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Operating Scheme of The Combined Unit Implementing The Resource-Saving Technology of Soil Working

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Abstract: The article presents the results of a study of the movement scheme of a combined unit that implements resource-saving technology of soil cultivation. At the same time, the aggregate is loosened in one pass with an interval of 1800 mm between the rows, forming two fertilized rows, and four rows of rows with an interval of 90 cm are formed in the return.

Keywords: Combined Unit, Operation, Scheme, Research, Result, Row Spacing, Softener, Fertilizer, Paddy, Harrow, Row Spacing, Conditions, Crop, Field, Harrow Depth, Minimum Tillage, Technology

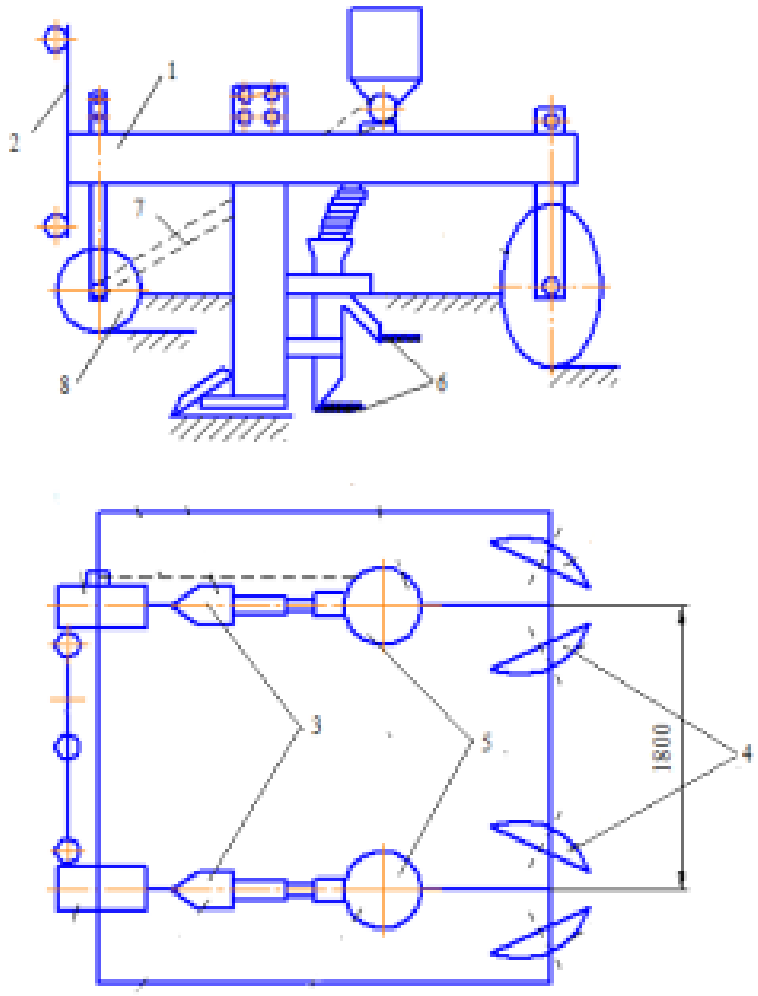
Introduction

The resource-saving technology of tilling the soil for growing cotton in cotton is carried out in the fall, and the last season's irrigation of the cotton-free fields is softened without overturning the aggregate in one pass, the softened area is fertilized in two layers, the old cotton fields are it is moved to the softened and fertilized areas and new bushes are formed, i.e., instead of the previous season's bushes, softened and fertilized bushes are formed, and instead of the bushes are formed(RAKHMATOV, 2024).

When comparing the existing and proposed technologies for preparing the fields for planting cotton in the field, the new technology softens the land without turning it over and does not require harrowing, grinding and chipping, significantly reducing the consumption of labor, energy and fuel-lubricants. due to a sharp reduction in the number of aggregates passing through the field (from 6-7 times to 2 times), it became clear that the soil is not over-densified(Alimova & Primkulov, 2020).

The main working bodies of the combined unit are a softener that softens the soil without overturning it, a device for fertilizing the softened layer in a tape-like manner, and dust collectors that form dust on the softened and fertilized layer(Yasnolob et al., 2019).

