American Journal of Biology and Natural Sciences
https://biojournals.us/index.php/AJBNS
ISSN: 2997-7185

Research Results on the Factors Affecting Precision Sowing of Onion Seed

Makhkamov G. U.
Docent, Namangan engineering-construction institute

Mamadjonov E.
Master's student, Namangan engineering-construction institute

Received: 2024, 15, Oct
Accepted: 2024, 21, Oct
Published: 2024, 12, Nov

Annotation: This article presents the results of research on seed sowing. It also presents an analysis of the literature on the modes of movement of the sowing machine, the seed box, the movement of seeds, and the modes of seed landing in the cells.

Keywords: Plant, trajectory, apparatus, sowing, seed, soil, nest, process, disk, diameter, distribution.

A number of researchers argue that the accurate placement of seeds in the furrow is associated with the completeness of the sowing device, the short flight trajectory, and the lack of seed bounces in the furrows.

According to V. Andreev, the following factors can be cited as factors affecting the even distribution of seeds [1]:

- the quality of seed distribution in the sowing device;
- the stability of the seed flight time and the trajectory of the seed from the nozzle of the sowing device to the furrow;
- their redistribution (bounce and roll) when interacting with the soil.

A sufficient amount of research has been conducted on each of these factors.

Most of the work is mainly focused on the landing of seeds in the nest of the sowing device and the justification of the dimensions of the device. However, the research work conducted lacks accuracy and consensus. Since the process of filling the seed chamber of a seeder with seeds is considered a random process, a number of scientists have used probability theory to study it.

In particular, V.A. Belodedov [2], S.D. Polonetsky, V.M. Sluginov [3] and others.

[4, 5] used seed dimensions to justify and calculate the linear dimensions of the seeding device slot. G.M. Buzenkov found that the slot and seed method is more convenient for selecting the parameters of the seeding device slot, and at the same time takes into account the state of the seed [6].

The proposed methods for selecting the parameters of the seeding device slot do not reflect the distributor speed. A. Budagov proved in his experiments that with an increase in the disk speed, the disk diameter should also be increased. According to his recommendations, when sowing seeds with a size of 4.5-5.5 mm and a diameter of the seeding device slot of 7 mm, the disk rotation speed of 0.25-0.4 m/s changed the completeness coefficient from 1.02 to 0.96, and with a slot diameter of 6 mm, it changed from 0.97 to 0.8, respectively [7]. In the works of V.A. Belodedov [8], it was also noted that with an increase in the disk rotation speed, the completeness of the slots worsened, and in order to maintain completeness at the same level, it was necessary to replace the disks with disks with a larger diameter of the slots. The stability of the flight time of the seeds and the method of ejection from the slot of the seeding device also affect the distribution. According to V.A. Prokhorov, 85% of the seeds fit freely in the slot of the seeding device and fall freely from the slot. At the same time, it is noted that the flight trajectory and speed of seeds that fall freely from the seeding device and those that fall by force are different.

It is advisable to choose the direction of the seeds falling from the sowing unit's hopper opposite to the direction of movement of the sowing unit and to set the speed of movement equal to the speed of the unit. This is because the main factor affecting the distribution of seeds in the furrow is the stability of its trajectory and the horizontal component of the free fall speed. Another factor that prevents the even distribution of seeds is the bouncing or rolling of the seeds that fall into the furrow.

It can be assumed that all types of seed conveyors have a slight effect on the even distribution of seeds in the furrow. Therefore, when sowing seeds precisely, it is necessary to exclude seed conveyors from the seed drill scheme or select a seed conveyor with a very small effect.

Many factors affect seed redistribution, the main ones being:

- ✓ seed trajectory;
- ✓ accumulated kinetic energy reserve;
- ✓ seed and soil viscosity;
- ✓ ridge profile;
- ✓ seed shape and size.

According to the results of the analysis, it was determined that the influence of the above factors on seed redistribution can be reduced by using the following methods:

- ✓ dropping seeds into the holes of the seeding device;
- ✓ dropping seeds at a horizontal speed equal to the speed of the unit from the nozzle.

Literature

1. Avdeev P.A. Sovershenstvovanie protsessa vyseva drajirovannyx semyan saharnoy svekly apparatom s vnutrennim zapolneniem cell: Dis….kand. tech. science - Voronezh, 2011. - 186 p.
2. Belodedov V.A. Issledovanie zapadaniya zerna v acheyki odnozernovykh vysevayushchih apparatov // Mechanization and electrification of rural households, 1983. - №6. - S. 44-46.
3. Polonetsky S.D., Sluginov V.M. Raspolojenie yacheek na vysevayushchem diske // Mechanizatsiya i elektrifikatsiya sotsialisticheskogo selskogo hozyaystva, 1972. - №10. - S. 45.

4. Laryushin N.P., shchuchenkov A.Yu., Shumaev V.V. Teoreticheskie issledovaniya katushechnogo vysevayushchego apparatus with sectional katushkoy dlya soveva zernovyx culture // Journal Niva Povoljya, 2017. -№ 2(43). - S. 70-77.
5. Nukeshev S.O., Eshojin K.D., Romanyuk N.N. i dr. Results of comparative experimental studies of tukovysevayushchikh ustroystv // Issledovaniya, results, 2017. - №4(76). - S. 524-531.
6. Buzenkov G.M., Ma S.A. Mashiny dlya poseva selskohozyaystvennyx kultur. - M.: Mashinostroenie, 1976. - 272 p.
7. Makhkamov G.U. Improving the quality of onion seed sowing by improving the design of a mechanical planting device: dissertation. –N.: 2021. - 153 p.
8. Turdaliev V.M., Askarov N.N., Kosimov A.A., Makhkamov G.U. Kinematic analysis of belt drives with an eccentric tension roller. - Scientific knowledge of our time. Moscow: 2018. - 85-90 p.
9. Turdaliev V.M., Mansurov M.T., Makhkamov G'.U. Study of the movement of onion seeds when ejected from the seeding apparatus. - collection of scientific articles. T.: 2020. 157-160 p.