



**No 47 (2020)**

**P.5**

**The scientific heritage**

(Budapest, Hungary)

The journal is registered and published in Hungary.

The journal publishes scientific studies, reports and reports about achievements in different scientific fields. Journal is published in English, Hungarian, Polish, Russian, Ukrainian, German and French.

Articles are accepted each month. Frequency: 12 issues per year.

Format - A4

**ISSN 9215 — 0365**

All articles are reviewed

Free access to the electronic version of journal

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# CONTENT

## AGRICULTURAL SCIENCES

<b>Biliavtseva V.</b> THE PRODUCTIVITY OF THE SEPARATED PIGLETS IS AT FEEDING OF BVMD "Enervic" ..... 3	<b>Tomchuk V.</b> MOISTURE CONSERVATION IN HORTICULTURE: TOOLS AND TECHNOLOGIES.....16
<b>Demchuk O.</b> FEATURES OF THE USE OF STRUCTURED WATER..... 11	<b>Chysyma R., Sambyla Ch.</b> BREEDING OF MARALS OF ALTAE-SAYAN BREED IN TURAN MARALOVOGRAPHY OF THE REPUBLIC OF TYVA .....28
<b>Rezvichkiy T., Tikidzhan R., Pozdniakova A., Mitlash A., Kochubey S.</b> INFLUENCE OF WATER-SOLUBLE COMPLEX FERTILIZERS ON THE YIELD OF THE CORN HYBRID KRASNODAR 292 AMB IN THE CONDITIONS OF THE CENTRAL ZONE OF THE KRASNODAR REGION ..... 14	

## ART STUDIES

<b>Karmazin A.</b> MUSIC IN THE LIFE OF TARAS SHEVCHENKO (ON THE MATERIALS OF THE UKRAINIAN MUSEUMS) .....31
--

## HISTORICAL AND ARCHEOLOGICAL SCIENCES

<b>Drok L.</b> HISTORICAL AND STATISTICAL ASPECT OF THE CORRELATION BETWEEN CATEGORIES OF OFFICERS IN THE ARMED FORCES OF NATO MEMBER COUNTRIES.....35
--

## PSYCHOLOGICAL SCIENCES

<b>Martynov V., Martynova N.</b> FORMATION OF ETHNOCULTURAL COMPETENCES OF FUTURE TEACHERS-ARTISTS IN THE COURSE OF DESIGN AND CREATIVE ACTIVITY IN THE UNIVERSITY. EXPERIENCE OF IMPLEMENTATION OF THE ETHNOCULTURAL PROJECT "RIDDLES OF ANCIENT PRIAMURYE" .....44	<b>Ivanova N., Ponomarenko A., Krapivina N.</b> FUNCTIONAL AND ACTIVITY ASPECTS OF INTERPERSONAL COMMUNICATION IN MODERN SOCIETY .....51
	<b>Chistiakova N.</b> SPECIAL EDUCATIONAL NEEDS OF STUDENTS WITH MUSCULOSKELETAL DISORDERS (MSDS) .....56

## SOCIAL SCIENCES

<b>Kuznetsova E.</b> STUDENT YOUTH AWARENESS ON HIV INFECTION ..58
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## FEATURES OF THE USE OF STRUCTURED WATER

*Demchuk O.**Postgraduate, Department of Ecology and Environmental Protection,  
Vinnytsia National Agrarian University (Vinnytsia), Ukraine***Abstract**

The processes occurring in water during its structuring are analyzed. The list of ways of structuring of water is defined. An analysis of the method of water structuring based on the use of energy fields is given. The structure of water molecules exposed to energy fields is visualized. The influence of such water on the state of living organisms is described.

**Keywords:** water, structure, energy, physical and chemical substances.

An innovative way to improve the quality and environmental safety of water is its structure. Among the many methods of water structuring: freezing, cavitation, the use of ultrasound, magnetic radiation. This method involves the harmonization of the geostan of water, which has a beneficial effect on the human body. Due to its special properties, the negative impact of the environment is reduced, and the water returns to its original vital energy [1].

Human activities involve the use of water from various sources in technological processes. Participating in a variety of technological processes, water loses natural information and acquires information technology. This information by its vibrations does not coincide with the information of the living cell and therefore the cell loses information programmed by nature.

Imperfect technologies in the national economy create a real vibrational chaos. The structure of water with the help of energy fields returns to humanity the initial flow of pure natural water structure, which improves human health when consumed.

The carriers of information can be physical fields of various natures. Thus, the possibility of information interaction of the water structure with objects of different nature with the help of electromagnetic, acoustic and other fields.

In production conditions, the most common is the chemical method of pre-sowing seed preparation. However, its use does not make it possible to obtain environmentally friendly products and increases the anthropogenic pressure on natural ecosystems. Therefore, it is important to develop alternative methods of pre-sowing seed preparation that would meet modern environmental requirements of agriculture and have high economic efficiency. Ultimately, the yield and quality of products depend on this [2].

