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Mechanised Technology of Planting Rice Seedlings

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Annotation: The article provides information about the technology of mechanized planting of seedlings in rice cultivation. Currently, traditional methods are used in farms specializing in rice cultivation, and in some farms, seedling rice cultivation is used. At the same time, due to the manual method of planting seedlings, the planting time and other costs are significantly increased. The conducted research has established the need to develop a mechanized method of planting rice seedlings in the conditions of rice cultivation in our Republic.

Keywords: Rice farming, traditional method, expense, productivity, local rice seedlings, mechanized technology.

Rice is one of the oldest crops on earth, the main source of food for one-third of the world's population, and despite its tropical origin, it is widespread in temperate regions. According to the information of the international organization FAO, in 2020 there will be 158.8 million people in the world. 742.5 mln. of rice was planted per hectare. tons of grain crops were grown, including in China - 30.5 mln. per hectare, 211 million tons, in India - on 42.9 million hectares, 158.7 million tons, in Indonesia on 14.2 million hectares, 77.2 million tons, in Bangladesh on 11.3 million hectares, 52.5 million tons, in Vietnam 7.7 million hectares, 43.4 mln. tons, on 6.7 million hectares in Myanmar, 25.6 million. tons, in Thailand on 8.6 million hectares, 25.2 million tons, in the Philippines on 4.5 million hectares, 17.6 million tons, in Pakistan on 2.7 million hectares, 10.4 million tons, in the USA on 1.2 million hectares, 10 1 million tons of rice was grown.

Therefore, the constant increase in the prices of food products all over the world and the decrease in the quality level require strengthening the selection, seed production and agrotechnical work in rice farming, increasing the volume of food production in the republic, increasing their types, and increasing the population's food products. demands full satisfaction of his demand.

In the decision of the President of the Republic of Uzbekistan dated February 2, 2021 No. PQ-4973 "On measures for the further development of rice cultivation", a number of tasks related to the strengthening of scientific research in the field of rice cultivation were defined. In this regard, in order to widely use water-saving technologies in the cultivation of rice, the Council of Farmers, Peasant Farms and Homeland Land Owners of Uzbekistan plans to plant seedlings in 20% of rice fields in 2021 and at least 40% in 2022, and to further expand measures from 2023. tasks were given to view.

The indicators of productivity in the rice industry of Uzbekistan are lower than the indicators of the world rice industry. The main reason for this is the fact that innovative, resource-efficient technologies widely used in world rice farming are not being used.

The conducted studies show that growing rice by the seedling method has advantages such as high yield, saving seeds, and efficient use of planted areas in world experiments.

The main goal of the research: to develop the mechanized technology of planting seedlings of local rice varieties in the conditions of Uzbekistan and the mechanism of its implementation, as well as to prepare an industrial copy of the machine for planting rice seedlings.

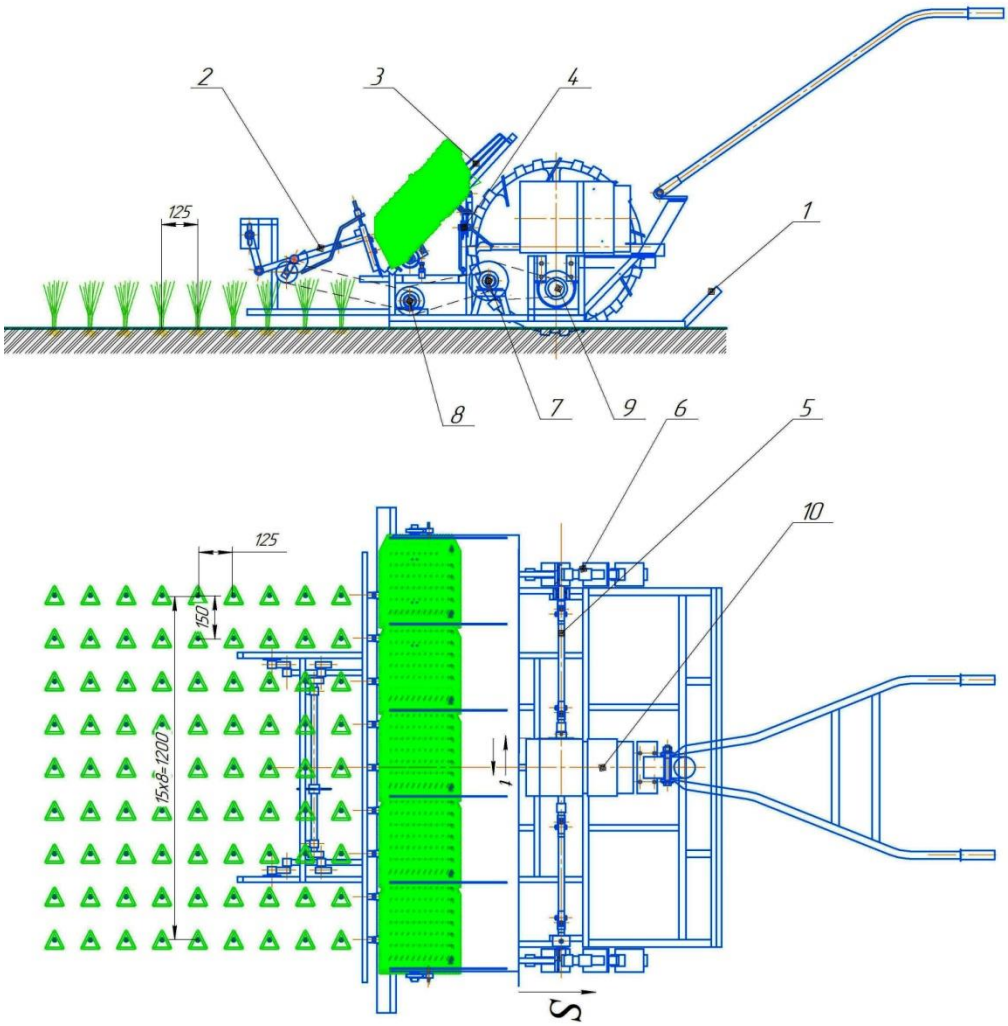
Today, RF-48 and RRO600V rice seedling planting machines of the South Korean company "TYM" (Tong Yang Moolsang) were delivered to the Rice Research Institute in Uzbekistan and are being used as an experiment. the distance is 30 cm, adapted to foreign rice varieties, foreign rice varieties have the ability to produce up to 18-25 heads on average. Our local rice varieties showed that they are not suitable, considering that they have 3-7 clusters.

