

ТИУТИУННИК Н.О.

postgraduate

Institute Of Market Problems And Economic&Ecological Research of the

National Academy Of Sciences Of Ukraine

Frantsuzskiy Boulevard, 29, Odessa, Ukraine

E-mail: ecoregnatures@ukr.net

FORMATION OF ENVIRONMENTALLY FRIENDLY AGRICULTURAL LAND AS A PRIORITY OF GREENING THE ECONOMY OF REGIONAL SYSTEM

Questions of creation the environmentally friendly agricultural land as a priority direction of greening the economy of regional system are considered. The role of environmentally friendly land as part of a balanced agricultural nature, quality characteristics which are the basis of agro-ecosystems preservation, productivity increasing, prevent degradation and agricultural landscapes restoration is analyzed. The article presents the issue of improving soil quality continues needs to be urgent. In particular, the task of improving the quality of agricultural land and considering the qualitative characteristics as an object of management remains unresolved, which necessitates further systematic research in this direction. The purpose of the article is to substantiate the essence of soil quality management, the creation of land masses with appropriate soil characteristics as a means of obtaining safe products of standardized quality, maintaining the quality of the natural environment, preventing its degradation and using innovative industrial technologies in alternative agricultural systems. It is substantiated that qualitative soil properties and fertility are inextricably linked. The processes of soil formation and soil fertility are determined by a number of natural factors and the nature of economic activity, which affects not only the arable layer but also deeper soil horizons, as well as groundwater and groundwater. The optimal parameters of fertility indices should be established for each type of soil, ie they can vary according to the fertility patterns as a combination of soil properties and modes that ensure the productivity of the land, the high quality and safety of the agricultural products derived from them. It is determined that the management of ecological agriculture will facilitate the creation of land uses with special characteristics, which are achieved through the implementation of the general laws of agriculture and a number of principles, among which the principles of environmental orientation are combined with the principles that facilitate their implementation.

Key words: environmentally friendly land massifs, soil quality, agroeconomic nature management, anthropogenic loading, humus, ecological monitoring, pollution of land.

ТЮТЮННИК Г.О.

здобувач

інженер I категорії

Інститут проблем ринку та економіко- екологічних досліджень НАНУ

Французький б-р, 29 м. Одеса, Україна, 65044

E-mail: ecoregnatures@ukr.net

ФОРМУВАННЯ ЕКОЛОГІЧНО ЧИСТИХ СІЛЬСЬКОГОСПОДАРСЬКИХ ЗЕМЕЛЬ ЯК ПРІОРИТЕТНИЙ НАПРЯМ ЕКОЛОГІЗАЦІЇ ЕКОНОМІКИ РЕГІОНАЛЬНОЇ СИСТЕМИ

У публікації підлягають розгляду питання щодо створення екологічно чистих сільськогосподарських земель як пріоритетного напрямку екологізації економіки регіону. Розглянута роль екологічно чистих земель, як складової збалансованого аграрного природокористування, якісні характеристики яких є основою збереження агроєкосистем, підвищення врожайності, запобігання деградації та відновлення агроландшафтів.

Ключові слова: екологічно чисті земельні масиви, якість ґрунтів, агрогосподарське природокористування, антропогенне навантаження, гумус, екологічний моніторинг, забруднення земель.

Problem statement and its connection with important scientific and practical tasks. One of the key stability conditions the economy of regional system is a full compliance with land use to landscape-zonal features and preserving their environmental performance. As a result of strong anthropogenic load current agrocenosis characterized by a negative balance of humus, organic matter, important elements of nutrition, contamination by heavy metals, activation of erosion. This leads to degradation and deterioration of the potential sustainability of agricultural landscapes, dropping biological, agrochemical, agrophysical indicators that determine soil quality. This is especially true to the most valuable and widely used Ukrainian black soil, which are very susceptible to anthropogenic impact.

Creation of land use with special characteristics will contribute to keeping the ecological agriculture which is based on the principles of the protection, management and expansion of natural areas, supporting the balance of agricultural ecosystems.

Analysis of recent publications on the problem. The environmental component in agricultural economic problems of nature is seen by many research groups. Implementation of policies to scientifically-based redistribution of land, forming a rational system of land ownership and land use, creating environmentally sustainable landscapes and agricultural systems remains a matter of strategic importance, implementation of which carries State Service of Ukraine of the Surveying, Mapping and Cadastre, which responsible among the other matters for the environmental regulation of land relations and establish a special regime and land use conditions.

