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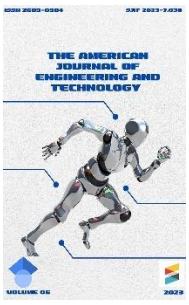

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Research Article

MONITORING OF SEED GERMINATION, DEVELOPMENT PERIOD AND IRRIGATION OF PLANTED AREAS USING DRONES

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ABSTRACT

Currently, it is necessary to assess agricultural land and crops based on remote sensing materials and conduct research on monitoring and improving land using drones. In particular, this article provides information on seed germination, development period, unmanned control of sown areas using drones.

KEYWORDS

Monitoring, land surveying, land surveying project, outline, irrigated land, land accounting, drone, cotton fields, ArcGIS, AutoCAD.

INTRODUCTION

In order to ensure the stability of relations related to agricultural land, radically improve the system of state control, use and protection of agricultural land widely introduce information and communication technologies in the field.

According to the Decree of the President of the Republic of Uzbekistan dated September 7, 2020 No. PF-6061 "On measures to fundamentally improve the system of land accounting and state cadastre management":

Decision PQ-5006 dated February 24, 2021 of the President of the Republic of Uzbekistan "On additional measures to improve the system of agricultural land use and protection" was adopted. According to the decision:

- Establishing procedures for monitoring works on agricultural lands and cultivated areas, state control over land protection, and conducting land preparation activities;

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- To use drones and fly them free of charge in order to monitor the state of agricultural lands, agricultural crops and agrotechnical activities using drones in the prescribed manner;

- direct purchase of agricultural unmanned aerial vehicles (drones) from manufacturing enterprises without a tender and import into the territory of the republic without paying customs duties, production and repair of drones in cooperation with manufacturers items such as opening branches and establishing services have been defined.[1]

Relevance of the topic. Land is a national wealth, the basis of the life, activity and well-being of the people of Uzbekistan, the most important natural resource. Therefore, it is one of the most important tasks of the state to ensure rational, effective and purposeful use of land, to protect land, to fully maintain a single system of State cadastres that are integrally connected with land.

Large-scale changes in the economic sphere require further improvement of the system of accurate accounting of land and related resources and their rational use.[2]

In the decision of the President of the Republic of Uzbekistan "On additional organizational measures to increase cotton productivity, introduce science and innovations in cotton cultivation" dated July 17, 2022 PQ-308 and Cotton Farming under the President of the Republic of Uzbekistan in order to ensure the execution of the tasks specified in the statement No. 1 of the meeting of the Council "On the organizational measures to establish the activities of the Cotton Council under the President of the Republic of Uzbekistan" dated July 5, 2022

"Uzdaverloyiha" state scientific-design institute specialists are implementing the project "Study of agrotechnical activities carried out in cotton fields with the help of drones and on the basis of digital technologies, development of scientifically based analytical materials, conclusions and recommendations".[3]

Research object and methods. Within the framework of the project, monitoring works were carried out in Sharaf Rashidov district of Jizzakh region. The research involves monitoring observations, historical-comparative analysis, field-geodetic surveying, project-research work, processing of metadata obtained by drones, ArcGIS and AutoCAD programs belonging to the family of cartographic, geo-information systems and technologies. [4]

Monitoring of cotton fields with the help of unmanned aerial vehicles (drones) is being carried out from seed planting in selected pilot plots to harvesting. To date, the data obtained from the selected pilot plots are as follows.

In the first release, a total of 30.02 ha of cotton planted on contours 3149k, 3150k and 3152 by the farm "Egamqul Hazrat" of "U.Khotamov" massif, Sharof Rashidov district, Jizzakh region, as of 01.06.2023.

