

## BTU CENTER - BIOTECHNOLOGY WITHOUT LIMITS

BTU-Center, a leading Ukrainian producer of high-analysis microbial drugs held annual scientific conference "Biotechnology without Limits" in Kyiv and traditionally in Ladyzhyn.

Agronomists, heads of farms from different parts of Ukraine visited us. Visitors learnt the reports on the use of biological products of Zhyva Zemlya TM, and reports from scientists UkrNDIPVT (Ukrainian Research Institute of Forecasting and Testing of Equipment and Technologies for Agricultural Industry) named after L.Pohorilyi, Institute of Agriculture of Ukraine, Mykolaiv National Agrarian University and Volyn Research Station.

Agronomists of BTU-Center	Valentyna Antonivna Bolokhovska, Prospects and Development Director, Candidate of Tech Sciences, Winner of the State Prize in the field of science and technology
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The conference was opened by Prospects and Development Director of BTU-Center, Valentyna Antonivna Bolokhovska, who spoke about the state of Ukrainian soils and emerging problems and ways to address them with the help of microbial drugs. Valentyna Antonivna explained that the aftermath of microbial drugs is felt from the very beginning: the earth revives and the class of products increases. For example, the gluten content increases in wheat, protein – in the soybeans... In addition, such grain will have higher quality when stored, because it does not develop fusariosis.

In 2016, BTU Center celebrated 17th anniversary. It is 17 years of development, quality and success. And today it is more than 25 preparations that have undergone state registration. These are bioactive agents, biofungicides, bioinsecticides, biodiversity and protection for each individual cultures, bio-adherents, bio-inoculants, biodecomposers, biopreparations for composting cattle, pigs and chicken litter. In the certified BTU-Center laboratory, the company's experts carefully select those strains of microorganisms that match each individual preparation the best.

Oleksandr Slobodyanyuk, BTU-Center agronomist, presented a novelty - **soil organic fertilizer Groundfix®, which not only improves the assimilation of the elements of plant nutrition, but also enables to accumulate in the soil significant amounts of NPK.**

The basis of Groundfix® organic fertilizer is silicate and active strains of potassium and phosphorus-metabolizing bacteria, naturally occurring endophytic and soil nitrogen fixing microorganisms. In addition, Groundfix® contains other beneficial microflora, as well as vitamins, phytohormones, enzymes, amino acids, and the like. Nitrogen fixers bind free nitrogen in the air in the amide form and enzymatically convert organogenic nitrogen-containing substances into nitrates available to plants. At the same time, other bacteria dissolve insoluble mineral compounds P, K in organic and mineral acids, and more complex organic compounds are included in the activity of microorganisms and through alkaline phosphatases and other enzymes are converted into forms that are available to plants.

"But the main thing - Groundfix® allows accumulating NPK in the soil, the volume of which depends on the rate of application: "Yes, to increase the fertilizer absorption coefficient of mineral fertilizers, reduce their application rates by 30-50% and accumulate N20-40 R15-25 K15- in the soil we recommend to apply the preparation in the rate of 3-5 l/ha, - says Oleksandr

Slobodyanyuk. - To reduce the amount of mineral fertilizers to the preplant rate or for organic farming and accumulation of N90-120, P50-70 K40-50 - 8-10 l/ha."

According to the expert, the Groundfix® should be applied in the spring before the cultivation, but it can also be applied in a row or under plowing up to 25 cm.

Potential is good, but how does Groundfix® work in practice? Oleksandr Slobodyanyuk said that in 2015 large-scale field experiments of the preparation were conducted, which showed, in particular, the following results.

KHMELNYTSK REGION. Branch of SFC "Ridnyi Krai". Groundfix® 5 l/ha was introduced in a tank mixture with a soil herbicide and Liposam® biodegradable on sunflower seeds. During the growing season in the experimental option, plants had a larger root system for control, and in harvesting yield by 5.78 hwt/ha higher was obtained.

CHERKASY REGION. SC "Uman-Agro". Only nitrogen fertilizers (ammonium sulfate 80 kg/ha, carbamide 40 kg/ha) and Groundfix® were normally applied at a rate of 10 liters per hectare after sowing of corn kernels. During the growing season, more and more mineral and alkaline hydrolysed nitrogen was recorded in comparison with the control. At the same time, its volumes in the soil, as well as potassium, were constantly increasing. Upon harvest 5 hwt/ha were added to the yield.

