Increasing the Efficiency of Walnut Production In the Frame of Food Safety Programs

**Abstract:** The relevance of the article lies in the modern interest of the walnut industry of Uzbekistan. The article describes the benefits of walnut plantations, their importance in the global consumer market. It describes the current state of walnut plantations in Uzbekistan, the ongoing reforms in this industry and their results.

**Keywords:** Uzbekistan, walnuts, efficiency of walnut production, walnut import, walnut export.

**Introduction.**

In order to meet the needs of an increasing population for food products today, the production of high-quality and high-calorie food products is considered important by all countries on earth. The walnut industry occupies a special place in this direction.

3.76 million tons of walnuts are produced annually in the world. China grows 1.79 million tons of walnuts per year and is the largest walnut producer in the world. The next place is the USA, the production volume of walnuts is 0.61 million per year on average. tons. China, the United States, Iran, Turkey and Mexico are the world's largest walnut-growing countries, accounting for 79 percent of the world's total walnut production.
The total export of walnuts from these countries is 676.3 million US dollars\(^1\). Looking at the intercontinental breakdown of gross walnut production between 2010 and 2020, Asia led the way with a 59.6% share. The smallest indicator corresponded to the contribution of the countries of the Oceania continent, and they produced 0.1% of the production.

According to the analyzes of the Food and Agriculture Organization (FAO), in the context of global climate change, it is not possible to fully satisfy the needs of people for food at the level of the countries of the world.

The main reasons for this can be explained by the natural growth of the population, the deterioration of ecological processes, the increase in the average annual temperature, the decrease in the average annual rainfall, the increase in droughts, and the decrease in the size of agricultural land as a result of industrialization.

These factors can lead to the cultivation of walnuts, the optimal distribution of walnut species, taking into account the soil and climatic conditions of the regions and an increase in the cultivation of walnuts, as well as a decrease in the quality of walnut fruits and disease.

According to an analysis of the indicators of growing walnuts in the context of improving the food supply of Uzbekistan in 2021, walnuts were grown on 8527 hectares, and this figure increased by 1.14 times compared to 2017. It was also noted that the yield of walnuts in 2017 amounted to 117.7 t/ha, and by 2021 this figure increased by 29.9 t/ha or 125.4 percent. In addition, in 2021, the average yield of walnuts in Andijan region amounted to 231.3 t/ha, an increase of 1.14 times compared to 2017. The annual consumption of walnuts in the republic averages 1.8-2.4 kg\(^2\) per person.

Considering that this indicator is 6.2 times less than the medical norm, today the study and analysis of the organizational and economic aspects of walnut production in Uzbekistan through the development of intensive walnut cultivation is considered one of the topical issues.

Analysis of literature and methods. The studies were carried out by H. Adem and Peter H. Jerry, Larry Harper, William Kurtz, etc. Also by Russian economists such as Nazranov Kh.M., Chemazokova Z.Z., Salvaridze L.Kh., Nakonechnaya O.A., Khashir A.A., M. Bakhshinejad.

Scientific-theoretical solutions aimed at improving the economic basis of fruit and vegetable growing, cooperative relations, intensive horticulture in the agriculture of Uzbekistan O.’Umurzakov, N.Khushmatov, O.Jumaev, Kh.Khushvaktova, Ch.Murodov, S.Eshmatov, O.Sattorov, It is reflected in the research works of a number of agrarian economists such as N.Ashurmetova, O.Norbekov, F.Polvonov. However, in the works of the above scientists, the features, economic efficiency and organizational and economic aspects of growing walnuts as a subject of research have not been studied in detail.

Indicators of economic efficiency of growing walnuts in the conditions of Uzbekistan are a relatively new direction and have only been partially studied in the framework of a number of studies in the field of fruit growing. Also, the demand for walnuts and walnut products increases during the period of intensive development, when new organizational and economic mechanisms are being implemented in the context of sustainable development of agriculture.

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Results. To date, seedlings of more than 20 varieties of rare high-yielding walnut varieties have been grown. It also grows seedlings of black walnuts, chestnuts, hazelnuts, pecans, almonds, pistachios and other nuts. When growing seedlings, walnut varieties with different ripening periods were selected, and it will be possible to collect them within 2 months. The total area of the farm is 6 ha, 1 ha of land is being built as a greenhouse for the purpose of growing seedlings, and 5 ha of land is planned for creating gardens for the purpose of intensive reproduction.

