https://doi.org/10.54481/uekbs2024.v1.32 CZU: 336.145

INVESTMENT MANAGEMENT IN THE CULTIVATION OF MINT FOR THE PRODUCTION OF DRIED PLANTS FOR MEDICINE

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Abstract

The purpose of the article is to analyze investment management through the development of the income and expenditure budget in the mint culture. In this sense, the authors developed the budget for the establishment of the mint plantation until fruiting and on the fruit, which serve as an important source of information for the interested parties in the development of the aromatic and medicinal plants sector and can use the information to receive correct decisions based on economic calculations. Conventional mint cultivation in Moldova offers high economic efficiency, with significant profitability. It provides farmers with a substantial commercial margin for dried plants, contributing to income diversification in rural areas. Mint is used in various industries, including pharmaceuticals, food, and cosmetics, with menthol and carvone as key components of its essential oil. Yields of fresh herb are substantial, and drying can be done naturally or artificially. Mint cultivation is largely mechanized, low-cost, and suitable for small and medium-sized farms. The sector holds untapped economic, social, and ecological potential, with organic farming offering higher market prices. Based on the research and analysis carried out, strategic conclusions were formulated for the sustainable development of the mint branch necessary for the implementation by the actors of the value chains in the sector.

Keywords: budget, profitability, sales revenue, cost of sales, gross profit, mint, medicinal plant.

The aromatic and medicinal plants sector is a component of horticulture in the Republic of Moldova and represents a promising sector because it is profitable, its products are in demand on regional and international markets, production factors are favorable, it benefits from support from authorities and donors, and the recorded experience/history facilitates its sustainable development.

The purpose of this article is to conduct sectoral research on the mint branch, and the results of the analyses will inform individuals interested in the sustainable development of mint cultivation. Moreover, these findings will encourage their association/cooperation and integration into value chains through the development of advantageous partnerships.

Mint is the common name for dozens of species in the genus of the same name, with the most commonly cultivated and used being Mentha piperita (peppermint), Mentha spicata (spearmint), and Mentha crispa (curly mint).

Their leaves or the entire plant are used as raw material containing volatile oil (0.5-6% of dry matter), widely used in the pharmaceutical, food, and cosmetic industries, as well as in medicine.

In medicine, mint is used in the following ways: Treating bile disorders (cholagogue and choleretic) and gastritis; Spasmolytic, antiseptic, and bactericidal effects; Improves brain function and stimulates the central nervous system; Prevents nausea and vomiting; Boosts immunity; Beneficial for allergies; Aids in hair regeneration; Induces drowsiness; Supports oral health; Reduces menstrual pain.

General characteristics and specific aspects of plantation establishment

Mint is one of the oldest known medicinal and aromatic plants. It is a herbaceous, perennial plant with a highly branched aerial part. The plant is notable for not producing fruit and reproducing exclusively vegetatively, through stolons. At the nodes of the stolons, small leaves, adventitious roots, and new aerial shoots form. The stolons branch and grow horizontally, leading to the self-expansion of the bush. Stolons form each year, starting from the flowering period, and ensure the regeneration of the plant's aerial part in the following year.

The stems are erect, and the leaves are large, opposite, short-petioled, oval-lanceolate, with strongly serrated edges, pointed tips, and dark green color. The flowers are grouped in spike-like cymes, located at the tips of the branches, and the corolla is pinkish-violet, blooming from June to September. Oil glands are present on all aerial organs, with a lower density on the dorsal side of the leaves.

