

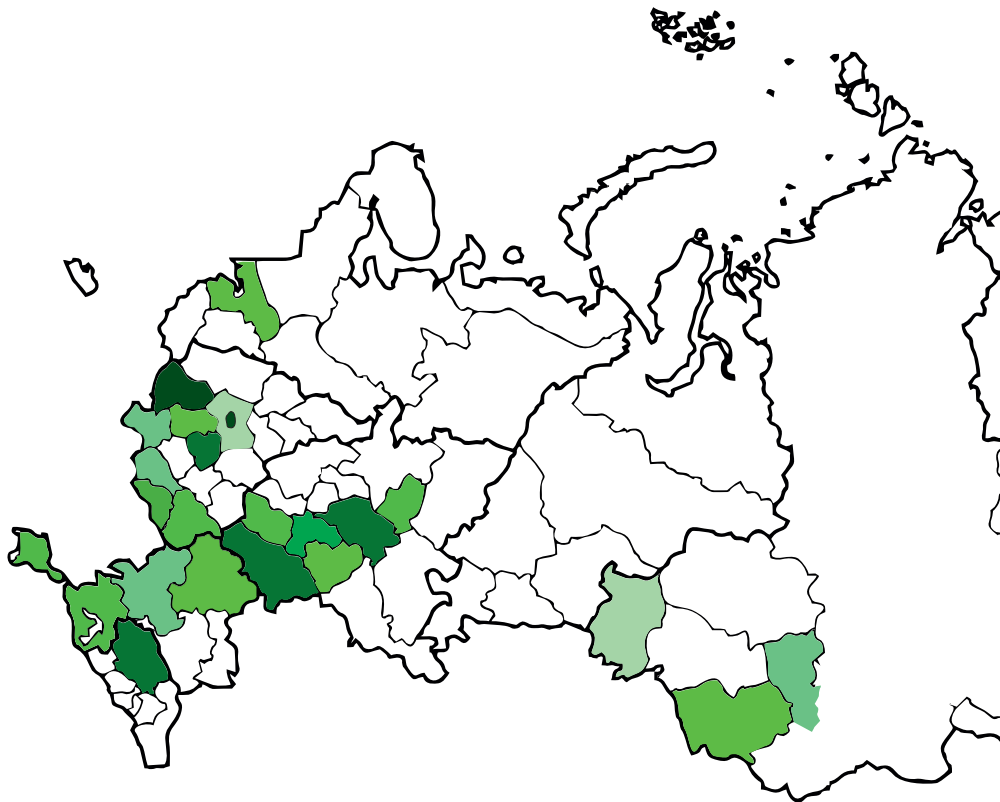
AgroVerm



BioEraGroup



FOLIAR ADDITIVE * GROWTH PROMOTER * SOIL CONDITIONER
The resident of the SKOLKOVO innovation center

AgroVerm IN FIGURES
FOR 2017

AgroVerm showed its effectiveness
in different agroclimatic zones from Blagoveshchensk to Belarus

