**Researcher:** V.V. Plotnikov  
**Research organizations:** Plant Designs International, Rochester, New York, and Agro Expert International, Kaharlyk, Ukraine  
**Location:** LLC “Spelta”, Bilgorod-Dnistrovsk District, Odesa Region, Petrivka Village, Ukraine; Southern Ukraine (270-350 mm of precipitation per year)  
**Variety:** Sherpa,  
**Planting date:** August 30, 2018  
**Planting rate:** 0.5 million seeds/ha  
**Previous crop:** winter wheat  
**Soil type:** Typical chernozem (humus=4.1%)  
**Field preparation:** disking to 10-12 cm, plowing to 20-22 cm, cultivation to 3-4 cm  
**Experimental design:** A winter canola field was divided into conventionally treated and Vitazyme treated portions to evaluate the effects of Vitazyme on the yield of the seeds.  

1. Control  
2. Vitazyme  

**Fertilization:** 32-52-24 kg/ha of N-P₂O₅-K₂O applied during fall plowing; 20 kg/ha of N applied at planting; 170 kg/ha of N and 36 kg/ha of S applied in the spring  

**Vitazyme application:** 1.0 liter/ha sprayed on the leaves and soil at early flowering on April 28, 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>3.1</td>
<td>—</td>
</tr>
<tr>
<td>2. Vitazyme + Cold Start</td>
<td>3.5</td>
<td>0.4 (+13%)</td>
</tr>
</tbody>
</table>

**Increase in yield with Vitazyme: 13 %**

### Income results:  
An extra 0.4 ton/ha of canola seeds produced added income of $140/ha.  
**Conclusions:** A winter canola trial conducted in Ukraine in 2018-2019, using a single Vitazyme foliar/soil spray at eary flowering of 1.0 liter/ha, produced an excellent 13% yield increase, grossing $140/ha more income for the farmer. This result points to the excellent responses farmers can expect with canola in Ukraine using the Vitazyme program.
Winter Canola with Vitazyme application

**Researcher:** V. V. Plotnikov  
**Location:** Bilgorod-Dnistrovskii District, Odessa Region, Petrivka Village, LTD Spelta, Ukraine  
**Variety:** Mercedes  
**Planting date:** August 20, 2017  
**Previous crop:** winter wheat  
**Soil type:** typical chernozem (humus = 4.1%)  
**Planting rate:** 400,000 seeds/ha  
**Field preparation:** disking to 10-12 cm, plowing to 20-22 cm, cultivation to 3-4 cm  

**Experimental design:** A winter canola field in southern Ukraine, planted in the late summer of 2017, was treated in part with Vitazyme the spring of 2018, and compared with untreated portions of the field to determine the product’s effect on seed yield and profitability.

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

**Fertilization:** 32-52-24 kg/ha N-P₂O₅-S at plowing; 20 kg/ha P₂O₅ at planting; 170-36 kg/ha N-S in the spring  

**Vitazyme application:** 1 liter/ha sprayed on the leaves and soil at early flowering on May 2

**Yield results:**

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Seed yield</th>
<th>Yield change</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>tonnes/ha</td>
<td>tonnes/ha</td>
</tr>
<tr>
<td>1. Control</td>
<td>3.8</td>
<td>—</td>
</tr>
<tr>
<td>2. Vitazyme</td>
<td>4.2</td>
<td>0.4 (+10%)</td>
</tr>
</tbody>
</table>

Notice the larger and deeper-penetrating root system of the Vitazyme treated winter canola. Better roots mean greater uptake of nutrients for higher yields.

**Income results:** A 0.4 tonne/ha yield increase gave $178/ha greater income.

**Conclusions:** A western Ukraine winter canola study, using Vitazyme at 1 liter/ha in the spring at early flowering, resulted in a yield increase of 10%, while boosting income by $178/ha. These results reveal the good efficacy of the program for canola growers in Ukraine.
Winter Canola with Vitazyme application

Researcher: V. V. Plotnikov
Location: Ivanove District, Odessa Region, Rosiiska Slobidka Village, Agricultural Farm Zolota Osin, Ukraine
Variety: Gybrirok  Planting date: August 20, 2017  Previous crop: winter wheat
Soil type: typical chernozem (humus = 4.1%)  Planting rate: 500,000 seeds/ha
Field preparation: disking to 14-16 cm, cultivation to 3-4 cm
Experimental design: A field trial in southern Ukraine with winter canola was prepared in 2017, with one portion of the field treated with Vitazyme the spring of 2018 to evaluate the effect of this product on canola yield and profitability.

