

REPRODUCTION OF PERENNIAL PLANTATIONS AS A PRECONDITION FOR EFFECTIVE FUNCTIONING OF HORTICULTURE

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Intensive principles of reproduction processes in industrial horticulture in modern farming conditions were considered. The ways of overcoming the negative tendencies and ensuring of sustainable development of the industry were worked up.

Key words: *reproduction of perennial plantations, a branch of horticulture, fruit and berries nursery gardening, qualitative planting material, innovations.*

Horticulture is an intensive agricultural branch of Ukraine. A variety of natural conditions and resources, a stable market demand for fruit and berries products is the favourable precondition for its effective development. However, under market conditions the development of this industry is characterized by instability, decreasing of effectiveness, loss of dominant positions in the domestic market and insufficient using of export potential. This is due to certain violations of structural proportions in industry organisation when production is characterized by a decrease of concentration and specialization, non-observance by enterprises optimal (rational) age structure of perennial plants, insufficient level of innovative processes of development.

The problems of industrial horticulture are widely studied in home science and can be found in scientific works of O.M. Shestopal, O.Yu. Yermakov, V.V. Yurchyshyn, I.I. Cherven, V.A. Ruliev, I.I. Lukinov and others. However, despite of the diversity of existing researches, the importance of this issue, particularly at the regional level, determines the need for further studying.

Methods of the research. The aim of the study is to analyze the current state of reproduction of perennial plants, its assessment and to find solutions for further development of this branch of horticulture. Methods of comparison, system analysis and synthesis, generalization were used to solve the problem.

Results of the research. Achieving a stable production of fruits and berries in any gardening enterprise can be provided by planned reproduction and use of fruit and berry plantations in space and time. The main point of planned plantations reproduction is timely renewal of fruit-bearing plantations, which should be replaced with new ones because of physical or mental wear. Reproduction of fruit plantations is a complex dynamic system which effectiveness is due to many natural, technological and economic factors. Great importance for increasing of effectiveness of reproductive processes in horticulture has a full recording of the quantitative and qualitative features of these factors and selecting those which are crucial at each stage of the branch development [2, p. 170, 3].

The essential part of horticulture is nursery gardening that forms the basis of fruit and berries complex. Fruit and berries nursery gardening is based on getting planting material of known origin with genetically improved properties, providing high productivity of a garden and producing qualitative, environmentally friendly products. The most optimal, environmentally friendly and cost-effective growing is when varieties of fruit and berries are resistant to diseases. Usage of such varieties does not only reduce costs for carrying out protective measures, but also improves the ecological situation in the gardens.

When using new innovative intensive technologies per 1 ha of perennial plantations the required number of apple saplings is about 2, 7 thousand. [1]. Over the period of 2011-2012 years Vinnytsia region produced over 3195,0 thousand plants, 489,0 thousand of them are fruit saplings, 143,9 thousand are berries saplings, 2562,1 thousand are strawberry seedlings which

does not make it possible to provide the region with own planting material (Table 1). Using the saplings which are not from this region at the agricultural enterprises for laying the industrial area become production-testing stations with all the possible risks arising from the use of non-studied and non-adapted to the growing conditions of introductive assortment. Thus, the costs for establishing such perennial plantations should not be reimbursed by the government financing.

The branch with qualitative planting material should be provided in order to perform the state program about the development of industrial horticulture of planting amount of fruit and berries plantations. For this purpose 19 fruits and berries nurseries were certified in the region, namely Podilsk Horticultural Research Station where the main amount of virus-free planting material is grown, "Ahroetalon" LLC in Tyvriv district, "Podillia Plant" CLLC in Vinnytsa district, "Pfanner-Bar" LLC in Bar district, "Kobzar" LTD in Gaisyn district, "Dary sadiv" PE in Mohyliv-Podilsk district and several other enterprises. The production amount of the planting material in non-state enterprises for research period was 2909,0 thousand more compared with state research stations. Scientists are primarily interested in cooperation with nurseries and horticultural enterprises only to implement commercially their technological developments and derived varieties. So the important task is organization of biotechnological laboratories in nurseries where the distribution of new and perspective varieties of domestic selection can be speeded and only healthy planting material can be grown with the means of microclonal method of propagation.

1. Production of planting material at agricultural enterprises of Vinnytsia region during 2011-2012 years, thousand pieces, ha

Varieties of fruit and berries plantations	Agricultural enterprises	including						
		State enterprises	Total	non-state enterprises				
				among them				
				Commercial companies	Agricultural cooperatives	Subsidiary and other non-state enterprises	Private enterprises	Farms
Fruit plantations	489,0	116,3	372,7	202,3	-	-	109,2	60,9
Berries plantations (without strawberries)	143,9	12,7	131,2	103,7	-	-	-	27,5
Runners of strawberries	2562,1	14,0	2548,1	2548,1	-	-	-	-
Fruit and berries plantations	3195,0	143,0	3052,0	2854,1	-	-	109,2	88,4

*Reference: Counted by data of Main Administration of Statistics in Vinnytsia region

Fruit and berries nurseries must become direct distributors of new technologies, work with scientific-research institutions and horticultural enterprises on a contractual basis for a long term. And therefore they will be liable (including financial) for the effectiveness of their products in fruit and berries plantations. Science must be directly involved in the production in a market system and jointly responsible for the results of its scientific advice. We need new

approaches for the development of intensive type of crop rotation, environmentally based systems of using mineral fertilizers, chemical and biological means against weeds, diseases and pests, economical systems of soil irrigation.

