Formulas of calculation of volume of imperfections are given. It allows to be defined with necessity of stuffs for pavement restoration.

Stereometric analysis, imperfections, fault, potholes, shelling-out, Shells volume of imperfections.

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THE QUESTION FORM BASIS HOLES Sowing DISC

AP Derkach, Ph.D.
NA Horvat, student
National University of Life and Environmental Sciences of Ukraine

The optimal design parameters of the shape of the hole in the disc pneumatic sowing device for sowing maize.

Options seed disk aperture form seed unit.

Problem. New technologies growing cultivated crops include odnozernovu sowing with given finite interval between seeds in a row, which eliminates the need for such technological operations as the formation of plant density and thus significantly reduces the cost of production. Odnozernovu (dotted) sowing mainly engage in drills with pneumatic vacuum seeding machines. One drawback of these devices is the lack of seeding uniformity of distribution of seeds in a row. On the uniform distribution has a significant impact form of seed hole disc.

So rational justification shape holes disk pneumatic vacuum seed sowing device is a key issue.

Analysis of recent research. The scientific basis for the creation of vacuum pneumatic sowing machines lies in the writings of GM Buzenkova, B.C. Basin, LV Pogorelogo and others [1, 2]. A significant contribution to solving the problems of precision seed made PV Sysolin, VA Oryshko and other researchers [3, 4]. The analysis process odnozernovoyi pneumatic sowing sowing device type showed that there is still a lot of issues, especially those related to the distribution of seeds in a row to be investigated.

The purpose of research. Determine the influence of shape hole in drive pneumatic vacuum seed sowing device for even distribution of seeds in a row.

Results. The basis of justification forms prysmoktuvalnoho hole on the following provisions: the likelihood of an increase in seed suction hole area increases; shape of the hole should orient seed that stuck him in a certain direction.

Taking into account the provisions defined optimal form prysmoktuvalnyh holes - triangular, square suction is determined by the expression

$$S_{mp} = \frac{1}{2} a d_0 tg\left(45° + \frac{1}{2} \arcsin \frac{d_0}{2a - d_0} \right) \quad (1)$$

where *a* - The average length of the seed, m; d_0 - Diameter of a circle inscribed in prysmoktuvalnyy hole m.

Dilution is necessary to guarantee the capture and removal of seed intake chamber openings triangular shape

$$H_n \geq \frac{\rho_n \left[\frac{4 m_c V_к \left(1-(1-k_з)^{0,5}\right)}{k_з d_0 (1-f_д)} - 0{,}5\pi\gamma_c \left(\frac{d_0}{k_з} \right) \left(\sin\alpha - f_{вн} \cos\alpha \right) + f_{вн} m_c g \right]}{2 m_c \alpha_c^2 k_{пар}} \quad (2)$$

where ρ_n - Density of air *kg / m3*;*mc* - The average weight of seed, *kg*;*kpar* - Coefficient of sails seeds *m-1*; γ_c - Bulk density seeds *kg / m3*;*fvn* - Coefficient of internal friction seeds; *fd* - Friction coefficient seed after seed disk; *VR* - Circular openings speed drive *m / s*;*k3* - Coefficient of proportionality; α_c - Aerodynamic drag coefficient of the hole; α - Angle relative to vertical stacking seeds, *hail*; *g* - Acceleration of gravity, *m / s2*.

Analysis of the expression (2) shows that the main factors affecting the energy performance of the sowing machine is the angular velocity of the disk holes *VR* prysmoktuvalnyh and size of holes, characterized *d0*. The calculation results depends *Hn =f (VR)*Show that with increasing speed mode and decrease the size of the holes prysmoktuvalnyh energy sowing device increases.

Probability calculation results desired dilution in a vacuum chamber apparatus for the dependence of experimentally confirmed.

The main objective of theoretical research on the stage Trunk seeds combined kickers always was to determine conditions that ensure the maintenance of basic seed of detachment from the hole as a result of shear force and the guide pin plug kickers extra seeds.