Yield results:

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Seed yield</th>
<th>Yield change</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>tonnes/ha</td>
<td>tonnes/ha</td>
</tr>
<tr>
<td>1. Control</td>
<td>2.80</td>
<td>—</td>
</tr>
<tr>
<td>2. Vitazyme</td>
<td>3.19</td>
<td>0.39 (+14%)</td>
</tr>
</tbody>
</table>

Income results: A seed increase of 0.39 tonne/ha produced $184/ha additional income.
Conclusions: Vitazyme at bud formation in this southern Ukrainian canola trial produced a yield increase of 14%, using only 0.5 liter/ha of the product. This led to an income increase of $184/ha, showing the great utility of the program for canola growers in Ukraine.
**Winter Canola with Vitazyme application**

*Researcher:* Vadim Plotnikov  
*Research organization:* “Zolota osin” Farm, Ukraine, Plant Designs, New York, USA, and Agro Expert International, Ukraine  
*Location:* Ivanivka District, Odessa Region, Rosiiska Slobidka Village, Ukraine  
*Variety:* ES Artist  
*Seeding rate:* 0.4 million seeds/ha  
*Planting date:* August 15, 2016  
*Previous crop:* wheat  
*Soil type:* typical Chernozem; humus=4.1%  
*Soil preparation:* diskng to 10-12 cm, plowing to 20-22 cm, harrowing to 3-4 cm  
*Experimental design:* A winter canola 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:* 12-12-12 kg/ha of N-P₂O₅-K₂O as starter at planting, and 52 kg/ha of N broadcast in the spring  
*Vitazyme application:* 0.5 liter/ha sprayed on the leaves and soil at flower bud formation (April 30, 2017)  
*Growing season weather:* dry

**Yield results:**

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Seed 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>1.84</td>
<td>—</td>
</tr>
<tr>
<td>2. Vitazyme</td>
<td>2.46</td>
<td>0.62 (+34%)</td>
</tr>
</tbody>
</table>

*Income results:* At a price of $475.81/ton of canola seed, the added 0.62 ton/ha gave an additional $295/ha income.

**Conclusions:** This winter canola southern Ukraine farm field Vitazyme trial, using one 0.5 liter/ha spray in the spring, proved that this program increased yield by 0.62 ton/ha (34%). This increase provided another $295/ha income, showing that Vitazyme is a highly viable adjunct to farming programs for canola growers in Ukraine.
**Canola**  
*A study conducted in 2013*

**Research organization:**  
SF- Soepenberg s.r.o., Trnava, Slovakia,  
**Farmer cooperation:** Jatov Trnovec, Vahom, Slovakia  
**Variety:** unknown  
**Experimental design:** A canola field was divided into Vitazyme treated and untreated areas to evaluate the effect of this product on the yield of seeds.

1 Control  
2 Vitazyme

**Fertilization:** unknown  
**Vitazyme application:** 1 liter/ha on the leaves and soil 50 days after planting, at flower formation along with fungicide and insecticide

**Yield results:**

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Yield</th>
<th>Yield change</th>
</tr>
</thead>
<tbody>
<tr>
<td>Control</td>
<td>4.18</td>
<td>—</td>
</tr>
<tr>
<td>Vitazyme</td>
<td>5.37</td>
<td>1.19 (+28%)</td>
</tr>
</tbody>
</table>

*Increase in canola seed yield with Vitazyme: 28%*

**Conclusion:** An excellent 28% yield increase resulted from a single 1 liter/ha Vitazyme application, applied 50 days after planting. Such results illustrate the great value of this product for canola growers in Slovakia.
**Researchers:** Jacob Hesseltine and Heba Khalid  
**Research organization:** Vital Grow Distribution LLC, Waterville, Washington  
**Farmer:** Jorgenson Brothers  
**Location:** Coulee City, Washington  
**Variety:** High Class 115 spring canola, Roudup Ready  
**Planting date:** last week of April  
**Seeding rate:** 3.5 lb/acre  
**Seedbed preparation:** plowing, rod weeding  
**Previous crop:** fallow in 2014, with fall canola, which froze out  
**Soil type:** sandy loam  
**Experimental design:** A 240-acre spring canola field was divided by a dirt road, which served as a separation for a 70-acre area treated with Vitazyme. The purpose of the study was to evaluate the effect of this product on plant characteristics.

