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Краткий обзор/Brief review

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Конфликт интересов отсутствует

Роль изменения климата в мониторинге богарных земель

РЕЗЮМЕ

Сегодня мониторинг засушливых земель в Республике Узбекистан остается одним из важнейших вопросов. В статье рассматривается мониторинг засушливых территорий и проблемы и недостатки, возникшие в этом процессе, причины их возникновения. По результатам мониторинга и предотвращения таких причин, а также их устранения в целом выделяют несколько систем развития засушливых территорий. Есть конкретные предложения и рекомендации по посеву сельскохозяйственных культур на засушливых землях, водоснабжению, применению удобрений и защите растений, а также по реабилитации этих территорий

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There is no conflict of interests

The role of climate change in rainfed land monitoring

ABSTRACT

Today, monitoring of dry lands in the Republic of Uzbekistan remains one of the most important issues. The article examines the monitoring of dry areas and the problems and shortcomings that have arisen in this process, the causes of their origin. Based on theresults of the monitoring and the prevention of such causes, as well as the elimination of them in general, several systems of development of dry areas are identified. There are specific proposals and recommendations for planting crops on dry lands, water supply, use of fertilizers and plant protection, as well as rehabilitation of these areas.

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Introduction

The agricultural products of our country are grown mainly on irrigated lands, the indicators of scientifically based use of arable lands remain low, and any perfect system needs reform and renewal in order to develop in accordance with the trends of time and space. The need for these reforms and innovations does not bypass the system of land use and management of all categories and types.

Decree of the President of the Republic of Uzbekistan dated May 31, 2017 № 5065 "On measures to strengthen control over the protection and rational use of land, improvement of geodesy and cartography, regulation of state cadastres" Land, geodesy, cartography and state Measures to effectively organize the activities of the State Committee for Cadastre, the introduction of advanced scientific and technical achievements in the field, the renewal of the material and technical base, the introduction of international grants in the industry were approved.

The main purpose of this is to organize the targeted, efficient, rational use of land resources of the republic on a scientific basis, in particular, to improve the mechanisms of use of agricultural lands.

At the meeting held during the visit of the President of the Republic of Uzbekistan to Kashkadarya region on 14 December 2018, he noted the unsatisfactory results in agriculture, serious shortcomings and the possibility of growing watermelons on 20,000 hectares of arable land. He stressed that planting marketable products such as peas, moss, beans, sesame seeds on farms and backyards will provide people with jobs and additional income.

The resolution of the President of the Republic of Uzbekistan dated March 18, 2019 "On measures to further develop and support the livestock sector" was adopted.

According to the resolution, the state will provide support to growers of fodder crops for the introduction of drip and rain irrigation technology on dry and pasture lands.

In the coming years, the Central Asian and Central Asian countries will be required to steadily increase productivity and economic incomes on dry agricultural lands. The growing population of the region and the growing demand for meat products require a constant increase in land productivity. This, combined with the protection and conservation of the environment and natural resources, will ultimately lead to an improvement in the lives of all local people. In irrigated areas, the components of production (planting high-quality varieties, water management, fertilizer use, and plant protection) typically provide a high level of productivity.

Applying new technologies to them will give even greater results. However, in dry lands, such innovative technologies work at the lowest level. Precipitation, which is an integral part of production, is considered to be the most important factor in dry lands. Due to the specific risks, fertilizers are rarely used on dry lands.

Dry land farming has its own characteristics and challenges, which include:

- First of all, the relief of the topsoil structure (plain) is inconvenient for farming.
- Secondly, it depends on the soil moisture conditions, i.e. the intensity, amount, time and type of precipitation.
- Therefore, in the assessment of lands where lalmi farming is carried out, natural categories such as land relief, land and climate should be taken into account.

