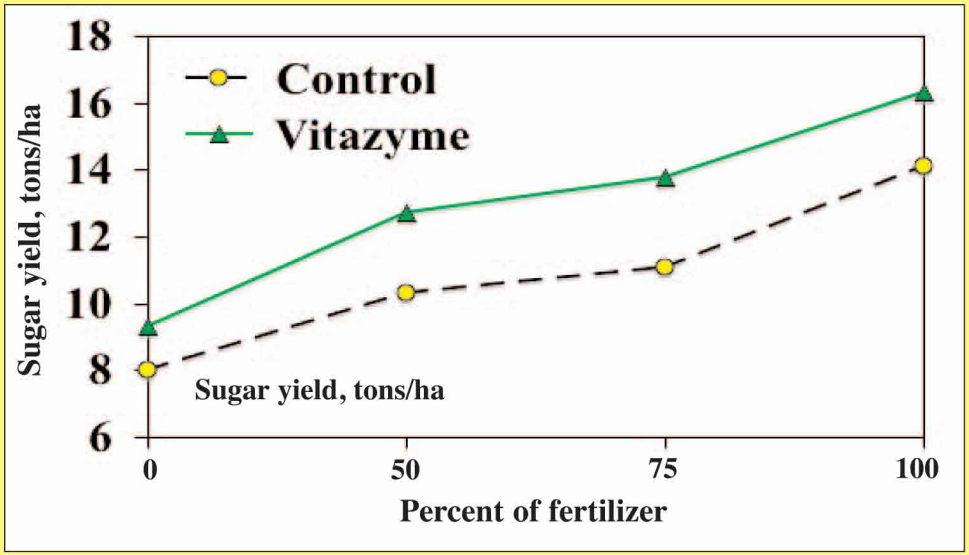
[1] P_2O_5 and K_2O were applied the fall of 2008; N was applied the spring of 2009.

Fertilization: See the table above.
Vitazyme application: (1) 1 liter/ha on the leaves on June 20, 2009; (2) 1 liter/ha on the leaves on July 10, 2009.
Yield results:

Treatment	Beet yield	Change[1]	Sugar content	Change[1]	Sugar yield	Change[1]	Added income[1]
	tons/ha	tons/ha	%	%	tons/ha	tons/ha	hrn/ha
1. No fertilizer	40.0	—	20.3	—	8.0	—	—
2. No fert + Vitaz	45.5	5.5 (+14%)	20.5	0.2 (+1%)	9.3	1.3 (+16%)	975
3. 50% fertilizer	50.5	—	20.4	—	10.3	—	—
4. 50% fert + Vita	61.0	10.5 (+21%)	20.8	0.4 (+2%)	12.7	2.4 (+23%)	2,225
5. 75% fertilizer	55.0	—	20.1	—	11.1	—	—
6. 75% fert + Vita	67.5	12.0 (+22%)	20.4	0.3 (+1%)	13.8	2.7 (+24%)	2,600
7. 100% fertilizer	70.0	—	20.1	—	14.1	—	—
8. 100% fert + Vita	80.5	10.5 (+15%)	20.3	0.2 (+1%)	16.3	2.2 (+16%)	2,225

[1] Comparisons at the same fertilizer level.

Sugar Yield



Conclusions: This Ukrainian sugar study revealed that, at every fertilizer level, Vitazyme increased the sugar production, first by increasing the beet yield, and then the sugar percentage at each level. Besides, the added income for each fertilizer level was substantial. These results prove that Vitazyme is a highly viable sugar beet amendment for Ukrainian agriculture.

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2009 Crop Results

Vitazyme on Sugar Beets

Researcher: unknown *Research organization*: Obolon-Agro *Location*: Ukraine
Variety: Alexandria *Soil type*: unknown *Planting date*: unknown
Experimental design: A field of sugar beets was divided into a control (untreated) and a Vitazyme treated area, for the purpose of determining the effect of this product on sugar beet yield and sugar yield.

