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Article

The Economic Analysis of the Costs and Revenues of Irrigated Tobacco Burley Producing in the Syrian Coast: A Case Study of the 2023–2024 Agricultural Season

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Abstract: The research aimed to conduct an economic analysis of the costs and revenues of producing the irrigated tobacco crop (Burley variety) in the Syrian coast, in addition to studying and analyzing the economic indicators related to the economic efficiency of the 2023-2024 agricultural season. The primary data were collected through a survey targeting a sample of 337 irrigated Burley tobacco farmers, the size of which was calculated according to the Stevenson-Thompson equation. The results showed that the average net annual profit achieved from a hectare planted with irrigated Burley tobacco was approximately US$3,526.6/hectare, while the profitability ratio relative to production costs was 83.5%, which is considered a very good indicator in the field of agricultural investment, as the profit rate is equivalent to US$83 for every US$100 invested annually. The results also showed that the economic efficiency index was 1.83, which is greater than one, indicating the efficiency of the utilization of fixed and variable capital and the feasibility of producing irrigated Burley tobacco on the Syrian coast. The research concluded that there is a need to increase attention to the cultivation of irrigated Burley tobacco, while encouraging and motivating farmers to increase the areas planted with this crop, given the economic savings it provides to rural families, the diversification of income sources, and the improvement of their standard of living.

Keywords: Burley tobacco; production costs; net profit; economic efficiency; profitability ratio; Syrian coast.

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1. Introduction

Tobacco is an important industrial crop due to its role in international trade and the economic and social life of many countries. Its cultivation is widespread across vast areas, due to the environmental adaptability of its varieties across different regions (Habib, 2025). Millions of people work directly or indirectly in agriculture, the tobacco production industry, and tobacco transactions worldwide (Sadeghi, 2007).

Tobacco is botanically classified within the Solanaceae family and the Nicotiana genus, which includes about 70 plant species, of which only two species are mentioned that are used in the preparation of various types of cigarettes, cigars, pipe tobacco, and other smoking products, namely: *Nicotiana rustica* L. and *Nicotiana tabacum* L. (Darwish et al., 2024).

Latin America is considered the original home of tobacco, as Native Americans smoked tobacco leaves and used it in some of their religious and social rituals (Kheti, Sabouh, 1994). Historians note that the first tobacco cultivation in Asia Minor occurred in the Latakia region, from where it spread to Turkey, Greece, and other neighboring countries (Hamad et al., 2025).

Syria ranks third in the Arab world after Yemen and Lebanon in terms of tobacco cultivation and production (Arab Agricultural Statistics Yearbook, 2022).

Tobacco is cultivated in Syria under both irrigated and rainfed conditions. In 2023, the area planted with various tobacco varieties under irrigated conditions reached 1,532 hectares, yielding 3,520 tons, while the area planted under rainfed conditions reached 3,792 hectares, yielding 4,271 tons. It is also widespread in geographically disadvantaged areas with relatively limited natural resources, such as the coastal mountain highlands, where rainfed varieties like the local variety "Shak al-Bint" are grown. In mid-altitude areas, other rainfed varieties such as "Brilib," "Basma," "Katrini," "Garnata," and "Zaghrin" are cultivated. Along the coastal strip, irrigated varieties such as "Burley" and "Virginia" are grown, in addition to the "Tanbak" variety (Darwish & Ali, 2009). The area planted with all tobacco varieties on the Syrian coast under irrigated conditions reached 408 hectares, yielding 820 tons, and under rainfed conditions reached 3,778 hectares, yielding 4,215 tons. (Agricultural Statistical Abstract, 2023).

The economic importance of tobacco in Syria stems from its position among strategic crops, as it is the third largest agricultural crop in the country. It also plays a role in driving economic development through the investment of capital. It is sufficient to note that the annual contribution of tobacco to the Syrian national economy amounted to approximately 3.5 million US dollars in 2016, in addition to its contribution to improving the standard of living and reducing unemployment. The number of workers in tobacco manufacturing in Syria in the same year reached 11,800 workers, in addition to more than 37,000 families working in tobacco cultivation (Naama et al., 2021).

Burley is one of the most famous irrigated varieties grown in the Syrian coast. The area planted with Burley tobacco in the coastal region reached about 450 hectares, with a production of about 503 tons (Saker, 2017). It is an American-origin tobacco and is classified within the group of American aromatic tobacco varieties (Ahmed, Ahmed, 2015). It participates at a rate of 33% in the American cigarette mix. It is also distinguished by its ability to absorb liquids and flavorings (sweetening materials). It is grown in the coastal strip and plains, and it was introduced into the Syrian Arab Republic because of its high rolling ability, high economic return in manufacturing, and good ignition (Hassan et al., 2018), in addition to the low percentage of nicotine in it, which is less than 2% (Al-Mahasneh, Bashir, 2018).