One of the studies Public Institution «Institute of Environmental Economics and Sustainable Development of the National Academy of Sciences of Ukraine» is the development of the institutional foundations of land use and methodological assess tools of socio-environmental and economic efficiency of land use in the context of sustainable rural development.

Among the of scientific priorities for the NSC "Institute of agrarian economy" is the justification for greening areas of agricultural land, development of scientific bases of rational and efficient use of land and preservation of their fertility.

Improving soil fertility through innovation in the field of soil sciences is the prerogative of the NSC "Institute of soil sciences" them. O.N. Sokolovsky.

Institute of Agroecology and Environmental NAAS of Ukraine holds the development of ecologically balanced fundamentals and revival of economic activities in the agricultural domain contaminated areas and their scientific support.

The subject of SI "Institute of soil conservation Ukraine" and its regional branches is the implementation of a unified scientific and technical policy in the field of soil and fertility, management and environmental safety of agricultural land, scientific and methodological and organizational support for state monitoring of soil and agrochemical certification of land agricultural purposes.

Institute of Water Problems and Land Reclamation NAAN Ukraine is leading in the development of scientific and technological bases farming on the reclaimed land and establishing patterns of ecological processes in these lands.

Research and project works in the field of land management, protection, evaluation and management of land surveying research teams conduct extensive system of land management institutions. There is some regional specificity studies leading agricultural universities of the country.

Identification of previously unsettled parts of the general problem. The question of improving the quality of soils remains urgent. In particular consideration of quality agricultural land as the basis for the creation of environmentally friendly land, which necessitates further research system in this field.

Formulation of research objectives. Given that most foods humanity gets through commercial cultivation and over 70% of all pollutants entering the body with food, the role of environmentally friendly land is actualized:

- as an irreplaceable natural resource and the basis for the safe products production, directly or indirectly, does not create harmful effects on human health;
- as the basis of formation of ecologically balanced agricultural ecosystems that require modeling according to the specialization of business activities.

This is consistent with the strategic objectives of the state and regional policy on agricultural land, particularly to improve the structure of agricultural land, restoration of fertility, rational use and protection of land on the greening basis [1, p. 273-275].

Presentation of the main results and their justification. Environmentally friendly land areas – spatially limited, artificially created territories, peculiar feature of which is the minimum tillage, distance from pollutants, monitoring of farming practices, conservation and management of soil fertility. Organization of land with special characteristics will resolve to prevent erosion, promote efficient use of land resources, improve the quality and safety of the resulting product, ensure the preservation of agricultural ecosystems through the use of natural factors only increase the yield of crops.

Creating arrays of environmentally friendly land will provide:

- sustainable agricultural production capacity and increase fertility in the long term;
- conservation of biodiversity within agricultural ecosystems and their integrity;
- using of renewed land resources in local agricultural systems for the production of organic products.

Environmentally friendly land areas according to their quality can be attributed to the valuable land. The categories of valuable agricultural land, which are grouped by species, geographical, economic and environmental grounds according to the Land Code of Ukraine are defined [2, P. 7]. However, the most valuable land, if they have contaminants can become environmentally unsuitable. Instead of that lands,

which are determined less by the value given attributes, but its characteristics are more environmentally favorable for the formation of environmentally friendly tracts of land.

That is part of land with high-value properties are concentrated most productive land that can generate high yields of crops have a positive impact on the environment and ensure the development of premium product segment. The environmentally friendly land areas can be attributed as a separate category of the most valuable land in their composition, on the basis of the qualitative features.

Environmentally friendly land areas, as most areas for quality properties can be differentiated by the degree of suitability for purpose commercial use. This allows the scale to rank the region land areas indicated by a sign and identify measures to improve them, the amount of the related costs and their sources.

Every single individual tracts of land has restrictions on its commercial use. Prospects for a tracts of land related to zoning under soil, relief and climatic characteristics of individual sites.