Selection of planting material and planting method

Mint is propagated through stolons or by rooting stem cuttings that originate from the nodes of the stolons. The propagation material should come from eco-friendly mint cultures that are being retired. The harvesting of stolons for establishing a new crop must be done according to the planting schedule. Due to their shallow rooting, stolons can be dug up with a fork on small surfaces or, on larger areas, using equipment such as a moldboardless plow, a dislocating blade, or a potato digger. From special plots, 6-8 tons of stolons per hectare can be obtained, and the amount of stolons collected from one hectare can be used as propagation material for up to 6 hectares. If stolons need to be stored over winter, this can be done in specially arranged silos equipped with ventilation systems, and the stolons should be watered regularly to prevent dehydration. Planting is recommended in the fall, as this allows for better rooting and proper plant density in the field. This way, the shoots begin growing earlier in spring, develop faster, and result in better and higher-quality yields. Before planting, vigorous, turgid stolons should be selected, trimmed with pruning shears to a length of 12-15 cm, and any browned sections should be removed. Planting the stolons can be done manually or semi-mechanized using a planting machine. Manual planting requires a large labor force. The recommended distance between rows is 70 cm. Furrows should be opened in time with planting to avoid water evaporation from the soil. Stolons are placed a few centimeters deep in the furrow and immediately covered with soil, either manually with a hoe or by passing a ridger between the rows, followed by light rolling or harrowing to prevent the soil from drying out. The planting rate is 1400 kg/ha of stolons. For semi-mechanized planting, far fewer workers are needed to establish one hectare of the crop.

For farmers, it is important to select mint varieties that ensure competitive yields, with high-quality and high-performance seed material. In the case of competitive mint varieties, the essential oil is of high quality, and the investments in one hectare of planted mint are recovered much faster.

The table below estimates the investments required for planting one hectare of mint using conventional methods and maintaining it during the first two years of growth.

Table 1. Budget for investments in planting and maintaining mint until it starts producing yields in a conventional system

Specification	UM	Amount /ha	Unit price, lei	Total - 1 year	Total – 2 year	Total (until the entrance to the orchard)	
						lei	Structure, %
I. The cost of the means of production	**lei**	**X**	**X**	**37.857**	**12.847**	**50.704**	**40,1%**
Planting material (scheme 1.6x0.5m)	unit	71.429	0,40	28.571		28.571	22,6%
Planting material filling the gaps (5% bushes)	unit	3.571	0,40		1.429	1.429	1,1%
Organic fertilizers for planting	t		400,00	0		0	0,0%
Total mineral fertilizers:				3.200	591	3.791	3,0%
Diamofos NPK 10:26:26	kg	200	16,00	3.200		3.200	2,5%
Microelement - Poly-Feed 19:19:19 + 6 ME	kg	9	65,70		591	591	0,5%
Chemical substances	lei			2.243	6.984	9.227	7,3%
Herbicides - glyphosate, 540 g/l, salt	l	10,00	224,25	2.243		2.243	1,8%
Herbicides – metamitron	l	1,50	819,00		1.229	1.229	1,0%
Herbicides – chlorpyralid	l	1,50	1.854,72			0	0,0%
Herbicides - quizalofop-p-ethyl	l	1,50	390,00		585	585	0,5%
Insecticide - lambda cyhalothrin	l	0,60	804,78			0	0,0%
Insecticide – acetamiprid	l	1,20	2.311,14		2.773	2.773	2,2%
Fungicides - tribasic copper sulfate	kg	5,00	304,20		1.521	1.521	1,2%
Fungicides – sulfur	kg	3,00	83,52		251	251	0,2%
Fungicides – pyrimethanil	kg	1,00	625,95		626	626	0,5%
Water (when planting and caring for the plantation)	m^3	114	3,00	343	343	686	0,5%

