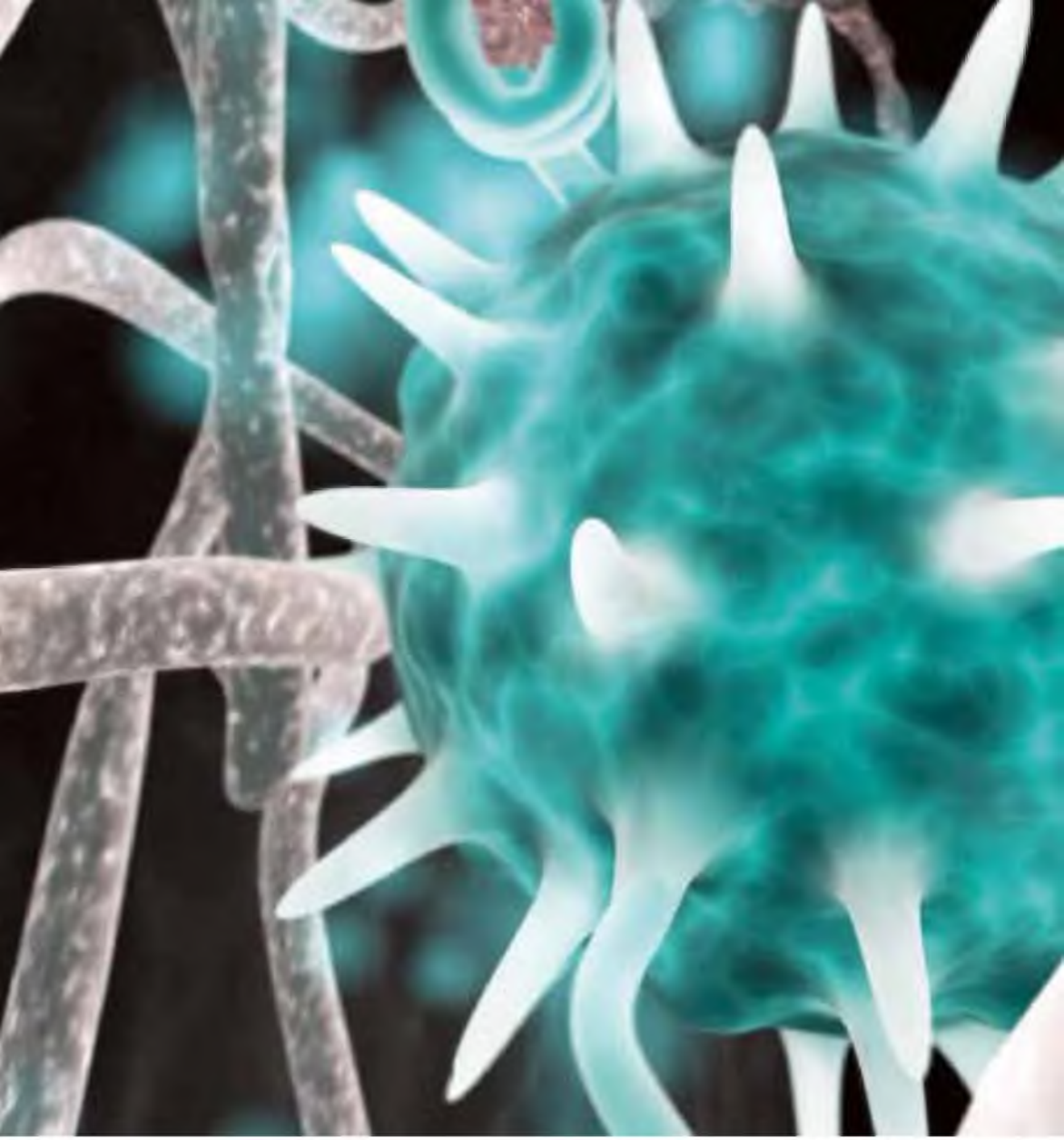


POLYVERSUM®

IPM READY®

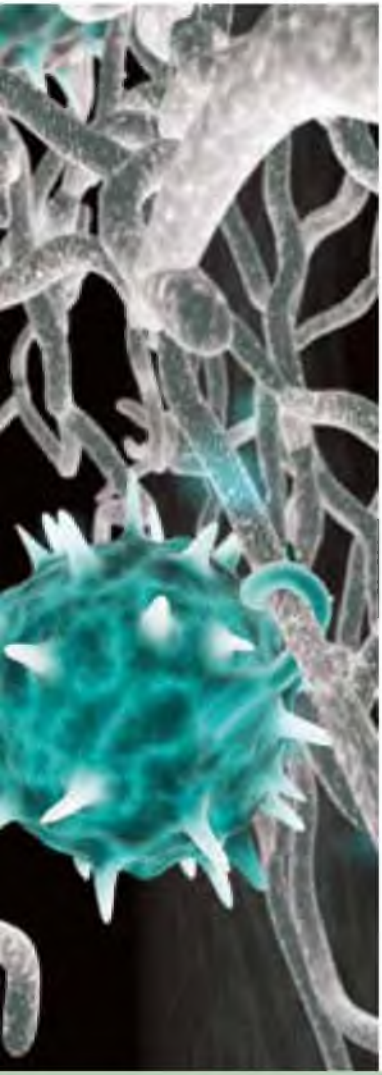


Table of contents

The product is suitable for use in Integrated Pest Management (IPM) in accordance with European Parliament and Council Regulation (EC) No 1107/2009.

TYPES OF APPLICATION:

SEED DRESSING
Dry or wet seed dressing

SPRAY APPLICATION
Foliar application

WATERING
Irrigation system or watering can

ROOT DIPPING
Dipping of roots in Polyversum suspension before transplanting

SEEDLING TREATMENT
Dipping of whole seedlings in Polyversum suspension before transplanting

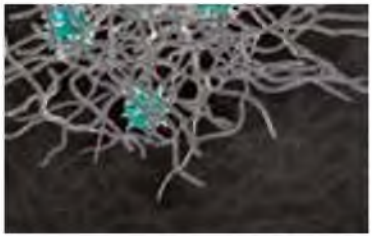
POLYVERSUM® – biological fungicide for plant protection

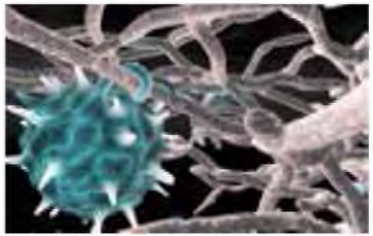
Microorganism *Pythium oligandrum* M1 (DV 74) is included in list of active substances by Implementing Regulation (EU) No. 540/2011 of the Regulation of the European Parliament and Council Regulation (EC) 1107/2009 concerning the placing of plant protection products on the market. The same strain of the microorganism *Pythium oligandrum* is under mark DV 74 registered as an active substance in USA by EPA (United States Environmental Protection Agency) under the registration number 81606-1 since May 7, 2007.

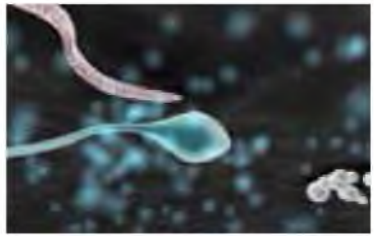
Active substance:	*Pythium oligandrum* Drechsler, content of oospores 1 x 10^6 / 1 g of product
Formulation:	WP (wettable powder) which contains germinable oospores of *Pythium oligandrum* placed on a mineral carrier
Packages:	50 g, 100 g, 500 g (2x250g) multi-layer PET/MET bag in a cardboard box
Storability:	Two years from the date of production (stated on the label of each bag)
Storage:	Store in original packaging in dry conditions at room temperature in accordance with relevant specific regulations. Keep out of the reach of children. Keep away from food, drink and animal food stuffs. Do not store under 5 °C (41 °F) and above 40 °C (104 °F) for prolonged periods.
Safety:	No signal words

Approved for all farming uses, including organic farming.

The product is suitable for use in Integrated Pest Management (IPM)
in accordance with European Parliament and Council Regulation (EC) No 1107/2009.





