THE METHOD AND RESULTS OF DETERMINING THE DIMENSIONS OF A CONICAL SPREADER

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Abstrakt. In this article, the method and results of determining the dimensions of the conical spreader for both spreading and sliding and smoothing the surface of hairy seeds and mineral fertilizer solution sprayed hairy seeds and determining the friction angle of hairy seeds sprayed with a solution of mineral fertilizers in water are presented. the results are presented.

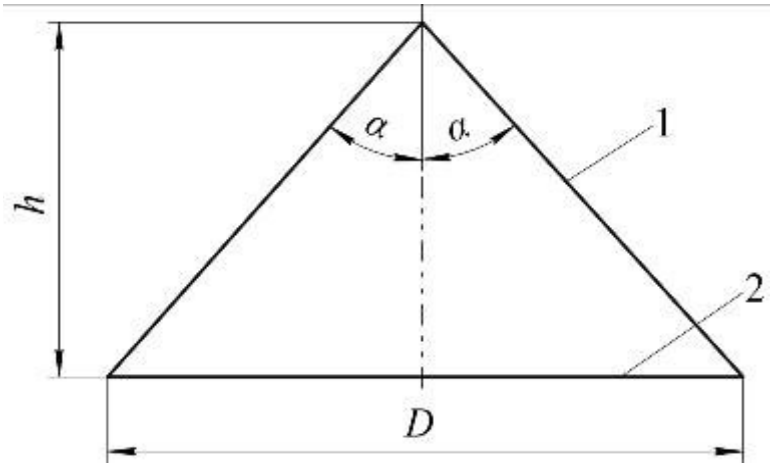
Key words: Conical spreader, angle of friction, mineral fertilizer, solution of micronutrient compositions in water, mean square deviation, height of conical spreader, width of conical spreader, slope angle

Introduction. Based on the study and analysis of previously conducted scientific research on methods for improving the quality indicators of seed grains, technologies for increasing the dispersibility of hairy seeds, the effect of treating seed grains with mineral fertilizers, the development of designs of shelling devices, and the study of previously conducted scientific research, a special device was developed for shelling hairy seeds with aqueous solutions of mineral fertilizers and microelement compositions. Theoretical study of the technological process carried out in the device and justification of its constructive dimensions and operating modes create the basis for qualitative experimental research. In addition, theoretical studies also allow for a quantitative assessment of the technological process of shelling hairy seeds with aqueous solutions of mineral fertilizers and microelement compositions.

According to the operating principle of the device for coating hairy seeds with a solution of mineral fertilizers in water, the first conical spreader must first evenly spread the hairy seeds, which are continuously fed to a vertical cylinder by a belt conveyor. The second and third conical spreaders must both spread and slide the

hairy seeds sprayed with a solution of mineral fertilizers in water, smoothing their surface. Therefore, it is necessary to take these factors into account when justifying the dimensions of the conical spreaders

Figure 1 shows the principle diagram of a conical spreader



1-inclined plane; 2-basis

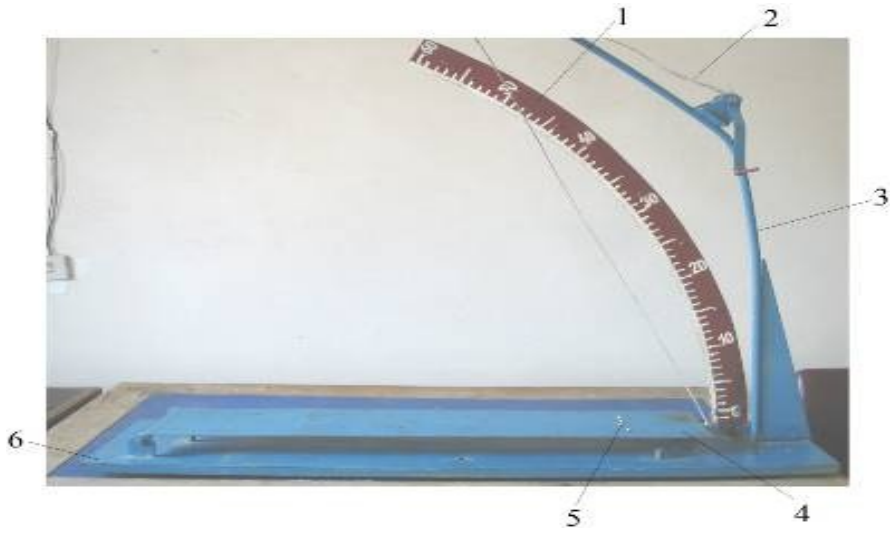
Figure 1. The principle scheme of the conical spreader