Water (for field irrigation)	m^3	1.000,00	3,00	3.000	3.000	6.000	4,7%
Fuel (field travel)	l	20,00	25,00	500	500	1.000	0,8%
II. Mechanized services	**lei**	**X**	**X**	**11.955**	**2.946**	**14.901**	**11,8%**
Deforestation and weed challenge	ha	1,0	283,0	283		283	0,2%
Semi-deep plow (35-40 cm)	ha	1,0	1.233,8	1.234		1.234	1,0%
Leveling the clearing plow (2 directions)	ha	2,0	273,5	547		547	0,4%
Transport services (sprinkled water - 2 times)	t/km	4,0	5,9	23		23	0,0%
Introduction of herbicides (2 times)	ha	2,0	177,3	355		355	0,3%
Total cultivation - 2 times	ha	2,0	337,8	676		676	0,5%
Transporting planting material	km	200,0	5,9	1.173		1.173	0,9%
Transporting water to planting and irrigation	t x km	1142,9	5,9	6.702		6.702	5,3%
Fertilizer transportation services	t/km	5,0	5,9	29		29	0,0%
Fertilization by spreading	ha	1,0	214,8	215		215	0,2%
Digging strips for planting	ha	1,0	358,4	358		358	0,3%
Mechanized cultivation between rows - 3 times	ha	3,00	236,04		708	708	0,6%
Transport services (sprinkled water)	ha	6,0	5,9	23	35	59	0,0%
Spraying the fields	ha	3,0	168,3	337	505	842	0,7%
III. Manual operations	**lei**	**X**	**X**	**33.055**	**16.190**	**49.246**	**39,0%**
Staking out the area for planting	om x day	6,0	400,0	2.400		2.400	1,9%
Mulching with soil	om x day	5,0	400,0	2.000		2.000	1,6%
Planting bushes	om x day	71,4	400,0	28.571		28.571	22,6%
Filling in the blanks	om x day	23,8	400,0		9.524	9.524	7,5%
Cutting the inflorescences	om x day	6,7	400,0		2.667	2.667	2,1%
Loading and unloading of fertilizers	om x day	0,2	400,0	84		84	0,1%
Weeding between bushes in a row (2 times)	om x day	10,0	400,0		4.000	4.000	3,2%
IV. Land tax	**lei**		**110**	**0**	**0**	**0**	**0,0%**
V. Lease Payment	**lei**	**1**	**0**	**0**	**0**	**0**	**0,0%**
VI. Contingencies (10%)	**lei**	**X**	**X**	**8.287**	**3.198**	**11.485**	**9,1%**
TOTAL investments (I+II+III)	**lei**	**X**	**X**	**91.153**	**35.182**	**126.336**	**100,0%**

The total investment for establishing and maintaining one hectare of mint until it starts producing in a conventional system is 126,336 lei, where the cost of production inputs accounts for the largest share at 40.1%, and manual labor operations account for 39% (Zbancă, 2022: 15).

Specific aspects of care and maintenance of the plantation

Mint has a high ecological adaptability and is widespread on all continents. Plant vegetation starts early in spring, at temperatures of 3-5°C, and mint stolons can withstand temperatures as low as -20°C. The optimal summer temperature is 18-22°C. Mint is highly dependent on soil moisture, with water being a limiting factor for production. Throughout the growing season, the plant consumes about 6000 m³ of water. Mint is also sensitive to light, which promotes the accumulation of volatile oil in the plant. It thrives in loose, permeable soils that are well-supplied with nutrients. It is recommended to cultivate it on alluvial and peaty soils with a medium to light texture and shallow groundwater. However, it can be grown on any type of soil under irrigation conditions. It is advised to cultivate mint as an annual plant and include it in crop rotation (Balan 58). If mint is kept on the same land for several years, the density of the stems increases excessively at the expense of leaf and volatile oil production, the soil becomes compacted, weeds proliferate, and pests and diseases multiply. Additionally, in subsequent years, shorter stolon's form in smaller quantities, which cannot be effectively utilized. Mint can also be maintained for two years on the same land. In this case, it is recommended that in the second year, at the beginning of the growing season, the plantation is worked with a cultivator to loosen the soil and control weeds. The best predecessors for mint are legumes for grain, vetch, and cereal grains. It is not recommended to grow mint after alfalfa, clover, or perennial grasses that produce shoots, as they require additional maintenance work. Mint responds well to organic fertilizers because its root system is not very well developed, and the plant grows quickly. The use of well-fermented manure, applied as

uniformly as possible, is recommended. This improves soil fertility, promotes vegetative growth, and increases volatile oil content. Between 25-40 tons/ha of manure can be applied in the fall before plowing, ahead of establishing the plantation. Manure or compost can also be used, applied in furrows at the time of planting the stolons. After early harvested crops like cereal grains or legumes for grain, stubble cultivation should be carried out, followed by deep plowing at 25-30 cm with a plow attached to a harrow. Repeated harrowing throughout the fall helps conserve moisture and destroy weeds. After late predecessors, stubble cultivation should be done, followed by deep plowing, and before planting the stolon's, the soil should be maintained by passing over with a disc harrow to break up clods and eliminate weeds.

