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

2012 Crop Results

Vitazyme on Spring Barley

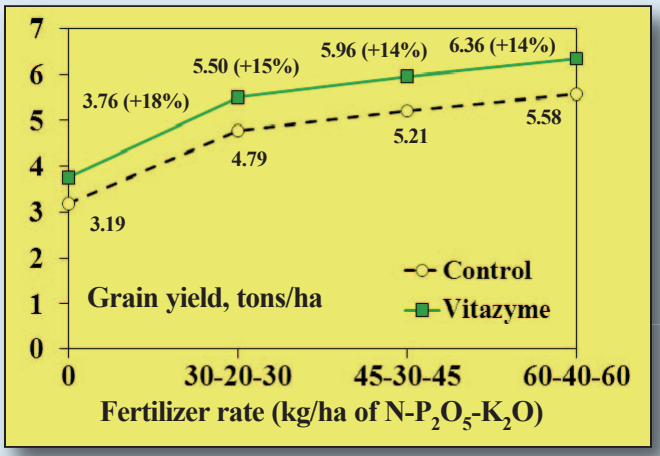
A Fertilizer Rate Study

Researcher: V. Plotnikov *Research organization*: National Academy of Agricultural Sciences
Location: Vinnytsia, Ukraine *Variety*: Nabat super elite *Tillage*: conventional (disking, plowing, and cultivating) *Soil type*: gray podzalic (2.2% organic matter, 8.4 mg/100 g of soil hydrolyzed N, 15.8 mg/100 g of soil P, 12.4 mg/100 g of soil exchangeable K, pH = 5.5)
Planting date: April 24, 2012 *Previous crop*: buckwheat *Planting rate*: 4 million seeds/ha
Experimental design: A replicated plot trial with spring barley, using four replicates, was conducted on 0.1 ha plots to determine the effectiveness of Vitazyme to improve the yield and quality of spring barley. Four fertility levels were used across the treated and control plots.

Treatment	Vitazyme	Nitrogen	Phosphate	Potash
		kg/ha		
1	0	0	0	0
2	X	0	0	0
3	0	30	20	30
4	X	30	20	30
5	0	45	30	45
6	X	45	30	45
7	0	60	40	60
8	X	60	40	60

Fertilization: Phosphorus and potassium fertilizers were applied dry in the fall with fall tillage, and nitrogen was applied in the spring.
Vitazyme application: 1 liter/ton on seeds, and 0.5 liter/ha sprayed on the leaves and soil at tillering
Weather for 2012: favorable for crop development

Yield results:



Treatment	Income increase*
	hrn/ha
2	950
4	1,216
6	1,292
8	1,349

*Comparisons are made with the untreated control at each fertility level.

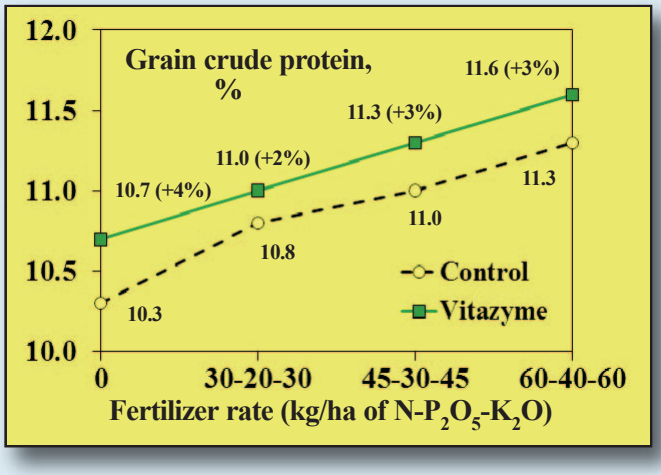
Increase in grain yield with Vitazyme at the same fertilizer level: 14 to 18%

Note the fine yield increases with Vitazyme at each fertility level, from 14 to 18%.

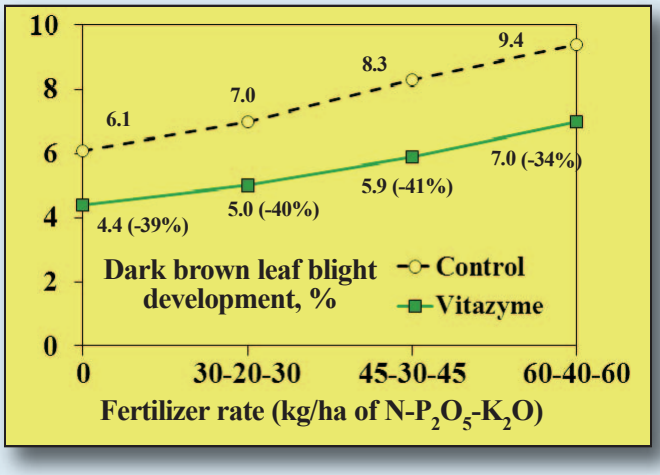
Crude protein results:

Increase in crude protein with Vitazyme at the same fertilizer level: 2 to 4%

All four fertilizer levels showed good protein increases with Vitazyme.