We need to have basic data to monitor dry lands, and the following observation methods are used to obtain this information:

- Remote sensing (aerospace images);
- Traditional (ground imaging and observation);
- Comparison of fund data (periodic comparison of collected data).Given the above factors, it is difficult to persuade farmers to use multi-cost methods of lalmi farming. All the factors of production show that it is not possible to provide farming on dry lands only by sowing crops. The following optimal systems should be developed for the efficient and effective use of rain-fed areas:

- early warning of perennial precipitation and monitoring of dry areas;

Distribution of the land fund of the Republic of Uzbekistan by land types as of January 1, 2019

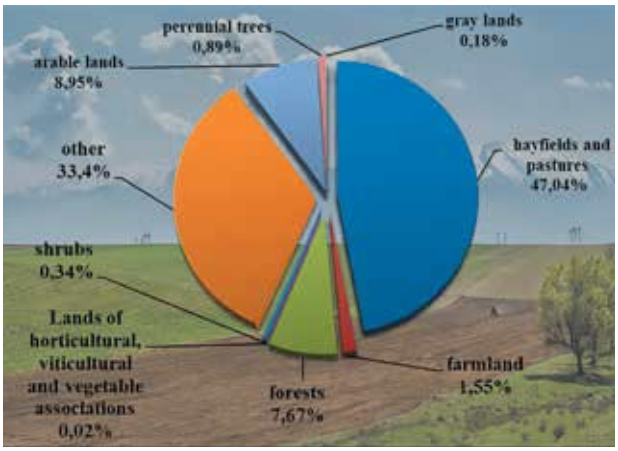
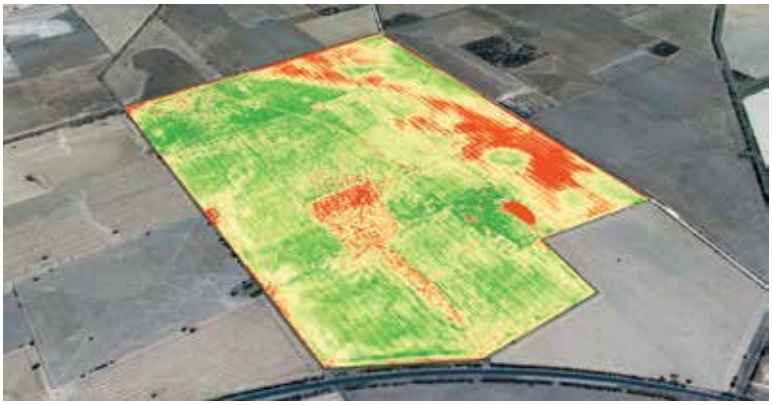


Fig. 1. Drought-prone areas

Fig. 2. Monitoring and evaluation of the area through the NDVI program



- control of poisonous and harmful weeds on dry lands;
- conducting research on farms and developing optimal farming systems.

The first system is early warning of the distribution of rainfall according to climatic conditions and its amount, which depends mainly on weather data. Weather data can be divided into three categories.

- short-term (valid for 3 days);
- medium-term (from 3 to 10 days);
- long-term (from 10 to 30 days).

These three categories are provided by meteorological agencies in many countries and are disseminated through the press, radio, and television. Monitoring of dry lands is currently carried out mainly on the basis of remote sensing data. This information is important because it affects productivity. In addition, the NDVI (Normalized Difference Vegetation Index) analysis, which is one of the modern methods, is an assessment of the degree of drought in the regions and on this basis preliminary analyzes are carried out without going to the ground.

Recommended drought mitigation practices can help make optimal decisions on drought management.

The second system is the control of poisonous and harmful weeds in dry lands. This is a huge task for farmers. Toxic and noxious weeds compete with crops for moisture and nutrients, both of which are factors that limit crop growth during drought. When improved management practices are adopted, effective weed management becomes more important, otherwise weeds, not just crops, will become more expensive.

The third system is the need for farm research and co-production of optimal farming systems for the sustainable management of dry lands. To do this, we need to divide farm programs into 3 categories

- short-term (5 years);
- medium-term (10 years);
- long-term (20 years).