Previous studies in a number of Arab and non-Arab regions have shown similar results regarding the economic feasibility of tobacco crops, with differences in challenges and available resources. In the Kotjevo region of Croatia, (Ranujajic, Domancic, 2018) studied the economic efficiency of tobacco production during the period 2012–2016. The results showed that total production costs ranged from **3**,**740** to **4**,**649** US dollars per hectare. Human labor costs constituted the largest proportion and amounted to about 38% of the total production costs, with a profit ranging between (**1**,**272**-**2**,**312**) US dollars per hectare. Economic efficiency indicators also showed positive results, as the economic efficiency ranged between (1.31-1.57), meaning that for every **15** US dollars invested in production, a profit ranging between (**5**-**9**) US dollars was achieved. The

profitability index also ranged between (31.6%-56.6%), which indicates that tobacco production is economically profitable in the study area.

In the Lamonirat district of Bangladesh, (Asif et al., 2018) conducted a financial analysis of tobacco cultivation in selected areas to determine the profitability of this cultivation. They found that the gross yield per hectare planted with tobacco was approximately **1,874** US dollars, while the cost of cultivation per hectare was **160** US dollars, and the net yield per hectare was **411** US dollars, while the benefit-cost ratio was approximately 1.28. Several problems facing tobacco cultivation were also identified, most notably the high prices of fertilizers in these areas, which reflects the importance of using high-yielding, drought-resistant varieties, which would be a good option for farmers in this region.

In West Godavari district of Andhra Pradesh, India, (Parimala et al., 2020) studied the economic analysis of Virginia tobacco production. Land rent, hired labor, mineral and organic fertilizers, and seeds were the main components of production costs. The results showed a significant increase in tobacco production due to increased productivity and an increase in the cultivated area. The study also indicated that the resource use structure of tobacco cultivation and its production costs varied across the size categories of agricultural holdings. The cost of growing tobacco per hectare and the input-to-output ratio were highest on small farms and lowest on large farms, indicating the importance of relying on large farms to achieve profitable production returns for farmers.

In Swabi district of Pakistan, a study (Ahmad et al., 2022) evaluated the cost and profitability of tobacco production during the 2018-2019 season. Data were collected using a random sampling method, and the total number of samples analyzed was 100. The results showed that the average total cost per acre planted with tobacco was about **1,290** US dollars per hectare. Marketing costs constituted the largest proportion of variable costs, while land rent accounted for the largest part of fixed costs. While the total revenue per hectare was US$. 3,900, the economic analysis results showed that the average net income (net profit) per hectare planted with tobacco was US$. 2,609, and the total income was US$. 2,923. The study recommends enhancing tobacco production through government support for farmers and reducing input prices to achieve high profitability that would contribute significantly to the gross domestic product.

In the Al-Ghab region of Syria, (Fardawi, Abdul Latif, 2023) studied the economics of tobacco cultivation and production by identifying some of the economic aspects of the cultivation and production of the two tobacco varieties, Burley and Virginia, which are prevalent in the study area. The study indicated a striking increase in the harvesting costs for both varieties and the drying costs for the Virginia variety, which negatively affected the profitability of agriculture. Despite these challenges, the results showed that the economic efficiency index for Burley and Virginia tobacco reached (1.77-1.83), respectively, indicating the continued feasibility of tobacco cultivation in this region.

Based on these findings, conducting this local study, which focuses in the Syrian coast, is particularly important given the unique characteristics of this region and the scarcity of analytical economic research on irrigated Burley tobacco production. In this context, the research problem stems from the limited attention given to Burley tobacco cultivation in the coastal region, where farmers face increasing input costs, fluctuating productivity, and inefficient resource use.

2. Materials and Methods

2-1- The Importance and Objectives of the Research

The importance of this research lies in the fact that studying and analyzing the economic resources used in the production of irrigated Burley tobacco, and assessing its production efficiency by identifying the structure of fixed and variable cost elements, helps in identifying shortcomings in the cultivation and production process. This, in turn, allows for the development of proposals expected to encourage farmers to expand Burley tobacco cultivation on the Syrian coast, given its significant impact on economic and social development. Burley tobacco is a key industrial crop that generates revenue for farmers and the General Tobacco Corporation, which in turn contributes to the state treasury and thus increases national income.

