

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 than 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-P₂O₅-K₂O. 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

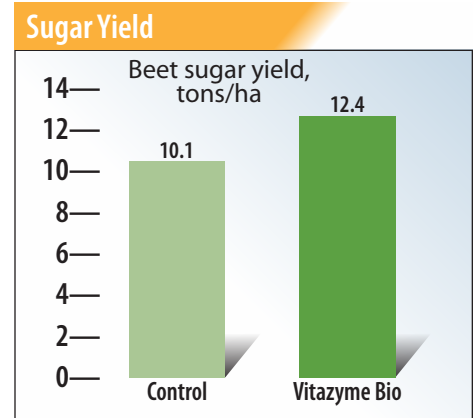
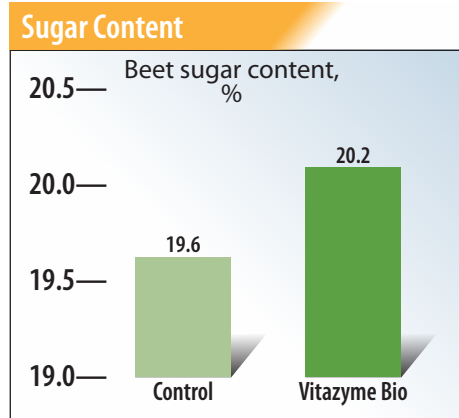
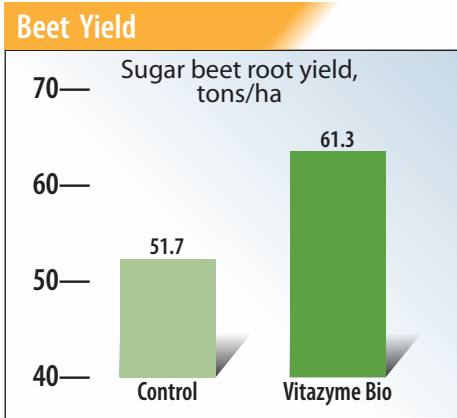
Yield results:

Treatment	Root yield tons/ha	Yield change tons/ha	Sugar content %	Sugar yield tons/ha	Yield change 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.



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 of the beets.

1 Control 2 Vitazyme

Fertilization: 140-120-160 kg/ha of N-P₂O₅-K₂O 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

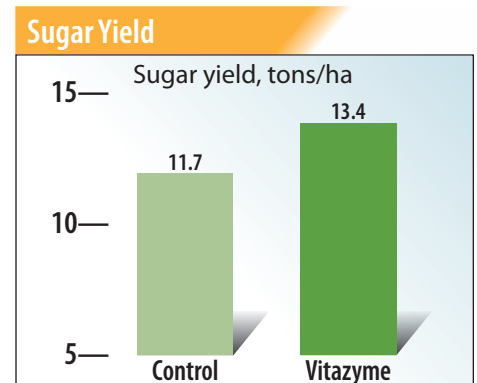
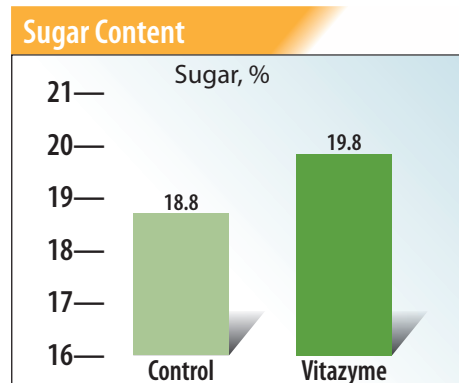
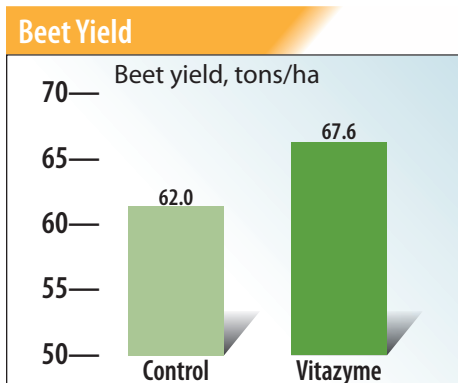
Yield and sugar results:

Treatment	Beet yield tons/ha	Yield change tons/ha	Sugar content %	Content change %	Sugar yield tons/ha	Yield change 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 %



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-P₂O₅-K₂O-S, plus hog manure at 3,200 gallons/acre to give 65-20-80 lb/acre of N-P₂O₅-K₂O.

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.

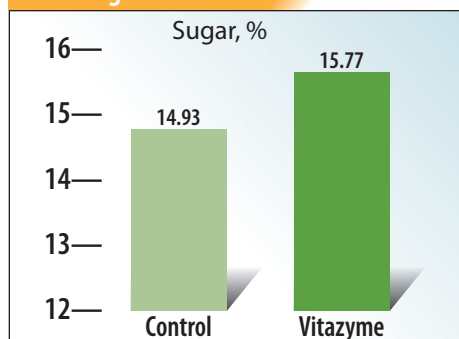
Treatment	Beet yield tons/acre	Yield change tons/acre	Sugar content %	Sugar change %	Sugar yield tons/acre	Sugar change tons/acre
1. Control	30.06	—	14.93	—	4.488	—
2. Vitazyme	30.22	0.16 (+1%)	15.77	+ 0.84	4.766	0.278 (+6%)

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.



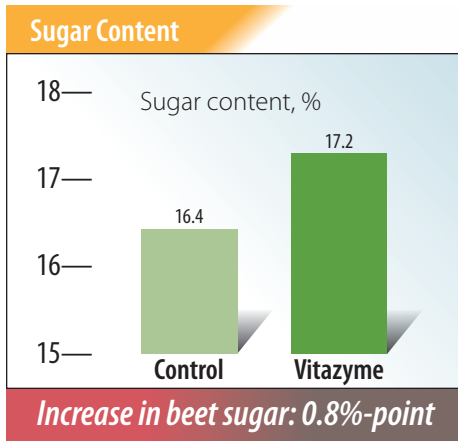
Sugar beets growth in Ukraine have consistently shown superb responses to Vitazyme, as shown in this sampling.

