equipment and energy. - K .: NUBiP divide in Ukraine, 2014. - Vol. 196, p. 2. - P. 165-171.

AS A klassyfykatorov at razdelenyy yzmelchennoy zernovoy Fire-proof compounds yspolzuyut Various Device Distribution Among kotorыh naybolsheho have obtained sieve. Features Uchtenы s stroenyya How perforyrovannыh systems and proanalyzyrovan yznos faces otverstyy at yzmelchenyy grain material.

Crusher, Sieve, yznos, yzmelchenyya, Durability, Tehnicheskoe decision, Changing forms, perforatsyya.

As separation of crushed grain mass used different devices, the most common are sieves. Also take into account features of its structure as perforated systems and analyzed the wear facets holes and milled grain material.

Crusher, Sieve, wear, crushing, dureliability, technical solution, change shape, perforation.

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RESULTS the reserve DOZATORANA precision seeding industrial crops cultivated pneumatic apparatus

OO Bannuy, Ph.D.

The paper presents experimental data for evaluating the effectiveness of additional backup dispenser technology to improve reliability performance pneumatic seeding machine.

Pneumatic seeding machine backup dispenser, technological reliability, probability spaces.

Problem. Accuracy of planting a foundation for subsequent yield when grown crops. Largely determined by the design of the accuracy of the seed system, which should provide the necessary level of reliability performance of the process. In turn indicators of technological parameters depend on the reliability of work study which has important practical value. For the main indicator of the reliability performance of the process sowing machine can

accept the likelihood of failure-free operation (safety factor). As one of the failures are gaps seeds, then the quantitative characteristics of the apparatus lawfully enter this figure as the probability of spaces. $_{пр}$

Results dosildzhen. Research conducted in the laboratory on a specially made for this installation NTS-2. Installation work simulates real pneumatic sowing machine. Surveys selected seeds cultivated crops: corn, sunflower, soybean, peas and beets.

*The impact velocity of the dosing element***.**Constant parameters in the pilot study were: average value dilution; conical shape prysmoktuyuchoyi cell with a hole diameter $= 4\ \text{Па}\emptyset = 4\text{мм}$.

For variable parameters accepted: velocity of the cell from 0.1 to 0.5 m / s in increments of 0.1 m / s; seed crops that are sown (peas, corn, sunflower, soybean, sugar beet).

The research results as graphic dependences of probability spaces from filling velocity V element relative weight of seed chute presented in Fig. 1. $_{\text{пр}}$

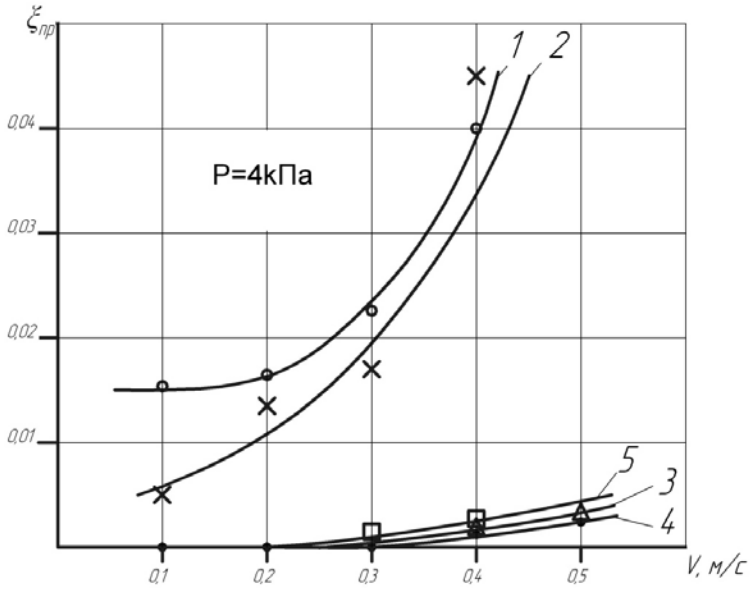

Fig. 1. Dependence of probability spaces serial device on the velocity of the dispenser for 1 - Corn 2 - peas, 3 - Sunflower 4 - soy, 5 - beets.

From Fig. 1 shows that all graphics are nonlinear. For all cultures are characterized gaps increase the likelihood of an increase in the relative speed of the metering element. Charts can be divided into two groups: those for which the probability spaces shifted upwards (corn, peas) and those for which the minimum specified probability (sunflower, soybean, sugar beet). The latter probability spaces at low speeds 0.1 ... 0.3 m / s at all close to zero, ie cases gaps in the pilot study were observed. Only at speeds faster than observed occurrence spaces in the machine. $= 0{,}3\,\text{м/с}$

Thus, on failures by-pass seed cultures were divided into two groups. A small probability spaces typical sunflower, beets and soybeans. Larger values obtained for the probability of corn and peas. In particular, this difference becomes apparent at speeds that exaggerate. Explain the results can be small distribution volume weight of sunflower seeds and soybean seeds form and beets, which is close to spherical. The first of these cells readily attach themselves pneumatic system, and the latter due to its shape well adjacent to the cell surface, leaving no possibility of the formation of additional air jets. $V = 0{,}3$ м/с