MIKOLAYIV REGION. "Oberig". Groundfix® was applied on a sunflower in a mixture with a soil herbicide at a rate of 3 l/ha, 5 l/ha and 8 l/ha. On the control - nitro-amphospax 220 kg/ha. As a result, Groundfix® gave a yield increase of 3 hwt/ha, 5 hwt/ha and 10 hwt/ha, respectively, as compared with control.

The second novelty was the first in Ukraine ground biofungicide with a powerful fungicidal, bactericidal and therapeutic action - MikoHelp®.

MicoHelp® contains high concentration of the most active strains of *Bacillus subtilis*, *Azotobacter*, *Enterobacter*, *Enterococcus* bacteria, saprophytic fungi - antagonists of *Trichoderma* genus and biologically active products of life: enzymes, vitamins, phytohormones, amino acids, fungicidal substances, etc.

"Due to such a combination of microorganisms, MicoHelp® strongly suppresses a wide range of pathogens, including *Fusarium*, *Phytophthora*, *Pythium*, *Rhizoctoria*, *Sclerotinia*, *Verticillium*, etc.", emphasized Volodymyr Bilko, director of the Vinnytsia representative office of BTU-Center. - Moreover, microorganisms and their metabolites have a positive effect on the condition of plants, which ensures their healthy growth and development."

MikoHelp® action against the disease can be exemplified by one of its components: *Trichoderma* fungus. Having found scleriosis of the pathogen, it grows into it with its hyphae, tears it apart and digests. Simply put, this preparation is a concentrate of natural enemies of pathogens.

According to the BTU-Center expert, MikoHelp® is very flexible in terms of application methods. This may be pre-sowing seed treatment in the normal rate of 1,0,0-3,0 l/ton for grains and industrial crops and 1,0-2,5 l/ton for legumes (if combined with the protectant, then it should have a lower effect against microorganisms), it is possible to plow it or not in the ground together with soil herbicides, as well as to spray plants during the period of vegetation with the

normal rate of 0.7-2.0 l/ha for grains, 0.7 -2.5 l a for legumes and 1.0-2.5 l/ha for industrial crops.

"However, MikoHelp® saturates the root system of the plant with an active microflora, which not only protects the roots, but also stimulates their growth. Thus, in particular, certain bacteria secrete mucus that retains moisture in the soil. And at the same time it is available to plants. In addition, it raises the classroom of agricultural products, removes phytotoxicity and fungicidal loading from the field ", - adds Volodymyr Bilko.

Last year, MikoHelp® effectiveness was verified by numerous laboratory experiments at the NSC "Institute of Agriculture of NAAS", whose results were shared by Candidate of Biological Sciences, Director of Scientific Research, Tamara Vinnichuk, head of Pests and Disease Control Department.

"We studied MicoHelp® effectiveness in different rates for seed treatment," she says. - In particular, for the use of MikoHelp® in the rate of 2.0 l/ton on winter wheat, the level of protection against bacterial infections was 94% and the same amount from fungal. At the same time, the grain germination energy was 91%, and the emergence rate was 97%. In addition, MikoHelp® 94% protects soybeans from pathogenic fungi and 100% - from bacterial diseases. The germinating energy of beans was 72%, and the emergence rate was 99%."

Olga Kulinich, an agronomist of the BTU-Center, spoke about new possibilities of LIPOSAM® adhesion. Namely, the joint use with soil herbicides. **Liposam® fixes the herbicide in the upper layer of soil, prevents rinsing against the depth of culture sprouting, improves the absorption of herbicides in the upper layers of the soil, reduces the disturbance of crops, prolongs the period of protective action for the crop.**

Furthermore, the conference guests got acquainted with the long-term research on the use of stubble biodecomposers of Zhyva Zemlya TM, with biotechnology for growing soya and other legume cultures. They had an opportunity to communicate with their colleagues and exchange practical experience in using microbial drugs. They participated in the creative project - "grew grain" on canvas.

Guests of the Scientific and Practical Conference "Biotechnology without Limits"

Agronomists and microbiologists of BTU-Center

Participation of the conference guests in the creative project "Grow Grain on Canvas"