

UDC 664.69:006.015.5:633.16:664.724

QUANTITY OF IMPURITIES AND COMPLETENESS OF CLEANING THE GRAIN MASS OF MAIZE AT DIFFERENT TECHNOLOGIES POST HARVEST HANDLING

Podpryatov G. I., Yashchuk N. O., Nasikovskyy V. A., Rozhko V. I.

PhD in Agricultural Sciences

The way harvest of corn cobs and technology their ventilation with follow processing and purification on air-sieve machines provide the minimal indicators content of impurities. Completeness clearing foreign material and grain impurity obtained higher in variants where used air-sieves cleaning machines irrespective the type of hybrid of maize and original humidity of grain.

Grain, corn cobs, hybrids, humidity, post harvest handling, grains impurities, foreign material, completeness cleaning.

Post harvest handling of maize held to bring corn to the condition that the industry will ensure the supply of good-quality raw materials. Corn is dispensed to consumers in the form of grain humidity no higher than 15 %, the presence of foreign material no more than 1-5 % of impurities and grain no more than 3-15 %, depending on the group to use.

Technologies post harvest handling corn includes preliminary cleaning of from impurities, drying in the dryer, cleaning of grain impurities and foreign material on separator. Regimes drying and cleaning set depending the destination and quality of the final product.

The purpose of research: to identify the best technologies of post harvest handling of different corn hybrids for clearing of foreign material and grain additives.

Materials and Methods. The research is based on the laboratory of department technology of storage, processing and standardization of plant products after prof. B.V. Lesik of NULES of Ukraine and Scientific production subsection “Ukrelitcentr” village of Motovylyvska Slobidka, Fastiv district, Kiev region. For

research have used grain of hybrids corn: Holosiivskiy, Solonyanskiy, Luigi and Techny. We studied two terms harvesting grain and corncobs that influenced the initial humidity researched hybrids. We investigated the next technologies of post harvest handling corn: 1. Sieve-air separation of grain + drying (control); 2. Aerodynamic separation of grain + drying; 3. Sieve-air separation of grain + ventilation; 4. Aerodynamic separation of grain + ventilation; 5. Drying of corn cobs + processing + sieve-air separation; 6. Drying of corn cobs + aerodynamic separation; 7. Ventilation of corn cobs + processing + sieve-air separation; 8. Ventilation of corn cobs + processing + aerodynamic separation.

Results. After harvesting corn in the first period the average indicator content of impurity of grain amounted to 16.3 % and foreign material – 6.6 %; in the second period respectively – 14.3 and 6.2 %.

It was noted a direct relationship between technologies of post harvest handling and the number of impurities. In embodiments studies where corn combine harvesting carried out directly, immediately getting the grain content of grain impurities is higher compared to options where harvesting was performed on the cob. Larger impurities can explain the injury during direct grain threshing.

In research variants of venting corncobs and their separation on air-sieve machines content of grain impurities was the lowest and had values within 1.69-2.47 %. The highest content of grain impurities marked with variants in aerodynamic separation and drying grain. It is noteworthy that the highest values of its characteristic hybrid Solonyansky – 5.95-6.13 %.

Describing the fullness of cleaning grain impurities should be noted high rates in options where applicable separation on air-sieve machines regardless of hybrid and initial moisture content. The higher initial content impurity of grain in the grain mass maize, the better is the air-sieve separation unlike aerodynamic and vice versa.

Also more substantial difference in the fullness of cleaning grain impurities of greater interest for air-sieve separation in versions harvesting corn in comparison with harvesting corncobs.

Foreign material smallest number of variants is characteristic of corn harvesting on the cob, its ventilation and separation for air-sieve machines. In these variants the amount of foreign material impurity was at 0.25-0.66%, while for corn harvesting direct and conduct the operations post harvest handling, its value was within 0.41-0.90 %.

Foreign material number directly dependent on the way cleared. Thus, in embodiments of the air-sieve separation foreign material content in 0.37-0.69 % was lower compared to cleaning of aspiration machines.

In embodiments with high performance moisture harvesting in the first period after the number of post harvest handling was higher than the same variants at a lower initial moisture content at 0.04-0.12 %.

Varietal features also affect the value of the contents foreign material. In hybrids Luigi and Techny they were on 0.1-0.4 % lower compared to the hybrids Holosiivskyi and Solonyansky.

Completeness purification foreign material again points to higher rates in options where applicable air sieve cleaning machines regardless of hybrid and initial moisture content. A significant difference in fullness cleaning fullness foreign material in between the options air-sieve and aerodynamic separation marked in corn hybrids Luigi and Techny – within 6-12 %, and slightly lower in hybrids Holosiivskyi and Solonyansky – within 5-7 %.

Conclusions

The way harvest of corn cobs and technology their ventilation with follow processing and purification on air-sieve machines provide the minimal indicators content of impurities. Cleaning of grain mass with using aspiration machines increase the amount of admixtures and accordingly reduce quality of products. The quality grain mass of maize to improved with using ventilation systems for grain drying and made possible to reduce the content of grain admixtures.

Completeness clearing foreign material and grain impurity obtained higher in variants where used air-sieves cleaning machines irrespective the type of hybrid of maize and original humidity of grain.