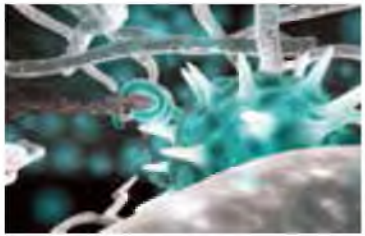
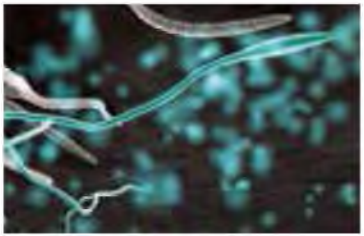
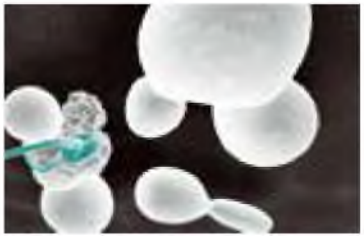
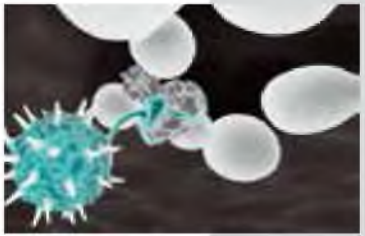


Pythium oligandrum – the active substance of POLYVERSUM®

***Pythium oligandrum* is a microorganism taxonomically belonging to the kingdom *Chromalveolata* and to the family *Oomycetes*. *Pythium oligandrum* was discovered by Charles Drechsler in the 1930's. He discovered in the course of further research, that *Pythium oligandrum* is a mycoparasite and it attacks a wide range of phytopathogenic microorganisms. During the 1970's, Dáša Veselý continued this research and he started testing the microorganism for use in plant protection. In the 1990's a product was formulated containing *Pythium oligandrum* by the company BIOPREPARÁTY, spol. s r.o.**

Modes of action:

- **Mycoparasitism** – *Pythium oligandrum* decomposes tissue of the phytopathogens by producing hydrolytic enzymes and thus obtains nutrients for its own nutrition in this manner.
- **Induction of resistance** – secondary metabolites of the microorganism *Pythium oligandrum* stimulate production of morphological and biochemical barriers in plant tissues against attack from fungal and bacterial diseases.
- **Growth stimulation** – secondary metabolites of the microorganism *Pythium oligandrum* support production of growth phytohormones.

Oilseed crops

Crops: Oilseed rape, Oilseed radish, Mustard, Sunflower, Poppy

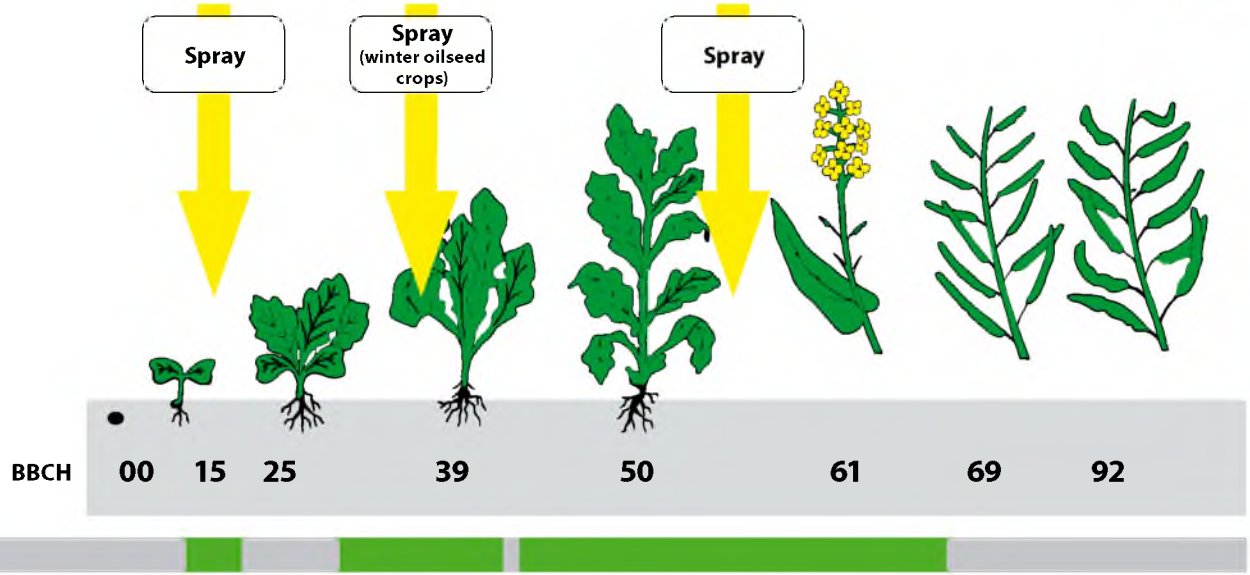
Target diseases:

- White Sclerotinia Stem Rot (*Sclerotinia sclerotiorum*)
- Blackleg (*Leptosphaeria maculans*)
- Alternaria Leaf Spot (*Alternaria* spp.)
- Grey Mould (*Botrytis cinerea*)
- Downy Mildew (*Peronospora arborescens*)
- Helmintosporiosis (*Pleospora calvescens* syn. *Helmintosporium papaveris*)
- Verticillium Wilt (*Verticillium dahliae*)

Product may be mixed with liquid fertilizers, herbicides and insecticides.
It improves quality of harvested seed.

Application during vegetation (spring oilseeds 1. + 3. application; winter oilseeds 1. + 2. + 3. application):

1. **Application**
   Dosage: 0.1 kg/ha
   Stage: BBCH 14–16
   Purpose: induction of resistance against fungal diseases. Control of Blackleg (*Leptosphaeria maculans*), *Alternaria* sp, Downy Mildew of Poppy (*Peronospora arborescens*), Verticillium Wilt (*Verticillium dahliae*) or Helmintosporiosis (*Pleospora calvescens*); parasitisation of *Sclerotinia* sclerotia in soil and on plant remnants.
2. **Application (winter oilseed rape)**
   Dosage: 0.1 kg/ha
   Stage: BBCH 30–39
   Purpose: Prevention of further development of Blackleg in the root collar and apothecia of *Sclerotinia sclerotiorum* growth of the topsoil around plants; regeneration support for plants post winter; induces resistance against fungal diseases.
3. **Application**
   Dosage: 0.1 kg/ha
   Stage: BBCH 49–65
   Purpose: *Pythium oligandrum* is able to parasitise *Sclerotinia sclerotiorum* at this stage and suppress Grey Mould (*Botrytis cinerea*).



Crop	Target disease	Dosage	PHI	Remarks
Oilseed rape	Blackleg White Sclerotinia Stem Rot	0.1 kg/ha	N/A	Max. 3 spray applications dosage of water: 300 – 400 l/ha
Mustard	White Sclerotinia Stem Rot Alternaria Leaf Spot Grey Mould	0.1 kg/ha	N/A	dosage of water: 200 –600 l/ha
Sunflower	White sclerotinia Stem Rot Grey Mould Alternaria Leaf Spot	0.1 kg/ha	N/A	Max. 2 spray application dosage of water: 300 – 400 l/ha
Poppy	Downy Mildew Helmintosporiosis	0.1 kg/ha	N/A	2–3 spray application dosage of water: 300 – 400 l/ha

Cereals

Crops: Wheat, Barley, Triticale, Oat, Rye

Target diseases:

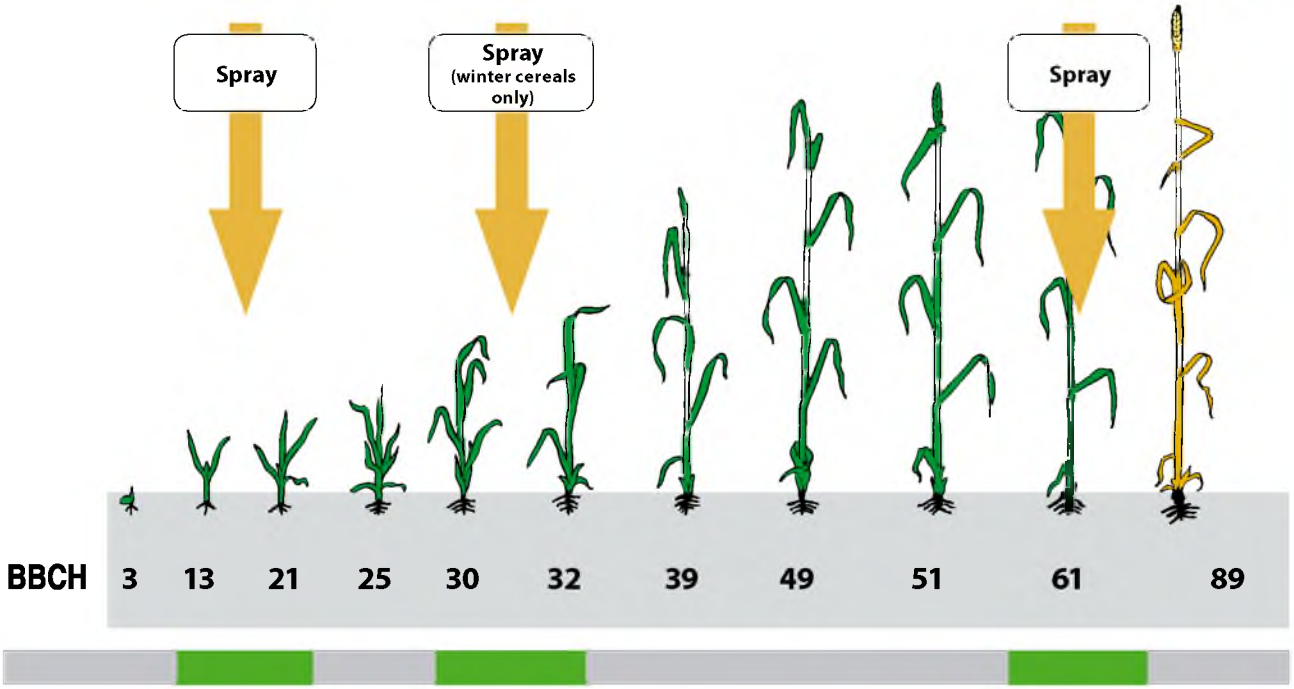
- Eyespot of cereals (*Tapesia yallundae*)
- Take-all disease (*Gaeumannomyces graminis*)
- Fusarioses (*Fusarium* spp.)
- Rusts (*Puccinia* spp.)
- Leaf spots diseases (*Septoria tritici, Pyrenophora teres*)

Application during vegetation:

1. **Application**
   Dosage: 0.1 kg/ha
   Stage: BBCH 12–23 (2 leaves – 3 tillers)
   Purpose: To supress soil pathogens surviving on plant remnants *Fusarium* spp., *Gaeumannomyces graminis, Tapesia yallundae* and induce resistance against other diseases.

2. **Application (winter wheat)**
   Dosage: 0.1 kg/ha
   Stage: BBCH 29–32 (at the end of tillering to the beginning of stem elonging)
   Purpose: To suppress *Fusarium* spp. and to induce resistance to *Puccinia* spp.

3. **Application**
   Dosage: 0.1 kg/ha
   Stage: BBCH 55–65 (the beginning of flowering)
   Purpose: To suppress *Fusarium* spp. in ears.



Crop	Target diseases	Dosage	PHI	Remarks
Cereals	Eyespot of Cereals Fusarioses Rusts Take-all Leave spots diseases	0.1 kg/ha	0	300 – 400 l of water/ha

Seed dressing of cereals

Crops: Wheat, Barley, Triticale, Oat, Rye

Target diseases:

- Fusarioses (*Fusarium* spp.)
- Take-all disease (*Gaeumannomyces graminis)*
- Common bunt (*Tilletia caries*)

Seed treatment:

A) **Dry seed treatment:** Seeds are treated by mixing in with the product.
Dosage: 0.5–1 kg of the product/t seed

B) **Wet seed treatment:** You can use all the common types of dressers. Per one ton of seed It is applied 0.5–1 kg of product perfectly dispersed in 5–10 litres of water. Application of this suspension must be performed immediately after mixing to prevent premature oospore germination.
Dosage: 0.5–1 kg of the product with 5–10 l of water/t seed

Purpose of seed treatment: Parasitisation of common bunt (*Tilletia caries*) chlamydospores and ascospores of *Fusarium* sp. which originate from infected seed, suppression of soil-borne fungi from the *Fusarium* genus causing root rot and stem-base diseases, it also induces resistance in germinating plants

Crop	Target diseases	Dosage	PHI	Remarks
Cereals	Fusarioses Common Bunt Take-all disease	0.5–1 kg/t	N/A	Seed treatment

Fruit vegetables

Crops: Cucumber, Tomato, Pepper, Eggplant, Pumpkin

Target diseases:

- Downy mildew (*Pseudoperonospora cubensis*)
- Late Blight (*Phytophthora infestans*)
- Complex of soil fungal diseases attacking the roots and root bases e.g.:
  - *Pythium* spp.
  - *Fusarium* spp.
  - *Botrytis cinerea*
  - *Sclerotinia* spp.
  - *Rhizoctonia* spp.
  - *Verticillium* spp.
  - *Alternaria* spp.

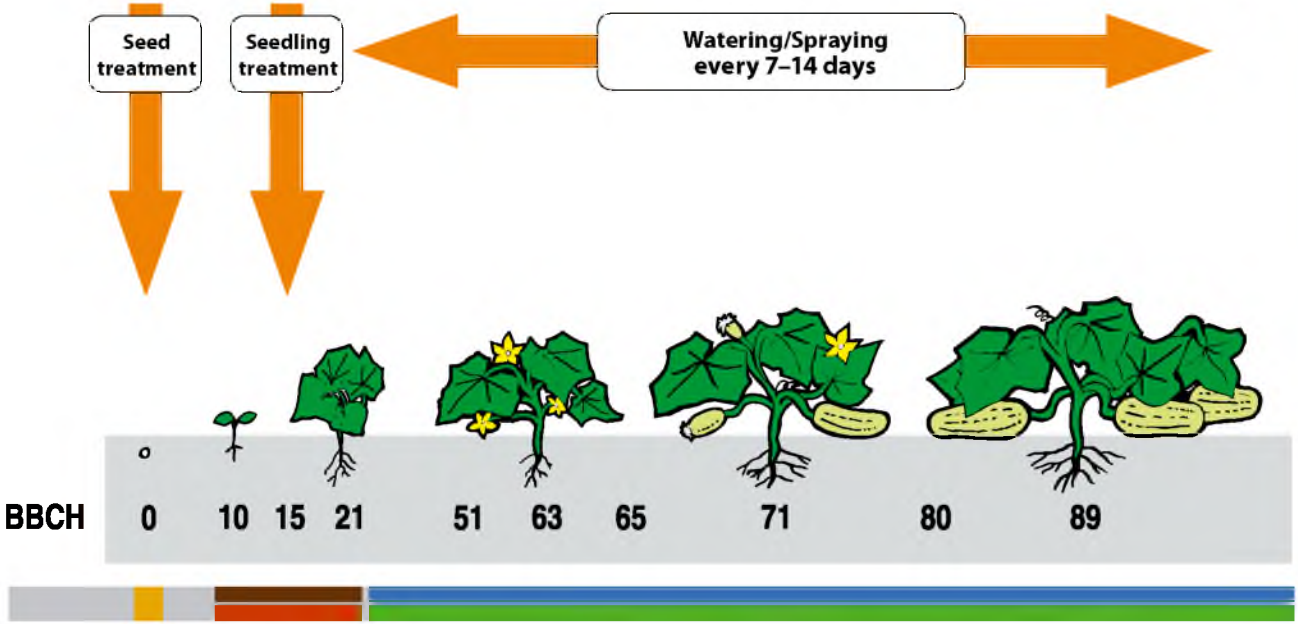
No pre-harvest interval required & vegetable consumption is possible immediately after product application
No chemical residues in the vegetables
The product is suitable for use in Integrated Pest Management
Number of applications is unlimited

Seed treatment: Seeds are treated by mixing in with the product.
Dosage: 5 g/kg seed
Purpose: Protection against soil phytopathogenic fungi that attack plants at the beginning of vegetation

Germinated plant treatment: Watering with 0.05% suspension of the product
Dosage: 0.05% suspension of the product
Purpose: Protection against soil phytopathogens and initial support of young plant growth

Seedling treatment before planting: Dipping of seedling root ball just before planting (alternatively seedling trays can be dipped in 0.05% suspension)
Dosage: 0.05% suspension of the product
Purpose: Protection against root rot

Application during vegetation: Spraying or watering – the total number of applications is not limited by human safety or environmental factor concerns
Dosage: 0.1–0.2 kg/ha
Stage: After planting every 7–14 days
Purpose: Prevention to delaying Downy Mildew, Late Blight and other fungal infections.



