

BIOGEOCHEMICAL CHARACTERISTICS OF BIOMICROELEMENTS IN IRRIGATED SOILS

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Abstract:

The article analyzes the bio microelement composition of irrigated meadow saz soils and light gray soils (calcisols) formed in the Fergana region and the cherry organs grown on them. The processes of migration and accumulation of biomicroelements in these soils and the cherry organs grown on them are also determined, biological absorption coefficients and geochemical spectra are developed.

Keywords: biomicroelement, biological absorption coefficient, biogeochemistry, geochemical spectrum, migration, accumulation.

INTRODUCTION

Today, scientific research is being conducted in a number of priority areas in the world to identify the problems of managing the exchange of chemical elements in the soil-plant chain, their quantity and balance, and changes in them, to eliminate the negative processes occurring in them, to determine the bioaccumulation of elements through the coefficients of biological absorption of microelements, to determine their intensity, and to develop background quantities.

Almost all elements of the periodic system of chemical elements have been identified in living organisms, including plants. Any change in the composition of elements in the soil is reflected in plants, that is, it immediately affects the chemical composition of the plant. According to A.P. Vinogradov [1], the chemical composition of plants depends on their place in the systematics.

Agricultural plants, optimal yield is formed in optimal biogeochemical provinces. Positive or negative provinces are, in turn, reflected in the yield and its quality [2] .

The geochemical, biogeochemical and physical properties of irrigated soils have been studied by a number of researchers and are presented in the scientific studies of AI Perelman [3], MAGlazovskaya [4], VV Dobrovolsky [5], G. Yuldashev [6], VY Isakov [7] and many other scientists.

Field studies were conducted using the method of VVDokuchaev, geochemical analyses were performed using the integrated approach developed by AI Perelman [3], MAGlazovskaya [4]. The total amounts of biomicroelements in soil and plants were determined using the neutron activation analysis method at the Institute of Nuclear Physics of the Russian Academy of Sciences.

It is also relative to call elements such as Cu, Zn, Mn, Mo biomicroelements, due to their quantities in the lithosphere, soil, and plants, as well as their physiological role in improving crop yield and increasing soil fertility [2]. The reason for their separate classification is that a number of their properties have been better studied than other elements in the irrigated farming system.

During the growth period of plants, changes in humidity and temperature have a significant impact on the biological activity of soils, the rate of oxidation-reduction processes in them, the amount of mobile manganese in the soil and plants, and the rate of absorption by plants. The main factors affecting the amount of copper in plants are weather conditions, soil properties, the mobile amount of the element, the rate of fertilizer application, the biological properties of agricultural crops, etc. [8].

Zinc deficiency inhibits the formation of generative organs and fruits, and negatively affects seed formation in cereal crops [9] . Zinc deficiency in plants causes chlorosis, and fruit trees develop small leaves and rosettes [10].

The amount of chemical elements in plants depends on the plant variety, soil properties, etc. Now, in this regard, we will focus on the amount of biomicroelements in cherries and the ability of these elements to be absorbed from the soil, that is, the biological absorption coefficients.

Studies have shown that the amounts of Mn, Mo, Zn, and Cu, which are important biomicroelements for plant development, are significantly reduced in meadow sedge and light gray were also detected in the stem, fruit, and leaves of cherry varieties grown in the soils and are listed in Table 1.

Table 1 Cherry Amount of biomicroelements in organs , mg/kg

Soil	Organs	Mn	Mo	Zn	Cu
Meadow music soil	fruit	1.7	0.76	1.4	5.6
	body	3.65	0.54	11.7	3.5
	leaf	61.9	3.23	9.84	9.0
background		453.1	3.8	68.7	20 *
Hungry colorful gray soil	fruit	5 , 9	0.92	3.36	2 , 9
	body	22.2	0.73	11.0	31.5
	leaf	55.3	4.66	25.4	6.1
background		615.6	0.6	95.9	20 *

*soil clarke.