1 Control 2 Vitazyme

Fertilization: 100 tons/ha of manure the fall of 2015; 60-60-60 kg/ha of N-P₂O₅-K₂O pre-plant; 120 kg/ha at N sidedressed

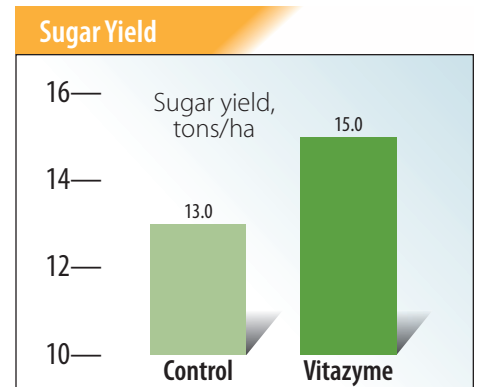
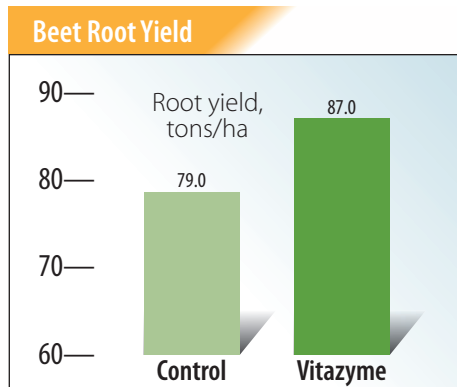
Vitazyme application: 1.0 liter/ha sprayed on the leaves and soil on June 21, 2016

Quality results:



Yield results:

Treatment	Beet yield tons/ha	Yield change tons/ha	Sugar yield tons/ha	Yield change 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.

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.

Increase with Vitazyme

Beet yield..... +10%
Sugar yield..... +15%

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 Ulianiiv's'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

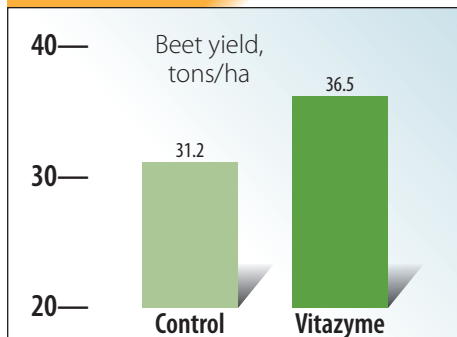
Cultivation methods: disking to 8 cm, plowing to 27 cm, cultivation to 4 cm

Fertilization: 45 kg/ha N, 45 kg/ha P₂O₅, 45 kg/ha K₂O in the fall of 2014; 70 kg/ha pre-plant incorporated in 2015

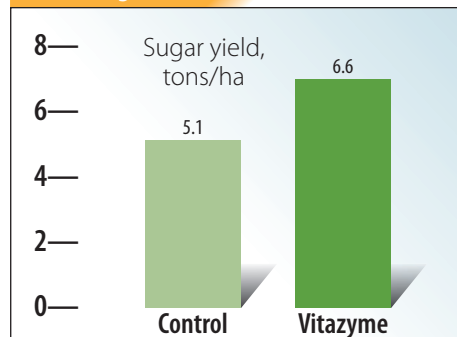
Vitazyme application: 1 liter/ha sprayed on the leaves and soil on June 18, 2015, together with 2 liters/ha of Wuxal Boron

Results: (See bar charts to the right)

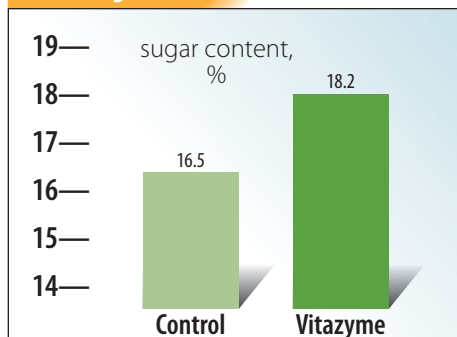
Beet Root Yield trial #1



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

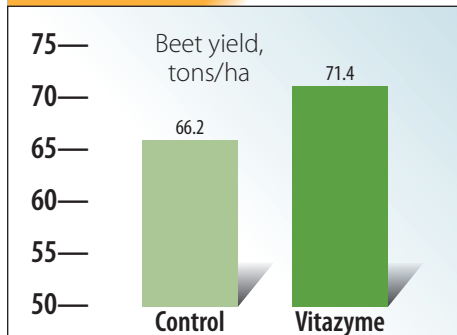
Cultivation methods: disking to 8 cm, plowing to 27 cm, cultivation to 4 cm

Fertilization: 40 tons/ha of manure the fall of 2014 and plowed in; 60 kg/ha N, 60 kg/ha P₂O₅, 60 kg/ha K₂O the spring of 2015 and incorporated

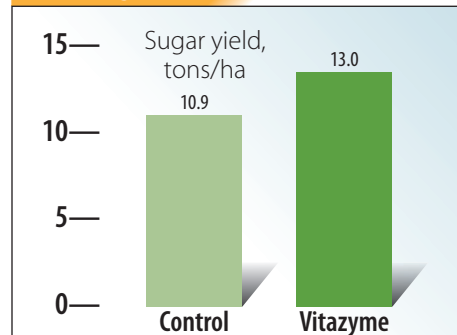
Vitazyme application: 1 liter/ha sprayed on the leaves and soil on June 21, 2015

Results: (See bar charts to the right)

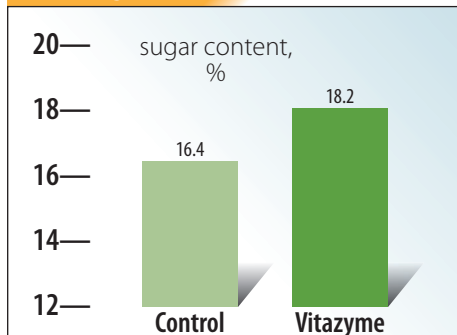
Beet Root Yield trial #2



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 Ukrainian Vitazyme studies, using 1 liter/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. Sylie, 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.

