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ENVIRONMENTAL AND FOOD SECURITY

Aspects of the Use of Soil and Land Resources of the Nizhny Novgorod Region in Crop Production in the 19th and 21st Centuries

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Abstract—This article considers the aspects of agriculture of the Nizhegorodskaya gubernia in the 19th and 21st centuries. It utilizes information contained in historical materials from the reports of the Nizhny Novgorod expedition under the leadership of V.V. Dokuchaev, as well as data on areas of cultivated crops in 2006. In the 19th century, the types of cultivated crops, the planted area, and the proportion of fertilized arable land largely depended on the composition of the soil cover and meteorological conditions, as well as on the harvest of the previous years. In the 21st century, there were no notable influence of differences in natural conditions, the share of fertilized arable land in different parts of the region was practically the same, and it did not depend on the composition of the soil cover.

Keywords: land use, soil quality, historical sources, geoinformation systems

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INTRODUCTION

The territory of Russia is characterized by a variety of natural (soil–climatic) conditions that determine the soil-forming processes, the properties and fertility of soils, and their resistance to various types of degradation, as well as the potential for effective use of soil cover in solving regional agricultural problems.

In the modern world, the independence of any country is primarily determined by its food security. Therefore, the efficient use of production resources, especially land resources, is an important factor in the policy of the state.

According to experts from the Food and Agriculture Organization of the United Nations, the overall indicator of national food security is the production of grain per capita. The rate of self-sufficiency is determined by a grain yield of 500 kg. In countries with a developed grain economy, this ratio comes to 900–1000 kg. In Russia, it was more than 825 kg in 2016. In Nizhny Novgorod region, this indicator in good harvest years only reaches 450 kg and in lean years does not exceed 250–300 kg. In Russia, 2016 was a fertile year: the harvested grain yield became the largest in the recent history of the country. Against this background, in the Nizhny Novgorod region, the production of grain fell by 2% and the potato yield was 7 less than that of the previous year by 7.1% [1].

The most important factor in the effective functioning and development of regional agricultural systems is the natural agropotential of the territory (a combination of natural conditions and resources directly affecting agricultural production), which has a significant impact on both the territorial organization of agriculture as a whole and its individual components. The effectiveness of the natural agropotential can be achieved only by determining the best options for locating selected sectors of agriculture and the rational use of the available material, technical, and labor resources of agricultural production. This requires the development of geographically differentiated programs for the integrated development of rural areas in the territory of Russia as a whole and in its separate regions [5].

The basis for ensuring national food security should be efficient use of the country's land resources, which is possible only with a knowledge of the properties of the soils and the state of the soil cover.

MATERIALS AND METHODS

Nizhegorodskaya gubernia (governorate) was chosen as the target for the study of the soil and land resources in the 19th and 21st centuries. This is because it was the first one that was studied by an expedition led by V.V. Dokuchaev for the purpose of