Crop	Target diseases	Dosage	PHI	Remarks
All vegetables	Fungal soilborn diseases	5 g/kg	N/A	Seed treatment
	Fungal soilborn diseases	0.05 %	N/A	Root dipping before planting
Fruiting vegetables	Downy mildew, Late Blight	0.1–0.2 kg/ha	N/A	Spraying (at the beginning of vegetation) or watering (during the vegetation stage) 300 – 1000 l of water/ha watering (according to the amount of crop leaf mass)
	Fungal diseases	0.05 %	N/A	Watering

Brassica vegetables

Crops: Cauliflower, Broccoli, Cabbage, Chinese cabbage, Kohlrabi

Target diseases:

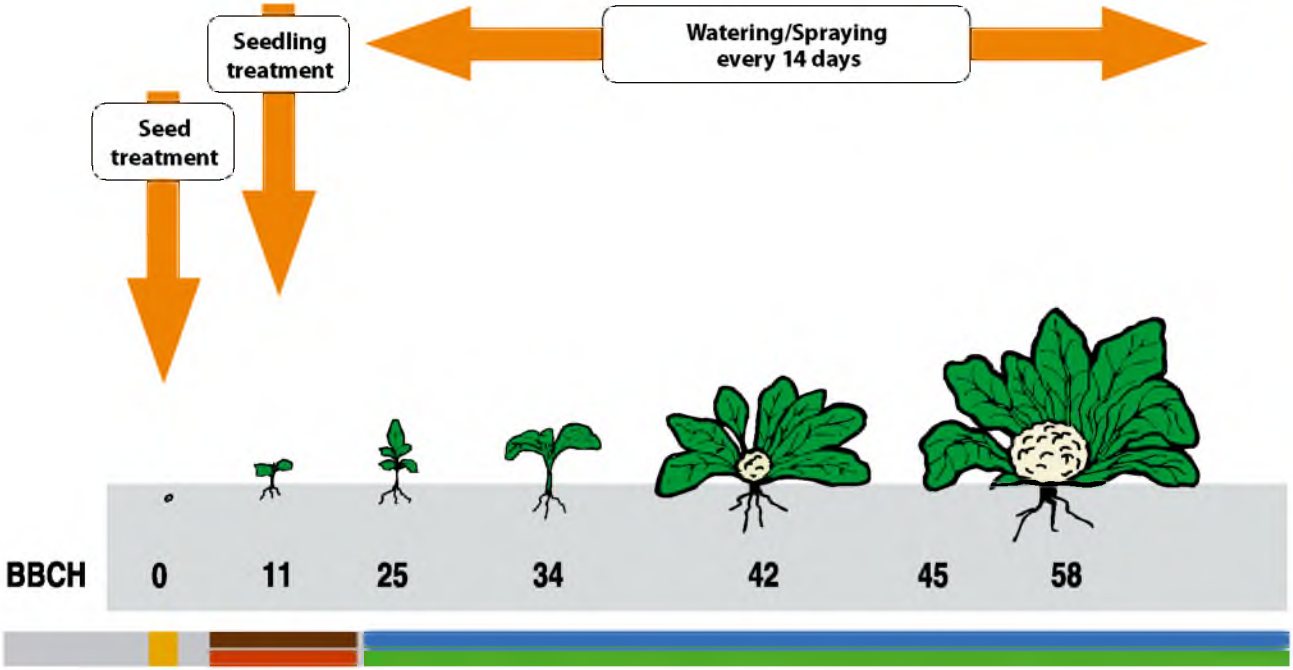
- Alternaria Leaf Spot (*Alternaria brassicae*)
- Phoma Root Rot (*Leptosphaeria maculans*)
- Downy Mildew (*Peronospora parasitica*)
- Club root (*Plasmodiophora brassicae*)

No pre harvest interval required & vegetable consumption is possible immediately after product application
No chemical residues in the vegetables
The product is suitable for use in Integrated Pest Management
Number of applications is unlimited

Seed treatment: Seeds are treated by mixing in with the product.
Dosage: 5 g/kg seed
Purpose: Protection against soil phytopathogenic fungi that attack plants at the beginning of vegetation

Root dipping and Seedling treatment: Watering/spraying
Dosage: 0.05% suspension of the product
Purpose: Initial support of young plant growth and to protect against soil phytopathogens and prevention of Club root (*Plasmodiophora brassicae*)

Application during vegetation: Spraying at the stage of germination or watering – the total number of applications is unlimited
Dosage: 0.2 kg/ha
Stage: The beginning of vegetation, during vegetation
Purpose: Protection against root rot at the beginning of vegetation & prevention of Downy Mildew



Crop	Target diseases	Dosage	PHI	Remarks
All vegetables	Fungal diseases	5 g/kg	N/A	Seed treatment
	Fungal diseases	0.05 %	N/A	Root dipping before planting
Brassica vegetables	Alternaria Leaf Spot Phoma Root Rot Downy Mildew	0.2 kg/ha	N/A	300 – 800 l water/ha; watering/spraying at the germination stage

Root vegetables

Crops: Carrot, Parsley, Celery, Radish, Horseradish, Beetroot

Target diseases:

- Complex of soil fungal diseases attacking the roots and root bases e.g.:
  - *Pythium* spp.
  - *Fusarium* spp.
  - *Botrytis cinerea*
  - *Sclerotinia* spp.
  - *Rhizoctonia* spp.
  - *Verticillium* spp.
  - *Alternaria* spp.

No pre harvest interval required & vegetable consumption is possible immediately after product application

No chemical residues in the vegetables

The product is suitable for use in Integrated Pest Management

Number of applications is unlimited

Seed treatment: Seeds are treated by mixing in with the product.

Dosage: 5 g/kg seed

Purpose: Protection against soilborn phytopathogenic fungi that attack plants at the beginning of vegetation

