



## **Analysis of factors which limited the spatial variation of barley yield on the forest-steppe chernozems of Kursk region**

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The crop yield is the most important indicator of the efficiency of agricultural production. It is the function that depends on a large number of groups of independent variables, such as the weather, soil fertility and overall culture agriculture. A huge number of combinations of these factors contribute to the formation of high spatial variety of crop yields within small areas, includes the slope agrolandscapes in Kursk region. Spatial variety of yield leads to a significant reduction in the efficiency of agriculture. In this connection, evaluation and analysis of the factors, which limits the yield of field crops is a very urgent problem in agroecology.

The research was conducted in the period of 2003-2004 on a representative field. The typical and leached chernozems with the varying thickness and of erosion degree are dominated in soil cover. At the time of field research studied areas were busy by barley. The researched soils have an average and increased fertility level. Chernozem typical full-face, and the leached contain an average of 4.5-6% humus, close to neutral pH, favorable values of physico-chemical parameters, medium and high content of nutrients. The eroded chernozems differs agroecogenic marked declining in fertility parameters. The diversity of meso- and micro-relief in the fields and soil cover influence to significant spatial variety of fertility. For example the content of nutrients in the soil variation can be up to 5-fold level.

High spatial heterogeneity of soils fertility influence to barley yield variety. During research on the productivity of the field varied in the range of 20-43 c/ha, and 7-44 c/ha (2004). Analysis of the factors, which limited the yield of barley, showed that the first priorities occupy unregulated characteristics: slope angle and the classification of soils (subtype and race of chernozem and the difference in the degree of erosion), which determines the development of erosion processes and redistribution available to plants form of moisture. As a rule, the maximum yield of barley is marked on most flat areas covered with chernozem leached and typical with the full profile.

The content of nutrients usually takes 3-4 levels of limitation. The significance of a particular element is determined by the characteristics of the particular agro-ecological homogeneous area. Most, however, the value in the 2003 - 2004's, plants were available forms of phosphorus and potassium

Thus, in terms of slope agricultural landscapes of the Kursk region, there is increased spatial variety of fertility and barley yields. This priority among the limiting factors are soils and agro-ecological conditions. Significant influence of agrochemical parameters are shown within the homogeneous agroecological regions. In this regard system of precision agriculture has a great prospects for acquiring practical, and must to imply the adaptation of existing agricultural technologies to change the conditions of cultivation of field crops within fields.