The process shift seeds, which operates speech guides and prysmoktuvalnoho hole edge is seen as a process of jamming round body between two perpendicular planes (Fig. 1). Working thickness *HB* speaking guides:

$$h_в \le \left(d_y + \frac{d_0}{2(2a - d_0)} \right) tg\varphi_1 \qquad (3)$$

where *dy* - Conditional mean diameter of the seed, *m*; φ_1 - Static friction angle seeds on the work surface kickers, *deg.*

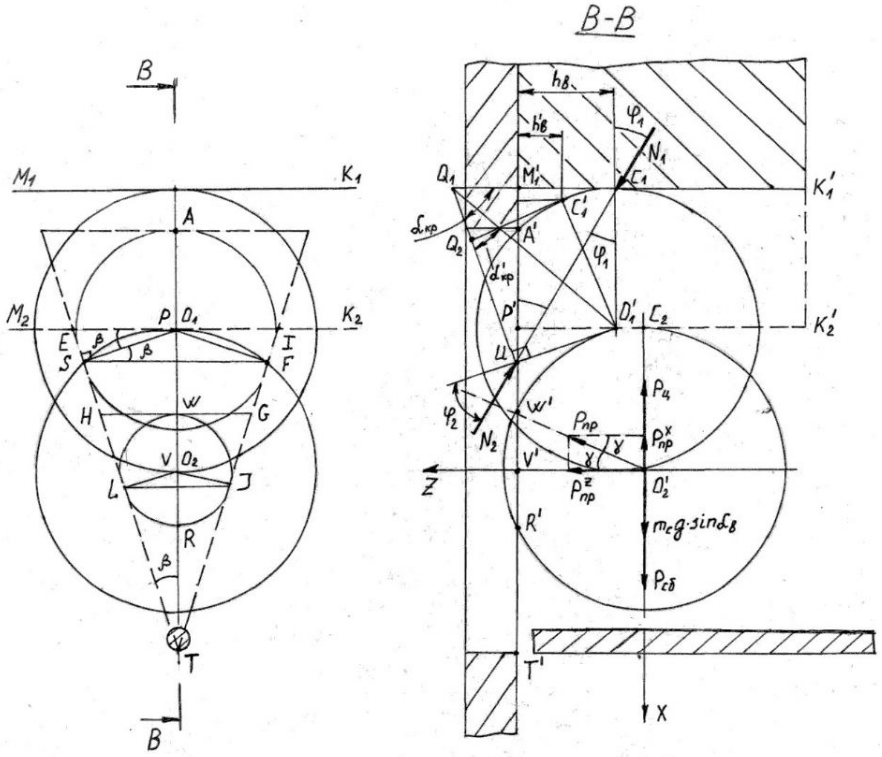

Fig. 1. The process of removing unnecessary seeds combined kickers.

Payments the expression (3) showed that guides Metal h_{to} ≤3.13 mmAnd for plastic - h_{to} ≤2.64.

Having assumption that touches the surface of the seed equipotential surfaces of equal airflow generated by the plane prysmoktuvalnoho hole that is partially screened by the guide, dilution is necessary for the maintenance of basic seed is given by:

$$H_n \ge \frac{2(2a - d_0)m_c \left[g \sin\alpha_c + V_к^2 \left(\frac{d_0}{2k_з l_в^2} - \frac{1}{r_0} \right) \right]}{k_з S_p k_n \left(2a - d_0 - \frac{d_0}{k_з} \right)} \qquad (4)$$

where *Sp* - Working unshielded area prysmoktuvalnoho hole *m2*;*KP* - Coefficient of proportionality; *lv* - Length performances guides, *m*;*r0* - Radius of the circle placement centers prysmoktuvalnyh triangular holes on the drive *m*; α_c - Kickers angle of the horizontal plane, *hail*.