Germinated plants treatment: Watering with 0.05% suspension of the product

Dosage: 0.05% suspension of the product

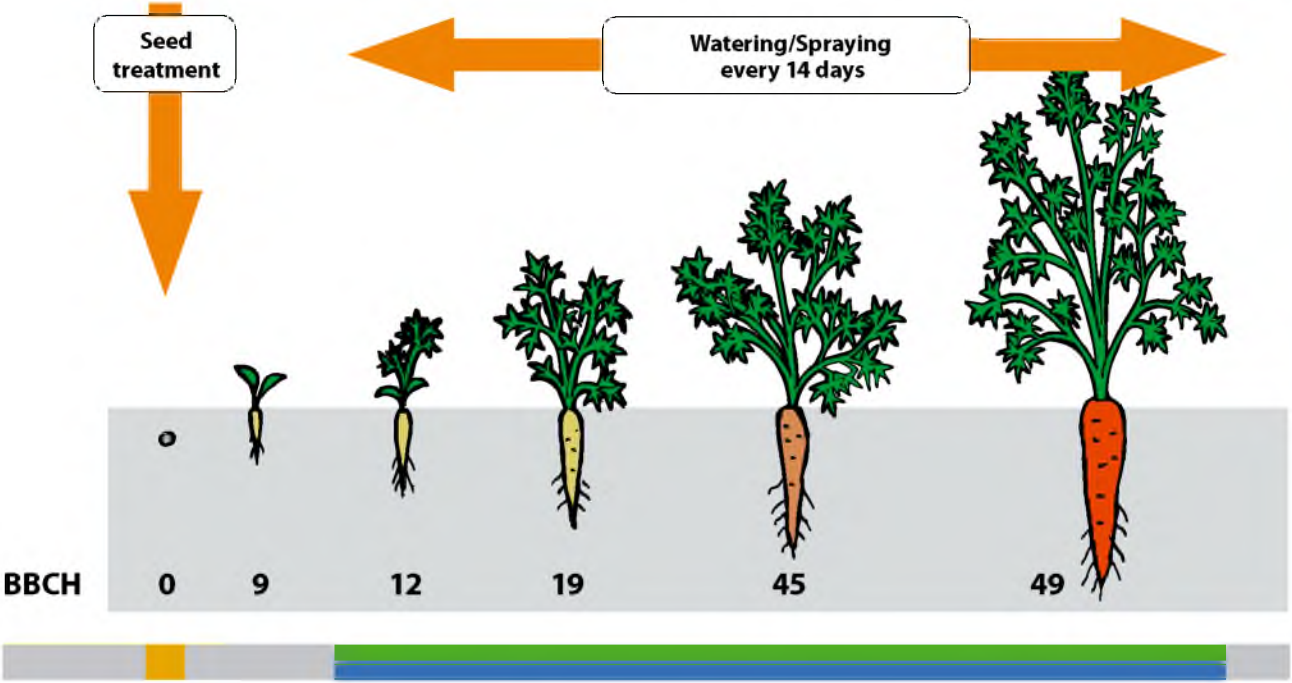
Purpose: Protection against soil phytopathogens and initial support of young plant growth

Application during vegetation: Spraying at the stage of germination or watering – the total number of applications is unlimited

Dosage: 0.1–0.2 kg/ha (according to the crop)

Stage: The beginning of vegetation, during vegetation

Purpose: Protection against leaf and stem root rot



Crop	Target diseases	Dosage	PHI	Remarks
All vegetables	Fungal diseases	5 g/kg	N/A	Seed treatment
Root vegetables	Alternaria Leaf Spot Phoma Root Rot	0.1 – 0.2 kg/ha	0	300 – 800 l water/ha; watering/spraying at the germination stage

Strawberry

Target diseases:

- Red Stele Root Rot (*Phytophthora fragariae*)
- Phytophthora Crown Rot (*Phytophthora parasitica*)
- Grey Mould (*Botrytis cinerea*)
- Leaf spot (*Mycosphaerella fragariae*)
- Anthracnoses (*Colletotrichum* spp.)

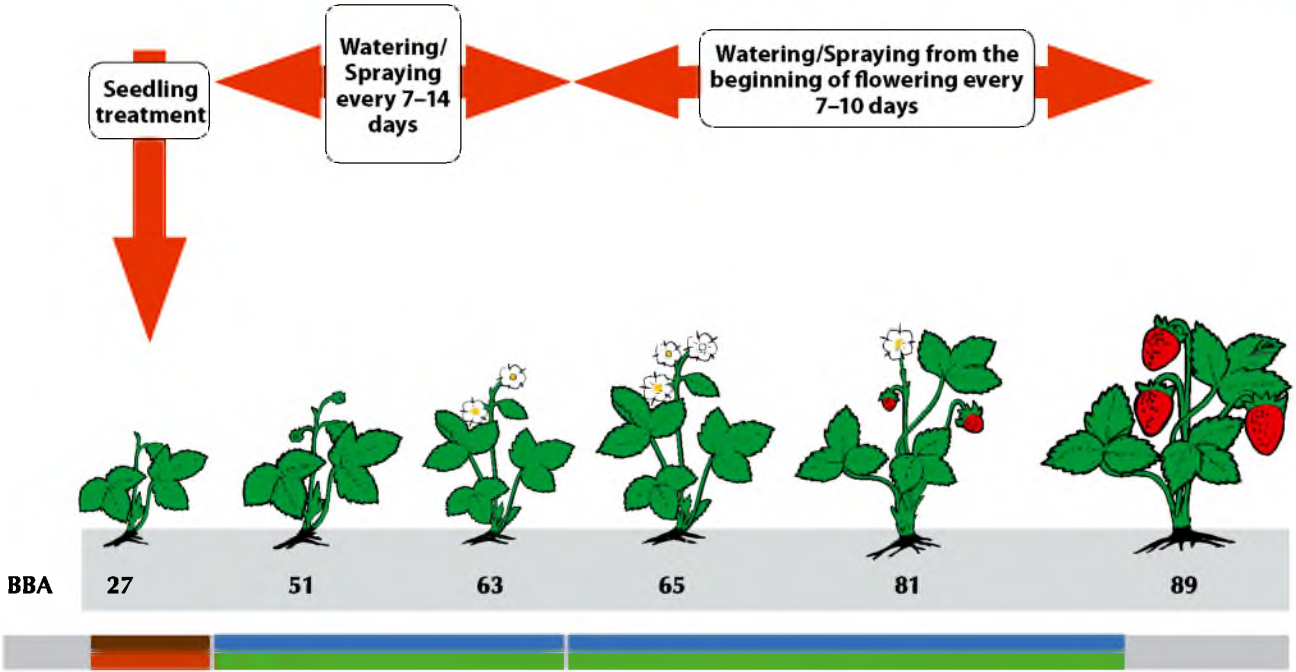
No pre-harvest interval required & fruit consumption is possible immediately after product application
No chemical residues in the fruit
Number of applications is unlimited
Application of the product prior to harvest extends fruit storability

Seedling treatment: Seedlings are dipped in 0.05% suspension of the product or seedling roots are dipped only

Dosage: 0.05% suspension of the product
Purpose: Protection against root rot (*Phytophthora* spp.), improved survival rate and faster development of treated plants

Application during vegetation: Spraying or watering – the total number of applications is not limited by human safety or environmental factors

Dosage: 0.1 kg/ha
Stage: Every 7–14 days from the beginning of vegetation
Purpose: Protection against root rot at the beginning of vegetation and induction of resistance in treated plants. Treatment with Polyversum from the beginning of flowering to harvest time serves to protect the plants against grey mould on fruit and treatment prior to harvest reduces attack of grey mould on harvested fruits



Crop	Target diseases	Dosage	PHI	Remarks
Strawberry	Red Stele Root Rot, Phytophthora Crown Rot	0.05 %	N/A	Dipping of seedlings before planting, watering after planting
	Grey Mould Phytophthora Crown Rot	0.1 kg/ha	0	Unlimited number of spray applications with 300–800 l of water/ha

Grape wine and fruit trees

Target diseases:

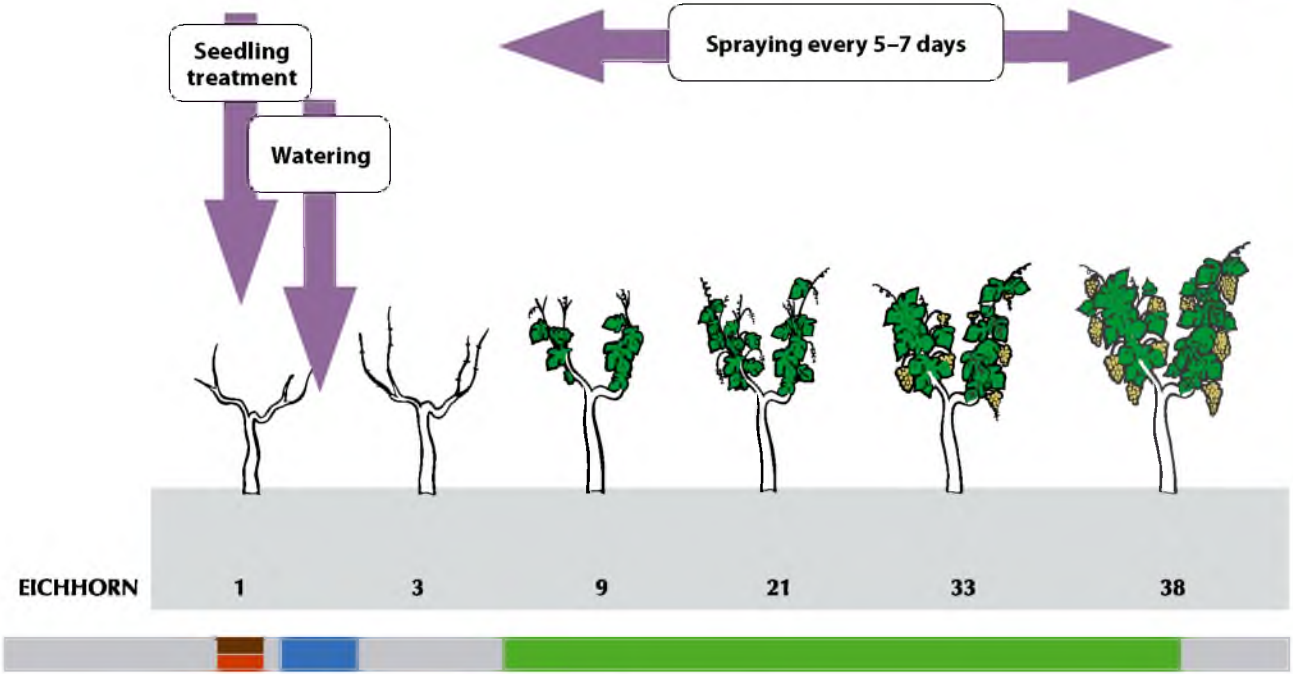
- Fungal diseases of seedlings e. g.:
  - *Pythium* spp.
  - *Fusarium* spp.
  - *Verticillium* spp.
- Grey Mould (*Botrytis cinerea*)
- Downy Mildew (*Plasmopara viticola*)
- Storage diseases

