PLAN ONION SEEDS IN A SEED ROW RESULTS OF EXPERIMENTAL STUDIES ON SLIDE FOUNDATION

A. Eshdavlatov

"TIIAME" Karshi Institute of Irrigation and Agrotechnologies of the NRU

Аннотация: *В статье приведены результаты экспериментальных исследовании по обоснованию радиуса кривизны передней части полоза сошника и приложенной вертикальной нагрузки на нее сеялки для сева семян лука ленточно-многорядному способу.*

Ключевые слова: *Сеялка, гребень, сошник, полоз, радиус кривизны передней части полоза, вертикальная нагрузка.*

Annotation*: The article presents the results of an experimental study to substantiate the radius of curvature of the front part of the opener runner and the applied vertical load on it of a seeder for sowing onion seeds in a belt-multi-row method.*

Key words: *Seeder, ridge, opener, runner, runner front curvature radius, vertical load.*

It is known that since there are no special seed drills in our Republic, planting of onion seeds is carried out with foreign seed drills that are not adapted to local conditions and various artificial devices. These devices cannot plant onion seeds in multiple rows and at the same depth. In addition, in the fields prepared for planting, opening and planting activities are being carried out with separate aggregates. This leads to the extension of the planting period, the increase in the consumption of seeds, labor, fuel and lubricants.

Based on this, the agricultural mechanization scientific-research institute has developed a seeder that opens one-way irrigation gates, creates bunds, and sows onion seeds in many rows in a strip method [1], and studies are being conducted to justify the parameters of its working bodies that plant seeds.

This article presents the results of experimental studies on the influence of the radius r_c of the front curved part of the seed slide of the multi-row seed drill on its performance.

Before conducting the experiments, soil moisture, density, hardness and aggregate state of the soil were determined according to GOST 20915-11 [2] in layers 0-5, 5-10 10-15 and 15-20 cm. In this case, the soil moisture in the 0-5, 5-10, 10-15 and 15-20 cm layers is 14,1; 17,2; 18,5; 20,6%, density 0,41; 0,56; 0,71; 0,78 g/cm^3 and hardness 1,11; 1,24; It was 1,21 and 1,25 MPa. The level of soil compaction (amount of fractions smaller than 25 mm) was 82,4%.

The density of the soil, the mean square deviation of the unevenness on the surface of the soil and its resistance to traction were selected as the evaluation criteria for the basis of the radius of the front bent part of the slide. In the experiments, the radius of the front bent part of the slide was changed from 140 mm to 230 mm with an interval of 30 mm. In this case, the height of the front bent part of the slide is 9 cm, the length of its compacting working surface is 16 cm, the width is 30 cm, the vertical compressive force applied to it is Q_T=400 N, and the unit's speed is 5,2 and 7,5 km/h. The results obtained in the experiments are presented in the table.

The influence of the radius of the front bent part of the slide on its agrotechnical and energetic performance

Of indicators name	The value of indicators							
	r_c=140 мм		r_c=170 мм		r_c=200 мм		r_c=230 мм	
Speed of movement, km/h	5,2	7,5	5,2	7,5	5,2	7,5	5,2	7,5
Soil density, g/см^3	1,06	1,04	1,11	1,08	1,18	1,14	1,20	1,14
The mean square deviation of the roughness on the surface of the brush, ±σ	2,18	2,41	1,94	2,11	1,21	1,32	1,20	1,31
Drag resistance of the slide, N	306,4	317,6	274,1	286,8	244,7	263,4	239,2	260,7

It can be seen from the information presented in the table that the aggregate is 5,2 and at speeds of 7,5 km/h, the density of the soil increased from 1,06 g/cm^3 to 1,04 g/cm^3 and from 1,11 g/cm^3 to 1,08 g/cm^3, respectively, with an increase in the radius of the front bend of the slide from 140 mm to 170 mm. cm^3, the mean square deviation of roughness on the surface of the brush increased from 2,18 cm to 2,41 cm and from 1,94 cm to 2,11 cm.

Then, with the increase of the radius from 200 mm to 230 mm, the density of the soil decreased from 1,18 g/cm^3 to 1,14 g/cm^3 and from 1,20 g/cm^3 to 1,14 g/cm^3. and deviation increased from 1,21 cm to 1,32 cm and from 1,20 cm to 1,31 cm. The main reason for this is that when the radius of the front curved part of the slide increases from 140 mm to 170 mm, it is observed that the soil particles pile up in front of the slide instead of being pushed down along the working surface. Later, when it was 200 mm and 230 mm, this situation was not observed.

At speeds of 5,2 and 7,5 km/h of the aggregate, with the increase in the radius of the front bent part of the slide, its traction resistance decreased from 306,4 N to 239,2 N and from 317,6 N to 260,7 N, respectively.

The increase of the aggregate from 5,2 km/h to 7,5 km/h caused the soil density to decrease to 0,06 g/cm, and the root mean square deviation to 0,23 cm. The main reason for this can be explained by the decrease in the time of interaction of the slide with the soil with the increase in aggregate speed. The tensile strength has increased to 21,5 N. This can be explained by the increase in the reaction force of the soil as the speed of the aggregate increases. When the radius of the front bent part of the slide is 200 mm or more, the unevenness on the paddy surfaces is reduced by the mean square deviation, and the density of the soil is at the level of agrotechnical requirements for planting onion seeds (1.1-1.2 g/cm^3).

In conclusion: Therefore, according to the results of the conducted experimental studies, the radius of the front bent part of the slide should be at least 200 mm in order for the surface of the paddy to be flat and the soil to be compacted at the required level with low energy consumption.

List of literatures:

1. Ibragimov A., Karakhanov A., Abdurakhmanov A., Eshdavlatov A., Uteniyazov P., Khadzhiev A. Research results for a new onion seed drill // Agricultural machinery and technologies. – Moscow, 2020. – N 4. – C.12-16.

2. ГОСТ 20915-2011. Сельскохозяйственная техника. Методы определения условий испытаний. – Москва, 2011. – 23 с.

3. Hoque M.A., Wohab M.A. Development and evaluation of a drum seeder for onion // *Int. J. Agril. Res. Innov. & Tech*. 2013. N3(1). pp.23-28.

4. Маматов Ф.М. Сесльскохозяйственные машины. –Ташкент: Ворис, 2014. – 387 с.

5. Шоумарова М.Ш., Абдуллаев Т.А. Сесльскохозяйственные машины. – Ташкент: Укитувчи, 2002. – 424 с.

6. Ibragimov A., Karakhanov A., Abdurakhmanov A., Eshdavlatov A., Uteniyazov P., Khadzhiev A. Research results for a new onion seed drill // Agricultural machinery and technologies. – Moscow, 2020. – N 4. – C.12-16.

7. E E Eshdavlatov, F M Mamatov, A E Eshdalatov, A A Suyunov and F F Yusupov. Drum dispenser of feed additives. Conf.Series:Earth and Environmental Science 1284 (2023) 012012 IOP ETESD-II-2023.IOP