Based on the above, the research primarily aims to provide a descriptive economic analysis of irrigated Burley tobacco production in the Syrian coast, achieved through the following sub-objectives:

- Conducting a descriptive economic analysis of the costs and revenues of irrigated Burley tobacco production in the Syrian coast.

- Studying and analyzing economic indicators related to economic efficiency.

Accordingly, this study seeks to answer several key questions, including:

- What is the level of economic efficiency of irrigated Burley tobacco production in the Syrian coast during the 2023-2024 growing season?
- What are the actual returns and profits per hectare?
- To what extent do economic indicators, such as profitability ratios, variable asset turnover, and the efficiency index, reflect the viability of this crop?
- Finally, what policies or measures can enhance its sustainability, improve farmers' incomes, and support its contribution to the local economy?

2-2- Research Methodology:

The study included the Syrian coast, which includes ten administrative areas where Burley tobacco is grown. These areas include (Latakia, Al-Haffah, Al-Qardaha, Jableh) belonging to the Latakia Governorate, in addition to the areas of (Tartous, Sheikh Badr, Al-Duraikish, Safita, Banias, Al-Qadmous) belonging to the Tartous Governorate. The descriptive economic analytical approach was adopted, based on a comprehensive review of Arab and international literature, as well as the analysis of field data on Burley tobacco production on the Syrian coast during the 2023-2024 agricultural season, which was collected using a structured questionnaire designed specifically for the study sample of 350 farmers. To verify the validity, reliability, and validity of the questionnaire (the study instrument), a pilot test was conducted on a sample of 30 farmers, which showed a high reliability coefficient (Cronbach's alpha coefficient = 0.87), indicating high internal consistency of the measurement instrument.

Data on tobacco production, prices, input costs, farm management, and marketing were obtained from the Agriculture and Scientific Research Directorate of the General Tobacco Corporation for the 2023-2024 agricultural season. After data collection, it was processed and analyzed to determine the components of production costs, including fixed (investment) and variable (material and service) costs, with their relative importance calculated using percentages and arithmetic means. In addition, economic efficiency indicators were calculated, such as the profitability ratio, variable asset turnover, and the economic efficiency index. The normality of the data was tested using the Shapiro-Wilk test ($p = 0.23 > 0.05$), which confirms that there is no significant deviation from the normal distribution and allows for the reliable use of means and

percentages. All statistical analyses were performed using SPSS version 26, which ensures the accuracy and robustness of the results.

2-3- Economic indicators and standards

Mathematical relationships to calculate economic return and economic efficiency indicators (Al-Atwan, 2011):

- Gross product value (average annual revenue) = production quantity × average farm price.

- Invested capital = total investment costs + operating costs.

- Annual production costs = annual depreciation + operating costs.

- Cost of producing a unit of product = Total annual production costs ÷ Annual production quantity.

- Average annual net profit = Annual gross output (average annual revenue) – Annual production costs.

- Ratio of Annual profit to annual revenue = Average annual net profit ÷ Average annual revenue × 100.

- Variable asset turnover rate = Average annual revenue ÷ Variable costs.

- Variable asset turnover time = 365 ÷ Variable asset turnover rate.

- Farm production efficiency = Gross output ÷ (Variable costs + Annual depreciation).

Variable costs represent operating costs without adding interest on invested capital.

- Overall economic efficiency = Gross output ÷ Annual production costs.

- Profitability ratio based on invested capital = (Gross annual profit achieved ÷ Investment capital) x 100.

- Profitability ratio based on production costs = Gross annual profit achieved ÷ (Material expenses + Labor wages) x 100.

- Capital payback period = Invested capital / Average annual net profit.

- Revenue ratio based on invested capital, equation (2):

$$\boldsymbol{R} = \frac{\boldsymbol{N.P}}{\boldsymbol{C.L}} \times 100 \qquad (2)$$

Where:

R: Rentability ratio based on invested capital, N.P: Net gross product = (Profit + Direct Labor Cost), C.L: Invested capital – Revenue ratio based on production costs, equation (3):

$$\boldsymbol{Em.l} = \frac{\boldsymbol{N.P}}{\boldsymbol{TC}} \times 100 \qquad (3)$$

Em.l: Rentability ratio based on production costs, N.P: Net gross product = (Profit + Direct Labor Cost), TC: Annual production costs.

