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Conference on Land Economy and Rural Studies Essentials**STATE AND TRENDS IN SMALL-SCALE HORTICULTURE**

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ekapk@yandex.ru(b) Michurinsk State Agrarian University, 101, Internatsionalnaya, Michurinsk, 393760, Russia,
nata-alexa@mail.ru**Abstract**

The article reviews the state, trends and peculiarities of the development of small-scale horticulture farming. It shows their role in supplying the population with fruit and berry products, reveals the factors that hinder the development of the branch in the studied organizational forms of management and substantiates the directions of increasing the production and rational use of fruits in these forms of management. The small-scale farming sector trends to increase the gross yield of fruit and berries while the area under fruit-bearing plantations decreases. Farms and small businesses have the highest growth rates. There is an increase in fruit and berry production by 4.1 times and 2.7 times respectively. In households, it increased by only 12.5%. Small-scale farms play a major role in fruit production. They grow 81.8% of fruit and berry production. The factors hindering the development of horticulture in these farms include low budget financing, difficulties in selling fruit, underdeveloped cooperation and insufficient quantities of high-quality planting material. The establishment of consumer cooperatives will make it possible to significantly reduce the loss of production and increase the marketability of horticulture, which will help saturate the market with fruit and berry products and solve the problem of supplying the population with fruit.

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1. Introduction

State agricultural policy pays great attention to the development of small-scale farming. Their role in the production of horticultural products, as well as in reducing unemployment in rural areas, is great. The State Programme for the Development of Agriculture and Regulation of Markets in Agricultural Products, Raw Materials and Food, approved by Resolution No. 717 of the Government of the Russian Federation of 14 June 2012, defines peasant farms, individual entrepreneurs, personal subsidiary plots, agricultural consumer cooperatives and small agricultural organizations (up to 100 people) as small forms of business. The concept was clarified following amendments and additions to the State Programme in 2020. Small-scale farms are represented by peasant farms, agricultural cooperatives, economic societies, economic partnerships and individual entrepreneurs with an annual income of up to 120 million roubles.

The development of horticulture in small-scale farming depends on the peculiarities of the industry: high capital intensity, perishable and low-transportable products, low-commodity production, high labour intensity, the use of fruit and berry plantations as fixed assets for a long time, increased requirements for the location of fruit and berry crops, the protective forest belts (Lowenberg-DeBoer et al., 2020; Nikitin et al., 2020).

It is important to consider these features when organizing small-scale horticulture and state support for the sector in the face of international sanctions from the European Union and the United States.

In the Russian Federation, small-scale farms are the main producers of fruit and berry products, but a large part of them are spoiled at the stage of bringing them to the consumer. The purpose of the study is to consider the state, trends and peculiarities of horticulture development and substantiate the directions of increasing production and rational use of fruits in small-scale farming (Korableva et al., 2018).

2. Problem Statement

In the Russian Federation, small-scale farms are the main producers of fruit and berry products, but a large part of them are spoiled at the stage of bringing them to the consumer. Fruit and berry losses at the production, storage, processing and marketing stages reach up to 30% of the gross harvest. Horticulture, along with potato and vegetable production, has the lowest level of marketability. In 2019, farms of all categories sold 42.4% of the fruit and berry produced, while small-form farms sold considerably less. For example, the level of marketability of horticultural products in household farms was 19.5% (Kulikov & Minakov, 2016; McFarland et al., 2018).

This low level of marketability of fruit and berry production is because the main producers, households, only sell their surplus produce on the market. The bulk of this production goes to meet the needs of their family. Another factor hindering the development of small-scale horticulture is the difficulty in marketing the produce.

The low level of state support also hinders the development of horticulture in small-scale farms. Most of the budget is allocated to the development of horticulture in medium and large enterprises.

3. Research Questions

Accordingly, the paper addresses the following questions:

- defining the concept of small-scale farming and the specifics of horticultural development in them.
- studying trends in the development of horticulture in small enterprises, farms and households and their role in ensuring food security in the production and consumption of fruit and berry products
- justifying directions for increasing production and rational use of fruit in small-scale farming

4. Purpose of the Study

The purpose of the study is to elaborate the main directions for the further development of horticulture in small-scale farming in the context of international sanctions and the retaliatory embargo on fruit imports.