<table>
<thead>
<tr>
<th>Indicators</th>
<th>2017 y</th>
<th>2018 y</th>
<th>2019 y</th>
<th>2020 y</th>
<th>2021 y</th>
<th>in 2021 compared to 2017, %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Area, hectares</td>
<td>7505</td>
<td>10958</td>
<td>16128</td>
<td>14144</td>
<td>8527</td>
<td>113,6</td>
</tr>
<tr>
<td>Gross yield, tons</td>
<td>65463</td>
<td>59758</td>
<td>67733</td>
<td>79141</td>
<td>79300</td>
<td>119,2</td>
</tr>
<tr>
<td>Growth rate compared to last year, %</td>
<td>x</td>
<td>91,2</td>
<td>113,3</td>
<td>116,8</td>
<td>98,6</td>
<td>-</td>
</tr>
<tr>
<td>Yield, c/ha</td>
<td>117,7</td>
<td>122,0</td>
<td>120,3</td>
<td>123,2</td>
<td>147,6</td>
<td>125,4</td>
</tr>
</tbody>
</table>

In 2021, walnuts were grown on 16,128 hectares of land in Uzbekistan, which increased by 2.1 times compared to 2017. Gross harvest increased by 113.6% between 2017 and 2021 and decreased by 98.6% over that period. It can also be seen that the walnut yield in 2017 was 117.7 t/ha, and by 2021 this figure increased by 29.9 t/ha or 125.4 percent. Compared to 2020, the growth rate decreased by 98.6 percent (Table 1).

In 2021 the share of walnut production is higher in the Republic of Karakalpakstan (increase by 2.4 times), Andijan (2.1 times), Bukhara (4.9 times), Jizzakh (1.94 times), Navoi (2.02 times), Tashkent (1.9 times), Namangan (1.8 times) and Ferghana regions (2.39 times). In this period walnut production decreased in Kashkadarya (30.8%), Samarkand (82.3%) and Surkhandarya (46.2%) regions. The main reason for this was the felling of walnut forests in mountainous and foothill areas, the emergence of various diseases, the lack of selection of varieties suitable for the climate, and the process of low water in the regions (Table 2).

<table>
<thead>
<tr>
<th>Regions</th>
<th>2017 y.</th>
<th>2018 y.</th>
<th>2019 y.</th>
<th>2020 y.</th>
<th>2021 y.</th>
<th>in 2021 compared to 2017, %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Uzbekistan</td>
<td>65463</td>
<td>59758</td>
<td>67733</td>
<td>79141</td>
<td>79300</td>
<td>121,1</td>
</tr>
<tr>
<td>Republic of Karakalpakstan</td>
<td>10</td>
<td>13</td>
<td>16</td>
<td>13</td>
<td>24</td>
<td>240</td>
</tr>
<tr>
<td>Andijan</td>
<td>12164</td>
<td>21146</td>
<td>22185</td>
<td>28392</td>
<td>26232</td>
<td>215,7</td>
</tr>
</tbody>
</table>

3 Calculated on base of the information of State Statistics Committee of Uzbekistan
4 Calculated on base of the information of State Statistics Committee of Uzbekistan
In recent years, much attention has been paid to the development of the walnut industry, and the trend of its development is to further increase the volume of walnut cultivation using modern innovative methods, growing productive varieties suitable for the natural and climatic conditions of the region selected in the laboratory, pay attention to the development of nurseries, and develop modern marketing methods in the trading system. The creation of walnut plantations, focusing on the creation of large plantations with an area of 2-3 hectares for farmers, creates an opportunity to increase the income of the population.

**CONCLUSION**

If we consider the periods after independence, then the first period of economic reforms in the industry includes 1990–2002, the second stage is the period of deepening reforms in the industry, including 2003–2016, at the beginning of this period, walnut production gradually increased, and the consumption of the population also increased per capita. As the 3rd stage, it is named as the period of successive structural changes in the industry and covers the years after 2017. At this stage, the industry is undergoing rapid changes and reforms, increasing the production of walnuts with the help of modern resource-saving technologies and intensive methods.

In 2021 the share of walnut production is higher in the Republic of Karakalpakstan (increase by 2.4 times), Andijan (2.1 times), Bukhara (4.9 times), Jizzakh (1.94 times), Navoi (2.02 times), Tashkent (1.9 times), Namangan (1.8 times) and Fergana regions (2.39 times). In this period walnut production decreased in Kashkadarya (30.8%), Samarkand (82.3%) and Surkhandarya (46.2%) regions.

If consider at the analysis in the context of all categories of farms, it can be seen that the weight of walnut production is mainly accounted for by farms, that is, in 2017, 60,217 tons were grown, and by 2021, it can be seen that 74,648 tons will be grown or 124.0% more. Farmers account for 94.1 percent of the total walnut crop grown in 2021. In 2021, compared to 2017, walnut production in farms decreased by 92.1 percent.

As a result of the development of high demand products in Uzbekistan, such as walnuts, hazelnuts, almonds, pistachios, some consumers buy nuts at relatively low prices to save on transport costs. In general, the organization of growing walnuts in our country by the bush method expands the possibilities of meeting the needs of the processing industry for raw materials.
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