2-5- Time and place of research:

The research was conducted in the Syrian coast, which includes Latakia Governorate, which in turn includes four administrative regions (Jableh, Latakia, Qardaha, and Al-Haffa), and Tartous Governorate, which also includes six administrative regions (Tartous, Safita, Drikish, Sheikh Badr, Baniyas, and Al-Qadmus), during the 2023-2024 agricultural season.

2-6- Data and its sources:

A- Primary data: Primary data were collected through a questionnaire directed at producers of burley tobacco on the Syrian coast. This questionnaire included several questions that served the research purpose and conducted a field survey to fill out the questionnaire through personal interviews with these farmers.

B- Secondary data: Issued by the Ministry of Agriculture and Agrarian Reform, the General Tobacco Organization, data from the FAO, and the Arab Agricultural Statistics Yearbook.

2-5- Research sample:

The number of farmers working in burley tobacco production on the Syrian coast, according to the General Tobacco Corporation, for the 2023-2024 agricultural season, was (2,785) farmers (statistics from the Directorate of Agriculture and Scientific Research at the General Tobacco Corporation, 2024). The Stephen-Thompson equation (1) was used to determine the size of the sample studied as follows (Thompson, 2012):

$$n = \frac{NxP(1-P)}{\{N-1x(d^2 \div Z^2)\}+P(1-P)} \qquad (1)$$

Where:

n*: Sample size, * P: The percentage of the characteristic's availability and neutrality, equal to (0.50), N*: The

size of the studied population, *d: The standard error (precision level) = 0.05, Z*: The standard score = 1.96 at a standard error of 0.05.

By applying the previous equation, the sample size taken is 337 farmers, and Table (1) shows the distribution of the research sample among the burley tobacco farmers on the Syrian coast for the 2023-2024 season. The sample was selected in each administrative region according to the distribution of the number of farmers, i.e. a random sample distributed according to the relative importance of the weight of the number of farmers in the administrative regions of the Lattakia and Tartous governorates.

Table (1). Distribution of the research sample among thyme farmers in the Syrian coast.

Governorate	Administrative Area	Number of burley Tobacco Farmers	% of Total (%)	sample size in each region*
Latakia	**Latakia**	1248	44.8	151
	Al-Haffa	–	–	–
	Qardaha	175	6.3	21
	Jableh	827	29.7	100

Tartus	**Total**	2250	80.8	272
	Tartus	336	12	41
	Safita	–	–	–
	Dreikish	121	4.4	15
	Sheikh Badr	–	–	–
	Baniyas	78	2.8	9
	Al-Qadmus	–	–	–
	Total	535	19.2	65
Final Total		2785	100	337

Source: Data from the Directorates of Agriculture and Agrarian Reform in Latakia and Tartous Governorates for the 2023-2024 season.* Sample size = Total sample size (308) × Relative weight of each crop ÷ 100.

3. Results and Discussion

3-1- Descriptive Economic Analysis of Irrigated Burley Tobacco Cultivation and Production in the Syrian Coast:

The questionnaire covered the aforementioned research sample and included an economic analysis of the hectare planted with irrigated burley tobacco over a one-year period. The prevailing market prices for the 2023-2024 season were used to determine the cost of materials and wages.

3-1-1-The Cost Structure of Producing and Cultivating Irrigated Burley Tobacco in the Syrian Coast:

3-1-1-1- Investment costs (fixed):

Table (2) shows the total and annual fixed costs per hectare planted with burley tobacco on the Syrian coast. The table data indicates investment cost items in terms of number, unit cost, and economic life.

Table (2). Total and Annual Investment Costs Per Hectare Planted with Irrigated Burley Tobacco in the Syrian Coast.

Fixed asset	Hectare Requirement / Quantity	Unit Price (USD)	Total Cost (USD)	Economic Life (Years)	Annual Cost (USD/year)	Relative Importance %
Metal arch, 5 meters	**100**	0.25	25	**10**	2.5	**.0**9
Plastic (nylon) cover, m²	250	0.31	77.5	**2**	38.7	**.13**3
Metal funnel	10	1.25	12.5	**2**	6.2	**2.1**
Backpack pump	10	8.33	83.3	**5**	16.6	**5.7**
1-inch pump	10	14.58	145.8	**10**	14.5	**5**
1-inch tube, per meter	**500**	0.16	80	**5**	16	**.5**5

Connection fittings	20	0.25	5	**5**	1	**0.3**
1-inch valve	10	0.83	8.3	**5**	1.6	**0.5**
Leaf-piercing tools (needles)	30	0.41	12.3	**5**	2.4	**.0**8
Land rent	**-**	**-**	166.6	**-**	166.6	**57**.2
1 Total	**-**	**-**	616.3	**-**	266.1	**-**
2 Interest on invested capital (9.5%)	**-**	**-**	58.5	**-**	25.2	**8.7**
Total investment costs (1+2)	**-**	**-**	674.8	**-**	291.3	**100**

Source: Research sample for the 2023-2024 season. 1 US$ = 12,000 SYP.