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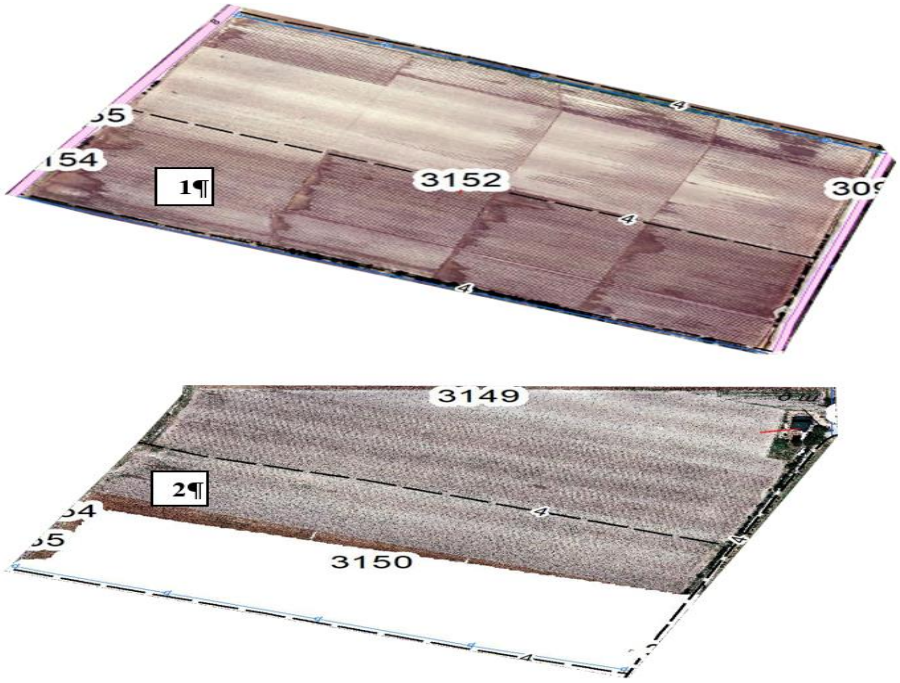

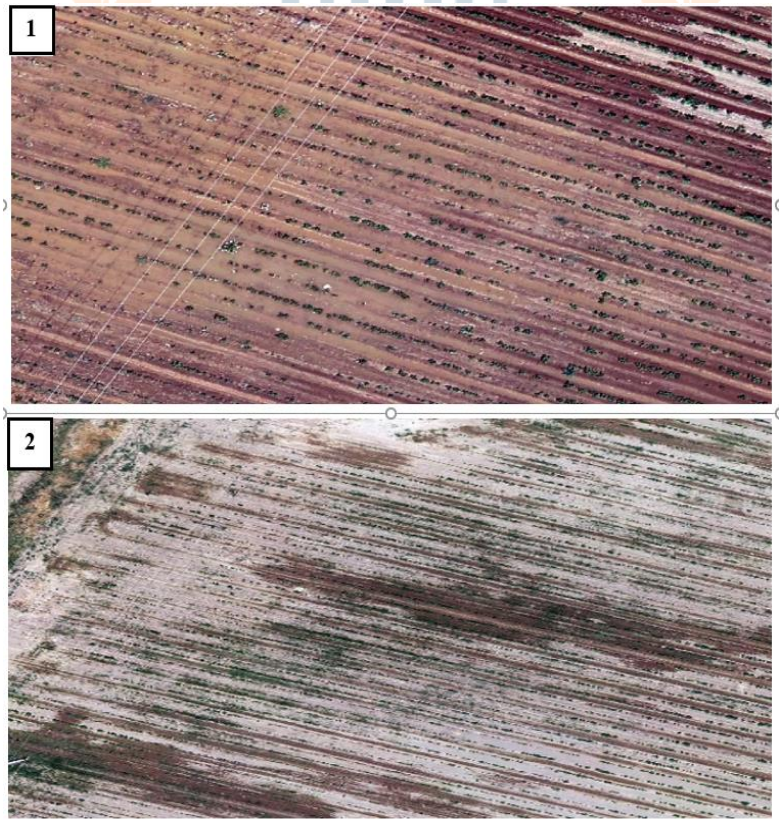

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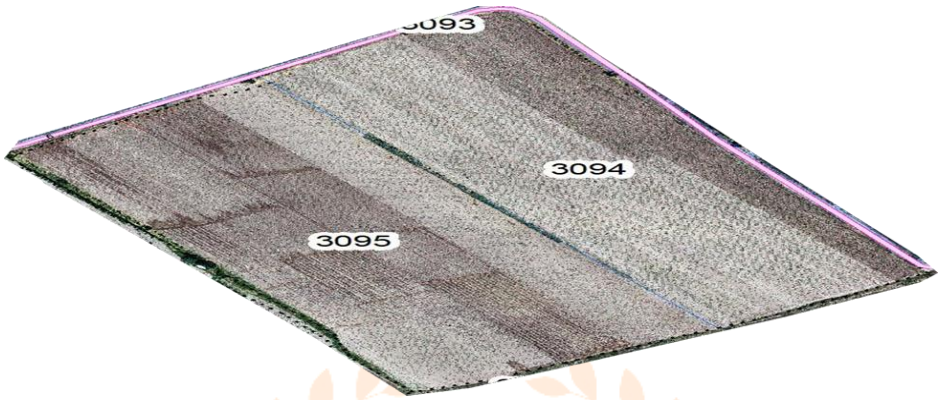
Similarly, the state of 01.06.2023 of 27.11 hectares of cotton planted on contours 3094 and 3095 by the "Shahzod" farm of this massif.