According to the data in Table 1 , it was found that Mn and Mo were several times more abundant in the leaves of cherry than in its fruit and flesh. Zn the amount is also cherry in the fruit less is 1.4-3.36 mg /kg . But cherry body and on the leaf many in quantities occurs and 9.84-25.4 mg/kg The amounts of Cu differ slightly from other microelements, being higher in the body of cherries on light gray soils than in the fruit and leaves, while on the contrary, it is slightly higher in the leaves of cherries on meadow-sedge soils than in other organs .

It is noteworthy that the accumulation of Mo in all organs of cherries grown on light gray soils and Cu in the trunk was observed, and their amounts were found to be higher than those in the soil.

According to the data reviewed, microelements are distributed in different amounts in different organs of cherries, depending on the variety and soil type. The rate of migration, accumulation and differentiation of chemical elements is determined by their biological absorption coefficients. For this purpose, biological absorption coefficients of biomicroelements such as Mn, Mo, Zn, Cu were developed based on their content in irrigated meadow moss and light gray soils and in cherry organs grown on them and are given in Table 2 below.

Table 2 Bioabsorption coefficients of biomicroelements

Soil type	Organs	Mn	Mo	Zn	Cu
Meadow music soil	fruit	0.0038	0.20	0.020	0 , 28
	body	0.0081	0.14	0.170	0 , 17 5
	leaf	0.1366	0.85	0.143	0.45
Hungry colorful gray soil	fruit	0.0096	1.53	0.035	0 , 145
	body	0.0361	1.22	0.115	1.5 75
	leaf	0.0898	7.77	0.265	0 , 305

According to the data provided, the BSK of Mo in the cherry leaf on light gray soils is 7.7, in the fruit 1.53 and in the flesh 1.22, and that of Cu in the flesh is 1.575, which means that Mo and Cu are strongly accumulated in these cases. Cu leaf and in fruit, Zn leaf and in the body average caught remains. Mn and plant organs by weak caught left over.

Irrigated meadow reed in the soil cherry all Mo and Cu in the organs, body and Zn in the leaf, only Mn biotrace elements in the leaf cherry organs by average biological caught. Fruit and Mn is weak in the body caught remaining determined. Comparative from analyses visible it is clear, every kind soil in the type cultivated cherry. There are differences in the biological absorption coefficients of biotrace elements in the organs of the body, which. The differences are clearly visible through the following geochemical spectra: and According to the biological absorption coefficients of biotrace elements, the following decreasing in sequence there is a name:

Irrigated lawn word in the soil in cherry BSK of bio microelements:

In fruit: $\text{Cu}_{0.28} > \text{Mo}_{0.20} > \text{Zn}_{0.02} > \text{Mn}_{0.0038}$;

On the body: $\text{Cu}_{0.175} > \text{Zn}_{0.170} > \text{Mo}_{0.140} > \text{Mn}_{0.081}$;

In the leaf: $\text{Mo}_{0.85} > \text{Cu}_{0.45} > \text{Zn}_{0.143} > \text{Mn}_{0.1366}$.

Watering hungry colorful in the soil in cherry BSK of bio microelements:

In the fruit: $\text{Mo}_{1.53} > \text{Cu}_{0.145} > \text{Zn}_{0.035} > \text{Mn}_{0.0096}$;

On the body: $\text{Cu}_{1.575} > \text{Mo}_{1.22} > \text{Zn}_{0.115} > \text{Mn}_{0.0361}$;

In the leaf: $\text{Mo}_{7.77} > \text{Cu}_{0.305} > \text{Zn}_{0.265} > \text{Mn}_{0.0898}$.

In plants Biogenic accumulation of microelements leads to the leaching of these elements from the soil, even in small quantities, and their accumulation in the topsoil layers. and This situation is considered slightly positive for irrigated soils

Conclusion

Chemical elements are differentiated in different amounts in different soils, depending on their properties and soil conditions, and accumulate in different amounts in plant organs or are weakly and very weakly biologically retained. Determining the accumulation and migration of microelements and the coefficients of biological absorption in plants, that is, studying their biogeochemical properties, serves to correctly place and fertilize cultivated plants and increase the yield and quality of crops.

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