

===== STRUCTURAL ORGANIZATION OF ECOSYSTEMS AND PATTERNS =====  
OF THEIR DISTRIBUTION

UDC 631.4

**AGRICULTURAL LANDS IDENTIFICATION ON THE SATELLITE IMAGERY<sup>1</sup>**

© 2021. I.N. Gorokhova\*, I.N. Chursin\*\*, N.B. Khitrov\*, Ye.I. Pankova\*

*\*V.V. Dokuchaev Soil Science Institute*

*Russia, 119017, Moscow, Pyzhevsky Per. 7, Building 2. E-mail: g-irina14@yandex.ru*

*\*\*Geoinformation Center of the Russian Academy of Sciences*

*Russia, 119019, Moscow, b/o 168, Novy Arbat 11. E-mail: chursin.ivan93@gmail.com*

Received Jili 30, 2021. After revision August 30, 2021. Accepted September 01, 2021.

Our work aims to determine the possibilities of identification of the fields with various crops, leys and fallows, using the multispectral high resolution (10 m) satellite imageries taken by Sentinel-2 Satellite. For this we studied the irrigation system of Volga-Don in the dry steppe zone of Volgograd Region. We analyzed the images, taken from February to August 2020, and used the field materials, obtained from the surveys that took place from August to September 2020 in the said area. The variations of the agricultural lands structure were carried out visually and automatically, which allowed us to identify winter cereals, spring crops, leys and fallows. Among them we identified such crops as Sudan grass, corn and soybeans. The accuracy of automated method of structure identification was 75%. We used a combination of different channels for multispectral images to divide the irrigated/non-irrigated fields of the irrigation system and the fallows of different years.

This resulted in a creation of a map of agricultural lands structure for the central part of the Volga-Don irrigation system. It shows the cultivated crops on the irrigated and dry lands, leys, uneven-aged fallows and the exact area of each field.

The calculated NDVI values represented the state of crops during different stages of their growing season. The obtained data made it possible to select key sites and study the irrigated soils, because the agricultural crops condition reflected the structure and degradation of the land cover and helps to select the required sites properly.

Our studies have shown us the possibility to use the high resolution remote data for assessment of the structure and state of agricultural lands, and selection of the key sites for soil surveys, the information about which is necessary to develop and select the suitable ameliorative measures.

*Keywords:* structure of agricultural lands, crops, leys, fallows, irrigated lands, satellite imagery processing.

**DOI: 10.24412/2542-2006-2021-3-34-59**

---

<sup>1</sup> The study was carried out according to the Governmental Tasks No. 0591-2019-0023 “To Study the Influence of Natural Conditions and Land Use Features on Soil Cover, Including Participation of Saline Solonchaks and Salinized Soils, and to Develop an Assessment Technology for the Intense Soil Exploitation in the Agricultural Lands”. and No. AAAA-A19-119012390065-9 “Development of Methods for Analysis and Complex Use of Earth Remote Sensing Data, Based on the Modern Geoinformation Technologies, for Monitoring of the Natural Landscapes in the Agricultural Lands, Using Groups of Small Spacecraft”.