

MYCOFRIEND

MYCORRHIZA FOR YOUR FIELD AND GARDEN

- **ROOT COLONIZATION** by mycorrhizal fungi
- **PROVISION** of balanced mineral nutrition
- **INCREASE IN THE AREA** of absorption of the root system



MYCOFRIEND – WHAT YOU NEED TO KNOW ABOUT

MYCOFRIEND is a complex mycorrhizal preparation for plant nutrition and improving soil health. It facilitates the colonization of the root zone and rhizosphere with mycorrhizal fungi and saprophytes, rhizospheric bacteria, increases resistance to stressful situations and intensifies metabolism.

Mycorrhiza is a symbiotic association between plant roots and fungi. Their major role is to enhance nutrient and water uptake by the host plant by exploiting a larger volume of soil than roots alone can do.

Competitive advantages:

- Root colonization by mycorrhizal fungi
- Increase in the area of absorption of the root system
- Provision of balanced mineral nutrition
- Water retention

MYCOFRIEND is available in liquid and peat forms.

Certified for organic farming



- Listed in the Input list for organic farming in Germany.
- The product is confirmed by Organic Standard Certification (approved for the use in organic agriculture according to the IACB Equivalent Union Organic Production & Processing Standard for Third Countries to the Regulations EU №834/2007 and №889/2008).

More than 150 000 ha is treated with Mycofriend worldwide

We provide more than 220 researches every year:

- **individual** – more than **175**
- **with other biological products** – more than **45**, including **72** at research stations



83% of farmers have positive results, where income covers application cost



Average additional income per ha is more than **125 \$**

The average incomes per hectare and yields increasing are demonstrated in the sheet.

| | Trial | | Income, \$/ha | | Increase, t/ha | |
|-------------------|-------|--------------|---------------|---------|----------------|---------|
| | total | % successful | Average | Maximum | Average | Maximum |
| Cereals | 65 | 74 | 107 | 397 | 0,35 | 1,28 |
| Corn | 68 | 84 | 137 | 433 | 0,53 | 1,68 |
| Sunflowers | 33 | 85 | 137 | 290 | 0,19 | 0,41 |
| Legumes | 24 | 92 | 165 | 400 | 0,33 | 0,90 |

HOW DOES IT WORK?

The composition of Mycofriend includes the vital microorganisms:

- A complex of mycorrhiza-forming fungi — *Glomus* and *Trichoderma harzianum*;
- microorganisms supporting the formation of mycorrhiza and plant rhizosphere: *Streptomyces sp.*, *Pseudomonas Fluorescens*;
- phosphate-mobilizing bacteria: *Bacillus Megaterium var. phosphaticum*, *Bacillus Subtilis*, *Bacillus Mucilaginosus*, *Enterobacter sp.*, the total number of viable cells $(1.0-1.5) \times 10^8$ CFU/ml;
- bacteria biologically active metabolites: phytohormones, vitamins, amino acids.

In the composition of the preparation fungi of the genus *Glomus* provide the formation of highly effective endomycorrhiza, fungi of the genus *Trichoderma* can form ectomycorrhiza, and the bacterial component promotes the development of the root system, in particular, stimulates the formation of mycorrhiza



Watch the video about mycorrhiza in cultivated plants, an episode of the free course for agronomists "SIMPLY ABOUT MICROBES".



The effect of each microorganism:



Fungi of the genus *Glomus* — provide assimilation of nutrients (mainly phosphorus and nitrogen-containing) from the soil, contribute to the survival of plants under adverse environmental conditions. In turn, plants supply carbohydrates and lipids to arbuscular mycorrhizal fungi.



Trichoderma harzianum — fungi that actively colonize soil and contribute to the rapid decomposition of plant residues, and also produce biologically active substances.



Bacillus subtilis — bacteria that can fix molecular nitrogen; mobilize phosphorus, produce enzymes for the degradation of complex organic compounds of the soil and their transformation into forms accessible to plants (humus, etc.).



Enterobacter — bacteria that can bind atmospheric nitrogen, improve plant phosphorus, produce phytohormones, biopolymers.



Bacillus megaterium var. phosphaticum — produce various biologically active substances that stimulate the growth and development of plants.



Bacillus mucilaginosus — absorb nitrogen from the atmosphere, and phosphorus and silicon from the corresponding minerals. They are able to partially solubilize difficultly soluble potassium and phosphorus from minerals containing these elements, which allows the use of this microorganism as a bacterial fertilizer.



Pseudomonas fluorescens get into the soil, inhabit the root system, release siderophores and growth-stimulating substances. The amount of useful microbiota grows.