5. Research Methods

The study of the state and trends in the development of horticulture in small-scale farming used data from the Federal State Statistics Service and the Ministry of Agriculture of the Russian Federation, as well as articles in Russian and foreign periodicals. The research methods included monographic, statistical-economic, computational-constructive, abstract-logical and other methods. The statistical-economic method was used to analyse the development of fruit and berry production in small enterprises, farms and private households. The monographic method served to study the activities of selected small-scale farms, which are notable for their high performance. The computational and constructive method allowed justifying proposals for the development of horticulture on the farm category.

6. Findings

The implementation of the State Programme for the Development of Agriculture and Regulation of the Agricultural Products, Raw Materials and Food Market made it possible to increase fruit production in small-scale farming while reducing the area of perennial plantations in fruit-bearing age (Table 01). During 2013-2019, the gross yield of fruits and berries increased from 2232.2 to 2863.8 thousand tonnes, or 28.3%, while the area of fruit-bearing plantations decreased from 323.9 to 315.0 thousand hectares, or 2.7%.

The rate of increase in fruit production varied sharply between small-scale farms. They peaked the highest on farms and small businesses. Here, fruit and berry production increased by 4.1 times and 2.7 times respectively. In households, it increased by only 12.5%. Consequently, horticulture is most successful in farms and small businesses. In these, the area of orchards and berries increased by 17.6% and 95.1%. In households, it fell by 8.2%.

Horticulture is developing more intensively in small businesses and farms. This is evidenced by the rate of growth in orchard and berry yields. The yield of fruit and berry plantations on private farms increased from 49.0 to 141.2 centner/ha, or 2.9 times; on small-scale farms from 37.6 to 98.8 centner/ha, or 2.6 times; on household farms from 76.3 to 90.2 centner/ha, or only 18.2%. This rate of development of horticulture in the small-scale farming sector is due to the level of state support. It is allocated for the development of horticulture only in small enterprises and farms. However, the bulk of the budget funds (over 90%) is allocated to medium and large enterprises (Dibrova et al., 2018).

Table 1. The development of a small-scale horticulture in Russia

Indicators	2013	2014	2015	2016	2017	2018	2019
The total area of fruit and berry plantations, ths. ha:							
small-scale enterprises	63.0	62.1	64.6	69.0	70.9	67.8	74.1
farms	18.5	21.1	24.7	27.7	28.4	31.8	36.1
households	309.9	311.0	305.8	296.2	293.5	292.4	284.5
including at a fruit-bearing age:							
small-scale enterprises	45.1	43.0	42.3	43.3	41.1	39.3	42.3
farms	10.9	13.1	14.4	16.1	15.4	14.9	16.3
households	267.9	270.5	268.0	265.7	264.2	264.1	256.4
Gross harvest of fruits and berries, thousand tonnes:							
small-scale enterprises	119.1	136.7	141.9	201.5	245.4	331.6	325.9
farms	53.4	66.1	80.8	87.1	115.9	150.5	218.9
households	2059.7	2066.6	1966.3	2183.5	1836.4	2140.2	2319.0
Yield, centner/ha:							
small-scale enterprises	37.6	40.8	54.0	66.3	79.2	108.6	98.8
farms	49.0	52.0	57.7	55.8	76.7	116.5	141.2
households	76.3	74.2	73.1	81.8	68.9	80.7	90.2

State support for horticulture in small enterprises takes the form of partial reimbursement of the costs for establishing and caring for perennial plantings before they enter commercial fruiting, and for the uprooting of retired plantings over 20 years of age. In farms, it takes the form of a grant to support a beginning farmer, which is allocated to co-finance the costs of establishing and developing a farm and new permanent jobs in rural areas based on the creation of at least 2 new permanent jobs - 2 million roubles or more, or 1 new permanent job - less than 2 million roubles. There is no state support for the development of horticulture in individual households.