8

representatives
offices are
connected
to work

already use
AgroVerm,
receive an increase
in crop productivity
16
regions

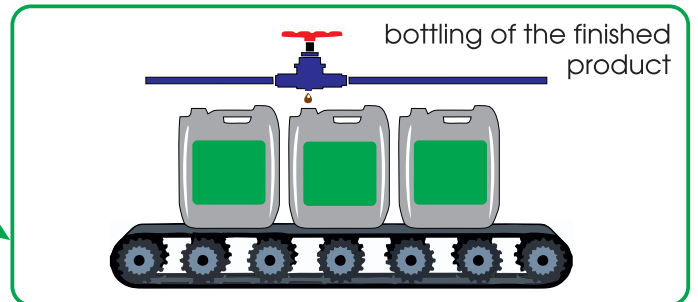
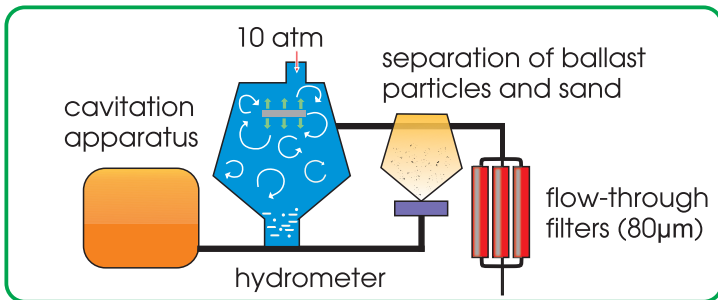
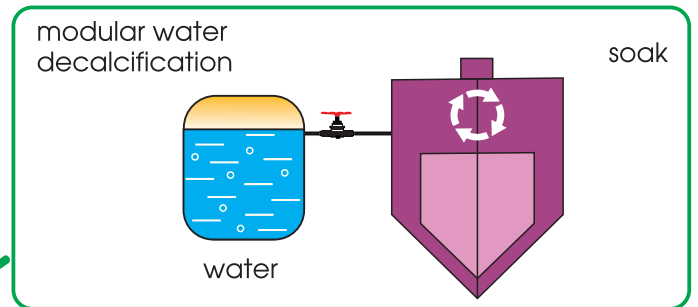
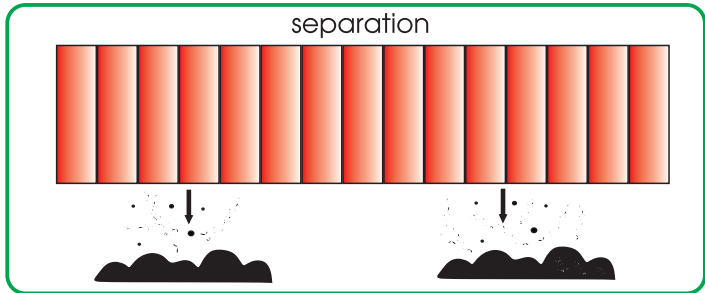
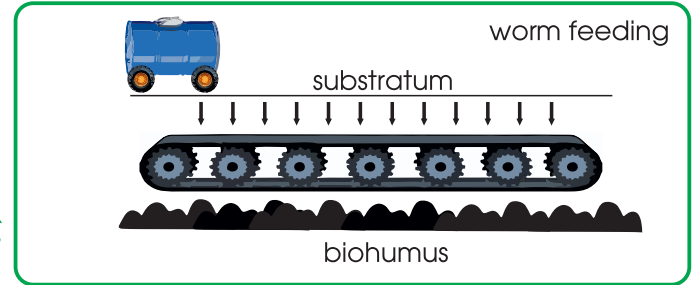
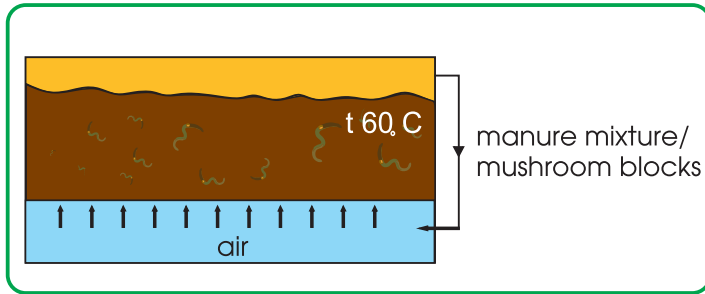
treated with
AgroVerm

800000
ha

in
189
field experiments
AgroVerm showed
itself better than
other foliar
additives