Magnetic treatment slows down corrosion processes, radically reduces the growth rate of mineral and biological deposits, reduces operating costs and energy consumption of production. Water structuring can significantly reduce operating costs and increase the efficiency of technological water treatment systems. Thus, magnetic structuring systems are built into existing technological lines (installed at the entrance or exit of the technological site) and do not require the construction of special structures. Since high-energy permanent magnets, corrosion-resistant materials and coatings are used for water structuring,

the significant advantages of magnetic treatment systems are reliability, durability, energy independence and minimal need for maintenance [3].

Water, having the same chemical composition, can have completely different effects on plants, birds, animals and humans depending on their structural condition. The structural model of water, which is formed by perfect tetrahedral fragments of five molecules and the formation of branched clusters, explains many of its anomalous properties, and also makes it possible to change them by external influences. Depending on the form of the connection of molecules in the associative structure, a field appears that can positively affect biological objects or inhibit the biological processes occurring in them. If water molecules are connected by hydrogen bonds in an associative structure randomly, then the resulting field inhibits the processes occurring in biological objects [4].

To date, there are no difficulties in obtaining structured water. Technological progress has provided us with compact and affordable devices for structuring water in both domestic and industrial. Most tori structures have a nozzle that connects directly to the pipes of the water supply network and provides a process of vortex structuring. The only difficulty for the user is the need to calculate between the amount of fluid supplied and its pressure entering the nozzle of the structurizer. The size of the nozzle and its capacity will depend on it [5].

Water and its quality play an important role in crop production and agriculture. In particular, plants need water as a solvent and nutrient transporter, for transpiration, cooling of plants, etc. Water affects the germination of seeds and determines its field germination, is also used for watering, spraying crops and fertilizers. Therefore, the yield and quality of the obtained products largely depend on the water quality. Low crop yields can also be the result of poor quality and polluted water. Water used for watering, irrigation, plant germination must contain a complex of nutrients and have a natural structure. The use of such water will promote faster passage of phenological phases of growth and development of plants and, accordingly, a bigger harvest [6].

The use of structured water after exposure to water magnetic (electromagnetic) field water becomes more structured than ordinary water. It increases the rate of chemical reactions and crystallization of solutes, intensifies adsorption processes, improves coagulation

of impurities and their precipitation. The influence of the magnetic field on water affects the behavior of impurities in it, although the essence of these phenomena is not yet clear. It is possible that the biological effect of structured water on the body is due to the fact that the channels (pumps) of tissue cell membranes pass molecules of structured water at high speed, because the regular structure of water resembles the regular structure of the cell membrane - highly structured organelles [ 7].

Structured-polarized water has unique properties:

- in the volume of water completely erased information obtained by water during the period of its existence before structuring;
- water has a right-hand (right) polarization of molecules, fractal (similar) to the energy of space. Through such water the organism receives energy and restores the energy exchange between the organism and space, the energy of which restores the organism at the energy, cellular and organ levels;
- water has a limiting fine-dispersed structure;
- inhibits the activity of pathogenic microflora;
- sanitary and microbiological indicators are significantly improved;
- water hardness decreases;
- prevents the formation of solid deposits;
- increases heat transfer;
- the ability to dissolve 2 times greater than usual, so saline soils of heavy mechanical composition is better to wash with structured water. This significantly improves the aggregate composition of the upper layers, increases the content of mobile forms of phosphorus, increases the initial filtration rate by 20-30%;
- reduces the consumption of pesticides and growth stimulants;
- plants are twice less likely to be affected by disease than when watered with ordinary water;
- 1.5 times more assimilation of fertilizers;
- the reaction of the soil changes from slightly alkaline to neutral;
- accelerates plant growth by 1.5 times;
- frost resistance (freezing temperature of structured water;
- when processing seeds and soil germination will increase by 35%. The growing season is reduced by 20-30% [8].

Structured water must have the following qualities: water must be absolutely clean; it must not contain chlorine and its organic compounds, salts of heavy metals, nitrites, pesticides, etc. Water should be of medium hardness, as very hard and very soft water are equally unacceptable for plant cells. This water prevents rot and eliminates bad odor. It accelerates the growth of plants and soil animals; flowering, development and ripening of the crop. It is effective in preventing the defeat of plants and animals by diseases, viruses and pests.

Studies conducted at Omsk State Agrarian University (Russia) have shown that all species of plants exposed to the device have developed much faster. A high saturation of plants with moisture was noted, which indicates an improvement in the ability of

plants to use habitat conditions. However, this was accompanied by a large accumulation of dry mass of plants, which changed mainly due to the increase in the amount of synthesized organic matter [9].

