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Method Of Determining The Sustainability Of Working Depth Of Earthquaking Machines With Digital Device

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ABSTRACT

Today, the Arduino device is used in many fields, as well as in agriculture. It allows to develop a device that mechanically determines the working depth and stability of tillage machines, the use of the device reduces the labor depth and other labor costs of tillage machines, productivity and measurement accuracy increase.

KEYWORDS

Energy, machinery, automotive, agriculture, metallurgy, heat supply, low-labor, low-cost.

INTRODUCTION

Currently, a number of practical measures are being taken in the developed countries of the world to promote the popularization of automated systems and technologies for

"smart" agriculture from 2022. In this regard, in the field of introduction of innovations in agriculture in the Republic, first of all, the introduction of modern tested forms of

agricultural production based on the concept of "smart agriculture", which allows rational use of available land, water and other natural resources, maximizes agricultural production in the agricultural sector. Tasks such as automation, significant increase in productivity and improvement of financial performance, as well as assistance in the introduction of innovative ideas, developments and technologies that will ensure food security of the country have been identified as key areas of activity.

In addition, information and communication technology systems are designed to automate many areas, such as energy, machinery, automotive, agriculture, metallurgy, heat supply, and so on.

The most widely used software and hardware in the design of such information and communication technologies systems is the Arduino device (Figure 1).

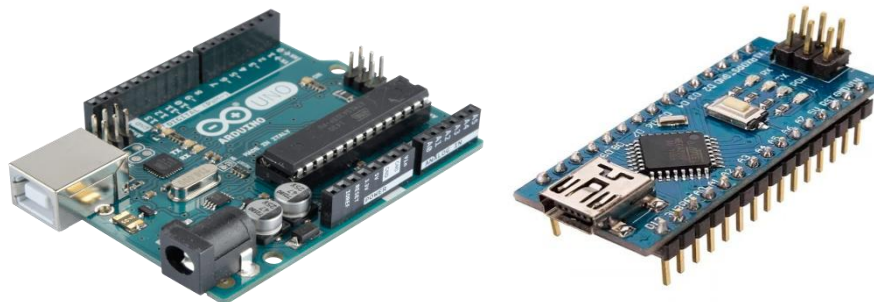


Figure 1. Technical means of Arduino device

MATERIALS AND METHODS

The Arduino device is a sufficiently functional and flexible platform that provides great opportunities for interaction with external devices in the development of built-in systems. It is very well suited for the study of microcontrollers and serves to create small types of machine and aggregate projects. Previously, to assemble a device based on a microcontroller, it was necessary to know the basics of circuitry, processor, programming devices in assembler language. In addition, the use of the device requires the use of additional devices such as editing, collecting, transmitting data. In this case, many users have not used

microcontrollers in their projects for a long time.

Today, the Arduino device is used in many fields, as well as in agriculture. It allows to develop a device that mechanically determines the working depth and stability of tillage machines, the use of the device reduces the labor depth and other labor costs of tillage machines, productivity and measurement accuracy increase. Tillage depth and its stability (single plane) are the main performance indicators of all tillage machines. If the depth of cultivation is at the required level and its stability is ensured, ie the crops are evenly developed and matured and high yields are obtained, otherwise, if the specified depth of cultivation and its stability is not ensured, the

plants will be unevenly developed and matured. productivity decreases by 12–15 percent. For this reason, there are strict requirements for the depth of operation and its deviations (unevenness) for each tillage machine.

At present, the working depth of tillage machines is determined by laborious and low-precision methods (obtaining transverse and longitudinal profiles, dipping a ruler into the treated layer, measuring the height of the furrow wall with a furrow, etc.).

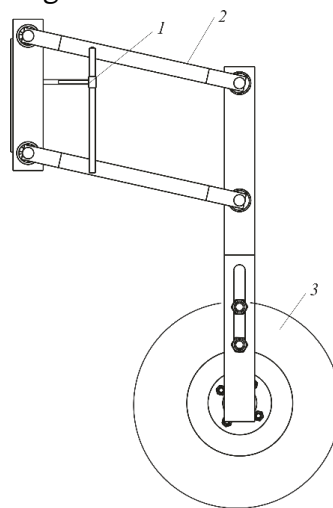
RESULT AND DISCUSSION

In this regard, in collaboration with scientists, professors and teachers of the Research Institute of Agricultural Mechanization and Namangan Engineering and Construction Institute, research work is being carried out on devices equipped with information and communication technologies to mechanically determine the performance of tillage

machines. it is planned to develop a device that measures the depth of processing in a mechanized way and simultaneously determines its statistical characteristics (arithmetic mean, standard deviation and coefficient of variation).

Based on the analysis of patent-information materials and scientific and technical literature on high-precision and low-labor and low-cost devices in our country and abroad, which determine the depth of existing tillage, the depth of tillage trailers and mounted agricultural machinery a principled and constructive scheme of the measuring device was developed in a mechanized way.

The device is mounted on the frame of trailers and hanging agricultural machines with parallelogram hanging mechanisms and directly on it (Fig. 2).



1- electronic ruler; 2 parralelogrom mechanism, 3 wheels

Figure 2. Design scheme of the device for determining the depth of processing using an electronic ruler with an angle gauge

CONCLUSION

A special program in C ++ has been developed for processing and transmitting and receiving a signal from an electronic ruler. This program allows you to determine the indicators of processing depth in a mechanized way.

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