Yuldoshev Jakhongir

Lecturer at the Department of General Professional Disciplines, Faculty of Tourism, Alfraganus University

Tashkent, Uzbekistan.

Orcid.org/0009-0002-2245-6212

ROLLER OF UNMANNED AERIAL VEHICLES IN AGRICULTURAL CROP VEGETATION

Abstract. *This article will talk about the roller of unmanned aerial vehicles in the vegetation of agricultural crops, which is one of the most relevant topics today. The application of modern technologies in agriculture is a period requirement. By dishifrovka data from unmanned aerial vehicles, it is possible to determine the vegetation indicator of crops.*

Key words. *Agricultural Land, Remote Sensing, vegetation, unmanned aerial vehicle, map, space photo, NDVI.*

Introduction. Remote sensing techniques are used in many fields. This field is developing very rapidly, has been tested in many fields and achieved positive results, and will be used in many fields in the future. Remote sensing techniques are widely used in the management of land and water resources, as well as in solving problems in atmospheric processes.

Land cover monitoring is based on continuous monitoring of the state of natural and human-made resources, as these resources change over time. Land use refers to the use of land by humans, so any land use change in any location refers to the transition of use from one land area to another, for example, the conversion of a land plot from agricultural to residential [3].

Main part. Recent years have been marked by the rapid development and spread of remote sensing and geoinformation technologies. Space images are actively used as a source of information in various fields of activity: cartography, urban planning, forestry and agriculture, water management, oil

and gas extraction and transportation infrastructure, inventory and monitoring of objects, and solving environmental assessment problems.

Remote sensing is the collection and study of data from a distance. Such research can be done using devices (such as cameras) and sensors or cameras mounted on ships, aircraft, satellites, or other space vehicles. Today, the data collected is usually stored and processed using computers [4].

In our republic, great achievements are being made in the efficient use of land and water resources, their regulation, and the use of aerial photographs in scientific research. Today, due to the use of innovative technologies, every field is developing rapidly and great achievements are being made.

The National Report on the State of Land Resources of the Republic of Uzbekistan is intended to be used as an important document for monitoring the state of the land fund of our republic, timely determination of changes in the level of quantity and quality, maintaining state cadastres, land management, rational and efficient use of land resources, and ensuring the protection of lands with information [1].

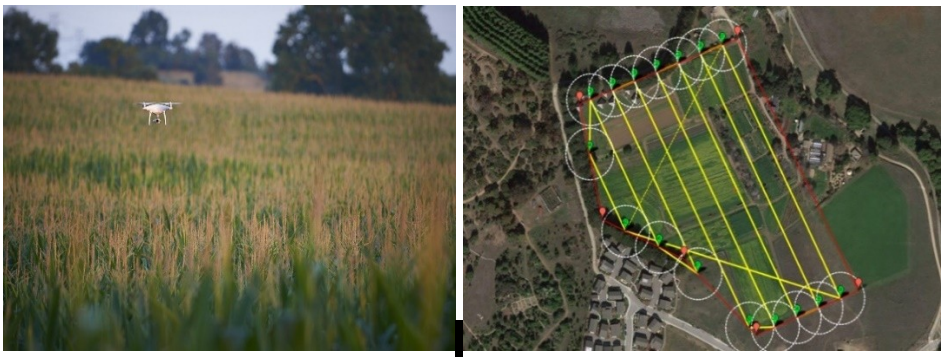
Using a drone equipped with a high-resolution optical camera, an area of up to 1,000 hectares is visually monitored within 1 day, and real-time information about agricultural lands and crops is obtained through aerial photographs and video files. As a result, information about negative changes in agricultural lands and crops is regularly obtained, and the information obtained is recorded on an electronic digital map, which allows planning the necessary agrotechnical and other measures [2].

The tasks performed by the unmanned aerial vehicle in agriculture are:

- on-site inspection of lands and conducting a survey;
- monitoring the state of land reclamation;
- creating a vegetative state index to clarify the land system;

- carrying out agrotechnical measures in land use in accordance with the law;

- agricultural insurance.