For planting, the soil must be very finely tilled and leveled using a disc harrow combined with an adjustable harrow and a leveling bar. If, for some reason, planting was not done in the fall, then soil preparation should be carried out very early in the spring, when weather conditions allow, with 1-2 passes of a disc harrow combined with a tine harrow. After fall planting, no additional work is necessary. In the spring, cultivation between rows and weeding within rows will be carried out to control weeds. In certain situations, it is recommended to harrow perpendicular to the row direction using an adjustable-tine harrow, ensuring the tines are pointing backward to avoid pulling the stolons out of the soil. Cultivation should be performed until the plants reach the branching stage; later, field hygiene will be maintained through repeated weeding operations.

Protection operations: Disease and pest control in an organic system

Disease control (rust, anthracnose) is achieved through preventive measures, including: planting healthy stolons in the fall, thoroughly cleaned of plant debris; rational fertilization with organic fertilizers; eliminating wild mint, especially in areas where water may stagnate and the soil remains wet; and rotating mint cultivation on the same land every 5-6 years. The most common pests in mint crops are mint spider mites, aphids, and mint fleas, which do not cause significant damage and can be controlled through the same preventive methods used for diseases.

Irrigation requirements

In conditions of water shortage, irrigation is necessary. After each harvest, mint must be irrigated. The best irrigation methods are furrow irrigation and drip irrigation. Sprinkler irrigation is not recommended, as it increases the risk of rust attacks, which can compromise the harvest.

The revenue and expense budget for cultivating one hectare of industrial mint in a conventional system is presented in the following table 2.

Table 2. Budget for cultivating industrial mint in a conventional system

Specificare	UM	Recommended technology at 1 ha			
		Quantity / rate per hectare	Unit price, lei	Amount, lei	Consumption structure, %
I. Net sales	**lei**		**X**	**273.000,0**	**X**
Dried plants	kg	4.200,0	65,00	273.000,0	X
II. The cost of the means of production	**lei**	**X**	**X**	**12.635,2**	**8,85**
Mineral fertilizers:				4.191,3	2,94
Diamofos NPK 10:26:26	kg	200,00	18,00	3.600,0	2,52
Microelement - Poly-Feed 19:19:19 + 6 ME	kg	9,00	65,70	591,3	0,41
Chemicals:				4.693,9	3,29
Herbicides – metamitron	L	1,50	819,00	1.228,5	0,86
Herbicides - quizalofop-p-ethyl	kg	1,50	390,00	585,0	0,41
Insecticide - lambda cyhalothrin	L	0,60	804,78	482,9	0,34
Fungicides - tribasic copper sulfate	L	5,00	304,20	1.521,0	1,07
Fungicides – sulfur	kg	3,00	83,52	250,6	0,18
Fungicides – pyrimethanil	kg	1,00	625,95	626,0	0,44
Water (for field irrigation)	m^3	1.000,00	3,00	3.000,0	2,10
Fuel (field travel)	L	30,00	25,00	750,0	0,53
III. The cost of mechanized services	**lei**	**X**	**X**	**56.619,1**	**39,67**
Irrigation services	ha	1.000,00	1,70	1.698,1	1,19
Transporting water to sprinkle the fields	ha	10,0	5,9	58,6	0,04
Spraying the fields	ha	4,0	168,34	673,4	0,47
Cultivation between the rows	ha	3,0	236,04	708,1	0,50
Mechanized harvesting of plants	ha	1,0	881,84	881,8	0,62
Harvest transportation	t x km	375,0	5,86	2.199,1	1,54
Processing services – drying	lei/kg	4.200,0	12	50.400,0	35,31
IV. Cost of manual operations	**lei**	**X**	**X**	**18.283,6**	**12,81**

