International Conference on Developments in Education
Hosted from Toronto, Canada
https: econferencezone.org
27th Nov. 2022

BENEFITS OF ESTABLISHING A PRECISION FARMING SYSTEM IN COASTAL AREAS

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Annotation:
This article talks about the need for food that arises in humanity in connection with the increase in the number of people on earth and the scientific work carried out by scientists and international organizations aimed at solving this problem. Information is also provided on the promising aspects of precision farming in the cultivation of agricultural products on soils scattered throughout the Aral Sea region, which has become a global problem in Central Asia.

Keywords: Irrigated soils of the Aral Sea region, salinity, productivity, automation, productivity, fertilizer rates, precision farming.

We know that natural resources are the basis of human life. In most cases, we are witnessing a shift in the focus of global agricultural development towards increased productivity rather than resource management and food security.

Currently, the world population is constantly growing (Pic1).

As of August 15, 2022, the world population is approximately 8 billion 9 million people. The countries of Africa and Asia rank highest on this indicator, while the countries of Central Asia also make a significant contribution to this indicator [1].

Picture 1. Dynamics of population growth on the surface of the earth. (Source: United Nations Population Fund)

According to forecasts, agricultural production by 2050 may increase by 70-80 percent due to population growth. This means that in order to solve the global problems associated with the

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growth of the world's population, it is necessary to change the methods of agricultural activities.

During the 20th century, classical tools have enabled us to achieve goals such as the use of efficient agricultural technology, the production of productive plant varieties and efficient fertilizers, and the creation of sustainable agriculture.

Today, these tools are still relevant, but their potential has almost reached the limit of what is possible with the current level of technology. At the same time, new tools are emerging that did not exist before. In particular, satellite and computer technologies available to the public.

Therefore, world experience shows that it is necessary to establish a clear system of farming in regions with a high population density and where agricultural production has become a problem, especially in the Aral Sea region.

For the first time the term "precision farming" appeared in the 90s of the 20th century. Currently, there are several terms in this system: "precision farming", "precision farming", "site-specific". In domestic literature, along with the term "precision farming", "coordination of farming" and "precision farming", etc. [2].

Precision farming is an innovative farming method based on digital field maps using the latest technology to improve crop quality. Precision farming technologies involve the use of accurate remote sensing data from drones or satellite images. Such images allow you to effectively track the condition of the soil and crops. This farming method is gaining more and more attention from farmers as it helps to reduce costs and improve the environment.

Many scientists believe that the introduction of this technology will lead to the beginning of a new revolutionary stage in agriculture, as it will significantly increase production efficiency, profitability and product quality. The result will be an automated integrated system between production and agriculture.

Precision farming is the most convenient and efficient intelligent system for the development of agriculture in the Aral Sea region.

Because among the countries of Central Asia, the main problem of growing agricultural products in the island regions of the Republic of Karakalpakstan is the Aral tragedy, which occurred as a result of a sharp change in the climatic conditions of the region. This natural disaster and the lack of a proper farming system in the region are leading to a decrease in the fertility of the soil used for growing agricultural products, as well as a decrease in the quality and quantity of products.

The morphogenetic indicators of soils widely used in agriculture in the Aral Sea region are formed in direct connection with the features of the terrain, soil-forming rocks, vegetation cover, climatic conditions, the location of the groundwater level, and the salinization process. . The soil profile is characterized by an increase in the thickness of the humus layer, a heavier mechanical composition, and an improvement in the structure from protected solonchaks to old-irrigated meadow-alluvial soils [3].

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According to the Davergeodes and Cadastral Committee, in the regions of the Aral Bay, including on the border of the Republic of Karakalpakstan and the Khorezm region.

Under the influence of desertification processes, 84.2 percent of 677.6 thousand hectares of irrigated lands are saline to one degree or another, of which 217.8 thousand hectares or 32.14% - weak, 188.8 thousand ha or 27.86% - medium, 82.3 thousand ha or 12.15% - strong and 81.7 thousand ha or 12.06% - very strong saline soil.

The process of salinization of agricultural land, the norm of agrochemical measures, i.e., the application of fertilizers, in a territory other than desertification and due to the fact that the deadlines are not set correctly.

Another advantage of using precision farming systems in island regions is that they allow planning and conducting multi-year, multi-scale fertilizer experiments. The availability of field maps of nutrient distribution, output maps of main and by-products, as well as maps of nutrient distribution in crops, allows a more accurate approach to planning and conducting new experiments, taking into account the consequences of previous experimental fertilizers and moving from one long-term experimental scheme to another reduces transition time.

Therefore, in order to establish a specific farming system in the region, we must complete the tasks in the following sequence:

- At the first stage, an electronic map of the field is created based on field data (field area and configuration, productivity, agrochemical and agrophysical and ameliorative properties of the soil) and digitized;
- Measuring and correcting the shape and boundaries of the field;
- satellite data Bypassing fields with a course indicator, an agrometer and an autopilot.
- At the second stage, we need to make a decision directly on the basis of information collected in the Aral Bay area using a predictive or control method.

The method for predicting the future state of solutions is based on static data that determine the history of field productivity, agrochemical parameters of the soil, and the costs of the crop production cycle.

The control method involves the use of constantly changing data in the process of growing plants, where the composition of crop biomass samples, soil, plant and air moisture, air and soil are constantly monitored.

The third step is the direct implementation of the decisions made above.

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