УДК 631.53:631.55

DEFINITION OF CARRYING OUT OF BIOGENOUS ELEMENTS WITH THE HARVEST OF AGRICULTURAL PLANTS IN THE CONDITIONS OF THE KHERSON REGION

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Definition of carrying out of biogenous elements with a harvest of agricultural plants in the conditions of the Kherson region taking into account the actual content of nitrogen and phosphorus in soils of agricultural purpose and type of agricultural plants is executed.

Key words: biogenous elements, agricultural plants, nitrogen, phosphorus, carrying out coefficients, productivity.

Introduction. The Kherson region is one of the crops which are most loaded on cultivation which demand introduction of mineral and organic fertilizers. Across this territory a lot of small proceeds and average of water objects which are exposed to considerable impact of processes of an evtrofirovaniye due to hit in the last of biogenous elements.

Problem. Biogenous elements get to the soil and are taken out with a harvest of agricultural plants. Depending on characteristics of the soil, type of agricultural plants and qualitative and quantitative characteristics of mineral and organic fertilizers the balance of biogenous elements is formed.

Analysis of the last researches and publications. Calculation of carrying out of biogenous elements from agricultural grounds is carried out on the basis of the known agrochemical dependences which connect amount of the substances which are taken out with properties of the soil, types and productivity of crops [1]. The settlement equation for definition of carrying out of biogenes from the soil is based on productivity of crops as on an integrated indicator of a condition of several basic factors (the soil, weather conditions, duration of the vegetative period, amount of fertilizers which are used of means of their introduction, etc.) [2].

Purpose of researches. Definition of carrying out of biogenous elements will allow to execute optimization of the mode of introduction of mineral and organic fertilizers for the purpose of reduction of load of a soil cover from the areas occupied under agricultural plants in the conditions of the Kherson region. **Results of researches.** By means of the given technique calculation of carrying out of biogenous elements from acreage of the Kherson region is executed. Specific carrying out of biogenes from the area, occupied and - oh a crop (R_i), is determined by a formula [3]:

$$R_i = \alpha_N k_i y_i + \alpha_p k_i y_i + \alpha_K k_i y_i \quad (1)$$

where $\alpha_N, \alpha_p, \alpha_K$ - respectively coefficients of carrying out of nitrogen, phosphorus and potassium for various soil conditions and crops; k_i - carrying out of biogenes from the soil with a harvest, kg/t; y_i - the actual productivity of a crop.

Respectively the general carrying out of biogenous substances from the water protection zone of the river or other water object is determined by a formula:

$$\sum W_{ПЛ} = \sum_{i=1}^{n} R_i S_i \qquad (2)$$

where $\sum W_{ПЛ}$ - the general carrying out of biogenes from the area of the water protection zone, kg in a year; R_i - specific carrying out of biogenes from the area occupied with a crop; n - quantity of crops on the square; S_i - area which is busy with a crop, hectare. When calculating use value of productivity of culture according to the forecast.

The area occupied with culture is determined by actual data of economy about structure of crops in the water protection zone of the river [4]. The initial quantity of the brought biogenous elements determine by a formula:

$$W_{ИСХ} = \sum_{j=1}^{m} \Phi_{M_j} W_{CP_j} \qquad (3)$$

where $W_{исх}$ - initial quantity of the biogenes brought in the soil, kg/year; m - quantity of types of fertilizers; Φ_{M_j} - the physical mass of j-go of a type of the fertilizers introduced, t; W_{CP_j} - the average content of biogenous elements in the look j-go fertilizer.

Increase of loss of biogenes can be observed at low levels of technologies of use of fertilizers. Therefore, using actual data, I was defined destiny of losses of biogenous elements and their total carrying out from a site owing to violations of technology (Wpot, kg/year) on a formula has paid off:

$$\sum W_{ПОТ} = \sum_{j=1}^{m} W_{ИСХ_j} q_j \qquad (4)$$

where q_j - part of losses of biogenous elements as a result of violations of technology of introduction of j-go of fertilizer; $W_{ИСХ_j}$ - initial number of introduction of the biogenous j-go fertilizers of a look, kg/year [3].

For the analysis of maintenance of the main minerals in soils of the Kherson region data on keeping of the last for 2013 have been used. In figure 1 it is presented the content of nitrogen in soils of the Kherson region. Analyzing the chart, is visible that the maximum value of content of nitrogen in soils of the Kherson region makes 42,3%, the minimum value - 6,3%. Average value for all areas makes 23,3%. In figure 2 it is presented the content of phosphorus in soils of the Kherson region. Analyzing region the chart, is visible that the maximum value of content of phosphorus in soils of the Kherson region makes 55,2%, the minimum value - 8,3%.