Based on the above, under the conditions of our Republic, the development of the mechanized technology of planting local rice seedlings and the construction of the device that implements it is recommended.

Based on the above, the mechanized technology of planting local rice seedlings in the conditions of our Republic and the design of the device implementing it are proposed (Picture. 1).

Rice seedlings planting scheme

Picture 1 below shows the planting scheme of the rice seedling machine, S is the direction of movement of the rice seedling machine, t is the transverse cutting step of the tray, the spacing of the seedling rows is 150 mm, the The distance between the chats is 125 mm, the coverage width of the machine is 1200 mm



Explanation. t - is the pitch of the tray, t = 10 mm

S - the direction of movement of the seedling planter

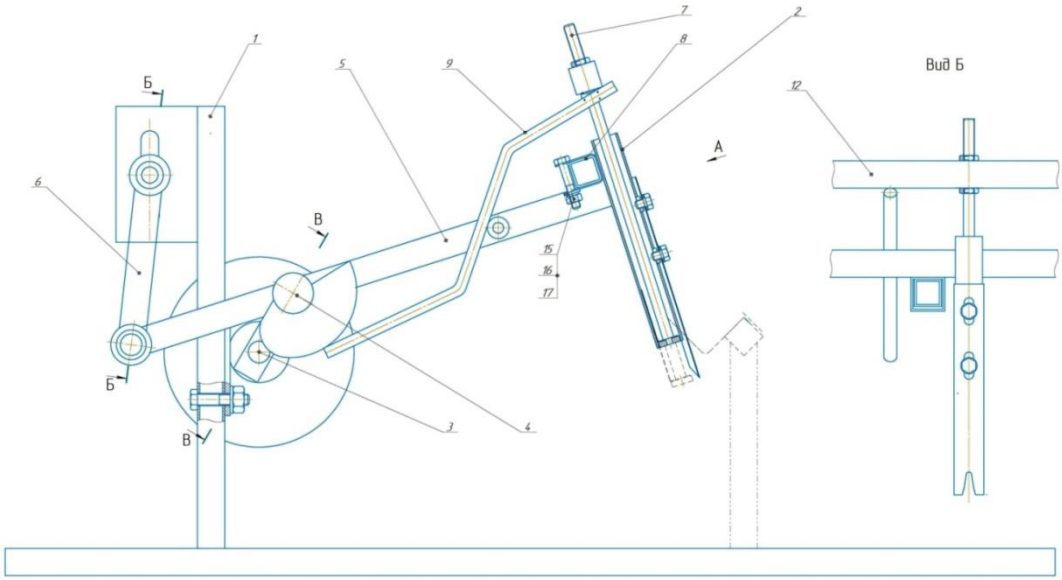
Picture 1. Seedling planting scheme in a rice seedling planter

