The results of research line identification rod deflection and stress distribution in any section of rod. Our results can be used in solving problems related to operation that is working in design of agricultural, forestry and other machinery.

Rod bending, deformation, line deflection, stress distribution.

UDC 631,331

Laboratory results From seed, providing stabilization water-air regime in the root layer of soil

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The article presents a method of seeding cereals, which stabilizes the water-air regime in the root layer and observations on seed germination in boxes of freshly loosened soil and compacted its surface layer and cutting slits in the center of each line, and the development of germs they are released to the surface.

Box, tray, ground, line, seeds, bar, compaction, surface layer crack.

Problem. Water and air are the main components of the soil and they play an important role in its formation and shaping fertility [1]. Regulation of water

regime often the most important technique improve productivity of farmland. Stated that peat and sod-podzolic soils Polesie stocks of productive moisture in the root layer of soil (0 ... 50 cm) during the year vary over a wide range and at the end of summer in most cases almost completely exhausted [2].

Particularly acute lack of water is felt during sowing during drought and dry winds [3]. Due to lack of moisture topsoil is dry to a depth of seeding, causing it not take sufficient moisture for nabubnyavinnya and consequently the onset of biochemical processes. As a result of seed not gaining enough strength for friendly germination and seed the part that still swollen and gave seedlings die in the soil from overheating and has not appeared on the surface. Therefore there is a need to develop a new

technology seed that will ensure continuous supply of water raised by capillaries in the surface layer of the zone seedbed and with minimal evaporation through the surface rows.

Analysis of recent research. Analysis of the literature dedicated issue of the dynamics of groundwater and soil moisture [1-9] shows that they are sufficiently studied. However, they stated effective ways that ensure constant supply of water raised by capillaries in the surface layer of the zone seedbed with minimal evaporation through the surface rows. The authors in papers [10-12], these issues have been considered and they proposed a new way of seeding the stabilization of water-air regime in the root layer of soil percolation phase for the period beginning on seed germination and ends with the beginning of tillering. This Agrotechnical method can be implemented Bunk scheme [11] sowing cereals and broke new ground in the fat of stabilization of water-air regime in the root layer [10, 12], which is shown in Fig. 1.

With the scheme shows that when moving seeds on the surface of the unit broke new field its working bodies compacted soil separate lines 2 through indentation to the formation of cracks in which initially seeded tuki 3, and 6. This seed soil in rows 1 is not treated and left a loosened condition. Most definitely the proposed method of sowing is different from known that surface soil is compacted separate multiple lanes wide, for example, 3 ... 5 lines on hlybynu2 ... 3 cm, and the center of each line 2 slot cut depth of less than 7, for example, from 10 mm Seeding depth and width not exceeding 5 mm. So over the aisles formed a thick crust surface 9, which prevents intensive evaporation of water from the surface of the field and therefore creates more favorable conditions for humidification only that part of the volume of soil in which the seeds of crops sprout shoots, developing their root system by the time the to the surface and minimal water inflow to row spacing, which is weed seeds. This cut through a surface crust in the center of each line of a cleft ensured a constant rise, lowering the air, followed by aeration (air saturation) of soil, which is in line, and removing carbon dioxide from it during the phase of seed germination to the phase of tillering.

