Journal of Contemporary Issues in Business and Government Vol. 27, No. 1, 2021
P-ISSN: 2204-1990; E-ISSN: 1323-6903
https://cibg.org.au/

Resource-saving technologies in the cultivation of walnuts in terms of conomic evaluation methodological approaches

Khushmatov Norqul Sadullaevich[1], **Abror Inobatov Boshlarovich**[2]
[1]*Agriculture and food supply research and production center*
[2]*Tashkent State Agrarian University*

Abstract: This article describes the technological features of walnut cultivation in Uzbekistan, evaluates the possibility of introducing cost-effective agro-technologies in the production process. The authors recommend an evaluation method, emphasizing the need for an economical evaluation of each economical agrotechnology. Resource-saving technologies can be selected in terms of its cost-effectiveness.

Key words: Walnut, walnut diseases, material resources, intangible resources, absolute resource savings, relative resource savings, agrotechnical measures.

The lack of complex agro-technologies in the cultivation of walnuts in Uzbekistan is due to the fact that walnuts are grown mainly in mountainous areas, in residential areas. The establishment of walnut plantations has only just begun. Although the walnut tree needs less attention than other fruit trees in caring for it during the growing season, in addition to feeding, the walnut is very sensitive to disease and pest control measures. As a result of the implemented agro-technical measures, there is a significant improvement in the yield of nuts and fruit quality.

Experts believe that walnuts are more susceptible when grown on low-yielding, non-nutritious rocky soils due to exposure to diseases and pests. Old trees, especially those whose branches are not cut, are a breeding ground for diseases and pests, which require appropriate agronomic techniques [1].

Due to the traditional cultivation of walnuts in Uzbekistan by rural families and the occasional planting of walnut trees on the edges of roadsides, roadsides, rocky areas, feeding and control of diseases is not systematized. Also, the nut business is a new industry for Uzbekistan in its modern form, so little attention is paid to it as a lucrative industry.

Due to the above features, one of the important tasks for scientists today is to develop resource-efficient agronomic techniques for growing walnuts in the country, to promote knowledge among walnut growers, to promote its introduction.

The development of walnut cultivation in Uzbekistan, the establishment of plantations, the development of diseases and insects specific to walnuts. In particular, some of the most common diseases of walnuts today are White Spots (Microstroma juglandis Sacc fungi), Gray

Spots, or Marsoniosis (Marssonina Juglandis fungus), which infect up to 50 percent of the walnut crop. possible [2].

One of the most dangerous diseases of walnuts is Bacteriosis (Xanthomonas campestris px juglandis), which infects all organs of the tree, causing severe damage during flowering and destroying up to 90% of the crop, leaving the tree almost barren.

Walnut Root Cancer (the causative agent of the disease Agrobacterium tumefaciens Smith & Townsend bacteria) leaves the tree trunk and fruit without nutrients, resulting in the death of the crop [3].

Among the pests that cause severe damage to the walnut crop and the economy of walnut growers, there is the "Walnut Cane" (ore clamp- Eriophyes tristriatus Nal Eriophyes tristriatus Nal). Insects feed on walnut leaves and cause strong negative pathological changes in the plant. The underside of the leaves is well protected - the net is wrapped with bark.

"Apple fruit" (yab¬lo¬ne¬vaya plo¬do¬jer¬ka) - Laspeyresia pomonella L. - the larva of the insect, along with other fruits, completely destroys the walnut crop due to its penetration into the fruit or reduces the quality of the crop (Figure 1). The “American white butterfly” damages 250-300 species of plants, causing not only 70-80% of the crop to die, but also the walnut tree to wither due to damage to the walnut leaves [4].

Figure 1. Infected walnuts with apple cider vinegar

Thus, agro-technical measures related to the protection of plants from diseases and pests are important in ensuring the economic efficiency of walnut cultivation, including the use of resource-saving methods and tools.

The importance of resource conservation in the agricultural sector is growing due to the growing scarcity of resources. In our view, resource-saving measures in the cultivation of walnuts on farms are carried out within the following resources (Figure 2).

The labor force at the disposal of nut-growing entities. It consists mainly of employees hired on a permanent basis under employment contracts, who are structurally appropriate employees with the appropriate skills and ability to work (on farms or other business entities). On farms, on the other hand, labor can be hired for short-term separate jobs, mainly due to the use of family labor. Temporary (seasonal) workers may also be hired by walnut growers during the harvest season. In particular, in the period of shaping the walnut tree, during the harvest, walnut growers will need additional hired workers for a short period. This need arises due to the complexity of climbing the tree due to the height and size of the walnut tree and at the same time the skill required in shaping the tree.

