

Private manufacturing company of equipment for alternative energy, ecology and agriculture.



Director of FOP Grinov O.V.

Grinov O.V.

"GrinBio-1000."

World's first mini plant for the production of natural, complex, organic, biological fertilizers.

Raw material input

GrinBio-1000

Fertilizers output

1. Simple soil from the field.
2. Peat
3. Manure
4. Chicken manure
5. Lignite
6. Sapropel
7. Lignin
8. River or sea silt
9. Seaweed
10. Gravel
11. Granite
12. Stone
13. Hard minerals
14. Sludge after processing in biogas plants



1. Nitrogen fertilizers from simple river and lake water.
2. Fertilizers made from copper, silver, zinc, potassium, magnesium.
3. Antibacterial water for irrigation, as well as for disinfection.
4. Complex, mineral, nitrogen fertilizers from peat.
5. Complex organo-mineral fertilizers from Sapropel.
6. Complex fertilizers from simple soil.
7. Complex nitrogen fertilizers from manure.
8. Complex humic, organomineral fertilizers from Lignita.
9. Mineral fertilizers from river stone, pebbles, granite.
10. Seaweed Fertilizers

1. Technical specifications of the **GrinBio 1000** unit.
2. Advantages of using mini plant "**GrinBio 1000**"
3. Method of use and applied technology.
4. Research conducted by **FOP "GRINYOY"**.
5. Fertilizers produced at our plant.
6. How to make fertilizers in our plant?
7. Conclusion

DESCRIPTION: MINI PLANT "**GrinBio-1000**"

"**GRINBIO 1000** (G**Re**en **I**Nnovations in **B**IOtechnology) by **GRINYOY**"



GRINBIO-1000

The world's first plant for the production of natural, mineral complex biofertilizers from ground and water!

www.grinbio.org

100 % FREE

Mini plant is designed to produce approximately 3500 tons per year of nitrogen, colloidal, complex, nitrate-natural, humic, natural, biological, organic, mineral fertilizers by electromechanical, electrohydraulic, electro-pulse, cavitation, electromagnetic, mixing, homogenization of liquids of different density and composition and consistency, crushing, grinding to the state of colloidal particles, sieving, emulsification of various types of biological, mineral, natural fertilizers, peat, lignin, humus, manure, animal waste, sapropel, brown coal, any type of coal, earth, clay, minerals in different forms (solid or liquid), as well as sterilization of fertilizers, feeds, water, juices, wine stabilization, as well as sterilization and neutralization of water bodies, pools, aquariums, water basins of agro livestock complexes.



Manufacturer:

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1. TECHNICAL SPECIFICATIONS OF MINI PLANT FOR THE PRODUCTION OF ORGANIC FERTILIZERS "GRINBIO 1000"

Name	GRINBIO-1000 Fertilizer production using electrohydraulic discharge with ozone enrichment and additional vacuum cavitation grinding
Power consumption	Up to 10 kWh
Network	1 phase 220 V 50 Hz 3 phases 380 V 50 Hz
Productivity	From 1000 liters per hour
Industrial Ozonator	Up to 100 g/hour
Capacity type	Continuous, 30 min working time 5 min resting time
Installation type	Mobile
Cooling type	Air
Housing type	Noiseless, moisture-proof, shockproof, fully insulated against electric shock
Installation Noise Insulation	Noiseless up to 100 dB
Safety Class for Protection Against Electric Shock	Class III: Protection is provided by power from an isolation transformer or a power source with safe voltage.
Classes for Protection Against Electric Shock	Class III: Protection is provided by power from an isolation transformer or a power source with safe voltage.
Personnel Qualification Level Class	Class IV: Operation is allowed for electrical and electrotechnical personnel without electrical safety group qualifications.
Dimensions	
Weight	400 kg
Length	2,2 m
Height	1,2 m
Width	1,0 m
Warranty on all units	12 months
Warranty does not apply	Consumables such as air discharge and water discharge





TABLE OF RAW MATERIAL AND PRODUCED FERTILIZERS

LOGIN TO GRINBIO-1000	EXIT FROM THE GRINBIO-1000
Field's ground	Complex nitrogen mineral fertilizer with enhanced composition of minerals, micro-macroelements. https://grinbio.org/fertilizers-from-the-ground
Peat	Nitrogen, complex organic, and mineral fertilizer in a soluble form useful and readily available to all plants. https://grinbio.org/fertilizers-from-peat
Seaweed	Fertilizers derived from seaweed are a real elixir of life for the garden. They not only increase soil fertility, but also stimulate plant growth, strengthen their immunity, increase resistance to diseases and pests. https://grinbio.org/algae-fertilizers
Ordinary water from reservoirs	Nitrogen fertilizer from plain water from a body of water, lake, river. https://grinbio.org/getting-100-nitrogen
Sapropel	Organic fertilizers from Sapropel. This substance, formed on the bottom of water bodies, possesses remarkable properties and finds wide application in various spheres. It is an excellent Biofertilizer https://grinbio.org/sapropel-fertilizers
Lignite	Nitrogenous, humic, mineral fertilizer. It is possible to obtain such fertilizer from the simplest not expensive brown coal. https://grinbio.org/fertilizers-from-coal
Manure	Organic fertilizer made from manure. Produced instantly and ready for use. https://grinbio.org/manure-fertilizer
Chicken droppings	Complex mineral organic fertilizer. Poultry manure, especially chicken manure, is superior to manure in terms of the balance of trace elements and soil beneficial substances in its composition. Moreover, it contains much less harmful microorganisms than any manure. The content of nitrogen and phosphorus is not inferior to mineral fertilizers and vitamin complexes. https://grinbio.org/chicken-fertilizer

2. ADVANTAGES OF USING A MINI PLANT "GRINBIO 1000"

Our company manufactures mini plant for the production of more than 3500 tons per year of complex, mineral, organic, nitrogen fertilizer by electrohydraulic discharge method from:

simple field soil, peat, manure, poultry/chicken manure, brown coal, sapropel, lignin, river or sea sludge, seaweed, crushed stone, granite, stone, solid minerals, sludge from biogas plants

With our plant you will be able to produce natural high quality complex fertilizers in quantities of up to 1000 liters per hour or more.

The new type of installation is designed for continuous operation for up to 30 minutes, after which a 5-minute break is required for the installation and all units to cool down, during which the finished fertilizer is drained and a new batch is poured in to process the raw material. It is possible to increase the working time during operation and additional settings up to 60 min of operation and 5 min for cooling down.

