

# MOVING GRAIN MASS BROADCASTER TREATMENT UNDER STRONG ELECTRIC FIELD

**O. Bereka**

**O. Naumenko**

*The factors influence the rate of grain mass in the chamber processing time and its source, presented set velocity leakage and leakage wheat from the time of opening the shutter angle outflow by gravity and the strong electric field.*

***Grain weight, velocity, processing, opening angle, a strong electric field.***

To kill insect pests in grain mass using a strong electric field (EPS) (Fig. 1) is necessary to ensure effective dose treatment. The main components of the dose treatment is ozone concentration and exposure time.

The concentration of ozone depends on the electric field in the grain mass, type of culture and Moisture. Time of pests in EPS depends on the height of the camera and processing speed of the grain mass. The presented install motion of the grain material is gravity, vibration and EPS. In previous work explored the movement of grain in the chamber by gravity and vibration. Since the action of a strong electric field also affects the rate of leakage from grain processing chamber, it is necessary to determine the time dependence of leakage and grain weight of camera handling tensions of a strong electric field.

The aim - a theoretical study of the process of grain leakage under the influence of gravity and the strong electric field and the establishment and practical test of time depending on the speed and grain leakage from the corner shutter opening and leakage of the electric field.

Materials and methods research. Velocity and time gravitational leakage grain processing chamber is set in previous work particular found that the velocity of the hole depends on the pressure chamber grain material over the hole.

Leakage of bulk materials in a strong electric field is studied in Yerevan Polytechnic Institute and Armenian ESI mechanization and electrification of

agriculture. They found that the rate of leakage loose material determined by the energy of interaction of a strong electric field of bulk materials.

Results. According to the established theoretical dependencies in software Mathcad 14 calculation of limit values of time and speed leak in a strong electric field of barley grain relative permittivity  $\epsilon_z = 6 \dots 10$  and the electrical  $\gamma_z = 1 \cdot 10^{-9} \dots 1 \cdot 10^{-8} \text{ S / m}$ . In the calculation took into account that the electrodes camera processing of celluloid plate installed with relative permittivity  $\epsilon_{pl} = 4.3$ . Values of physical and mechanical properties were taken to the experimental conditions. Sizes install adopted in accordance with the design parameters of the experimental chamber treatment: height  $H = 0,82 \text{ m}$ ; the distance between the electrodes  $L = 0,03 \text{ m}$ ; chamber length  $X = 0,05 \text{ m}$ . The angle of opening the gate leakage  $\alpha = 0 \dots 90^\circ$ . The calculation was performed for voltage  $U = 0 \dots 20 \text{ kV}$ . Since the values of physical and mechanical and electrical properties of grains vary widely, the calculation determined by the maximum possible and minimum possible values of speed and time grain mass leakage from the camera processing.

Experimental verification of theoretical dependencies conducted on barley varieties "Solntsedar" moisture content of 12.5%. For this grain barley covered in camera processing, applied high voltage to the electrodes camera shutter open and determined a leak grain. We determined the average speed of barley processing chamber and a diversion of grain processing chamber. Studies conducted in the triple repetition.

The data show that the experimental values of time and speed camera leaks grain processing within the allowable values defined by calculation.

### **Conclusions**

The process of gravitational diversion of grain mass in a strong electric field of the camera processing. The dependences allow to determine the time and rate of leakage from the camera grain processing depending on the angle of opening of the gate leakage, voltage applied to the electrodes, given the values of its physical and mechanical and electrical properties. Also found that under the influence of a strong electric field significantly slows down the movement of grain mass processing chamber, which can lead to stopping the flow of grain.