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APPLICATION OF AN IMPROVED WORKING BODY IN THE REBURIAL OF CLOSED HORIZONTAL DRAINAGE TRENCHES.

Khalimov Tilavjon
doctoral student of Bukhara Institute of Natural Resources Management, National Research University "TIIAME"

Khakimov Akobir
master's students of Bukhara Institute of Natural Resources Management, National Research University " TIIAME".

Amrullayev Timur
master's students of Bukhara Institute of Natural Resources Management, National Research University " TIIAME".

Akramova Nargiza
Students of Bukhara Institute of Natural Resources Management, National Research University "TIIAME".
tilavjon.halimov@mail.ru

Abstract:
The article describes the work to be done to improve land reclamation. Problems encountered in soil compaction and reburial of excavated trenches, as well as the scheme of an improved toothed roller for compacting the soil of newly opened trenches, are shown, and suggestions are made to prevent excessive costs.

Keywords: saline, drainage, trench, filter, ceramic, plastic, slope, soil, roller, cabin, surface, cone.

Decree No. PF-6079 dated October 5, 2020 of the President of the Republic of Uzbekistan "On approval of the strategy "Digital Uzbekistan - 2030" and measures for its effective implementation" and "Wide introduction of digital economy and electronic government on measures" in accordance with the decision PQ-4699 dated April 28, 2020, and also in order to increase the effectiveness of the use of digital and geo-information technologies in agriculture and water management, a decision of the Cabinet of Ministers was adopted. One of the priority directions is the creation of a platform for mutual economic cooperation between the producers, suppliers and

processing organizations of the "Digital Agriculture" information system, "Smart Agriculture". » technologies development and implementation in republican territories [1]. In this regard, as the most important priority tasks of agricultural development, the fundamental improvement of the land reclamation condition of irrigated lands is based on the strict division of tasks between the customers and executors of land reclamation works and the improvement of their responsibility. formation Fundamentally changing approaches to implementation, providing a reliable mechanism for financing works on improving the reclamation of irrigated lands, ensuring the effective operation of reclamation stations, the proper release of drainage and wastewater through the collector-drainage network. to improve the quality of the mechanism of maintaining tributaries, to strengthen the material and technical base of water management organizations and water user associations through the wide introduction of leasing operations, to create a palace of reclamation techniques, to create new modern reclamation equipment and improved technology that will allow to improve the land reclamation condition and it is necessary to consider their application to production. The role of closed horizontal drains is important in improving land reclamation, and their construction is required based on the needs of the times. Taking into account the above-mentioned problems and tasks, it is appropriate to use the machines in a targeted way, to ensure that all the specified requirements are fulfilled on time and at the required level.

As we know, open or closed drains are used to wash saline lands and prevent the rise of groundwater level. Open drains are built in areas with not very dense subsoil, with good drainage capacity, and they need to be cleaned from sediments and various grasses every two or three years. Areas occupied by open horizontal drains limit the total land area for planting agricultural crops. This causes a decrease in the coefficient of land use. Therefore, the use of closed horizontal drainage is considered more effective in improving land reclamation and increasing the coefficient of land use. The construction of drains is carried out by means of special drainage laying machines. The efficiency of using existing drainage laying machines has decreased significantly. Therefore, effective use of closed drainage laying machines is one of the urgent problems of the industry today.

Closed horizontal drains are mainly used in conditions where the water permeability of the underground soil is low.

The construction of closed horizontal drains is carried out in two ways: one of them is called semi-mechanized, and it is mainly used in unstable soils, in places with very

hard soils and in places where the groundwater level is very close to the surface of the earth. [2]

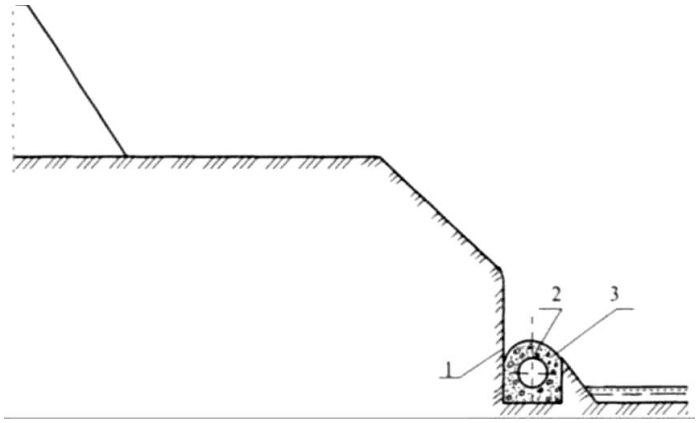

Figure 1. Construction of semi-mechanized closed horizontal drainage:
1- trench; 2- drainage pipe; 3- filter.

The reason why it is called semi-mechanization is that the digging of drainage trenches and the reburying of excavated soil are carried out with the help of mechanisms, and the digging of drainage trenches, the installation of drains and pipes are done by hand (Fig. 1).