PROCESS OF PRODUCTION OF AgroVerm

2

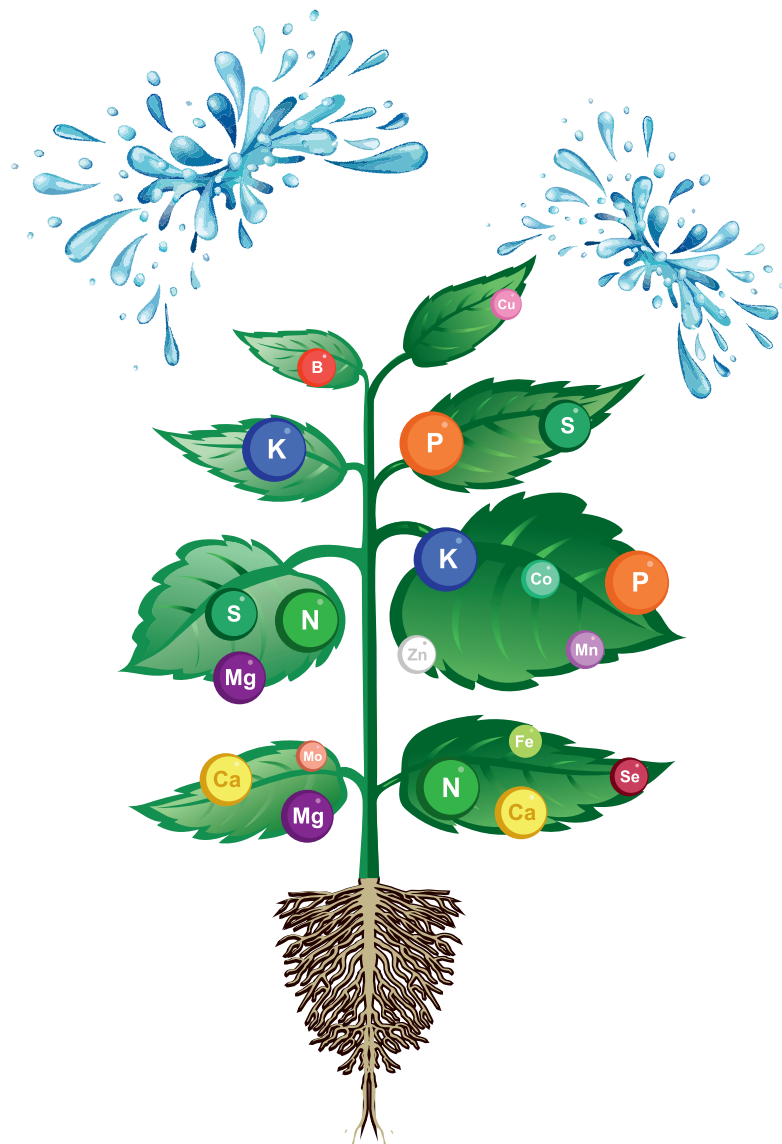


AgroVerm is a complex liquid biofertilizer, derived from vermicompost (biohumus). We receive biohumus on our production, on the unique equipment by innovative technology. It includes all water-soluble fractions of trace elements, organic acids, phytohormones. An important feature is the high content of hydroxyl and carboxyl groups (-COOH), which in turn ensures the presence of stable amino complexes, the total amino acid content is 38.6% of the organic matter.

In the composition of AgroVerm product 18 amino acids were identified. Their presence ensures the activation of growth mechanisms, increases the ability of assimilation of nutrients and resistance to unfavorable environmental factors.

Native natural processes involved in the production of "AgroVerm" do not break the structure of the constituent elements. When transitioning to a liquid aggregate state, the elements remain in a form that is accessible to plants.

So complexes of humic and fulvic acids have a low molecular weight of 2000-4000 amu, which indicates a high lability of organic compounds and their availability for plants and biota. And the predominance of amphiphilic components makes the constituent complexes of trace elements and organic acids stable, including, when the concentration changes (for example, when diluted with water).



1. **Foliar additive (non-root treatment) with "AgroVerm"** in the recommended phases gives an increase in the crop productivity of cereals, legumes, oilseeds on average from 7% to 22%, vegetables - from 17% to 38%.

2. **AgroVerm biofungicide** - with regular application during the growing season, the plant becomes more resistant to damage by many diseases (root rot, mold, bacterioses, fusariosis, powdery mildew, rust, etc.). When combining the drug with chemical fungicides, the rate of application of chemical fungicides can be reduced by 20-30%.

Laboratory-field experiments on cereals, oilseeds, legumes showed that AgroVerm suppresses the development of fungal diseases of the genus:

- *Alternaria alternate* (Fr.) Keissl. (causative agent of alternaria).
- *Fusarium* sp. (pathogens of fusariosis).
- *Mucor* sp., *Trichothecium roseum* Link.
- *Cladosporium herbarum* Link.
- *Pseudomonas glycinea* Coerper (pathogen of bacteriosis).
- *Bipolaris orokiniensis*.
- *Botrytis cinerea* Pers (causative agent of gray rot).
-

3. **AgroVerm antidepressant** - processing plants in stressful situations (frost, drought, herbicide stress, damage to plants by pests, etc.) reduces the risk of crop loss. The plant quickly gets out of stress and at the same time continues vegetation. In the drought conditions of "AgroVerm" significantly increases the stability of the protein synthesized and photosynthesized cells. As a result, the plant as a whole, including the reproductive apparatus, especially sensitive to lack of moisture, becomes more resistant to drought. As a result, under drought conditions, the productivity of plants treated with the product is 15-20% higher than in untreated ones.



4. **AgroVerm - a growth promotion** - after treatment with the leaf surface of the plant, physiological and biochemical processes are intensified, which make it possible to accelerate the passage of phenophases. Presowing treatment of seed by AgroVerm has a growth-stimulating effect on the development of the grain, provides better germination and accelerates the energy of germination.

5. **AgroVerm is rich in amino acids** - their presence in the composition provides activation of growth mechanisms after hydrochloric stress and low temperatures, increases the ability to assimilate nutrients and resistance to pests and diseases. Such modifications are easily perceived by the plant organism and are quickly included in the metabolism as their own.