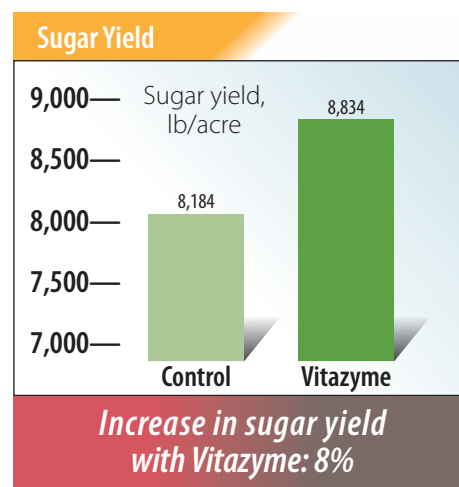
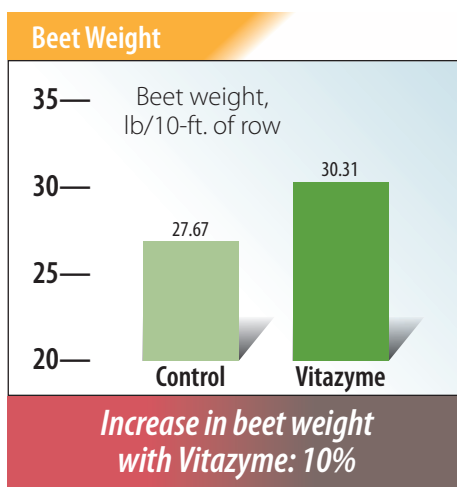
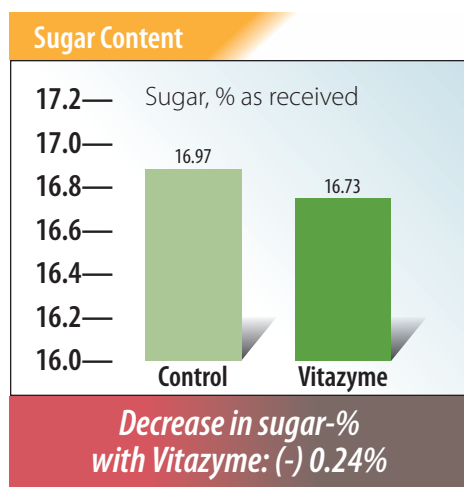
Sugar Beets *with Vitazyme application cont.*

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%)

^aMeans 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

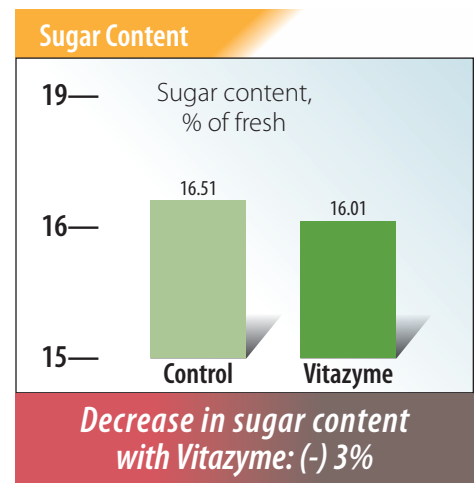
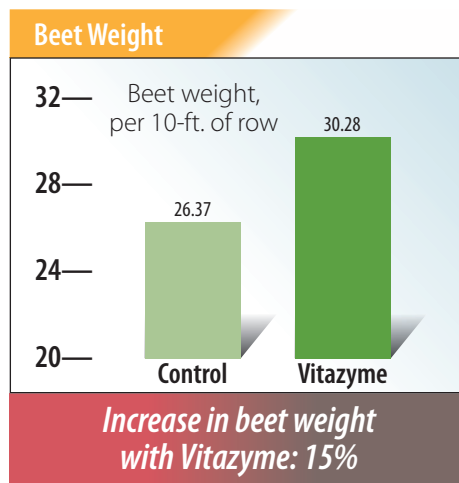
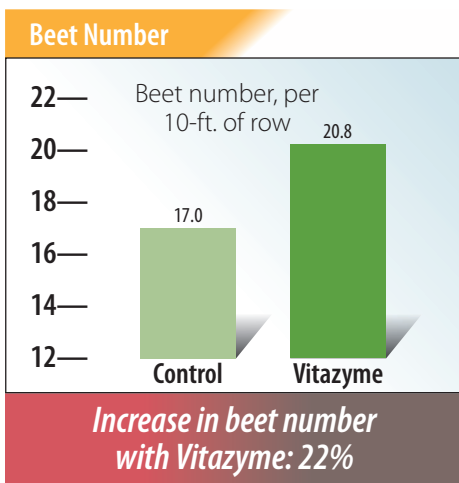


Sugar Beets *with Vitazyme application cont.*

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%)

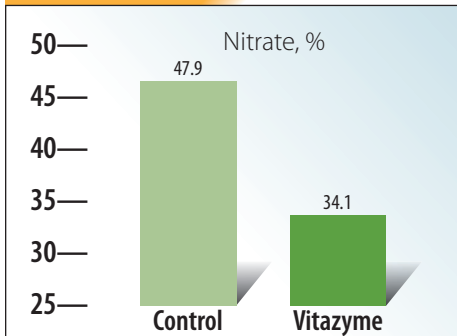
^aMeans followed by the same letter are not significantly different at P=0.10.

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



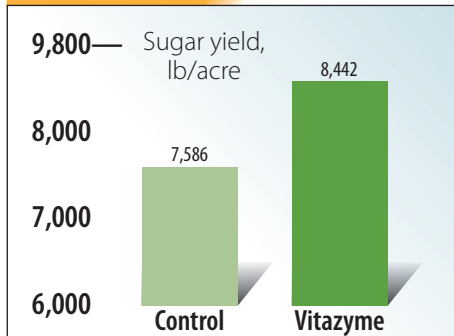
Sugar Beets *with Vitazyme application cont.*

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.

Vital Earth Resources

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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.