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

**Fertilization:** 50 lb/acre of nitrogen in the fall of 2014  
**Vitazyme application:** 13 oz/acre sprayed on the plants and soil in the spring, along with Roundup (glyphosate), using a 90-foot sprayer  
**Growing season weather:** a very dry and hot summer  
**Harvest date:** last part of August, 2015  
**Plant parameter results:** On July 14, 10 typical plants were dug from both of the two treated areas, near to each other to minimize soil differences, to evaluate several plant parameters.

**Conclusion:** This split field spring canola trial in Washington, using just one Vitazyme application of 13 oz/acre, produced excellent plant responses when evaluated during the mid-growth period. Plant height was increased by 8%, pods per plant by 38%, stalk diameter by 27%, pod weight per plant by 47%, and average pod weight by 6%. These improvements set the stage for great yield increases, especially the greater pod number and weight per plant. It was not possible to separate the field areas for a yield evaluation, but it is presumed that a considerably greater yield was achieved on the Vitazyme treated area of the field. These results agree with responses of canola to Vitazyme noted in many other places across North America and the world, showing the great efficacy of this program for canola growers.

### Canola 2015 Crop Results

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Control</th>
<th>Vitazyme</th>
<th>Increase with Vitazyme</th>
</tr>
</thead>
<tbody>
<tr>
<td>Plant Height</td>
<td>31.85</td>
<td>34.40</td>
<td>8%</td>
</tr>
<tr>
<td>Stalk Diameter</td>
<td>7.8</td>
<td>9.9</td>
<td>27%</td>
</tr>
<tr>
<td>Pods per Plant</td>
<td>82.8</td>
<td>114.5</td>
<td>38%</td>
</tr>
<tr>
<td>Pod Weight per Plant</td>
<td>24.52</td>
<td>36.07</td>
<td>47%</td>
</tr>
<tr>
<td>Pod Weight</td>
<td>0.296</td>
<td>0.335</td>
<td>6%</td>
</tr>
</tbody>
</table>
2009 Crop Results

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

Vitazyme on Canola

Researcher: O.V. Korniychuk, V.V. Plotnikov, and agronomic scientists
Organization: Vinnytsia State Agricultural Experiment Station, Ukraine Academy of Agrarian Sciences, Vinnytsia, Ukraine
Seeding rate: 7 kg/ha  Seeding date: August 30, 2008
Location: Ukraine central forest-steppe area near Vinnytsia  Previous crop: spring barley
Variety: Black Giant, super elite  Tillage: plowing, cultivation, and harrowing
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 Vitazyme treated and untreated plots of 1.0 ha, replicated four times, to discover the effect of the product on the canola yield.


Fertilization: in the fall of 2008, 30 kg/ha N, 60 kg/ha P\textsubscript{2}O\textsubscript{5}, and 90 kg/ha K\textsubscript{2}O; in the spring of 2009, 90 kg/ha of N.

Vitazyme application: Treatment 1 received a fall application at 1.0 liter/ha on October 22, 2008, and Treatment 2 received this treatment plus another in the spring on April 30, 2009, at 1.0 liter/ha.

Yield results:

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Canola yield (tons/ha)</th>
<th>Yield change</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Control</td>
<td>4.46</td>
<td></td>
</tr>
<tr>
<td>2. Vitazyme</td>
<td>5.15</td>
<td>0.69 (+15%)</td>
</tr>
<tr>
<td>3. Vitazyme, fall</td>
<td>5.64</td>
<td>1.18 (+26%)</td>
</tr>
<tr>
<td>+ spring application</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Increase in canola yield with Vitazyme

Fall application ....................... 15%
Fall + Spring application ............. 26%

Income results:

- Income increase with fall Vitazyme: 1,663 hrn/ha
- Income increase with fall + spring Vitazyme: 2,786 hrn/ha