Weeding between the rows (2 times)	om x zi	8,00	400,00	3.200,0	2,24
Harvest support	om x zi	21,00	400,00	8.400,0	5,89
Loading and unloading the crop	om x zi	6,00	400,00	2.400,0	1,68
Sorting - production packaging	om x zi	10,50	400,00	4.200,0	2,94
Loading and unloading of fertilizers	om x zi	0,21	400,00	83,6	0,06
V. Other Costs and Fees	**lei**	**X**	**X**	**42.205,4**	**29,57**
Plantation Wear (not apportioned to stream)	lei	X	X	42.111,9	29,51
Land tax	lei	1,00	93,50	93,5	0,07
VI. Contingency expenses ((II+III+IV+V)*10%)	**lei**	**X**	**X**	**12.974,3**	**9,09**
VII. Variable + fixed consumptions (II+III+IV+V+VI)	**lei**	**X**	**X**	**142.717,7**	**100,00**
VIII: Gross margin (gross profit) (I-VII)	**lei**	**X**	**X**	**130.282,3**	**X**
IX: Gross margin percentage (VIII / VII*100%)	**%**	**X**	**X**	**91,3**	**X**

Note. The proposed budget is a model for entrepreneurs and may vary depending on production factors and the specific conditions of the beneficiary. In the "Other Costs and Taxes" (V) category, the costs include the annual depreciation of the plantation, amounting to 42,111.9 lei. Depreciation is calculated from a financial perspective to recover the investments made, based on their operational lifespan, and its value remains under the entrepreneur's management for the following year (Zbancă, 2022: 22).

Examining the data from the table, we conclude that mint cultivation is profitable in a conventional system, as it allows for an annual gross profit of 130,282.3 lei per hectare (total revenue from sales – 273,000 lei, and cost of sales – 142,717.7 lei).

Table 3. Cash flow for cultivating industrial mint in a conventional system

Specification	1	Cash flow by months of the year, lei											
	Total - area, lei	January	February	March	April	May	June	July	August	September	October	November	December
Initial cash flow	**X**	**0**	**0**	**0**	**-92**	**-9.313**	**-14.471**	**-52.219**	**-92.468**	**-94.140**	**42.269**	**178.677**	**178.585**
I. Net sales	**273.000**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**136.500**	**136.500**	**0**	**0**
Dried plants	273.000									136.500	136.500		
II. The cost of the means of production	**12.635**	**0**	**0**	**83**	**7.698**	**2.157**	**1.280**	**1.083**	**83**	**83**	**83**	**83**	**0**
Mineral fertilizers:	4.191	0	0	0	3.797	197	197	0	0	0	0	0	0
Diamofos NPK 10:26:26	3.600				3.600								
Microelement - Poly-Feed 19:19:19 + 6 ME	591				197	197	197						
Chemicals:	4.694	0	0	0	3.817	877	0	0	0	0	0	0	0
Herbicides - metamitron	1.229				1.229								
Herbicides - quizalofop-p-ethyl	585				585								
Insecticide - lambda cyhalothrin	483				483								
Fungicides - tribasic copper sulfate	1.521				1.521								
Fungicides - sulfur	251					251							
Fungicides - pyrimethanil	626					626							
Water (for field irrigation)	3.000					1.000	1.000	1.000					
Fuel (field travel)	750			83	83	83	83	83	83	83	83	83	
III. The cost of mechanized services	**56.619**	**0**	**0**	**0**	**602**	**932**	**27.543**	**27.306**	**236**	**0**	**0**	**0**	**0**
Irrigation services	1.698					566	566	566					
Transporting water to sprinkle the fields	59				29	29							
Spraying the fields	673				337	337							
Cultivation between the rows	708				236		236		236				
Mechanized harvesting of plants	882						441	441					
Harvest transportation	2.199						1.100	1.100					
Processing services - drying	50.400						25.200	25.200					
IV. Cost of manual operations	**18.284**	**0**	**0**	**0**	**84**	**1.600**	**5.400**	**8.200**	**1.200**	**0**	**0**	**0**	**0**
Weeding between the rows (2 times)	3.200					1.600		1.600					
Harvest support	8.400						4.200	4.200					
Loading and unloading the crop	2.400						1.200	1.200					
Sorting - production packaging	4.200							1.200	1.200				
Loading and unloading of fertilizers	84				84								
V. Other Costs and Fees	**42.205**	**0**	**0**	**0**	**0**	**0**	**94**	**0**	**0**	**0**	**0**	**0**	**0**
Plantation Wear (not apportioned to stream)	42.112												
Land tax	94						94						

