



IMPROVEMENT OF FERTILIZATION NORMS IN THE CULTIVATION OF STRAWBERRY IN CLOSED AREAS

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Abstract

This article highlights the issue of improving fertilizer application rates for growing strawberries in enclosed areas. The biological characteristics of strawberry plants, agrotechnical requirements, adaptation of varieties to soil and climatic conditions, and the need for various types of fertilizers were analyzed. In particular, the effectiveness of fruit cultivation in greenhouse conditions was studied using the example of the "Kulver" and "Tashkent" varieties. The amount of nitrogen, phosphorus, and potassium fertilizers applied during the growing season, the stages of their assimilation, and their impact on the yield are scientifically substantiated. The possibilities of growing products throughout the year based on hydroponics technology were also considered. The research results will be of great practical importance in the implementation of intensive technologies in the horticulture sector of the republic.

Keywords: Strawberry, field, agricultural techniques, fertilizer application rate, nitrogen, phosphorus, potassium, greenhouse, hydroponics, varieties, yield, fruit crops.

Introduction

In obtaining high and quality yields of agricultural crops, the proper organization of selection and seed production work is of great importance, since in the development of agriculture, increasing yields and product quality is mainly carried out in two ways: firstly, the application of high agricultural techniques; secondly, the introduction into production of intensive varieties and hybrids adapted to each soil and climatic conditions, producing high-yielding, high-quality products. It is known that correctly selected varieties ensure a high and quality yield under appropriate agrotechnical conditions. Fruit growing is a complex and multifaceted branch of agriculture. Fruit and berry crops are grown in various soil, climatic, and agricultural conditions, and their fruits are used for various purposes in fresh, dried, and processed form.

As a branch of agricultural production, the main task of fruit growing is to provide the population with fresh fruits and industry with raw materials. Fruit growing as a science consists in the development of theoretical foundations and practical methods for obtaining high-quality and continuous yields based on the study of the structure, growth, reproduction, and yield of fruit and berry crops, their relationship to environmental factors, and their biology.

LITERATURE ANALYSIS

Currently, more than 25 types of fruit and berry crops are widespread in Uzbekistan. Seed-bearing fruit trees, mainly apples, are widespread in the Tashkent region. Apricots are rarely planted here, because due to early flowering, they are often affected by spring frosts. In the Fergana Valley, Bukhara, Surkhandarya, and Samarkand regions, stone fruits and fruit crops are grown on large areas. In recent years, apple and pear orchards have been increasing in other regions of the republic. The scientific-production association of horticulture, viticulture and winemaking named after academician R.R. Schröder, its regional branches, the Uzbek Research Institute of Plant Growing, Tashkent Agrarian University, and the Samarkand Agricultural Institute have made significant contributions to the development of horticulture in Uzbekistan. The merits of such scientists as Hero of Labor, Academician Mahmud Mirzaevich Mirzaev, doctors of agricultural sciences, Professors Arkady Andreyevich Rybakov, Mikhail Mikhailovich Kuznetsov, and Professor Serafima Andreyevna Ostrukhova are immeasurable.

In recent years, scientists have created new varieties that bloom once a season and produce successive yields, including Ada, Neischerpayemaya, and Sakhalinskaya. These varieties grow and yield abundant harvests even in Uzbekistan's conditions.

RESULT AND DISCUSSION

Therefore, along with the methods and techniques for creating new varieties of fruit and berry crops, it is impossible to introduce them into production without a good understanding of varieties, their biological characteristics and traits, and their relationship to agricultural techniques. Introduction to typical morphological characteristics of fruit and berry crops and the rules for taking plant samples for their evaluation.

It also consists of "Improving the norms of fertilization in the cultivation of strawberry plants in enclosed spaces," studying soil and climatic conditions, studying new modern technologies for growing strawberries in enclosed spaces, and growing products in accordance with the conditions. The importance of fruit growing in the national economy is immense. Fruits and berries contain sugars, organic acids, proteins, fats, tannins, pectin, aromatic substances, colloids, mineral salts, enzymes, and vitamins harmful to the human body. The sweetness of fruits contributes to better digestion of food. Many fruits have healing properties, preserving and strengthening the body's protective forces.

Strawberry varieties. Laugh. The leaves and peduncles are strong, the leaves are dark green, the bushes are leafy, standing at the same height as the inflorescence. The fruit is large, red, with an average weight of 15-25 g per first harvest. The flesh of the fruit is pink, the inside is light red, slightly fragrant, and has a pleasant taste. This is a mid-season variety, resistant to frost, and its fruit and leaves are resistant to fungal diseases. The fruit is mainly used for consumption, but it can also be used in the preparation of juices and fillings.

