EduVision: Journal of Innovations in Pedagogy and Educational Advancements
Volume 2, Issue 6, June 2026
brightmindpublishing.com
ISSN (E): 3061-6972
*Licensed under* CC BY 4.0 *a Creative Commons Attribution 4.0 International License.*

# COMBINED UNIT FOR SOWING SEEDS

Igamberdiev Anvarzhon Uktamovich
Andijan State Technical Institute
t.f.f.d., (PhD).Igamberdiev@mail.ru

**Abstract**
The article presents the results of the technological process of research on the preparation of the soil of the combined aggregate for minimal tillage.

**Keywords**: Combined aggregate, pulverizer, fertilizer, deep softening working body, seed, cotton.

## Introduction

The method of planting seeds in the field is widely used in our Republic at the present time. In this method, after the fields are fertilized and plowed in the fall, unevenness is leveled, chiseled, the field surface is treated with a harrow and a trowel, and the dust is removed from behind. In the spring, the fields are cultivated and seed is sown on them [1].

According to the research conducted at the Agricultural Mechanization Research Institute [2], when the seed is planted in the field and cotton is grown:

- the zone with soft soil where cotton roots develop increases;
- the seeds are planted in soft soil that is not crushed by the wheels of tractors and agricultural machines;
- due to the increase in the level of the field receiving sunlight, more heat is accumulated in the soil and its temperature is two to three degrees higher than the flat ground. This makes it possible to start planting early and collect the seed quickly;
- since the bushes are removed in the fall, the work of processing the land before planting becomes much easier;
- in the years of low rainfall, the dry soil on the paddy field is removed, the seed is planted in wet soil and its germination is ensured;
- due to the fact that the rainwater that falls on the paddy field flows down to its edge, there is no strong slush on the row where the seed is sown. For this reason, root rot disease of plants is rare;

EduVision: Journal of Innovations in Pedagogy and Educational Advancements
Volume 2, Issue 6, June 2026
brightmindpublishing.com
ISSN (E): 3061-6972
*Licensed under* CC BY 4.0 *a Creative Commons Attribution 4.0 International License.*

- during the first treatment between the rows of cotton, the probability of burying the newly emerged or sprouting cotton seedlings with soil is reduced;
- the fertilizers given before planting are given only to the part where the seeds are planted, not to the whole;
- the susceptibility of cotton to various diseases decreases.

Due to these advantages, when the seed is planted in the field, it germinates better than when it is planted on the flat ground, the plants develop better and as a result, a high yield is achieved tomorrow.

## Research Methodology

The existing technologies of seed preparation for sowing on paddy fields consist of many agrotechnical activities, such as fertilizing, plowing, harrowing, harrowing, grinding and harvesting, which are carried out with separate aggregates, and for their implementation at least 2-3 types of tractors and 5-6 types of agricultural cars and weapons are being used. This, in turn, leads to an increase in labor, fuel and other material expenses in preparing the land for planting, and the repeated passing of aggregates through the field leads to the destruction of the soil structure and compaction of the subsoil layer. One of the most important ways to overcome these shortcomings is to use combined units, add and carry out technological processes simultaneously, reduce their number and reduce the depth of processing, and switch to step-by-step processing without complete processing of the driving layer.

Combined units used in tillage combine some or all of the main and pre-planting technological processes in one pass through the field. This will reduce the negative impact of tractors and agricultural machines on the soil, reduce fuel consumption, labor and other material costs, increase the quality and productivity of work, reduce the time of soil cultivation, and preserve the moisture accumulated in it.

The combined aggregates used in tillage can be divided into the following groups [3,4]:

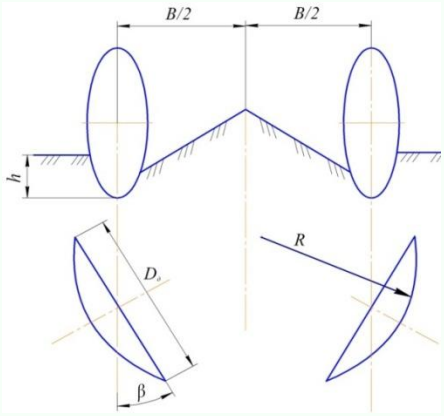
- aggregates that perform basic and additional processing of land. Such aggregates mainly consist of the main tillage machine (turning plow, chisel plow, deep softener) and the working bodies installed on it, the working bodies crush, level and compact the plowed or softened field surface;
- aggregates that add processing processes to the land before planting. When such aggregates pass through the field, they soften the soil to a specified depth, level its

EduVision: Journal of Innovations in Pedagogy and Educational Advancements
Volume 2, Issue 6, June 2026
brightmindpublishing.com
ISSN (E): 3061-6972
*Licensed under* CC BY 4.0 *a Creative Commons Attribution 4.0 International License.*

surface, grind it and compact it to the required level;
- aggregates that add processing processes to the land before planting. When such aggregates pass through the field, they soften the soil to a specified depth, level its surface, grind it and compact it to the required level;
- aggregates that perform land cultivation and planting activities together. Such aggregates consist of tillage and planting machines or working bodies. Therefore, they combine tillage and planting [5].