6. **AgroVerm contains trace elements** in a chelated form (accessible to plants) - due to their presence, plants have the ability to synthesize a full range of enzymes that will allow more intensive use of energy, water and nutrition (1M, R, K), and accordingly receive a higher crop.

7. **AgroVerm allows to reduce** the dose of mineral fertilizers by 30%, since the atomic ratio of N / C (1.04) indicates a strong mixing of aromatic rings in the "core" of the molecule of humic acids and a well-developed aliphatic "periphery", which provides good transport function, in other words, this enhances the penetration of mineral elements into the plant in the form of humic-mineral compounds.



Presowing processing of seed

Treatment is carried out at the same time with the disinfectant. The rate of consumption of AgroVerm is 1L / 1 ton of seeds. Concentration 10%.

Working solution for 1 ton of seeds = 1 L of AgroVerm + etchant + 9-10 L of water.

Enhances the development of symbiotic microorganisms.



Non-root treatment (foliar treatment)

1-3 liters per 50-300 liters of tank mixture per 1 hectare.

The concentration is 1- 1.5%.



Introduction through drip irrigation systems

Concentration of AgroVerm 0.05-1%. Used for open and closed ground.



Delivery of AgroVerm is carried out in 10 liters canisters

Compatible with almost all fungicides, herbicides, insecticides, presented as emulsion concentrates and suspension concentrates, also with urea and carbamide.

PREPARATION OF A TANK SOLUTION

To prepare the working solution, the tank of the sprayer should be filled with water for 1/2 volume, then - to switch on the blending mode, add plant protection products and agrochemicals, then add the required calculated (for a given area) amount of AgroVerm preparation. After a few minutes, add water to 3/4 of the tank volume, then add surfactants, if necessary. They are added in the last turn to avoid the formation of excessive foam. Further, when the mixing mode is switched on, the spray tank should be filled with water to the full volume.



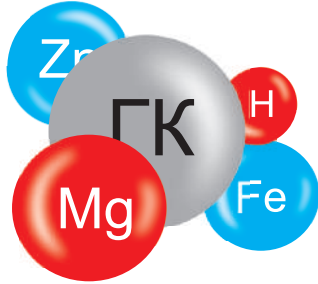
1. Fill the tank with water for 1/2 volume



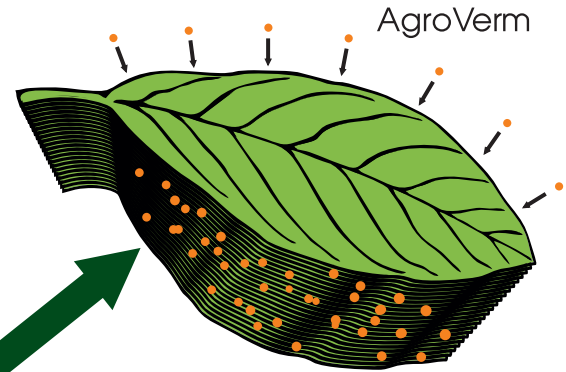
2. The introduction of all necessary components into the tank solution, except AgroVerm.



3. Adding AgroVerm to the tank solution, mixing. Add water to the full volume of the tank.



Stable complexes do not lose properties when diluted and combined with other products