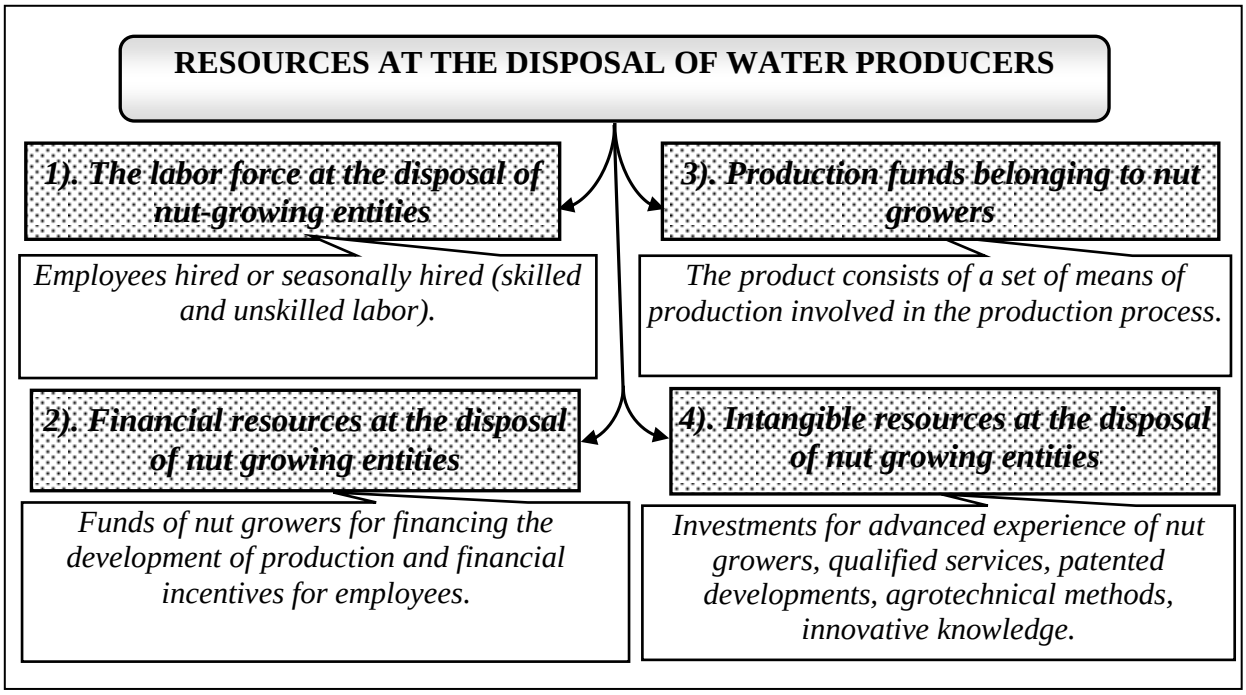

Figure 2. Composition of resources used in the savings system at the disposal of nut growers [5]

Financial resources at the disposal of nut growing entities. These resources are mainly aimed at the development of walnut production, the fulfillment of financial obligations of walnut growers to various economic entities, financial incentives for workers. Financial resources consist of the financial resources of nut-growing entities - the benefits of their activities and attracted (bank loans or sponsorship funds).

Production funds belonging to nut growers. The means of labor involved in the production process (trees, agricultural machinery, vehicles, technological equipment for storage and processing of products, equipment for processing trees during the growing season, etc.), in

turn, means of labor (land and water, seeds, mineral fertilizers, insect repellents, petroleum products, etc.). At the same time, saving water and chemicals is economically and environmentally important.

Intangible resources at the disposal of nut growing entities. Intangible resources are the experience gained on farms, patented developments, methods of processing trees, funds spent on the acquisition of new knowledge, trademarks, the right to use agricultural land on a lease basis. However, the consumption of these resources is not currently significant in the cost of the product.

Hence, the issue of resource conservation within the agro-technologies used in walnut cultivation should be implemented on the first, second and third resources shown in Figure 2.

In this case, resource conservation means that in the process of resource use, the relative stability of the amount of resource consumption is maintained in order to increase (or not decrease) the production of nuts in terms of quantity and quality. The task of the resource-saving system is to save resources, that is, to save resources through the use of less resources or the use of new technologies.

The basis of resource savings is to achieve quality and timely implementation of agro-technical measures through the area of walnut plantations or less resource consumption at the expense of a single walnut tree. At the same time, the introduction of irrigation, feeding systems or methods of pest and disease control, formed on the basis of the experience of nut growers, provides absolute and relative cost savings. Therefore, special attention should be paid to the issue of absolute and relative saving of resources (Figure 3).