Methods. To determine the inclination angles of conical spreaders relative to the vertical plane, that is, to find their dimensions, 100 grains were separated from the original hairy seeds and hairy seeds coated with a solution of mineral fertilizers in water [1,2,3,4,5,6,7].

The angle of friction of each separated hairy seed was determined. The slope method was used to determine the angles of friction of the original hairy seeds and hairy seeds coated with a solution of mineral fertilizers in water [8,9,10,11,12,13.14].

Figure 2 shows the slope method for the original and mineral fertilizers in water

The general view of the stand for determining the angle of friction of hairy seeds coated with a solution of mineral fertilizers is depicted[15,16,17,18,19.20]. To determine the angle of friction of the original hairy seeds and hairy seeds sprayed with an aqueous solution of mineral fertilizers, the movable plane 4 was lowered to a horizontal position and a single hairy seed 5 was placed on it. Then, using the handle 3 and the rope 2, the movable plane 2 was gradually raised upwards. As soon



1-scale; 2-thread; 3-ruqayatka; 4-moving plane;5- hairy seed; 6th basis

Figure 2. Overview of the stand for determining the angle of friction

as the hairy seed 5 sprayed with an aqueous solution of mineral fertilizers started moving, the lifting of the movable plane 4 was stopped and the angle reading was recorded on the scale 1. In the same way, the angle of friction of the original hairy seeds and 100 hairy seeds coated with an aqueous solution of mineral fertilizers was determined, and the reading of each seed was recorded in a field notebook

Results. The obtained results were processed using mathematical statistics methods based on programs available on modern computers, and the average values of the friction angles of the original hairy seeds and hairy seeds sprayed with a solution of mineral fertilizers in water were found. Based on these values, the inclination angles of the walls of the conical spreaders relative to the vertical plane were determined.

At the same time, the dimensions of the shelling device and metal consumption were also taken into account when determining the height and width of the conical spreader.

Table 1 presents the results of determining the friction angles of hairy seeds and hairy seeds sprayed with a solution of mineral fertilizers

The results show that the minimum value of the friction angle of hairy seeds was 29° and the maximum value was 38°42′, with a standard deviation of σ=3°13′

and a coefficient of variation of V=9.63 percent, and an average of φ=33°28′,

Table 1

Results of determining the friction angle of hairy seeds sprayed with a solution of mineral fertilizers in water

№	Name of the seeds	Minimum value of the friction angle, degrees	The largest value of the friction angle,	The average value of the friction angle, degree	Mean squared deviation s, degrees	Coefficient of variation V, %
1	Hairy seeds	29°	38°42′	33°28′	3°13′	9,63
2	Hairy seedlings sprayed with an aqueous solution of mineral fertilizers	11°	60°	32°54′	13°15'	40,43

while the minimum value of the friction angle of hairy seeds coated with an aqueous solution of mineral fertilizers was 11° and the maximum value was 60°, with a standard deviation of σ=13°15′ and V=40.43 percent, and an average of φ=32°54′. Based on the average values of the friction angles of hairy seeds sprayed with an aqueous solution of mineral fertilizers and the results obtained for their spreading and sliding on the surface of a conical spreader, we assume that the angle of inclination of its walls relative to the vertical plane is α=45º.