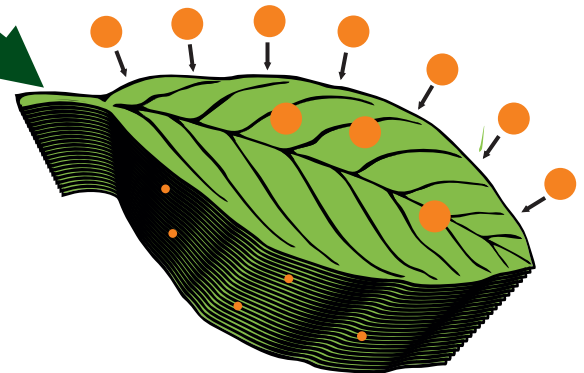


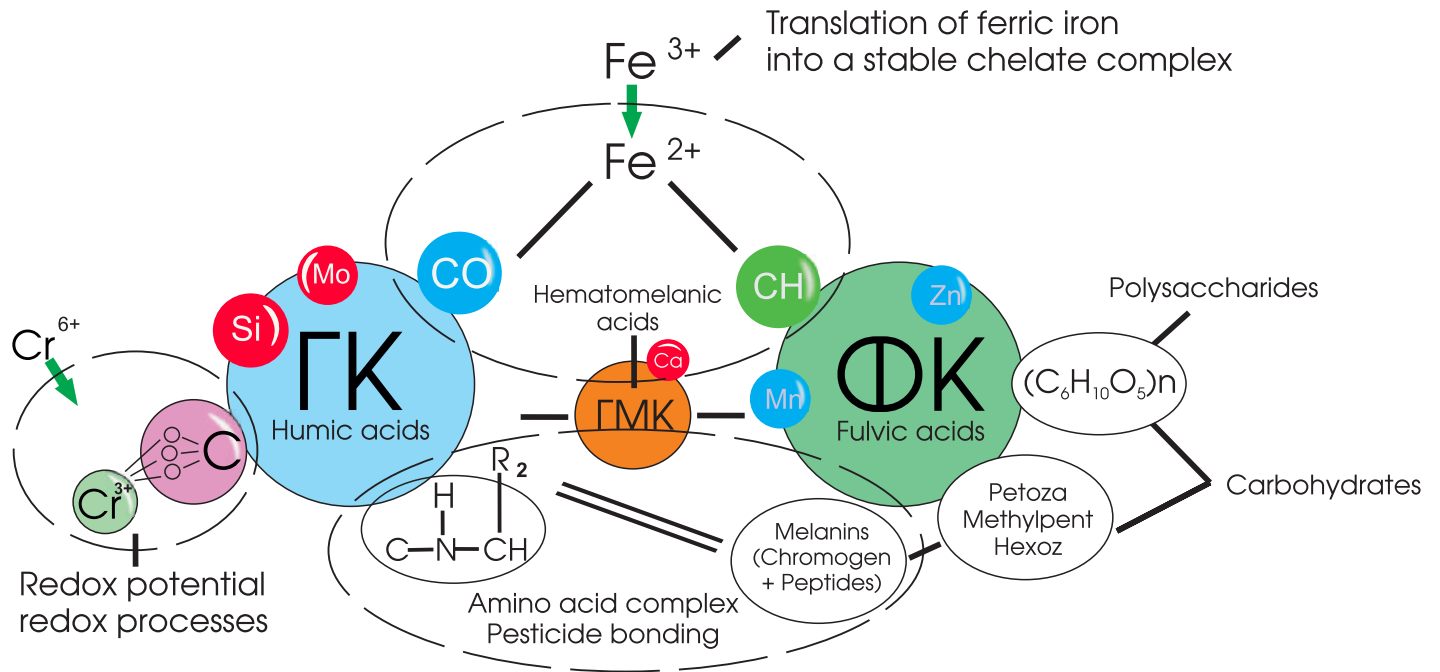
Quickly assimilated due to low molecular weight

Chelated microfertilizers



Activation of growth processes due to the release of growth hormones, symbiotic microorganisms





Carbohydrates, polysaccharides - elimination of the effect of water deficiency on carbohydrate metabolism. Carbohydrates are the main products of photosynthesis and the basic substrate of respiration. In many agricultural plants, they accumulate in large quantities in roots, tubers and seeds and are then used as a reserve substance. With water deficiency, the production of carbohydrates is reduced.

Amino acid groups - Amino acids are necessary for the normal passage of plant metabolism, since they are the «bricks» from which proteins are built. Along with the reserve proteins that determine the quality of the crop, the more important role is played by the enzyme proteins involved in the regulation of ALL processes occurring in the plant cell.

In the preparation AgroVerm 18 amino acids have been determined, they are all alpha-amino acids of the L-series, the same as in plants, it is noteworthy that they are represented approximately in the same proportions.

Amino acids, which are part of plant proteins, refer to α -amino acids (alpha). In nature are two optical isomers of amino acids: L- and D-series. All the amino acids that make up plant and animal proteins belong to the L-isomers. Synthetic amino acids are a mixture of L- and D-isomers. And this is a very important element. The fact is that L-forms are well assimilated by plants and easily included in various metabolic processes, whereas D-forms by plants are not absorbed, and sometimes even inhibit the processes of metabolism. This is explained by the fact that the enzymatic systems of organisms are specifically adapted to L-amino acids. For example, D-forms of amino acids are not absorbed by the human body and animals, and are often included in pathogenic proteins (for example, alkaloids of a bunt, anthrax bacilli, potato bacillus, etc.).

Adding AgroVerm to tank mixtures with pesticides reduces the stress on the plant. Also, he shows himself well in situations where plants are affected by frost, hail, low temperatures, and can quickly fix the situation. Along with this, low molecular weight amino acids increase the penetration of the pesticides themselves into the tissues, allowing them to reduce their norms when used together.