Leaf blight results:



Reduction in leaf blight with Vitazyme at the same fertilizer level: 34 to 41%

At all fertilizer levels the incidence of dark brown leaf blight was decreased by Vitazyme application.

Conclusions: A spring barley trial in Ukraine, using replicated plots with and without Vitazyme and four fertility levels, proved that Vitazyme increased the yield by 14 to 18% above the control, the highest percentage increase being for the lowest fertility level. Crude protein increased with Vitazyme by 0.2 to 0.3 percentage points at all fertility levels, and dark brown leaf blight development was reduced by from 34 to 41% for all four levels. These results prove that Vitazyme is a powerful tool to improve spring barley yields, protein, and plant health in Ukraine, and should be incorporated into farmers' production programs.

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2011 Crop Results

Vitazyme on Barley

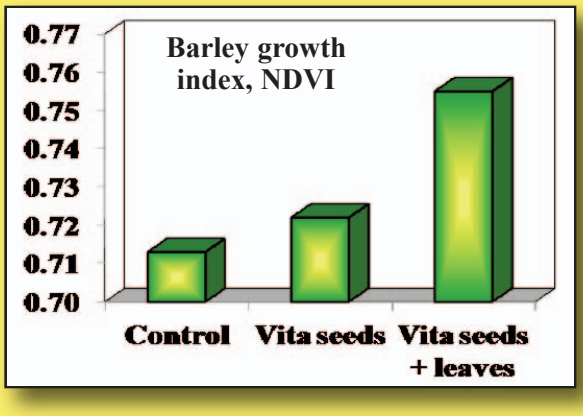
Farmer: AGRivision Systems, Perth, Australia *Researcher*: Steven David *Research organization*: Organic Farming *Location*: Goshen, Victoria, Australia
Variety: unknown *Planting date*: June, 2010 *Soil type*: sandy clay loam
Experimental design: A barley field was divided into three sections – the normal farmer practice, and two Vitazyme programs – to evaluate the effect of this product on barley yield and growth.

1. Control **2. Vitazyme on the seeds** **3. Vitazyme on the seeds and leaves**

Fertilization: farmer practice
Vitazyme application: (1) 1 liter/tonne of seed for Treatments 2 and 3; (2) 0.5 liter/ha on the leaves at early tillering
Growth results: Early barley growth was significantly increased by Vitazyme, as shown below.

Treatment	Barley growth*	Growth change
	---------- NDVI analysis ----------	
Control	0.713 b	—
Vitazyme on seeds	0.722 ab	0.009 (+1%)
Vitazyme on seeds and leaves	0.755 a	0.042 (+6%)

*Means followed by the same letter are not significantly different at P=0.05 according to Duncan's Multiple Range Test.

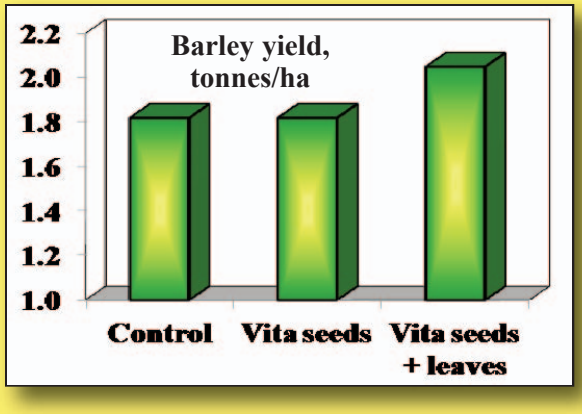


Increase in early growth with Vitazyme twice: +6%

Yield results: The crop was harvested in December of 2010.

Treatment	Grain yield*	Yield change
	tonnes/ha	tonnes/ha
Control	1.82 b	—
Vitazyme on seeds	1.82 b	0
Vitazyme on seeds and leaves	2.05 a	0.23 (+12%)

*Means followed by the same letter are not significantly different at P=0.05 according to Duncan's Multiple Range Test.



Increase in yield with Vitazyme twice: +12%

Conclusion: In this Australian barley trial, Vitazyme applied on the seeds and again at early tillering significantly increased both early growth (+6%) as well as final grain yield (+12%). The seed treatment alone did not significantly improve plant growth or yield, revealing the importance of a foliar application on barley. This trial success reveals the great value of the Vitazyme program for barley production in Australia.

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2011 Crop Results

Vitazyme on Spring Barley

Researcher: Unknown
Research coordinator: I.V. Braginets
Research organization: Alfa-Agro, Ukraine
Variety: unknown
Experimental design: A field was divided into a Vitazyme treated and an untreated portion to evaluate the effect of this product on crop yield.

1. Control **2. Vitazyme**

Fertilization: farm practice
Vitazyme application: 1 liter/ha sprayed on the leaves and soil with the herbicide
Yield results: No yield results are available, but the increase in yield is given.

