

UDC 631.315.4

INTRODUCTION OF AN IMPROVED DEVICE FOR THE FORMATION OF A LONGITUDINAL BOLLARD IN COTTON IRRIGATION

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Annotation: *The article presents improved technical means and technologies for the formation of longitudinal bollards when dividing areas into plots in the process interval after the third cultivation and before the formation of irrigation furrows in cotton-growing farms. For this purpose, the designs of existing bollard-forming devices are analyzed and an optimal design and a unit equipped with a sealing roller for the formation of longitudinal bollards is recommended. As a result of the use of a device for the formation of a longitudinal bollard in the aisles of cotton, equipped with a sealing working body, a 46,2% reduction in manual labor was achieved, labor productivity increased 1,5 times.*

Keywords: *cotton row spacing, longitudinal bollard, manual labor, bollard forming device, bollard strength, bollard compaction, roller for bollard compaction.*

INTRODUCTION

It is known that in cotton-growing farms, in the interval of processes after the third cultivation and before the formation of irrigation furrows, the creation of longitudinal bollards is primarily required to divide areas into plots [1]. If we take into account that an average of 400-600 square meters of bollards are required per hectare of land, we can see how much work is required. Until today, this process was carried out manually, in individual farms they were carried out with the help of various kinds of equipment that has no scientific justification [2].

Such scientists as L. V. Tarasov, F. M. Mustakimov [3], V. M. Kim, G. M. Samsonov, M. P. Kim, and V. N. Berdyansky [4], A. I. Voronin, G. G. Kazakov, and A. I. Korotkov [5] conducted research on the creation and improvement of equipment and technologies for the formation of palovs. Shabaev, V. I. Strelbitsky, V. A. Papafilov, N. T. Semenov [5], V. P. Lisyutin [6], A. E. Teshabaev, O. S. Osipov, M.A.Akhmedzhanov and A.V.Sergienko [7, 8], A. G. Myulyar, N.F. Oponasenko and R. B. Talipov [9] and others, however, most of these techniques and technologies were designed for the formation of bollards in areas cleared of plants.

N.M.Muradov, H.H.Olimov, H.N.Shodiev, I.G.Khaydarov, A.N. Murtozaev and N.H.Abdualiev also conducted research works on the creation and improvement of equipment and technologies for the formation of longitudinal piles in the rows of cotton.

In particular, N.M.Murodov, Kh.K.Olimov, Kh.N.Shodiev and I.G.Khaydarov created a device for the formation of a longitudinal bollard in the row spacing of cotton, consisting of a working body with a screw [10]. The main disadvantage of this device is that in the conditions of fields with developed weeds, mounds of earth are formed between active screw working organs that raise the soil at an upward angle. As a result, the quality of the longitudinal blade decreases and the productivity of the unit decreases.

The stick-forming device created by N. M. Muradov, H. H. Olimov and A.N.Murtazoev consists of a passive working body with a semi-screw tilting surface of the body [11]. The main disadvantage of this device is that due to the lack of an additional sealing device that ensures the strength of the longitudinal bollards, the sealing work is carried out manually. This, in turn, causes an increase in labor costs and a decrease in its productivity.

Taking into account the fact that the bollard-forming devices in the row spacing of cotton are not equipped with sealing devices, the implementation of the bollard formation process in a fully mechanized way is relevant and important.

Research methodology. Taking into account the above, in the Bukhara branch of the Tashkent Institute of Irrigation and Agricultural Mechanization Engineers, a compaction roller of bollards was manufactured and installed in a bollard formation device developed by N.M.Muradov, Kh.K.Olimov and A.N.Murtazoev (Fig. 1) [13].

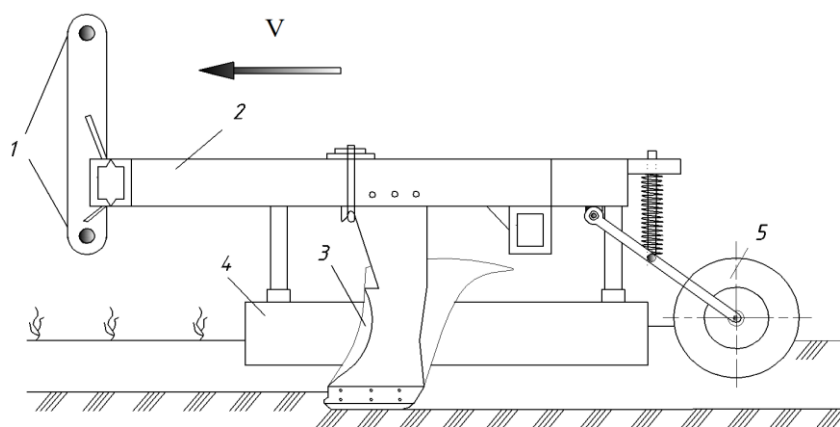


Fig. 1. Diagram of the device equipped with a sealing roller.

The working process of the device is as follows: when the device is set in motion with the help of a tractor, the soil located in the side furrow along the tipping surface of the housing 3 rises up and passing through the shell 4 protecting the cotton sprouts from the earth thrown out from the tipping machine falls into the furrow, where a bollard should form and the pressure force given by the sealing roller to the bollard is regulated by a pressure spring.

As a result of the movement of the unit in opposite directions, a bollard in the aisle is formed in two passes. In both passages, the compacting roller centers the ground along the furrow and compacting it increases the strength of the bollard.

RESULTS

Using the developed device described above, preliminary experimental experiments were conducted. Based on the results of preliminary experimental experiments, preliminary requirements and technical specifications were developed for the stick-forming device.

According to preliminary requirements, the height of the bollard formed and compacted by the bollard device must be at least 20 cm, its standard deviation is not more than ± 2 cm, hardness soils in the formation 0-20 cm should be up to 1.5 MPa, humidity up to 18 %, the density of the pal doln should be 1.3-1.4 g / cm³.

Conclusions. Taking into account the above, it can be stated that according to the preliminary requirements and technical specifications developed for the device for the formation of bollards in the aisles of cotton, equipped with a sealing roller, the formation of high-quality bollards is ensured.

As a result of the use of a device for the formation of a longitudinal bollard in the aisles of cotton, equipped with a sealing working body, a 46,2% reduction in manual labor was achieved, labor productivity increased 1,5 times.

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