GENERAL RECOMMENDATIONS



The preparation can be used:

- 1.5 - 5 l/t **for pre-sowing seed treatment**
- 1.5 - 5 kg/t **for seed treatment in a seeder**
- 0.2-0.5 l/ha **application in a row at the time of sowing.**



The use of Mycofriend at a rate of 1.5 l/t **steadily increases the yield of winter wheat, sunflower and corn, regardless of the fertilizer system.**



The use of Mycofriend at a rate of 1.5 l/t can be combined with inoculants **for legumes, which increases the yield of legumes**



For corn and sunflower, the use of Mycofriend in furrow application with a rate of 0.2-0.3 l/ha, provides a stable increase in yield. Can be combined with other biological preparations and LCF.

RECOMMENDED APPLICATION RATES IN INTEGRATED AND ORGANIC FARMING

| Crop | Seed treatment, l/t | | Row fertilization, fertigation, l/ha | | Seedling treatment, l/1000 pcs | |
|----------------------|----------------------|-----------------------|--------------------------------------|------------------------|--------------------------------|------------------------------|
| | MYCOFRIEND, l/t | Working solution, l/t | MYCOFRIEND, l/ha | Working solution, l/ha | MYCOFRIEND, l/1000 pcs | Working solution, l/1000 pcs |
| | Number of treatments | | | | | |
| | 1 | | 1-2 | | 1 | |
| Cereals | 1.0-1.5 | 10-15 | | | - | - |
| Corn | 3.0-5.0 | 5-10 | 0.2-0.5 | 20-50 | - | - |
| Technical | 4.0-6.0 | 10-20 | | | - | - |
| Legumes | 1.0-1.5 | 15-20 | | | - | - |
| Vegetables | 20-30 ml/kg | 0.7-1.0 l/kg | 0.5-1.0 | | 0.2-0.5 | 20-50 |
| Horticultural | - | - | | Water application rate | - | - |
| Berries | - | - | 1.0-2.0 | | - | - |

INDUSTRIAL AND SCIENTIFIC TRIALS

+ 0,23 t/ha
+ 0,25 t/ha
+ 0,18 t/ha

+ 0,29 t/ha

Location: **Institute of agriculture of Steppe zone NAAS of Ukraine**

Crop: **sunflower**

Predecessor: **corn for grain**

Soil agrochemical properties:

Level of humus content – 4,72 %

Alkaline hydrolyzable nitrogen – 10,4

Soil available phosphorus and potassium – **19,1 and 14,2 mg per 100 g of soil**

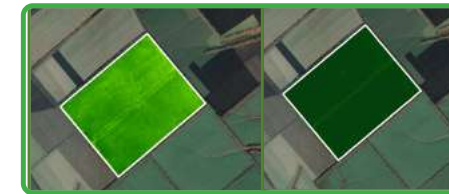


Location: **Ukraine, Kahrkiv region**

Crop: **sunflower**

Predecessor: **winter wheat**

Soil: **typical chernozem**



The effectiveness of Mycofriend on sunflower depending on the level of mineral nutrient content

Trial 1. Without fertilizer

The seeds treatment

Control: –

Trial: Mycofriend 5 l/t

| | Yield, t/ha | Increment over control, t/ha | % |
|---------|-------------|------------------------------|------------|
| Control | 3,65 | – | – |
| Trial | 3,88 | 0,23 | 6,3 |

Trial 2. Mineral fertilizers N₄₀P₄₀K₄₀

The seeds treatment

Control: Only mineral fertilizers N₄₀P₄₀K₄₀

Trial: Mycofriend 5 l/t

+ Mineral fertilizers N₄₀P₄₀K₄₀

| | Yield, t/ha | Increment over control, t/ha | % |
|---------|-------------|------------------------------|-------------|
| Control | 3,99 | – | – |
| Trial | 4,24 | 0,25 | 6,26 |

Trial 3. Organic – mineral fertilizers N₄₀P₄₀K₄₀

The seeds treatment

Control: Only organic - mineral fertilizers N₄₀P₄₀K₄₀

Trial: Mycofriend 5 l/t + Organic - mineral fertilizers N₄₀P₄₀K₄₀

| | Yield, t/ha | Increment over control, t/ha | % |
|---------|-------------|------------------------------|-------------|
| Control | 4,15 | – | – |
| Trial | 4,33 | 0,18 | 4,33 |

In furrow Experience in 3-fold repetition. Seeding with GPS fixation.

Control: LCF Diafan 5:20:5 (30 l/ha).