Discussions. Considering that the diameter of the vertical cylinder is Dc=800 mm and the diameter of the base of the conical spreader is Db=500 mm, and if a distance of 150 mm is left between the vertical cylinder and the conical spreader around the circumference, conditions are created for the hairy seeds to slide around the conical spreader and fall into the truncated cone-shaped collector.

Since the angle of inclination of the wall of the conical spreader relative to the vertical plane and the diameter of the base are known, its height can be found from the following expression

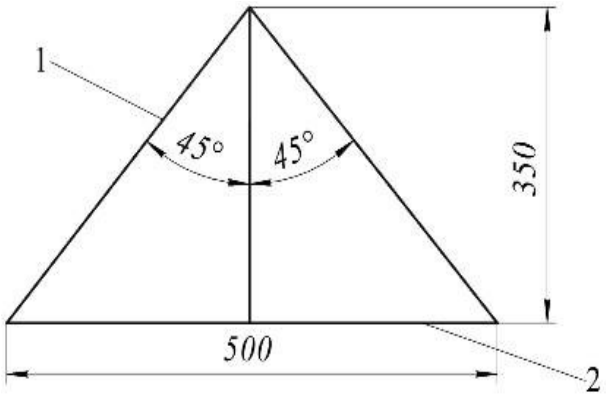
$$h= D_b \cos\alpha, \qquad (1.1)$$

where h is the height of the conical spreader, m; D_b is the diameter of the base of the conical spreader, m; α is the angle of inclination of the wall of the conical spreader relative to the vertical plane, degrees.

Substituting the values of d and α into expression (1.1), we find

$$h=500 \bullet \cos 45^\circ=350 \text{ mm}.$$

Figure 3 shows the principle diagram of a conical spreader with defined dimensions.



1-slope wall; 2-basis

Figure 3. Diagram of a conical spreader with defined dimensions

Conclusions. In conclusion, it can be said that if the angle of inclination of the wall of a conical spreader relative to the vertical plane is α=45º and the diameter of its base is Db=500 mm, its height should be h=350 mm. These results correspond to the values based on theoretical studies.

References:

1.Tuxtamirzayevich, M. A. (2020). Study of pubescent seeds moving in a stream of water and mineral fertilizers. *International Journal on Integrated Education*, *3*(12), 489-493

2. Росабоев А. Т. и др. Теоретическое обоснование движения опушенных семян хлопчатника после поступления из распределителяв процессе капсулирования //Science Time. – 2017. – №. 5. – С. 239-245.