The subjects of the Russian Federation independently determine the subsidy rates per hectare of plantation. Thus, in the Tambov region the size of subsidies for the planting of 1 hectare of the ordinary orchard (number of trees to 800 pieces) is 80.0 thousand roubles (72.8 thousand roubles will be allocated from the federal budget, 7.2 thousand - from the regional budget), 1 hectare of the intensive orchard with more than 800 trees to 1500 pieces - 300 thousand roubles (273 and 27 thousand from the regional budget, respectively), over 1500 pcs. (garden without trellis) - 730 thousand roubles (664,3 and 65,7 thousand roubles), over 1500 pcs. (trellised garden) - 900 thousand roubles (819 and 81 thousand roubles). The size of subsidies for the care of 1 hectare of young plants is 21,9 thousand roubles (19,9 and 2 thousand roubles) and for the uprooting of 1 hectare of old plants is 76 thousand roubles from the regional budget. The current levels of state support encourage the planting of intensive orchards, which have higher yields than conventional plantations.

The structure of the breed composition of fruit and berry plantations varies sharply between small-scale farms. In small-scale farms the share of pome fruits is 79%, stone fruits - 11%, berry plants - 7%; in farms the share of pome plants is 61%, stone plants - 21%, berry plants - 15%; in private farms the share of pome fruits is 33%, stone plants - 35%, berry plants - 30%. Thus, small enterprises and farms have a

higher prevalence of pome fruits, which are less labour-intensive than other crops. The farms of the population mainly grow the most labour-intensive crops - stone fruits and berries.

Horticulture is one of the most labour-intensive branches of agriculture, with an overall mechanization rate of 20-25%. The current distribution of fruit and berry plantation species to small-scale farming is therefore largely due to a lack of labour in horticulture, especially during harvesting.

In the Russian Federation, small-scale horticultures are widespread. In macro-regions with a strong commercial horticulture industry, small enterprises and farms are common. These categories of farms have the highest level of marketability in horticulture, i.e. production is market-oriented. Small enterprises in the Central Black Earth, Southern, North Caucasus macro-regions play an important role in fruit production. Commercial horticulture is concentrated in these macro-regions. The role of small enterprises in fruit and berry production in the Central and South Siberian macro-regions is insignificant. The Northern, Ural-Siberian, Angaro-Yenisei, Far Eastern and West Siberian macro-regions have virtually no horticultural activity.

Farms play a role in the cultivation of fruit and berry products in the North Caucasus macro-region. In this region they account for about 20% of the gross fruit and berry harvest. In macro-regions other than the Southern macro-region, they produce less than 1% of the fruit. In the Southern region, they grow 2.7% of fruit and berry production. Farmers in the Northern and Ural-Siberian macro-regions are not involved in horticulture at all.

The bulk of fruit and berry production in many macro-regions comes from individual households. Their share in the structure of fruit production ranges from 83.7% in the Volga-Ural to 100% in the Northern and Ural-Siberian macro-regions.

Small-scale farms in our country play a major role in fruit production (Table 02). They grow 81.8% of fruit and berry production. Over the period of implementation of the State agricultural development programme and regulation of markets of agricultural products, raw materials and foodstuffs the share of small enterprises increased from 4.4% to 9.3%, the share of farms increased from 2.0% to 6.3%, and the share of individual households decreased from 75.2% to 66.2%.

The development of horticulture in small-scale farming is constrained by the low level of budget financing, difficulties in selling fruit, underdeveloped agricultural cooperation and insufficient amounts of high-quality planting material (Popova, 2015).

The importance of small-scale farms in the production of marketable horticultural products is lower than in the production of gross output. The main producers of fruit and berry products from individual households have a low level of marketability of horticulture, as they grow fruit and berry products for their own consumption and only sell the surplus. In addition, they mismanage their yields, with losses of up to 30%. Households account for 30.4% of the structure of fruit and berry production and 66.2% of fruit production.

The main producers of marketable horticultural products are agricultural organizations. They account for 57.8% of the fruit and berry products sold, although they produce only 27.5% of the gross fruit harvest. The share of farms in the structure of sold products is 11.8%, and they grow 6.3% of the gross harvest of fruit and berry products (Popova, 2015).