1. Control **2. Vitazyme**

Fertilization: unknown
Vitazyme application: two spray applications at 1.0 liter/ha each time
Yield results:

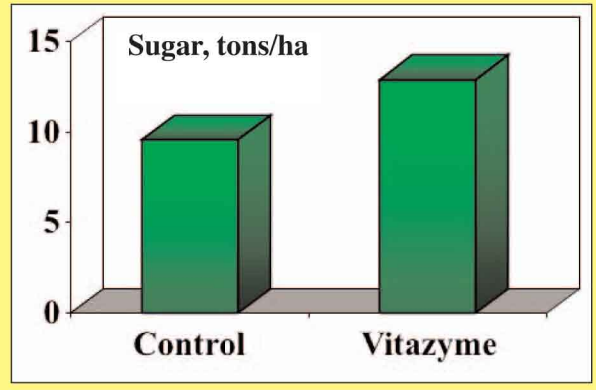
Treatment	Beet yield	Chamge	Sugar content	Change	Super yield	Change
	tons/ha	tons/ha	%	%	tons/ha	tons/ha
Control	48	—	20.0	—	9.6	—
Vitazyme	60	12 (+25%)	21.5	1.5 (+8%)	12.9	3.3 (+34%)

Increase in beet yield with Vitazyme: 25%

Increase in sugar content with Vitazyme: 8%

Increase in sugar yield with Vitazyme: 34%

Sugar Yield



Conclusions: This Ukrainian sugar beet study revealed that two Vitazyme applications increased the beet yield (25%), the sugar content of the beets (1.5 percentage points), and the total sugar yield (34%). This great boost is sugar production reveals the potential of this product to aid Ukraine's agriculture.

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2007 Crop Results

Vitazyme on Sugar Beets

Researcher: Sergei Velichko and Zhenya Moskalov
Location: Visnitsa, Olgopil, Ukraine
Planting date: first part of April
Soil type: mollisol

Organization: Agrimatco – Ukraine, Kiev, Ukraine
Variety: Hamber
Watering: center-pivot irrigation
Planting rate: unknown

Experimental design: A field was divided into a Vitazyme treated and untreated area to determine the effect of the product on increasing sugar beet yield. Another product, called Amcolon B, a fertilizer, was added to Vitazyme to evaluate a possible synergism.

1. Control **2. Vitazyme** **3. Vitazyme + Amcolon**

Fertilization: autumn of 2006, 350 kg/ha 0f Kalimag super (potassium and magnesium sulfates), and 150 kg/ha of MAP (12-52-0% N-P_2O_5-K_2O); June 15, 200 kg/ha of ammonium nitrate and lime

Vitazyme application: two foliar treatments of 3 liters/ha each time: (1) June 11, at 4 to 5 leaves; (2) June 29 at 8 leaves

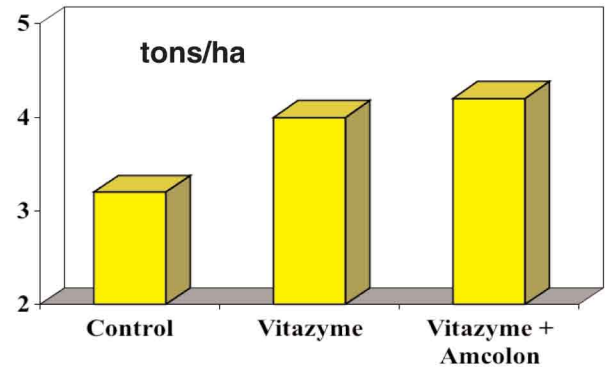
Amcolon application: A 30-0-22.5-3.5 (Mg)-1.5 (B) + TE product, applied with Vitazyme at 3.0 liters/ha

Harvest date: unknown

Treatment	Yield	Yield change
	kg/12 plants	kg/12 plants
1. Control	3.2	—
2. Vitazyme	4.0	0.8 (+25%)
3. Vitazyme + Amcolon	4.2	1.0 (+31%)

Beet yield increase with Vitazyme: 25%

Sugar Beet Yield



Yield results: Twelve average plants from each treatments were harvested and weighed.

Conclusions: In this Ukranian sugar beet trial, Vitazyme alone increased the beet yield by 25% over the control, while additional foliar fertilizer nutrients (N, K, Mg, and B) further boosted yield by 31%. Thus, the efficacy of Vitazyme to improve sugar beet yield, and synergize with foliar nutrients, is demonstrated in this farm study.