**Barley (Winter)** Use of the Cold Start variation of Vitazyme

**Researcher:** V.V. Plotnikov  
**Research organizations:** Plant Designs International, Rochester, New York, and Agro Expert International, Kaharlyk, Ukraine  
**Location:** ALLC “Dnipro”, Pogrebyshchne District, Vinnytsia Region, Monchin Village, Ukraine; Central Ukraine (440-590 mm of precipitation per year)  
**Variety:** Naomi, F1 generation  
**Planting date:** October 5, 2018  
**Planting rate:** 4 million seeds/ha  
**Previous crop:** sunflowers  
**Soil type:** Podzolized Chernozem (humus=3.5%)  
**Field preparation:** cultivation with a heavy cultivator to 20-22 cm, disking to 10-12 cm  
**Experimental design:** A winter barley field was divided into normally treated and Vitazyme treated portions to evaluate the effects of Vitazyme Cold Start on the yield of grain.

1. Control  
2. Vitazyme Cold Start

**Fertilization:** 20-52-52 kg/ha of N-P_2O_5-K_2O applied during fall cultivation, 15-15-15 kg/ha of N-P_2O_5-K_2O during planting, and 85 kg/ha of N in the spring.

**Vitazyme Cold Start application:**  
1 liter/ha sprayed on the leaves and soil at greenup on April 30, 2019

**Yield results:**

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Yield</th>
<th>Yield change</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>tons/ha</td>
<td>tons/ha</td>
</tr>
<tr>
<td>1. Control</td>
<td>5.4</td>
<td>—</td>
</tr>
<tr>
<td>2. Vitazyme Cold Start</td>
<td>6.9</td>
<td>1.5 (+28%)</td>
</tr>
</tbody>
</table>

**Increase in yield with Vitazyme Cold Start: 28%**

**Grain Yield**

<table>
<thead>
<tr>
<th>Yield, tons/ha</th>
</tr>
</thead>
<tbody>
<tr>
<td>Control</td>
</tr>
<tr>
<td>Vitazyme CS</td>
</tr>
</tbody>
</table>

**Conclusions:** This winter barley trial with Vitazyme Cold Start revealed that a single 1 liter/ha spring application to the greening leaves increased the grain yield by a full 28%. This result illustrates the great efficacy of this product to boost barley yields in Ukraine.
Researcher: V.V. Plotnikov
Location: LLC “VKAF Maiaky”, Odessa Region, Maiaky Village, Ukraine; Southern Ukraine (270-350 mm of precipitation per year)
Variety: Luran, F1 generation
Planting date: October 1, 2018
Planting rate: 4.5 million seeds/ha
Previous crop: peas
Soil type: Typical Chernozem (humus=4.1%)
Field preparation: disking to 6-8 cm, a second disking to 14-16 cm
Experimental design: A winter barley field was divided into normally treated and Vitazyme treated portions to evaluate the effects of Vitazyme + Vitazyme Cold Start on the yield of grain.

1. Control
2. Vitazyme + Vitazyme Cold Start

Fertilization: 21 kg/ha of N and 24 kg/ha of S during disking; 10-20-12 kg/ha of N-P₂O₅-K₃O at planting; 80 kg/ha of N as KAS urea-ammonia mixture in the spring, with Vitazyme Cold Start

Vitazyme and Vitazyme Cold Start application: 0.5 liter/ha of Vitazyme on the seeds before planting; 0.3 liter/ha of Vitazyme Cold Start sprayed on the leaves and soil at early tillering on February 2, 2019

Yield results:

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Yield</th>
<th>Yield change</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>tons/ha</td>
<td>tons/ha</td>
</tr>
<tr>
<td>1. Control</td>
<td>5.6</td>
<td>—</td>
</tr>
<tr>
<td>2. Vitazyme + Cold Start</td>
<td>6.1</td>
<td>0.5 (+9%)</td>
</tr>
</tbody>
</table>

Income results: The extra 0.5 ton/ha of yield gave added income of $76/ha.