Table (2) shows the annual fixed investment costs per hectare of irrigated burley tobacco planted in the Syrian coast. These costs are distributed between land rent and equipment such as the plastic (nylon) cover, the backpack pump, and the 1-inch tube. Land rent is of paramount importance, accounting for 57.2% of the total annual fixed costs, indicating that land costs are the primary factor in fixed production costs. The plastic (nylon) cover, the backpack pump, and the 1-inch tube are relatively lower in cost, representing a combined 24.5%, with annual depreciation occurring over two years for the plastic cover and five years for the backpack pump and the 1-inch tube. Furthermore, the interest on invested capital affects the annual cost by 8.7%, increasing the total investment costs and adding a financial burden on farmers.

Hence, it can be interpreted that the high cost of land rent may limit the profitability of burley tobacco cultivation on the Syrian coast, necessitating the search for solutions such as improving land use efficiency or subsidizing rental costs. Effective management of financial resources, especially the cost of capital, is also essential to ensure sustainable production and an adequate return for farmers.

3-1-1-2- Operating Costs (Variable Costs):

3-1-1-2-1- Production Input Costs:

Production inputs constitute the backbone of the success of growing a hectare of irrigated burley tobacco, determining crop quality and cost efficiency. These inputs include seeds, organic and mineral fertilizers, pesticides, as well as packaging and transportation tools.

Table (3) shows the cost items related to the inputs for producing a hectare of irrigated burley tobacco in the Syrian coast, indicating the timing of addition or application of each item, the required quantities, unit prices, number of applications, and the annual total of these costs. This systematic arrangement helps achieve tight cost management and increase productivity.

Table (3): Production Input Costs for One Hectare of Irrigated Burley Tobacco Cultivation in the Syrian Coast.

Material or service	Requirement	Unit price (USD)	Number of applications	Total cost (USD /year)	application Timing
Materials that prevent the germination of weed seeds	2.5 liters	6.6 USD/liter	1	16.5	20 Mar (one month before planting seedlings)
Organic fertilization Seedling beds	20 bags	0.8 USD/bag	1	16	1 Feb

	Hectare	80 m^3	1.2 USD/m^3	1	96	1 Mar
Mineral fertilization (soil-applied)	Seedling beds	Superphosphate 30 kg	0.5 USD/kg	1	15	20 Jan
	Hectare	Superphosphate 500 kg	0.5 USD/kg	1	250	1 Mar
Mineral fertilization (soil-applied)	Seedling beds	Potassium 5 kg	1.6 USD/kg	1	8	10 Mar
	Hectare	Potassium 300 kg	1.6 USD/kg	1	480	15 Jun
Mineral fertilization (soil-applied)	Seedling beds	Ammonium Nitrate 2 kg	1 USD/kg	1	2	1 Mar
	Hectare	Ammonium Nitrate 750 kg	1 USD/kg	1	750	(500 kg on 1 Jun – 250 kg on 15 Jun)
Mineral fertilization (foliar)		Foliar fertilizer (Panlo) 5 kg	2 USD/kg	1	10	1 Jul
Pest control (pesticides)		seasonal program	-	-	151.2	During 20 Mar – 5 Jul
Irrigation		seasonal program	-	-	2	During the season
Materials that prevent lateral branch growth		6 liters	3.3 USD/liter	1	19.8	**29** Jun
doubt threads		20 kg	2.7 USD/kg	1	54	At harvest
Discounts of 3% of the total amount		-	-	-	158.1	When selling the crop to the General Tobacco Corporation
Total amount		-	-	-	2028.6	-

Source: Research sample for the 2023-2024 season. 1 US$ = 12,000 SYP

Table (3) shows that the total cost of requirements for producing a hectare of Irrigated burley tobacco in the Syrian coast amounts to 2028.6 USD annually, distributed over several vital stages. The season begins with preparing 20 Seedling beds for producing burley tobacco seedlings, noting that the appropriate date for spraying the seeds is February 20th, and the seeds are distributed free of charge by the General Tobacco Corporation. After producing the seedlings and approximately 30 days before planting them, 2.5 liters/hectare of germination inhibitor for weed seeds is added on March 20th, 16.5 USD, considering that the appropriate date for the planting process (seedling) is April 20th. This is followed on March 1st by adding 80 m^3 of organic fertilizer for 96 USD, then three batches of ground mineral fertilizers between March 1st and May 15th (500 kg of superphosphate for 250 USD, Ammonium Nitrate twice combined for 750 USD, and Potassium for 480 USD).

