Polyversum®
Biofungicide for integrated pest management


Biopreparáty, spol. s r.o.
Opening Door for Sustainable Agriculture

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Company founded in 1997 producing biological plant protection products for conventional, integrated and organic farming.

Company has a long tradition in the market for plant protection products. We want to offer to the final users - farmers - plant protection products on a natural base, which are as effective as synthetic plant protection products.

Company has currently 47 employees.
3 production units.
Production capacity 2017 is 80 tons. = 800,000ha
Projected capacity in 2018: 200 tons. = 2mil ha
Pythium oligandrum - major mechanisms of action

• Mycoparasitism
• Induction of resistance
• Growth stimulation
Typical target microorganisms (mycoparasitism)

- *Alternaria* spp.
- *Botrytis cinerea*
- *Fusarium* spp.
- *Gaeumannomyces graminis*
- *Phytophthora cactorum*
- *Sclerotinia sclerotiorum*
- *Verticillium dahliae*
Polyversum registered in the EU and worldwide

- Czech Republic 1107/2009
- Poland 91/414 and 1107/2009
- Slovakia 1107/2009
- Hungary 91/414
- France 1107/2009
- United Kingdom 1107/2009
- Romania 1107/2009
- Italy 1107/2009
- Austria 1107/2009

- USA
- People’s Republic of China
- Morocco
- Serbia
- Macedonia
- Montenegro
HOP

Target diseases:

• Downy mildew (*Pseudoperonospora humuli*)

• Fungal diseases of hop seedlings (*Fusarium* spp., *Verticillium albo-atrum*)
HOP

Efficacy trials against downy mildew (peronospora)
Hop Institute, Žatec, 2016 - 2017
**Efficacy trials against downy mildew 2016**

<table>
<thead>
<tr>
<th>Variant</th>
<th>Efficacy</th>
</tr>
</thead>
<tbody>
<tr>
<td>Untreated variant</td>
<td>0,00</td>
</tr>
<tr>
<td>Polyversum</td>
<td>81,55 %</td>
</tr>
<tr>
<td>Aliette 80 WG</td>
<td>90,06 %</td>
</tr>
</tbody>
</table>
### Efficacy trials against downy mildew 2017

<table>
<thead>
<tr>
<th>Variant</th>
<th>Untreated variant</th>
<th>Aliette</th>
<th>Polyversum</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>7 days after</td>
<td>14 days after</td>
<td>21 days after</td>
</tr>
<tr>
<td></td>
<td>application</td>
<td>application</td>
<td>application</td>
</tr>
<tr>
<td>Untreated</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>variant</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Aliette</td>
<td>73,3</td>
<td>91,67</td>
<td>94,48</td>
</tr>
<tr>
<td>Polyversum</td>
<td>60,4</td>
<td>77,50</td>
<td>84,14</td>
</tr>
</tbody>
</table>
Grape wine

Target diseases:

- Fungal diseases of seedlings e.g.: \(\text{Pythium spp., Fusarium spp., Verticillium spp.}\)
- Grey Mould \(\text{(Botrytis cinerea)}\)
Grape wine – treatment by Polyversum
Grape wine

Untreated grape wine

Grape wine treated by Polyversum
CdS Sagea
Anno 2014 - Cormons (GO)

Varietà: Merlot.
Biofungicidi a confronto:
4 trattamenti ripetuti
da fine fiorello (20/06) a pre-raccolta (26/08).
Standard antibiotico chimico
cypordonil+fluoxonil):
2 trattamenti al 20 giugno e 12 agosto.
Rilievi: 17 settembre.

- diffusione
  (testimone = 35% grappoli colpiti)
- intensità
  (testimone = 2% acini attaccati)

% Efficacia Abbott

<table>
<thead>
<tr>
<th></th>
<th>Polyversum</th>
<th>Bacillus subtilis</th>
<th>Standard chimico</th>
</tr>
</thead>
<tbody>
<tr>
<td>60%</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>50%</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>40%</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>30%</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>20%</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10%</td>
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<tr>
<td>0%</td>
<td></td>
<td></td>
<td></td>
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</tbody>
</table>
CdS CRPV-Astra Innovazione
Anno 2016 - Faenza (RA)

Varietà: Trebbiano.
2 trattamenti: 9 e 19 settembre.
Rilievi: 28 settembre.
Standard antibotrici chimico: cyprodinil+fludioxonil

% Efficacia Abbott

- Polyversum
- Standard chimico

diffusione (testimone = 69% grappoli colpiti)
intensità (testimone = 11% acini attaccati)
Winter wheat

- Against Fusarium head blight
- Confirmed efficacy against rusts, take all, snow mold and septorioses)

**APPLICATION:**
- 100 g/ha in the stages:
Spring barley

- Against Fusarium head blight
- **APPLICATION:**
- 100 g/ha in stages:
Oilseed rape

- Against sclerotinia and phoma
- Confirmed efficacy against alternaria leaf spot, gray mold, verticillium wilt, clubroot)

**APPLICATION:**
- 100 g/ha in stages:
Costumers in Czech Republic

• We have more than 400 customers managing over 40,000 hectares of arable land in the Czech Republic.