No pre-harvest interval required & fruit consumption is possible immediately after product application
The product can be used in conjunction with root protective hydrogels
Unlimited number of applications

Seedling treatment: The whole seedlings are dipped in 0.05% suspension of the product or the root system is dipped in this suspension. The product can be used together with gel-like preparations for example, seaweed based for better adhesion to plant roots.
Dosage: 0.05% suspension of the product
Purpose: Protection against soil-borne diseases causing root rot. The presence of *Pythium oligandrum* in the root system of the planted trees is growth-stimulating and secondary metabolites induce natural resistance against fungal diseases in grapes. Hereby, ensuring improved and quicker development of treated plant seedlings.

Plant treatment after planting: Watering
Dosage: 0.05% suspension of the product
Purpose: Protection against soil phytopathogenic fungi and plant growth stimulation at the beginning of vegetation

Application during older plants vegetation (for organic agriculture only): Spraying
Dosage: 0.25 kg/ha
Purpose: Protection against phytopathogens (*Botrytis cinerea, Plasmopara viticola*), which may occur from the stage of flowering and induction of resistance



Crop	Target diseases	Dosage	PHI	Remarks
Grape wine	Fungal diseases	0.05 %	N/A	Dipping of seedlings, watering after planting
	Grey Mould Downy Mildew	0.25 kg/ha	0	Spraying from the beginning of sprouting, repeat every 5–7 days (dosage of water 300 – 3 500 l/ha)
Fruit trees	Storage diseases	0.25 kg/ha	0	Spraying from the beginning of sprouting, repeat every 5–7 days (dosage of water 1000 – 3 500 l/ha)

Hop

Target diseases:
- Downy mildew (*Pseudoperonospora humuli*)
- Fungal diseases of hop seedlings
  - *Fusarium* spp.
  - *Verticillium albo-atrum*

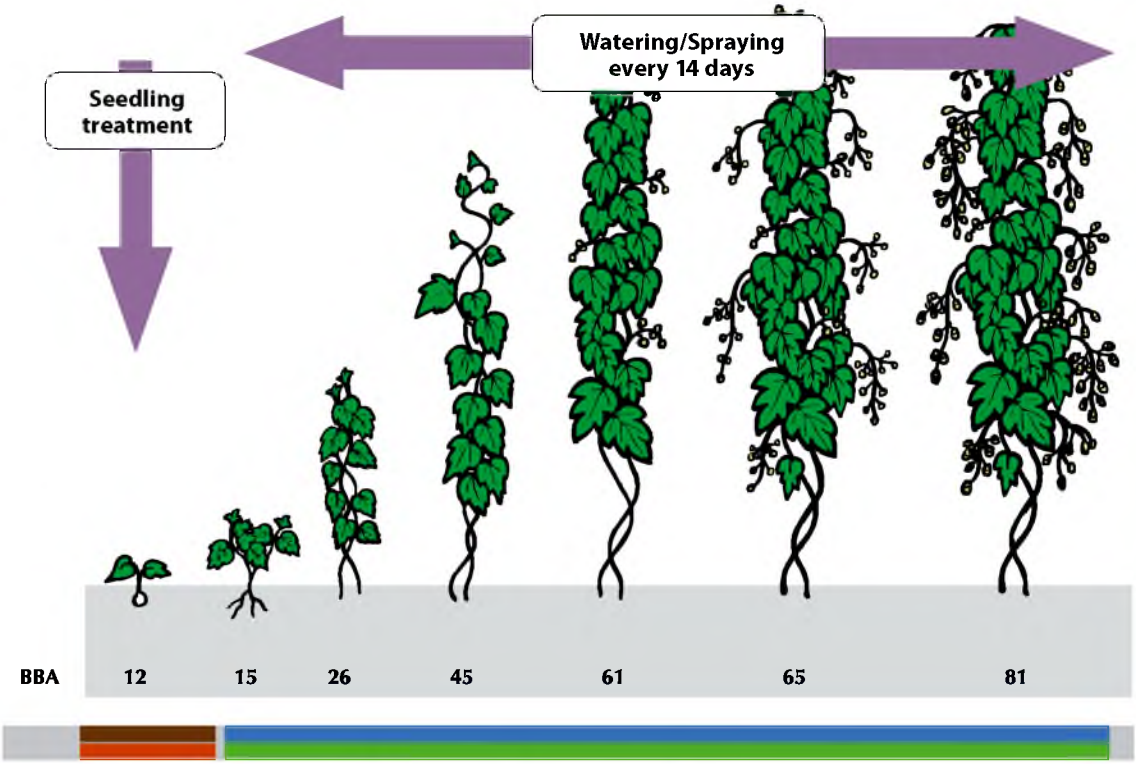
Possibility of using the product with root protective hydrogels simultaneously
It may be applied in conjunction with leaf fertilizers or insecticides
Unlimited number of applications
No pre-harvest interval required

Hop seedling treatment:

a) Growing of hop seedlings: Hop seedlings are dipped in 0.05% suspension (10 g of product/20 l of water) of the product
Dosage: 0.05% suspension of the product
Purpose: To protect the hop seedlings against soil-borne plant pathogens

b) Hops planting: Either the whole hop seedling is dipped in 0.05% suspension of the product or only the seedling root system is dipped in the suspension. The product can be used together with gel-like preparations for example, seaweed based for better adhesion to plant roots.
Dosage: 0.05% suspension of the product
Purpose: Improved survival and quicker development of treated plants.

Application during vegetation: Spraying
Dosage: 0.25 kg/ha
Stage: From the beginning of vegetation at 14 day intervals, depending on disease severity and local conditions
Purpose: Downy mildew (*Pseudoperonospora humuli*) control.



Crop	Target diseases	Dosage	PHI	Remarks
Hop	Downy mildew	0.25 kg/ha	0	700 – 2000 l of water/ha for watering (according to the amount of hop leaf mass)
	Fungal diseases of hop seedlings	0.05 %	N/A	Dipping of seedlings

Golf courses and ornamental lawns

Target diseases:

- Fungal diseases e. g.:
  - Fairy Rings (*Marasmius oreades*)
  - Dollar spot (*Sclerotinia homoeocarpa*)
  - Root Rots:
    - *Fusarium* spp.
    - *Pythium* spp.

Seed treatment: Seeds are treated by mixing in with the product. When larger quantities of seeds are needed, wet seed dressing can be used in all common types of seed dressing machines. The dose is 0.5 kg of the product/100 kg of seeds dispersed in 10 litres of water. Application of this suspension must be performed immediately after mixing to prevent premature oospore germination.