The basis of the effective development of nursery as a branch of horticulture is a steady demand for planting material based on the terms of the annual laying of fruit and berries plantations and their reproduction. The territory of fruit plantations by agricultural enterprises of Vinnytsia region for 2011-2012 years was 3.4 times larger compared with the berries plantations (Table 2).

2. The territory of fruits and berries plantations at agricultural enterprises of Vinnytsia region for 2011-2012 years, ha*

Varieties of fruits and berries plantations	Agricultural enterprises	State enterprises	including					
			non-state enterprises					
			Total	among them				
Commercial companies	Agricultural cooperatives	Subsidiary and other non-state enterprises		Private enterprises	Farms			
Fruit and berries plantations	895,3	14,1	881,2	486,3	53,5	35,4	42,8	263,3
Pome fruit	706,2	8,7	697,6	381,3	53,5	35,4	35,2	192,3
Stone fruit	36,4	-	36,4	23,8	-	-	5,2	7,5
Nut plants	50,2	-	50,2	-	-	-	-	50,2
Berries plantations	102,5	5,4	97,1	81,3	-	-	2,5	13,4

*Reference: Counted by data of Main Administration of Statistics in Vinnytsia region

Analysis of the data indicates that during the research period the laying territory under pome varieties is 706,2 ha (78,9 %) within the newly established gardens. Stone fruit trees were planted in the smallest amount – 36,4 ha (4,1%). The largest laying territories under fruit and berries plantations were made by commercial companies (54,3 %) and farms (29,4%) in 2011-2012 years among the total number of agricultural enterprises. However, available areas of laying young perennial plantations are insufficient to compensate the decline of gardens in Vinnytsia region.

Abundance of normative correlation between areas of fruit-bearing and young orchards and berries plantations, that is, the optimal age structure of perennial plantations is a necessary condition for sustainable fruit and berries production. The reproduction of fruit and berries plantations is realized due to the system organization of planned reproduction of plantations in territory and time (Table 3). Because of the physical and moral wear a certain part of perennial plantations is withdrawn from productive circulation and needs replacing with new elements. Failure of this natural feature results, in practice, on the one hand, to reduction of the total area under plantations, and on the other hand to reduction of their productivity.

3. Reproduction of fruit and berries plantations at agricultural enterprises in Vinnytsia region for 2011-2012 years *

Plantation areas, ha		Laying of young gardens, ha	Withdrawn from productive circulation	Index of laying	Index of withdrawing	Laying area to withdrawing area ratio	Withdrawing area to laying area ratio
At the beginning of the period	At the end of the period						
Fruit and berries crops - total							
14305	14610	895,25	589,75	0,06	0,04	1,52	0,66
including pome fruit							
13084	13256	706,20	534,20	0,06	0,04	1,32	0,76
stone fruits							
705..	650	36,4	91,4	0,06	0,15	0,40	0,76
nut plants							
108	177	50,2	-18,3	0,26	-0,15	-2,74	-0,36
Berries nurseries							
479	542	102,5	39,0	0,19	0,08	2,63	0,38

*Reference: Counted by data of Main Administration of Statistics in Vinnytsia region

Reproduction of fruit and berries plantations during 2011-2012 years at the agricultural enterprises shows that the index of laying (0,06) exceeds the index of withdrawing (0,04) by increasing the area under pome, nut and berry nurseries. So, the important factor in the intensification of horticulture branch is a planned reproduction of perennial plantations. Innovations are realized through the forming of new orchards and berry nurseries [4]. Time of productive usage of apple plantings on vegetative dwarf rootstock is only 12-15 years and on seed rootstock is 20 years. Decreasing of production amount of fruit and berries in many diversified and specialized enterprises is explained with the late replacement of old plantations with the new ones, which may lead to partial or complete loss of fixed capital goods and labor equipments by an agricultural enterprise.

Conclusions. Selection and nursery gardening, improvements of planting material, creating a net of scientific-research institutions are of the prior importance for intensive development of gardening branch. Their centers could be existed scientific-research institutions and newly created subdivisions of specialized horticultural enterprises. Increasing of fruit and berries production will be achieved only by planned reproduction of fruit and berries plantations which lies in timely renewal of fruit-bearing plantations, which should be replaced with new productive varieties from this region because of physical or mental wear.

The next step in the revival of the industry should be a gradual development which must be based on transformation of old or forming new competitive advantages of production by increasing its quality, ecological properties, insurance coverage, etc. Final stage in revival process should become innovative-investment development of the branch which foresees its structural reorientation, buying new facilities, advanced technologies, taking part in the processes of integration and globalization.

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