What are the benefits of our installation:

1. You produce great fertilizer for practically FREE and FOREVER!
2. You can use any kind of organomineral raw material for fertilizer production! Even ordinary pebbles and quarry stones can be turned into readily available minerals for your crops!
3. When using peat or other quarry fertilizers, you increase the cost of the product several times, because processing at our plant, due to the disintegration of hard-to-break-down minerals, you make a concentrated product!
4. The installation operates from a simple household network of 220-230 V 50 Hz, and can also use a 3-phase network of 380 V.
5. The power consumption of the installation ranges from 5 to 10 kW, including additional equipment.
6. High maneuverability and ease of use. It is enough to plug into a 220 v socket and connect a hose with liquid to the inlet and outlet of the unit.
7. A high-performance homogenizer pump was installed, which allows pumping peat compost from the reactor to the storage tank, up to 5000 l/hour.
8. The plant has a reactor and all processes take place in a closed, protected enclosure, which ensures safety in operation.
9. Automatic cooling, air-cooled, provides constant monitoring against overheating.
10. Automatic shutdown in case of overheating.
11. Complete tightness.
12. The high degree of protection against high voltage is ensured by the complete insulation of all sensitive elements.
13. The possibility of working with the installation of personnel who are not specialized electricians or technicians, who can easily operate and carry out the appropriate manipulations when necessary.
14. All plant components are designed in an easily accessible location for easy replacement or monitoring.
15. When work is complete, simply switch off from the mains. All residual discharges will be automatically discharged, allowing the side doors to be opened safely and the plant components to be manipulated as required.
16. Full noise and vibration isolation of the plant enclosure.



17. Optional noise and vibration absorbing water discharger system with a simple and easy form of connection.
18. No wires outside the unit, all processes take place inside the unit, resulting in a completely safe operation.

Our installation is unique and fully automatic.

You only have to connect to our spigot/cock with a diameter of 50 mm your tank of min 1000 liters, in which the mixing of peat and water will take place.

Our unique pre-mixing system, in the process, further treats the mortar by pulverizing and enriching it with oxygen and ozone, which contributes significantly to the entire mortar treatment process.

3. USAGE METHOD AND APPLICABLE TECHNOLOGY

FROM TILLAGE TO CROP PRESERVATION "FERTILIZER WITHOUT FERTILIZER"!

Think about the title of the subtitle: what is this play on words, a paradox, a statement that contradicts common sense? Indeed, is it possible to fertilize fields without fertilizer? As it turns out, it is possible. After all, it has long been known that the soil contains much more nutrients than plants are able to extract from it. So they say: these substances are in an indigestible form. The question is how to turn them into digestible, available to plants. Then - then it will be real and will be a significant reduction in the use of expensive and sometimes environmentally unsound fertilizers, and sometimes it will be possible to do without them at all. However, it is not easy to do this. The soil storehouse is rich, and its locks are strong, with a secret.

And here to help comes the electrohydraulic effect of our mini plant **GrinBio-1000**, which, in addition to the obvious mechanical effect, has an amazing ability to accelerate the flow of chemical reactions thousands of times, dramatically increase the activity of catalysts, transfer into the working fluid chemical elements associated with the treated material.

In the experiments of electrohydraulic crushing of rocks and other natural materials it was found that many chemical substances and compounds contained in them in insoluble form become soluble. And another interesting feature: the poorer the rock is in these elements and compounds, the more intensively and with less energy they are released into solution. And the earth? After all, it is, in fact, a broken rock, "fertilized" with organics. So, if the earth is treated with electrohydraulic shocks, the trace elements contained in it, potassium, calcium, phosphorus will be transferred into solution. But only experiments could give an answer to such an important question. And the experiments conducted over the last 80 years, in which soil samples from different zones of our country were studied, have brilliantly confirmed the initial assumption.

These samples were subjected to electrohydraulic treatment in a laboratory batch crusher under strictly the same regime and at the same ratio of soil mass and water. The analyses showed that as a result more than 60 chemical elements pass into the soluble state, and the total amount of such compounds increases dozens of times in comparison with the processes of natural dissolution. Thus, after electro-hydraulic influence 3200 g of iron, 4700 g of sodium, the same amount of magnesium, increased doses of potassium, phosphorus and other elements very necessary for plants (e.g. copper, nickel, beryllium, cobalt, titanium, etc.), which are insoluble during conventional soil treatment, are in solution from a ton of soil.

Why does this happen? It is because EG-treatment (Electrohydraulic treatment) stimulates and sharply accelerates the course of chemical reactions. It was also established that in soil mixed with water under the action of electrohydraulic shocks the content of O_2 and O_3 ions significantly increases, and a large amount of OH anions intensively transforms into hydrogen peroxide (H_2O_2), which then, decomposing into H_2O and O , causes energetic oxidation of formerly "passive" salts of fertile layer by formed atomic oxygen.

In natural conditions, the overwhelming majority of complex soil salts can be considered insoluble in water, which, by the way, in fact, does not so much dissolve as decompose or destroy them, carrying out this process extremely slowly, over tens of years. First, water "takes away" some of the salt, converting it into simpler compounds. Then the remaining part of the still complex (no less than before) salt under the further action of water again "simplifies". This continues until the initial soil salts are transformed into the final, simplest mineral compounds (SiO_2 , Al_2O_3 , Fe_2O_3 , etc.) possible under specific conditions. But at electrohydraulic soil treatment all considered processes are accelerated sharply (up to hundredths of a second) and besides they can be made controllable, i.e. selectively influence their course.

An important factor is that the soil represents a polydisperse system: its solid phases consist of particles of different sizes, ranging from the largest - sand grains - to colloidal particles with a diameter of several millimicrons. The role of highly dispersed colloidal fractions in creating the necessary soil conditions for plant development is very responsible and diverse. After all, they are the main suppliers of nutrients, as the availability of their assimilation by plants and the ability of soil to retain these substances is in direct dependence on the size of its constituent particles: the larger the specific surface area of particles, the higher their nutritive properties. Thus, the leadership of silty soils in fertility is explained, in particular, by the fact that the total surface of their particles reaches a huge value of 23000 cm^2 per kilogram of soil.

As a result of electrohydraulic treatment, almost the whole soil sample is pulverized to close to colloidal or colloidal particles, and their formed total surface can become much larger than even natural muddy fractions. The resulting highly dispersed, very fine particles actively interact with compounds that have passed into solution, so such processes as dissolution and especially sorption, qualitatively increase, are extremely effective. And large particles serve as a reserve fund, soil reserve, due to which electrohydraulic effect increases its general dispersibility. Obviously, several electrohydraulically treated handfuls of soil will be quite enough to satisfy the needs of plants in necessary nutrition elements on one square meter of a field during a year.

But so far, we have not mentioned a word about nitrogen, which is the basis for a full-fledged "menu" of plants. This element is very widespread in nature, but plants often remain hungry, being, as they say, at the rich table. The EG effect can help here too. Experiments have shown that if electrohydraulically treated, "crush" ordinary irrigation water taken from any reservoir, it quickly increases the amount of dissolved nitrogen compounds. In addition, air consisting of 78% nitrogen, gaseous nitrogen and even exhaust gases can be blown through it under low pressure, which, having been utilized in this way, will pollute the atmosphere less. The result is astonishing: ordinary irrigation water becomes a nitrogen-rich fertilizer!