Dosage: 5 kg seed

Purpose: Protection against soil phytopathogens and initial support of young plant growth.

Application during vegetation: Spraying or watering – the total number of applications is not limited by human safety or environmental factor concerns

Spring application

Dosage: 0.2 kg/ha

Stage: Spring (at temperatures of at least 10 °C): ornamental lawns and fairways 2 applications (according to disease pressure) in the interval of one month; greens and tees 3 or more applications at 14-day intervals

Purpose: Suppression of fungal disease agents and stimulation of grass growth.

Autumn application

Dosage: 0.2 kg/ha

Stage: Autumn (at temperatures of at least 10 °C): ornamental lawns and fairways 1 application; greens and tees 2 or more applications in 14-day intervals

Purpose: Preventive liquidation of fungal disease agents prior to winter

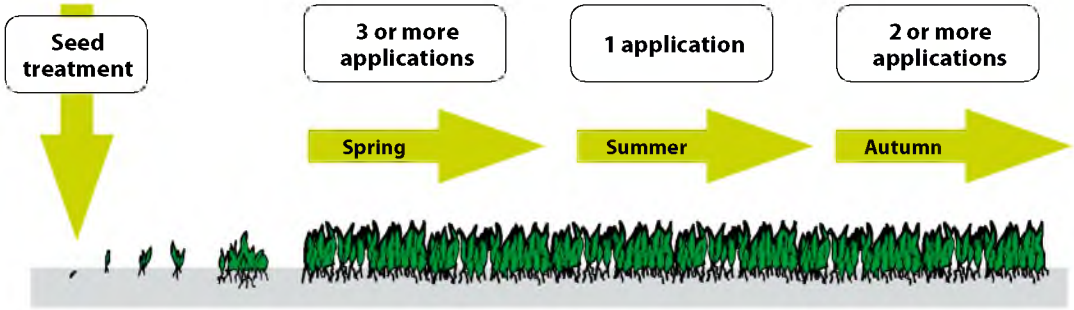
Summer application

Dosage: 0.2 kg/ha

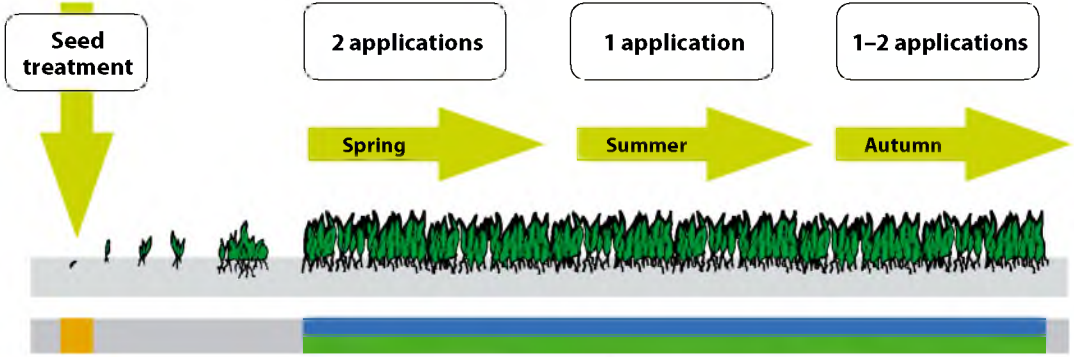
Stage: Summer: ornamental lawns and fairways 1 application (June); greens and tees 2 or more applications in 14-day intervals (June–August)

Purpose: Fungicidal treatment against fungal pathogens, induction of resistance to fungal diseases and growth stimulation.

GREENS and TEES:



FAIRWAYS and ORNAMENTAL LAWNS:



Crop	Target diseases	Dosage	Remarks
Golf courses and ornamental lawns	Fungal diseases	0.2 kg/ha	Watering/Spraying with 300–800 l of water/ha
	Fungal diseases	5 g/kg	Seed treatment

Forest and ornamental nurseries

Target diseases:

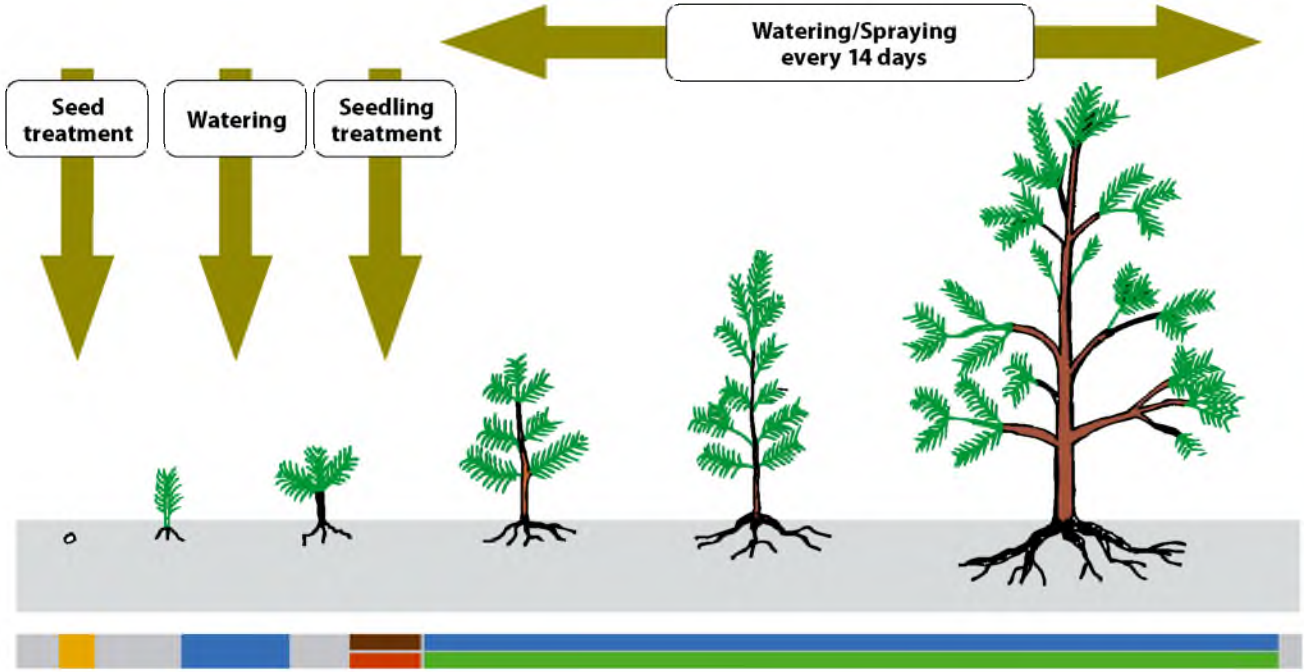
- Complex of soil fungal diseases attacking the roots and root bases e.g.:
  - *Pythium* spp.
  - *Fusarium* spp.
  - *Botrytis cinerea*
  - *Sclerotinia* spp.
  - *Verticillium* spp.
  - *Alternaria* spp.

Seed treatment: Dry seeds are treated by mixing with the product.
Dosage: 5 g/kg seed
Purpose: Control of soil pathogenic fungi, which can attack plants at the beginning of vegetation.

The seedling treatment before planting: dipping of seedling root ball just before planting (alternatively seedling trays can be dipped in 0.05% suspension)
Dosage: 0.05% suspension of the product
Purpose: Protection against root rot

Plant treatment at the beginning of vegetation: watering with 0.05% suspension of the product
Dosage: 0.05% suspension of the product
Purpose: initial support of young plant growth and protection against soil phytopathogens.

Application during vegetation: watering or spraying
Dosage: 0.25 kg/ha
Stage: every 7–14 days from the beginning of vegetation, according to the forecast of fungal disease occurrence
Purpose: Protection against fungal diseases.