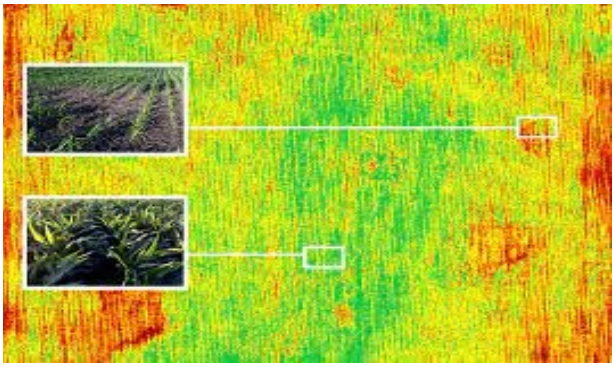
1-fig. Automatic aerial photography in agriculture using an unmanned aerial vehicle (Agrodron)

A spray drone designed to implement targeted agrotechnical treatment measures for agricultural crops based on analytical data obtained from cartographic and monitoring drones. It can treat up to 6 hectares of land in 1 day, and due to the targeted treatment of the damaged area, the damage to plants is significantly reduced. Also, due to the droplet size during liquid spraying, which is 3-6 times smaller than that of traditional spraying techniques, the amount of chemical fertilizers applied is also reduced. As a result, the productivity of agricultural crops will increase, while at the same time significantly reducing the cost of agricultural products [5].

2-fig. Analysis of data obtained from an unmanned aerial vehicle intended for agricultural monitoring

The use of UAVs (unmanned aerial vehicles) to create modern maps from aerial photographs has a number of advantages: their efficiency, when images can be taken several times a day; high image resolution (from 1.5 cm to 20 cm per pixel), simultaneous assessment of crop development, crop condition and the quality of agrotechnical measures based on the vegetation index (NDVI-Normalized Difference Vegetation Index) based on spectral imaging data from UAVs [6].

NDVI (Normalized Difference Vegetation Index) is a vegetation index that is calculated based on the way a plant reflects and absorbs sunlight at different wavelengths. The index allows you to identify problem areas in the field at different stages of plant growth in order to respond in a timely manner. Pay attention to areas where NDVI values are significantly different. For example, fields with very low NDVI levels may indicate problems with pests or plant diseases, and areas with abnormally high NDVI levels may indicate the presence of weeds.



3-fig. The difference between a damaged and undamaged plant.

The NDVI index describes the main indicators of existing vegetation:

• productivity (temporary changes);

• biomass;

• soil moisture and mineral (organic) saturation;

• evaporation;

• precipitation;

• thickness and properties of snow cover.

The most accurate forecast of crop yield according to the NDVI index can be given at the time of passing the highest point of the NDVI value. For example, for intensively grown winter wheat crops, the NDVI value at the peak reaches 0.80-0.88. The peak of NDVI usually occurs at the beginning of the heading phase.

Conclusion. The results of decoding the results obtained from drones indicate a clear strategic basis for the implementation of strategic work by showing the vegetation of agricultural crops.

According to the method of analyzing images obtained from drones, the results of determining the composition of crop species and assessing the impact of agro-climatic conditions and soil salinity on crop yield in the contours of crop fields show a correlation between the total yield and the average biomass accumulation NDVI from the fields.

References

1. O‘zbekiston Respublikasi Prezidentining 2019 yil 17 iyundagi PF-5742-sonli “Qishloq xo‘jaligida yer va suv resurslaridan samarali foydalanish chora-tadbirlari to‘g‘risida” gi farmoni.

2. O‘zbekiston Respublikasi Prezidentining 2020 yil 7 sentyabrdagi “Yer hisobi va davlat kadastrlarini yuritish tizimini tubdan takomillashtirish chora-tadbirlari to‘g‘risida”gi PF-6061-son farmoni.

3. Mirzaliyev. T., Safarov E.Yu., Egamberdiyev A., Qoraboyev J. Kartashunoslik. - Toshkent.: Cho‘lpon, 2012-240 b.

4. Bekanov K.K., Ochilov Sh.Sh., Yo‘ldoshev J.O. Web-kartografiyada geoportal va kartografik xizmatlarning nazariy masalalari. Mirzo Ulug‘bek nomidagi O‘zbekiston Milliy universiteti ilmiy jurnali, 2023.

5. Yuldoshev J. GENERALIZATION OF SPECIAL CONTENT IN MAPS DESIGNED FOR AGRICULTURE. "Экономика и социум" №12(127)-2 2024. www.iupr.ru. 994-997 b.

6. Юлдошев Ж.О., Негмуродов М.Н. Изучение состояния орошаемых земельна основе материалов дистанционного зондирования и технологий GAT. UNIVERSAL JOURNAL OF MEDICAL AND NATURAL SCIENCES VOLUME. Respublika ilmiy jurnali, 2023. – 32-44 б.

7. https://earthexplorer.usgs.gov