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THE EFFECT OF ETHYLENE AND STORAGE CONDITIONS ON THE QUALITY OF APPLES

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Abstract: This article examines the effect of ethylene gas on the external and internal properties of apple fruits during storage, in particular, on their degree of hardness. The main purpose of the study is to evaluate the effect of ethylene on biochemical and physiological changes in fruit tissues and, as a result, to determine changes in the shelf life, appearance and consumer properties of apple fruits.the notation. The article examines the effect of ethylene gas on the external and internal properties of apple fruits during storage, in particular, on their degree of hardness. The main purpose of the study is to evaluate the effect of ethylene on biochemical and physiological changes in fruit tissues and, as a result, to determine changes in the shelf life, appearance and consumer properties of apple fruits. Data on the possibility of preserving the quality of apples for a longer period of time through the use of ethylene sorbents in fruit storage and reducing the ethylene content are presented.
Keywords: Storage of apple fruits, degree of hardness, gas content of ethylene, local methods, appearance, physiological condition of fruits.

Introduction. Currently, one of the most important tasks of the agro-industrial complex is to ensure food security, long-term preservation of the quality of fruit and vegetable products and providing consumers with healthy products. The fruits of the apple tree are among the most cultivated in our country and are in great demand among the population. The appearance, hardness, taste, and amount of biologically active substances in them vary depending on different storage conditions.

In Uzbekistan, traditional and local methods of storing agricultural products are still widely used (basements, basements of private residential buildings and various warehouses, as well as refrigerating chambers with limited ventilation efficiency). Under these conditions, the physiological condition of the fruits and, in particular, changes in the action of the hormone ethylene, especially a decrease in the level of stiffness, are considered urgent problems [3].

The experiments study the dynamics of hardness levels, the effect of ethylene gas, and the degree of resistance of various varieties to these conditions during storage of Simerenko, Golden Delicious, Boiken, and Star Crimson apples using local methods. The research results serve to develop practical recommendations in the field of fruit growing. The experiments study the dynamics of hardness levels, the effect of ethylene gas, and the degree of resistance of various varieties to these conditions during storage of apples of the Simerenko, Golden Delicious, and Boiken Star Crimson varieties using local methods. The research results serve to develop practical recommendations in the field of fruit growing. Studies on the storage of apple fruits show that temperature, humidity, and ethylene gas have a major impact on the physiology of fruits during storage (Ibragimov et al., 2020; Hasanov, 2018). Ethylene gas is a phytohormone that accelerates fruit ripening and enhances enzyme activity by increasing the activity of pectinase and cellulase. This causes the destruction of cellular tissue and loss of stiffness (Kader, 2002). Depending on the variety, the degree of sensitivity of fruit tissues to ethylene varies [4].

Research methods and materials. The object of the study. Apple varieties, Simerenko, Golden delishes, boyken, Star Crimson, storage conditions, local basement warehouses (temperature 3-

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8°C, humidity 85-90%), ventilation, natural air exchange, the amount of ethylene is not controlled, hardness determination method: penetrometer or measure of mechanical deformation. Measure it once every 7 days.These are the research and materials. The object of the study. Apple varieties, Simerenko, Golden delishes, boyken, Star Crimson, storage conditions, local basement warehouses (temperature 3-8°C, humidity 85-90%), ventilation, natural air exchange, the amount of ethylene is not controlled, hardness determination method: penetrometer or measure of mechanical deformation. Measure it once every 7 days. 10 samples of each fruit variety. Research methods. GOST 27819-88 standard for storing apple fruits in refrigerators for determining quality indicators during storage of apple fruits in research GOST 25999-83 standard for determining vitamins in apple fruits by the content of mono- and disaccharides, organic acids, pectin substances in Apples before and after storage-by the carbazole method; organoleptic evaluation of apples by tasting is carried out according to GOST 8756.1 standard FFV-50 certification and quality control requirements were applied. When determining the significance coefficients in the organoleptic analysis of E.Methods for determining significance coefficients in the organoleptic analysis of E.P.Shirokov and V.I. products, methods developed by Polegaev were used to determine significance coefficients in the organoleptic analysis of E.P.Shirokov products**.**