Crop	Target diseases	Dosage	Remarks
Forest and ornamental nurseries	Fungal diseases	5 g/kg	Seed treatment
	Fungal diseases	0.05 %	Root dipping
	Fungal diseases	0.25 kg/ha	Spraying/Watering (300 – 800 l of water/ha)

Ornamental plants

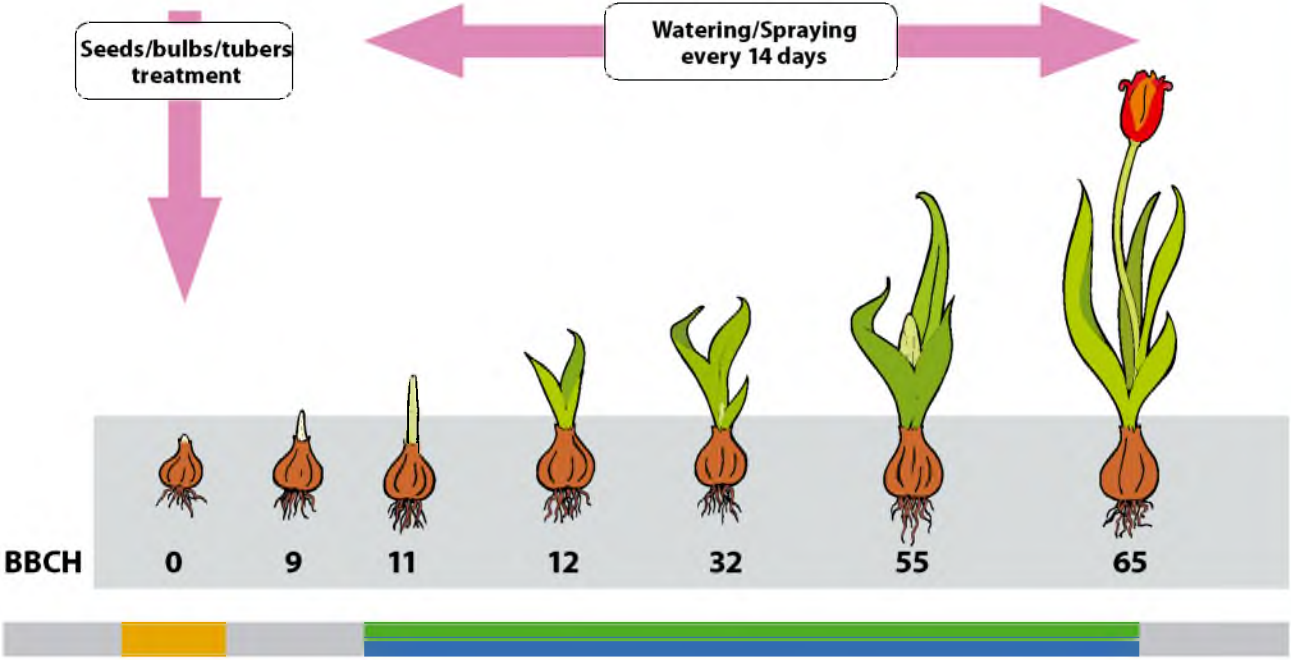
Target diseases:

- Complex of soil fungal diseases attacking the roots and root bases e.g.:
  - *Pythium* spp.
  - *Fusarium* spp.
  - *Botrytis cinerea*
  - *Sclerotinia* spp.
  - *Verticillium* spp.
  - *Alternaria* spp.

Seed treatment: Seeds/bulbs/tubers are treated by mixing with the product.
Dosage: 5 g/kg seed/bulbs/tubers
Purpose: Control of soil pathogenic fungi, which can attack plants at the beginning of vegetation.

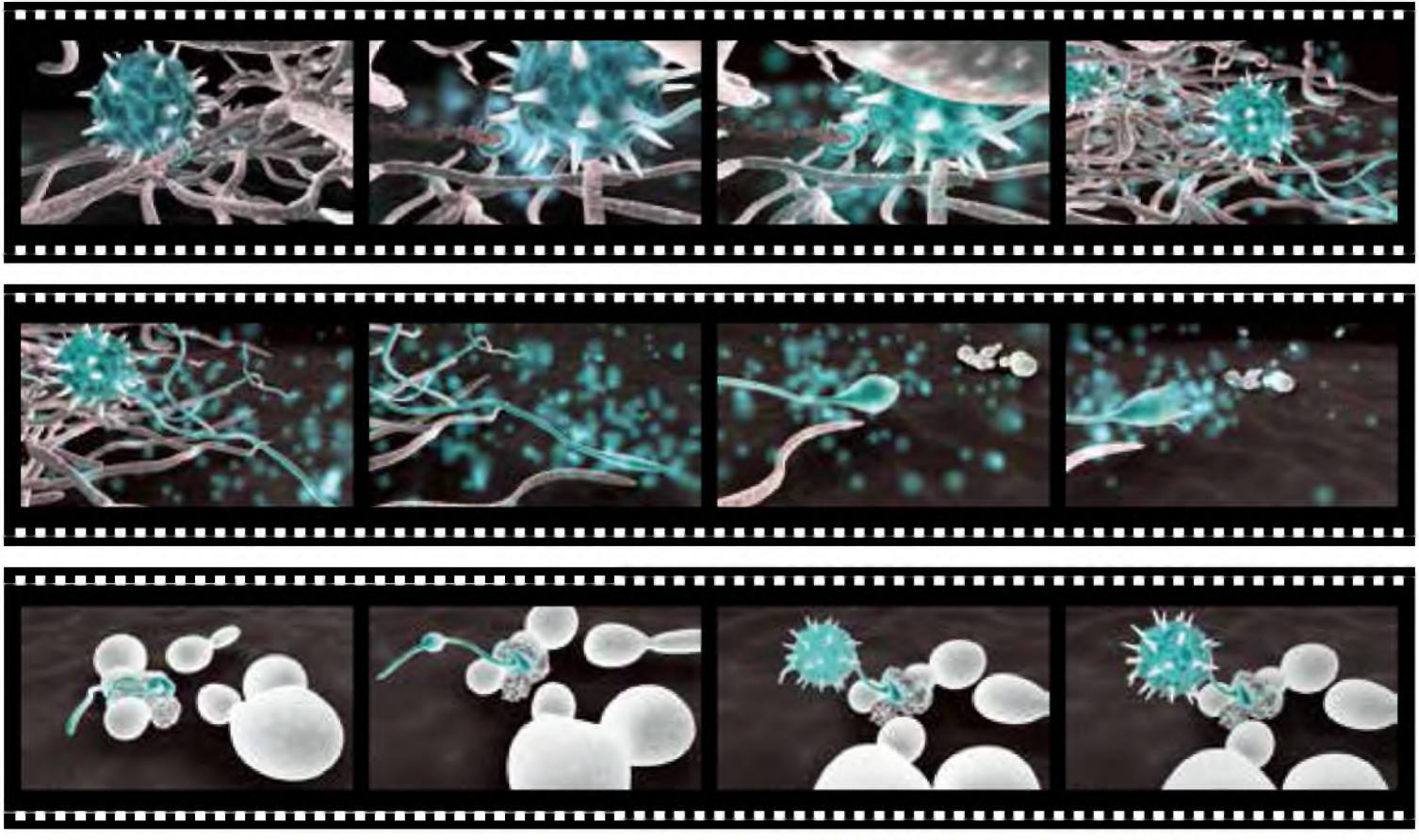
Application during vegetation:
Spraying
Dosage: 0.25 kg/ha
Stage: every 7–14 days from the beginning of vegetation
Purpose: Protection against fungal diseases.

Watering
Dosage: 0.05% suspension of the product
Stage: every 7–14 days from the beginning of vegetation
Purpose: Protection against fungal diseases.



Crop	Target diseases	Dosage	PHI	Remarks
Ornamental plants	Fungal diseases	5 g/kg	N/A	Seed/bulbs/tubers treatment
	Fungal diseases	0.25 kg/ha	N/A	Spraying/Watering (300 – 800 l of water/ha)

Pythium oligandrum



Office & mailing address:
BIOPREPARÁTY, spol. s r. o.
Na Viničních horách 37
160 00 Praha 6, Czech Republic
+420 212 240 409
+420 608 208 649

Headquarters:
BIOPREPARÁTY, spol. s r.o.
Únětice 150
252 62 Horoměřice, Czech Republic
www.biopreparaty.eu
www.polyversum.eu

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www.biopreparaty.eu
biopreparaty@biopreparaty.eu