The system of zoning indicators to create environmentally friendly land use should include crop growing conditions, namely:

- relief (landforms, absolute and relative height relative excess, swiftness slope, slope exposition), which causes a change of differentiation methods development activities, the nature of the soil, vegetation and landscapes in general. As a result, there is spatial variability of physiological intensity and biochemical processes, microbial activity, plant productivity;

- qualitative condition of soil (reserves of humus in the plow layer, particle size distribution, content of active carbonates, depth groundwater, environmental sustainability soil, the presence of pollutants, etc.) that identifies a particular farm land area, location of crop rotation, possible transformation of agricultural land and definition of tillage and fertilizer;

- climatic features (the amount of active temperature, lighting regime, the average of the absolute minimum temperature, duration of frost-free period, annual precipitation), the nature of which affect the growing season of crops;

- preliminary culture (the degree of contamination of pests and diseases, yield).

Analysis and comparison of specified indicators solve issues ranging tracts of land on the degree of suitability on the possibilities of transformation in clean areas. According to preliminary estimates the creation of environmentally friendly land expedient in the Steppe zone, which unlike Woodlands and Carpathians is characterized by the highest ecological stability of the soil.

According to international experience (Canada), differentiation can be performed on a 100-point system assessment in which is considering eight factors: four "hard variables" - the structure and size distribution of soils, their capacity, terrain, climate and four "easily removable" - nutrient content, mode of moisture and soil acidity. List of soil characteristics that should be used when differentiation is given in Table 1.

Table 1

List of measuring soil characteristics, properties and processes

Elements of soil measurement characteristics	Soil properties	Soil processes	Soil quality (level properties)
Soil chemical state	Acidity (pH) nutrients (potassium, calcium, magnesium, sodium, aluminum, manganese, etc.). micronutrients, chemical pollution	Soil buffering, filtering capacity and degradation of nutrients Fe, Al and P	The level of acidity (pH), nutrients, micronutrients availability state of chemical pollution
Soil physical state	Soil structural integrity resources texture and content of clay soil profile and horizon	Soil temperature control soil compaction visual description	The degree of loss and erosion of soil porosity (total volume of all pores between particles of soil solids) depth of soil compaction
Soil water and gas	Groundwater anaerobic / aerobic conditions drainage Hydrology and Hydrogeology of Soil	Keeping moisture fluctuations in water levels of the soil, moisture conductivity	The moisture content, permeability, water level
Soil carbon	Groundwater reserves of soil organic matter (carbon)	The issue (release) of greenhouse gases	The levels of soil organic matter, carbon
Soil biodiversity	Pests and disease organisms, non-invasive native species		
Other	Soil resistance (against erosion)	Adaptive capacity	Resistance

Note: developed based on [3, P. 4]

Condition of soils is dependent on their functions in agricultural ecosystems, resulting in the creation of land use with special characteristics will contribute to greening the economy of regional system, based on the principles of protection, management and natural areas expansion, supporting the balance of agro-ecosystems (Table 2).

Table 2

The role of environmentally friendly tracts of land in the agricultural domain

Artificially created groups	Definition	Features	Purpose	Environmentally friendly land areas
Agrolandscape	The totality of ecosystems formed as a result of conversion of agricultural landscape	Most of the natural vegetation is replaced by plantations and field crops, horticultural and forest crops	Consistent reproduction of resources and environment in the technological cycle of obtaining the necessary quantity and quality of products, the formation of highly ecologically balanced agricultural ecosystems based on knowledge of the laws and regularities of functioning of natural systems, accounting, land and resource potential of more in-depth technological adaptation actions	Reproduction of biological productivity of land; humus formation; Terrestrial Invertebrate self-regulation; creating conditions for environmentally friendly agriculture; improvement of soils chemical condition
Agroarea	Part of the agrolandscape, limited by the same geological and microclimatic conditions	The soils agroarea agricultural landscapes characterized by arable layer	Agroecological groups by similarity of conditions of cultivation of major crops and taking into account territorial proximity to maintaining sustainable agriculture	Reproduction of and improving the natural state of the individual parts agrolandscape, to the synthesis of the most environmentally friendly tracts of land
Artificially created groups	Definition	Features	Purpose	Environmentally friendly land areas
Agro-ecosystems	Artificially created complex of biotic and abiotic natural ingredients, which is in direct relationship with natural environmental conditions - soil, soil, and bar. moisture, soil microorganisms	unstable, not capable of long existence without constant man maintenance	sustainable use of biological resources, in order to obtain high yields	increased yields; ecologically safe products; create environmental living conditions of vegetation and animals
Agrobiocenosis	The artificially created by man group of plants, animals, fungi and microorganisms in the form of crops or plantation crops	minor species diversity, slightly branched chain supply, inability to self-regulation, the need for constant human intervention to prevent unwanted succession	obtaining high yields of one or more crops selected for cultivation by man	increasing crop resilience to negative factors; formation of safe crops with the acquisition of natural immunity to pests