**Results and discussion**

The combined aggregate developed at the Scientific Research Institute of Agricultural Mechanization is intended for use in areas where the stalks are uprooted or crushed and scattered on the field surface. The technological process performed by the combined unit is described (Figure 1). It has been shown that the use of spherical discs as a shock absorber of the combined unit is desirable. In this case, each push is formed by two disks placed opposite to each other.



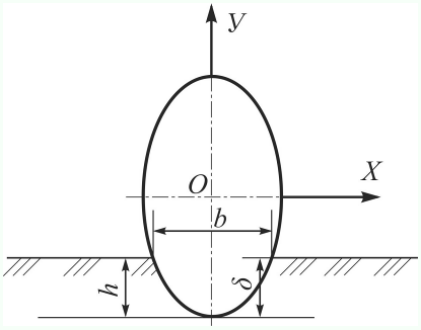

**1- picture. Scheme of the process of extraction of flour with spherical disks**

In the process of work, the discs cut the soil clods, lift them along the working surfaces and throw them to the side, forming a pile.

Based on these points, we will consider the conditions for the cutting of soil flakes by the discs, their movement on the surface of the discs, and the formation of high-quality powder.

As can be seen from the diagram shown in Figure 2-the picture spherical disk cuts out rods from the soil with a cross-section of a rod. The part of the disk cut by the cutting edge of the disk is in the form of an ellipse, which can be expressed by the following equation

EduVision: Journal of Innovations in Pedagogy and Educational Advancements
Volume 2, Issue 6, June 2026
brightmindpublishing.com
ISSN (E): 3061-6972
*Licensed under* CC BY 4.0 *a Creative Commons Attribution 4.0 International License.*




$b$ – cross-sectional width; $h$ – the depth of immersion of the spherical disk into the soil; $\delta$ – thickness of the cross section

**2- picture. The scheme for determining the shape and dimensions of the soil slab that the spherical disc cuts**

$$\frac{Y^2}{R_\partial^2} + \frac{X^2}{R_\partial^2 \sin^2 \beta} = 1 \qquad (1)$$

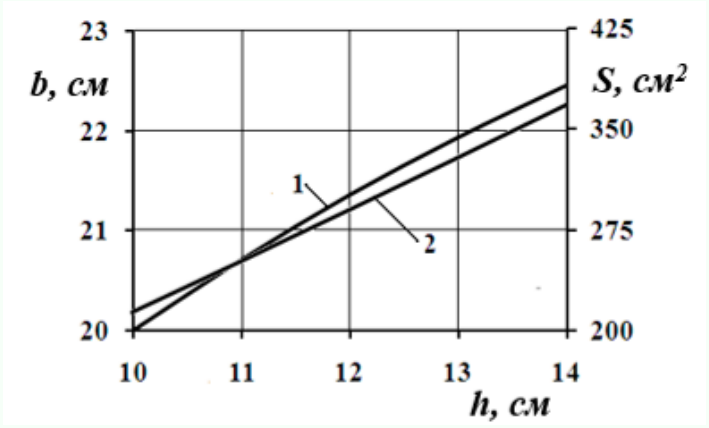
in this Rd – disk radius, m;
X, U – coordinate axes passed through the center of disk rotation;
b- is the angle of installation of the disc relative to the direction of movement, degrees.
The blade being cut by the disc is characterized by:
- cross section width b;
- the thickness of the cross section $\delta$
- cross-sectional surface S.

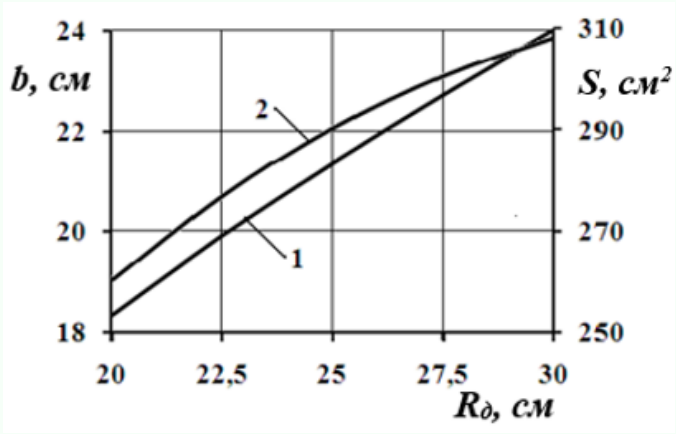
As can be seen from the expressions given above, the shape and size of the blade that the disk cuts from the soil depends on its diameter (radius), the angle of installation in relation to the direction of movement, and the depth of immersion in the soil.
In Figure 3Graphs of variation of "b" and "S" with respect to h and Rd are constructed. As can be seen from these graphs, the width and surface of the cross-section of the cultivated blade increased from 10 cm to 14 cm when the depth of the disc working body into the soil increased from 20.0 cm to 22.4 cm and from 213.9 cm2, respectively.
It increased linearly up to 367.8 cm2. Because it increases the depth of immersion of the working body into the soil and, as can be seen from the expressions, leads to an increase in the volume of the processed soil. For this reason, increasing the radius of