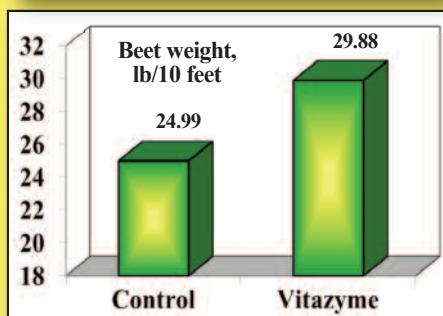
Southern Minnesota Sugar Beet Cooperative

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	

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

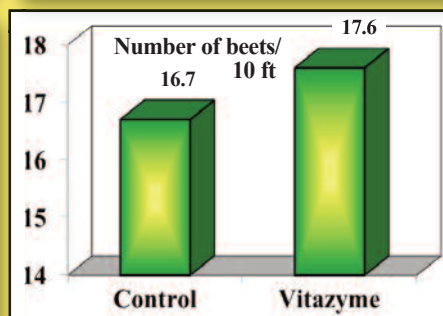
These results show a significant increase in clean beet weight with Vitazyme. Beet number increased with Vitazyme as well, but not significantly. Weight per beet was increased at P = 0.66, and the sugar content was significantly less with Vitazyme; this result conflicted with sugar analyses performed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

Clean Beet Weight



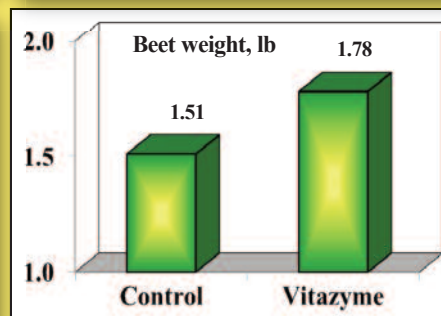
Increase in beet weight with Vitazyme: 20%

Beet Number



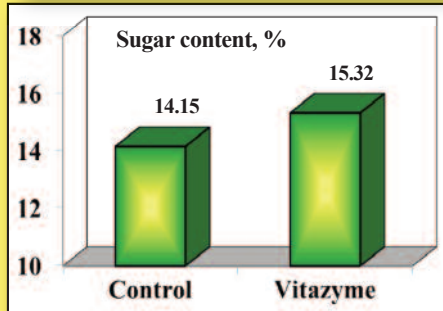
Increase in beet number with Vitazyme: 5%

Weight Per Beet

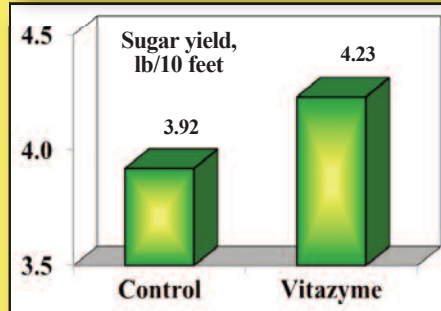


Increase in beet weight with Vitazyme: 18%

Beet Sugar Content



Beet Sugar Yield



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

Increase in sugar yield with Vitazyme: 8%

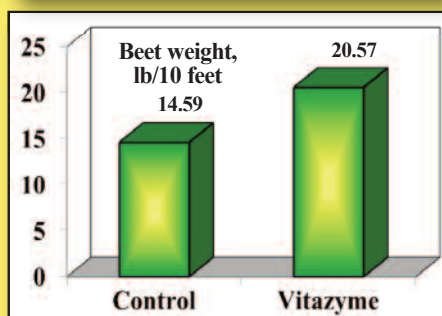
Minnesota Valley Testing Laboratories, Inc. New Ulm, Minnesota (analyzed October 13, 2014)

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

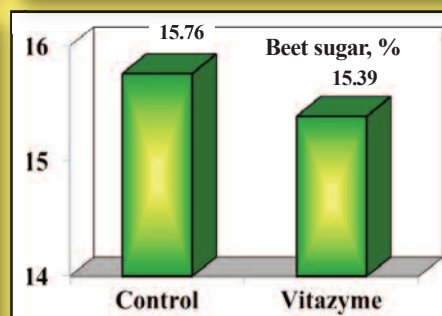
¹A row 10 x 2.5 ft = 0.0005739 acre. Statistical analyses were performed using a completely randomized design.

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.

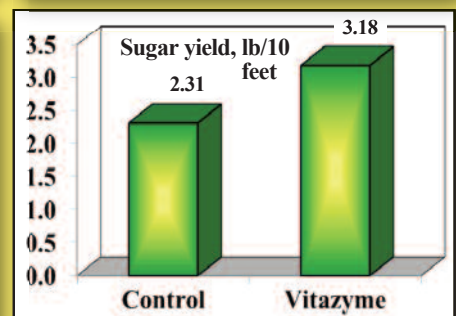
Sugar Beet Weight



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.

Vital Earth Resources

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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-P₂O₅-K₂O, 1 lb/acre boron, 5 lb/acre magnesium, and 1 lb/acre copper

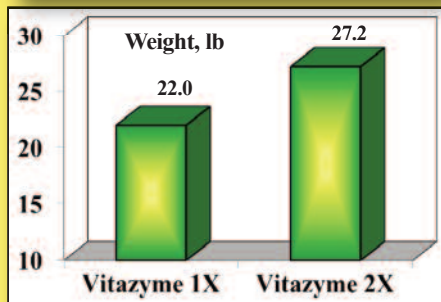
Vitazyme application: (1) 13 oz/acre in late March after emergence on 44 acres; (2) 13 oz/acre over all areas on July 14, well after seed-set, along with insecticide, fungicide, and nutrients

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

Sampling date: August 11, shortly before harvest

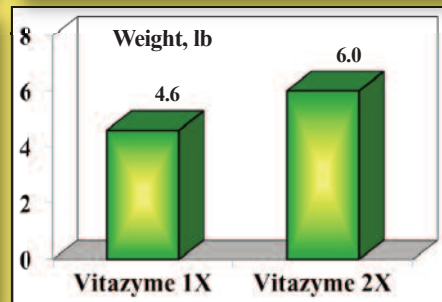
Growth results:

Total Plant Weight



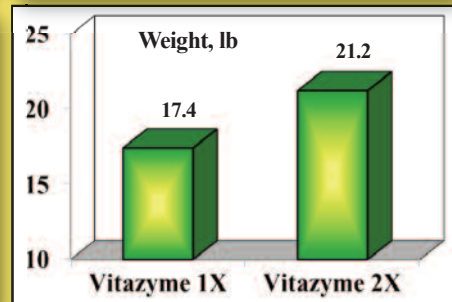
Increase in total weight with Vitazyme: 24%

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

Farmers: Matt and Brian Huhnerkoch

Location: Belview, Minnesota

Variety: Beta

Population: 45,000 to 50,000 seeds/acre

Soil type: clay loam

Planting date: April 19, 2012

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.

