

## MAPPING OF MEDICINAL PLANTS USING REMOTE SENSING DATA

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**Abstract.** *This article provides information on the use of drones to create a geoinformation map of medicinal plants distributed in the territory of our republic. Based on it, it is possible to solve the current problems of the present time, to describe the land types of the flora, to monitor and predict their distribution, to use modern drones to monitor their distribution, and to implement a plan of measures for their management.*

**Keywords:** *the world of plants, agricultural land, modern drones, medicinal plants, modern electronic programs, geographic information technologies and electronic cards.*

45.4% of the territory of the Republic of Uzbekistan is occupied by agricultural land, which is the main means of agricultural production. The distribution of land intended for agricultural purposes in the territory of the republic is determined according to natural and climatic factors. Only field experience can correctly determine the relationship between the productivity of agricultural crops and the factors leading to it.

More than 4,000 species of plants are found in Uzbekistan. About 700 of them are medicinal plants. The level of accuracy and scientific value of data obtained in field experiments largely depends on compliance with certain methodological requirements. The lands given for the needs of medicinal plants or designated for these purposes are the lands of medicinal plants. The lands intended for medicinal plants are the lands necessary for the health of the population of our Republic.

The land for medicinal plants in our republic is of great importance for the future of our country. Modern technologies, including remote sensing of the Earth, Geographical Information Technologies (GIS) and modern mapping are of particular importance in the creation of electronic and digital maps of lands intended for medicinal plants. In this process, thematic maps of medicinal plants are created.

So far, the compilation of a comprehensive geo-information map of lands intended for medicinal plants has not been developed according to the recommended methodology. Accordingly, the development of the methodology of the complex geoinformation map for medicinal plants and its components remains an urgent modern scientific and technical problem.

Landsat 8 digital spatial images, a topographic map of the researched area and additional network information are used as initial data for the implementation of these tasks. The foothills located in the Bostonlik district of the Tashkent region were chosen as the research object.

The method of creating a card of herbs for medicinal plants includes four stages:

Field research;

Classification of agricultural crops in spatial terms;

Vectorization of classification results;

Creating and equipping maps;

ENVI programming, one of the most effective and available software products, provides the complete stack of remote sensing data processing in Landsat digital spatial velocity processing, and thus their integration with geospatial information system (GAT) data. supply has been selected.

In order to create a comprehensive geo-information map of the lands intended for medicinal plants according to ENVI, the processing of spatial rates is presented on the basis of the technological sequence.

Initial image

Unraveling visual numbers

Creating benchmarks

Automatic classification

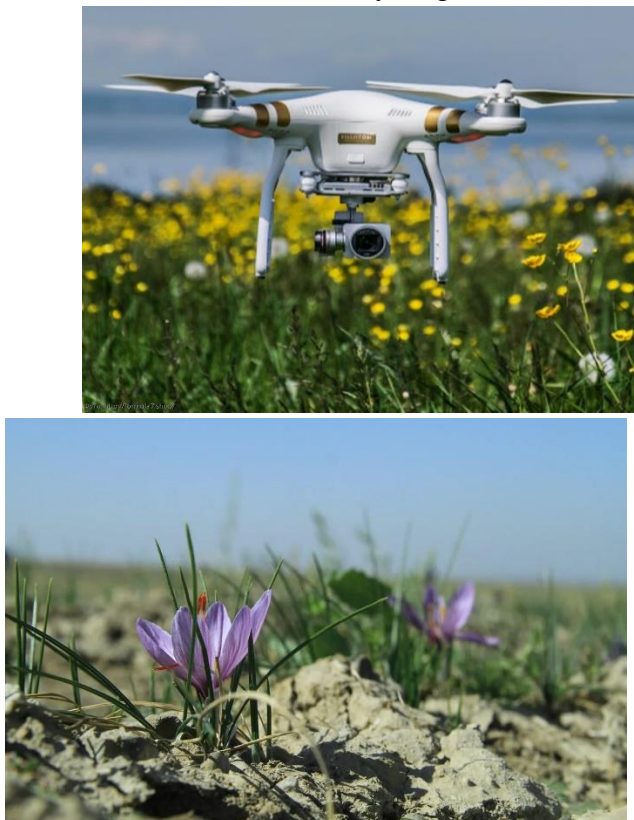
Equipping raster cards

Vectorization of classification results

The result of the creation of raster maps of lands intended for medicinal plants

The result of creating a raster map is exported in a vector layer to accept it in the GAT environment. In this case, the WGS ellipsoid (World Geodesic System 1984) is selected. One of the most popular geoinformation systems in the world for such a task is the geographic information system (GAT) - GAT MapInfo, which is designed for collecting, storing, displaying, editing and analyzing data. Professional software is used.

