

Technology Of Preparing Land For Row Sowing

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Abstract

The article presents the results of the technological process of scientific research on the preparation of land for sowing with a combined unit designed for minimal soil tillage.

Keywords: Combined unit, cotton picker, fertilizer spreader, deeploosen working element, seeds, cotton.

Introduction

The method of sowing seeds in beds is currently widely used in our Republic. In this method, after the fields are fertilized and plowed in the fall, the irregularities are leveled and chiseled, the field surface is worked with a harrow and a trowel, and then the beds are removed. In the spring, the beds are worked and seeds are sown on them [1]. Studies conducted at the Research Institute of Agricultural Mechanization have shown that when seeds are planted in beds and cotton is grown:

- the zone of soft soil where cotton roots develop increases;
- seeds are sown in soft soil that is not crushed by the wheels of tractors and agricultural machinery;
- due to the increase in the surface area of the field that receives sunlight, it allows for greater accumulation and harvesting of heat in the soil;
- since the beds are removed in the fall, pre-sowing cultivation of the land is much easier;
- in years with little rainfall, the dry soil on the pad is removed, and the seed is planted in moist soil, ensuring its germination;
- since rainwater falling on the pad flows down to its base, there is no strong compaction on the row where the seed is planted. For this reason, the plants are less likely to suffer from root rot;
- during the first tillage between the cotton rows, the likelihood of newly emerged or

sprouting cotton seedlings being buried by the soil is reduced;

- fertilizers applied before planting are not applied to the entire pad, but only to the part of the pad where the seed is planted;
- the susceptibility of cotton to various diseases is reduced [2].

Literature review.

The existing technologies for preparing seeds for sowing in furrows consist of a large number of agrotechnical measures, such as fertilization, plowing, chiseling, harrowing, harrowing and furrowing, performed by separate units, and at least 2-3 types of tractors and 5-6 types of agricultural machinery and tools are used to perform them. This, in turn, leads to an increase in labor, fuel and other material costs in preparing the land for sowing, and the multiple passes of units over the field lead to soil structure deterioration and compaction of the subsoil. One of the most important ways to eliminate these shortcomings is to use combined units, combine and simultaneously carry out the technological processes performed, reduce their number and depth of cultivation, and switch to row cultivation without completely processing the subsoil.

Methodology.

Combined aggregates used in land cultivation combine several or all technological processes performed on them in one pass through the field, including the main and pre-sowing processing. This leads to a decrease in the negative impact

of tractors and agricultural machinery on the soil, as well as a decrease in fuel consumption, labor costs and other material costs, an increase in the quality and yield of work, a reduction in the duration of soil cultivation, and the preservation of moisture accumulated in it. Combined aggregates used in land cultivation combine several or all technological processes performed on them in one pass through the field, including the main and pre-sowing processing. This leads to a decrease in the negative impact of tractors and agricultural machinery on the soil, as well as a decrease in fuel consumption, labor costs and other material costs, an increase in the quality and yield of work, a reduction in the duration of soil cultivation, and the preservation of moisture accumulated in it. Currently, combined units used in land cultivation can be divided into the following groups [3,4]:

- units that perform both primary and secondary land cultivation. Such units mainly consist of a machine for primary land cultivation (roller plow, chisel plow, deep tiller) and working bodies mounted on it, which grind, level and compact the plowed or tilled field surface. Figure 1 shows the main working body of an experimental combined unit.



Figure 1. Main working bodies of the combined unit and their location

Aggregates that combine pre-sowing tillage processes. Such aggregates, when passing through the field, loosen the soil to a specified depth, level its surface, grind it, and compact it to the required level.

Results.

Such aggregates are also equipped with fertilizer spreaders, and in one pass through the field, they perform basic or pre-sowing tillage and apply fertilizer. Aggregates that perform combined tillage and sowing operations. Such aggregates consist of soil-tending and sowing machines or working bodies. Therefore, they perform combined tillage and sowing [5,6].

Discussion.

The combined aggregate developed at the Research Institute of Agricultural Mechanization is intended for use in areas where cotton stalks are uprooted or crushed and scattered on the surface of the field. The combined unit developed at the Research Institute of Agricultural Mechanization is somewhat simpler, less material and energy-intensive than other units. When using the combined unit, it was shown that labor and fuel and lubricants consumption for preparing the land for sowing seeds are reduced, and cotton yields are increased.

Conclusions.

The existing technology for preparing the land for sowing consists of many agrotechnical measures, such as fertilizing, plowing, harrowing, chiseling, and grinding, which lead to additional labor, fuel and other material costs and damage to the soil structure.

Reducing fuel consumption and other material costs in preparing the fields for sowing can be achieved by using a combined unit that performs several agrotechnical measures at once.

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