Features of structured water: sanitary and microbiological indicators are significantly improved; water hardness decreases; prevents the formation of solid deposits; increases heat transfer; the ability to dissolve 2 times greater than usual, so saline soils of heavy mechanical composition is better to wash with structured water. This significantly improves the aggregate composition of the upper layers, increases the content of mobile forms of phosphorus, increases the initial filtration rate by 20-30%; reduced consumption of pesticides and growth stimulants; plants are twice as likely to be affected by disease than by watering with ordinary water; 1.5 times increased assimilation of fertilizers; the reaction of the soil changes from slightly alkaline to neutral; accelerates plant growth by 1.5 times; frost resistance (freezing temperature of structured water – from -5 to -12 ° C); when cultivating seeds and soil germination will increase by 35%. The growing season is reduced by 20-30% [10].

A sample image of unstructured water indicates the quality of water with little vital energy, but without significant pollution. Crystalline samples are diffuse (scattered), show little shaping forces. Although amorphous structures show certain traces of structuring forces, they are clearly small. This is a sign that the water is taken from a natural source. Treated water from sewage treatment plants or from a polluted river or lake shows much more negative structures with angles of 90°. The enlarged image of the structure shows the remnants of the organic structure in full. Of interest are individual round crystals in the background, which do not have structural forces. This is a sign of minerals without vitality, which can accumulate in the body and cause disease.

A sample of structured water showed a good level of crystal activation, indicating that it has undergone effective treatment. The crystals show a very pronounced star shape, which is a sign of a high degree of activation. There are no signs of destabilizing effects of electromagnetic radiation. This sample will not have any other harmful effects, it will only cause an increase in energy and health effects.

Studies on the influence of the Odjas mug were conducted under the guidance of Professor MV Kuryk of the Ukrainian Institute of Human Ecology on the influence of changes in the physical and chemical parameters of different types of water [11].

The method of structuring water "Ojas" is based on the transmission of bioelectric information, or energy. During processing, harmful frequencies are "erased" and those that support the life process are transmitted [12].

Table 1 shows the data of physicochemical parameters for drinking water from the city network and bottled mineral water, which were in the structurizer "Ojas" for several hours, compared with samples of control water, which was the same time in ordinary ceramic vessels.

Table 1

Physico-chemical characteristics of the water that was in the structurizer "Ojas"

Water	Sample	Acid-base balance pH	Conductivity $\sigma$ ( $\mu\text{S}/\text{m}$ )	The total concentration of dissolved impurities TDS ( $\text{mg}/\text{l}$ )	Redox potential (mV)	Structural order
Drinking from the city network	control	7.82	360	354	+384	-
	structured	7.90	361	392	+392	-
Mineral	control	8.80	700	605	+133	+
	structured	8.95	890	620	+132	+

In particular, in structured drinking water from the city network, the acid-base reaction increases – by 1%, and in mineral water – by 1.7%. Electrical conductivity also increased by 0.3% and 21.3%, respectively. There is also an increase in the concentration of dissolved impurities – by 9.7% and 2.4%, respectively. The redox potential of structured drinking water from the city network increased by 2% and mineral water, on the contrary - decreased by 0.8%.

Seed germination energy was determined on the

third day after laying by calculating the average percentage of full-fledged seedlings to the number of sown seeds. Laboratory germination of seeds was calculated on the seventh day after sowing the seeds by calculating the average percentage of full-fledged seedlings in the number of sown seeds.

The germination energy of radish seeds for sowing with unstructured water was 13.3%. With the use of structured water, the germination energy of radish seeds increases 2 times and is 26.7% (Table 2).

Table 2

Influence of structured water on laboratory germination and germination energy of radish seeds, %

Indicator	Unstructured water	Structured water
Seed germination energy, %	13,3	26,7
Laboratory germination of seeds, %	66,6	86,7

Laboratory germination of radish seeds for moistening with unstructured water is 66.6%, and for moistening with structured water - increases by 20% to 86.7%.

The application of structured water on soils can restore their natural state; to improve the growth and development of plants, increase their productivity. However, for the use of structured water on large areas of agricultural land, it is necessary to develop an effective way of its structuring and application.

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### **ВЛИЯНИЕ ВОДОРАСТВОРИМЫХ КОМПЛЕКСНЫХ УДОБРЕНИЙ НА УРОЖАЙНОСТЬ ГИБРИДА КУКУРУЗЫ КРАСНОДАРСКИЙ 292 АМВ В УСЛОВИЯХ ЦЕНТРАЛЬНОЙ ЗОНЫ КРАСНОДАРСКОГО КРАЯ**

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### **INFLUENCE OF WATER-SOLUBLE COMPLEX FERTILIZERS ON THE YIELD OF THE CORN HYBRID KRASNODAR 292 AMB IN THE CONDITIONS OF THE CENTRAL ZONE OF THE KRASNODAR REGION**

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