VI. Contingency expenses ((II+III+IV+V)*10%)	**12.974**	**0**	**0**	**8**	**838**	**469**	**3.432**	**3.659**	**152**	**8**	**8**	**8**	**0**
VII. Variable + fixed consumptions (II+III+IV+V+VI)	**142.718**	**0**	**0**	**92**	**9.222**	**5.158**	**37.748**	**40.249**	**1.671**	**92**	**92**	**92**	**0**
VIII: Gross margin (gross profit) (I-VII)	**130.282**												
IX: Gross margin percentage (VIII / VII*100%)	**91**												
Final cash flow	**X**	**0**	**0**	**-92**	**-9.313**	**-14.471**	**-52.219**	**-92.468**	**-94.140**	**42.269**	**178.677**	**178.585**	**178.585**

Note: Depreciation is not included in the cash flow, as the allocated funds remain within the company and are accounted for financial purposes (profitability calculation).

The available cash flow at the end of the year for producing industrial mint in a conventional system will amount to 178,585 Lei, which is sufficient to meet the cash needs for the following year and to provide dividends to the founders.

Harvesting and post-harvest operations

If the raw material is intended for essential oil extraction, harvesting should be done when 50% of the inflorescences are open. If the raw material is intended to be used in teas, as dried material, harvesting should occur when 30-40% of the plants are in bloom. Harvesting of the aerial vegetative mass is carried out by mowing with a mechanical mower. It is recommended to harvest at the pace of distillation to avoid losses of essential oil. Mechanical mowers or windrowers can be used for cutting, which leave the cut vegetation in rows, from where it can be loaded into transport vehicles using a forage loader. Leaf harvesting can begin when the leaves are 5-6 cm in length, and it is done in several stages. Harvesting leaf by leaf ensures the highest quality plant material.

Harvesting should not be done too early, during the budding phase, as the essential oil content is lower and of poorer quality. Harvesting can also be done by stripping the leaves by hand along the stems, but this partially damages the plant material, leading to crushing and loss of essential oil. Harvesting should take place in the middle of the day, between 10 a.m. and 2 p.m., on sunny, warm days without wind, dew, or fog, and the leaves should be dried to maximize their essential oil content.

Profitability is the economic category that reflects the company's ability to generate profit, indicating its performance. Achieving this goal depends on conducting a profitable activity.

The following table presents the main indicators of the economic efficiency of cultivating industrial mint in a conventional system on a unit of land.

Table 4. Analysis of the economic efficiency of cultivating industrial mint in a conventional system

Nr.	The main economic indicators	Calculation formula	UM	Date de calcul (suprafața 1 hectar)
1	The investment budget for the establishment of the plantation	Investment budget	lei	131.335,77
2	Subsidies possible to obtain	Subsidy regulation	lei	10.000,00
3	Sales revenue	Budget per fruit	lei	273.000,00
4	Cost of sales	Budget per fruit	lei	142.717,65
5	Annual gross profit	3 - 4	lei	130.282,35
6	Profitability of revenues (revenues obtained per 1 leu of consumption)	3 / 4 * 100%	%	191,29
7	Economic profitability (profits obtained per 1 leu of consumption)	5 / 4 * 100%	%	91,29
8	Cash flow at the end of the year	Budget per fruit	lei	178.585,46
9	Unit cost	4 / harvest per hectare	lei / kg	33,98
10	Average trading price	3 / harvest per hectare	lei / kg	65,00
11	The gross profit (gross margin) of the production	10 - 9	lei / kg	31,02
12	Investment recovery period (fruitful years)	(1-2) / 5	year	0,93
13	Investment payback period (years from planting)	10 + 2 years vegetation period	year	1,93