The conducted researches testify to the fact that the small-scale farms have reserves to increase the

marketability of fruit and berry production by improving its quality and rational use, reducing losses at all stages of its movement from the producer to the consumer.

The achieved level of fruit production does not solve the problem of food security in our country. In 2019 Fruit self-sufficiency was 40.2% of the threshold of 60%, and affordability was 62% of the threshold of 100%.

Table 2. Share of small-scale farms in fruit and berry production in Russia, %

Indicators	2013	2014	2015	2016	2017	2018	2019
Small-scale farms:	81.6	81.6	81.8	80.9	81.9	78.5	81.8
small-scale enterprises	4.4	4.9	5.3	6.6	9.1	9.9	9.3
farms	2.0	2.4	3.0	2.9	4.3	4.5	6.3
households	75.2	74.3	73.5	71.4	68.5	64.1	66.2

The State Programme for the Development of Agriculture and Regulation of Markets in Agricultural Products, Raw Materials and Foodstuffs provides for the highest rate of development of horticulture in agricultural organizations and farms. By 2025, the gross yield of fruit and berries in this category of farms is planned to reach 1,759,200 tonnes, or an increase of 49.9% compared to 2019. In 2019, agricultural organizations and farms produced 1,181.1 thousand tonnes of fruit and berries, against the 1,095 thousand tonnes stipulated in the State Programme. The plan was implemented at 107.9%. However, the planned rate of development of horticulture in the State Programme will not ensure food security in fruit production and consumption.

In the future, household farms will continue to play an important role in supplying the country's population with fruit and berry products, although their share in the fruit production structure will decrease, but it will not be less than 50%. In 2019, their share was 66.2%. The development of agricultural consumer cooperation is an important prerequisite for the rational use of grown produce in small-scale farming. The creation of marketing and processing consumer cooperatives will increase the marketability of fruit and berry production by involving all the products produced, including those of poor quality, in the commodity turnover.

The development of small-scale horticulture will be facilitated by improved methods and directions of state support and increased allocations from the federal budget. At present, subsidies are provided mainly for planting and caring for young orchards, and little attention is paid to supporting the development of the industry's material and technical base and the development of fruit storage and processing in the sites of fruit production. The majority of the budget is allocated to large enterprises.

According to the Ministry of Agriculture of the Russian Federation, about 45 million seedlings of fruit and berry crops are required annually for the establishment of orchards and berries. Our country grows 24 million planting materials, with 73% of the total production certified. Imports reach 21 million seedlings. Imported planting material is not suitable for orchards in all regions, as it is not adapted to the local natural and climatic conditions. Therefore, a necessary condition for the further development of horticulture in both large enterprises and small businesses is to increase domestic production of high-quality planting material of fruit and berry crops.

7. Conclusion

The small-scale farming sector trends to increase the gross yield of fruit and berries while the area under fruit-bearing plantations decreases. Farms and small businesses have the highest growth rates. There is an increase in fruit and berry production by 4.1 times and 2.7 times respectively. In households, it increased by only 12.5%.

Small-scale farms play a major role in fruit production. They grow 81.8% of fruit and berry production. The factors hindering the development of horticulture in these farms include low budget financing, difficulties in selling fruit, underdeveloped cooperation and insufficient quantities of high-quality planting material. The establishment of consumer cooperatives will make it possible to significantly reduce the loss of produce and increase the marketability of horticulture, which will help saturate the market with fruit and berry products and solve the problem of supplying the population with fruit.

The State Agricultural Development Programme stipulates the highest rate of development of horticulture in agricultural organizations and farms. It plans to increase the gross yield of fruit and berries on this category of farms by 49.9% in 2025 compared to 2019. However, the planned pace of development of horticulture in the State Program will not allow ensuring food security in fruit production and consumption.

Individual households will continue to play an important role in supplying the population with fruit and berry products, although their share in the structure of fruit production will decrease, but it will not be less than 50%. An indispensable condition for the rational use of grown products in small-scale farming is the development of agricultural consumer cooperation. The creation of marketing and processing consumer cooperatives will increase the level of marketability of fruit and berry production by involving all the products produced in the turnover.

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