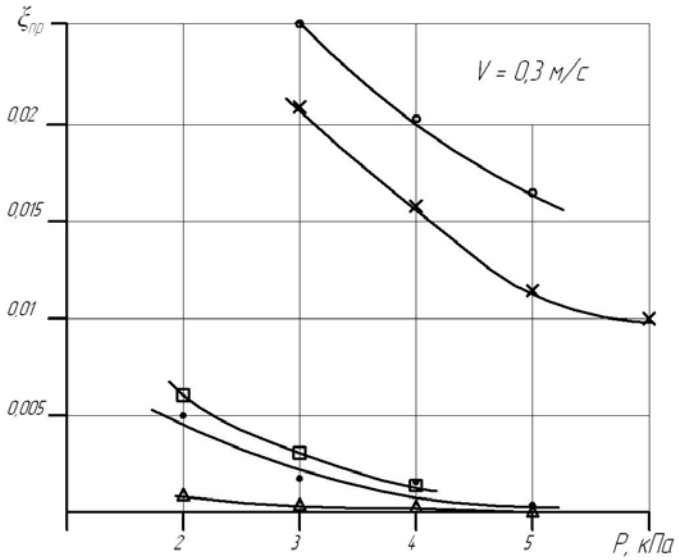

Fig. 2. Dependence of probability spaces of degree of vacuum in the vacuum chamber serial device for 1 - corn; 2 - peas; 3 - sunflower; 4 - soy; 5 - beets.

Effect of vacuum in the vacuum chamber Second, in addition to speed, an important parameter that significantly affects the quality of seeds dosage in isolation from the masses is a power vacuum (vacuum depth R). The influence of this parameter on the probability spaces (Fig. 2) showed that for all crops with increasing dilution in a vacuum chamber decreases the probability spaces. Moreover there is a linear relationship between the size of a gradual reduction of the impact of dilution. The data can be divided into two groups. One of them (beet, sunflower, soybean) have relatively small values of probability spaces (on average). Significantly different from the results, obtained for seed corn and peas where the probability of an order of magnitude larger spaces. In addition, to reduce the likelihood of these crops with increasing vacuum is much faster than other seed crops.$\xi_{\text{пр}} = 0{,}0025$

Established that the formation of gaps were more susceptible corn seed (Fig. 1 and Fig. 2).

Improving the quality and reliability of process performance pneumatic seeding machine is achieved through the introduction of additional back-feeder structure and its control system synchronous action. Additional dispenser designed to reduce (eliminate) passes, implied by nezahvatom seeds prysmoktoyuchoyu cell, or those that have arisen as a result of skyduvacha extra seeds. For additional laboratory studies Reserve dispenser and controls its action mounted on the stand NTS-2 and connected to a common pneumatic system sowing machine.

*The impact velocity of the dosing element***.**As with regular (standard) pneumatic system, research staff with back dispenser, conducted in the same speed mode and sparse and seeds of the same prosapnyk cultures.

Naturally, the general nature of the change of probability spaces of the velocity of the cells for experimental apparatus and stored corresponding to the serial (Fig. 3). The reason is the only mechanics seeds capture process. In fact, in this important act of cooperation dosing element with separate seed, nothing has changed, and therefore the statistical characteristics of the process are preserved.$\xi_{\text{пр}}$

Changes in the formation of a regular flow of seeds that are sent to the furrow occurred thanks to the correction of "errors" dosing element. Since this system phase of its operation is skewed to the delay in the time it has an effect only at the result of the capture or nezahvatu (pass) seeds after exposure skyduvacha.

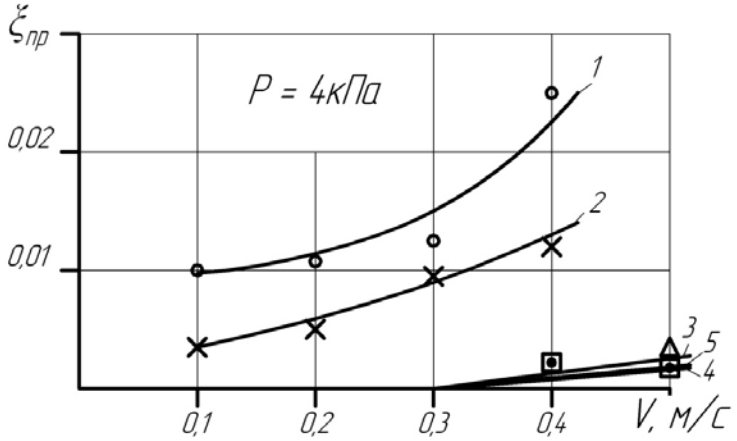

Fig. 3. Dependence of probability spaces Research dosing device with backup of velocity prysmoktuyuchoyi cells: 1 - corn; 2 - peas; 3 - sunflower; 4 - soy; 5 - beets.

