UDC 631,331

APPARATUS FOR MAKING LOCAL BIOLOGICAL ACTIVE FERTILIZERS

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The analysis of the working of dosing for making dietary fertilizers and presents the results of research eccentric dispenser for dispensing of biologically active in their local fertilizer application.

The device, active fertilizers, working parts, machine.

Problem. Scientifically grounded system of soil fertilization of agricultural land is aimed not only at increasing crop productivity, but also to the maximum possible savings fertilizers, which in terms of deficit and high cost has considerable economic importance [1].

In recent years, Ukraine has sharply decreased organic fertilizers - to 0.9 t / ha and minerals to 35-49 kg / ha of active ingredient is a consequence of much reduced livestock animals, and fertilizers were expensive. As a result, soil zakyslyuyutsya and lose fertility.

Analysis of recent research. Known devices and equipment for dispensing bioactive fertilizers are not in full measure

providing high-quality local Supplements making under row crops and feeding them by suitable technical and economic indicators. Therefore, the development tukovysivnoho apparatus for making local supplements is important and timely issue for agriculture Ukraine.

The purpose of research. Providing the necessary uniformity making supplements in row crops at their sowing and fertilizing disclosure under the combined effects of physical and mechanical properties of dietary supplements and parameters of working and developing tukovysivnoho apparatus.

The object of research. The dependence of the parameters entering a local bio of structural and technological parameters of working tukovysivnoho apparatus.

Research Methods. Analytical and experimental studies conducted on the basis of a systematic approach, statistical processing of material and experimental design.

Results. All tukovysivni devices for process operation can be divided into: devices rotatsiynovyshtovhuvalnoyi action; devices vyhribalnoyi action; devices that operate on the principle of sifting through the fat reshitchaste bottom; devices that operate on the principle of milling (zchisuvannya fat from the upper box); devices that render tuki with fertilizer box power zscheplennya fat from the surface of the movable drive belt, plate; devices vidtsevoyi actions that scatter tuki by vidtsevoyi forces during rapid rotation of the disc blades.

The first type include rotary buoyancy aids, appeared before the others. The device of this type released for acquisition limestone planters for sowing a powder fat, tend to form arches. These devices are not suitable for making dietary supplements. Sowing machine in them, which placed horizontally at the bottom of the crack fertilizer box with roller working bodies in the form of butterflies, blades, Half-disk set at an angle. In (Fig. 1) shows a diagram of one of these devices and its working body.

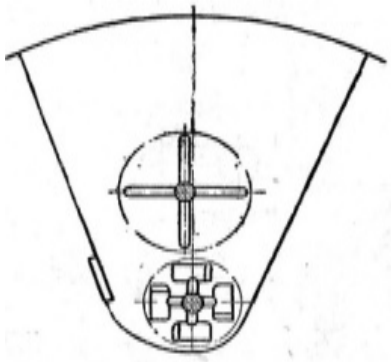

Fig. 1. Scheme of rotary machine vyshtovhuvalnoyi action.

The main dimensions of devices of this type are determined by the following relationship:

$$Q = 10000i\frac{db}{\overline{DB}}S\gamma, \quad (1)$$

where Q - seeding rate, kg / ha; d - diameter of the roller on the periphery of butterflies, m; D - diameter wheels, m; b - the length of the seed hole, m; B - width machine, m; S - width seed hole mm; γ - surround fat weight, kg / l; and - the gear ratio to seed bead.

Seeding in these devices is regulated, usually varying the seed box.

Seed of tukovysivnymy devices of this type were most widespread in Germany and other Western European countries.

The second type can be assigned units vyhribayuchoyi action. The most structurally perfect of them are well-known chain tukovysivayuchi drills TS-1 and TC-1 factory "Red Star", located in Kirovograd.

Seeding is regulated in two ways: sowing largest gap, which is set by overlapping slit strip within 6-24 mm and change the speed of the working circuit using variable gears from 6 to 160 mm / s.

In the United States in planters vyhribayuchoyi actions (drills "Imperial") working bodies were stars, located on vertical cylinders along the fertilizer box. Stars that rotate vyhribayut tuki paltsepodibnymy its branches through the slit from the bottom of fertilizer box. Tests such drills have shown that they are compared with the chain are much worse.

The third type are centrifugal devices that have a special place among all of sowing machines. The working body of the apparatus is a disk with blades that set a horizontal drills. Tuki, acting through the guide on the disc tray rotating scattered it on the soil surface by centrifugal force.