Average value for all areas makes 25,3%. The total value of carrying out of biogenes (Wob, kg/year) will make:

$$W_{об}=\Sigma W_{ПЛ}+\Sigma W_{ПОТ}, \qquad (5)$$

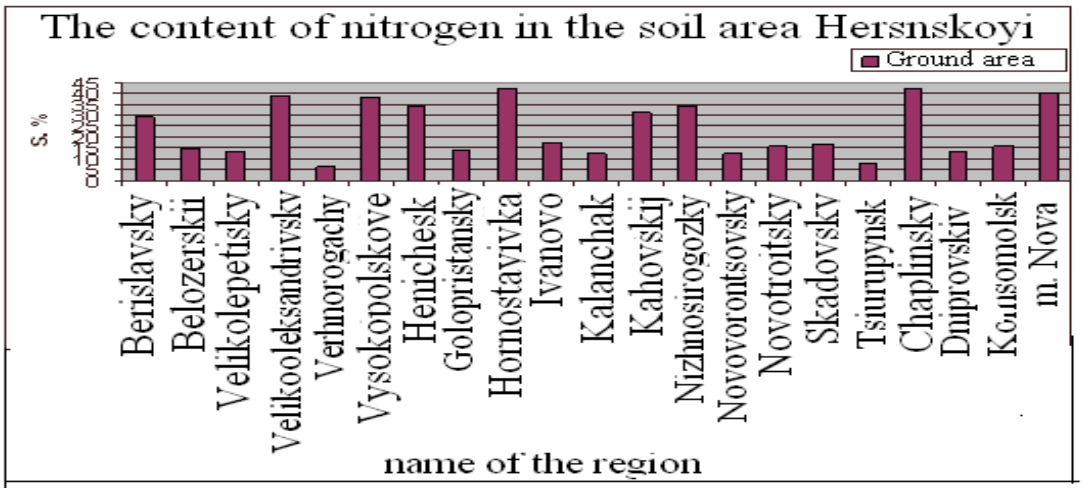

Fig. 1. -Content of nitrogen in soils Kherson region.

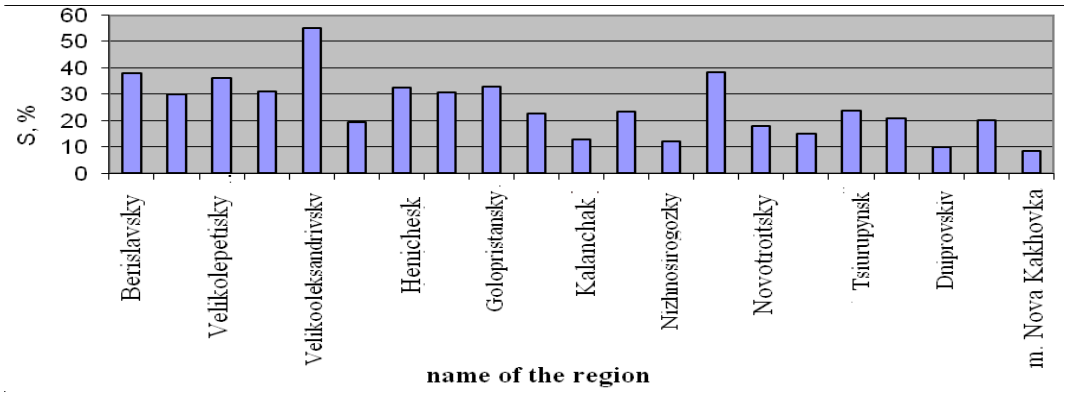

Fig. 2 . Content of phosphorus in soils of the Kherson

and coefficient of losses

$$\alpha_{ПОТ} = W_{об} / W_{ИСХ} \quad (6)$$

On the basis of the technique given above definition of carrying out of biogenous elements is executed from agricultural grounds of the Kherson region.

Table 1 - Carrying out of biogenous elements from grounds

Index	Вар-т	The agricultural crop				Total value of an indicator
		grain and leguminous	sunflower	potatoes	vegetables	
Initial quantity of the brought biogenes $W_{исх}$, t/year	1	317648	20754	9591	10640	358632
	2	55276	3769	974	2385	62405
The quantity of biogenes, is taken out with a harvest $W_{пл}$, t/year	1	33026	549	716	5517	39808
	2	33026	549	716	5517	39808
Carrying out of biogenes as a result of violations of technologies $W_{пот}$, t/year	1	26451	1718	772	890	29830
	2	2871	186	62	114	3233

Total value of carrying out of biogenes $W_{об}$, t/year	1	59477	2267	1488	6407	69638
	2	35896	736	778	5631	43041
Expense ratio $\alpha_{пот}$, %	1	18,7	10,9	15,5	60,2	19,4
	2	64,9	19,5	79,9	236,1	69,0

Conclusions. Proceeding from the obtained data it is visible that the greatest carrying out of biogenous elements happens to a grain yield and leguminous plants.

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ОПРЕДЕЛЕНИЕ ВЫНОСА БИОГЕННЫХ ЭЛЕМЕНТОВ С УРОЖАЕМ СЕЛЬСКОХОЗЯЙСТВЕННЫХ РАСТЕНИЙ В УСЛОВИЯХ ХЕРСОНСКОЙ ОБЛАСТИ

Ильина В.Г., Прикуп Л.А.

Ключевые слова: биогенные элементы, сельскохозяйственные растения, азот, фосфор, коэфициенты выноса, урожайность.

Резюме

Выполнено определение выноса биогенных элементов с урожаем сельскохозяйственных растений в условиях Херсонской области с учетом фактического содержания азота и фосфора в почвах сельскохозяйственного назначения и типа сельскохозяйственных растений.

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