ANALYSIS OF THE AVAILABLE TECHNOLOGIES USED IN THE PREPARATION OF LAND FOR SEED PLANTING IN THE CONDITIONS OF KARAKALPAKSTAN

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Abstract: Using combined aggregates, adding technological operations on the main and pre-sowing soil treatment, and carrying them out simultaneously are important ways to overcome the shortcomings in the preparation of irrigated fields for seed sowing and to increase the productivity of agricultural crops.

Key words: agricultural machinery, seeder-cultivator, soil surface treatment, soil compaction, development of technology for combining planting.

The most energy-intensive stage in agricultural production is the primary and pre-sowing soil treatment in irrigated fields, which accounts for 40–50% of the energy used to cultivate agricultural crops in our Republic. As a result, cutting down on energy use during the primary and pre-planting tillage of the field enables significant fuel and lubricant savings in agricultural output, as well as a reduction in labor and other expenses and an increase in the longevity of machinery and its components. Consequently, the cost of the final product might be decreased. The usage of combined units is one of the primary approaches to assure energy-resource savings in land cultivation under the conditions of our republic. Comprehensive steps are being done in our nation to produce high-performance agricultural machinery, grow crops using modern methods, and save resources in agricultural production.

Compared to other regions, Karakalpakstan has a far higher amount of agricultural operations during the land preparation phase. The model technological card for cotton cultivation outlines 23 distinct operations that are planned for the time leading up to planting, including washing the land to remove salt, harrowing in the early spring, main cultivation, soil preparation for planting, double hoeing, twice disking, three times harrowing, three times leveling, which includes three times grinding, and finally, the planting operation that is completed separately. Because of this, the soil is repeatedly compressed and stomped by agricultural materials during the planting season.

The primary goal is to develop combined machines that are entirely devoid of the aforementioned flaws and eliminate needless, redundant technical operations in soil cultivation, particularly in wet fields where various technological operations and activities are combined depending on the soil type and weather.

In order to guarantee the integration of planting operations and soil preparation for

planting on the backdrop of a field that is plowed and irrigated in the fall, a technological solution has to be developed.

For this reason, it's essential to create a combined aggregate that allows for the mixing of plant seeds with high-quality seed mulching while developing a technology that combines soil cultivation and planting.

In cotton farming, a lot of technical vehicles pass through the field, particularly during the cotton processing process. The pressure from the wheels causes the soil structure to alter, and it takes ten to fifteen years for the soil to return to its previous state.

Using two-layer plows during autumn plowing completely turns the soil layer, burying plant leftovers, weeds, and their seeds deep in the ground. As a result, there is less weed growth in the fields, the soil's mechanical and physical qualities are enhanced, and the amount of cotton produced increases.

A roller-softener is used to thoroughly crush and densify the dried cuttings, and it also levels the treated layer once the field surface has been leveled with a trowel-leveler.

However, fields that have not been plowed or tilled are the primary application for these levelers. Our nation has not carried out any particular study or research on these levelers.

Utilizing a tilting plow in the fall along with a specialized leveler for extensive soil surface treatment and flat plowing, as well as building a combined unit that combines soil preparation and planting operations based on a seeder-cultivator mounted on a plow tractor, can satisfy all of these requirements.

There are several generally accepted types of tillage:

1. Economic technologies of tillage (zero tillage, tillage, soil mulching, etc.).
2. Working the soil in traditional ways.
3. Minimal tillage.
4. Reduced soil tillage technology.

Depending on the technological functions they carry out, combined aggregates used in agriculture nowadays can be categorized into the following groups::

1. Machines incorporating basic and additional tillage.
2. Machines that include soil preparation operations before planting.
3. Machines incorporating fertilization with basic and pre-sowing tillage.
4. Machines that include planting with tillage before planting.

The "zero" tillage method involves only one instance of aggregate-soil interaction during the planting season. Here, expenditures are cut by 70–80% by doing one or more activities at the same time with a planting width of 2.5–2.7 cm. With zero tillage technologies, new combination units are being manufactured with various kinds of working bodies.

By using the APP-6-70 combined unit for pre-sowing, row crop seeding, row compaction after planting, and mineral fertilizer application, along with the assistance of multiple working bodies simultaneously (in a closed or belted manner), planting time is greatly reduced, crop yield is increased, and seed germination energy is increased.

Combined aggregates designed for belt milling and planting are used in the cultivation of cultivated crops. This technology helps to save manpower and energy consumption, attract machinery to agriculture, reduce soil erosion and increase the yield of fodder crops.

According to an analysis of the studies that have been done, using combined aggregates, adding and concurrently performing technological operations on the primary and pre-sowing soil processing, tilling the soil without overturning, and switching to a gradual cultivation strategy without fully cultivating the field's surface are all important ways to improve the productivity of agricultural crops and eliminate flaws in the preparation of land for planting seeds.

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