Short-term measures. Such measures will immediately benefit land users. The ideal approach starts with processing local technologies. It doesn't require a lot of money, but it can bring significant benefits, such as increasing productivity. This strengthens farmers 'confidence in the program and encourages them to take medium- and long-term measures that require large labor and financial costs. Short-term solutions include planting drought-tolerant varieties, timely processing, provision of mineral and organic fertilizers, and more. Here are some examples. Such solutions are designed to have an impact in a short period of 2-5 years and to create sustainable water resources. Development can improve crop management and increase productivity under unstable and uncertain water supply conditions. In short, the main goal of short-term projects is to direct land users to adopt low-income practices and strengthen their willingness to participate in future technology improvements.

Medium-term measures. Once land users realize the benefits of adopting new methods (through short-term measures), they become involved in implementing medium- and long-term measures. At the same time, farmers will solve their problems in 5–10 years, and measures such as updating existing technologies and adopting alternative land use systems fall into this category.

Long-term measures. The term of these is 10–20 years. In addition to building large-scale surface and groundwater resources, it is based on the creation of alternative land use systems. Such long-term measures can make dry lands more fertile.

Conclusion

Currently, many government agencies and non-governmental organizations are working to increase agricultural productivity in drought-prone areas. Their efforts are designed to sense the need for a skilled workforce and to use the latest research technologies. Therefore, in order to solve problems in the right perspective, knowledge exchange and experience exchange, farm program development, and farm research and technology development should be structured to implement short, medium, and long-term forecasts in an organized manner. Gradual capacity building of farmers should form the basis of these efforts.

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Нанотехнологии помогают изучать строение почвы

Уникальная разработка российских ученых поможет проводить подробный анализ образцов почвы. Воспользоваться результатами исследований смогут представители различных отраслей экономики. Наиболее востребованы исследования почвы в сельском хозяйстве, но они представляют интерес также и для геологов, гидрогеологов, специалистов строительной индустрии.

В разработке впервые удалось одновременно применить ионную пушку – она обнажает внутреннюю структуру почвы, и электронный микроскоп для сканирования поверхности. Для сельского хозяйства данный метод исследования, по мнению специалистов, трудно переоценить. Задача АПК – неуклонно наращивать производство продовольствия, чтобы обеспечивать им растущее население планеты. Однако для эффективного выращивания тех или иных культур нужно подобрать наиболее подходящие почвы, и здесь не обойтись уже без проведения их качественного анализа. При составлении оценки состояния почвы необходимо также учитывать процессы изменения и истощения почвенного покрова. Помочь разобраться в изменениях, которые происходят в почве, в ее характеристиках и быстро провести анализ как раз и призвана совместная разработка Института физики Земли имени О.Ю. Шмидта РАН, Почвенного института имени В.В. Докучаева и Московского физико-технического института. Исследователи предложили новый метод внутреннего анализа образцов почвы, действующий на основе использования нанотехнологий.
Используемые ранее технологии не позволяли изучить микроскопическую структуру почвы, но теперь этот пробел устранен. Новый метод позволяет определять пористость и внутреннюю структуру образцов, показывает наличие минеральных и органических включений, которые являются важными показателями не только плодородия почвы, но и других ее важных свойств.

Гидрогель для удержания влаги не нанесет вреда экологии

Ученые Томского политехнического университета совместно с чешскими коллегами разработали экологически чистый гидрогел, для удержания влаги в почве. Об этом сообщает пресс-служба вуза.

Гидрогели используют в сельском и лесном хозяйстве для обеспечения всхожести семян. Еще одна из областей их применения – с помощью гидрогелей можно вносить удобрения.
В качестве исходных компонентов разработчики использовали белок молочной сыворотки и альгиновую кислоту. Это доступные, натуральные и совершенно нетоксичные компоненты. В этом и есть главное преимущество нового гидрогеля по сравнению с предшественниками. С течением времени он разлагается в почве на углерод и азот – важнейший строительный материал для растений.