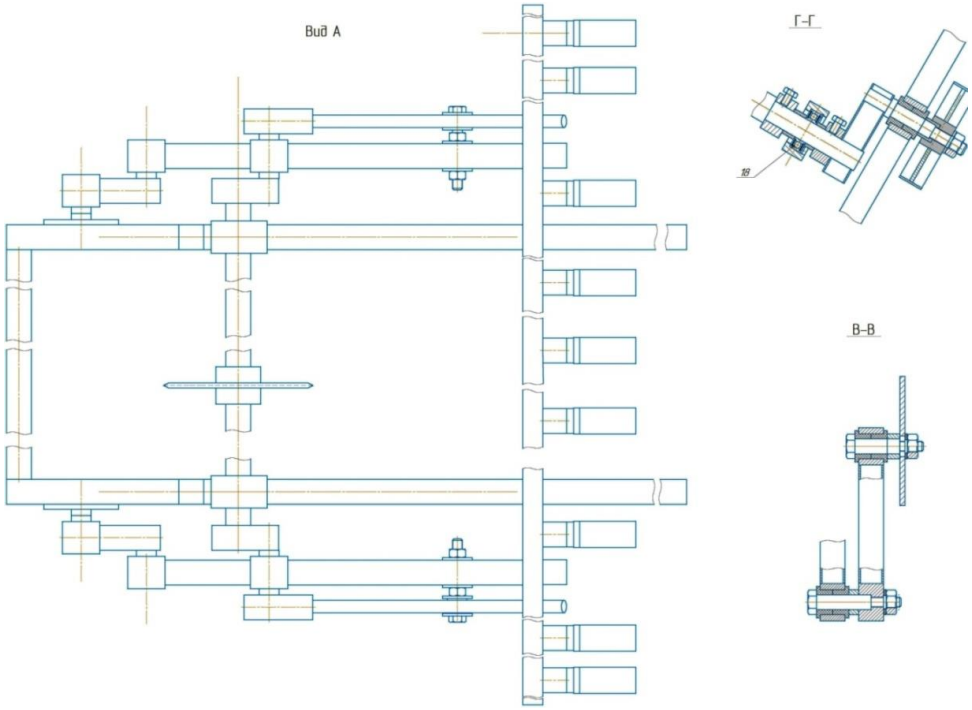
All the elements of the machine are fastened to the base (10) The drive (drive) consists of a carburetor internal combustion engine with a power of 4 kW (1400 rpm in the normal state, up to 2800 rpm in the working process) and a reducer (the output shaft of the reducer has two different rotations 1st speed with speed transmission 50 rev/min, second 100 rev/min). The movement of the machine is transmitted from the IYOD reducer (5) to the drive wheel through the cardan shaft, the speed of the machine is 2.5...3.0 km/h. The planting device of the machine receives the movement from the drive reducer with the help of a chain transmission consisting of (9) leading star, (7), (8) sets of shafts (step 12.7 mm), the number of transmissions is 1: 8, i.e. the leading wheel in one full rotation, the crankshaft of the planter rotates 8 times. Based on theoretical calculations, the driving wheel covers a distance of 1 meter in one complete rotation, and the planting device plants 8 times for this distance. The distance between seedlings is 125 mm. The total planting width of the machine is 1200 mm, seedlings are planted in 9 rows with a row spacing of 150 mm.

If the speed of the car is assumed to be 3000 m/h and the coverage width is 1.2 meters; The time of planting power on 100 square meters is about 2 minutes. Therefore, it takes 200 minutes, or 3 hours and 20 minutes, to plant seedlings on 10,000 square meters, that is, one hectare of land. It takes 5 hours.

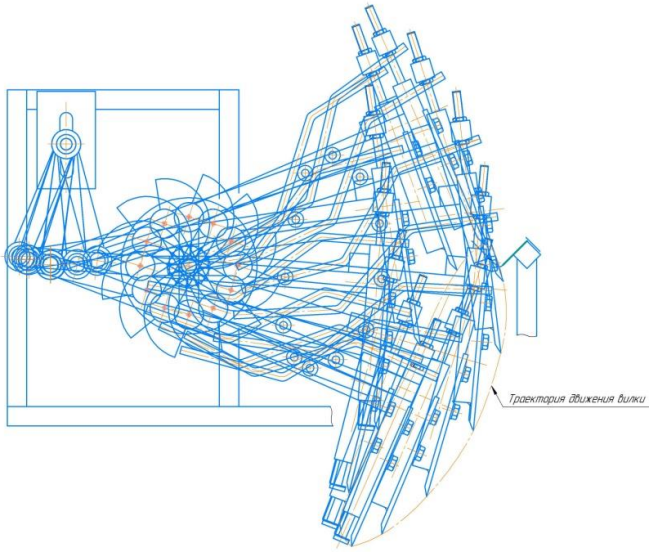
The principle of operation of the planting device

The main task of the lever (6) is to adjust the complex movement of the connecting rod (5). During the rotational movement of the crankshaft, the connecting rod moves, and the body (2) of the plug attached to it and the plug (7) and the pusher (7) move up and down, and at the same time forward and backward. During the top-down movement process, it also moves forward, using the fork-shaped tip of the sower, grabs the seedling from the tray and brings it closer to the clay soil. pushes down and stabs the root of the seedling into the mud. When the connecting rod moves up, it moves a little back and up, in the process, the cam engages with the working surface of the bushing (4) and lifts the pusher up, the process is repeated with the rotation of the crankshaft.