Now we can assert that right in the field the electrohydraulic effect can extract nutrients for plants from soil, irrigation water and even air, i.e. fertilize without fertilizers. And there is no need to worry about the reserves of "raw materials" - they are practically inexhaustible.

However, if this is true for the most widespread in nature very scarce lands, EG-treatment will be especially beneficial for soils rich in nutrients, but, alas, very reluctant, as we know, to give them to plants. Here, for example, peat, deposits of which, both in our country and in other countries are extremely large. It is not without reason that they are called the storehouse of the sun. Peat, indeed, as if accumulates solar energy, becoming an excellent raw material for many sectors of national economy. However, fertilizing qualities of peat acquires only at a certain degree of decomposition, and this process in natural conditions proceeds very slowly. To speed it up, various thermal, chemical and biological methods are used to transform organic matter into a state that can be assimilated by plants.

Our experiments and of course the practice of several years have shown the extreme efficiency of electrohydraulic treatment of peat. It was found out that at this process there is a rapid decomposition of organic matter of peat, bound forms of nitrogen and other nutrient elements, which become soluble, mobile, i.e. assimilable by plants. For example, the content of ammonia nitrogen increases depending on the type of peat by 1.5-5 times, water-soluble organic matter by 1.5-6 times.

But the most amazing surprise was waiting ahead. Experiments revealed that decomposition of organic matter of peat and increase in its mobile forms of nitrogen, water-soluble carbon and other nutrients continues after electrohydraulic treatment, during storage. Subsequently, based on the results of hundreds of experiments it was found that free storage of electrohydraulically treated peat at positive temperatures leads on the 10-15th day to a sharp (10-30 times!) increase in its content of nutrients assimilated by plants. For example, the dynamics of content change (mg per 1 kg of dry mass) in peat is as follows: in the natural state 23.4 mg/kg, 3-4 days after EG-treatment - 73.6, and after 14 days already 760 mg/kg. And what is very important, in the future peat practically does not lose the acquired fertilizing qualities.

4. RESEARCH CONDUCTED IN OUR LABORATORY OVER 5 YEARS

The results of the research on peat and soil showed:

- Increase in mass content of ammonia nitrogen by 1.4-4.5 times.
- Increase in water-soluble organic matter by 1.5-5 times.
- Hydrolytic deamination of free acids.
- Increase in the content of soluble nitrogen compounds by 5-10 times on the 10th-15th day of storage.
- Effective and environmentally friendly solution for agriculture.
- A step towards the development of nanotechnology in the agro-industrial complex.
- Innovations for fertile land and rich harvests.
- **Yield increase from 30-100%**
- Reduction of plant disease incidence by 80% without the use of chemical components
- Tillage of soil, plants without chemical fertilizers.
- Cultivation of crops on 100% Biological natural basis.

Table 1 - Research results on increasing of nitrogen content in peat fertilizer after electrohydraulic treatment

Sample	NH4 (nitrogen) per kg. Dry peat						
	Before Treatments	after electrohydraulic treatment "GRINBIO 1000"					
		three to four days later		after 14 days		30 days later	
		mg/kg g	%	mg/kg	%	mg/kg	%
N _o 1	23,4	73,6	314,5	96,0	410,9	759,0	3243,6
N _o 2	17,3	295,2	1706,4	1115,0	6445,1	1020,0	5898,2
N _o 3	40,6	83,8	206,4	211,0	519,7	213,0	524,6

Table 2 - Results of treating ordinary soil from 3 plots located 500 m apart.

Sample	NH4 (nitrogen) per kg. Dry earth						
	before Treatments	after electrohydraulic treatment GRINBIO1000					
		three to four days later		after 14 days		30 days later	
		mg/kg g	%	mg/kg	%	mg/kg	%
N _o 1	0,6	3,1	516	6,1	1016	9,8	1630
N _o 2	1,2	7,3	608	5,0	416	18,3	1525
N _o 3	3,8	8,6	226	11,2	294,7	15,4	524,6

What explains such a rapid and significant change in the properties of the peat under study?

BACTERIAL EXPLOSION

This name was given by L. A. Yutkin to the discovered phenomenon of extremely intensive - "explosion-like" multiplication of bacteria in electrohydraulically treated bacterial medium 90 years ago.

For the first time the researcher encountered such an effect in experiments on electric water treatment 90 years ago. It was noticed that as a result of EG-influence the vitality of water microflora is quickly suppressed to a greater or lesser extent depending on the duration and intensity of treatment. But after the treatment is stopped, the opposite happens: microorganisms begin to multiply rapidly. What is the reason for this?

The scientist explained it this way. The microorganisms that retained the ability to reproduce were probably the most resilient, since only they could survive the "artificial selection" carried out by the powerful impact of the electrohydraulic shock. This high viability is probably the key to their rapid reproduction. Moreover, they have no enemies and competitors in EG-treated water, and the substrate itself, containing instantly killed and completely destroyed bacteria, becomes an ideal nutrient medium for the subsequent development of microflora.

But this process can be controlled by changing the parameters of electrohydraulic shocks, introducing into the substrate certain protective substances that allow the microorganisms we need to survive, achieving a bacterial explosion by sowing microorganisms into the medium previously sterilized by the electrohydraulic effect. In short, the "bacterial explosion" can be very precisely regulated, which opens wide prospects for its practical use.

In the case of peat (which is the richest bacterial medium), the dependence of the yield of soluble nitrogen compounds and other nutrients assimilated by plants on the characteristics of the source material and electrohydraulic treatment regimes was established. Experiments with peat were conducted not only in the author's laboratory, but also in the Kiev Soil Institute under the guidance of Academician I. S. Lupinovich, and their results were identical. For example, in one of the experiments, a kilogram of peat before electrohydraulic treatment contained only 17 mg of ammonia nitrogen, four days after treatment it already contained 295, and two weeks later - 1115 milligrams. It turns out that the amount of ammonia nitrogen of the most valuable fertilizer compound, not counting nitrates, suddenly increased neither much nor little in 65 times! This is the phenomenal stimulating power of the "bacterial explosion"!

The essence of this phenomenon is reduced to the fact that the bacterial environment of ammonifying (decomposing non-mineralized peat nitrogen to ammonia), nitrifying (oxidizing NH_3 to nitrates) and nitrogen-fixing (fixing atmospheric nitrogen) microorganisms turns out in the process of electrohydraulic treatment to be more resistant than other forms of bacteria inhabiting peat and, therefore, does not die completely, its most viable representatives survive. After electrohydraulic treatment, having received the environment of electrohydraulically treated (i.e., first of all, dispersed peat), which is practically free from competition and now contains many different salts and microelements in soluble state, these bacterial species find themselves in especially favorable conditions and begin to develop extremely rapidly, actively and in large quantities fixing atmospheric nitrogen and decomposing non-mineralized peat nitrogen.