Pre-Sowing Seeds Treatment Biological Product AgroVerm Rost

Ingredients:

humic acid– 3%, fulvic acids - 0,4%, amino acids – 1,2 % from C main, nanoparticles Fe_2SO_4 , SiO_2
recommended application rates:
seed treatment is carried out 10% solution of the drug, 1 liter per 1 ton of seeds.



For vegetables AgroVerm Viggi

Ingredients:

humic acid– 3%, fulvic acids - 0,4%, amino acids – 1,2 % from C main, nanoparticles SiO_2 , Cu, Zn, Mn.

Recommended application rates:
it is recommended to carry out leaf treatment of vegetating plants 0.5-1% solution of the drug, but not more than 3 l/ha. working solution consumption – 50-300 l/ha.
root feeding: 2-4 l/ha, when applying through irrigation systems, drip irrigation



Biological Product AgroVerm Master

Ingredients:

humic acid– 3%, fulvic acids - 0,4%, amino acids – 1,2 % from C main
recommended application rates:
it is recommended to carry out leaf treatment of vegetating plants 0.5-1% solution of the drug, but not more than 3 l/ha. working solution consumption – 50-300 l/ha.
root feeding: 2-4 l/ha, when applying through irrigation systems, drip irrigation



The Soil Conditioner

improves physical properties, neutralizes pH.
application is made directly into the soil.
Foliar: from 100 l/1 ha

PROMOTES DEVELOPMENT OF POWERFUL
ROOT SYSTEM INCREASES FIELD

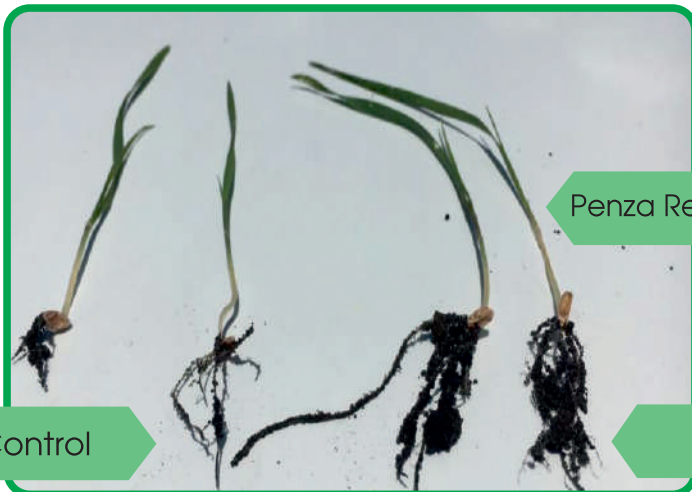
SPRING OATS

Smolenskaya obl., Potapovo village, ZAO Rassvet

- the thickness and length of the roots increase;
- additional roots are formed;
- due to the development of the active growth zone, a strong rooting takes place.



WINTER WHEAT



Penza Region, Luninsky District, LLC "Management Company RosAgro"

- shoots appear 1-3 days earlier;
- healthier color LEAF plate;
- there is a friendly growth and development of shoots;
- bushiness is 15% higher;
- alignment of shoots.

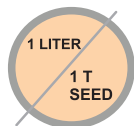
WINTER WHEAT

Smolenskaya obl., Potapovo village, ZAO Rassvet



Control

SPRING BARLEY



Recommended application program

- presowing seed treatment with 10% solution



- spraying in the tillering phase
(the flow rate of the working solution is 200-300 l / ha)



- spraying into the phase of earing (milk ripeness),
(flow of working solution 200-300 l / ha)



KFK POMINOV (VORONEZH REGION)

REGION	COMPANY	CROPPER/ BREED	CROP YIELD		% INCREASE FROM THE TEST AREA
			AgroVerm	Control	
Voronezh region	KFH Pominov	Spring barley	52	45,4	14,5
Republic of Belarus, Mogilev region	"Avangard"	Spring barley	51,1	44,2	15,6
Republic Tatarstan	LLC AgroSila	Spring barley "Raushan"	54,3	49,8	9



SPRING/WINTER WHEAT



Recommended application program

- presowing seed treatment with 10% solution



- spraying in the phase of tillering
(the flow rate of the working solution is 200-300 l / ha)



- spraying into the phase of stem elongation,
(flow of working solution 200-300 l / ha)

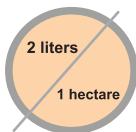
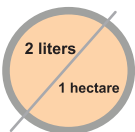
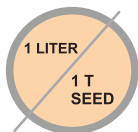