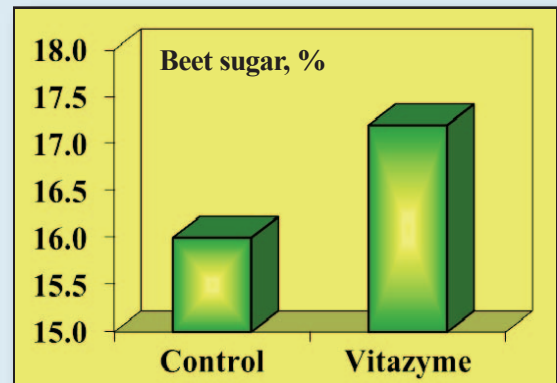
Yield results: Due to harvest restrictions it was impossible to measure exact yields of the two areas, but the farmers estimated that the Vitazyme treatment produced 1.0 ton/acre more beets.

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

Farmer: Bob, Brian, and Matt Huhnerkoch

Location: Belview, Minnesota

Variety: Crystal 265

Soil type: clay loam

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

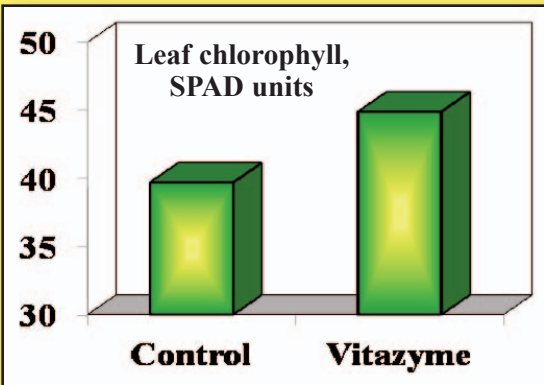
Weed control: glyphosate

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

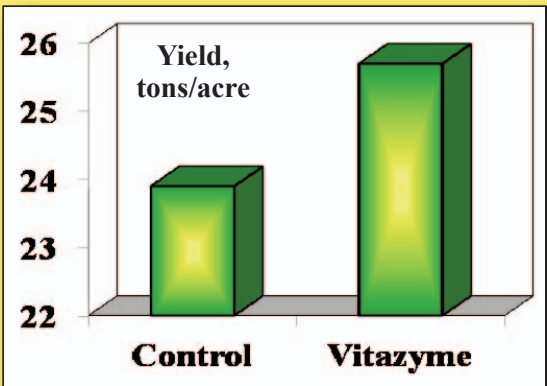


Disease susceptibility: Vitazyme reduced the susceptibility of the roots the beet rot.

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

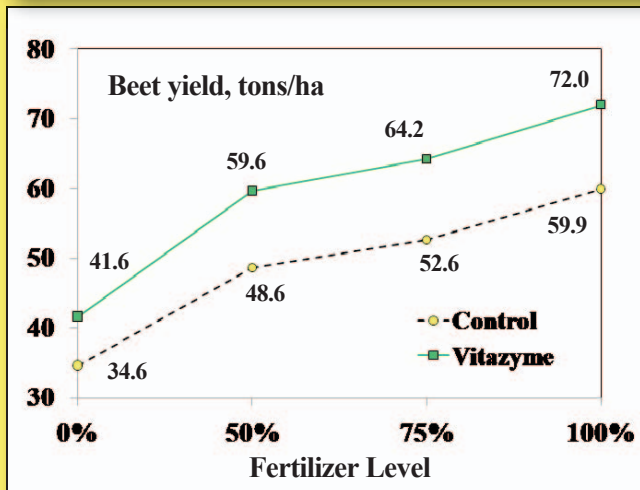
State Agricultural Research Station, Vinnytsia, Ukraine (Central Forest and Steppe Region)

Treatment	Fertilizer			Vitazyme ¹
	N	P ₂ O ₅	K ₂ O	
		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

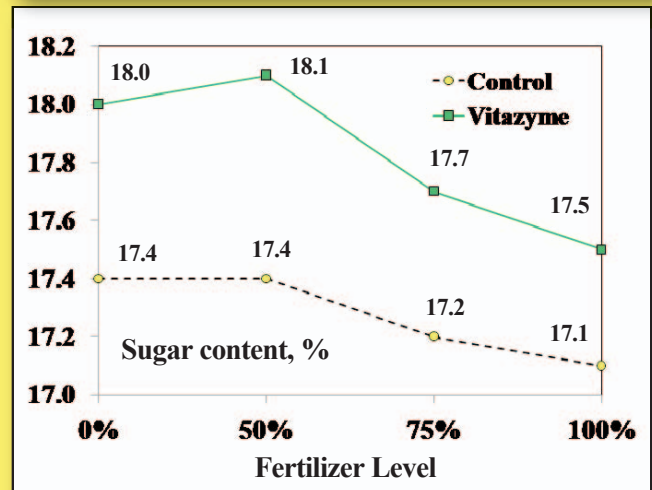
¹Applied at 1 liter/ha twice, in mid-June and early July.