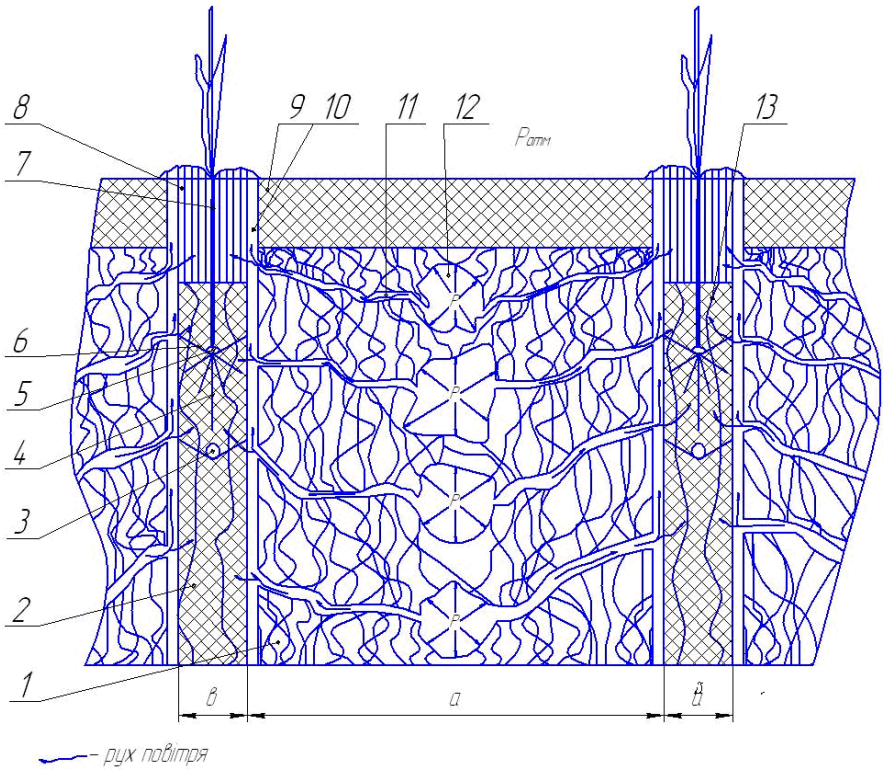

Fig. 1. Scheme stabilize water-air regime in the root layer 1 - aisle; 2 - line; 3 - fertilizer granule, 4 - primary roots; 5 - seed; 6 - seed bed; 7 - stem, 8 - loosened soil; 9 - superficial crust; 10 - vertical crack; 11 - lateral cracks; 12 - season; 13 - capillary system.

However, this mechanism stabilizing the water-air regime in the root layer is considered only on a theoretical level. The lack of experimental data that would confirm or refute its effectiveness, inhibits the development of working groups for its implementation. Verify the effectiveness of a new method of sowing is possible by setting the laboratory experiment of seeding in the loosened soil in a box that simulates broke new field.

The purpose of researchare observations on seed germination cereals and the development of germs on the surface of freshly loosened soil from its sealed surface layer and cut a slit in the center of each line, and on this basis to obtain reliable results that prove or disprove the benefits of a new way of sowing.

Results. Laboratory experiments were conducted with seeding cereals in boxes without a bottom with a basis of internal size 250×100 mm and a height of 200 mm and side glass wall. Boxes mounted on a pallet and filled with soil. To ensure the "purity of the experiment" box

filled with soil (previously crushed and sieved through a sieve with oblong holes) to form a layer of 150 mm.

By laying the first experiment determined vigor crops. For this selected thirteen seed samples of crops that are most widely cultivated in farms Volyn region, including: three varieties of winter wheat Lybed, Woodland 90 and "Artemis", one sample Myronivska spring wheat, two varieties of barley Gelos and Carat, two varieties of winter Irina rye and Sintek 38, two varieties of winter triticale and Rarity Ratne, one kind of spring triticale Zgurivka and two varieties of oats Desnyanskiy and sunset. These samples were taken ten seeds and germinated them in the tray on zvolozhuvanomu filter paper, Fig. 2.

Fig. 2. Sprouting seeds from selected samples of cereals.

Observations have shown that these crops on the tenth day of the highest 100% similarity were winter wheat and winter triticale Lybed Rarity and 90% barley and 80% Gelos winter rye Sintek 38. These cultures were taken for seeds for experiments. Seeding was performed as follows.

At a distance of 45 mm from the edge of the wooden wall of the box on the soil surface carried a line perpendicular to the glass wall of the box, then at a distance of 80 mm from it conducted the second line, and the same distance to the third. On these lines at intervals of 10 to 10 mm laid seeds. General view of the unfolded boxes of seeds on the soil surface are shown in Fig. 3.

Fig. 3. General view of the unfolded boxes of seeds on the soil surface.

Seeds sown in the boxes carefully covered with a layer of soil equal to 60 mm to fit the enveloping him in the field, and on the surface put wooden block section 95×245 mm with handle bar through which vdavlyuvaly into the soil until it settled on 30 mm. Then gently removed the bar and center left and right line cut vertical slit depth of 20 mm and a width of 5 mm and a tray filled with water, bringing it to the level of 5 mm. On average, this line does not cut through the gap and took it as a standard because it sown seeds imitated weed seeds in rows.