A pest control program totaling 151.2 USD, will then be implemented during March-April-May-June, before the agricultural year is completed with expenses such as the annual irrigation tax collected by the Water Resources Directorate, lateral branch growth inhibitors, strands of thorns, and a 3% discount imposed by the General Tobacco Corporation totaling 158.1 USD, ensuring full and effective coverage of all agricultural cycle needs.

3-1-1-2-2- Production Operations Costs:

Production operations costs constitute one of the basic components for estimating the total cost of growing burley tobacco on the Syrian coast. These operations include all work and services performed during the agricultural season, from land preparation to harvesting, drying, and packaging. These operations are carried out using a combination of agricultural machinery and direct human effort, with costs varying depending on the type of operation, its duration, and the number of repetitions.

Table (4) shows the costs of agricultural operations that fall within the annual production cycle for one hectare planted with irrigated burley tobacco in the Syrian coast. These operations represent a set of sequential activities that begin with land preparation and end with harvesting, drying, and packaging. These operations include the use of agricultural machinery (such as plowing and spraying for foliar fertilization and pest control), in addition to the direct labor contribution in the stages of cultivation, fertilization, pest control, harvesting, drying, and packaging.

The costs in this table are classified into two main categories: machinery and service costs, and direct labor costs, specifying the number of procedures, the time required for each operation, and unit wages, in order to provide an accurate and comprehensive picture of the cost burden borne by the unit of cultivated area.

Table (4): Costs of Agricultural Operations for One Hectare Planted with Irrigated Burley Tobacco in the Syrian Coast**.**

The material or process		Number of workers	Number of times	Time per Occasion	Unit wage	Annual cost (USD)
First: Costs of machines and services						
Soil Plowing (basic and supplementary)		—	40		8.3 USD/once	248
Renting the sprayer for foliar fertilization and pest control		—	100		4.1 USD/once	410
Second: Direct labor costs						
Preparing the seedbeds and sowing seeds		10	1	4 hours	0.3 USD/hour	12
Materials to prevent weed seed germination		10	1	1 hours	0.3 USD/hour	3
Planting seedlings		40	1	1 working day (8 hours)	2.5 USD/day	100
Replanting (to replace missing or failed plants)		10	1	2 hours	0.3 USD/hour	6
Weeding		40	2	4 hours	0.3 USD/hour	96
Organic fertilization	Seedling beds	10	1	0.5 hours	0.3 USD/hour	1.5
	Hectare	10	1	3 hours	0.3 USD/hour	9
Mineral fertilization (soil-	Seedling beds	10	1	0.25 hours	0.3 USD/hour	0.7
	Hectare	10	3	2 hours	0.3 USD/hour	18

applied)							
Mineral fertilization (foliar) per hectare			10	1	1 hours	0.3 USD/hour	3
Pest control	Seedling beds	Fungal control	10	5	0.25 hours	0.3 USD/hour	3.7
		Insect control	10	5	0.25 hours	0.3 USD/hour	3.7
	Hectare	Fungal control	10	3	1 hours	0.3 USD/hour	9
		Insect control	10	6	1 hours	0.3 USD/hour	18
Irrigation	Seedling beds		10	10	0.25 hours	0.3 USD/hour	7.5
	Hectare		10	8	2 hours	0.3 USD/hour	48
Breaking the flower cluster and adding materials to prevent lateral branch growth			20	1	1 working day (8 hours)	2.5 USD/day	50
Harvesting and leaf pricking			30	3	1 working day (8 hours)	2.5 USD/day	225
Drying in the shade away from sunlight			20	3	1 hours	0.3 USD/hour	18
Packing the leaves into bundles			30	1	3 hours	0.3 USD/hour	27
Subtotal (direct labor)			—	—	—	—	659
Total for production operations			—	—	—	—	1317

Source: Research sample for the 2023-2024 season. 1 US$ = 12,000 SYP.