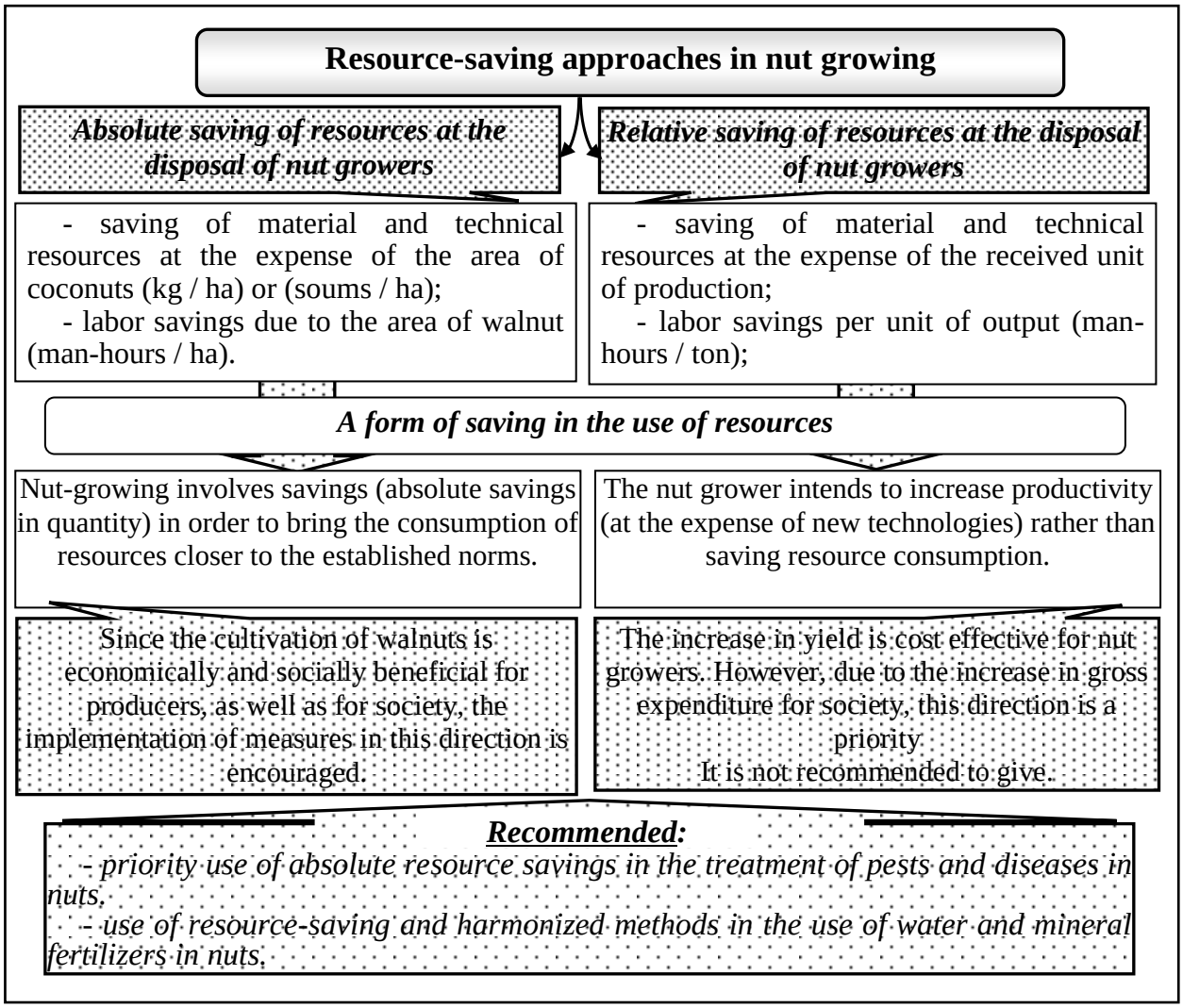

Figure 3. Agrotechnical measures in walnut plantations

resource-saving approaches in implementation [5]

Thus, in the implementation of agro-technical measures in the coconut fields in the framework of resource-saving measures - it is possible to adopt the directions of "absolute resource saving" and "relative resource saving". At the same time, in the first direction - control of resource consumption per unit of crop area in the case of assessment of austerity measures in relation to resource consumption norms or indicators of previous years.

