NEED FOR DEVELOPMENT OF THE MACHINE FOR THE DISTRIBUTION OF PERFECT IMPURITIES FROM GRAIN MATERIAL

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The main raw material for the production of the most important foodstuffs for people and feeds for animals is the grain of agricultural crops. Therefore, an increase in the gross grain harvest is the most important task facing the agro-industrial complex of the Russian Federation. One of the main reserves for increasing grain production is the use of high-quality grain material, free of impurities, for sowing.

Winter wheat is a special place in the structure of the gross harvest of cereals. It is the traditional and the most common grain crop in the Volga Federal District of the Russian Federation due to its unpretentiousness to the conditions of growth, the ability to produce high enough and guaranteed yields on soils with low fertility. However, rye is often affected by ergot, which is a poisonous admixture. The strong damage to ergot rye is explained by the duration of flowering and the peculiarities of the structure of its flowers, which are characterized by cross pollination, and they are open for a long time [1].

The effectiveness of grain production for food, fodder and seed purposes depends largely on the quality of post-harvest work, determined by the technical level of development of grain cleaning machines and equipment. At the same time, many scientists solved the majority of issues related to the development of grain cleaning machines and production lines for post-harvest grain processing using methods of mechanics [2, 3, 4].

From the analysis of the works of these scientists, we can conclude that, primarily when cleaning grain heaps of impurities, the effect of air flow and separation on sieves is used. Currently, the cleaning of the grain of rye from ergot sclerotia is carried out with the help of air-screening machines, pneumatic sorting tables, photo-

separators and other devices. However, the physico-mechanical properties of ergot sclerotia have similar values similar to the values of rye grain, therefore traditional methods do not give good results for the separation of ergot from rye, which requires the development of a more efficient cleaning machine having the simplest and most convenient working organs.

One of the properties, according to which the values of ergot differ from rye, is the specific mass (mass density), which allows the use of salt solutions as a rye and ergot separator.

Noting the rather high degree of development of the topic on the development of machines for cleaning grain from various impurities, it should be noted that the authors of the above authors do not consider the cleaning of rye grain from ergot sclerotia by specific weight (mass density) using aqueous solutions of inorganic salts. An example of a suitable machine consisting of a bath, conveyors of rye seeds and ergot sclerotia with transverse slats arranged at regular intervals along their length, a hopper with a feeder whose wall is immersed in a salt solution and divides the bath cavity with a rye seed transporter from an ergot horn transporter can serve as a patent RF No. 2616037 [5].

A comparatively small number of papers devoted to this subject, in which theoretical and practical studies are given, are not yet widely used. It is obvious that the method of cleaning the grain material in a «wet» way in order to reduce grain losses into waste and ensure the separation of ergot sclerotia from winter rye grain requires further research into the efficiency of using aqueous solutions of inorganic salts as a separator and the development of an appropriate cleaning machine.

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