Tashkent variety. A new variety developed by the All-Union Institute of Local Lore (VIR), the fruit is large at first harvest, with a single grain weight of 20-25 g. In subsequent harvests, the fruit becomes smaller (10-15 g). The fruit begins to ripen in May. High-yielding variety, yielding up to 10-12 centners per hectare. The flower is dioecious (with only the pistil), cross-pollinated. When

making jam, the fruit is not crushed.

In recent years, modern greenhouses have been built to provide the population with berries. These facilities will contribute to the industrial development of vegetable cultivation. Greenhouses occupy large areas (several hectares), within which people, tractors, and machines move (loading and transporting fertilizers, soil, and finished products).

The size, length, width, and height of greenhouses always depend on the need. The expenses incurred for greenhouses should be covered by the income from the taxation of the received products and generate additional profit. In greenhouses, under the influence of heat, water continuously evaporates from the leaves of plants and from the soil, and even if there are no plants, the moisture in the soil still evaporates. Greenhouse frames are usually made of metal or plastic. The width and height of the frames depend on the size of the greenhouse. When wrapped with film, the edges are secured in metal frames with light tubes or smooth round sticks so that they do not tear in the wind. The films are made in two layers, with a distance of 3-5 cm between each layer, and the cold hardly penetrates in winter.

Strawberry agrotechnology. It ranks first among the berry-fruit crops grown in Uzbekistan. In natural conditions, it ripens in the first days of May. The fruit is highly valued for its taste, dietary consumption, technological quality, and the beauty of its color. Strawberry seedlings planted in summer (July-August) yield abundant harvests the following year. The fruit contains 4.5-11% sugar, 0.28-1.5% various acids, and 0.12-1.68 g pectin. In addition, there are salts of iron, phosphorus, potassium, calcium, and up to 50-75 mg% vitamins A, B, and C. Strawberries spoil quickly and are not suitable for long-distance shipments. It can be stored and eaten frozen for a long time.

Strawberry Fertilization. For the establishment of strawberry plantations, areas with good water supply are selected. Before plowing, as much as possible, 40-60 tons of manure and 100-160 kg of phosphorus are applied to the soil. After plowing, the field is leveled and furrows are taken. The effectiveness of fertilizers depends on the soil type, fertility, and irrigation, which ensure fertilizer absorption and high strawberry yields.

The main part of nutrients is absorbed in the first year of fruiting, and a very small part in the third year. In the first year, the fruit-bearing plant absorbs more potassium, and in the second year, the amount of nitrogen increases, and the consumption of phosphorus and potassium decreases. This crop absorbs most of the mineral fertilizers in spring and uses them to form new leaves, flowers, and fruiting organs. Strawberries require 2-2.5 times more potassium and nitrogen than phosphorus. When fertilizing, it is necessary to take into account that nitrogen and phosphorus are absorbed in large quantities from the beginning of the growing season to the harvest. The newly harvested strawberry plantation is water-demanding and requires irrigation 13-15 times or more during the growing season, depending on weather conditions.

During the growing season, 120-180 kg of nitrogen, 90-120 kg of phosphorus, and 30-60 kg of potassium (in pure substance) are applied per hectare. In spring (February-March), 45-60 kg of nitrogen and phosphorus are applied; in June, after harvesting strawberries, 45-60 kg of nitrogen and phosphorus are applied; and in autumn, 60 kg of potassium and nitrogen are applied.





CONCLUSION

Therefore, in order to obtain high yields of agricultural crops, it is important to grow strawberries in greenhouses in accordance with soil and climatic conditions, or to cultivate various strawberry varieties in the summer-winter months using the hydroponic method in the cultivation of the most important crop of today.

The possibilities of obtaining a high and quality yield of strawberries in closed areas through the improvement of agrotechnology and fertilizer application rates are being determined. As can be seen from the research, the strawberry plant is sensitive to soil and climatic conditions, and the amount and timing of fertilizer application directly affect the yield. It is especially important to scientifically substantiate the application of nutrients such as nitrogen, phosphorus, and potassium during the growing season. Strawberry plantations organized in greenhouses not only ensure a stable supply of agricultural products to the population, but also provide the opportunity to grow fruits year-round based on hydroponic technologies.

Strawberry varieties - "Kulver" and "Tashkent" - are distinguished by their adaptability, yield, and high-quality fruit in the conditions of Uzbekistan. By deeply studying the biological characteristics of these varieties, analyzing soil fertility, and introducing modern agricultural techniques, it is possible to expand the industrial cultivation of fruits and berries. The research results will serve the development of horticulture, ensuring food security, and increasing export potential.

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