As can be seen from the obtained graphs, probability spaces depending on the speed of movement of the dispenser (Fig. 3) are

nonlinear. With increasing speed probability increases. Particularly susceptible to this are the seed corn and peas, and to a much lesser extent sunflower, beets and soybeans. However, it should be noted that compared to full-time work (serial) pneumatic sowing machine for experimental characteristic overall decrease in probability spaces seed all crops tested. Thus, for seed corn and peas, worst dosed probability spaces at reduced speed in accordance with to and from to. That is, corn 1.6 and 3.75 for peas in times. On average 2-fold decreased probability spaces, sunflower, soybean and beet (Fig. 3, curves 3, 4 and 5). The data are the result of compensating actions backup dispenser. In general, the overall trend has determined the impact velocity of the dosing element to the quality and reliability of process unit dosage seed dispenser with an additional reserve. It was established that the increase in the rate leads to an increase in admissions, but to a much lesser extent (1.6-fold) than the serial device. Thus the introduction of additional dosing increases the quality of the crop.$\xi_{\text{пр}} V = 0{,}4\text{м}/c 0{,}040{,}0250{,}0450{,}012$

Effect of the degree of vacuum in the vacuum chamber. Another important parameter that influences performance prysmoktuyucha cell dosing element is the degree of vacuum in the vacuum chamber. Research on the likelihood of changes dilution features of technical reliability of the system with backup dispenser dependencies are graphic in Figure 4. Studies have shown that with increasing dilution decreases the probability spaces. This is attributed to prysmoktuyuchoyi force acting on a single seed thrilled when her cell.

For corn, peas and sunflowers these dependencies are descending character. Almost linear relationship established for beets. For soybean seeds in the range of parameters investigated dilution spaces in general were found.

As a result of additional backup dispenser probability spaces significantly reduced. Comparison of experimental apparatus with serial showed that the probability of gaps research staff at dilution $P = 4\ k\Pi\text{a}$ at a fixed rate amounted to about peas and corn. In the same parameters and the same crop serial device makes passes at: corn - 0.02, and for peas - 0,016.$V = 0{,}3\ \text{м/с}\, \xi_{\text{пр}} = 0{,}01$

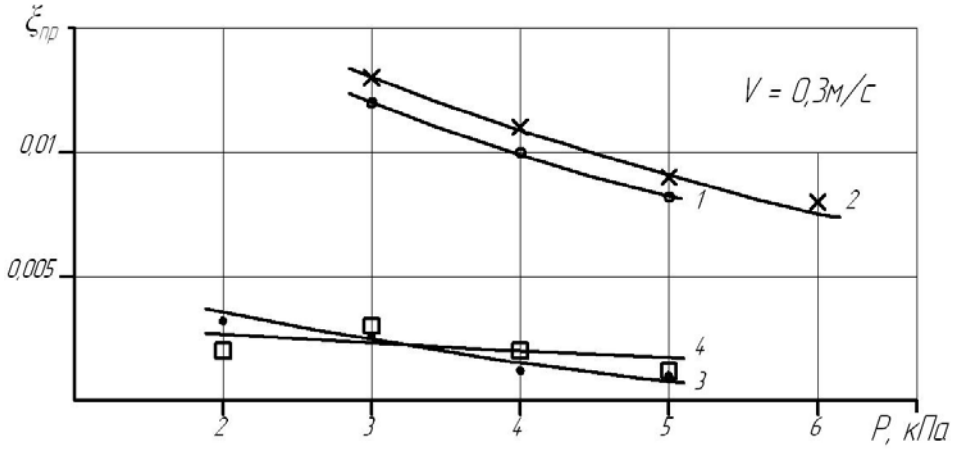

Fig. 4. Dependence of probability spaces of degree of vacuum in the vacuum chamber experimental apparatus with back dispenser for 1 - corn; 2 - peas; 3 - sunflower; 4 - beets.

So experiment with bench testing that simulated real operating conditions brought benefits in the experimental apparatus with backup metering device. On the index of probability spaces of process security system with backup for increased dosing of different cultures from 1.6 to 2.0 times.

Conclusion. Introduction to the design of pneumatic sowing machine backup backup dispenser can reduce the likelihood of spaces that generally increases the reliability of the implementation process and thus the performance of crops.

In articles predstavlennыe Experimental Data otsenki work of the effectiveness Extended reserve the dispenser to Increase technological nadezhnosty perform vыseva semyan pneumatic mechanical apparatus.

Vыsevnoy pneumatic mechanical apparatus, rezervnыy dispenser, technological nadezhnost, probability propuskov.

In paper presented these experimental estimations of efficiency of work of additional reserve metering device are on increase of technological reliability of implementation of sowing of seed by pneumomassage vehicle.

Pneumomachanic sowing vehicle, reserve metering device, technological reliability, probability of admissions.

631,365 UDC: 635.54