Centrifugal machines for the first time used in France for the dispersion of grain crops in the US they are used as vapnorozkydachi. In Germany and other Western European countries centrifugal devices are used not only for spreading lime, but also increasingly for the distribution of liquid manure on the soil surface, especially in the meadows.

Options conveyor calculated using the following formula:

$$Q = 10{,}000\frac{\mathcal{V}_{\text{Ст}}\mathcal{b}_{\text{Ст}}\gamma}{\mathcal{V}_{\text{МВ}}} \quad (2)$$

where vst. - The speed of the belt, m · s⁻¹; bst - belt width, m; γ - proportion of fat, kg / m³; vst - speed unit, m · s⁻¹; B - width unit, m.

Thus, following investigation fertilizer devices and examined their classification and design features and functional circuits can be concluded that such devices seeding rate is regulated by changing peredatoch tion in relation Actuators and is pulsating supply of seed material, which leads to disruption of the process .

Therefore, it is advisable to develop and introduce fertilizer unit, which would have eliminated these shortcomings, thus increase the effectiveness of their use in a production environment.

Experimental device for making local Supplements (Fig. 2) enhances the performance and reliability of the unit for the local application of fertilizers as granular and granular.

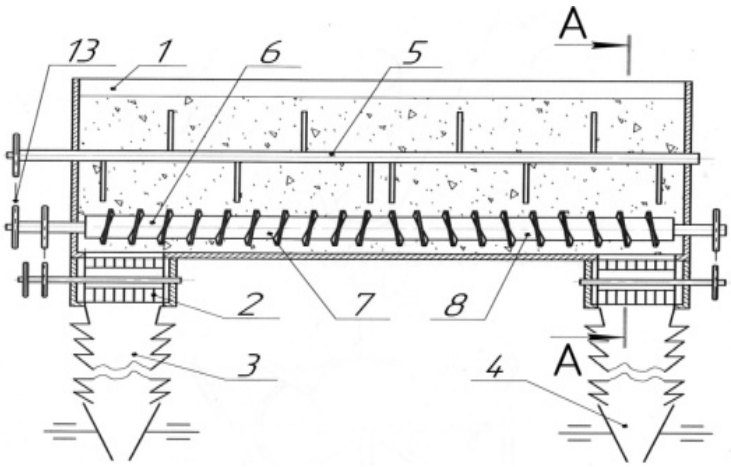

Fig. 2. Functional diagram of apparatus for making local dietary fertilizers 1 - bunker; 2 - eccentric rotor; 3 - Tukoductors; 4 - Sowing working bodies; 5 - Horizontal mixer; 5 - cylinder primary auger; 7, 8 - multidirectional winding; 13 - mechanical transmission.

It is decided that a local unit for introducing biologically active fertilizers containing hopper, two doses of the eccentric rotor, two Tukoductors drive, metering, Sowing working parts, wherein additionally equipped inject screw, screw winding one part of which is directed oppositely screw navyvtsi other parts horizontal mixer, with cylinder primary and horizontal auger mixer resulted in movement of over dosing; eccentric dispenser has a plate that can freely move in the radial direction and additionally equipped with copier, which plate contact their inner ends. Functional diagram fertilizer device shown in (Fig. 2), which is depicted: a general view of the device for the local introduction of biologically active fertilizers (front view) in (Fig. 3) - general view of the device for the local introduction of biologically active fertilizers (side view); on (Fig. 4) - general view ekstsestrykovoho dispenser.

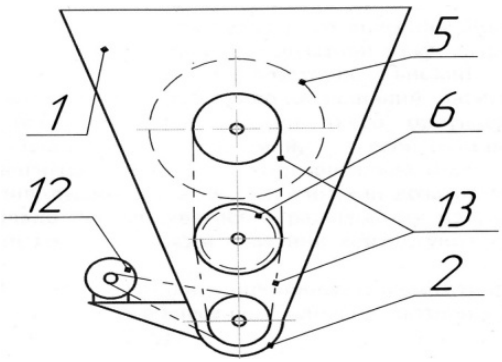

Fig. 3. Bunker tukovysivayuchoho machine: 1 - bunker; 2 - eccentric rotor; 5 - Horizontal mixer; 6 - cylinder primary auger; 12 - dispensers; 13 - mechanical transmission.