• Polyversum is selling mostly for foliar application in these crops:
  ➢ Cereals
  ➢ Oil seed rape
  ➢ Sunflower
Co-operative farm Žichlínek

• Total acreage is 7,000 hectares agricultural land
• Altitude: 348 meters above sea level
• Crop composition: winter wheat 4,500 ha, spring and winter barley 870 ha, oilseed rape 1,000 ha, peas 100 ha, poppy 50 ha
• Polyversum – 5 years on poppy, barley and oilseed rape
• Yields 2015: wheat 8 t/ha, barley 8 t/ha, oilseed rape 4.7 t/ha, peas 3 t/ha, poppy 0.6 – 0.8 t/ha

• Consumption of Polyversum kg/year - 520 kilograms = 5,200 hectares (saving around 5,200 liters of chemical fungicides)
Václav Novák - Kobylníky

- Total acreage is 3.500 hectares agricultural land
- Altitude: 262 meters above sea level
- Crop composition: winter wheat 1.400 ha, spring barley 400 ha, corn 600 ha, oilseed rape 530 ha, sugar beet 180 ha, alfalfa 300 ha
- Polyversum – 4 years on wheat and barley
- Yields 2015: wheat 9.3 t/ha, barley 7.3 t/ha, corn 6 t/ha, oilseed rape, 4 t/ha, sugar beet 95 t/ha, alfalfa 6.8 t/ha
- Tank mix: herbicide

**Consumption of Polyversum kg / year - 120 kg = 1.200 hectares (saving around 1.200 liters of chemical fungicides)**
Zeva Bečov – Aleš Charvát

• The total area is 700 hectares of farmland
• Crops: 82 ha rapeseed, 400 ha winter wheat, sunflowers 73 ha, 90 ha of spring barley
• Polyversum used from 2011 on all crops for rapeseed and sunflower state subsidies
• Revenue: oilseed rape - 4.1 t / ha, winter wheat - 7.5 t / ha, spring barley - 5.1 t / ha, sunflower - 2.5 t / ha

• Consumption of Polyversum kg / year - 130 kg = 1.300 hectares (saving around 1.300 liters of chemical fungicides)
• 5 YEARS NOT chemical fungicide !!!
NEW REGISTRATION 2017
POLYGANDRON WP

Active substance: *Pythium oligandrum* M1, content of oospores $5 \times 10^5$ /g of product

Formulation: WP (wettable powder)
Target pest: *Phytophthora infestans* (potato late blight)

Dosage: 200 g/ha

The product use is intended for postponing the potato late blight infection and for protection against this disease at its early stages. If the disease develops, treatment by authorised curative products is necessary.
POLYGANDRON WP AGAINST PHYTOPHTHORA INFESTANS 2012

Krásné Údolí, 12bio-kud-polygandron-br-pb1

1) Non-treated control
2) 4x Dithane Neotec 75 WG 2 kg/ha; 2x Altima 500 SC 0,4 l/ha
3) 4x Polygandron WP 200 g/ha; 2x Altima 500 SC 0,4 l/ha
4) 6x Polygandron WP 200 g/ha
5) 7x Polygandron WP 200 g/ha
### Potato - *Phytophthora infestans* - Efficacy (%), Evaluated 18.7.2012, Incidence, Variety Belana, Krásné Údolí, 12bio-kud-polygandron-br-pb1

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Efficacy (%)</th>
<th>Incidence, Variety</th>
</tr>
</thead>
<tbody>
<tr>
<td>Non treated control</td>
<td></td>
<td>Belana, Krásné Údolí, 12bio-kud-polygandron-br-pb1</td>
</tr>
<tr>
<td>4x Dithane DG Neotec 2 kg/ha (7.6., 18.6., 28.6., 10.7.); 2x Altima 500 SC 0.4 l/ha (19.7., 27.7.)</td>
<td>b</td>
<td>18.7.2012</td>
</tr>
<tr>
<td>4x Polyversum - Polygandron 200 g/ha (7.6., 18.6., 28.6., 10.7.); 2x Altima 500 SC 0.4 l/ha (19.7., 27.7.)</td>
<td>b</td>
<td>18.7.2012</td>
</tr>
<tr>
<td>6x Polyversum - Polygandron 200 g/ha (7.6., 18.6., 28.6., 10.7., 19.7., 27.7.)</td>
<td>b</td>
<td>18.7.2012</td>
</tr>
<tr>
<td>7x Polyversum - Polygandron 200 g/ha (7.6., 18.6., 28.6., 10.7., 19.7., 27.7., 6.8.)</td>
<td>b</td>
<td>18.7.2012</td>
</tr>
</tbody>
</table>
DON´T WORRY, BAN COPPER, AZOLS AND OTHER DANGEROUS SYNTHETIC FUNGICIDES

ADEQUATE SUBSTITUTES EXIST

Thank you for your attention
Martin Suchánek CEO
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WWW.BIOPREPARATY.EU