Conclusions: This winter barley trial in Ukraine, using Vitazyme on the seeds (0.5 liter/ha) and Vitazyme Cold Start on the leaves and soil in the spring at early tillering (0.3 liter/ha), showed a very respectable yield increase of 0.5 ton/ha, giving the farmer $76/ha greater income. This program is seen to be an excellent adjunct to barley production in Ukraine.
Researcher: V.V. Plotnikov
Location: LLC “APK Nastashka”, Rokyme District, Kyiv Region, Nastashka Village, Western Ukraine (550-620 mm of precipitation per year)
Variety: Hannelore, F1 generation  
Planting date: September, 30, 2018
Planting rate: 4 million seeds/ha  
Previous crop: sunflowers  
Soil type: Podzolized chernozem (humus=3.3%)

Field preparation: disking to 10-12 cm, deep cultivation with a heavy cultivator to 20-22 cm

Experimental design: A barley field was divided into normally treated and Vitazyme treated portions to evaluate the effects of Vitazyme on the yield of the barley grain.

Control  Vitazyme

Fertilization: 13-39-34 kg/ha of N-P₂O₅-K₂O applied during fall cultivation; 5-14-20 kg/ha of N-P₂O₅-K₂O at planting in the spring

Vitazyme application: Four days before planting, on September 26, 2018, the barley seeds were treated with Vitazyme to give 1.0 liter/ha

Yield results:

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Yield</th>
<th>Yield change</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>tons/ha</td>
<td>tons/ha</td>
</tr>
<tr>
<td>1. Control</td>
<td>7.62</td>
<td>—</td>
</tr>
<tr>
<td>2. Vitazyme</td>
<td>8.08</td>
<td>0.46 (+6%)</td>
</tr>
</tbody>
</table>

Income results: A 6% yield increase (0.46 ton/ha) gave an additional $74/ha income.

Conclusions: Vitazyme at 1.0 liter/ha, applied to the seeds, increased barley grain yield by an acceptable 0.46 ton/ha (6%), giving the farmer $74/ha more income. This result illustrates the value of this program for complementing the growth of barley in Ukraine.
Winter Barley with Vitazyme application

**Researcher:** Vadim Plotnikov  
**Research organization:** PJSC "Vin Agro," Ukraine, Plant Designs, New York, USA, and Agro Expert International, Ukraine  
**Location:** Rozdilna District, Odessa Region, Kuchurgan Village, Ukraine  
**Variety:** 9 Val (generation 1)  
**Seeding rate:** 4.0 million seeds/ha  
**Planting date:** November 26, 2016  
**Previous crop:** sunflowers  
**Soil type:** typical Chernozem; humus = 4.4%  
**Soil preparation:** plowing to 20-22 cm, harrowing to 4-5 cm  
**Experimental design:** A winter barley field was divided into Vitazyme treated and untreated control areas to determine the efficacy of this product in promoting yield increases.

1. Control  
2. Vitazyme

**Fertilization:** 15-15-15 kg/ha of N-P₂O₅-K₂O as a starter at planting, and 30 kg/ha of N broadcast in the spring  
**Vitazyme application:** 0.5 liter/ha sprayed on the leaves and soil at flower bud formation (July 5), and 0.5 liter/ha sprayed on the leaves at mid-pod development (July 31)  
**Growing season weather:** dry  
**Yield results:**

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Grain yield</th>
<th>Yield change</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Control</td>
<td>2.73</td>
<td>—</td>
</tr>
<tr>
<td>2. Vitazyme</td>
<td>3.05</td>
<td>0.32 (+12%)</td>
</tr>
</tbody>
</table>