A closed drainage trench is a trench with vertical walls (up to 3m deep) and width (0.35...0.60m) dug with a drainage machine. At the bottom of the trench, there is a drain, i.e. a (ceramic or plastic) pipe surrounded by a filter (filter) at a certain slope (Fig. 2).

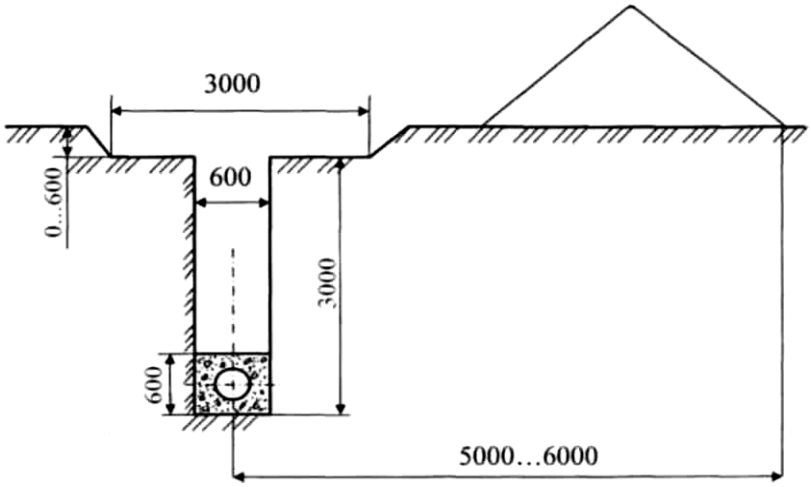

Figure 2. Cross-section of a drainage trench

Through the leaker, water enters the drainage pipe through its special holes or slits in the places where the pipes are connected.[2]

In both of the above methods, as a result of soil compaction without special compaction, the drainages built under the influence of irrigation water fail and cause the deterioration of land reclamation conditions.

As we know, open and closed horizontal drains are hydrotechnical structures that serve to improve land reclamation. If existing open and closed horizontal drains are not cleaned and repaired from time to time, the service life of the drains will be shortened. As a result, there is a sharp drop in the efficiency of land use. In order to prevent such situations, it is required to repair the constructed drains on time and construct new drains in accordance with the drainage criteria.

In order to ensure the efficient operation of existing closed horizontal drains in our republic, they are repaired every few years. Despite this, due to several gross errors during the construction of the existing closed horizontal drains, the period of effective operation of the drains is decreasing. An example of this is that after laying the pipes of the newly dug closed horizontal drains, in the process of reburying the trench, the compaction processes, that is, the connection of the newly excavated (compacted) soil with the smooth surface soil excavated with the help of work equipment, is not good.

In order for closed horizontal drains to work effectively, it is necessary to compact the soil reburied in its trench and ensure its strong connection with the walls of the trench. As a result of the rotary movement of the working equipment, the walls of the trench excavated with the help of multi-bucket excavators are smoothed and a compacted soil layer is formed. This layer, reburied and compacted soil, does not allow the natural (mother) soil to solidly unite (consolidate). It should be noted that as a result of compaction of reburied soil, its density should be brought to the density of natural (mother) soil. Then the drains will be protected and conditions will be created for their good functioning. In practice, drains are being built and used without meeting this very necessary requirement. [3]

In order to provide a positive solution to the above-mentioned problematic situations, we have developed an improved working device for densifying soil in the process of reburying trenches below. During the process of reburial of the closed drainage trench created with the help of this device, it performs the function of densifying the reburied soil. The device is fixed to the frame of the working equipment by means of the holder 6, and the coverage width of the device is 0.30 m, which, in turn, differs from the width of the trench by 0.05 m.

The compacting cage is connected to the frame of the work equipment by means of handles. The design of the compactor consists of left and right conical parts and a central cylindrical part (Fig. 3). They perform the function of densification in the process of reburying the trench dug with the help of a multi-bucket excavator. In the left and right conical parts of the compaction roller, there are special grinding teeth 4, these teeth scratch the polished surface of the trenches formed in the process of compaction, which in turn reduces the smoothness of the surface and ensures good compaction in the process of burial.