Getting seed germination cut crevices in the middle of two extreme lines are shown in Fig. 4. The study was conducted on seed germination in two extreme lines of cut through slits and a single line without slits placed between them, that is, between the rows. Because the boxes have a bottom, the soil moisture is gradually from its lower to upper layers.

Fig. 4. Start seed germination in cracks cut through the middle of two extreme lines.

This intense hydration layer of soil was lower during the first two hours, during which time the moisture has risen to 30 mm. However, further soil moisture flows not evenly. Thus, soil moisture throughout the thickness of the layer initially held in the rows of slits cut through, and in line with no cracks it zvolozhyvsya only three days. Adequately humidification process occurred and the process of seed germination. General view of the boxes of germinated seeds are shown in Fig. 5.

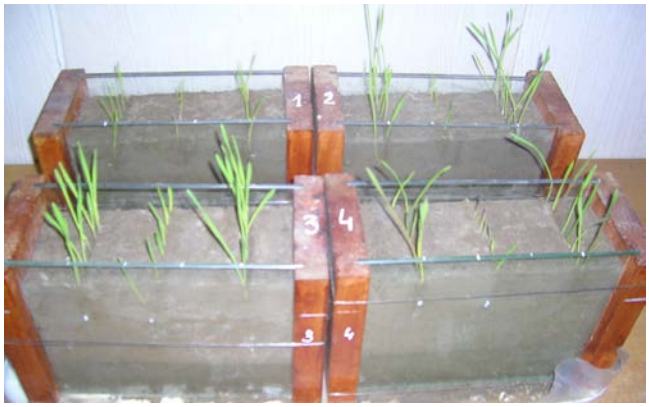

Fig. 5. General view of the boxes of germinated seeds: 1 - Lybed wheat; 2 - winter triticale rarity; 3 - Gelos barley; 4 - rye Sintek 38.

Analysis of the observations showed that all four versions first came to the surface sprouts from seeds sown in rows of slits cut through and no cracks in the lines they appeared three days later. This first sprouted barley seeds. Then both took the stairs from the seeds of

triticale and rye, and a day later and wheat seeds. In general, germination of seeds sown in rows of slits cut through in barley was 100%, 90% triticale, rye 80% and 70% wheat only. However, the overall development of plants and their growth after the crop differed in intensity. So the most intensively developed barley. Its stems appeared thick, strong, had lush green color, while in triticale were thin and even wheat weakened. This stems and the height was different. So in line with slits cut through the height of the stems to 12 days after sowing in triticale was higher and was 17 cm, 15 cm in rye, barley at 12 cm, 9 cm in wheat and in lines without cuts, it was three times lower. The highest it has been in barley was 5 cm in wheat and triticale 4 cm and rye only 3 cm. In our opinion the main reason for the lag in the growth of wheat and triticale stalks have a negative impact sandy soil in which the seeds vysivalos research cultures. From the research results shows that the negative impact on soil development stems not only suffered barley.

Thus, by analyzing research results we can conclude that the seeding cereals broke new ground in its compacted with a surface layer and cut a slit in the center of each line is a real and effective agricultural practices.

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The technique in this article vыseva semyan kolosovыh grain crops kotorыy obespechyvaet Stabilization of water-air spaces in root mode sloe, as well as Results of observing the proyzrastanyem semyan in boxes co Fresh razrыhlennoy pochvoy, uplotnennыm poverhnostnыm sloem and prorezannыmy schelyamy centered kazhdogo rows, as well as development rostkov after Exit on dnevnuyu s surface.

Box, poddon, soils, Line, seeds, bar, Seals, poverhnostnыy layer of, schel.

Methods over of sowing of seed of ear grain-crops, which provides stabilizing of aquatic-air mode in root layer and results of watching germination of seed in boxes with freshly loosening soil and make more compact him by superficial layer and cut cracks on center of every line are brought in paper, and also by development of sprouts after their output on daily surface.

Box, pallet, soil, line, seed, bar, compression, superficial layer, crack.