Table (4) shows the costs of agricultural operations for producing Irrigated burley tobacco in the Syrian coast, divided into machinery and service costs, and direct labor costs. The cost of basic and supplementary soil plowing amounts to 248 USD annually (40 times at a fee of 6.2 USD each), while the cost of renting a sprayer for foliar fertilization and control amounts to 410 USD annually (100 times at a fee of 4.1 USD each). Direct labor includes several operations such as preparing the Seedling beds and planting seeds at a cost of 12 USD, using weed inhibitors at a cost of 3 USD, planting seedlings at a cost of 100 USD, organic fertilization for the seedbeds and the hectare at approximately 1.5 USD and 9 USD respectively, ground mineral fertilization (20 Seedling beds, hectare). And soil-applied mineral fertilization (20 Seedling beds, hectare) and foliar fertilization (hectare) at costs of (0.7, 18) USD and 3 USD respectively, in addition to pest control of both types (fungal and insect) per hectare at a cost of 9, 18 USD, and for the 20 Seedling beds at a cost of 3.7 USD respectively. Total direct labor costs amount to 659 USD, and total production costs amount to 1317 USD. These figures illustrate how costs are distributed between mechanical and manual aspects, helping to accurately determine production costs and analyze the efficiency of agricultural operations.

3-1-1-2-3- Total annual variable costs per dunam planted with Burley tobacco on the Syrian coast.

Table (5) provides a detailed overview of the total annual variable costs incurred per hectare of Irrigated burley tobacco in the Syrian coastal region. These costs are key indicators in assessing the economic feasibility of production, as they include the costs of production requirements and agricultural operations, in addition to annual overhead expenses and interest on invested capital. The data are organized to demonstrate the relative importance of each cost item within the total costs, helping to analyze the overall cost structure and identify the largest contributor to the burden of production expenditures.

Table (5): Total annual variable costs per hectare planted with Irrigated Burley tobacco in the Syrian coast.

	Item	Annual Cost (USD/year)	Relative Importance %
Production Requirements	Herbicide materials to prevent weed seed germination	16.5	.04
	Organic fertilization	112	2.8
	Mineral fertilization	1515	38.5
	Pest control	151.2	3.9
	Irrigation	2	.01
	Materials to prevent lateral branch growth	19.8	.05
	Doubt of threads	54	1.4
	Value of deductions	232.5	6
	1 Total cost of production requirements	2103	-
Agricultural Operations	Plowing per hectare	248	6.3
	Direct labor costs	659	17
	Rental fee for sprayer for foliar fertilization and pest control	410	10.4
	2 Total cost of agricultural operations	1317	-
3 Total cost of production requirements and agricultural operations		3420	–
4 Miscellaneous expenses 5%		171	4.4
5 Total costs (3+4)		3591	–
6 Capital interest 9.5%		341.1	8.3
Total variable costs per hectare (5+6)		3932.1	100

Source: Research sample for the 2023-2024 season. 1 US$ = 12,000 SYP

Table (5) shows the detailed structure of the annual variable costs associated with producing one hectare of Irrigated burley tobacco on the Syrian coast. The total of these costs amounted to 3932.1 USD. The data show that the largest share of expenditures is concentrated in production inputs, amounting to 2103 USD, which represents 53.6% of the total costs. These include mineral fertilization costs (1515 USD), followed by Value of deductions (232.5 USD), pest control costs (151.2 USD), then organic fertilization costs (112 USD), and the cost of doubt threads (54 USD). Miscellaneous expenses were also added at a rate of 5% (171 USD) and capital interest at a rate of 9.5% (341.1 USD). In contrast, the costs of agricultural operations amounted to (1317 USD), which represents about 33.7% of the costs, and includes important elements such as direct labor costs (659 USD). Which alone constituted 17% of the total, followed by the Rental fee for sprayer for foliar fertilization and pest control (410 USD), Then Plowing per hectare (248 USD), which reflects an

accurate calculation of the true cost of production, and shows the importance of each component in affecting the final cost per hectare.

3-2- Revenues from a descriptive economic analysis perspective:

The results indicated that the average production per hectare planted with Irrigated Burley tobacco for the 2023-2024 season amounted to approximately 4000 kg/year. Returning to the classification of production according to quality grades and the price of each type, according to data from the General Tobacco Corporation (extra, excellent, regular (extra), good, medium), the results showed that production per hectare is distributed as follows:

1250 kg of excellent regular (extra) at a price of 2.5 USD per kilogram.

2000 kg of good quality at a price of 1.5 USD per kilogram.