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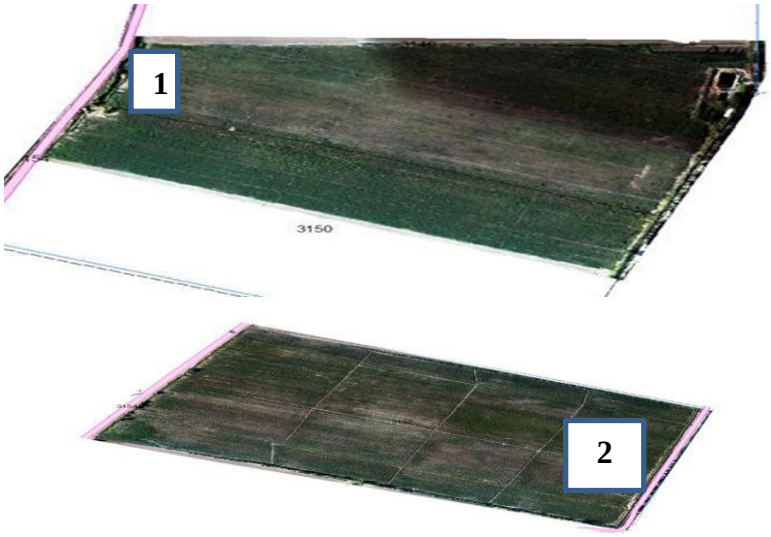
In the second visit, as of 16.07.2023, studies were carried out in the contours of the "Egamqul Hazrat" and "Mamatqul Bobo" farms of the "U. Khotamov" massif, which were monitored in the first visit.



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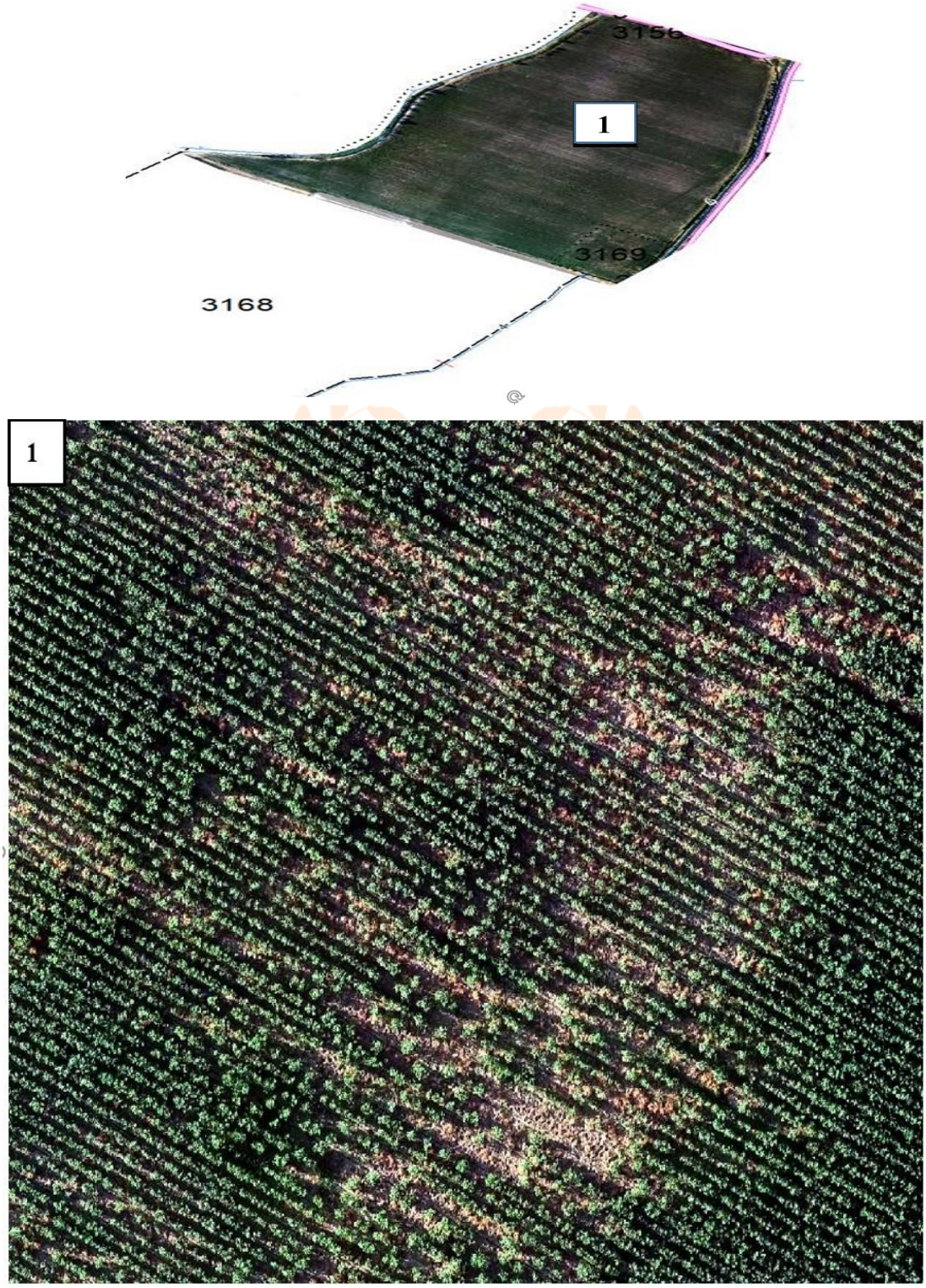