Working area *Sp* hole is constantly changing throughout the working surface of the guide speech, and the last stage is:

$$S_p = \frac{d_0(2a - d_0)}{4\cos\arcsin\left(\frac{d_0}{2a-d_0}\right)} \tag{5}$$

In view of (5) the expression (4) becomes:

$$H_n = \frac{6m_c\left[g\sin\alpha_c + V_к^2\left(\frac{d_0}{2k_n l_в} - \frac{1}{r_0}\right)\cos\arcsin\frac{d_0}{2a-d_0}\right]}{d_0(2ak_n - d_0k_n - d_0)k_p} \tag{6}$$

Analysis of dependencies *Hn = f (Vc; and*) And *Hn = f (Vc; lv*) Obtained by calculating the expression (6) shows that with increasing speed mode of the apparatus of dilution required for the maintenance of basic seed in the hole, in the discharge of extra seeds increases. However, the rate of growth *Hn* decreases with increasing *lv*And at *lv*≥ 15mm decreases the value itself *Hn*. Therefore, the use of performance guides *lv*≥ 15mm requires no increase *Hn*And hence an increase in power consumption while increasing sowing machine speed of the holes.

Conditions that eliminates clogging prysmoktuvalnyh triangular holes Seeds (cleaning of):

$$d_{01} \le \frac{am_c(1+\delta)(1-2\delta)\left(\frac{V_0^2}{r_0}\cos\alpha + g\cos\beta\right)\sqrt{1-k_з^2\frac{d_y}{b^2}}}{12f_1Eb_к\left(0{,}5k_з d_y - \sqrt{0{,}25k_з^2d_y^2} - b_к\frac{b}{a}\left(\sqrt{b^2 - k_з^2d_y^2} + b_к\frac{b}{a}\right)\right)}, \tag{7}$$

where *and*,*b* - The length and width of the seed, *m*;*E* - Modulus of elasticity; δ - Coefficient of punches; f_1 - Static coefficient of friction outer seed on the edge of the hole; α - The angle between the plane and the vector drive centrifugal force *hail*; β - Angle prysmoktuvalnyh early discharge openings (point vacuum shielding) *hail*;b_{for} - Thickness of the edge openings *m*.

Expression (7) allows for specific modes of the seed system (*V0*), Various parameters of seed disc (*r0*;b_{for}) And technological properties of seed (*and*,*b*,*c*,*mc*,*f*,δ,*E*) To determine the maximum value prysmoktuvalnyh sized holes in vacuum pneumatic sowing machines.

Seeding process is a set of processes and constantly changing working conditions vazhkokerovanymy dosing system actually used seed and consists of many particles (seeds), with the properties of an elastic body. So for engineering calculations adopted the following generalized condition of self-purification prysmoktuvalnyh holes.

$$d_{01} \le 2\sqrt{0{,}25k_з^2d_y^2 - b_к\frac{b}{a}\left(\sqrt{b^2 - k_з^2d_y^2} + b_к\frac{b}{a}\right)}. \tag{8}$$

Analyzing the expression (8) we can say that increasing the thickness *bk* prysmoktuvalnoho edge of the hole leading to the need to reduce the diameter *d0* inscribed circle, which provides cleaning of

holes. However, in this case, reduced aerodynamic characteristics of the process suction hole and seeds to speed performance of the device. Reduction *bk* makes it possible to increase the size of the hole, following the conditions of its self-cleaning and increasing productivity sowing machine.

On the basis of theoretical research was designed pneumatic vacuum seeding device, which is shown in Fig. 2. The main difference from the series is that the shape of the holes in the overlay 12 (Fig. 2) drive *And* - Triangular and combined pusher extra seeds, which consists of a plug from pins 3, 4 position adjustment mechanism pin plug holes in relatively kickers disk 6 of the guide projection 5, which is located in the area prysmoktuvalnyh holes. The process of this sowing device is as follows. Seeds that prysmoktalosya to triangular holes 1 disc *And,* meets the working surface 5 performances guides 6, part (as a result of constant change working area) overlapping holes prysmoktuvalni guides 1. 6 seed pushes the trajectory of their movement so that each hole triangular shape is only one seed, which dominates in suction air stream and the remaining excess seeds reset pins plug kickers 3 seed in the camera. Seeds remaining in the holes 1 is transported into the zone of discharge, where as a result of overlapping holes prysmoktuvalnyh separated from sowing drive and enter the drill.