In the second case - the analysis of resource consumption is carried out at the expense of the product unit, not at the expense of the area of nuts. However, other aspects can also be considered. For example, overuse of toxic chemicals or water resources used to control pests and diseases of the walnut tree is effective in preventing crop losses, but it also increases the risk of environmental problems (soil, water pollution) and harms society. Therefore, it is recommended to use the absolute saving of resources as a priority in the implementation of agro-technical measures. It is also advisable to look for opportunities to use resources in an integrated way in both directions.

The resource-saving task for nut growers requires the solution of a number of organizational, economic, and technological issues in relation to each resource used in production. In particular, the issue of absolute or relative savings in the use of resources requires the following conditions (Figure 4).

The following conditions are required for the economical use of the labor force at the disposal of nut growers as a resource:

- Effective use of new cost-effective techniques and technological equipment, the formation of cost-saving skills by improving the skills of employees employed in nut-growing entities;
- organization of internships aimed at gaining experience in the field in order to improve the knowledge and skills of employees hired on a regular basis;
- Systematic financial incentives for employees (permanent and seasonal), the implementation of measures aimed at improving labor productivity and product quality through the formation of a system of social packages for all employees.

The above-mentioned conditions create the basis for the creation of an economic incentive to increase labor productivity through the efficient use of labor in nut-growing entities, to improve the quality of products.

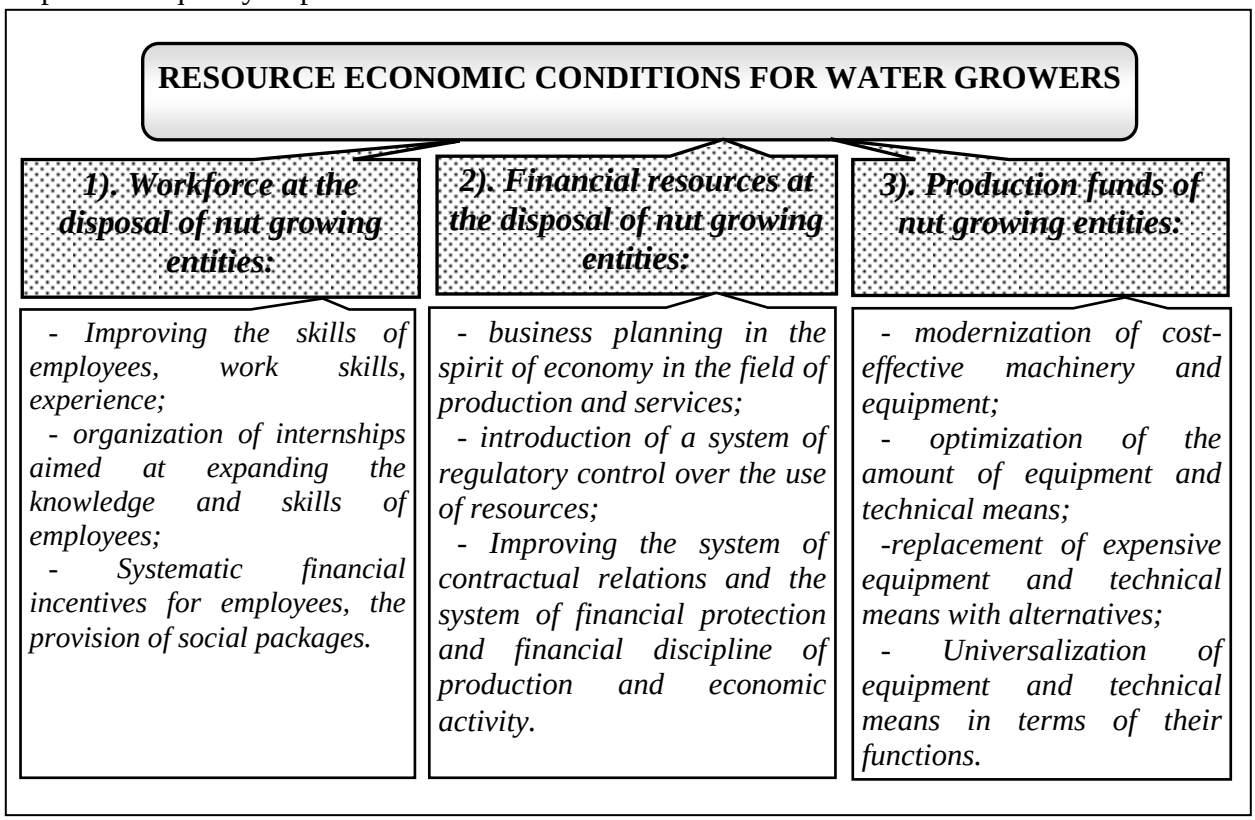

Figure 4. Conditions required for resource saving in nut growing entities

The following conditions are required for the economical use of production funds of nut-growing entities:

- Replacement of production facilities at the disposal of economic entities with fuel-efficient materials and labor-saving equipment by updating the structure of production assets with cost-effective machinery and equipment;

- Implementation of measures to optimize the quantity of agricultural machinery and equipment, mineral fertilizers, the cost of which has a significant share in the cost of production;
- It is possible to reduce the cost of using machinery per unit of land area by forming it with the provision of universalization in terms of the functions performed by technical means in nut-growing entities.