750 kg of medium quality at a price of 1.1 USD per kilogram.

The average annual revenue (gross product value) = (1250 x 2.5) + (2000 x 1.8) + (750 x 1.1) = 3125 + 3600 + 825 = 7750 USD/year.

The results also showed that deductions (fees, stamps, etc.) amount to 3% of the total value of the crop from the sale of the crop. Therefore, the value of the deductions = 232.5 USD.

3-3- Calculating various economic indicators for the production of Irrigated burley tobacco in the Syrian coast:

Studying economic indicators is an essential tool for analyzing the feasibility and financial sustainability of any agricultural activity. In this context, a set of economic indicators related to Irrigated burley tobacco production in the Syrian coastal region was calculated, based on actual data collected from the studied fields. These indicators contribute to providing a comprehensive picture of the relationship between costs and returns, measuring investment profitability, and resource utilization efficiency. They also provide a clear assessment of farm performance in terms of capital recovery and return. Table (6) provides a summary of the most prominent of these indicators, which reflect production performance under the prevailing economic and agricultural conditions in the region.

Table (6): Summary of the studied economic indicators for Irrigated Burley tobacco production in the Syrian coast.

Item	Unit of Measurement	Value
Average Annual Revenue (Gross Output)	USD/Hectare/Year	7750
Average Annual Net Profit	USD/Hectare/Year	3526.6
Annual Profit to Revenue Ratio	%	.455
Payback Period of Invested Capital	Year	.13
Farm Production Efficiency	-	1.99
Overall Economic Efficiency	-	1.83
Turnover Ratio of Variable Assets	USD	.215
Turnover Duration of Variable Assets	Day	169.7
Profitability Ratio Based on Invested Capital	%	76.5
Profitability Ratio Based on Production Costs	%	83.5
Return on Investment Ratio (ROI)	%	90.8
Return on Production Cost Ratio	%	99.1

Source: Research sample, and from the data of Tables (2, 5) for the agricultural season 2023-2024.

Table (6) highlights a set of economic indicators that reflect the overall performance of the Irrigated Burley tobacco production process in the Syrian coast during the 2023-2024 agricultural season. According to the data, the average annual revenue per hectare amounted to 7750 USD, while the average annual net profit amounted to 3526.6 USD, indicating a high return. The annual profit to revenue ratio represents 45.5%, a ratio that reflects the viability of the activity. The results also showed a relatively short payback period (1.3 years), indicating rapid capital turnover and low risk**.** Regarding efficiency, the farm production efficiency (1.99) indicates that every USD dollar spent on production generates 1.99 USD of output, while the overall economic efficiency (1.83) reflects the effectiveness of the investment as a whole. On the other hand, the variable asset turnover ratio (2.15) shows that revenues exceed variable costs by more than double, despite the fact that the turnover time of these assets (169.7 days) means that capital remains invested in the production process for nearly half a year.

Profitability and return indicators are high, confirming the attractiveness of this agricultural activity. The profitability ratio to invested capital reached 76.5%, and to total costs 83.5%, while the return coefficients based on capital and costs reached 90.8% and 99.1%, respectively, reflecting a high level of economic efficiency and return on investment. These indicators, taken together, confirm that burley tobacco cultivation is a profitable economic activity in the study area.

4. Conclusions

The study concluded that growing Irrigated Burley tobacco is one of the most important economic crops on the Syrian coast. The results of the economic analysis showed that this variety enjoys high yields, with the average net annual profit per dunam reaching approximately 3526.6 USD. In contrast, economic efficiency indicators, including profitability ratio, capital recovery rate, and the Economic Efficiency Index (EEI), exceeded one, confirming the system's ability to achieve sustainable returns. Based on these findings, the study recommends that agricultural policies focus on ensuring the timely and affordable availability of essential production inputs (seeds, fertilizers, and pesticides). This should be coupled with promoting horizontal expansion supported by strategies to increase productivity per hectare through the use of modern agricultural technologies and efficient resource management. Furthermore, the study recommends conducting further studies to identify and record Burley tobacco varieties, to determine the most economically important variety for adoption, and to encourage farmers to grow it. Finally, it recommends implementing a clear action plan that prioritizes support measures, ensuring a continuous increase in the purchase price of the Burley variety from farmers by the General Tobacco Corporation. This would encourage farmers to obtain more licenses to cultivate this variety. The category includes providing financial incentives or credit facilities, as well as regularly monitoring performance indicators to maximize economic returns in the study area.

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