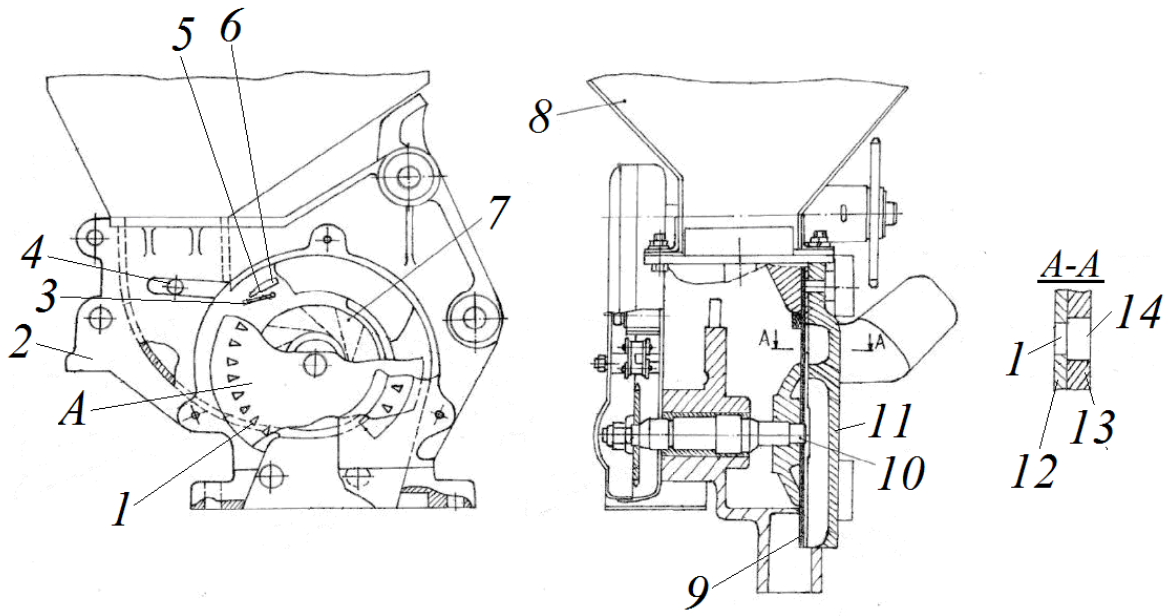

Fig. 2. Pneumatic Vacuum seed type: *And* - Seed disc; 1 - triangular hole; 2 - the case; 3 - plug kickers; 4 - adjustment mechanism; 5 - working surface performance; 6 - the guide; 7 - rake; 8 - bin; 9 - laying; 10 - shaft; 11 - cover; 12 - overlay; 13 - basis; 14 - a round hole.

Conclusion. The study found that the most rational form holes in the drive pneumatic sowing device for sowing corn is a triangular shape, which has an area of increased suction and directs seed that stuck in a certain direction, which in turn provides a more uniform distribution of seeds line, and thus improves the quality of sowing.

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Ustanovlenы optymalnыe konstruktyvnыe Options otverstyya forms a disk apparatus for Pneumatic vыsevayuscheho vыseva semyan kukuruzы.

Options vыsevnoy drive otverstye, shape, vыsevnoy apparatus.

The optimal design parameters of the holes in the form of a disk pneumatic sowing seeds for planting corn.

Parameters seeding disc, hole shape, seeding device.

UDC 631

IMPLEMENTATION OF MILK TRANSPORT
At the stage of pouring in measured capacitance

VI Rublev, PhD
AS Nine, a graduate student *

National University of Life and Environmental Sciences of Ukraine

Considered common basic elements of milking cows. Detected shortcomings of existing types of machines for bottling milk. On this basis, developed a schematic diagram of filling and closing