The conditions for the economical use of financial resources at the disposal of nut growing entities are as follows:

- Optimal business planning in the spirit of economy in the production of goods and services in nut growing entities;
- It is necessary to expand the conditions for reducing excess costs during the growing season on the basis of the introduction of a system of control over the consumption of resources in the production process on business plans.

Among the main agro-technical measures used today in the cultivation of walnuts (compared to existing walnuts) are the following (Figure 5).

It does not take into account the agro-technical measures to be used in the cultivation of walnuts, but the main agro-technical measures used by farms in the cultivation of walnuts today, identified on the basis of monographic observations.

Irrigation of nuts (individually planted walnut trees). Usually the irrigation regime and norm depends on many factors, the main of which are the full yield of the walnut tree, the mechanical composition of the soil of the planted areas, groundwater level, dry or rainy season, air temperature.

The amount of water and labor required to irrigate a walnut tree depends on many factors (watering the trees that are harvested). Also, if we take into account that walnut trees grow in Uzbekistan, mainly in the backyards, without forming a single massif, then under each walnut tree is poured 20-30 liters of water per week.

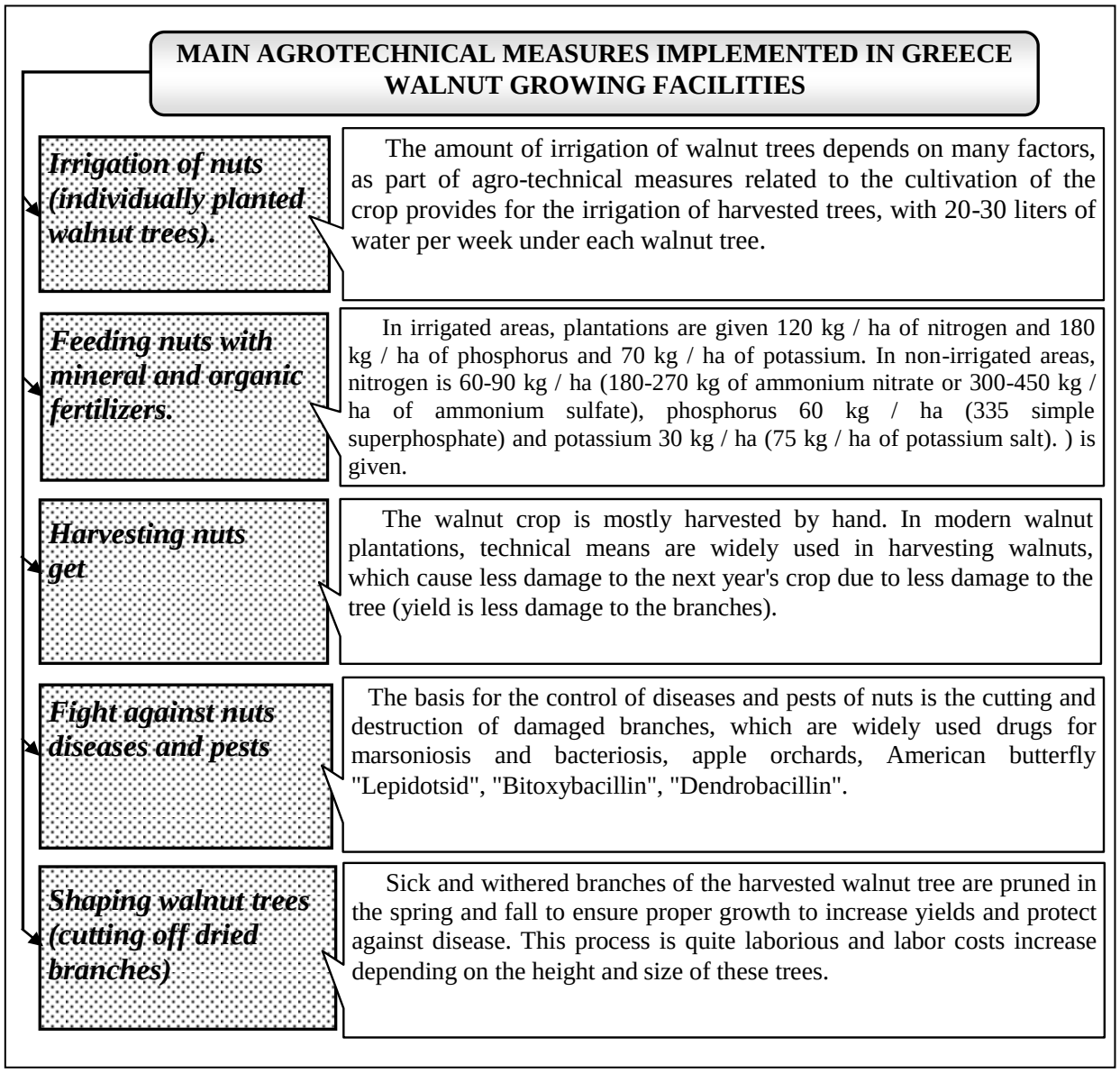

Figure 5. The main thing that is done in the cultivation of walnuts

agrotechnical measures [7]

Due to the moisture requirements of walnuts, there are walnut groves on the banks of mountain rivers in mountainous and foothill areas. In the republic, walnut trees grow well on slopes with a rainfall of not less than 800 mm. Nuts growing on the banks of mountain rivers are usually watered once or twice a year.

