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ENVIRONMENTALLY SAFE DECONTAMINATION AND ELECTROTECHNOLOGY IMPROVEMENT SOWING QUALITIES OF SEED CROPS

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Presented environmentally sound way to improve sanitation and sowing qualities crop seeds and hardware implementation.

The electric field of high tension, seeds, ozone, bias current, discharge current.

The grain sector in Ukraine is strategic sector of the state economy, which determines the volume of deals and value of the main types of food for the population, including food processing grain and livestock production, generates a significant share of agricultural incomes, determines the status and trends of rural generates foreign exchange revenues for the state through exports. Increased production and improve the quality of crop production possible by reducing crop losses from phytopathogenic microorganisms and utilize the potential biological capabilities seed.

During storage (3-6 months). Disadvantaged grain contamination fungi may grow 35 - 40 times inside - 3 - 4 times.

This is an annual loss of 2.3 million tons of grain and a significant reduction in biological usefulness many other parties.

Property data pathogens alter the biochemical composition of grain and mycotoxins contaminate it creates a serious problem for the food industry. To date, there is no biologically acceptable and cost-effective way to detoxify the grain.

It is known that 25% of world production of grain contaminated mycotoxins.

Fungi of the genus Fusarium grain damage in adverse conditions during plant growth and produce a "field" mycotoxins. Aspergillus and Penicillum begin to grow after harvest, and their toxins called "toxins silos." In granaries infection by fungi is the result of complex interactions between the substrate temperature, humidity, oxygen and carbon dioxide, the presence of insects and fungal spore concentrations.

In order to prevent the development of grain microflora are chemical, biological and physical methods. At this time, grain processing is carried out mainly by chemical means. But at the achievement of positive results, the use of chemicals has a number of negative consequences, including pollution by pesticides and their accumulation in the soil as well as in crop production, which poses a threat to human and animal health, labor when performing work.

Fumigation methyl bromide and phosphine (pills, pellets) hitherto regarded as reliable and radical means of disinfection grain hollow elevators, warehouses and more. However, the use of methyl bromide in Ukraine (MeVh) for fumigation of grain elevators and mills, with the exception of quarantine requirements for grain processing and shipping, prohibited from 1 January 2005. under the Montreal Protocol, ratified by Ukraine. Therefore, the domestic industry storage units needed alternative fumigation.

The purpose of research - development of efficient and environmentally friendly method of disinfecting grain processing, its technical implementation.

Materials and methods research. Scientists electric department and electrotechnologies National University of Life and natural bark-stuvannya Ukraine conduct research on the use of strong electric fields and ozone, which is one of the most promising means of influencing the grain mass. One of the priorities of the use of strong electric fields are preplant seed treatment and processing of grain storage and processing.

Modern technological means of ozone treatment of grain, except ozone generators have auxiliary equipment, system cleaning and drying air cooling system, compressor facility, duct system, measuring device. When applying ozone from the generator to the material handling it partially decomposed, resulting in significant losses. In addition to a large amount of it is laid out in the first layers of the grain mass, which prevents uniformly and efficiently handle it with ozone.

Installing us ionization processes and consequently the formation of ozone in the whole volume of grain mass under the influence of a strong electric field opens up new technological possibilities for disinfecting and pre-treatment of the grain.

Results. When placing the grain mass in a strong electric field occurring partial discharges in air inclusions, where the uneven distribution of the electric field the largest. With increasing applied voltage ionization occurs in an increasing number of air inclusions, and the value of the partial discharge pulse in these will be more than in the past. There will also be enhanced to include ionization where it started at a lower voltage.

The first channel oscilloscope filmed voltage losses in active resistance (R) during the passage of discharge current, and the second pulses induced in the sensor registration relative intensity discharge processes. The voltage applied to the electrodes 10.4.

When ionization processes in grain mixtures with increasing voltage ionization current increases as by increasing the amplitude of the current pulses and by increasing the frequency of pulses.

The total current flowing through the grain mass under the influence of a strong electric field consists of the discharge current and bias current.

On the basis of the phenomena and theoretical research conducted at the Department of electric and electrotechnologies NUBiP Ukraine. A pilot plant for disinfecting and pre-treatment of the grain mass. The advantage in the formation of ozone in the grain mass directly under an electric field of high tension.

Installation is as follows. After filling the chamber processing grain weight at high voltage electrodes served. When appropriate the electric field in the volume of production occurring partial discharges in air inclusions where uneven distribution voltage electrostatic field most. With increasing applied voltage ionization occurs in an increasing number of air inclusions, and the value of the partial discharge pulse in these air inclusions will be higher than last year. Also will be enhanced to include ionization where it started at lower voltages. When appropriate level field intensity in the whole volume of products produced ozone-agroionic mixture concentration is regulated by the electric field of high voltage AC.

Production studies found that treatment of grain in the electric field of high tension can increase cereal yields by 30%. Laboratory studies revealed that the proposed method can neutralize about 90% smut spores artificially zasporenomu wheat.

The proposed electrotechnology decontamination and improve quality of cultivated crop seeds favorably with existing ones. It has low power consumption and allows environmentally safe process grain products.

Conclusions

Under the influence of a strong electric field in air inclusions grain mass occurring partial discharges result, which is the formation of ozone in the whole volume. Thus grain has a number of factors: the electric field of high intensity, volume and surface electric current, ozone, air ions, temperature. As a result of the proposed electrical technologies can effectively neutralize harmful mushroom flora and improve crop quality seeds, for example, eliminated about 90% of smut spores and increasing cereal yields up to 30%.