



TECHNOLOGY OF LONG-TERM STORAGE OF SOME TYPES OF FRUITS AND VEGETABLES USING SORBENTS

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ABSTRACT

It is known that the storage of agricultural raw materials is an important step in providing the population with food. Storage of fruits and vegetables should be organized in such a way that these food products do not lose their inherent taste and smell, then remain fresh, do not mold and do not rot.

The article presents the results of studies on the effect of treatment with various sorbents on the preservation of certain types of fruits and vegetables. It was found that treatment with organosilicon biostimulants provides 98% yield of potatoes and vegetables after prolonged storage. The use of expanded vermiculite as a sorbent material for storing fruits, vegetables and tubers has also been studied. The use of vermiculite increases the yield of standard products by 12.1%.

Keywords: *temperature, bacteria, biological product, cold storage, microbes - antagonists, pathogenic microflora.*

INTRODUCTION

Over the past 20 years, the world consumption of vegetables and fruits has been growing by an average of 5-7% per year. Uzbekistan not only meets the needs of its population, but also exports agricultural products and has great potential in this area.

Soil and climatic conditions of Uzbekistan are favorable for the production of a wide range of vegetables and melons significantly superior to similar products from other countries by quality, content of such important microelements as sugar, fructose, ascorbic acid and a number of other biologically valuable substances that provide a balanced diet. Along with excellent taste parameters, produced in Uzbekistan, agricultural products are notable for their low cost.

For example, in the USA, which are simultaneously one of the the largest importers and manufacturers of agricultural products, the cost of potatoes, carrots, cabbage, melons on average 5-6 times, and tomatoes are almost ten times higher than in Uzbekistan. Wherein Uzbekistan has significant additional potential to reduce relative cost by increasing yields for all major horticultural crops. More than 21 million tons are produced in Uzbekistan annually fruits and vegetables, of which about 870 thousand tons are exported. Currently, over 140 thousand farmers work in the republic. farms that provide domestic and foreign markets high-quality fruits and vegetables. Total storage capacity by the republic is 1012 thousand tons of products, including modern

refrigerating chambers for 680 thousand tons. This contributes to uninterrupted supplying the population with basic types of agricultural products, expanding its exports. The transport infrastructure, at the same time work is underway to provide interconnected logistics networks, foreign trade relations are expanding, ensuring the growth of the sector's export potential.

Government-approved Agricultural Development Program for 2016-2020 identified the main areas of continuation structural changes in agricultural production, introduction of advanced agricultural technologies, comprehensive mechanization agriculture and deepening the processing of raw materials. It provides for a phased optimization of cotton areas for due to the withdrawal of low-yielding lands with subsequent placement on the released area of crops of fruits and vegetables, potatoes and other crops, as well as the organization of intensive gardens, further development breeding and seed production.

The implementation of these and other measures in the agricultural sector will allow further enhance food security and self-sufficiency of the republic in basic types of food, as well as a significant increase in the export of this highly demanded in foreign markets, products. At a new stage in the implementation of a consistent strategy development of the agricultural sector in the country, the key goals are further strengthening food security through own production of food resources, increasing production potential of agriculture with effective use of land and water resources. Social impact implementation of such a program is an increase in employment, income rural population and the quality of food consumed by the entire population of the country. The development of the fruit and vegetable sector is not only about providing food security, but also the formation of new sectors, creating new jobs that increase living standards of the people.

At the same time, the provision of the population with vegetables of its own production does not exceed 50-80%, fruits - 20-25%.

One of the reasons for this situation is the loss of products at all stages of its promotion to the consumer. Only during storage, losses reach 35-40%. The problem of efficient storage of the grown crop is complex and requires the solution of a number of issues, ranging from selection, pre-sowing seed preparation, observance of crop rotations and all agricultural techniques, and to timely harvesting with subsequent laying of healthy material for storage. In addition, only 70% of the required number of storages is functioning, of which only 30% has artificial cooling, gas storage methods, pre-cooling points and refrigerators in the areas of fruit and vegetable production are not used enough, the production of modern equipment and devices for microclimate control has not been established, as well as means of mechanization of loading and unloading operations. The introduction of advanced biological and chemical methods of processing fruits and vegetables requires the creation of appropriate integrated lines. Having eliminated these problems, it is possible to obtain additional products without increasing production volumes.

OBJECTIVE

Processing of some types of fruits and vegetables with natural sorbents during their long-term storage.

The object of the study was carrot root crops cultivated on personal plots and farms of the Fergana region.