The walnut crop is mostly harvested by hand. However, in recent walnut plantations, the harvesting of walnut crops using techniques has resulted in less damage to the tree (yielding branches are less damaged). Based on the results of the monographic study, depending on the size of the walnut tree (mainly wild nuts), 0.7-0.9 people are required to harvest from a large walnut tree planted alone in a single work shift. This process is a labor-intensive agro-technical measure.

Preparations are used in the fight against diseases and pests, pruning of damaged branches, marsoniosis and bacteriosis, apple cider vinegar, American butterfly ("Lepidotsid", "Bitoxybacillin", "Dendrobacillin") [9].

Therefore, from the 5 resources shown in Figure 5, the main ones that have a significant impact on the cost of the product should be selected and evaluated economically in terms of resource efficiency. Because the lack of choice for a number of agro-technical measures gives a methodologically uncertain result. For example, the fact that harvesting of walnuts is done manually and there is no possibility of mechanization does not allow to evaluate the agro-technical measure on an alternative basis.

In view of the above, the following approaches are recommended in the methodological approach to the issue of resource-saving assessment in the context of agro-technologies used in the cultivation of walnuts:

- The selected agrotechnology should be widely used in the cultivation of products in most walnut growers;
- The cost of the selected agro-technologies used in the cultivation of nuts should have a significant (or largest) share in the cost of production;
- There should be alternative options for the implementation of selected agro-technologies in the cultivation of nuts.

Based on the proposed methodological approach, it is recommended to choose from the agro-technologies used in the cultivation of walnuts (Figure 5), taking into account the current level of development of the industry (the number of agro-technologies may vary depending on the organization of walnut cultivation, mechanized areas) (Figure 6).).

Therefore, in the context of Uzbekistan, the measures "Feeding nuts with mineral and organic fertilizers" and "Irrigation of nuts (individually planted walnut trees)" should be considered as an object of savings associated with the cultivation of nuts.

