TECHNOLOGY OF SELECTING SMALL SEEDS IN AGRICULTURE

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It is known that the fertility of the seeds of any agricultural crops in laboratory and field conditions, as well as the productivity as a result, are directly related to their quality indicators. Agricultural crop seed quality can be measured in a variety of ways, including cleaning and sorting. However, until now, there is no device for sorting or cleaning small seeds in the technological systems of seed preparation of agricultural production in our country [1, 2]. Therefore, since the quality indicators of the small seeds being prepared for planting do not fully meet the agrotechnical requirements and are at a low level, the cost of one hectare of land is 2-3 times more than the scientifically based norms, and it is necessary to use 120 man•hours/ha of additional manual labor to collect the surplus seedlings. As a result, thousands of tons of seeds that can be used for human consumption and animal feed are thrown into the ground and wasted [3]. This leads to an excessive increase in the scale of expenses for the cultivation of vegetable and fruit crops and an increase in the cost of harvested products.

In recent years, "PEDKUS" sorters imported from abroad are being used to sort the seeds of agricultural crops and clean them from weeds. But the sorting and cleaning of small seeds in "PEDKUS" devices imported from abroad is not economically efficient. This is due to the fact that, firstly, the price of these sorters is very expensive, secondly, their use in technological systems for preparing small seeds for planting or on farms is not economically justified due to their high productivity, and thirdly, the possibility of sorting small seeds according to all important physical and mechanical properties is limited in these devices. [4].

It is known from scientific sources that in order to obtain high-quality seeds with close biological properties, it is necessary to sort them according to all important physical and mechanical properties. This requirement is fully met by the sorting of agricultural crop seeds in the electric field. Because the electric field affects the seeds with an electric field force directed to them, taking into account all their important physical-mechanical properties, that is, the electric field affects the seeds with an electric force of different values, taking into account all their important physical-mechanical properties. As a result, the seeds are sorted in the electric field according to all important physico-mechanical properties, i.e. mass, geometric size, density, electrical properties [5, 6].

It should also be noted that the electric field has a positive effect on the germination of seeds in laboratory and field conditions and the growth of seedlings.

With this in mind, we recommend using a triboelectric device to sort and clean small seeds. The advantage of the triboelectric device over other electric sorters is, firstly, its structure is simple, secondly, it is easy to prepare, thirdly, it is energy and resource efficient, fourthly, it is safe from electricity and fire, and fifthly, most importantly, it does not need an external source to generate a high voltage electric field [7].

In the proposed triboelectric device, the electric field is generated as a result of the friction of two dielectric materials rotating against each other, that is, a dielectric drum and a separating brush [8]. The seeds falling on the surface of the charged rotating dielectric drum are polarized and separated into the seed or technical fraction based on the mutual ratio of the acting forces.

Good results have been obtained in many years of theoretical and experimental research on the sorting and cleaning of small seeds in a triboelectric device [9, 10].

Taking into account the above, this project envisages the development of an experimental copy of the triboelectric device for sorting and cleaning of small seeds, as well as testing the seeds prepared for sowing in laboratory and field conditions.

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