EduVision: Journal of Innovations in Pedagogy and Educational Advancements
Volume 2, Issue 6, June 2026
brightmindpublishing.com
ISSN (E): 3061-6972
*Licensed under* CC BY 4.0 *a Creative Commons Attribution 4.0 International License.*

the working body from 20 cm to 30 cm also led to an increase in the cross-section and surface of the treated blade from 18.3 cm to 24.0 cm and from 260 cm2 to 308.1 cm2, respectively. But here the processing width is a straight line, and the surface of the straw cross-section is changed according to the bubble curve. On the working surface of the disk, the soil particles are complex, that is, rotating with the disk and in relative motion along its working surface.

In the process of work, the combined aggregate softens the bottom of the beds and creates new beds in their place, and new irrigation beds in place of the old beds [6].




*б)*

**3- picture. Cross-section of the processed palm width (1) and face (2) depend on h(a) and Rd (b) change graphs**

EduVision: Journal of Innovations in Pedagogy and Educational Advancements
Volume 2, Issue 6, June 2026
brightmindpublishing.com
ISSN (E): 3061-6972
*Licensed under* CC BY 4.0 *a Creative Commons Attribution 4.0 International License.*

The combined unit developed at the Scientific Research Institute of Agricultural Mechanization is simpler, less material and energy-intensive compared to other units. When using a combined unit, it was shown that the cost of labor and fuel lubricants for preparing the land for seeding is reduced, and the yield of cotton is increased.

## Conclusion

The existing technology of land preparation for harvesting consists of many agrotechnical activities such as fertilizing, plowing, harrowing, chipping, grinding, which lead to the consumption of additional labor, fuel and other material costs, as well as the destruction of the soil structure.

Reduction of fuel consumption and other material costs in the preparation of rice fields can be achieved by using a combined unit that performs several agrotechnical measures.

## References

1. Sample technological cards for the cultivation of agricultural crops and production. for 2016-2020. Part I. - Tashkent: QXIITI, 2016. - 140 p.

2..Игамбердиев, А. У. (2023). ТУПРОҚҚА ИШЛОВ БЕРУВЧИ КОМБИНАЦИЯЛАШГАН АГРЕГАТНИНГ ТЕХНОЛОГИК ЖАРАЁНИ. Innovations in Technology and Science Education, 2(7), 1502-1508.

3.Маматов Ф., Худояров Б., Мирзаходжаев Ш. Комбинированный агрегат для подготовки почвы к севу хлопчатника на гребнях //Агроинженерияда таълим, фан ва ишлаб чиқариш интеграцияси. – Тошкент, – С.54-56.

4.МаматовФ.М.,Худояров Б.М.,Утемуратов О.,Қузиев У.Ражабов А.Х. Комбинациялашган агрегат //Ўзбекистон қишлоқ хўжалиги журнали. – Тошкент, 2006. № 4, – Б. 36-37.

5.Тўхтақўзиев А., Худоёров А., Мамадалиев М. Тупроққа ағдармасдан минимал ишлов беришга йўналтирилган технология // ФарПИ илмий-техника журнали – Фарғона, 2008. - №2. – Б.12-16.

6. Игамбердиев, А. У., & ўғли Бурхонов, З. А. (2022). Ерларга ишлов беришда қўлланиладиган комбинациялашган агрегат ва унинг афзалликлари. Science and Education, 3(7), 66-71

7. Igamberdiyev, A. (2023). COMBINED AGGREGATE FOR SOIL WORKING. The American Journal of Engineering and Technology.

**EduVision: Journal of Innovations in Pedagogy and Educational Advancements**
**Volume 2, Issue 6, June 2026**
brightmindpublishing.com
**ISSN (E): 3061-6972**
***Licensed under* CC BY 4.0 *a Creative Commons Attribution 4.0 International License.***

8. Igamberdiyev, A. (2022). RESULTS OF AN EXPERIMENTAL STUDY OF A COMBINED AGGREGATE. SCIENTIFIC AND TECHNICAL JOURNAL MACHINE BUILDING.

9. Бойметов Р.И., Игамбердиев А.У. Комбинациялашган агрегат пушта олгичининг турини танлаш ва параметрларини асослаш. ФарПи, Илмий-техника журнали, 2020 йил, № 2, ( 24) б 43-48.