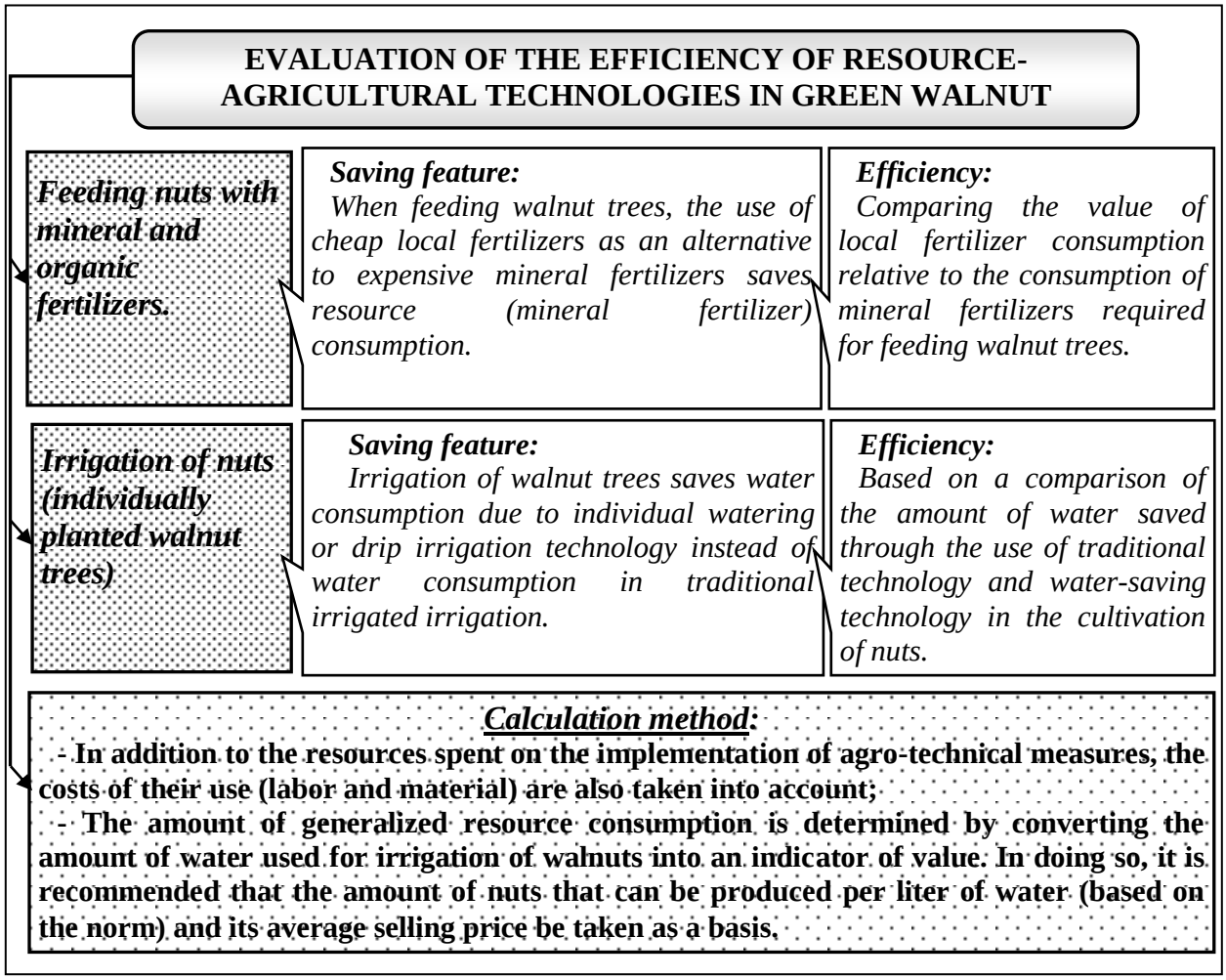

Figure 6. Economical technologies in the cultivation of walnuts to evaluate in terms of cost-effectiveness

methodological approach

The savings in the technology of "feeding nuts with mineral and organic fertilizers" - the cost savings in feeding walnut trees by using cheap and environmentally friendly local fertilizers as an alternative to relatively expensive mineral fertilizers.

In this case, the assessment of the cost-effectiveness of the technology used in the cultivation of the product is determined by comparing the consumption values of local fertilizers relative to the consumption of mineral fertilizers required for feeding walnut trees.

Savings under the technology of "irrigation of walnut (single planted walnut trees)" - an economic assessment based on the difference between the amount of water consumed in energy-saving technology, which consumes less water than traditional technologies, which cause relatively high water consumption in irrigation of walnut trees. Bunda:

- In addition to the resources spent on the implementation of agro-technical measures, the labor and material costs associated with the introduction of these technologies are also taken into account;
- Generalized resource consumption is determined as the sum of other resources by converting the amount of water consumption in the irrigation of walnuts as an indicator of

value. In order to make the water consumption more valuable, it is recommended to take as a basis the amount of nuts that can be produced per liter of water (based on the norm) and the average selling price of walnuts.

It is clear from the proposed method that other factors (such as increasing productivity, improving product quality, marketing activities) lie in the savings and the benefit gained by reducing the cost of the product as its economic content.

It can be seen that in the framework of economical agro-technical measures used in the cultivation of walnuts, there is a consumption of different amounts of labor, financial resources, material and technical resources. At the same time, the cost-effectiveness of different methods is characterized by different indicators. For example, the consumption of mineral fertilizers and its savings are measured in kilograms, it is easy to convert resource consumption into a measure of value, and it has no other alternatives. Water consumption is measured in liters and converted into a value indicator is more complex and can be calculated in various alternatives (such as the cost of water supply, the value of agricultural products that can be grown at the expense of one liter of water saved).