The phenomenon of "bacterial explosion" is characteristic for ordinary soils as well, as evidenced, in particular, by experiments conducted at the Timiryazev Agricultural Academy. If before sowing a kilogram of soil not exposed to EG-influence contained 48 mg of nitrogen, and after harvesting only 28 mg remained, then in electrohydraulically treated soil during the same period the amount of nitrogen increased up to 65 mg. This is mainly due to EG-stimulated, nitrifying and nitrogen-fixing bacteria.

And needless to say, rich soil is the key to high yields!!!!

In this study we would like to present a unique technology for the production of a highly effective biofertilizer based on electrohydraulic peat treatment in a **GRINBIO 1000** unit.

Our technology:

- Reduces the cost of biofertilizer production by times! Cost less than 2 euros/ton.
- Increases the value of peat by 10-20 times, both energetically and financially.
- No chemistry or chemical compounds for fertilizer production. Only water and soil!
- Ideal for no-till.
- Financial benefit from production up to 1000%.
- Provides efficient pulverization (to micro and nano particle sizes), dispersion and other processes.
- Colloidal compounds are readily assimilated by plants, resulting in full utilization of any soil.
- Increasing the availability of nutrients to plants.
- Stimulation of crop growth and development.
- Improving soil fertility.
- Reducing the need for mineral fertilizers.
- Improving soil structure.
- Increasing plant resistance to diseases and pests.
- Reducing soil erosion.
- Environmental Safety.
- Increases soil fertility.
- It is enough **2-3 tons of peat + GRINBIO-1000**, for a full-fledged feeding of the land plot of 1 hectare, which will receive all the necessary micro and macroelements for a whole season!

The current Problem with using peat:

Peat in its pure form is not effective!!!

- High application rates of up to 60 tons per ha are required
- Not economically profitable.

The amount of peat needed to fully fertilize 1 hectare of land depends on several factors:

- **Peat Type:**
 - **Top peat:** 50-70 t/ha. It has a low degree of decomposition, contains few nutrients, but improves soil structure and water holding capacity.
 - **Lowland peat:** 30-40 t/ha. More decomposed than top peat, contains more nutrients but has less influence on soil structure.
 - **Transitional peat:** 40-50 t/ha. It is an intermediate variant between high and lowland peat in terms of its properties.
- **Soil Type:**

- **Sandy and sandy loam soils:** require more peat than loamy and clay soils because of their low water and nutrient-holding capacity.
- **Loamy and clayey soils:** It is sufficient to apply less peat, as they already contain these nutrients and hold water well.
- **Planned crops:**
 - **Vegetable crops:** require more nutrients than cereals or legumes, so they need more peat.
 - **Cereals and legumes:** less demanding and can make do with less peat.

On average, it is recommended to apply 40-60 tons/ha of peat for a complete fertilization of 1 hectare of land.

Extras:

- **Peat can be used not only for fertilizing,** but also for mulching the soil, which will help retain moisture and improve soil structure.
- **Peat is a renewable resource,** but its extraction can be harmful to the environment. Therefore, it is important to use it wisely and to look for alternative sources of organic fertilizers whenever possible.

Today's Activation Methods:

- Biochemical (microbiological). **Expensive**
- Thermal. **Expensive**
- Ultrasonic (cavitation). **Expensive**
- **GRINBIO-1000 electrohydraulic technology: Simple, cheap, efficient.**

How does GRINBIO-1000 work?

A high-voltage spark discharge in a liquid medium destroys the cellulose and lignin shell of an organic cell, resulting in:

- Release of beneficial substances.
- Crushing minerals to colloidal particles resulting in 100% instant plant uptake!
- Increase in soluble nitrogen compounds by more than 20-30 times.
- Preservation of properties during storage.
- The content of particles less than 150 microns reaches 80-90%.

Research has shown that different peat from different quarries gives different results. The same can be said regarding land from different locations.

Our results proved that common soil gives similar results on the growth of nitrogen-fixing bacteria that produce NH_4 (nitrogen).

Moreover in the process of cultivation, the results showed an increase of more than 300-500% in the content of micro and macronutrients.

This increase is due to the fact that during the treatment process, under tremendous pressure and high temperature, the insoluble minerals in the earth were converted into colloidal particles, making them 100% plantable.

This means that before the moment of treatment, the soil was depleted and required additional application of chemical fertilizers. But after treatment the received composition had excellent properties of complex mineral fertilizers, which allowed to give the growth of sown crops with an increase of up to 200%, both in terms of the weight of the finished crop and the green mass of the plant itself. Consequently, no more additional chemical elements are needed to increase yields and enrich the soil!

Simply treat the soil with our machine and apply the resulting slurry back to the field!

The savings are real!

100% environmentally friendly crop growth!

Increased yields up to 100%!

We have developed a revolutionary method of electro-hydraulic treatment of peat and soil in our GRINBIO 1000!!!

This method allows you to:

- Significantly reduce the need for mineral fertilizers and manure.
- Improve the sanitary and hygienic properties of soils.
- Restore the gummosis layer of soils.
- Make agricultural production cheaper.

Electro-hydraulically treated peat slurry has bactericidal properties, making it ideal for growing vegetables in closed soils.

It can also be used effectively:

- In greenhouse farming.
- To sterilize the soil while simultaneously fertilizing it.

In addition, electrohydraulic treatment allows the peat to be enriched, making it more efficient and instantly suitable for plant nutrition.

Electrohydraulic peat beneficiation process:

Advantages of electrohydraulic peat treatment:

- Reduction of costs of agricultural production.
- Improving soil fertility.
- Improvement of sanitary and hygienic conditions in greenhouses.
- Obtaining a highly effective complex fertilizer.
- Low energy costs for processing.

Electrohydraulic peat treatment is a promising technology that has great potential for the development of agriculture and the fuel industry.

5. TYPES OF PRODUCED FERTILIZERS.

Thanks to our mini plant "GrinBio 1000", it is possible to obtain the following natural, biological, natural fertilizers, both for enriching the soil with minerals and for pest control.

