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GRAIN PROCESSING MODES DISINFECTING IN STRONG ELECTRIC FIELDS

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One of the promising areas of the developing world in recent years is the use of strong electric fields for pre-treatment of crop seeds in order to stimulate growth processes and processing grain mass storage with the aim of neutralizing the surface microflora.

The department and the electric electrotechnologies National Agricultural University of Ukraine in recent years conducted research on the application of strong electric fields for pre-stimulation of seeds and disinfecting processing of grain in storage.

The purpose of research - development of effective treatment regimes disinfecting grain in a strong electric field.

Materials and methods of research. As a result of experimental studies have found effective dose of disinfecting process, which depends on exposure time and the concentration of ozone. After determining the concentration of ozone in the grain mass, you can set the time required for effective dose. In a production environment task of determining the dose is complicated because measurement of ozone concentration difficult and time-consuming process requiring additional equipment. Therefore there was the need to develop alternative and easy way to determine the dose depending on the grain handling grain mass known parameters such as humidity.

Moisture causes the dielectric properties of the grain mass that significantly affect the bit processes it under an electric field of high tension, and hence the concentration of ozone.

Results. To investigate the influence of humidity on the amount of ozone used barley cultivar "Etiquette" with moisture from within 12.2% to 17.2%. In studies distance between the electrodes was 3 cm, height 6 cm barley mixture. Pressure on the electrodes was 16 kV.

It was established that the maximum ozone concentration achieved with certified Moisture 14-14,5%. This can be explained by the ability of the grain mass to move from state insulator to conductor depending on the humidity. So, at 12% moisture corn in a state of the dielectric and the number of ions in the intercellular fluid is very small. In this condition the grain mass partial discharges occur infrequently and therefore ozone concentration is quite low. With increasing humidity increases the number of ions in the intercellular fluid grains, which contributes to the formation of the electric field in the air on and under intense passage bit processes. Therefore, there is an increase of ozone concentration to a moisture content of 14.5%. With further increase in number of ions humidity continues to rise, but because grain mass begins leak current conductivity that prevents the accumulation of charge in the air inclusion. The intensity of the occurrence of partial discharges decreases.

Also for the construction of the nomogram should be established to determine the dependence of exposure time at various concentrations of ozone required for treatment doses in 2940 (mg • m3) / min, which provides 90% neutralization of harmful microorganisms. Options identified for installation developed with the distance between the electrodes 3 cm, dielectric plates with a thickness of 0.5 mm and polyethylene voltage to the electrodes 16 kV.

Using the above mathematical dependence and the dependence of the concentration of ozone in the grain mass at a field strength of 5.3 kV / cm of humidity, was built nomohramu.

For the given nomogram can determine the time needed to ensure effective dose of disinfecting treatment of barley grain mass at a certain value of its humidity.

Conclution

Effective decontamination of grain in the electric field of high tension possible while ensuring the required dose treatment, depending on ozone concentration and exposure time. Measurements of ozone concentration difficult and time-consuming process requiring additional equipment. Therefore nomohramu developed, which can

be determined using the regime parameters for disinfecting treatment of barley grain mass.