REGION	COMPANY	CROPPER/ BREED	CROP YIELD		% INCREASE FROM THE TEST AREA
			AgroVerm	Control	
Saratov region	LTD Zolotoy Vek	Winter wheat "Ershovskaya"	41,9	37	13,2
Altai region	LTD Stimul	spring wheat	22,4	18,6	20,4
Altai region	LTD AgroSila	spring wheat "Simbircit"	55,4	51,3	8
Kursk region	Federal State Budget Scientific Institution "Kursk Research Institute of Agricultural Production"	Winter wheat "Grom"	58,8	53,4	10,1
Penza region	LTD RosAgro	Winter wheat "Skipetr"	54	47	14,9



WHEAT

In areas with AgroVerm plants have a large mass (dry and wet) of the ground part of the roots and a large average length of the ground part.



Алтайский край, ООО «Мельниково»

Indicators	Control	AgroVerm
The amount of gluten, %	20,8	25,8
The amount of gluten, standard unit	55	75
Nature, g/l	780	780
Protein, %	10,3	12,7



Altai region, LTD Melnikovo

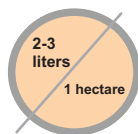


CORN

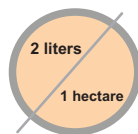


Recommended application program

- presowing seed treatment with 10% solution



- 3-5-leaf spraying
(the flow rate of the working solution is 300 l / ha)



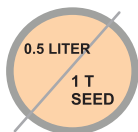
- spraying into the phlegm discharge phase
(flow of working solution 200 l / ha)



REGION	COMPANY	CROPPER/ BREED	CROP YIELD		% INCREASE FROM THE TEST AREA
			AgroVerm	Control	
Saratov Region	FGBOU V "Saratov State Agrarian University. N.I. Vavilov "	Hybrid of corn "Falcon"	30,6	28,3	8,1
Saratov Region	FGBOU V "Saratov State Agrarian University. N.I. Vavilov "	Hybrid of corn «P9074»	56,1	41,8	34,2
Voronezh region	CJSC Pavlovskaya MTS Builowka	Hybrid of corn "TKS 3705"	49,4	46,2	7

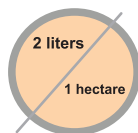


SUNFLOWER

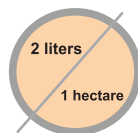


Recommended application program

- presowing seed treatment with 5% solution



- spraying into the sprouting phase
(the flow rate of the working solution is 200- 300 l / ha)



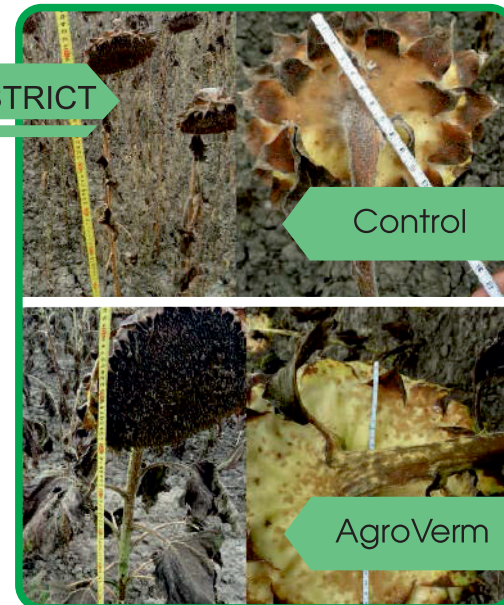
- spraying into the phase of the beginning of the formation of the basket (flow of working solution 200-300 l / ha)*

*on additional consultation of an agronomist



KRASNODAR REGION, ABINSKY DISTRICT

REGION	COMPANY	CROPPER/ BREED	CROP YIELD		% INCREASE FROM THE TEST AREA
			AgroVerm	Control	
Krasnodar region	Abinskaya AF LCC	Sunflower hybrid "Condi»	11,7	8,9	31,5
Saratov Region	JSC "Agrofirma Volga»	Sunflower hybrid "NSH6009"	12,3	11	11,8
Volgograd Region	APC "Staroanninsky»	Sunflower hybrid "Tunka»	27,6	21	31,4
Saratov Region	FGBOU V "Saratov State Agrarian University, N.I. Vavilov "	"Sunflower "SUR»	7,9	6,3	25,4
Saratov Region	FGBOU V "Saratov State Agrarian University, N.I. Vavilov "	Sunflower hybrid "Megasan"	9,8	7,6	29