Conclusions: This winter canola trial at Vinnytsia, Ukraine, revealed that a single Vitazyme application in the fall, at 1 liter/ha, gave a large yield increase of 15%. An additional spring application at 1 liter/ha provided nearly double the fall-only application: 26%. Both treatments resulted in substantial increases in income, of 1,663 and 2,786 hrn/ha. These results prove the great utility of this product to improve winter canola yields under Ukrainian soil and climatic conditions.
Vital Earth Resources
706 East Broadway, Gladewater, Texas 75647
(903) 845-2163    FAX: (903) 845-2262

2008 Crop Results

Vitazyme on Winter Canola

Researchers: O.V. Kornijchuk, V. V. Plotnikov, and agronomic scientists
Organization: Vinnysia State Agricultural Experiment Station of Forage Institute, Ukraine Academy of Agrarian Sciences, Vinnysia, Ukraine
Location: Ukraine central forest – steppe area of Ukraine near Vinnysia
Variety: Black Giant Super – Elite  
Seeding rate: 6 kg/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: August 18, 2007  
Previous crop: winter wheat
Tillage: plowing to 22 cm, and cultivation to 3-4 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 in the fall  
3. Vitazyme applied both fall and spring

Fertilization: In the fall of 2007 a broadcast application of 30-60-90 kg/ha N-P₂O₅-K₂O was made. In the spring, 90 kg/ha of nitrogen was applied.

Vitazyme application: for Treatment 2, 1 liter/ha over the leaves and soil on October 5, 2007 (8 to 10 leaves), and for Treatment 3, 1 liter/ha on October 5, 2007, and also 1 liter/ha on May 15, 2008 (bloom).

Harvest date: unknown

Yield results:

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Seed yield</th>
<th>Change</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>tons/ha</td>
<td>tons/ha</td>
</tr>
<tr>
<td>Control</td>
<td>4.67</td>
<td>—</td>
</tr>
<tr>
<td>Vitazyme 1x</td>
<td>5.11</td>
<td>0.44 (+9%)</td>
</tr>
<tr>
<td>Vitazyme 2x</td>
<td>5.53</td>
<td>0.86 (+18%)</td>
</tr>
</tbody>
</table>

**Increase in yield with fall application: 9%**

**Increase in yield with fall and spring applications: 18%**

Income results: Based on current canola prices, the increase in income from Vitazyme for the two treatments is as follows:

- Fall application: 952 hrn/ha
- Fall and spring application: 1,855 hrn/ha

Conclusions: A fall application of Vitazyme (1 liter/ha) after planting resulted in a sizeable 9% increase in canola yield in Ukraine. Applying a second 1 liter/ha application in the spring doubled this yield increase to 18%, showing how effective this fertility supplement is to improve yields and profits on canola in Eastern Europe. Income increases were substantial for the two treatments: 952 and 1,855 hrn/ha, respectively.
1999 Crop Results

Vitazyme on Canola

Farmer: James Harrison
Variety: Martina (a high uric acid industrial oil variety)
Harvest date: unknown
Experimental design: A canola field was divided into two parts, one treated with Vitazyme and the “Eco-Ag” System and the other left untreated.

1. Control
2. Vitazyme + Eco-Ag products

Fertility treatments: No P₂O₅ or K₂O and reduced nitrogen fertilizer
Vitazyme applications: Vitazyme was applied at recommended rates with other Eco-Ag products.

Yield results:

<table>
<thead>
<tr>
<th></th>
<th>Control</th>
<th>Vitazyme</th>
<th>Increase</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yield, tonnes/acre</td>
<td>1.23</td>
<td>1.43</td>
<td>0.20 (+16%)</td>
</tr>
</tbody>
</table>

Yield increase: 16%

Income results: Canola price = $254.40/tonne.

<table>
<thead>
<tr>
<th></th>
<th>Control</th>
<th>Vitazyme</th>
</tr>
</thead>
<tbody>
<tr>
<td>Income</td>
<td>$312.91/acre</td>
<td>$363.79/acre</td>
</tr>
</tbody>
</table>

Income increase: $50.88/acre

Comments: Using Vitazyme within the Eco-Ag program meant the crop required less fertilizer, especially nitrogen, than the conventional program. Even so, the Eco-Ag program still produced the highest yield and a sizeable income increase.