Increase in barley yield with Vitazyme:
0.54 ton/ha (10.0 bu/acre)

Conclusion: This yield increase was an excellent result of Vitazyme application in this Ukraine study.

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2010 Crop Results

Vitazyme on Barley, Spring

Researcher: V. V. Plotnikov *Location*: National Academy of Agrarian Sciences, Vinnytsia State Agricultural Research Station, Vinnytsia, Ukraine (Central Forest and Steppe Region)
Varieties: Skiff, Lofant, Nezabudka *Soil type*: gray podzolic (organic matter = 2.2%, hydrolyzed N = 8.4 mg/100 g soil, P = 15.8 mg/100 g soil, exchangeable K = 12.4 mg/100 g soil, pH = 5.5)
Previous crop: corn *Planting date*: April 7, 2010 *Planting rate*: 4 million seeds/ha
Soil preparation: disking to 6 to 8 cm, tillage to 22 cm, harrowing to 4 to 5 cm
Experimental design: A spring barley plot area, using a total area of about 1.0 ha, with four replicates, was established using two Vitazyme regimes to determine the product's effect on barley yield and grain quality.

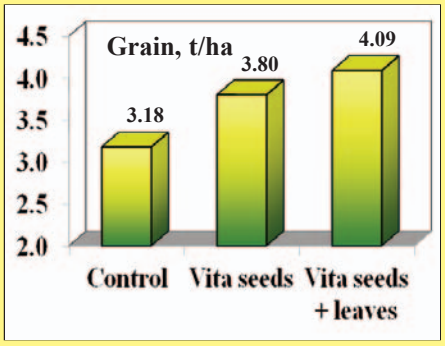
1. Control 2. Vitazyme on the seeds 3. Vitazyme on the seeds, and leaves and soil

Fertilization: 60 kg/ha N, 30 kg/ha P_2O_5, and 30 kg/ha K_2O incorporated before planting

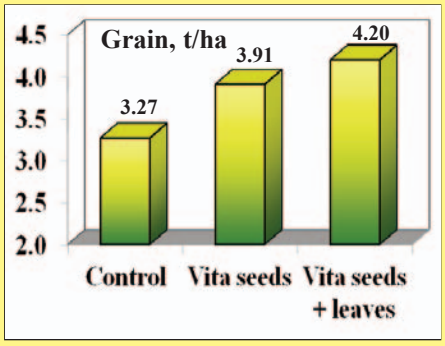
Vitazyme application: Treatments 2 and 3, a seed treatment at 1 liter/ha; Treatment 3, an additional foliar and soil treatment of 1 liter/ha on May 15, 2010

Yield results:

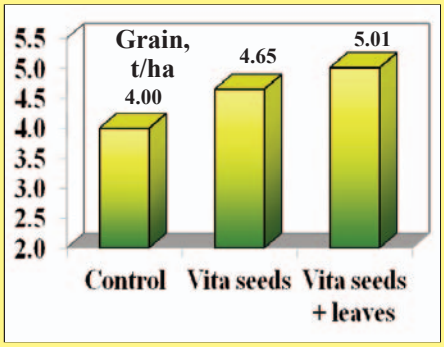
Skiff



Lofant



Nezabudka



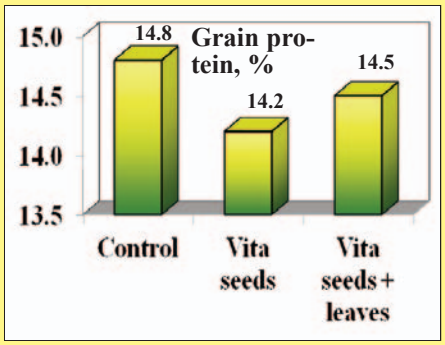
Treatment	Increase in grain yield with Vitazyme		
	Skiff	Lofant	Nezabudka
	tons/ha		
Vitazyme on seeds	0.62 (+19%)	0.64 (+20%)	0.65 (+16%)
Vitazyme on seeds + leaves	0.91 (+29%)	0.93 (+28%)	1.01 (+25%)

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

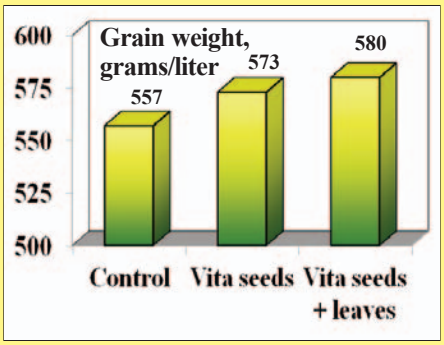
Grain quality results:

Skiff

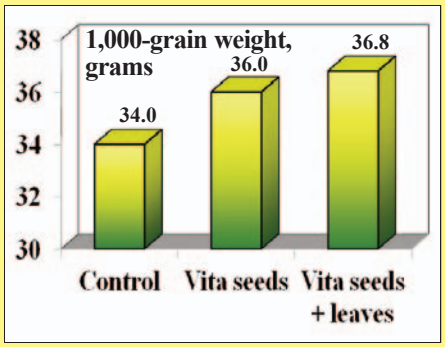
Crude Protein



Test Weight

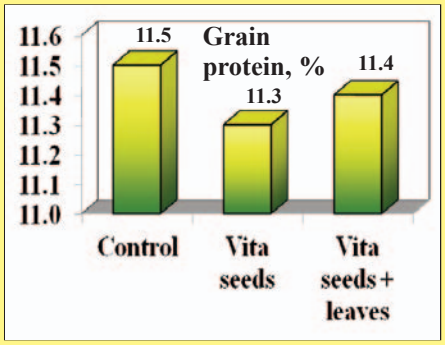


1,000-Grain Weight

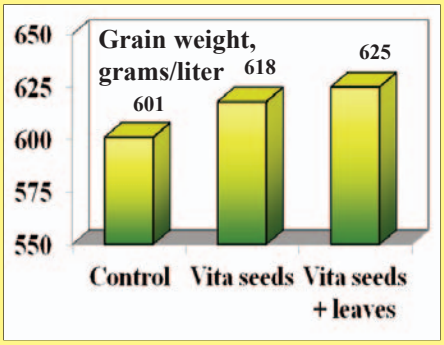


Lofant

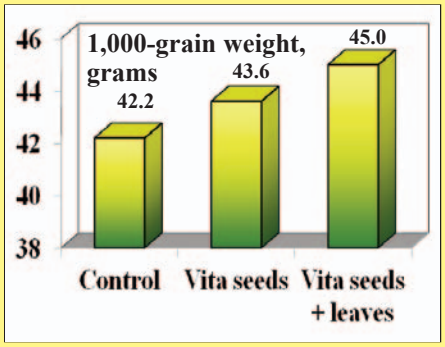
Crude Protein



Test Weight

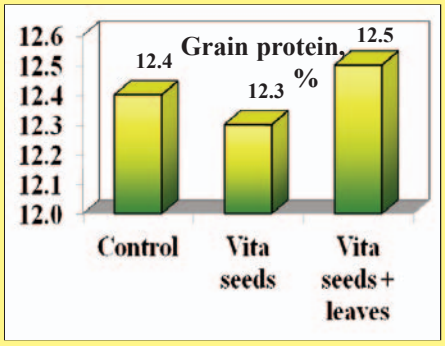


1,000-Grain Weight

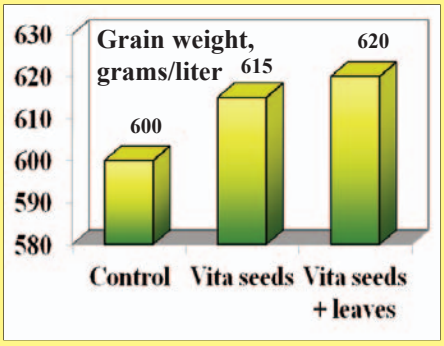


Nezabudka

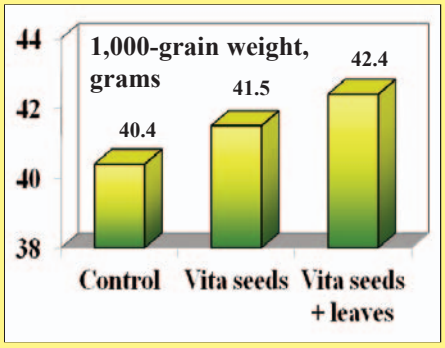
Crude Protein



Test Weight



1,000-Grain Weight



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

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

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

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2009 Crop Results

Vitazyme on Barley, spring

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
Seeding rate: 4 million seeds/ha *Planting date*: April 13, 2009 *Variety*: Nezabydka
Tillage: plowing, harrowing, and cultivation *Previous crop*: corn
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 uniform field was divided into plots of 1.0 ha each with three treatments and four replications. The objective of the study was to evaluate the effect of Vitazyme as either one or two foliar applications on the yield of spring barley.

1. Control **2. Vitazyme, once foliar** **3. Vitazyme, twice foliar**

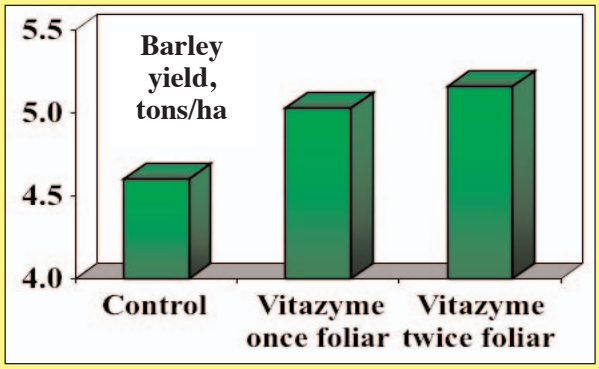
Fertilization: 60 kg/ha N, 30 kg/ha P_2O_5, and 60 kg/ha K_2O.