Average Values Over Three Years 2009 to 2011

Beet Yield



Sugar Content



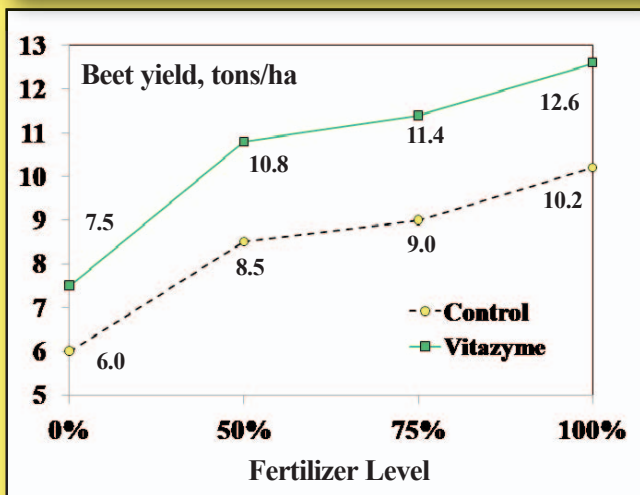
Increase in beet yield with Vitazyme

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



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

Increase in sugar yield with Vitazyme

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

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 m² 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.

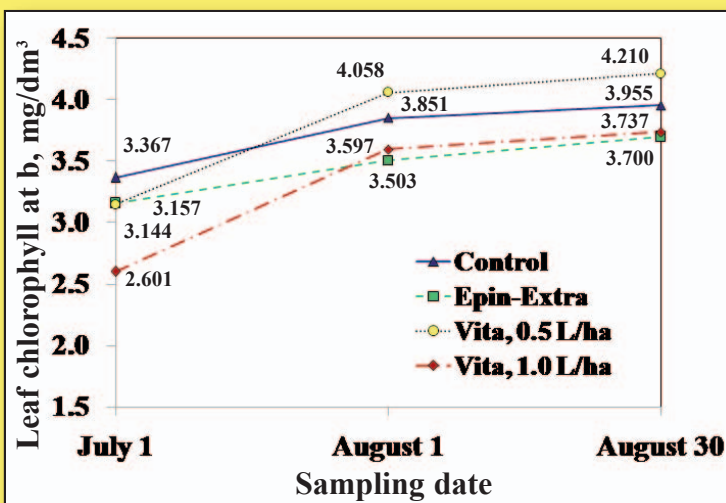
Treatment	Seed treatment	2-4 leaves	6-8 leaves
1. Control	0	0	0
2. Epin-Extra	0.012 L/ton	0.1 L/ha	0
3. Vitazyme	0	0.5 L/ha	0.5 L/ha
4. Vitazyme	0	1.0 L/ha	1.0 L/ha

Fertilization: 120 kg/ha N, 120 kg/ha P₂O₅, and 120 kg/ha K₂O 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

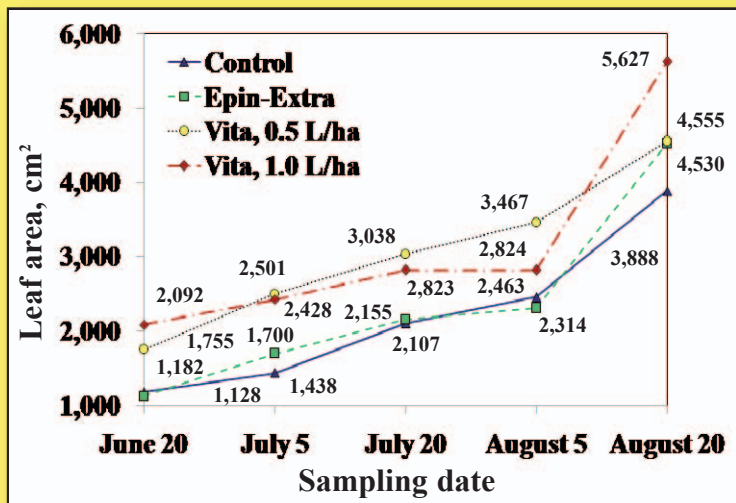
Weed control: Vector (1 liter/ha) + Caribou (30 g/ha) + Lontrel (100 g/ha) at the second leaf pair; 30 days later, Fusilad Forte at 1 liter/ha



The highest chlorophyll levels of the leaves as the season progressed were with the 0.5 liter/ha Vitazyme treatment. This 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.

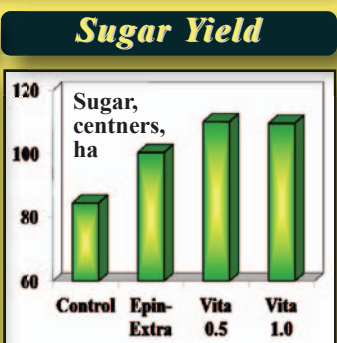
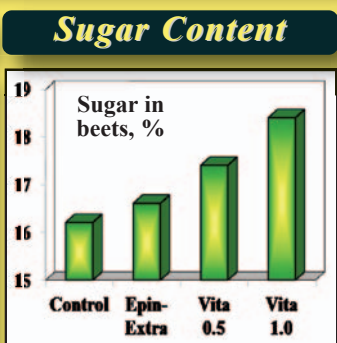
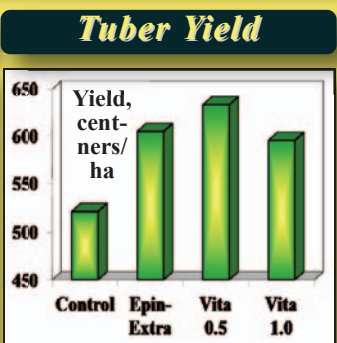
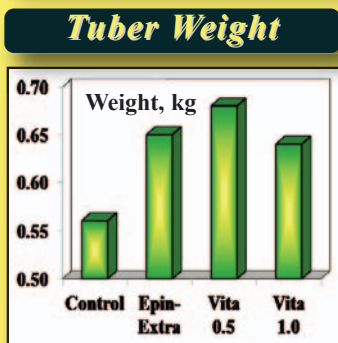


Both Vitazyme treatments caused the greatest leaf areas of the four treatments.

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 kg	Weight change kg	Tuber yield centners/ha	Yield change centners/ha	Beet sugar %	Sugar change % point	Sugar yield centners/ha	Yield change 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			



Increase in tuber weight with Vitazyme
 0.5 liter/ha 21%
 1.0 liter/ha 14%

Increase in tuber yield with Vitazyme
 0.5 liter/ha 21%
 1.0 liter/ha 14%

Increase in sugar content with Vitazyme
 0.5 liter/ha 1.2%-pts
 1.0 liter/ha 2.2%-pts

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.