Trial: Mycofriend-l 0.25 l/ha + LCF Diafan 5:20:5 (30 l/ha).

The average increase – +0,29 t/ha



+ 0,28 t/ha
+ 0,80 t/ha

+ 0,89 t/ha
+ 0,80 t/ha

Location: **Ukraine, Poltava region**
Crop: **sunflower**
Soil: **typical chernozem**



Location: **Ukraine, Vinnitsa region**
Crop: **corn**
Predecessor: **sugar beat**
Soil: **chernozem**



In furrow
Control: –
Trial: Mycofriend 0,2 l/ha

| | Yield, t/ha | Increment over control, t/ha | % |
|---------|-------------|------------------------------|--------------|
| Control | 2,34 | – | – |
| Trial | 2,62 | 0,28 | 11,96 |



In furrow
Control: –
Trial: Mycofriend 0,2 l/ha

| | Yield, t/ha | Increment over control, t/ha | % |
|---------|-------------|------------------------------|-------------|
| Control | 12,1 | – | – |
| Trial | 12,9 | 0,89 | 7,35 |

Location: **Haren (Ems), Germany**
Crop: **corn**
Soil: **Gleysols**



In furrow
Control: –
Trial: Mycofriend 5 l/t

| | Yield, t/ha | Increment over control, t/ha | % |
|---------|-------------|------------------------------|-------------|
| Control | 12,7 | – | – |
| Trial | 13,5 | 0,8 | 6,29 |

Location: **Ukraine, Sumy region**
Crop: **corn**
Fore **corn for grain**
Soil: **chernozem podzolized**



Seed treatment in seeder
Date of sowing 30.04.21
Control: –
Trial: Mycofriend-t 4kg/t

| | Yield, t/ha | Increment over control, t/ha | % |
|---------|-------------|------------------------------|-------------|
| Control | 7,89 | – | – |
| Trial | 8,7 | 0,8 | 7,35 |

+ 0,62 t/ha
+ 0,25 t/ha

+ 0,07 t/ha
+ 0,12 t/ha
+ 0,43 t/ha

Location: **Institute of agriculture of Steppe zone NAAS of Ukraine**

Crop: **winter wheat**

Predecessor: **fallow**

Soil agrochemical properties:

Level of humus content – 4,72 %

Alkaline hydrolyzable nitrogen – 10,4

Soil available phosphorus and potassium – **19,1 and 14,2 mg per 100 g of soil**



Location: **Institute of agriculture of Steppe zone NAAS of Ukraine**

Crop: **soybean**

Soil agrochemical properties:

Level of humus content – 4,72 %

Alkaline hydrolyzable nitrogen – 10,4

Soil available phosphorus and potassium – **19,1 and 14,2 mg per 100 g of soil**



The effectiveness of Mycofriend on winter wheat depending on the level of mineral nutrient content

Trial 1. Without mineral fertilizers

The seeds treatment

Control: –

Trial: Mycofriend 1,5 l/t

| | Yield, t/ha | Increment over control, t/ha | Increment over control, % |
|---------|-------------|------------------------------|---------------------------|
| Control | 3,78 | – | – |
| Trial | 4,4 | 0,62 | 16,4 |

Trial 2. With mineral fertilizers N₉₀P₆₀K₆₀

The seeds treatment

Control: Only mineral fertilizers N₉₀P₆₀K₆₀

Trial: Mycofriend 1,5 l/t + mineral fertilizers N₉₀P₆₀K₆₀

| | Yield, t/ha | Increment over control, t/ha | Increment over control, % |
|---------|-------------|------------------------------|---------------------------|
| Control | 4,59 | – | – |
| Trial | 4,84 | 0,25 | 5,45 |

Trial 3. With organic – mineral fertilizers N₉₀P₆₀K₆₀

The seeds treatment

Control: Only organo – mineral fertilizers N₉₀P₆₀K₆₀

Trial: Mycofriend 1,5 l/t + organic-mineral fertilizers N₉₀P₆₀K₆₀

| | Yield, t/ha | Increment over control, t/ha | Increment over control, % |
|---------|-------------|------------------------------|---------------------------|
| Control | 4,87 | – | – |
| Trial | 5,35 | 0,48 | 9,86 |

The effectiveness of Mycofriend on soybean depending on the level of mineral nutrient content

Trial 1. Without mineral fertilizers

Control: Background (Rizoline 2l/t+ Rizosave 1 l/t)*

Trial: Mycofriend 1,5 l/t + Background (Rizoline 2l/t+ Rizosave 1 l/t)

| | Yield, t/ha | Increment over control, t/ha | Increment over control, % |
|---------|-------------|------------------------------|---------------------------|
| Control | 2,55 | – | – |
| Trial | 2,62 | 0,07 | 2,7 |

