

REPRODUCTION OF LAND FERTILITY

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ABSTRACT

The goal of study is the understanding of impact agricultural production cycles on land fertility and ways of management it. Soil fertility depends on kinds of the fertility reproduction: restricted, simple, extended. Farmer can lose profit from land usage if he has the restricted reproduction fertility. For protection of soil fertility we offer using the self-supporting system of incentives of sustainable land use.

INTRODUCTION

Global croplands and pastures cover 46 million km². More than 40 % Earth's land has been created for agriculture. Land has productive function that it produces food, feed, fuel, fiber, etc. The soil fertility is the kingdom of life. We know three kinds of the fertility reproduction: restricted, simple, extended. If we want to survive, we must take care of the soil. The soil today is yesterday's being transformed into tomorrow. Land fertility is result of agricultural production cycles. For plants, nitrogen is food. Understanding soil fertility – the availability of food for plants is a top priority. Based on that need, soil scientist Doug Collins develops practical soil fertility management strategies (Collins, 2012).

Soil organic matter (SOM) plays an essential role and its dynamics merit special interest (Sanchez et al., 1989). SOM contributes significantly to soil nutrient resilience (Balduck and Skjemstad, 2000), renders the physical environment of soil suitable for plant growth. SOM is one in the important indicators of soil quality (Larson and Pierce, 1994; Rosell, et al., 2001) and its management is envisaged to maintain soil fertility and promote sustainable agriculture (Martin et al., 1990). Soils are a significant factor in land use and the important link between climate and biogeochemical earth systems. That is why land use practices and land cover change are always is case of soil change. Not only the carbon cycle but also the soil cycles have been changed by human land use practices over time.

The natural life cycle of agricultural fields must be maintained through additions to the humus bowl after residues from the previous crop have been depleted, in order to build new organic, biological and mineral nutrition for the next crop. This action cannot be replaced with overdoses of chemical fertilizers, which harm soil life (Caron, 2007).

In the soil management it is very important to take into the consideration the humus state of soil to assure an adequate annual input of locally grown residue into the soil and to supervise that the soil would contain enough of organic matter or humus adequate to the humus capacity characteristic to the according soil type (Kölli, 1996). Humans must integrate the science of a soil genesis into the methods of food produce without ecological damages.



Practices that reduce losses of nutrients and thereby reduce the potential for negative environmental impact are considered Best Management Practices. It may include erosion and sediment control to reduce movement of soil and nutrients into streams from field edges, such as grassed waterways, buffer strips and riparian buffers. Incorporation of nutrients to reduce off-site movement, volatile losses and odors may also be considered best management practices. Using cover crops to scavenge nutrients remaining in the soil could also be an effective best management practice to reduce the loss of nutrients from a land application site. (Steven, 1995).

RESULTS

In life cycle assessment, land use is often referred to as land occupation and land use change as land transformation. Land fertility is result of agricultural production cycles. In this case land is the subject of labor. Farmer uses the agricultural land improving the biological, physical, and chemical properties of soil to increase the crop capacity. Consequently, farmers improve the subject of labor which apply in the follow cycle production as a tool for affect the seeds and plants. If farmer doesn't care the reproduction fertility in agricultural production cycles he will lose benefits and profits in the future.

Cycle of agricultural usage land begins at the start of field season when production affects the soil as a subject of labor. After seeding the soil becomes the fixed assets because of addition function of soil as a tool of labor. Harvesting stops the function of soil as a tool of labor but the cultivation of land continues for autumn and winter. It reflects dual nature of land function.

Land usage is implementation of soil function as fixed assets and land usage cycle includes land tillage, production, and recovery stages. These stages have the fertility consumption and fertility reproduction. We know three kinds of the fertility reproduction: restricted, simple, extended that depends on the rate the consumption and contribution of soil organic matter during the land usage cycles (Pechenkina, 2010).

DISCUSSION

Protection of productive land has become a major priority in many regions of the world. Land degradation by intensive agriculture is a major driver of land loss; a number of national and international programs have responded with land reforms. However, effectiveness of policy efforts often has the limited outcome.

In the course of land redistribution, serving the basis for the Agrarian Reform in Russia, major violations in the reproduction of land, material and technical resources have occurred. As a result, the soil fertility continues to decrease, the land environmental conditions are deteriorating, and the labor tools are not being renovated. In the 90's the process of land degradation has strengthened. The crop rotations were broken that led to the intensification of soil erosion as well as its dehumification. The reduction in reclamation works has resulted in increasing proportions of acidic, waterlogged and saline soils. The issue is to find the balance between the increasing level of food production and the protection soil, its conservation and improvement.

The primary goal of every farmer must be to maintain stable humus in the soil. Organic farmers are interested in reducing the input of manufactured fertilizers and are supposed more on increasing humus in their soils, so that needs of their plants can be fertilized by the nitrogen cycle directly. Understanding the cycling of nitrogen through soils is determinant for number reasons. If farmers don't apply a little extra fertilizer at the proper time, their plants may not produce an economically viable yield. If they apply too much, they are simply wasting money, because fertilizer is expensive and if the plants don't need it, they'll just disregard it. And if the plants don't take up the nitrogen in the soil, there is a chance it can pollute the soil and water.

This is the way of the agricultural development without violating the environmental conditions. Both agricultural and ecological land structure optimization will provide nature with the initial impetus to begin self-healing. It also involves economic mechanisms of managing land system.

We offer using the regional system of economic encouragement for conserving and increasing the soil fertility. It includes land tax, irrational land use fee, land insurance fee, and mortgage. Our calculations (table 1) show the stimulating function of the suggested system for the soil fertility reproduction on the regional level. The system will positively affect the agrarian enterprises of different types of ownership, production volume, technical resources, and food production efficiency.

Table 1. Receipts and expenditure of the land uses, million roubles

Indicator	Kind of reproduction of the soil fertility			Distance
	Restricted	Simple	Extended	
Receipts				
'Nazarovskoe' Joint Stock Company	1,672	1,865	2,066	394
Educational farm 'Minderlinskoe'	114	126	139	25
Private farm K – 16	3	4	4	0.911
Expenditure				
'Nazarovskoe' Joint Stock Company	364	213	166	-196
Educational farm 'Minderlinskoe'	34	19	15	-18
Private farm K – 16	0.148	0.089	0.078	- 0.070
Benefit				
'Nazarovskoe' Joint Stock Company	1,308	1,652	1,900	
Educational farm 'Minderlinskoe'	80	107	124	
Private farm K – 16	3	4	4	



CONCLUSIONS

The management of land usage cycles has to achieve a delicate balance of production and protection for the overall goal of sustainable development which based on ecological, social and economic pillars.

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