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Effectiveness of cultivation of new types of intensive plantings of sweet cherry in Forest-Steppe region

Objective. Identify the most effective types of intensive orchards in the Forest-Steppe, which would provide high profitability and competitive yield levels. **Methods.** Constructive-calculation, normative and comparative. **Results** It has been established that the cost of creating gardens on vegetatively propagated rootstocks is paid for 1,2 - 1,8 years earlier than seed. **Conclusions** New domestic types of gardens are economically profitable, because they require smaller capital investments, provide high productivity and merchantable quality of products, which is competitive on the domestic and foreign markets.

Key words: cherry, planting type, yield, capital investments, profit, competitiveness.

According to FAO [7], Ukraine now occupies 6th place in the world in terms of productivity of cherry trees, which in the last 3 years (2011-2013) is 6.1 tons / ha. However, reserves for the further growth of this indicator are practically exhausted due to the annual reduction of areas under the gardens, the use of low-yielding varieties, rootstocks, labor-intensive cultivation technologies, etc. For the recoupment of production costs and high profits the yield of high-yielding cherry fruit should be 10 - 15 t / ha [4, 8, 9]. Therefore, the main direction of increasing the productivity of plantings of this crop is their comprehensive intensification, the main link of which is the type of garden, and the components are the rootstock, the variety, the planting scheme and the crown shape. Given the extremely favorable conditions of the internal and external markets of cherry fruit due to the shortage of these products and high demand for it, domestic competitor types of plantings should be offered for production, which would significantly improve the profitability of gardening state supplies. The purpose of the research is to determine the most effective types of intensive cherry-nesting in the forest-steppe, which would provide high profitability and competitive yield levels. **Research methods.** The economic efficiency of growing crops in the plantings of the Institute of Horticulture of NAAS and its research facilities at the state enterprise "DG" Novosilky "IS NAAN with the help of constructive-calculation, normative and comparative research methods [5] is analyzed.

According to FAO [7], Ukraine now occupies 6th place in the world in terms of productivity of cherry plantings, which is 6.1 tons per hectare in the last 3 years (2011-2013). However, reserves for the further growth of this indicator are practically exhausted due to the annual reduction of areas under the gardens, the use of low-yielding varieties, rootstocks, labor-intensive cultivation technologies, etc. For the recoupment of production costs and high profits the yield of high-yielding cherry fruit should be 10 - 15 t / ha [4, 8, 9]. Therefore, the main direction of increasing the productivity of plantings of this crop is their comprehensive intensification, the main link of which is the type of garden, and the components are the rootstock, the variety, the planting scheme and the crown shape. Given the extremely favorable conditions of the internal and external markets of cherry fruit due to the shortage of these products and high demand for it, domestic competitor types of plantings should be offered for production, which would significantly improve the profitability of gardening state supplies. The purpose of the research is to determine the most effective types of intensive cherry-nesting in the forest-steppe, which would provide high profitability and competitive yield levels. **Research methods.** The economic efficiency of growing crops in the plantings of the Institute of Horticulture of NAAS and its research facilities at the state enterprise "DG" Novosilky "IS NAAN with the help of constructive-calculation, normative and comparative

research methods [5] is analyzed. Research results. The determining factor in choosing a garden type is its capital intensity. The research has established that the planting of cherries on vegetatively propagated subspecies with dense tree planting is the most capital-intensive and time-consuming at creation and requires higher production costs during the period of their productive use. Thus, capital investments and labor costs for the creation of 1 hectare of cherry plantations on the rootstocks VSL-2 with a spindle-shaped crown (a scheme of seeding 4,5x2,0 m) and Studenikovskaya with a rounded crown with a reduced area of bearing (4,5x2,5 M) were higher in 1,2 - 1,3, and the cost of labor per 1 hectare - 1,2 - 1,4 times than on the control on the rootstock antipka (the scheme of planting 6x3 m, the crown is round). At the same time, the cost of recoupment is 1.2-1.8 years earlier than in seedlings on seedlings. The lowest capital intensity (60 ths. UAH / ha) was for the creation of cherry trees on wild squirrel cherries with a density of 417 trees / ha. The newest foreign technology of gardening is characterized by even higher costs when creating and using, as it involves gardening with a film, grid, or the use of high tullable shelters without the risk of losing frost, rain, hail or bird damage with obligatory installation of irrigation systems and fertigation [6]. Due to the excessive density of trees and the high degree of their trimming, it is necessary to intensify the use of means of protection against pests and diseases, and in order to increase the weight of the fruits, there are also growth regulators [2, 10]. Taking into account all these expenses, 1 hectare of such a garden under the film (the scheme of placement 3,5x1,5 m) in Ukraine will cost 384 thousand UAH, in high tunnel shelters - 574 thousand UAH, which is 4,2 - 6,2 Times more than in the Ukrainian technology under the scheme of 4,5x2,0 m. In such high-rise gardens production costs make 112,3 - 114,0 thousand UAH per 1 hectare, and the cost of production is increased by 38,0 - 67,4%. In the case of the implementation of modern foreign technology of production of fruit cherries in full, we will receive products, which at cost will be similar to the prices of the European market (6 - 14 euros per 1 kg).