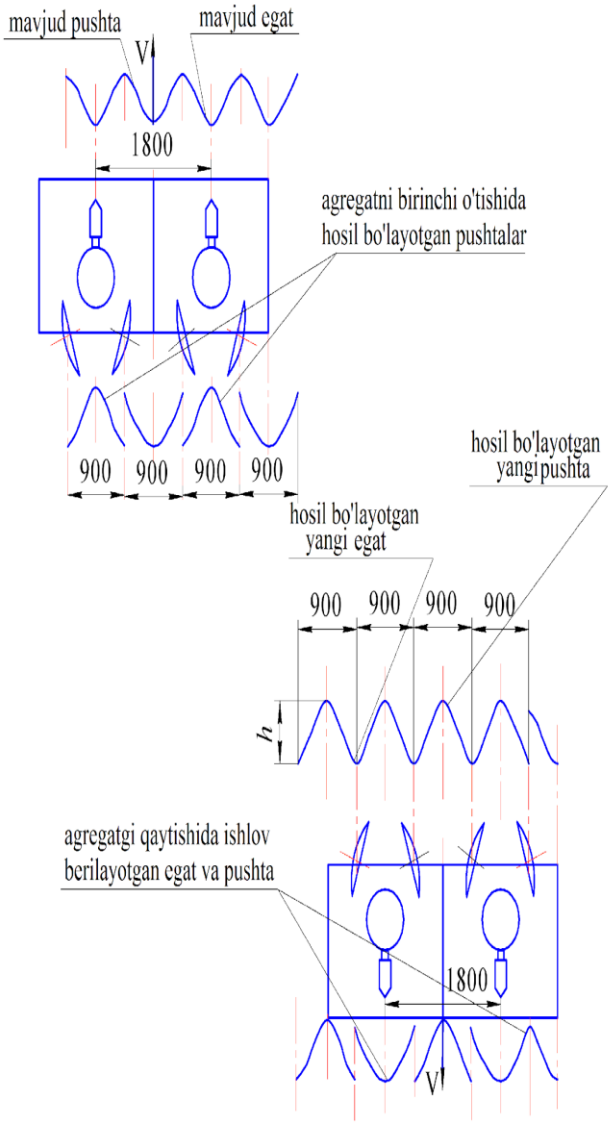
Combined unit (Fig. 1) frame 1, suspension device 2, softeners 3, dust collectors 4, fertilizer hoppers 5, fertilizer spreaders 6, mechanism for driving the fertilizer device 7 and support g The wheels consist of 8(Nikolaeva & Buslaeva, 2019).



1-frame, 2-installer; 3-softener; 4-pusher; 5-fertilizer hopper; 6-fertilizer-distributor; 7- the mechanism driving the fertilizing device 8- support wheel

Picture 1. Scheme of the combined unit

The softeners are placed on the frame with an interval of 1800 mm (Fig. 2), for irrigation between the rows of cotton, they soften the inside of the last season's egates to a depth of 30-40 cm. The working process of the combined unit is as follows: The fertilizing device applies fertilizer to the bottom of the layer softened by the softener and to a height of 30-40 cm. It creates new buds(Igamberdiev et al., 2024).



a and b are the dust formed during the first pass and return of the aggregate, respectively

Picture 2. Scheme of movement of the combined unit

The combined aggregate is mainly used in the regions where the natural and climatic conditions allow the cultivation of cotton (Cherniaiev et al., 2021)in cotton fields, where there is no salinity and no irrigation water. is available, and the combined aggregate softens the bottom of the existing beds and creates new beds in their place, and new irrigation beds in place of the old beds(Ilyasov et al., 2021).

