THE INFLUENCE OF EXTERNAL FACTORS ON THE CHEMICAL COMPOSITION OF FRUITS AND VEGETABLES

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All the properties of fruits, namely taste, color, aroma, etc., appear during their ripening. Therefore, the study of the biochemical processes occurring during this period is of great importance. The chemical composition of fruit nodules formed from flowers is similar to the chemical composition of leaves, but they contain much less sugar, acids, and other substances. According to S. Grebensky, during the development of fruit nodules, the amount of organic acids and tannins in them increases. During this period, the fruit becomes sour and tart. The hardness of raw fruits depends on the high content of water-insoluble protopectin and fiber in them. During the formation of fruits, the amount of starch in them also increases.

Before the fruits ripen, all the polysaccharides in them are hydrolyzed. In well-ripened fruits, there is almost no starch left. Although partially, other polysaccharides are also broken down. Due to this, the sugar concentration in ripe fruits increases somewhat. Changes in the amount of carbohydrates have been detected in ripening apricots. The main part of the substance in apricots is sucrose. It is equal to 70-76% of the total sugar. However, the amount of sugar in all fruits does not increase due to sucrose. For example, when fruits such as grapes, cherries, and cherries ripen, the total amount of sugar substances in their content increases by 5-10 times, while the amount of fructose increases by 15-20 times. One of the characteristics of ripe fruits is a decrease in the amount of acids in them and, as a result, an increase in the sugar-acid coefficient [1].

The quality and chemical composition of fruits are greatly influenced by soil, climate and agrotechnical conditions. Fruits grown in southern regions have a slightly higher sugar content and lower organic acids than those grown in northern regions. For example, the differences in the sugar and acid content of apricots grown in different regions of our country can be seen in the following. According to V. Arasimovich, the fruits of apricot varieties grown in Central Asia contain more sugars and fewer acids. In areas with low humidity and hot weather, fruits accumulate a particularly high amount of sugar. Fruits grown in irrigated areas contain less dry matter and sugars [2].

Various phytohormones, pesticides, and mineral fertilizers widely used in agriculture also affect the taste and aroma of fruits. Therefore, mineral fertilizers should be used correctly to

prevent their properties from deteriorating. Nitrogen fertilizers applied in high doses delay the ripening of fruits. Potassium fertilizers have a positive effect on their taste and aroma.

Phytohormones and fungicides affect fruit colour. Spraying apple trees with 2,4,5-TP (trichlorophenoxyacetic acid) has been shown to improve fruit colour. The fungicides orthophthalate and mancozeb accelerate anthocyanin synthesis, but delay fruit ripening. When using fertilizers in horticulture, their effectiveness is studied separately, that is, the biology of each fruit tree grown is taken into account, as well as the properties of the soil [3].

It is recommended to study the composition of the soil in what proportions mineral fertilizers should be applied to the soil. Fertilizers with humus, phosphorus and potassium fertilizers are mainly applied to ploughed land in late autumn since this is done to place them close to their roots. When developing a system for feeding fruit trees, it is necessary to fully know their agrochemical properties, on this basis the type, amount and timing of fertilizers are determined. The method of feeding fruit trees determines their productivity and longevity. The properties of the soil, the composition and the properties of fertilizers play an important role in this, serving as a source of nutrition for plants through the roots. There is little information in the literature about the photosynthesis of fruit trees, and in general, the assimilation of carbon dioxide proceeds like any other process in plants. There is probably no need to dwell on this issue. We aimed to examine the specific aspects of the photosynthesis process in fruit trees. When comparing the photosynthesis intensity of one-year-old apple trees, it was found that different groups, namely autumn and winter varieties, have different indicators [4].

Plants with high photosynthesis intensity have a short growing season. The longer the growing season, the later the period of carbon dioxide absorption by the leaves. Early varieties of apples have a large number of stomata on the leaf surface, which distinguishes them from late varieties. Winter varieties have a small number of stomata on the leaf, which differs from summer and autumn varieties. In early varieties, the stomata are small, and the parenchyma tissue of the leaf is strongly developed. It is important to note that the stomata of apple leaves are located only on the backside. In experiments conducted on two-celled Wagner apple trees, it was found that under natural conditions, when the amount of carbon dioxide in the atmosphere is 0.5 mg, carbon dioxide is absorbed by the back and surface of the leaves [5].

The number of stomata on the back of the leaves has been observed to range from 928 to 2000 per cm2. There are no stomata on the surface. The surface of the leaves accounts for 20-30% of the total photosynthesis intensity under natural conditions, and the rest is on the back.

When the same species of different fruit trees are studied at the same time, that is, under the same meteorological conditions, their leaves absorb carbon dioxide at different rates. It has been studied that some fruit trees and shrubs contain chlorophyll in their branches and stems and that its importance is great. This chlorophyll, as well as chloroplasts in the stems and

branches, are of incomparable importance for the normalization of gas exchange in these organs [6].

Carbonic acid, which is formed during respiration and passes through the soil to the root system, is consumed in the process of photosynthesis. The oxygen released at the same time is used in the process of respiration. If there is one side to the vital activity of chloroplasts, then the other, even more important, is that they contain a huge amount of pigments and enzymes, physiologically active substances, and play an important role in metabolism. Thus, the results of the observations and experiments of scientists show the great physiological and biochemical importance of chlorophyll and chloroplasts, which serve to carry out processes in the plant organism. The amount of chlorophyll in the leaves of apple and pear trees located in different layers is different.

During photosynthesis, primary organic substances formed in the leaves flow to other organs and participate in the synthesis processes and the accumulation of reserve substances. Organic substances move through the phloem network of plants. The movement of organic substances along the phloem can be observed by the ring method. In this case, if the ring is removed (from the bark), a flow of organic substances is observed above the ringed area. This flow moves from the leaf phloem towards the root. This flow is called a bottom-up flow. This name is conditional, and often organic substances can move upwards, that is, towards the growth zones of the stem, to the bud, flower and ripening fruits. Assimilations move through the cells of the leaves in the form of monosaccharides. In the phloem, disaccharides are formed from monosaccharides, which move through the phloem network to the leaves and stems [7].

Before the leaves fall off, carbohydrates and other compounds move rapidly to the stems and roots. In plants, starch is synthesized from sugars as a result of the transfer of organic substances from cells with a high concentration to cells with a low concentration, while protein synthesis occurs from the combination of amino acids. At the same time, the substances formed are consumed in the processes of growth and respiration. Sometimes the opposite is observed, and substances can pass from solutions with a low concentration to solutions with a high concentration [8-10].

Sugars formed as a result of the breakdown of polysaccharides in the seeds of germinating cereal plants are used for seed germination and, in part, for respiration. The role of enzymes in the transfer of carbohydrates from one form to another is invaluable. The oils in plant seeds are a source of energy for seed germination, and at the same time, the amount of water produced as a result of their oxidation is very large, which plays a major role in seed germination. For example, 1g of protein oxidation produces 0.41g of water, 1g of carbohydrates oxidation produces 0.55g of water, and 1g of fats oxidation produces 0.7g of water.

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