Thus, the agro-technologies for growing walnuts ("Feeding nuts with mineral and organic fertilizers" and "Irrigation of nuts (individually planted walnut trees)"), which require a cost-effective assessment of the above resources, have been economically evaluated on separate relevant indicators and converted into value in general. considered the case.

It is also necessary to assess the level of impact of these technologies on the final financial results of production as a result of the use of cost-saving options, including the cost-effectiveness of walnut growers.

An economic assessment can be made based on the difference between the total production costs generated by the use of economical options of the two agrotechnologies and the profitability levels within the production costs incurred through the use of the traditional form of these technologies. In this case, it is recommended to determine the amount of additional profitability as follows ($\mathbf{P_К}$)[1]:

$$\mathbf{P_К} = \left(\frac{\mathbf{АТФ}}{\mathbf{АТИЧХ}} \times \mathbf{100}\right) - \left(\frac{\mathbf{ТТФ}}{\mathbf{ТТИЧХ}} \times \mathbf{100}\right)$$

Here, **АТФ and ТТФ** – based on traditional technology and, accordingly nuts at the expense of the use of economical technology can be obtained by the growing entity amount of net profit, (soums);

АТИЧХ and ТТИЧХ – accordingly from conventional technology production that occurs at the expense of use cost and use of cost-effective technology production costs incurred at the expense of, (soums).

Based on the level of profitability determined in this way, it is possible to see how much the level of profitability has increased due to the use of cost-effective technologies in walnut growing entities. This is a generalized synthetic index. Because due to the use of cost-

effective technologies, there are changes in the amount of profit, as well as the amount of production costs in yogurt growers, and it is reflected in the change in the level of profitability.

REFERENCES:

[1] Bolezni gretskogo orexa: o chem govoryat chernye pyatna. https://www.apteka-sadivnyka.ua/ru/plodovye-derevia/orekh/bolezny-hretskoho-orekha-o-chem-hovoriat-chernye-piatna/.
[2] Konstantinova M. Diseases of the Greek orex and ix treatment. // Propozitsíya / -2017. -№5. -S.126-129. https://propozitsiya.com/bolezni-greckogo-oreha-i-ih-lechenie.
[3] Osnovnые bolezni gretskogo orexa. http://asprus.ru/blog/osnovnye-bolezni-greckogo-orexa/.
[4] M. Kon¬stan¬ti¬no¬va M. Vrediteli gretskogo orexa: sistema zashchity. https://propozitsiya.com/vrediteli-greckogo-oreha-sistema-zashchity.
[5] Xushmatov N. The issue of savings in the cultivation of walnuts. Agro hydro NEWS socio-economic magazine // J. -№7. -2020 –B.18-19.
[6] Xushmatov N. How to save resources in walnut production. Agro hydro NEWS socio-economic magazine // J. -№9. -2020 –B.14-15.
[7] Xushmatov N. Cost savings in growing walnuts. Agro hydro NEWS socio-economic magazine // J. -№10. -2020 –B.18-19.
[8] Inobatov A. Organizational and economic mechanism of increasing efficiency of industrial processing of nuts in Uzbekistan https://ijrcs.org/wp-content/uploads/IJRCS201911023.pdf // 2019, Б. 124-128.
[9] How to protect Greek orex from disease and harm ?. http://sad.usadbaonline.ru/ru/2014mar/ problems / 7324 /.
[10] Durmanov A., Umarov S. (2018). Economic-mathematical agricultural production. Asia Pacific Journal of Research in Business Management Vol. 9, Issue 6, June 2018, 10-21.
[11] Umarov S.R. (2017). Innovative development and main directions of water management. Economy and Innovative Technologies, (1). Available at: https://goo.gl/eEHSJK. (in Uzbek).
[12] Umarov S. (2018). Scientific-theoretical basis of the innovative development of water resources
[13] Uzbekistan. Bulletin of Science and Practice, 4 (12), 409-415. (in Russian).
[14] Yusupov E. D., Diversification of the activities of business entities in agriculture: theoretical foundations and market principles for its implementation. Russian Electronic Scientific Journal 12 + No. 4 (30), 2018. DOI: 10.31563 / 2308-9644-2018-30-4-162-167.
[15] Eshev AS, Nazarova F. Kh. (2019). Influencing factors for the development of agricultural strategy in the republic of Uzbekistan. International journal for innovative research in multidisciplinary field. V - 5, I - 7, July - 2019. 151-160 p.
[16] All the subtleties of the collection and preservation of the Greek orexa. https://www.dacha-svoimi-rukami.com/vse-tonkosti-sbora-khraneniya-gretskikh.html.