

Improving the Economic Basis of Walnut Cultivation

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Abstract: The possibility of establishing cost and income formation and high investment efficiency in the effective use of agricultural land in the current water resource shortage, drought-resistant walnut groves that can be used at the expense of natural precipitation or low-cost options in the intensive irrigation system was substantiated. The volume of land resources required for the production of one unit of walnut is 67.1-47.5 percent, which is the basis for the increase in the consumption of other types of resources. When giving conclusions based on scientifically based results, the assessment of resource efficiency in walnut cultivation in the traditional way was calculated in the minimum and maximum limits.

Keywords: Uzbekistan, walnut production, efficiency, intensive method, maintenance costs.

The sustainable development of the walnut industry in Uzbekistan depends first of all on the correct assessment of the economic efficiency of the production, processing and sales processes, on the scientifically based use of all opportunities to increase efficiency, i.e. internal and external factors. Because the favorable natural and climatic conditions are fully compatible with the development of resource-efficient sectors in agriculture. According to the results of scientific research, the possibility of establishing cost and income formation and high investment efficiency in the effective use of agricultural land in the current water resource shortage, drought-resistant walnut groves that can be used at the expense of natural precipitation or low-cost options in the intensive irrigation system was substantiated.

Based on scientifically based standards of labor and material resource consumption required for the production of agricultural products, "Sample technological tables for the production of agricultural crops" and based on the conducted researches, establishment of walnut groves on one hectare in different ways, maintenance costs and incomes, as well as efficiency indicators was comparatively analyzed (Table 1).

The results of the analysis show that even if the minimum yield and product price are calculated at prices 25-30 percent lower than the retail prices, the income from production per hectare in the traditional method is 42059-51467 thousand soums, and in the intensive method it is 86838-103549 thousand soums. Production profitability levels will be 150.4 and 329.5 percent, respectively.

Table 1. Average economic efficiency indicators of walnut cultivation in different ways per one hectare of land (in 2020 prices)

Indicators	Unit	In the traditional way, according to varieties		In an intensive way, by varieties	
		Ideal	Chandler	Ideal	Chandler
Costs of establishing a walnut grove on 1 hectare of land	thousand UZS	13164	14926	133657	136755

Annual maintenance costs of 1 hectare of walnut grove, (when fully harvested)	Total	thousand UZS	14577	15491	19446	22263
	Salary		5559	5915	7414	7919
	Material costs and other		9018	9576	12032	14344
Productivity during the main crop periods of walnut groves	5 year	c/ha	5,3	8,4	10,5	16,4
	7 year	c/ha	10,1	15,3	22,2	32,1
	10-15 years	c/ha	25	31,2	54,4	65,5
Average indicators, from 1 hectare of walnut grove (when fully harvested)	Income	thousand UZS	42059	51467	86838	103549
	Net profit	thousand UZS	21923	30061	59978	73367
Efficiency		%	150,4	194,1	308,4	329,5

Source: "Sample technological tables for the production of agricultural crops for 2016-2020 years" and calculations of author

The trends among the data presented in the table are mainly due to walnut cultivation methods, walnut varieties, land relief, planting scheme, i.e. seedling consumption per hectare. It is worth noting that, in the establishment of walnut plantations, these account books serve as a basis for product growers and investors to assess various economic and financial risks and draw appropriate conclusions.

Based on the account books, it can be seen that the difference between the costs associated with the establishment of one hectare of walnut plantation is 8-9 times higher in the intensive method. However, it can be noted that intensive walnut cultivation is effective through the following aspects:

- 3-4 times the number of seedlings planted per hectare of land in an intensive method;
- high possibility of effective use of water and mineral fertilizers through intensive drip irrigation;
- high level of labor mechanization in product cultivation;
- ease of product quality control and management;
- high efficiency and effectiveness of disease and pest control;
- rapid fruiting of intensively established groves and implementation of relevant agrotechnical measures;
- facilities for collecting the product and carrying out other agrotechnical activities;
- despite the 8-9 times higher costs associated with planting a garden in an intensive way, these costs will be fully compensated in 3-4 years after the garden is fully harvested due to the introduction of high resource-saving technologies.

Table 2 shows the resource efficiency in walnut cultivation. The land area required for the production of 10 tons of walnuts, the number of walnut seedlings, the required irrigation water, mineral fertilizers, fuel-lubricants, labor costs, grove establishment costs, and annual maintenance costs were compared in different methods of product cultivation.

Table 2. Assessment of resource efficiency in walnut cultivation technologies (when fully harvested, in 2020 prices)

№	Indicators	Unit	For 10 tons of walnuts		In the intensive method compared to the traditional
			In local conditions		
			Traditional	Intensive	

			method	method	method, %
1.	Cultivated area	hectares	1,7-2,4	1,14	67,1-47,5
2.	The number of seedlings	piece	360-508	319	88,6-62,7
3.	Irrigation water	m ³	3600-6192	5341	148,4-86,3
4.	Mineral fertilizers (all)	kg	283-447	316	111,7-70,7
5.	Fuel	liter	374-528	328	87,7-62,1
6.	Labor cost	person/hour	2150-3024	1539	71,6-50,9
7.	Grove establishment costs	thousand UZS	17280-24384	143550	8,3-5,9 times
8.	Annual maintenance costs	thousand UZS	21382-30187	17609	82,3-58,3

Source: "Sample technological tables for the production of agricultural crops for 2016-2020 years" and calculations of author

The conclusions show that the volume of land resources required for the production of one unit of product is 67.1-47.5 percent, which is the basis for the increase in the consumption of other types of resources. When giving conclusions based on scientifically based results, the assessment of resource efficiency in walnut cultivation in the traditional way was calculated in the minimum and maximum limits.

Because, in the cultivation of walnut products on the farmlands of small households, the costs mentioned above, depending on the size, number of seedlings and other similar factors, are practically not realized and the accounts are not recorded. However, the traditional way of growing walnuts on large areas of land limits the possibilities of efficient use of resources. From this point of view, the following strategic tasks have been determined by the state management system in the effective use of agricultural land and development of horticulture.

- destruction of old and ineffective groves, establishment of new intensive orchards and greenhouses;
- establishment of groves and greenhouses in the form of plantations (not less than 20 hectares);
- organization of groves and greenhouses, conducting agrotechnical activities and monitoring the production;.
- selection and designation of walnut clusters.

Today, statistical accounting of main product producers from the point of view of ownership, lack of formalization of economic processes in preliminary and summary documents limits the possibility of obtaining accurate conclusions in the evaluation of costs and incomes in walnut cultivation, as a result, management decisions in the field have to be made based on approximate data.

Taking into account the high internal possibilities of the sustainable development of the walnut industry in Uzbekistan, the provision of walnut products to the domestic and foreign markets, the correct definition of strategic plans requires, first of all, a scientifically based complex and systematic approach to the organization of the industry. Tasks and measures aimed at eliminating problems in each structural part should be determined.

The supporting policy of the state plays an important role in the development and improvement of the productivity of walnut farming. Today, it is desirable to increase the volume of walnut cultivation,

store and process it, introduce intensive and resource-efficient digital technologies, and implement government incentives in this regard.

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