1. Nitrogen fertilizer from plain river, lake water.
2. Fertilizers enriched with copper. Silver, Zinc, Potassium, Magnesium.
3. Sterile antibactericidal water for watering green masses of plants as well as for soil disinfection.
4. Complex, mineral, nitrogen fertilizers from peat.
5. Complex organo-mineral fertilizers from Sapropel.
6. Complex fertilizers from plain earth.
7. Complex nitrogen fertilizers from manure.
8. Complex humic, organomineral fertilizers from Lignita - brown coal.
9. Mineral fertilizers with increased amounts of river stone minerals, pebbles, granite and other hard minerals.
10. Seaweed fertilizers

6. HOW TO PRODUCE FERTILIZER?

1. Nitrogen fertilizer from plain river, lake water.

During a spark discharge in water, the temperature at the point of discharge rises to 40,000 degrees Celsius. As a result, oxygen, hydrogen and other gases that form vacuum bubbles burn. The cavitation effect occurs, in which the vacuum bubbles undergo avalanche-like compression. At this stage, the pressure, as estimated by scientists, can reach 400 thousand atmospheres.

Not surprisingly, there are no materials that can withstand the aqueous effects of spark cavitation. To overcome this problem, the supply of ozonized air to the electrodes is used. When lightning occurs in the water, this process is accompanied by a cavitation effect that simultaneously disinfects the water from pathogenic bacteria and creates nitrogen fertilizer.

Nitrogen has an important function in plants, and one of its key roles is N_2 nitrogen fixation.

Nitrogen fixation is the process by which gaseous nitrogen (N_2) from the atmosphere is converted into ammonium (NH_4^+) or nitrate (NO_3^-), becoming available to plants in milliseconds in our plant, thanks to a spark discharge of over 60000 volts.

It takes 2 simple steps to produce nitrogen fertilizer from plain river, spring or lake water:

- pour water into the unit, turn it on for 30 min and then leave the finished product in a dark, warm place for 14-20 days.

IMPORTANT!

After that, the amount of ammonia nitrogen in the water grows to huge values, which allows it to be used as a fertilizer, but beforehand it is required to conduct an analysis of the nitrogen content, for further dilution with plain water before irrigation.

2. Fertilizers enriched with Copper, Silver, Zinc, Potassium, Magnesium.

Thanks to our mini plant, you can get excellent natural mineral fertilizers with different mineral content, the composition of which you can independently adjust depending on the desired result.

During operation, the positive electrode in the reactor is a catalyst, thanks to which, at a high-voltage discharge in a tank of water exceeding 60,000 volts, ions of the material composition of which the electrode is composed are released.

Colloidal particles of minerals are released in milliseconds and thus such a composition is ready and instantly assimilated by the root system of plants.

To obtain a variety of mineral composition, simply screw the desired tip onto the electrode, Copper, Silver, Zinc, Potassium or Magnesium.

In this case, you yourself combine the right composition of minerals that you need.

3. Sterile anti-bactericidal water for irrigation of green plants and for soil disinfection.

To control pest species in the soil or on the green mass of growing crops, it is sufficient to produce nitrogen water, which is used to water the soil and green mass.

IMPORTANT TO KNOW!

The obtained sterile water should be used not more often than 1-2 times a week for green mass and once a week for soil, as the water has disinfection properties that can kill not only dangerous for plants microorganisms, but also kill vital microorganisms.

Therefore, the use of ozonized water should be avoided deep watering. It is sufficient for the soil, moistening no deeper than 5-10 cm, depending on the root system of the plants.

It is necessary to avoid getting large amounts on the root system.

Due to its sterility, the water kills virtually all bacteria on the surface of the green mass as well as those in the ground.

After the topsoil is treated, the dangerous bacteria, fungi die leaving room for nitrogen-fixing bacteria, which in turn get free space to develop their colonies, without that resistance of parasitic bacteria.

4. Complex, mineral, nitrogen fertilizers from peat.

Peat is a valuable raw material for the production of organic fertilizers. However, its use in conventional composting methods can be time-consuming and labor-intensive

Electrohydraulic treatment of peat by our method allows simultaneously obtaining a complex: both organic and mineral fertilizer in a soluble form, useful and easily accessible to plants.

Electrohydraulic treatment of peat with our unit is the most important and most promising source of organic, especially humic substances, which are found in soil or peat peat.

Humic substances of peat contain a huge amount of nitrogen and are able to stimulate physiological processes of plant life. In addition, peat contains almost all elements of the Mendeleev table, useful for plant growth and development. But the bulk of nutrients are present in peat and water in the form of compounds that are inaccessible to plants. All that is required is to convert what is already abundant in the fertile soil layer - peat - into a water-soluble state. Nature takes years to do this. Electrohydraulic treatment of peat has a multifactorial physical and chemical effect on complex organic structures and is a promising method of its activation in a matter of seconds.

Within the pulp (a mixture of peat and water) a pulsed electric discharge of high power, called in nature lightning, is generated within a microsecond. In this case, ultra-high pressures are created in the medium around the discharge zone, cavitation processes occur, accompanied by such physical and chemical phenomena as resonance, infra- and ultrasonic vibrations, powerful magnetic fields, pulsed light, thermal, X-ray and neutron radiation. All this leads to crushing of solid materials and breaking of chemical bonds in molecules. Intensive dispersion of particles smaller than 250 microns takes place, the number of which reaches 80-90 percent. Thus, the size of the formed surface becomes even larger than that of the most highly dispersed silty fractions of ordinary soil. Mass content of nutrients and microelements in the treated peat sharply changes towards increase, there is a multiple ionization of elements contained in the liquid. As a result of treatment, more than 30 chemical elements in the form of various compounds are transferred from the soil to the water-soluble state.

With 1 cubic meter of peat you can get 9 kg of nitrogen, 4 kg of potassium, 0.5 kg of phosphorus fertilizers.

Further accumulation of ammonia nitrogen continues and during storage of the finished product - pulp (mixture of peat and water) due to the growth and development of nitrogen-fixing bacteria, there is a so-called "bacterial explosion", which leads to an increase in nitrogen content of more than 300 times!

Subsequently, the pulp (a mixture of peat and water) is applied to the soil to improve its reproductive properties.

Energy costs for electro-hydraulic peat treatment do not exceed 10 kW per 1 ton.

Advantages of electrohydraulic peat treatment:

- simultaneous production of both organic and mineral fertilizer in a soluble form that is useful and easily accessible to plants,
- electrohydraulic treatment is able to cause the appearance of active free atomic oxygen and hydrogen, and even the simplest amino acids in water,
- There is no worthy alternative to peat and its derivatives for large-scale improvement of agronomic soil properties,
- useful organics and mineral substances contained in peat are converted into an easily accessible form for plants,
- simple, cheap and highly efficient peat treatment due to the electrohydraulic effect,
- electrohydraulically treated peat can be used in the application of no-till technology in agriculture,
- electro-hydraulically treated pulp (mixture of water and peat) has bactericidal properties, which is very important when growing vegetables in closed grounds and greenhouses,

➤ simultaneous sterilization of treated peat.