Note: prepared by the author based on [4, P. 1-3]

The key areas to improve the general state of agricultural landscapes of the region and their components agroareas, agro-ecosystems, agrobiocenosis is the introduction of environmentally friendly tracts of land and providing a number of activities:

- granting annual rewards to landowners who voluntarily care for severely eroded soil and other ecologically important lands for 10 years;
- facilitate the planning control of the farms that produce agricultural products for erosion-prone cropland;
- financial assistance to farmers to implement preservation and soil pollution;
- measures of protection of soil, habitat, recreation and rural development;
- ensuring cost-sharing and technical assistance to producers who voluntarily adopting best management technologies improve the quality of soil;
- submission of information and advice for landowners soil in association with soil protection service;
- requirements on reporting and assessment of the trends of soil and water bodies, including the nature and extent of contamination, and contamination control methods for restoring soil quality;
- presentation of technical assistance to farmers in the protection of soils when planning, implementing soil conservation.

Conclusions and perspectives of further research. The problem of allocation of territories with special environmentally friendly characteristic is not disclosed. Mandatory measures for greening the economy of regional system (as a whole) should be the systematic monitoring of land, complete procedure which was carried out over 20 years ago. The data base will be monitored to determine the suitability of tracts of land for agricultural use and formation of environmentally friendly land, with soil differentiation according to their qualitative properties.

Створення масивів екологічно чистих сільськогосподарських земель є основою для подальших дій щодо розвитку органічного сектора сільськогосподарської галузі регіону і країни в цілому, збереження та відтворення якісного стану земельних ресурсів, біорізноманіття, забезпечення споживання населення та майбутніми поколіннями екологічно безпечної продукції харчування, а також, загального покращення екологічного стану оточуючого середовища.

LITERATURE

1. Розвиток економіки сільського господарства України в 2011-2015 р.р.: наукова доповідь /Національний науковий центр «Інститут аграрної економіки» [Гадзало Я.М., Лупенко Ю.О., Пугачов М.І. та ін.]: за ред. Ю.О. Лупенка. – К.: ННЦ «ІАЕ». 2016. – 546с.
2. Земельний кодекс України : Закон від 25.10.2001 № 2768-III / Відомості Верховної Ради України від 25.01.2002. – 2002 р. – № 3. – стаття 27.
3. Soil Monitoring Action Plan : report / Helaina Black, Patricia Bruneau, Karen Dobbie // Soil Focus Group monitoring sub-group. – Scotland, 2012. – 30 p. – P.4
4. Мусієнко М. М. Екологія: тлумачний словник / М.М. Мусієнко, В.В. Серебряков, О. В. Брайон. – К. : Либідь, 2004. – 376 с.

REFERENCES

1. Hadzalo YA.M., Lupenko YU.O., Puhachov M.I. et al. (2016). Rozvytok ekonomiky sil's`koho gospodarstva Ukrainy v 2011-2015 [Economic development of agriculture in Ukraine in 2011-2015]. Kyiiv: NSC «IAE» [in Ukrainian].
2. Zemelnyi kodeks Ukrainy: Zakon vid 25.10.2001 № 2768-III [The Land Code of Ukraine: Law from 25.10.2001 No. 2768-III]/ Vidomosti Verkhovnoi Rady Ukrainy. – Bulletin of Verkhovna Rada of Ukraine from 25.01.2002. (2002) 3, 27. [in Ukrainian]
3. Black, H., Bruneau, P. & Dobbie, K. (2012). Soil Monitoring Action Plan : report. Soil Focus Group monitoring sub-group. Scotland
4. Musiienko, M.M., Serebriakov V.V., Braion O.V. (2004) Ekolohiia: tлумachnyi slovnyk [Ecology: glossary]. Kyiiv: Lybid [in Ukrainian]