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RESEARCH RESULTS AND THEIR DISCUSSION

During the monitoring of the areas where seeds will be sown for the harvest of 2023 in the "U. Khatamov" massif, Sharof Rashidov district, Jizzakh region, the following was determined.

According to the results of the monitoring, the "Egamqul Hazrat" farm is planning to plant 30.02 hectares of seeds planted in contours 3149k, 3150 and 3152 for the 2023 harvest, and it was found that the land leveling works have been completed in practice. The data received from the monitoring drone was processed and an orthophoto plan of the object was created.

It can be seen from this orthophoto plan that 95-96% of the land surface of contours 3149k, 3150 and 3152 shows that the leveling works were carried out based on full agrotechnical requirements. It was observed that the remaining 4-5% of this contour is partly agrotechnically treated on the surface. As a result, it was found that seeds are scattered and weeds have grown in many parts of these contours. In our opinion, this situation depends on the fact that this field was plowed without sufficient moisture.

In this regard, appropriate instructions were given to the head of the farm in order to ensure uniform germination of the seed planted in this area.

Next, monitoring works were carried out with the help of drones on the territory of the "Shahzod" farm of this massif. According to the results of studies, 27.11 hectares of seeds planted in contours 3094 and 3095 are planned for the harvest of 2023. The data received from the monitoring drone was processed and an orthophoto plan of the object was created.

It can be seen from this orthophoto plan that in 94-96% of the 24 contours, leveling works were carried out in accordance with agrotechnical requirements. As the remaining 4-6% of this contour is in a bumpy state on the surface of the earth, it has led to some uneven plowing in the microrelief of this area. As a result of this, it was found that seeds are scattered and weeds have grown on the edges and middle parts of these contours. In our opinion, this situation depends on the fact that this field was plowed without sufficient moisture.

According to the results of studies on the land area of the "Mamatqul Bobo" farm, it is planned to plant 23.07 hectares of seeds planted on contours 3168 and 3169 for the 2023 harvest of the "Mamatqul Bobo" farm. it was determined that the work was completed. The data received from the monitoring drone was processed and an orthophoto plan of the object was created.

It shows that the leveling of the land surface in 96-97% of the contours of the "Mamatqul Bobo" farm was carried out in full compliance with agrotechnical requirements. Due to the fact that the remaining 3-4% of this contour is in a lumpy state on the surface of the earth, it has led to some uneven plowing in the microrelief of this area. In our opinion, this situation

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depends on the fact that this field was plowed without sufficient moisture.

In this regard, relevant instructions were given to the managers of the farms in order to ensure the uniform germination of the seeds planted in these fields.

CONCLUSION

The practical project on the study of agrotechnical activities carried out in cotton fields using drones and on the basis of digital technologies, the development of scientifically based analytical materials, conclusions and recommendations is the first project implemented in the Republic. As a result of the implementation of this project, the following problems will be solved in the field of agriculture:

- agrotechnical activities are conducted using drones and digital technologies, and an electronic database is created for each event;
- It will be possible to prepare quick information on the period of development of cotton, from planting the seed to harvesting;
- Scientifically based analytical materials, conclusions and recommendations will be developed based on the results of the study of agrotechnical activities carried out in cotton fields with the help of drones and on the basis of digital technologies.

These problems are studied for the first time within the framework of this project. As a result, it allows agricultural workers, agricultural land users (agricultural clusters, farms, etc.) to effectively use and manage cotton fields.

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