The electrohydraulic shock method in our GRINBIO 1000 is a method developed by our research center, which is based on an invention made back in 1950 by the famous Soviet scientist L. Yutkin. This method offers an innovative approach to the production of fertilizers from peat. This method allows fast and efficient peat processing, producing high quality fertilizers, while shortening the natural phenomena that affect peat during its traditional use.

In nature, it takes a long time, years, for the micro and macronutrients in peat to be assimilated by plants. But using our GRINBIO 1000, all these phenomena can be obtained within minutes!

In the process of working in our plant, all the natural phenomena that are necessary for peat activation occur instantly, leading not only to peat activation, but also to an increase in the entire composition of micro and macronutrients.

So for example, in dry peat content of P - 0.5%, N - 1.5%, K - 0.09% per 1 kg, then after its treatment sharply increases the content of all elements several times!

Advantages of the GRINBIO 1000 method

- **Fast:** The GRINBIO-1000 allows peat to be processed several times faster than traditional composting methods.
- **Effectiveness:** GRINBIO-1000 breaks down the structure of peat, making it more accessible to microorganisms that participate in the decomposition process.
- **Quality:** Fertilizers obtained by the EGU method are rich in nutrients such as nitrogen, phosphorus and potassium and others in which the content increases several times due to the ongoing processes of crushing minerals to the state of colloidal particles!
- **Environmentally friendly:** the GRINBIO-1000 uses no chemicals and produces no harmful emissions, it only needs a little electricity and water to operate!

5. Complex fertilizers from the ground

Fertilizer without fertilizer: a new technology!

It seems paradoxical, but it is! And it's practically free!

Is it possible to get fertilizer directly on the fields, while cultivating them?

Yes, and here's why it can be done.

As a result of electrohydraulic crushing of rocks and other materials, many chemical elements and their compounds, which are part of their composition, pass into water in the form of soluble compounds in amounts reaching 90-95% of their content in the original material. The number of elements passing into solution is counted in tens.

It is interesting to note that the poorer a given rock is, the more intense and with less energy is the release of elements from it into solution.

Our soils are poor "ores" from this point of view, but our needs are also small. In fact, in order to provide the life of a plant for a year with trace elements, they are needed in very small quantities, very little of the basic elements potassium, phosphorus and others are also needed.

From two or three handfuls of soil taken from any field, it is possible, with very little energy and by very simple means, to obtain fertilizer sufficient to feed plants on an area of 1 m² for a whole year.

In addition, it is possible to receive not at once, but several times during the year, making periodic fertilization of crops.

"GrinBio 1000" is a unique solution that allows you to make complex fertilizers from the ground!

The ground from the field + water and in 30 minutes the ready fertilizer can be applied back to the field without using any chemicals!

We are presented with a grandiose prospect: fertilizing the fields... the fields themselves!

But we are only talking so far about the basic elements and trace elements used by plant organisms.

But what about nitrogen, the foundation of the basics of all fertilizer?

It is possible to obtain it as well. If you start electrohydraulically treating ordinary water taken from any stream or river, it turns out that the amount of dissolved nitrogen compounds in it begins to increase rapidly. With very small energy inputs, the amount of nitrogen compounds dissolved in water increases 300 times or more. Water turns into a strong nitrogen fertilizer!

What's going on here? Why is there nitrogen in the water?

Air is dissolved in all water, and air is 78% nitrogen. During electrohydraulic treatment, the nitrogen of air is transferred to water in the form of soluble compounds. But there is relatively little air in water. To saturate the solution with nitrogen, air must be continuously blown through the water under very low pressure.

The new technology of electrohydraulic fertilizer opens wide prospects for the development of agriculture. It can lead to a sharp increase in crop yields, improve product quality and reduce production costs.

6. Complex nitrogen fertilizers from manure.

Manure as fertilizer: why in our plant manure is immediately ready for use and does not have to wait a year for its **"ACTIVATION"** or, as they say, drying out.

Manure is an organic fertilizer that is the decomposed feces and bedding of farm animals.

The GrinBio 1000 intensifies natural processes that take place in nature throughout the year. Under the influence of an electrohydrodynamic shock generator (EHG), extreme conditions are created in the tank of the plant:

- Pressure: over 100,000 atm.
- Temperature: over 10,000°C
- Cavitation effects: formation of microbubbles which then collapse with the release of tremendous energy
- Formation of ozone (O₃), oxygen (O₂) and hydrogen (H₂)

The benefits of expedited processing:

- Instant sterilization: Ultraviolet radiation, ozone, high temperature and pressure destroy virtually all pathogenic microflora, creating favorable conditions for the development of nitrogen-fixing bacteria.
- Rapid oxidation: Organic matter in manure is oxidized in minutes.
- Stopping fermentation and fermentation: The manure becomes neutral, which prevents nitrogen losses.
- Breakdown and disintegration of coarse residues: Under the influence of cavitation and high pressure, coarse manure particles are broken down into smaller particles, releasing beneficial micro- and macronutrients.

Result:

Thanks to the intensification of natural processes, the manure in the **GrinBio 1000** becomes usable immediately after treatment. It is a highly efficient manure treatment solution that provides:

- Safety: Sterile and neutral manure is safe for agricultural use.
- Environmentally friendly: Rapid manure recycling reduces greenhouse gas emissions and odors.
- Effectiveness: Manure treated with **GrinBio 1000** has a high nutritional value and provides improved soil fertility.

"**GrinBio 1000**" is an innovative technology that allows manure to be processed quickly and efficiently, making it a valuable resource for agriculture.

Types of manure:

- Loose: rich in nitrogen, potassium and trace elements, friable and rapidly decomposing. Suitable for most crops, especially flowers, vegetables and berry bushes.
- Cow: contains less nitrogen than horse nitrogen, but more phosphorus and potassium. Suitable for all crops, but particularly useful for fruit trees and potatoes.
- Sheep: rich in nitrogen, potassium and magnesium. Suitable for all crops, but particularly useful for garlic, onions and beet.
- Pig manure: the most concentrated of all manure types, high in nitrogen, phosphorus and potassium. Requires composting before use as it can be toxic to plants in fresh form.
- Poultry: rich in nitrogen, phosphorus and potassium, as well as trace elements. Suitable for all crops, but especially useful for flowers, vegetables and seedlings.

Benefits of manure:

- Improves soil fertility: manure contains all the macro- and microelements needed by plants, as well as organic matter that improves soil structure.
- Increases water retention capacity: organic matter in manure increases the soil's ability to retain moisture, which is especially important in dry regions.
- Stimulates the growth of beneficial soil microorganisms: microorganisms in manure decompose organic matter and make nutrients available to plants.
- Reduces the need for chemical fertilizers: manure is a long-term source of plant nutrients, which reduces the use of chemical fertilizers.