Vitazyme application: Treatment 2 received 1.0 liter/ha applied to the leaves and soil on May 15, 2009, and Treatment 3 received this first treatment plus a second foliar/soil treatment of 1.0 liter/ha on June 4, 2009.

Yield results:

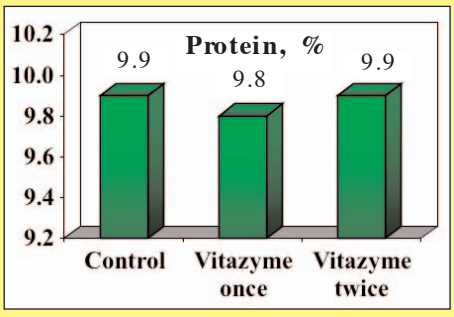
Treatment	Barley yield	Yield change
	tons/ha	tons/ha
1. Control	4.60	—
2. Vitazyme, once foliar	5.03	0.43 (+9%)
3. Vitazyme, twice foliar	5.16	0.56 (+12%)

Increase in barley yield with Vitazyme
Once 9%
Twice foliar 12%



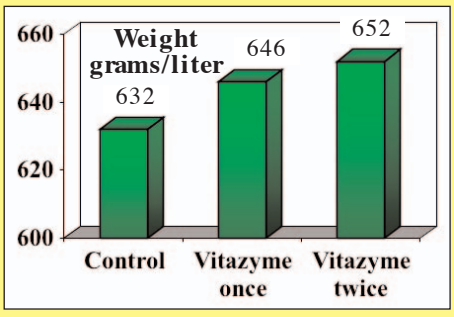
Quality results:

Crude Protein



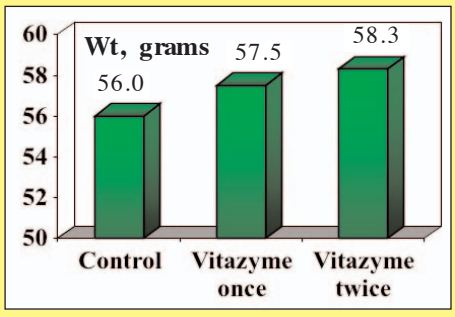
Change in grain protein with Vitazyme: 0 to -1%

Grain Weight



Increase in grain weight per liter with Vitazyme: 2 to 3%

1,000 Grain Weight



Increase in 1,000 grain weight with Vitazyme: 3 to 4%

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2009 Crop Results

Vitazyme on Barley, spring

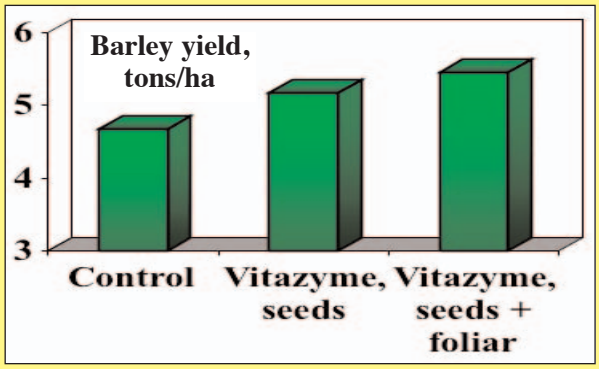
Researcher: O.V. Kornijchuk, V.V. Plotnikov, and agronomic scientists
Organization: Vinnytsia State Agricultural Experiment Station, Ukraine Academy of Agrarian Sciences, Vinnytsia, Ukraine *Seeding rate*: 4 million seeds/ha *Variety*: Skif, superelite
Location: Ukraine central forest-steppe area near Vinnytsia *Planting date*: April 13, 2009
Tillage: plowing, harrowing and cultivating *Previous crop*: corn
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 uniform field was selected to establish three treatments, of 1.0 ha plots and four replications, to evaluate the effects of Vitazyme on the seeds alone, or on the seeds plus the leaves.

1. Control **2. Vitazyme once** **3. Vitazyme twice**

Fertilization: 60 kg/ha N, 30 kg/ha P_2O_5, and 60 kg/ha K_2O.
Vitazyme application: Vitazyme was applied to the seeds of both treatments at 1.0 liter/ha on April 12, 2009, with an additional 1.0 liter/ha sprayed on the leaves and soil on May 15, 2009.
April 30, 2009, at 1.0 liter/ha.
Yield results:

Treatment	Barley yield	Yield change
	tons/ha	tons/ha
1. Control	4.67	—
2. Vitazyme, seeds	5.17	0.50 (+11%)
3. Vitazyme, seeds + leaves	5.44	0.77 (+16%)

Increase in barley yield with Vitazyme
Seed treatment..... 11%
Seed + foliar treatment..... 16%



Quality results:

Crude Protein

Treatment	Protein	Change
	%	
1. Control	9.4	—
2. Vitazyme, seeds	9.0	(-) 0.4 (-4%)
3. Vitazyme, seeds + leaves	9.6	0.2 (+2%)