Research results and their discussion. Ethylene gas plays an important role in the process of storing apple fruits in warehouses. Ethylene (C_2H_4) is a gaseous phytogormone naturally produced by plants that affects fruit ripening, aging, and other physiological processes. Ethylene is naturally produced by growing and ripening fruits, in particular apples.esearch results and their discussion. Ethylene gas plays an important role in the process of storing apple fruits in warehouses. Ethylene (C_2H_4) is a gaseous phytogormone naturally produced by plants that affects fruit ripening, aging, and other physiological processes. Ethylene is naturally produced by growing and ripening fruits, in particular apples. Its concentration varies depending on the storage conditions and the condition of the fruit. Apples are a climacteric fruit that dramatically increases the production of ethylene during the ripening process. During the ripening phase, the amount of ethylene increases, which has the property that it also affects other fruits. Table 1.

Ethylene gas affects the following processes.

Table 1

№	Processes occurring in fruits	Effects of ethylene gas on fruits
1	Maturation	There will be a change in the color, taste and softness of the fruit
2	Aging	Fruits age faster and tend to break
3	Sugar gathering	Under the influence of ethylene, starch is converted into sugar
4	Organoleptic properties	Taste and aroma may increase

At the same time, as in other Muslims, this verse states that Imam Ali (AS) was the Imam and Caliph after the Prophet Muhammad, who was the Imam and Caliph after the Prophet Muhammad. As an Ombudsman, we have modern control over ethylene concentration, filtration and special chemicals and control their shelf life.

Apple fruit cataclysmic is an important quality lens with its many applications. Katyklik (also known as meat fruit Basim when transferred to hookah course) is a type of fruit that is consumed as food for a certain period of time. In this article, we will tell you how to grow fruits and vegetables at home. 1. Draw.

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Figure 1. Processes for measuring the hardness of apple fruits.

Hardness in local storage of apple varieties (kg/cm2)

scope = "col" /

Table 1.

№	Week	Simerenko	Golden Delicious	Boiken	Star Crimson
1	0	8.2	7.5	8.0	7.8
2	2	7.5	6.2	7.4	6.8
3	4	6.7	5.1	6.2	5.5
4	6	5.9	4.2	5.0	4.3
5	8	5.1	3.5	4.0	3.1

In our experiments, each apple selected has a natural degree of hardness of the Variety, the analysis of which was presented in the table at the top. During the storage of apple varieties, the highest indicator in terms of yogurt was observed in the varieties of Apple simerinko and Boyken. The Golden Deleshes Variety has a high-sensitivity property to ethylene, and the hardness disappears quicklyn our experiments, each apple selected has a natural degree of hardness of the Variety, the analysis of which was presented in the table at the top. During the storage of apple varieties, the highest indicator in terms of yogurt was observed in the varieties

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of Apple simerinko and Boyken. The Golden Deleshes Variety has a high-sensitivity property to ethylene, and the hardness disappears quickly. The Star Crimson variety is well preserved in appearance, but we can recommend keeping them if the hardness is not fast.

Conclusion. Our research results show that biochemical changes in the fruit are active due to the lack of ethylene control under local storage conditions. The high content of ethylene was responsible for more than 50% loss of hardness in the Golden Delishes and Star Krimson varieties in 8 weeks. The Simerenko and Boyken varieties, on the other hand, performed relatively well in these conditions.onclusion. Our research results show that biochemical changes in the fruit are active due to the lack of ethylene control under local storage conditions. The high content of ethylene was responsible for more than 50% loss of hardness in the Golden Delishes and Star Krimson varieties in 8 weeks. The Simerenko and Boyken varieties, on the other hand, performed relatively well in these conditions. It was found that due to the high pectin content in the tissues of the Simerenko variety, it is more resistant to the effects of ethylene. Experiments have shown that the Simerenko and Boyken varieties are suitable for local storage.

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