RESULTS AND DISCUSSION

The storage technology must ensure the high quality of the vegetables and fruits sold. When choosing the most acceptable ways of storing fruit and vegetable products, many factors are taken into account - economic efficiency, timing, availability of material and technical base.

The storage regime for products of plant origin should provide conditions determined by natural immunity, with a maximum decrease in the intensity of biochemical processes and suppression of the development of microflora. Various sorbents are often used to provide these parameters.

The technology developed by us for storing potatoes, root crops and other vegetables using sorbents from natural zeolites, the introduction of which in farms and vegetable bases of the Fergana region ensured a 5-8-fold reduction in losses of potatoes, root crops and onions.

Almost 100% of the yield of potatoes and vegetables after long-term storage is provided by treatment with organosilicon biostimulants. By penetrating into cell membranes, they change their interaction with biological receptors, the rate of reaction, and in some cases, possibly, the pathways of metabolic degradation, which affects the direction and effectiveness of biological action. Silatrans protect chloroplast cells from the damaging effects of high or low temperatures, the action of herbicides and peroxides, reduce damage during acute irradiation, facilitate the transport of auxins through biomembranes, as they exhibit a membranotropic effect,

For storage of fruits, vegetables, plant tubers, bulbs, cuttings in warehouses and during long-distance transportation, the sorbent material - expanded vermiculite - has proven itself as an excellent medium. Vermiculite ensures the safety of tubers by 98% with a natural loss during normal storage 12-17%. The use of vermiculite in the storage of plant materials has a number of advantages: storage areas are reduced, greater resistance to moisture content and ambient temperature is ensured. Vermiculite is used for interlayering when placing vegetables in permanent storages, piles and trenches instead of sand or earth, which are susceptible to rot and mold infestations and in which rodents and pests quickly enter, as it is biostable, sterile and good moisture retention material.

Ferghana-Real Logistic LLC studied the effect of sorbents (sawdust, vermiculite) used as interlayer on the safety of carrot root crops when stored for six months in a storage with artificial cooling. During the experiments, preservation, natural loss, diseases (gray, white and black rot, phomosis) and the number of seedlings were taken into account. Root crops of carrots in all experimental variants differed from the control in a more attractive appearance, were fresh, dry and clean; diseased roots were enveloped in sorbents, which, absorbing decomposition products, formed a lump and did not let the rest get wet. Free separation of sorbents from carrot root crops during bulkhead allows complete mechanization of this process.

CONCLUSION

The use of fresh sawdust and vermiculite made it possible to increase the yield of standard products by 9.4 and 12.1%, respectively, while the losses from diseases were 1.5-2 times less, the natural loss decreased by 0.9-1.8%, the amount seedlings and roots decreased by 3-4 times.

REFERENCES

1. Chernikov V. A., Sokolov O. A. // Environmentally friendly products. - M.: KolosS, 2009. -- 438 p.
2. L.A. Unmentionable. "Modern technologies for storage and processing of fruits and vegetables". - Moscow, FGNU "Rosinformagrotech", 2009, 172 p.
3. Nazirova R. M., Sulaymonov O. N., Usmonov N. B. // Qishloq xo'jalik mahsulotlarini saqlash omborlari va texnologiyalari // O'quv qo'llanma. Premier Publishing s.r.o. Vienna - 2020. 128 bet.
4. E.P. Shirokov, VI Polegaev "Storage and processing of crop production with the basics of standardization and certification" - Moscow "Kolos", 2000, 255 p.

5. V. I. Manzhosov, I. A. Popov, D.S. Shchedrin "Technology of storage of crop products" - Moscow "Kolos" - 2005, 392 p.
6. Nazirova R.M., Usmonov NB, Khaitov R., Tukhtashev F.E.// Influence of cultivation conditions and storage regimes on the chemical composition of carrots // "Problems of modern science and education" scientific-methodical journal. Publishing house "Problems of Science". Moscow, 2020. No. 5 (150). pp. 16-19.
7. Nazirova RM, Usmonov NB, Sulaimonov RI // Change in the chemical composition of potato tubers during storage // "Problems of modern science and education" scientific and methodological journal. Publishing house "Problems of Science". Moscow, 2020. No. 6 (151). pp. 19-22.
8. Nazirova RM, Kurbanova US, Usmonov NB. // Features of ozone treatment of some types of fruits and vegetables for their long-term storage // Universum: chemistry and biology: scientific journal. - No. 6 (72). M., Ed. "MCNO", 2020, pages 6-9. Electron. print version publ. - <http://7universum.com/ru/nature/archive/category/6-72>