3. Мамадалиев А. Т. Теоретическое обоснование параметров чашеобразного дражирующего барабана //Universum: технические науки. – 2021. – №. 6-1 (87). – С. 75-78.
4. Гафуров, К., Росабоев, А., & Мамадалиев, А. (2007). Дражирование опущенных семян хлопчатника с минеральным удобрением. *ФарПИ илмий-техник журнали.–Фарғона*, *3*, 55-59.
5. Мамадалиев, А. Т. (2022). Уруғлик чигитларни макро ва микроўғитлар билан қобиқловчи қурилманинг ўлчамлари ва иш режимларини асослаш. In *МИРОВАЯ НАУКА 2022. ПРОБЛЕМЫ И ПЕРСПЕКТИВЫ РАЗВИТИЯ. МЕЖДУНАРОДНЫЕ КОММУНИКАЦИИ* (pp. 54-57).
6. Tukhtamirzaevich, M. A. (2023). Theoretical Study of Macro and Micro Fertilizer Compositions in the Water Solution of Mobile Seeds after Dropping from the Spreader. *Web of Synergy: International Interdisciplinary Research Journal*, *2*(6), 35
7.Tukhtamirzaevich, M. A. (2022, December). DIMENSIONS AND JUSTIFICATION OF OPERATING MODES FOR PANING DEVICE OF HAIRED COTTON SEEDS WITH MACRO AND MICRO FERTILIZERS. In *International scientific-practical conference on" Modern education: problems and solutions"* (Vol. 1, No. 5).
8. Tukhtamirzaevich, M. A. (2022, December). RESULTS OF LABORATORY-FIELD TESTING OF HAIRY SEEDS COATED WITH MINERAL FERTILIZERS. In *Proceedings of International Educators Conference* (Vol. 1, No. 3, pp. 528-536).
9.Mamadaliev,A.(2019). THEORETICAL SUBSTANTIATION OF PARAMETERS OF THE CUP-SHAPED COATING DRUMS. *Scienceweb academic papers collection*
10.Tukhtamirzaevich, M. A. (2023). PLANTING SEEDS WITH NITROGEN PHOSPHORUS FERTILIZERS. *PRINCIPAL ISSUES OF SCIENTIFIC RESEARCH AND MODERN EDUCATION*, *2*(1).
11.Tuxtamirzaevich, M. A. (2021). Presowing Treatment of Pubescent Cotton Seeds with a Protective and Nutritious Shell, Consisting of Mineral Fertilizers in an Aqueous Solution and a Composition of Microelements. *Design Engineering*, 7046-7052.
12.Rosaboev, A., & Mamadaliyev, A. (2019). Theoretical substantiation of parameters of the cup-shaped coating drums. *International Journal of Advanced Research in Science, Engineering and Technology*, *6*(11), 11779-11783.
13.Mamadaliev, A. (2002). УРУҒЛИК ЧИГИТЛАРНИ МАКРО ВА МИКРОЎҒИТЛАР КОМПОЗИЦИЯЛАРИ БИЛАН ҚОБИҚЛАШ ТЕХНОЛОГИЯСИ ВА ҚУРИЛМАЛАРИ. *Scienceweb academic papers collection*.

14.Mamadaliev, A. (2014). ТУКЛИ ЧИГИТЛАРНИ МИНЕРАЛ ЎҒИТЛАР БИЛАН ҚОБИҚЛОВЧИ ҚУРИЛМАНИНГ КОНУССИМОН ЁЙГИЧИ ПАРАМЕТРЛАРИНИ АСОСЛАШ. *Scienceweb academic papers collection*.
15.Мамадалиев, А. Т., & Мамаджанов, З. Н. (2022). Минерал ўғитлар ва микроэлементли композицияларни сувдаги эритмаси билан қобиқланган тукли чигитларни лаборатория-дала шароитида синаш натижалари. *Экономика и социум*, (2-1 (93)), 382-387.
16.Mamadaliev,A.(2012).ТУКЛИ ЧИГИТЛАРНИ ҚОБИҚЛАШ БАРАБАНИНИНГ ПАРАМЕТРЛАРИНИ НАЗАРИЙ АСОСЛАШ. *Scienceweb academic papers collection*
17. Tukhtamirzaevich, M. A. (2023). LABOR PROTECTION IN MAINTENANCE AND REPAIR OF AGRICULTURAL MACHINES. *World of Science*, *6*(6), 63-72.
18.Абдуллаев, М. Т., & Мамадалиев, А. Т. (2022). ИЗУЧЕНИЕ ЭФФЕКТИВНОСТИ ДРАЖИРОВАНИЯ СЕМЯН ХЛОПЧАТНИКА В ВОДНОМ РАСТВОРЕ МИНЕРАЛЬНЫХ УДОБРЕНИЙ И КОМПОЗИЦИИ МИКРОЭЛЕМЕНТОВ. *Экономика и социум*, (1-1 (92)), 270-275.
19.Росабоев, А. Т., Мамадалиев, А. Т., & Тухтамирзаев, А. А. У. (2017). Теоретическое обоснование параметров капсулирующего барабана опушенных семян. *Science Time*, (5 (41)), 246-249.
20.РУз, П. (2007). IAP 03493. Способ покрытия поверхности семян сельскохозяйственных культур защитно-питательной оболочкой и устройства для его осущетсвления/К. Гафуров, А. Хожиев, АТ Росабоев, АТ Мамадалиев. *БИ–2007*, *11*.