CHICKPEA



Recommended application program



- presowing seed treatment with 10% solution



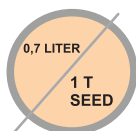
- spraying into the sprinkling phase (the flow rate of the working solution is 200- 300 l / ha)

REGION	COMPANY	CROPPER/ BREED	CROP YIELD		% INCREASE FROM THE TEST AREA
			AgroVerm	Control	
Rostov region	LLC Ust-Donetsk AIC	Chickpea "Krasnokutsky 36"	13,8	12,7	8,7
Saratov region	CJSC "Zolotoy vek"	Chickpeas "Privo 1"	14	12,3	13,8
Saratov region	Dergachi-Ptitsa LLC	Chickpeas "Zoovit"	9,5	8,2	15,9

SOYA



Recommended application program



- presowing seed treatment with 7% solution



- spraying into the sprinkling phase (the flow rate of the working solution is 200- 300 l / ha)

REGION	COMPANY	CROPPER/ BREED	CROP YIELD		% INCREASE FROM THE TEST AREA
			AgroVerm	Control	
Krasnodar region	Novokubansky branch of FGBIC "Rosinformrath"	Soya "Vilana"	22,97	20,92	10

POTATO



Recommended application program

before planting



the beginning of budding



5-7 days after flowering

REGION	COMPANY	CROP	CROP YIELD		% increase from the test area
			AgroVerm	Control	
		beet			
Saratov region	LTD "Ovoshnaya dolina"	Red Cloud	566	502	12,8
		cabbage			
Saratov region	LTD "Ovoshnaya dolina"	Taifun	740	682	8,5
		carrot			
Saratov region	LTD "Ovoshnaya dolina"	Kaskad	740	540	37
		onion			
Saratov region	LTD "Ovoshnaya dolina"	Safran	950	790	20,3
		potato			
Altai region	LTD "Saturn 2"	Red Scarlett	392	370	6



The content of organic matter, humic acid and folic acid in biofertilizer AgroVerm

Defined indicator	Unit of measurement	AgroVerm
Organic matter	g / l	42.7
Potassium humates	g / l	31.8
Fulbates of potassium	g / l	9.0

Microelement composition of AgroVerm

Defined indicator	Unit of measurement	Definition result	Index	Definition result
Al	mg / kg	1276,4	A ₅	no
Fe	mg / kg	2361,0	Ba	no
Ca	mg / kg	306,3	Zn	51,2
Mg	mg / kg	106,4	Cu	11,6
Cr	mg / kg	4,7	Hg	no
Ni	mg / kg	12,3	Mn	295,9
Co	mg / kg	no	Sn	-
Pb	mg / kg	3,6	Mo	0,1
Sr	mg / kg	6,1	Se	2,2
Cd	mg / kg	0,1	Ag	no
Na	mg / kg	1,4	B	no
K	mg / kg	1397,5	Ti	no
V	mg / kg	no		
S	mg / kg	700,5		

Amino acid	sample	
	FP	PH
Glycine	10,1	9,86
Alanin	8,98	9,32
Valine	8,79	8,9
Leucine	7,10	5,87
Isoleucine	5,16	4,96
Proline	4,29	4,06
Phenylalanine	4,68	4,21
Methionine	0,33	0,33
Serin	2,59	3,11
Theonin	5,39	5,45
Lysine	0,94	0,88
Arginine	4,37	4,96
Histidine	2,60	2,18
Asparagine	20,90	20,80
Glutamic	11,11	11,70
Cysteine	2,09	0,87
Tyrosine	0,58	1,07
Ornithine	-	-
Amount of amino acids, % of ashless preparation	30,3	11,00

The certificate of entrance
in the register of SKOLKOVO participants



The certificate
of state registration



THE PRINCIPLE OF OPERATION OF THE SOIL CONDITIONER

- connects micro-aggregates
- increases water resistance
- catalyst for soil microflora
- improves water and air exchange
- increases the content of humus in the soil

SOIL CONDITIONER AS AN IMPORTANT ELEMENT OF BIOLOGIZATION

- introducing by standard equipment
- reduces the rate of application of mineral fertilizers
- convenient form to use
- economic effect in the first year of application

RESULTS OF APPLICATION

- Soil samples were taken from 3 points on each field three times. Samples were taken in May 2018 before the introduction of drugs and in July, during the growing season.



Indicators of soil agronomic properties	Control	The Soil Conditioner
Structure ratio	0,73 passable	3,7 good
Water-stability of soil aggregates, %	16,7	47,3
Organic substance, %	2,7	3,6 (+33,3%)