ANALYSIS OF PHAUNISICAL COMPOSITION OF GRAIN CARBON MACHINERY AND APPLICATION OF COOLING WITH THE AIM OF THE LIMITATION OF THEIR EXTENSION

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One of the important factors in maintaining quantitative and qualitative indicators of grain is reducing its losses from pests during storage. According to our research, the best way to store grain in a refrigerated state. This mode is based on the fact that the temperature of breathing of the grain mass is significantly reduced at 10ºC, and most of the insect pests become sedentary and stop multiplying. Further lowering the temperature creates increasingly unfavorable conditions for the propagation of insects, which will eventually disappear. Low temperatures also reduce the activity and development of microorganisms, but they do not die from low temperatures. This grain preservation regime is well manifested in case of application for a short period. For a successful storage of a batch of grain by this method for a longer time should be pre-dried. With the use of natural cold sources, canning of cereals by cooling is affordable and economically most profitable [1]. The traditional method of accounting for the species composition of pests of cereal stocks is the analysis of average samples. It is effective up to 40.0 - 50.0%, but it is quite labor-intensive. Our long-term studies [2] have shown that, given the diverse nature of the damage to insects and mites, two indicators of the state of grain and grain products are identified in the normative documentation: contamination (technological indicator) and pollution (hygiene) of cereal stocks. It is obvious that the dynamics of

the number of pests in recent years varies. The total density of contamination / contamination depended on the terms and conditions of storage, the use of chemical methods of protection, in particular fumigation (the highest level of pollution was detected), from culture, its class. Triticum wheat (Triticum aestivum L.) (Triticum vulgare) has a relatively high degree of overall pollution and contamination, compared to other crops, on average in 2015-2018. During the investigated period, the level of contamination of the seeds with the covered pests was determined from I (<1) - III (3,5-5), IV- (1,0-90,0 instance / kg) depending on the indicator of the total density of the infection . On average, IV degree is most often manifested. The small density of populations, even relatively dominant species, was noted; for the usual predator there were only about 2 individuals.

Application of I degree of cooling of the grain by reducing its temperature to 10 - 0ºC is possible as a prophylactic purpose, and for suppressing the life of most pests. It can be used both prophylactically and in order to suppress the life of most pests. The advantage of this method is that there is a freezing of a large part of the moisture from the outside air, that is, it drains the air that is blown through the grain mass. To do this, it is enough to bring the temperature of the grain mass to 8-10 ° C. And given the fact that the grain mass has a rather low heat and temperature conductivity, this (lowered) grain temperature will be maintained for a long time, that is, within a few months. In different countries, artificially cooled air is used to cool the grain both in order to control grain pests and to preserve grain quality during storage [3]. It should also be noted that storage of grain mass of high humidity, that is, when the moisture content of the grain mass exceeds the critical value, can be provided by cooling the artificially cooled air to a temperature of + 5- + 10 ° C.

Cooling dramatically reduces the intensity of all biological processes in the grain mass. The grain from the harvesters, as a rule, gets stored at a temperature of 20°C and above. At this temperature seeds of grain with a moisture content of 24-26% can be stored for no more than 4-10 days. Cooling of grain by active ventilation allows to increase the period of its safe storage to drying 3-4 times. As the temperature of the grain mass decreases, the intensity of its breathing decreases. At

temperatures of 3 to 10 ° C, even at a humidity of 18%, the intensity of respiration is negligible. A system of active ventilation can be used to cool the grain, that is, when the outside air is blown through the grain mass. This allows you to refresh the grain, and if the temperature of the outside air is lower than the temperature of the grain mass, then it is possible to reduce the temperature of the grain. A significantly better way of cooling the grain is to use artificially cooled air. The advantage of this method is that there is a freezing of a large part of the moisture from the outside air, that is, it drains the air that is blown through the grain mass. The amount of air for active ventilation is determined on the basis of the specific air supply and the initial moisture content of the grain. The air from the fan with such ventilation is fed from the pressure duct across the height of the silo, permeates the grain mass in a transverse direction and is removed from the silo by means of the outlet duct. Such installations require the presence of two fans: one - for the injection of air into silo, the other - for the outflow of exhaust air. When choosing one or another ventilation installation for silo silos, consider that, due to the significant resistance of the ventilation network (air ducts and mantle), when vertical purging, fans should create a pressure of about 6860 Pa (700 kg cm/ m^2). This is accompanied by an increase in air temperature by 9-11 °C compared to the original one. The heating of the air promotes more intensive drying of grain in silos, but reduces the efficiency of cooling. Cooling and lowering the moisture content of grain in silos when blown up from the bottom upwards correspond to the direction of air movement. First and foremost, the grain is intensively cooled and dried intensively at the entrance of the air into the grain embankment, and at the latest and less intensively - at the exit from it.

Referens

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