Grain Weight

Treatment	Weight	Change
	grams/liter	
1. Control	627	—
2. Vitazyme, seeds	652	15 (+2%)
3. Vitazyme, seeds + leaves	650	23 (+4%)

1,000 Grain Weight

Treatment	Weight	Change
	grams/1,000 grams	
1. Control	50.5	—
2. Vitazyme, seeds	51.5	1.0 (+2%)
3. Vitazyme, seeds + leaves	52.0	1.5 (+3%)

Grain structure results:

Stems Per Square Meter

Treatment	Stems	Change
	------stems/m^2 ------	
1. Control	533	——
2. Vitazyme, seeds	565	32 (+6%)
3. Vitazyme, seeds + leaves	574	41 (+8%)

Grains Per Head

Treatment	Grains	Change
	------grains/head -----	
1. Control	18	——
2. Vitazyme, seeds	19	1 (+6%)
3. Vitazyme, seeds + leaves	20	2 (+11%)

Grain Weight Per Head

Treatment	Weight	Change
	----- grams/head ------	
1. Control	0.91	——
2. Vitazyme, seeds	0.98	0.07 (+8%)
3. Vitazyme, seeds + leaves	1.04	0.13 (+14%)

Income results:

- **Income increase with Vitazyme, seed: 360 hrn/ha**
- **Income increase with Vitazyme, seed + leaves: 376 hrn/ha**

Conclusions: Barley treated with Vitazyme in this Ukraine test revealed that a 1.0 liter/ha seed application produced an excellent 11% grain yield increase, while an additional foliar 1.0 liter/ha application further improved yield to 16%. Moreover, quality factors were improved with Vitazyme: crude protein (a favorable reduction, or small increase), grain weight (+2 to 4%), and 1,000 grain weight (+2 to 3%). Grain structure factors also improved with Vitazyme, including stem density (+6 to 8%), grains per head (+6 to 11%), and grain weight per head (+8 to 14%).

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Organization: Vinnytsia State Agricultural Experiment Station, Ukraine Academy of Agrarian Sciences, Vinnytsia, Ukraine *Location*: Ukraine central forest-steppe area near Vinnytsia
Seeding rate: 4 million seeds/ha *Planting date*: April 13, 200
Variety: Lofant *Tillage*: plowing, harrowing, and cultivating *Previous crop*: corn
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 uniform field was divided into plots of 1.0 ha each with three treatments and four replications . The objective of the study was to evaluate the effect of Vitazyme as either one or two foliar applications on the yield of spring barley.

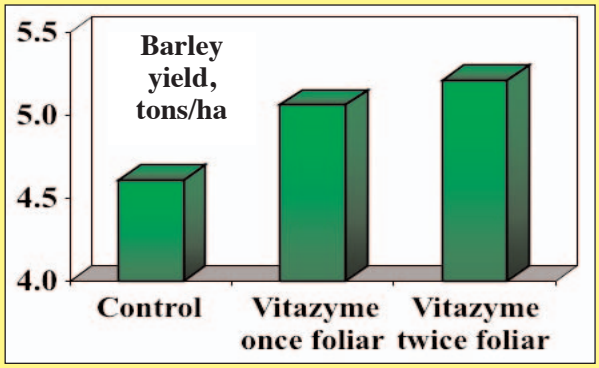
1. Control **2. Vitazyme, once foliar** **3. Vitazyme, twice foliar**

Fertilization: 60 kg/ha, 30 kg/ha P_2O_5, and 60 kg/ha K_2O

Vitazyme application: Treatment 2 received 1.0 liter/ha applied to the leaves and soil on May 15, 2009, and Treatment 3 received this first treatment plus a second foliar/soil treatment of 1.0 liter/ha on June 4, 2009.

Yield results:

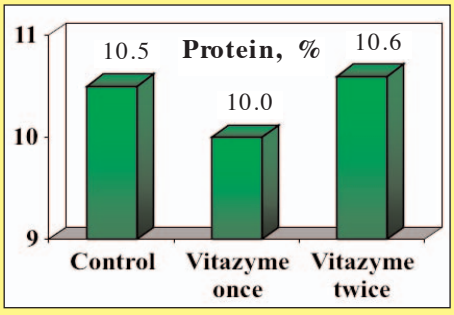
Treatment	Barley yield	Yield change
	tons/ha	tons/ha
1. Control	4.61	—
2. Vitazyme, once foliar	5.06	0.45 (+10%)
3. Vitazyme, twice foliar	5.21	0.60 (+13%)



Increase in barley yield with Vitazyme
Once foliar..... 10%
Twice foliar 13%

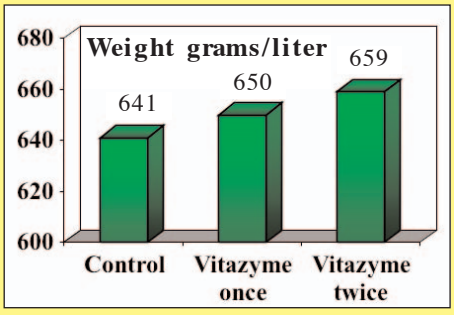
Quality results:

Crude Protein



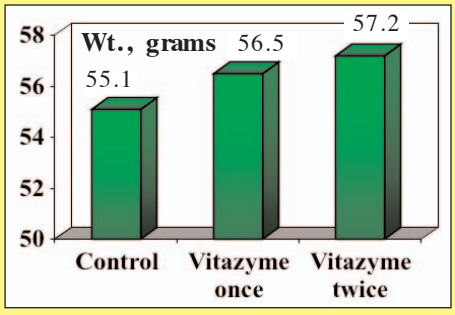
Change in grain protein with Vitazyme: -5% to +1%

Grain Weight



Increase in grain weight per liter with Vitazyme: 1 to 3%

1,000 Grain Weight



Increase in 1,000 grain weight with Vitazyme: 3 to 4%

Income results:

- **Income increase with Vitazyme on seeds: 160 hrn/ha**
- **Income increase with Vitazyme on seeds + leaves: 80 hrn/ha**

Conclusions: This spring barley trial in Ukraine, using Vitazyme as either one or two foliar applications at 1.0 liter/ha each time, revealed that both treatments boosted yield significantly. The single application sprayed on the leaves and soil produced a 10% yield increase, whereas two foliar applications produced a 13% yield increase. Vitazyme also did not increase grain protein, but increased grain weight per liter and 1,000 grain weight (up to 4%). Such results prove the great value of this program to increase barley yields in Ukraine.

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2008 Crop Results

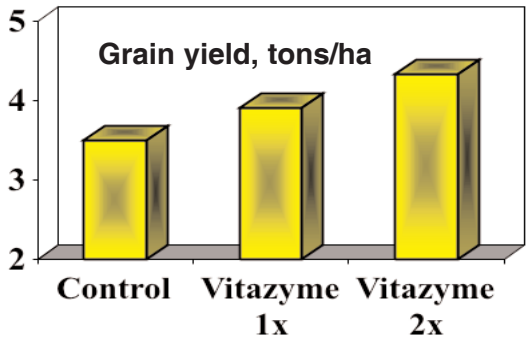
Vitazyme on Spring Barley

Researchers: O.V. Kornijchuk, V. V. Plotnikov, and agronomic scientists
Organization: Vinnytsia State Agricultural Experiment Station of Forage Institute, Ukraine Academy of Agrarian Sciences, Vinnytsia, Ukraine
Location: Ukraine central forest – steppe area near Vinnytsia
Variety: Vinnytsia 28 *Seeding rate*: 6 mil/ha
Soil Type: gray forest steppe soil; in the 0-30 cm layer, 2.2% organic matter, 8.4 mg/100 g of soil "hydrolyzed nitrogen", 15.8 mg/100 g of soil phosphorus, 12.4 mg/100 g of soil exchangeable potassium, and pH = 5.5.
Planting date: unknown *Previous crop*: spring vetch *Tillage*: tilled to 4-5 cm.
Experimental design: A uniform field area was selected to place 1.0 ha plots, replicated four times, over the test area. The objective was to determine if Vitazyme could favorably influence crop yields for this gray forest soil area of Ukraine.

1. Control **2. Vitazyme applied once** **3. Vitazyme applied twice**

Fertilization: In the fall of 2007 a broadcast application of 30-60-90 kg/ha N-P_2O_5-K_2O was made. In the spring, 120 kg/ha of nitrogen was applied at two times (50 and 70 kg/ha).
Vitazyme application: 1 liter/ha applied on June 12 for Treatment 2, and on May 29 and June 12, 2008, for Treatment 3
Harvest date: unknown

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



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

Yield results:
Vitazyme applied once provided a sizable 11% yield increase, whereas two applications gave a 24% increase.

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

Quality results:
Vitazyme improved both the "hatypa" and test weight of barley grain, especially with two applications.

Increase in "hatypa" with Vitazyme	
Vitazyme once	+10
Vitazyme twice	+13

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

Income results: Based on the current grain price, the increases in income from Vitazyme for the two treatments were as follows:

Vitazyme once ..... 234 hrn/ha
Vitazyme twice ..... 495 hrn/ha

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

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2007 Crop Results

Vitazyme on Barley

Researcher: Patrick O'Neil *Organization*: Agro-Engineering, Alamosa, Colorado
Location: Mosca, Colorado *Variety*: malting barley
Soil type: sandy loam *Planting rate*: 90 lb/acre
Irrigation: center-pivot *Planting date*: April 10, 2007

Experimental design: A center-pivot field of barley was divided into a 60 acre untreated and a 30 acre Vitazyme treated area to determine if the product would improve barley yield and quality.

