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THE INFLUENCE OF THE HERB-HUMUS SYSTEM ON THE ACCUMULATION OF NUTRIENTS IN THE LEAVES OF APPLE VARIETIES

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Abstract
Due to the lack of organic fertilizers in agriculture among garden rows, the influence of the sod-humus system on the main nutrients in the leaves of apple varieties was studied, which is used as an additional organic agent and at the same time provides a high and high-quality yield from gardens. In studies conducted on the formation of a sod-humus system using perennial green grasses as organic fertilizers in apple orchards, it was found that the leaves accumulate the total amount of nitrogen, phosphorus and potassium compared to a black plow.

Keywords: organic fertilizer, compost system, legumes, ears, nutrients.

Introduction

Today, in the USA, Germany, England, France, Hungary, Australia and Russia, where gardening is well developed, scientific research is being carried out aimed at increasing the volume of environmentally friendly, export apple products and the use of biological methods (green manure). agricultural crops, sod-humus system) in gardens to increase productivity.

The creation of a sod-humus system using a mixture of perennial leguminous green grasses as an organic fertilizer between the rows of the garden allows you to get high-quality products from the gardens. In this agricultural operation, a mixture of perennial leguminous grasses is scattered between the rows of the bed, and at a height of 15-20 cm it is cut, chopped and left on the soil as mulch. As a result of 4-6-fold mowing of perennial green grass during the growing season and leaving it on the soil between the rows of the garden, a sod-humus system is formed. The KIR-1.5 unit is designed for mowing and chopping perennial green grass. Perennial leguminous crops completely cover the soil surface and leave a lot of organic matter; during the growing season, the soil is not processed [1; 2; 4; 7]. As a result of rotting of perennial leguminous grasses, the formation of a sod-humus system between rows was established from the second and third years [3;4].

The accumulation of organic matter when using a sod-humus system between rows not only improves the physical properties of the soil and increases its microbiological activity, but also has a positive effect on the nutrient regime of the soil and significantly increases the amount of mobile substances. forms of nitrogen, phosphorus and potassium in the soil [6; 8; 10; 11].

When using perennial green fertilizers, determining the amount of nutrients in the leaves - nitrogen, phosphorus, potassium - has a great impact on the food environment of apple trees (7).

It was found that when using perennial green grass between rows of apple orchards, the amount of organic matter in the leaves of fruit trees increased by 14-16% [9]. Determining the amount of nutrients in plant leaves is important for the effective use of organic and mineral fertilizers, proper irrigation, studying the growth and development of plants, increasing their resistance to adverse external factors. The leaf analysis method is part of fertilization based on the gross structure of nutrients in the leaves, correlatively related to plant nutrition and the chemical composition of the leaves. Determining the amount of nutrients in leaves is important for their growth and development, to determine how much and what nutrients the trees require or absorb. Most of the nutrients are used for fruiting, leaf formation and plant growth. When assessing soil fertility, it is advisable to conduct not only a chemical analysis of the soil, but also an analysis of plants, taking into account the quantitative need of plants for nutrients. The chemical composition of plants is their gross value. The content of the main nutrient element - NPK in the leaves of apple varieties was comprehensively determined using the method of H. N. Pochinok [5].

Experiments in orchards of apple trees Starkrimson, Golden Delicious varieties of perennial plants - red sedge (*Trifolium pratense* L.), white sedge (*Trifolium repens* L.), meadow oats (*Festuca pratensis* Huds.) and ryegrass (*Arrenatherum elatius* [L.] P. .ex J.Presl and C.Presl).

In order to study the relationship "soil-plant-garden", the total amount of nitrogen, phosphorus and potassium in the leaves of trees was determined. At the beginning of the growing season, as a result of the rapid growth of the root system and the upper part of the soil, accumulation of nutrients in the leaves was observed. The content of the main nutrients in the leaves of apple trees, where the grass-humus system was used, taking into account their changes during the season, was carried out in periods when these indicators are the lowest, that is, in the period when the leaves are fully formed, before watering.

In the conducted experiments, the amount of total nitrogen in the leaves was higher in the Starkrimson apple variety compared to the Black Plow control in the sod-humus

system, in the system red clover + a mixture of ears - 30.7%, white clover + a mixture of spikes was determined - 28.1% and a mixture of spikes - 22.3%. This indicator was higher in the Golden Delicious variety compared to the Black Plow control, red clover + a mixture with an ear - 40.4%, white clover + a mixture with an ear - 38.2% and a mixture with an ear - 36.7%. Thus, the amount of nitrogen in the Starkrimson and Golden Delicious apple varieties in the black plow control was 1.92 and 1.88%, which showed a low level of provision, while the nitrogen content in the leaves of the Starkrimson and Golden Delicious apple varieties in the sod-humus system was 2.35-2.51% and 2.57-2.64%, which reflected the standard level of provision. The amount of phosphorus in the leaves of the apple tree is 40.6%, 31.2% and 18.7% of the phosphorus content in the Starkrimson variety compared to the black plow control, the red clover + spikelet mixture and the Golden Delicious variety in the sod-humus system. The phosphorus content in the leaves of the Starkrimson and Golden Delicious apple varieties in the Black Plow control was 0.32 and 0.5%, while Red clover + mixture with ear - 41.1%, White clover + mixture with ear - 38.2% and mixture with ear - 26.4%. The content was 34%. When analyzing the amount of potassium from the main nutrients in the apple tree leaves, it was 1.08 and 1.10% in the leaves of the Starkrimson and Golden Delicious apple tree varieties in the black plow control, and in the Starkrimson variety in the sod-humus system compared to the black plow control, red clover + thorn mixture - 20.3%, white clover + thorn mixture - 15.7% and thorn mixture - 12.9%, as well as Golden Delicious red clover + thorn mixture - 10.9%, white clover + thorn mixture - 10.9% and it was found that the coniferous mixture is 9.0% higher (Table 1).

Table 1 The amount of essential nutrients in the leaves of apple varieties in the grass-humus system (as a percentage of dry matter)

Variants of sod-humus system	Amount of essential nutrients in leaves					
	nitrogen		phosphorus		potassium	
	%	with respect to control, %	%	with respect to control, %	%	with respect to control, %
Variety Starkrimson						
Black plow (Management)	1,92±0,150	100,0	0,32±0,025	100,0	1,08±0,084	100,0
Mixture of red clover + conifers	2,51±0,196	130,7	0,45±0,035	140,6	1,30±0,102	120,3
Mix of white clover + coniferous.	2,46±0,192	128,1	0,42±0,033	131,2	1,25±0,098	115,7

Mix of thorns	2,35±0,184	122,3	0,38±0,030	118,7	1,22±0,095	112,9
Variety Golden Delicious						
Black Plow (Control)	1,88±1,47	100,0	0,34±0,027	100,0	1,10±0,086	100,0
Red clover + Coniferous Mix	2,64±0,26	140,4	0,48±0,038	141,1	1,22±0,095	110,9
White clover + Coniferous Mix	2,60±0,203	138,2	0,47±0,037	138,2	1,22±0,095	110,9
Thorn Mix	2,57±0,201	136,7	0,43±0,034	126,4	1,20±0,094	109,0

Among the main nutrients in the leaves of the experimental apple varieties in the variant of the mixture red clover + spikelets, nitrogen 2.51-2.64%, phosphorus 0.45-0.48% and potassium (1.20-1.22%) accumulated, these indicators are monitored. slightly less in the variant with a black plow, they are respectively: 1.92-1.88; It turned out to be equal to 0.32-0.34 and 1.08-1.10%.

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