How to use manure:

- Fresh manure: It is not recommended to use fresh manure to fertilize plants as it can be toxic. Fresh manure is best composted before use.
- Turned manure: Turned manure can be incorporated in the fall or spring. It can be spread on the soil surface and incorporated by loosening.

- **Liquid manure:** Liquid manure can be used for fertilizing plants during the growing season. It is diluted with water at a ratio of 1:10 and watered under the root.

Important:

- Do not use manure in fresh form.
- Do not apply manure to the soil immediately before planting.
- Do not use manure on waterlogged or poorly drained soils.

Manure is a valuable organic fertilizer that can significantly improve soil fertility and plant yields. When used properly, manure is an excellent alternative to chemical fertilizers.

Manure over-fertilizes throughout the year for several reasons:

Decomposition of organic matter:

- Fresh manure contains large amounts of organic matter such as fiber, proteins and fats. These substances are not available for plant uptake in fresh form.
- During over-fermentation, microorganisms break down these substances into simpler compounds that can be easily digested by plants.

Destruction of pathogenic microorganisms:

- Fresh manure may contain pathogens that are dangerous to humans and animals.
- The manure temperature rises to 50-60°C during overmixing, which kills pathogens.

Structural Improvement:

- Fresh manure has a dense structure, making it difficult to incorporate and spread.
- During over-fermentation, the structure of the manure breaks down, it becomes more friable and is easily distributed on the soil.

4. Odor reduction:

- Fresh manure has a pungent odor that can be unpleasant to humans and animals.
- The odor of the manure becomes less pungent during over-fermentation.

5. Increased nutrient concentrations:

- During over-fermentation, some of the nitrogen in the manure is removed, but the concentration of phosphorus and potassium increases.

Thus, over-fermentation of manure throughout the year allows:

- Make manure more available for plant uptake.
- Ensure manure management is safe.
- Improve the structure of the manure.
- Reduce the odor of manure.
- Increase the concentration of phosphorus and potassium in the manure.

It is important to note that not all types of manure need to be over-fermented within a year. For example, horse manure decomposes faster than other types of manure and can be used after 3-4 months.

But when using our plant, the manure is already ready for use immediately after treatment and settling for 14-20 days to increase the development of nitrogen-fixing bacteria.

7. Complex humic, organomineral fertilizers from brown coal.

Not all lignite coals are suitable for humic fertilizer production.

The coal must meet the following criteria:

- **Content of humic substances:** Not less than 30% per organic mass of coal (OMC).
- **Oxidation capacity:** Coal should be readily oxidized by chemicals or microorganisms.
- **Minimum content of harmful impurities:** The content of heavy metals, radioactive elements and other toxic substances should be within the permissible limits.

Brown coals are considered to be the most suitable for humic fertilizers:

- **Leonardites:** These are brown coals with a high content of humic acids (up to 70% per WMD). They are well oxidizable and have few harmful impurities. Leonardites are mined in many countries around the world, including Ukraine, Russia, Germany (Rhine Basin), and the United States (North Dakota and Montana).
- **Brown coals with high humic acid content:** In addition to leonardites, humic fertilizers can be obtained from other brown coals if their humic acid content is at least 30% per WMB.

Humic acids, or humates, are obtained from peat, lignite or sapropel by treating the basic substance with a weak alkaline solution. In fact, humic acids are a concentrate of soil humus, the very compound that activates the work of soil microorganisms and stimulates plants to develop more actively.

Although it is common to call humates a fertilizer, in fact it is a natural growth stimulant. Humic acids themselves do not "feed" dacha crops, but when added to the soil, they improve its structure, water and air permeability. When humates are absorbed by the roots or shoots of plants, metabolic processes are normalized in the cells of the green organism and the rate of protein synthesis increases.

Thanks to our plant "**Grin Bio 1000**", the production of humic fertilizers containing a huge amount of natural substances has become much easier and more cost-effective!

You can use different ingredients, but the most important thing is that all humic fertilizers on the market are only 5-10% of what you buy.

Why?

Well, firstly, for the root system to assimilate minerals, the condition of those very minerals must be molecularly prepared.

And what we have in nature today, peat, coal, lignin, wood ash, are large and coarse microlites, that when washed out by water, irrigation or rain, does not dissolve them, and accordingly they are like a stone, washed by water, is in the ground, not doing any good!

Humic fertilizers are natural substances that are formed as a result of the decomposition of plant residues. They contain a large amount of humic acids, which are natural biostimulants of plant growth.

Humic acids have the following properties:

- They improve soil structure by increasing its water permeability and breathability.
- They increase plant resistance to drought, frost and disease.
- They help to increase crop yields.

Humic fertilizers can be derived from a variety of sources including:

- Peat
- Lignite
- Lignin
- Wood ash

Humic fertilizers are applied to the soil in the form of granules, powder or solution. The dosage of fertilizers depends on the type of soil, growing crops and other factors.

Humic fertilizers are environmentally friendly and safe for the environment. They do not contain harmful chemicals and do not pollute the soil.

Benefits of humic fertilizers:

- They increase crop yields.
- They improve the quality of crops.
- They increase the resistance of plants to diseases and pests.
- They improve the structure of the soil.
- They are environmentally friendly and safe for the environment.

8. Complex, organomineral fertilizers from algae

The underwater world holds untold treasures, and algae is one of the most valuable gifts it gives us. Many species of red (Palmaria), brown (Alaria, Fucus, Laminaria, Ascophyllum) and green (Enteromorpha, Ulva) algae that grow in the depths of the sea not only decorate underwater landscapes, but also have an amazing ability to stimulate plant growth.

The secret of this magic lies in the rich chemical composition of seaweeds. They are packed with macro- and microelements, vitamins, amino acids and other biologically active substances that play a vital role in plant life.

Fertilizers derived from seaweed are a real elixir of life for the garden. They not only increase soil fertility, but also stimulate plant growth, strengthen their immunity, increase resistance to diseases and pests.

These are just a few of the benefits of using seaweed fertilizer:

- **Stimulate plant growth:** Seaweed contains auxins and other plant hormones that stimulate cell division and plant growth.
- **Improve soil fertility:** Seaweed contains humic acids, which improve soil structure, increase its water and air permeability and stimulate the development of beneficial microorganisms.
- **Strengthen plant immunity:** Seaweed contains phytosterols and other biologically active substances that strengthen the immunity of plants and increase their resistance to diseases and pests.
- **Increase yield:** Seaweed stimulates flowering and fruiting of plants, resulting in higher yields.
- **Eco-friendly:** Seaweed fertilizers are eco-friendly and safe for humans and the environment.

Thanks to our **GRINBIO-1000** plant, it is already possible to increase the fertility of arid lands, as it is possible to obtain an unlimited amount of minerals and their compounds from seaweeds, which in turn are very rich in a variety of minerals (depending on the region and type of algae).