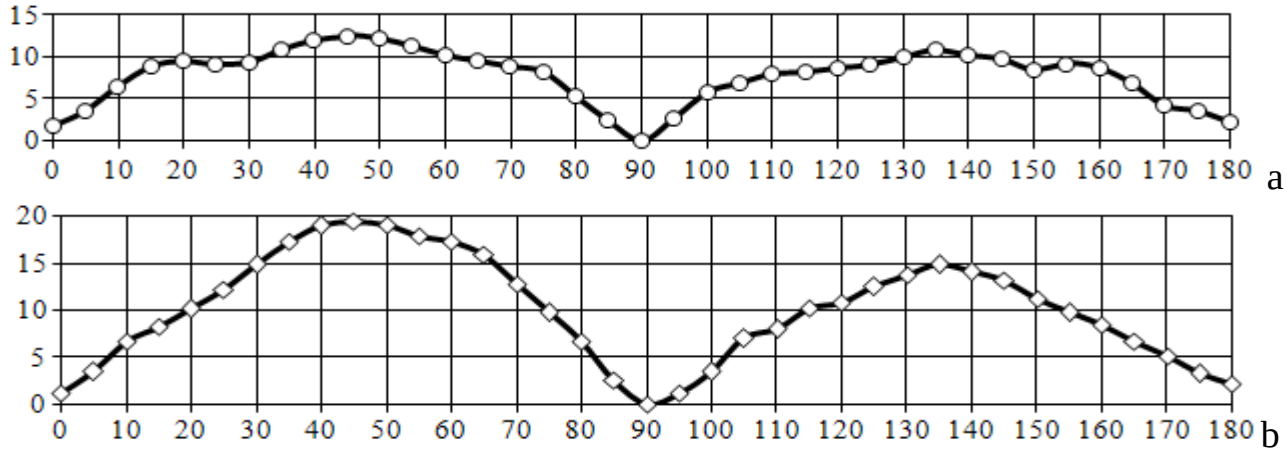
Picture 3 and 4 show a general view of a field prepared for cultivation with a combined aggregate and cross-section profiles of the existing stubbles and egates in the fields freed from cotton and planted with corn as a repeat crop after winter wheat(Bondarenko et al., 2019).

a b

a-cotton field; b- a field free from repeated crops

Picture 3. To work with a combined aggregate

General view of prepared field



Picture 4. Cross-sectional profiles of cotton and ergot present on the surface of fields free of cotton (a) and re-cropped (b)

The results of the research showed that the depth of the furrows (or the height of the furrows) varies between 10.7-12.4 cm(Shabalkin et al., 2023), and their average value is equal to 11.7 cm. In fields where corn was grown as a repeat crop after winter wheat, these indicators were 14.8-19.4 and 17.1 cm, respectively. The soil moisture in the 20 cm layer is 4.8-8.0%, (Borisenko et al., 2021)the density is 1.33-1.38 g/cm3 and the hardness is 0.92-2.89 MPa, in the 0-40 cm layer of the agate, these parameters are 7.3- 15.8%, 1.38-1.54 g/cm3 and 2.89-4.89 MPa, and in fields free of repeated crops, these indicators are 11.3-15.4%, 1, 24-1.38 g/cm3 and 1.21-2.86 MPa, 14.7-17.2% in egat, 1.31-1.53 g/cm3 and 1.74-4.78 MPa did(Домущі et al., 2023)

The obtained results show that the hardness and density of the egat soil in both backgrounds is greater than that of the rice and chok row(Monastyrskiy et al., 2021). This can be explained by the compaction of the soil under the influence of the wheels of the plow tractor during the growing season. It should also be noted that the soil moisture was low, and the hardness and density of the soil was high in the field freed from the cotton crop. This can be explained as follows(Gamayunova et al., 2024): firstly, the corn grown after winter wheat is irrigated in September, and secondly, the soil is less compacted due to the fact that the tractors enter between the corn rows 2-3 times less than between the cotton rows. showed(Korneeva, 2023)

Result and Discussion

1. The conducted analyzes and researches lead to the development of a combined aggregate that implements the technology of preparing the land for planting cotton and the technological processes of the aggregate in one pass(Polous et al., 2022).
2. In one pass, the unit creates two softened and fertilized piles with an interval of 1800 mm between the rows, and on its return, it forms four rows of piles with a distance of 90 cm.
3. In the results of the research, it was shown that the depth of the furrows (or the height of the furrows) (Ivanov et al., 2023)varies in the range of 10.7-12.4 cm, and their average value is equal to 11.7 cm. .
4. In fields where corn was grown as a repeat crop after winter wheat, these indicators were 14.8-19.4(Borisenko & Meznikova, 2021) and 17.1 cm, respectively. The soil moisture in the 0-20 cm layer is 4.8-8.0%, the density is 1.33-1.38 g/cm3 and the hardness is 0.92-2.89 MPa, in the 0-40 cm layer of the egate, these parameters are 7, 3-15.8%, 1.38-1.54 g/cm3 and 2.89-4.89 MPa, and in the fields free from repeated crops, these indicators are 11.3-15.4% in cotton, respectively. 1.24-1.38 g/cm3 and 1.21-2.86 MPa, 14.7-17.2% in egate, 1.31-1.53 g/cm3 and 1.74-4.78 MPa formed(Maksimova et al., 2019)

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