**Increase in grain yield with Vitazyme: 12%**

**Income results:** At a price of $193.75/ton of barley, the added 0.32 ton/ha gave an additional $62/ha income.

**Conclusions:** A barley study of farmer-field size was conducted during a very dry year in southern Ukraine. Despite the low yield, a 1 liter/ha Vitazyme application in the spring improved the yield by 0.32 ton/ha (12%), giving an enhanced income of $62/ha, showing the value of Vitazyme as a very useful and profitable barley treatment, even during drought situations.
**Researcher:** Vadim Plotnikov  
**Research organization:** “Svitanok” Farm, Ukraine, Plant Designs, New York, USA, and Agro Expert International, Ukraine  
**Location:** Sarat District, Odessa Region, Nadia Village, Ukraine  
**Variety:** Luran (generation 1)  
**Seeding rate:** 4.0 million seeds/ha  
**Planting date:** October 10, 2016  
**Previous crop:** sunflowers  
**Soil type:** typical Chernozem; humus=3.5%  
**Soil preparation:** disking to 6-8 cm, plowing to 20-22 cm, harrowing to 4-5 cm  

**Experimental design:** A winter barley field was divided into Vitazyme treated and untreated control areas to determine the efficacy of this product in promoting yield increases.

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

**Fertilization:** 10-26-26 kg/ha of N-P₂O₅-K₂O as starter at planting, and 65-36 kg/ha N-S broadcast in the spring

**Vitazyme application:** 1 liter/ha sprayed on the leaves and soil in the spring (April 7, 2017)

**Growing season weather:** dry

**Yield results:**

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Grain yield</th>
<th>Yield change</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>tons/ha</td>
<td>ton/ha</td>
</tr>
<tr>
<td>1. Control</td>
<td>6.23</td>
<td>—</td>
</tr>
<tr>
<td>2. Vitazyme</td>
<td>6.94</td>
<td>0.71 (+11%)</td>
</tr>
</tbody>
</table>

**Income results:** At a price of $178.87/ton of barley, the added 0.71 ton/ha gave an additional $127/ha income.

**Conclusions:** This winter barley trial in southern Ukraine revealed that Vitazyme increased the grain yield by 0.71 ton/ha (11%), which provided an income improvement of $127/ha for a single application at 1 liter/ha in the spring. Such results show the great efficacy of this program for barley growers in Ukraine.

Barley grown with Vitazyme in a trial in Ukraine reveals advanced growth compared to the control. Note the growth stage, plant biomass, and root development.
Vitazyme on Winter Barley

Researcher: V. Plotnikov  
Research organization: National Academy of Agricultural Sciences  
Location: Vinnytsia, Ukraine  
Variety: Luran  
Previous crop: corn  
Soil type: gray podzolic (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: October 13, 2011  
Tillage: conventional (disking, plowing, and cultivation)  
Planting rate: 5 million seeds/ha  
Experimental design: A replicated plot design was established using plots of 0.1 ha, and four replicates, to evaluate the effect of Vitazyme on the yield on the yield of winter barley.

1. Control  
2. Vitazyme

Fertilization: 50 kg/ha of dry nitrogen in the spring  
Vitazyme application: 0.5 liter/ha on the leaves and soil at the boot stage (leaf tube formation)  
Weather for 2012: favorable for crop development  
Yield results:

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Grain yield</th>
<th>Yield change</th>
<th>Extra income</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>tons/ha</td>
<td>tons/ha</td>
<td>hrn/ha</td>
</tr>
<tr>
<td>Control</td>
<td>3.05</td>
<td>——</td>
<td>——</td>
</tr>
<tr>
<td>Vitazyme</td>
<td>3.35</td>
<td>0.30 (+10%)</td>
<td>475</td>
</tr>
</tbody>
</table>

Increase in grain yield with Vitazyme: 10%

Conclusions: This replicated barley trial in Ukraine revealed that Vitazyme, applied at the boot stage at 0.5 liter/ha, increased grain yield by an excellent 10%, resulting in improved income of 475 hrn/ha. The utilization of a seed treatment at fall planting would likely have boosted the yield and income even more. These results prove the excellent value of this product in agricultural systems for barley production in Ukraine.