Type of algae: **Not all types of algae are the same in composition.**

It is recommended to use algae that are rich in macro and micronutrients such as kelp, fucus and ascophyllum.

It doesn't matter the type of algae, as almost all are rich source of various minerals such as:

- **Magnesium:** Magnesium plays an important role in photosynthesis and other metabolic processes of plants.
- **Calcium:** Calcium is essential for the formation of strong cell walls and other plant structures.
- **Potassium:** Potassium improves water absorption of plants and increases their resistance to drought.
- **Iron:** Iron is an important component of chlorophyll and plays a key role in photosynthesis.
- **Zinc:** Zinc is essential for many enzymatic reactions in plants.
- **Manganese:** Manganese plays an important role in photosynthesis and respiration of plants.
- **Copper:** Copper is essential for many enzymatic reactions in plants and increases their resistance to disease.
- **Iodine:** Iodine is essential for complete metabolism.
- **Kelp:** Kelp is rich in magnesium, calcium, potassium, iodine and other minerals.

Our **GRINBIO-1000** plant is able to obtain from such algae all the necessary nutrients for soil and plants.

The electro-hydraulic method in GRINBIO-1000 is able to break down the cell walls of algae and release the nutrients they contain.

This process produces a mixture containing macro and micronutrients that can be used as fertilizer.

It should be noted that at this point there are already enough studies that have confirmed the effectiveness of using electrohydraulic discharge to obtain a fertilizers from algae, because the cell walls of algae are easily subject to hydrostroke and, accordingly, the enormous pressure released by the cavitation effect not only destroys the walls releasing all minerals and micro-macroelements into the water, but also simultaneously disinfecting the entire mixture.

After completion of the treatment cycle, the fertilizer should be allowed to stand for about 14 days to ferment and release nitrogen-fixing bacteria that bind molecular nitrogen. The amount of molecular nitrogen in this

fertilizer can increase by more than 100 times during this period, which makes it necessary to dilute with plain water before irrigation.

There are also a number of other sea life residues along the coast that are useful for fertilization:

- **Sea grasses:** Sea grasses, like algae, are also rich in macro- and micronutrients as well as nitrogen. They can be harvested and processed in our GRINBIO-1000 at the same level as algae.

Due to the fact that our mini plant is able to process all these species, we can get totally free organic, mineral fertilizer for reviving and greening sandy arid lands.

9. Mineral fertilizers with increased amounts of river rock minerals, pebbles, granite and other hard minerals.

Stone, river pebbles, limestone or granite is a "closed safe" in which a huge amount of minerals and trace elements are locked!

But it is not easy to extract these minerals, as the structure of the stone does not allow it.

Our plant comes to the rescue, where electrohydraulic discharge disintegrates solid compounds and a huge amount of minerals in the state of colloidal particles into water, which can then be used for irrigation of plants or crops.

With electrohydraulic discharge with a spark gap of more than 5 cm, the sand is instantly crushed to the state of colloidal compounds, which pass into water and thanks to this, the resulting water becomes a natural, natural, mineral fertilizer!

We've done a lot of tests and they've proven there are a tremendous amount of minerals transferring into the water.

The electrohydraulic effect causes the following effects in sand:

- **Change in sand structure:** EG waves lead to the breakdown of sand grain aggregates and the formation of smaller particles.
- **Increasing the electrical conductivity of sand:** EG waves change the distribution of charges on the surface of sand grains, which leads to an increase in their electrical conductivity.
- **Change in sorption properties of sand:** EG waves change the ability of sand grains to bind water and dissolved substances.

These effects cause most of the minerals that are normally insoluble in water to become soluble and pass into the aqueous phase.

Thus forming a natural mineral fertilizer!

Attention: It is necessary to analyze the resulting fertilizers, because after processing in our machine, the molecular nitrogen + high concentration of minerals increases, can be dangerous for plants and root system.

SAND MINERAL CONTENT

The content of minerals in marine sand can vary depending on where it originates the geological history of the region and the influence of other factors.

However, some of the most common minerals in sea sand are:

- **Quartz:**The most common mineral in the Earth's crust, quartz is also a major component of sand. It is composed of silicon dioxide (SiO_2) and is usually white, gray, or transparent in color.
- **Feldspar:**A group of minerals consisting of silicates of aluminum, sodium, potassium, and calcium. Feldspars are usually white, pink, or gray in color.
- **Mica:**A group of minerals consisting of silicates of aluminum, iron, magnesium, and potassium. Mica usually has a lamellar structure and may be lustrous.
- **Calcite:**A mineral composed of calcium carbonate (CaCO_3). Calcite is a major component of mollusk and coral shells, and it can also occur as sand.
- **Magnetite:**A mineral consisting of iron oxide (Fe_3O_4). Magnetite has magnetic properties and is often found in black sand.
- **Ilmenite:**A mineral composed of titanium and iron oxide (FeTiO_3). Ilmenite is an important source of titanium and is often found in black sand.
- **Pyrite:**A mineral consisting of iron sulfide (FeS_2). Pyrite has a characteristic golden color and is often called "fool's gold".
- **Cornea:** A mineral consisting of aqueous magnesium silicate ($\text{Mg}_2\text{SiO}_3(\text{OH})_2$). Cornea is a major component of talc and is often found in white or gray sand.
- **Augite:**A mineral consisting of a silicate of calcium, magnesium and iron ($\text{Ca}_2(\text{Mg,Fe})\text{Si}_2\text{O}_6$). Augite is one of the most common minerals in basalt and is often found in black or dark green sand.

In addition to these minerals, sea sand may also contain traces of other minerals such as garnet, zircon, monazite, and rutile.

- **Plagioclase:** A group of minerals composed of silicates of sodium, calcium and aluminum. Plagioclases are a major component of many types of feldspar.
- **Potassium feldspar:**A group of minerals consisting of silicates of potassium and aluminum. Potassium feldspars include orthoclase, microcline, and sanidine.
- **Apatite:**A mineral consisting of calcium phosphate. Apatite may occur in feldspar as small grains.

CONCLUSION

Our company has been researching this technology for many years, and only now have we succeeded in building the world's first plant of this type capable of producing over 3500 tons of the purest natural fertilizer!

All types of fertilizers described above, we have been able to produce at our plant, which is fantastic because this plant has the unique ability to utilize all types of minerals, organic substances, and most importantly – GROUND FROM THE FIELD!!

Yes, that's the most important and the simplest part! No expenses, and in the end, you will have complex natural fertilizers from simple soil for your entire life!

If you want to give the world the best - our GRINBIO-1000 plant will help you!

All your products will not only acquire the brand BIO, but most importantly will be tasty, safe for health and of course very profitable for you, as a BIO product is valued many times higher than a simple chemical-filled "bag" under the name of product!

Regards CEO FOP GRINOV

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