Trial 2. With mineral fertilizers N₄₀P₄₀K₄₀

The seeds treatment

Control: Background (Rizoline 2l/t + Rizosave 1 l/t) + Mineral fertilizers N₄₀P₄₀K₄₀

Trial: Mycofriend 1,5 l/t + Background (Rizoline 2l/t + Rizosave 1 l/t) + Mineral fertilizers N₄₀P₄₀K₄₀

| | Yield, t/ha | Increment over control, t/ha | Increment over control, % |
|---------|-------------|------------------------------|---------------------------|
| Control | 2,73 | – | – |
| Trial | 2,85 | 0,12 | 4,39 |

Trial 3. With organic – mineral fertilizers N₄₀P₄₀K₄₀

The seeds treatment

Control: Background (Rizoline 2l/t + Rizosave 1 l/t) + Organic-mineral fertilizers N₄₀P₄₀K₄₀

Trial: Mycofriend 1,5 l/t + Background (Rizoline 2l/t+ Rizosave 1 l/t) + Organic-mineral fertilizers N₄₀P₄₀K₄₀

| | Yield, t/ha | Increment over control, t/ha | Increment over control, % |
|---------|-------------|------------------------------|---------------------------|
| Control | 2,6 | – | – |
| Trial | 2,98 | 0,43 | 16,53 |

*- Background includes inoculant Rizoline and bioprotector Rizosave

+ 0,38 t/ha
+ 0,80 t/ha

+ 0,99 t/ha

Location: **Ukraine, Zhytomyr region**
Crop: **winter wheat**
Predecessor: **sunflower**
Soil: **dark-grey**



Location: **Ukraine, Chercasy region**
Crop: **potato**
Predecessor: **winter wheat**
Soil:
Date of sowing: 14.05.2019
Date of harvesting: 13.09.2019



Control: –
Trial: Mycofriend-t 2kg/t

| | Yield, t/ha | Increment over control, t/ha % | |
|---------|-------------|--------------------------------|-------------|
| Control | 4,8 | – | – |
| Trial | 5,18 | 0,38 | 7,91 |

Treatment with an applicator during planting 23.04.2021
Trial: Farm technology + Mycofriend – 0.5l/ha

| | Yield, t/ha | Increment over control, t/ha % | |
|---------|--------------|--------------------------------|-------------|
| Control | 71,56 | – | – |
| Trial | 72,55 | 0,99 | 1,38 |

MYCOFRIEND. EFFICIENCY STUDY OF HAZELNUT GROWN BY LAYERING

The effectiveness of Mycofriend application was studied with different methods of hazelnuts layering using sawdust as a substrate

Location: **Ukraine, Zhytomyr region**
Crop: **soybean**
Predecessor: **winter wheat**
Soil:
Date of sowing: 14.05.2019
Date of harvesting: 13.09.2019



WITH A VERTICAL METHOD OF SHOOTS GROWING:

variety Praznichnyi + MycoFriend:
20.5 pieces / Parent plant
Per 1 ha – 455,5 thousand pieces/ha
Sawdust: 231.1 thousand pieces/ha

Result +224,4 thousand pieces/ha

WITH A HORIZONTAL METHOD OF SHOOTS GROWING:

variety Praznichnyi + MycoFriend:
39,2 pcs. / running meter
Per 1 ha – 261.3 thousand units/ha
Sawdust: 229.3 thousand pieces/ha

Result +32 thousand pieces/ha

MYCOFRIEND is relevant for garden and vegetable crops. Both consumers buy the product very well both, for garden and vegetable crops. Especially those who have drip irrigation. Of a high importance for them that trees and bushes are extremely strongly responsive to mycorrhiza. Mycofriend is an excellent solution for provision of balanced mineral nutrition and to increase the area of the nutrients absorption by root system.




Control: (Optimize + Maxim XL)
Trial: Mycofriend 1 l/t + Control (Optimize + Maxim XL)

| | Yield, t/ha | Increment over control, t/ha % | |
|---------|-------------|--------------------------------|-----------|
| Control | 2,0 | – | – |
| Trial | 2,8 | 0,80 | 40 |

Manufacturer:


BTU-CENTER, Ukraine


 btu-center.com

 +38 097 941 1123

Office in Germany:

BTU-CENTER, Europe GmbH

 btu-center.de

 +49 593 2902 536



btu-center.de



btu-center.com/en/