In the map of medicinal plant lands, the main medicinal plant lands of the researched area, as well as the main natural and economic complexes, road networks, relief, hydrographic network and flora are shown in different colors. is described by (Fig. 1).

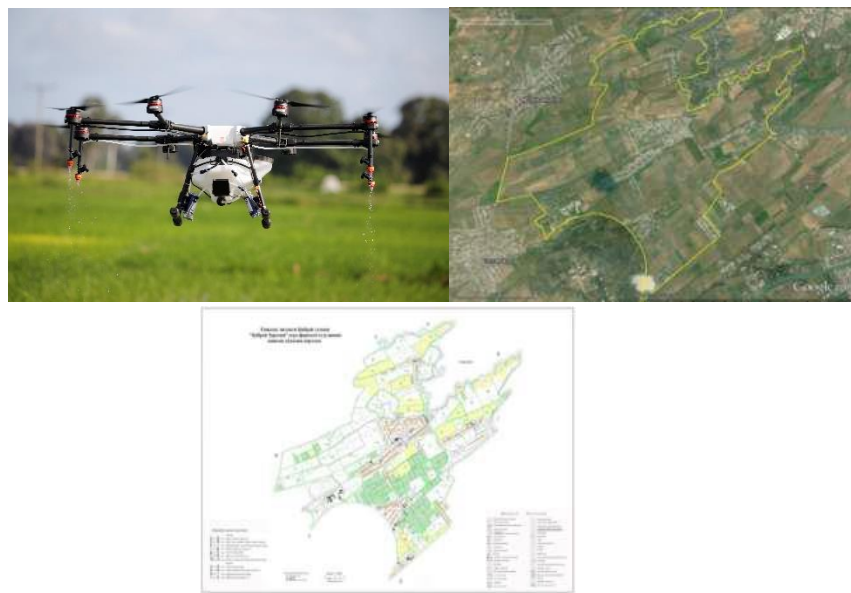


*Figure 1. Monitoring the spread of medicinal plants using a drone*

A drone is a lightweight, autonomous vehicle that can navigate the skies but doesn't require the investment of an airplane or helicopter. A modern device used to monitor the spread of medicinal plants and determine their spread.

In the process of updating the electronic and digital map, comparing the electronic map created in previous years with the situation in the last drone, aero or space photo, all the changes that were not reflected in the previous electronic map were reflected in the updated electronic map. Cases that were not reflected in drone, aerial or space photographs were examined in the field and additionally included in the updated electronic map (Fig. 2).

Electronic and digital maps were updated in all land types, organizations, educational, company, auxiliary, farmers and farms, state land reserve, forest and water fund, all land users, districts, regions.



***Figure 2. A drone, aerial and space photo of the land for medicinal plants located in the Bostonlik district***

The situation on the updated electronic map was examined in field conditions, the information that was not reflected in the aerial photo, but was available on the spot, was determined, and the contours of the places were changed based on the appropriate conditional signs. Unclear new contours and objects in places were drawn with the accuracy set on the updated electronic map using appropriate tools. In the process of updating the electronic map in camera condition, complex decoding work was carried out in aerial photography documents, contours and objects on the ground, elements whose accuracy and correctness in place are not in doubt were examined in camera mode, contours that were not identified in aerial photography were decoded in field conditions. In the process of updating the electronic map in the camera case, the borders were drawn based on the border lines reflected in the inter-farm land survey documents made by the land survey service in previous years. In the case that the land intended for medicinal plants was not marked or the places where the marks were broken, the administrative boundaries were reduced to the historical basis according to the existing legal documents.

Determining the boundaries of land owners and land users correctly is one of the most important elements of updating the electronic map. Before starting camera work, the borders of all land plots in the territory of the research object were mapped. At the same time, the boundaries taken from the technically correct documents were drawn down. After placing the elements of the

card, which illuminates the content of the lands intended for medicinal plants, the card is prepared for publication.

In conclusion, it can be said that the electronic map of the lands intended for medicinal plants can be useful for determining their expansion and for conducting multi-year and seasonal monitoring of the condition of medicinal plants. This method can also be used to create similar electronic and digital maps of all medicinal plants located in our Republic. In general, the use of electronic and digital maps of the lands intended for medicinal plants will increase the quantity and round off the quality of medicinal products of the country.

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