Vital Earth Resources

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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-P₂O₅-K₂O

Treatments 5 and 6: 120-90-120 kg/ha N-P₂O₅-K₂O

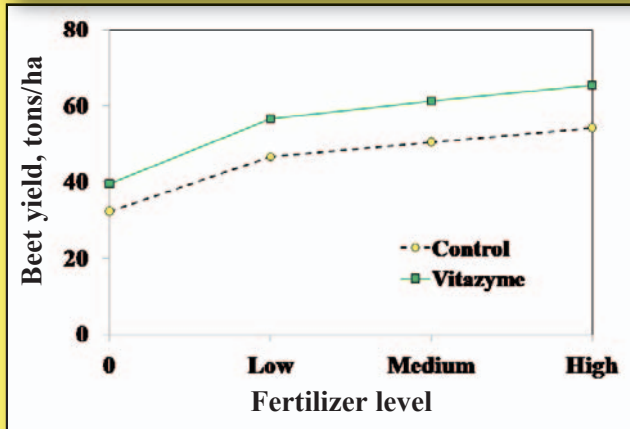
Treatments 7 and 8: 160-120-160 kg/ha N-P₂O₅-K₂O

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

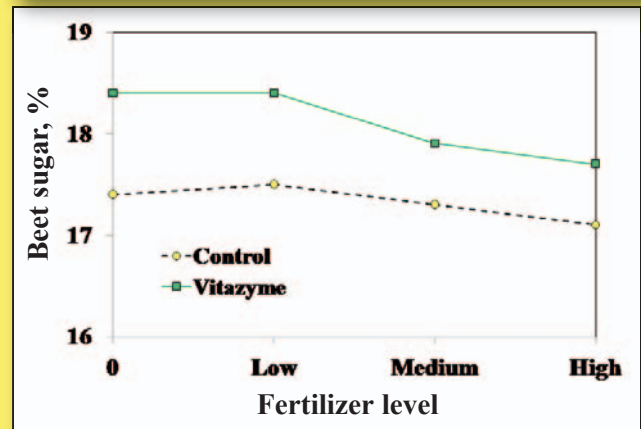
Sugar and beet yield results:

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%)

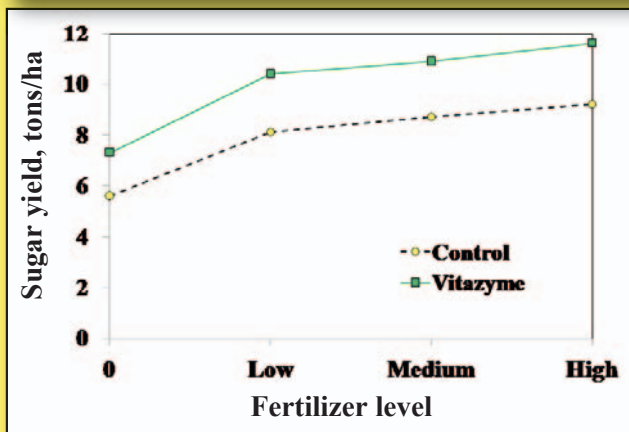
Sugar Beet Yield



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

Vital Earth Resources

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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

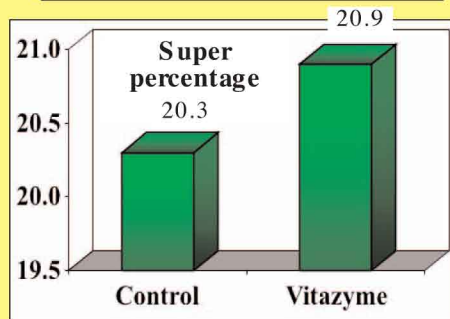
Fertilization: 60 kg/ha N, 30 kg/ha P₂O₅, and 60 kg/ha K₂O; N applied in the spring, P and K in the fall

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

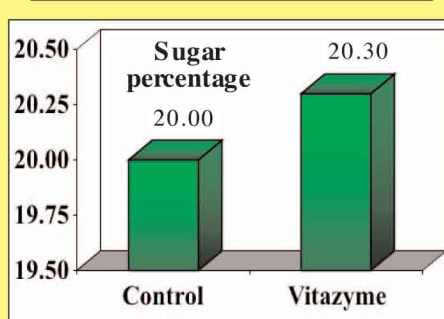
Sugar content results: At harvest time, the sugar percentage of each variety was determined.

Oleksandria



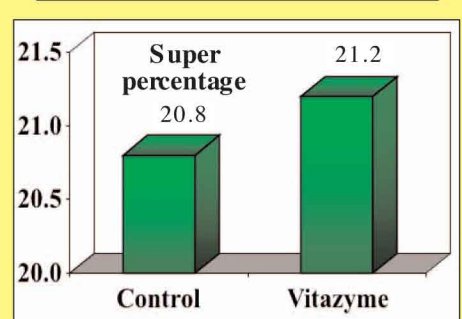
Increase in sugar
0.6 percentage point

Karmelita



Increase in sugar
0.3 percentage point

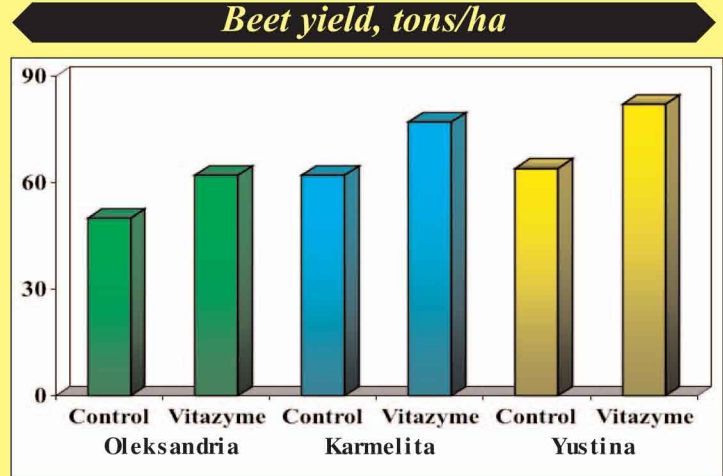
Yustina



Increase in sugar
0.4 percentage point

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

Treatment	Beet yield tons/ha	Yield change 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%)