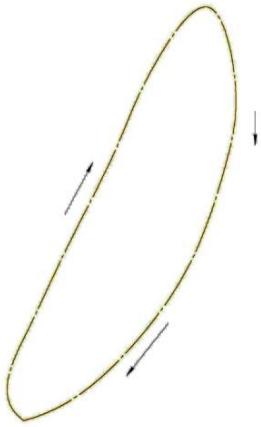




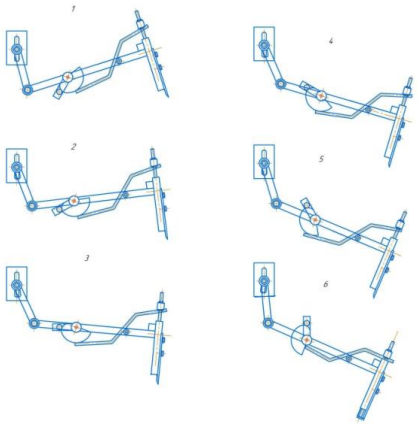
Kinematic diagram of the planting device



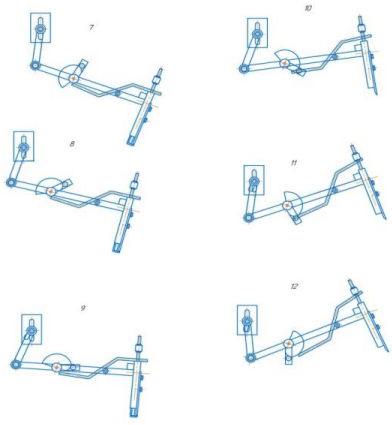
General kinematic scheme of the planting apparatus



Planting 's movement trajectory



Planting 's 1...6 situations ko'rinishi



Planting 's 7...12 situations

As can be seen from the kinematic scheme, the pusher is in the raised position in situations 1,2,3,4,5,10,11,12. planted to a depth of cm.

In order to obtain a high yield from rice, to meet the demand of the population for rice products and to save foreign currency by reducing the amount of imported rice, placing high-yielding rice varieties that are resistant to soil and climate conditions, with high-quality grain indicators, and using high-efficiency resource-efficient agro-technologies for their cultivation and rice cultivation development and introduction of special techniques is one of the most important tasks.

Cultivation of rice by seedling method is one of the most important branches of this technological process, this method has many differences and advantages from the method of direct sowing from traditional seeds.

When using the mechanized technology of planting local rice seedlings and the device that implements it, the following tasks will be systematically solved in the rice farming network:

- 20-30% of fertilizer and 30% of water can be saved as a result of rice seedlings being cared for in the nursery for at least one month and fully supplied with water and fertilizer in a small area in the nursery;
- 65-70 kg of high-quality seeds are used for one hectare in the seedling method, which saves 150 kg of seeds and increases the grain yield by 20-30%, compared to the traditional method of sowing and growing seeds.
- the mechanized technology of planting seedlings of local rice varieties will be developed and a seedling machine will be created, preliminary requirements and technical tasks for the development of the machine will be prepared;
- agrotechnical requirements for the mechanized technology of planting seedlings of local rice varieties will be developed;
- by applying the proposed mechanized technology of planting rice seedlings in practice, work productivity will increase, the yield of rice will be increased, and opportunities will be created to provide the population with food products.

Summary.

1. Obtaining a high yield from rice, meeting the population's demand for rice products, deploying high-yielding rice varieties that are resistant to soil and climate conditions, with high-quality grain indicators, developing and implementing highly efficient, resource-efficient agrotechnologies and special techniques for their cultivation is one of the most important tasks.
2. As a result of the fact that most of the farms of our republic, which are specialized in rice cultivation and grow rice as a repeated crop, mainly use the traditional method, and some of them use manual labor to grow rice by seedling method, the result is excessive expenses, low productivity, and extended planting periods. it was found that it will lead to collapse.
3. Rice seedling planting machines were brought from abroad and are being used as an experiment, and it was found that the distance between the rows of the planting bodies of these machines is 30 cm. In turn, it was found that it is not suitable for planting seedlings of local rice varieties.
4. The results of the conducted research are proposed mechanized technology of planting local rice seedlings in the conditions of our republic and the construction of the device that implements it.

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