1. Control **2. Vitazyme**

Fertilization: 200 lb/acre of nitrogen was achieved for total residual soil nitrogen plus pre-plant applications, and applications in irrigation water following planting

Vitazyme application: (1) 13 oz/acre at the first true irrigation, soon after emergence, and (2) 13 oz/acre during late tillering

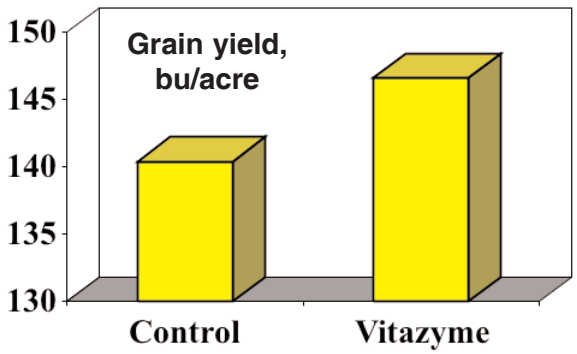
Weather: some hail damage late in the season

Harvest date: swathed in late July, and combined in early August

Harvest results: A one-acre strip was combined and weighed in a truck for both the treated and untreated areas.

Treatment	Yield	Change
	tons/acre	tons/acre
Control	140.4	—
Vitazyme	146.6	6.2 (+4%)

Increase in grain yield: 4%



Conclusions: This malting barley trial in southern Colorado proved that Vitazyme, at two applications through irrigation water, improved the yield by 4%. The level of protein for the two treatments was not avail-

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2000 Crop Results

Vitazyme on Winter Forage

Barley, Oats, and Wheat

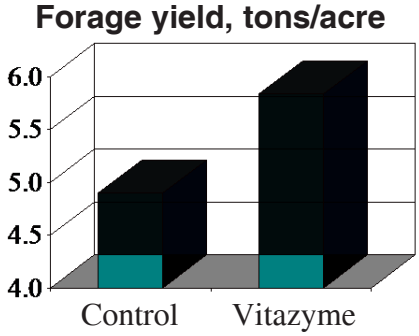
Farmer: Cornelius Van Diest
Location: Newberry Springs, California
Variety: barley, oats, and wheat varieties
Planting date: November 11, 1999
Soil type: light blow sand with high levels of boron in the subsoil
Seeding rate: 150 to 200 lb/acre
Experimental design: A center pivot system was divided into four quadrants. Three (90 acres) were treated with the Vitazyme program and one (30 acres) was left untreated.

1. Control **2. Vitazyme**

Fertilization: 18 lb/acre of NH_4NO_3 liquid at the sixth true leaf; 35 lb/acre of NH_4NO_3 liquid two times (sometimes three times) per cutting sequence, giving about 125 lb/acre total of the N fertilizer per crop
Vitazyme treatment: (1) On the seeds at planting at 6.4 oz/acre, with the starter fertilizer; (2) 13 oz/acre sprayed on the leaves and soil twice, after each nitrogen fertilizer application
Harvest date: April 11, 2000, for the Vitazyme treatment; April 14, 2000, for the control
Yield results:

	Control*	Vitazyme*	Change
	100 lb bales/acre		
Forage yield	98.0	116.7	18.7
	tons/acre		
Forage yield	4.900	5.833	(+) 0.933 (+19%)

Forage yield increase: 19%



Income results: A value of $125.00/ton is estimated

	Control	Vitazyme	Change
	$/acre		
Crop income	612.50	729.13	(+) 116.63

Income increase: $116.63/acre

Conclusions: This forage trial in the Mojave River drainage basin, with poor desert soils having high yield potential if managed well (12 tons/acre of 20% protein and 60% TDN alfalfa), showed the potential of Vitazyme to substantially increase grass forage yields and income. A 19% yield increase resulted in $116.63/acre more return, giving a 9:1 return on investment for a Vitazyme seed treatment and two foliar applications.

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1999 Crop Results

Vitazyme on Barley (Organic)

-- Testimonial --

Farmer: Leon Roske *Location*: Olivia, Minnesota *Variety*: Logan spring barley
Planting date: April 24 *Seeding rate*: 3.5 bu/acre *Previous crop*: corn
Harvest date: July 25 to 27, 1999

Fertilization: None, except a carryover of 2.6 tons/acre poultry litter applied in 1998. This 79-acre field of barley suffered from serious nitrogen tie-up in the spring, due to cool and wet conditions on heavy corn stalk residues. Vitazyme (13 oz/acre) plus molasses (3 gal/acre) had been sprayed over the soil after planting. An additional application of Vitazyme (6 oz/acre), molasses (1 gal/acre), and $MgSO_4$ (3 lb/acre) was made by air in June to try and alleviate the low chlorophyll and stunted condition of the barley.

During the aerial spraying with Vitazyme, molasses, and $MgSO_4$ in June, an area of the field along a power line at the edge of the field was not sprayed. This unsprayed area yielded much less than the remainder of the field, although the entire field yielded less than normal due to the nitrogen stress and dry summer conditions. **The sprayed portion of the field yielded about 40 bu/acre, while the unsprayed portion yielded only about 15 bu/acre.** Clearly, Vitazyme and other nutrients combined to greatly stimulate a recovery of this highly stressed barley crop.