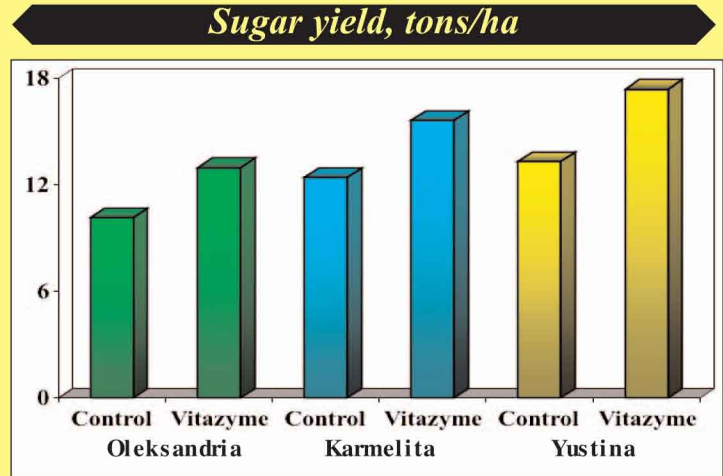


Increase in sugar yield

Oleksandria	24%
Karmelita	24%
Yustina	28%

Sugar yield results:

Treatment	Sugar yield tons/ha	Yield change 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%)



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.

Vital Earth Resources

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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 ₂ O ₅	K ₂ O
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

¹P₂O₅ and K₂O were applied the fall of 2008; N was applied the spring of 2009.

Fertilization: See the table above.

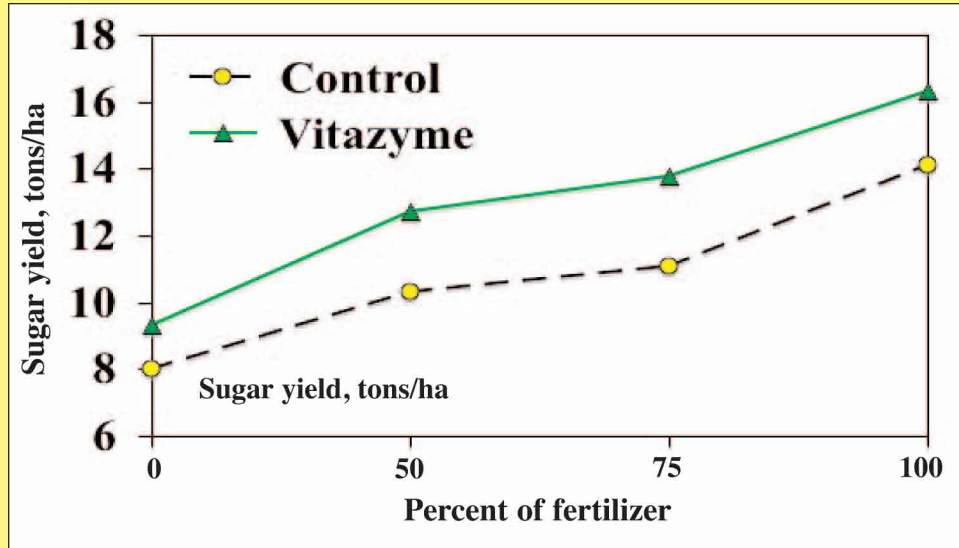
Vitazyme application: (1) 1 liter/ha on the leaves on June 20, 2009; (2) 1 liter/ha on the leaves on July 10, 2009.

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

¹Comparisons 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:

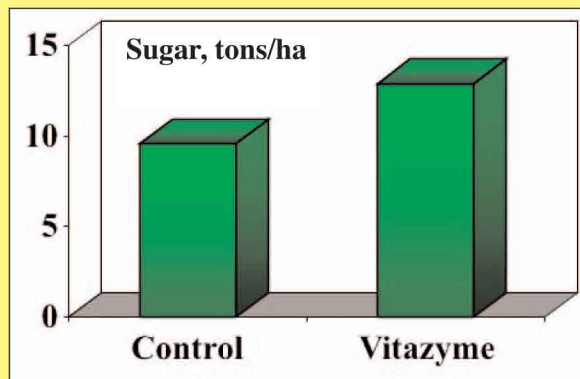
Treatment	Beet yield	Change	Sugar content	Change	Super yield	Change
	tons/ha	tons/ha	%	%	tons/ha	tons/ha
Control	48	—	20.0	—	9.6	—
Vitazyme	60	12 (+25%)	21.5	1.5 (+8%)	12.9	3.3 (+34%)

**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 in sugar production reveals the potential of this product to aid Ukraine's agriculture.

Vital Earth Resources

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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 Of Kalimag super (potassium and magnesium sulfates), and 150 kg/ha of MAP (12-52-0% N-P₂O₅-K₂O); 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

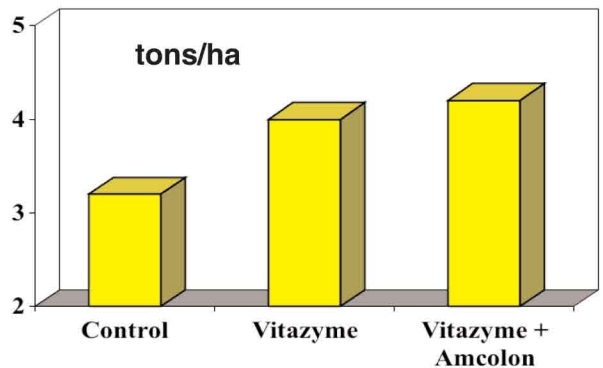
Amcolon application: A 30-0-22.5-3.5 (Mg)-1.5 (B) + TE product, applied with Vitazyme at 3.0 liters/ha

Harvest date: unknown

Treatment	Yield kg/12 plants	Yield change 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 Ukrainian 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.