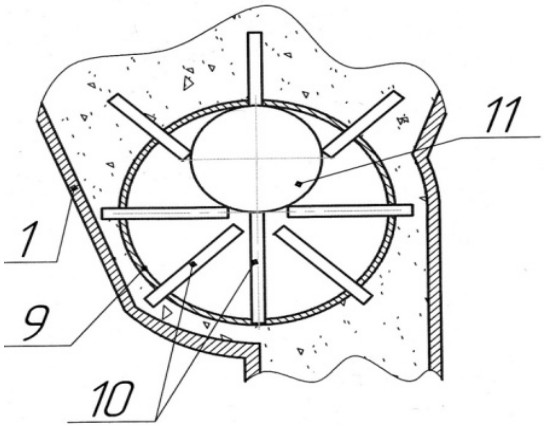

Fig. 4. Weigh the sowing machine 1 - bunker; 9 - rotors; 10 - plate; 11 - copiers.

Apparatus for making local dietary fertilizer (Fig. 2) consists of a hopper 1, which combines the two doses eccentric rotor 2, 3 and Tukoductors Sowing working bodies 4. The bunker is located 1 horizontal mixer 5 and 6 cylinder primary screw that has plots multidirectional winding 7 and 8. Dispensers with eccentric rotor containing 2 rotors 9 (Fig. 4), plate 10 that can Move-schuvatys in the radial direction, and copiers 11 plate 10 which contact their inner ends. Dispensers with eccentric rotor 2, horizontal mixer 5 and 6 cylinder primary screw driven into motion to weigh about 12. The torque is transmitted by mechanical transmission (eg chain)

Apparatus for making local BAA operates as follows. Raw subject sowing (fertilizer), located in the hopper 1 (Fig. 2) goes to to weigh with eccentric rotor 2. steady flow of raw materials to the metering facilitates rotation of the primary auger 6, and lack of raw hang in the bunker, and provides horizontal rotation mixer 5. Since the rotation of the primary auger 6 one part 7 fueling dispenser raw materials to the left of the eccentric rotor 2, and another part 8, having directed inversely wound to the right dispenser with eccentric rotor 2. When rotating rotors 9 (Fig. 4), plate 10, moving on copier 11 are displaced in the radial direction, thereby performed of purification. More raw flagged Tukoductors 3 (Fig. 2), which lead her to seeding working bodies 4. The rotation of moving parts is carried out using dosing over 12 and transmitted through, for example, chain drives 13 (Fig. 3). The use of two dosing with eccentric rotor allows double the performance of the machine for making local Supplements and cylinder primary auger can significantly increase the capacity and performance of its bunker with considerable length, so that it can simultaneously sowing fertilizer in two lines.

Use horizontal mixers gets rid phenomenon hovering material in the bunker, which increases the reliability of the system, and plates that are free to move radially and copier can significantly increase the value

of moving plates (cleaning efficiency) and increase the durability of plates (by eliminating joints with connection and bending load).

The proposed modification of the apparatus for making local supplements can effectively solve the problem without requiring excessive investment while.

The proposed tukovysivnyy apparatus for making local dietary fertilizers will help in working conditions of its operation safely perform seeding fertilizer production process and thus to improve its performance in the 1.2 - 1.5 times compared to analog.

Conclusions

1. Effective use of bioactive fertilizers (BAA) is dictated by economic considerations and environmental issues from pollution. The role of technical tools is to accurately convey to fertilizer plants, thus increasing the utilization of the power of plants.
2. Analysis of existing tukovysivnyh devices showed that when making dietary supplements, whose physical and mechanical properties of different fertilizers, they do not satisfactorily meet process and therefore unreliable and ineffective in operation.
3. The use of screw-spring system tukovysivnoho even helped reduce the destruction of granules during operation of the machine, but the drawback of such devices is that the output quantity is regulated by changing stepwise Gear ratio of mechanism about the result is a pulsating supply of seed material, which adversely affects the uniformity coefficient feed fertilizers.
4. The proposed tukovysivnyy device provides a high coefficient of uniformity of seeding supplements (85-90%), increased productivity v1,2 - 1.5 times the performance and ensure the reliability of the process, resulting in the increase of sugar beet yields up to 37%.

References

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BROUGHT analysis dozyruyuschyh workers bodies for making fertilizers and biologically aktyvnыh predstavlenы results of research eccentric dispenser for dozyrovanyya biologically aktyvnыh fertilized with local vnesenyy s.

Apparat, Active udobrenyya, Rabochie orhanы the machine.

The analysis of working organs measuring out is resulted for vnesennya biologically active fertilizers that are presented rezultati

researches of ekstsentrikovogo metering device for dosage biologically of active fertilizers at their local bringing.

Device, Active fertilizers, working parts, machine.