Conventional mint cultivation allows farmers to achieve high levels of economic efficiency, with an economic profitability rate of 91.29% for conventional agriculture. The average commercial margin for dried plants is 31.02 Lei/kg, which is beneficial for farmers and supports the diversification of income sources in rural areas.

The industrial cultivation of mint in a conventional system offers a high level of economic efficiency and is advantageous for implementation on farms in rural areas of Moldova (Zbancă, 2023: 887).

Processing and Usage

The raw material can consist of leaves or the whole plant. Mint has a variety of uses in the pharmaceutical, food, and cosmetic industries, and is also included in medicinal teas with digestive, carminative, antiemetic, choleretic, or cardiotonic effects. Dried mint leaves contain 0.5-3.5% essential oil, while fresh herbs contain between 0.15 and 0.55% essential oil.

The primary component of the essential oil is menthol for the species Mentha piperita (about 75%), while carvone makes up around 40-60% of the fresh herb.

Drying the plant material should be done naturally in the shade (in sheds or attics) for 5-6 days. Leaves and herbs can also be dried artificially at temperatures of up to 35°C. The reception standards specify the following conditions: maximum 14% moisture, no more than 3-5 brown leaves per stem, maximum 1.5% organic foreign matter, 0.5% mineral foreign matter, and at least 1% essential oil content.

Yields can range from 10-20 tons/ha of fresh herb, equivalent to 2.5-3 tons/ha of dried herb or 1-1.3 tons/ha of dried leaves.

Packaging and Storage - after drying, the herb is packed in cloth bags and stored in dry, clean, and well-ventilated spaces, with a maximum storage period of 3 years.

State institutions and donors should focus their efforts on improving the existing framework to stimulate the development of the aromatic and medicinal plant sector, providing much more targeted and determined support for this promising sector, which has untapped economic, social, and ecological potential.

Advantages of Cultivating Medicinal Plants (including mint) in Moldova:

- Dried mint plants are in demand in the pharmaceutical industry and other sectors.
- Farmers can provide high-quality competitive products, directly contributing to consumer protection.
- Business relationships are established between domestic and international producers and processors.
- Mint cultivation is mecanized and doesn't require significant investments.
- Medicinal plant farming is suitable for small and medium-sized farmers, offering important income alternatives.
- Mint can also be grown in organic systems, with dried plant prices being 20-35% higher if certified by international bodies.
- Medicinal plants are highly profitable crops, allowing for more efficient use of production factors such as land and fixed assets.

Bibliographic References

Zbancă, A., Melnic, V., Stratan, D. Tehnologii și inovații în sectorul plantelor aromatice și medicinale în contextul schimbărilor climatice: Ghid / Unitatea Consolidată pentru Implementarea Programelor IFAD (UCIP IFAD). Chișinău: Print-Caro, 2022.

Zbancă, A., Melnic, V., Stratan, D. Exportul uleiurilor etero-oleaginoase în Republica Moldova: Ghid practic / Unitatea Consolidată pentru Implementarea Programelor IFAD (UCIP IFAD). Chișinău: Print-Caro, 2022.

Zbanca, A., Balan, I., Urîtu, V. Investment management in the cultivation of lavender for the production of the essential oil. In: Management, Economic Engineering in Agriculture and Rural Development. 23, 2023, pp. 887-894.

Balan, I., Zbanca, A., Urîtu, V. Fezabilitatea și dezvoltarea sustenabilă a sectorului plantelor medicinale în Republica Moldova. În: Vector European. 1, 2024, pp. 58-67.