

Determination of the Parameters of the Aggregate Rotation Working Body Combined With a Pump Retainer between the Row of B Analysis of Experimental Research Conducted On

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Annotation: This study is devoted to the study and analysis of the design and technological parameters of a combined aggregate-rotary working element that collects cotton between rows. In horticulture, important units are high-quality inter-row cultivation, improvement of air and moisture content of the soil, as well as increasing the yield of agricultural crops.

The study analyzes the geometry of the rotary cutter, its rotation speed, work productivity, mechanical impact on the soil and optimal operating modes. Recommendations on the design, choice of materials and ergonomics of the working element will also be developed. The operating parameters of the rotary working element are analyzed using computer modeling

and laboratory tests taking into account the mechanical properties of the soil.

The research results will serve as a basis for developing modern mechanized technologies that will allow for the efficient cultivation of row crops in horticulture. At the same time, these results can be used in the production processes and modernization of agricultural units.

Keywords: Gardening, row spacing, tillage unit, rotary cutter, design parameters, mechanical impact on soil, agricultural machinery, mechanization, computer modeling, labor productivity, ergonomics, selection of materials, laboratory tests, performance, optimal operating modes.

Introduction. In order to obtain high yields in fruit production worldwide, the improvement of soil cultivation machines and tools, as well as the use of advanced technologies and modern technical means, while maintaining soil fertility, are taking a leading place. The presence of fruit orchards on an area of more than 40 million hectares worldwide requires the widespread introduction of energy- and resource-efficient machines and devices that cultivate the soil with high quality and productivity. In this regard, the development and widespread introduction of a combined machine that prepares the soil between rows of fruit seedlings for planting in one pass is of great importance.

In the world, scientific and research work is being carried out to develop new scientific and technical solutions for modern resource-saving equipment and technologies that are highly efficient, soften the soil between rows of orchards, retain moisture, eliminate weeds, and ensure high yields, while leaving a protective zone. In this regard, special attention is paid to the development of combined machines and working bodies that prepare the soil between rows of orchards for planting in one pass, and to justify the technological process and parameters that ensure energy efficiency by placing them in a single frame according to an optimal scheme.

In our republic, comprehensive measures are being taken to reduce labor and energy consumption in fruit growing, save resources, use advanced technologies, and develop high-performance agricultural machinery. The “Development Strategy of New Uzbekistan” for 2022-2026 sets out important tasks, including “Intensive development of agriculture on a scientific basis...”. The implementation of these tasks, including the development of an energy-saving and resource-efficient machine that prepares garden rows for planting in one pass based on agrotechnical requirements, and the justification of the parameters of its main working units, is of great importance. This dissertation research will to a certain extent serve to implement the tasks set out in the Decree of the President of the Republic of Uzbekistan No. PF-60 dated January 28, 2022 “On the Development Strategy of New Uzbekistan for 2022-2026”, Resolutions No. PP-4246 dated March 20, 2019 “On measures for the further development of horticulture and greenhouse farming” and No. PP-4410 dated July 31, 2019 “On measures for the accelerated development of agricultural machinery, state support for providing the agrarian sector with agricultural machinery”, as well as regulatory and legal documents related to this activity.

Research objective is to develop a combined machine that loosens the soil and forms a ridge in one pass for effective use of garden row spacing, and to improve the quality of work and reduce

costs by optimizing the parameters of its main working elements.

Research tasks. An analysis of previous research on garden interrow rotary tiller and soil preparation combined machines, as well as loosener and harrow opener tiller;

Development of a resource-saving technology for preparing crops for planting in one pass between garden rows and the construction scheme of a combined machine that implements it;

Theoretical research of the parameters of the combined machine softeners and egate opener working bodies that ensure low energy consumption and high work quality;

Preparation of a pilot version of a combined machine equipped with a toothed softener and a hoe with reasonable parameters;

Determining the results of field tests of the combined machine in accordance with agrotechnical requirements and economic indicators.

The object of the study is a combined machine for preparing garden rows for planting crops, its loosening and loosening working bodies, and the technological process of the work. The subject of the study is the process of interaction of the loosening and loosening working bodies of the combined machine for preparing garden rows for planting crops with the soil and the analytical relationships that allow determining its parameters, the laws of change in the agrotechnical and energy performance indicators of the machine depending on the parameters of the working bodies and the speed of movement.

The scientific novelty of the study is as follows:

The construction scheme of the device for collecting rice between garden rows is developed and the technological work process is based;

a rotary softener construction was developed, which ensures the loss of weeds and quality softening of the soil on the slopes of the fields;

The optimal parameters of the device were determined based on analytical relationships that represent the processes of cultivating the bottom of the furrows with a rotary harrow, the interrows with a rotary harrow, and the slopes of the furrows with a toothed harrow;

The stability of the depth of processing on the top of the pistons is based on the dependence of the gears of the parallelogram mechanism.

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