Thus, the fruit cherries obtained such technologies are uncompetitive in the domestic market and can realizovuvatysya only for export, provided there is a niche for marketing and enterprise got the international quality certificates required in the country, where's put plans Of this product. However, the receipt of such certificates - a long and expensive procedure, which will directly affect the increase in the cost of production and the prices of its implementation. Only the large enterprises of the agro-industrial complex or similar firms with foreign capital can engage in export supply of the products. An important element of a modern garden is the use of fast-growing high-yielding varieties. For skoroplidnistyu and produktyvnistyu all stands for vegetatively propagated rootstock varieties differed among domestic variety Donchanka with the highest average yield on the rootstock Studenykivskiy - 19.2 t / ha [3], among inozemnyh - Regina on rootstock Gisela 5, Secured 18.9 t / ha. In seeds, including wild cherries, the most effective vykorystannya varieties Lubava malo-habarytnoyi form with the formation of the crown, where stanovyla yield 16 t / ha (Table). These domestic varieties were characterized by high commodity of fruits and ensure the highest level of wholesale price of sales for the last 3 years (2011-2013) - 15 UAH / kg. In this connection, during the comparative estimation of the best foreign types of gardens, the price of realization of the fruits of the Regina variety was 15 UAH / kg. Among the domestic types of gardens, the highest payback period (6.6 years) is noted on the seed stock of wild cherries, which is explained by the later introduction of trees into fruiting. Such gardens, thanks to the high stable yield, provide forests with a unit area of 127.1 thousand UAH and a profitability of 187.2%. In the gardens on the subsoil VSL-2 also achieved a significant annual economic effect of 1 hectare in the range of 114.0 - 128.8 thousand UAH, and the early introduction of forage during the period of bearing fruit provides a return on investment for 5, 1 - 5.2 years. The best indicators of economic efficiency were noted in the cherries of the Donchanka variety on the base of Studenikovska, where twice the density of trees (889 trees / ha) and high yield yielded a profit of 197,700 UAH / ha, and the level of rent- Was 219%. Such gardens enter the fruiting at the 4th year after planting and provide the return on capital investments at the 5th year after planting, when the positive monetary cash is 81 thousand UAH. During the laying of gardens for best foreign technology uses 2-year kronovanyy propagating material, so start fruiting usually takes place on the 2nd, after receiving sadiny and harvest volume of at least 0.8 t / ha. It should be noted that the

establishment of irrigation system and fertigation (30 thousand hryvnias) and the system of protection against rain and hail (230 thousand hryvnias) significantly affects the increase in the payback period of investment in production. Even higher by 5.7 t / ha yield on the 5 th year after planting in the on-planting on rootstock Gisela 5 kapi-talnyh return on investment is only the 7th year after planting, when the positive cash flow of 401.8 Thousand UAH In tunnel shelters, the return on investment takes place over 12 years. When evaluating different types of gardens, it is important to compare the time spent on the income from fruit sales. For 14-year period, stands on the rootstock Gisela 5 with the scheme of planting 3,5x1,5 costs exceed the amount of income is only 1.3 times, at the same time as the rootstock Studenykivskiy the scheme of planting 4,5x2,5 m - 2.4 Times This is again confirmed by the higher capital and labor cost of growing high-density plantations. Increasing the efficiency of production costs in such gardens is possible only to increase the level of mechanization of planting care work.

Comparative economic assessment of different types of cherry plantations

At the same time, during the 14-year period in the planting of sweet cherries, the Donchanka variety on the Studenikivs'kyi substrate, laid out with one-year cement material with a density of 889 trees / ha, even without application of irrigation and protection against hail and rain, in the conditions of the forest-steppe, Net profit in the amount of 2009.2 thousand UAH, which is 475.5 thousand UAH more than in the gardens of sweet cherry variety Regina on the rootstock Gizel 5 with a density of 1905 trees / ha. The reliability of our calculations is confirmed by the data of the German scientist MS Weber, who conducted research in cherry plants on the substrate Gizella 5 with a scheme of planting 3.5x1.5 m. Thus, in the 10th year of research, the cash flow, according to him, amounted to 856.9 thousand UAH [1]. Therefore, in today's difficult economic conditions, due to the low purchasing power of the population, the lack of state financial support for gardening, excessively high interest rates on long-term loans, the introduction of high-cost foreign technology in Ukraine is quite problematic and unprofitable.

Conclusions

Research has found that the best indicators of economic efficiency are the domestic types of intensive planting using the Lyubava variety on the rootstock of wild cherry tree with a small-sized crown (417 trees / ha) and the Donchanka variety on the substrate VSL-2 with a small size (889 trees / ha) and spindle-like crowns (1111 trees / ha) and on the Studenikivskyi rootstock with a rounded crown with a reduced frontal area (889-1000 trees / ha). Use in the gardens of the Donchanka variety on the Studenikovskaya rootstock (889 trees / ha) provides a 4.7-fold reduction of capital expenditures on their creation and obtaining 1.3 times the total net profit than in comparable foreign plantings of the Regina variety on the substrate Gizella 5 (1905 trees / ha). In the difficult economic conditions of today, the use by economic agents of the proposed methods of creation and productive use of intensive plantings, primarily due to a significant reduction in the quality of their investment, will provide highly profitable cultivation of sweet cherries. This will give the opportunity to receive large wholesale lots of competitive products for the satisfaction of the needs of the domestic market and increase its export volumes.

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