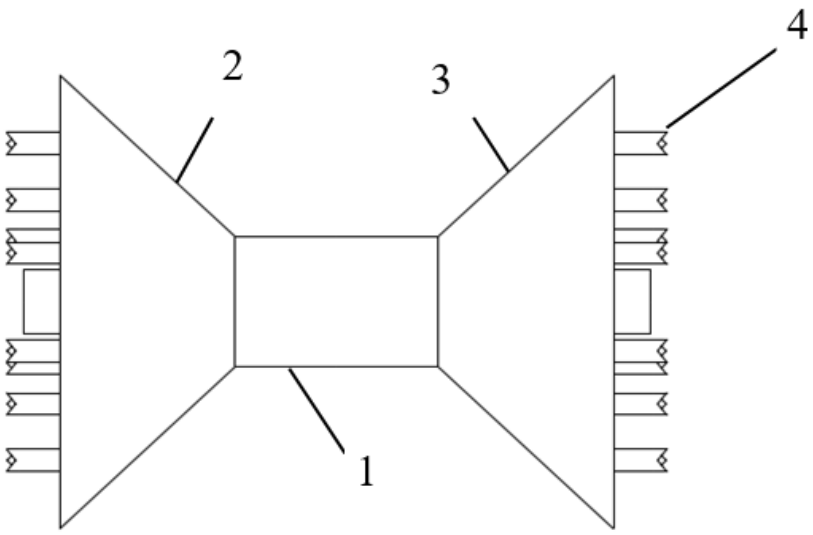

Figure 3. Scheme of the thickening coil
1- cylindrical part; 2,3- conical parts; 4- molar tooth

The analysis of the conducted scientific and technical literature and the study of the scientific works of various authors dedicated to the processes of soil compaction show that the process of compacting the uncompacted soil in the created trench with a roller is influenced by the process of interaction between the soil and the roller, the pressure of the roller on the soil , it was found that the distribution of stress in the soil in the transverse and vertical directions and the deformation of the soil, the partial recovery of the deformed volume are affected.

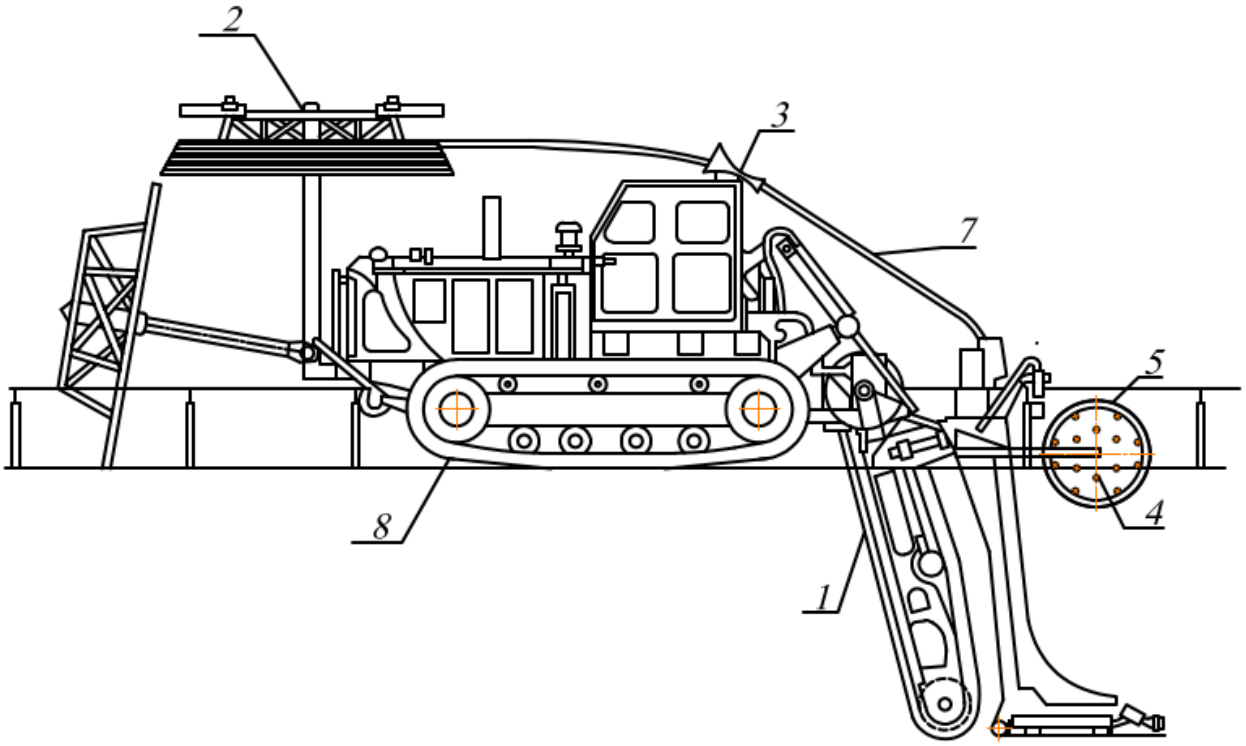

Figure 4. Closed horizontal drain opening machine with improved compactor equipment

1- multi-bowl trench digger; 2- drainage pipe wrap; 3- cabin; 4- grinding teeth; 5- condensing coil; 6- handle; 7- drainage pipe; 8- walking equipment.

Summary

Based on the analytical studies, reburying closed horizontal drains without compaction causes a reduction in the duration of use of existing drains, which in turn leads to the approach of groundwater to the upper layer of the earth, as a result of which the level of land productivity decreases sharply, and the surface part of the earth occurs due to salinity. It was found that the process of reburial of trenches by using the improved katok that we offer increases the productivity of the land by 26% compared to the traditional method**.**

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