MANIFESTATION OF MORPHOBIOLOGICAL TRAITS AND GREEN MASS PRODUCTIVITY OF MELISSA CULTIVATED IN SOUTHERN UZBEKISTAN

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Abstract. This article presents the results of research on the cultivation of lemon balm, introduced in southern Uzbekistan, for green products during spring and autumn planting periods. Studies have shown that lemon balm can fully complete its development periods under Uzbek conditions at different planting periods and produce high-quality green products. This indicates that the introduction of lemon balm to Uzbek conditions is promising.

Keywords: lemon balm, introduction, planting period, development periods, plant height, yield.

One of the plants used in world agriculture not only as a medicinal plant, but also as a vegetable crop, is lemon balm - medicinal lemon balm (Melissa officinalis L.), which occupies a special place in our country.

Melissa - (Melissa officinalis L.) has been successfully used in folk medicine and scientific medicine in many countries of the world for more than 2000 years [3].

The name of the plant comes from the Greek word "melissa" and means honey, bees, and the Latin "officinalis" - medicinal.

Melissa is also called "little ginseng" because of its healing properties for various diseases. Its aroma lifts the mood, and the phytoncides it contains purify the air. Melissa is an appetite stimulant, sedative, improves the functioning of the endocrine glands, and a hemostatic agent. It is effective in heart and blood vessel diseases, and is used to treat tachycardia and other diseases. The essential oil contained in it is used against viruses and cures various diseases caused by viruses such as herpes and influenza [4].

Melissa is widely used in industries such as food, pharmaceuticals, perfumes and cosmetics. It contains a number of substances that are extremely necessary for the human body.

In the food industry, melissa is used to make aromatic teas and vinegars, flavored liqueurs and drinks. It can replace tea [1].

Young leaves of Melissa are used as a spice for preparing salads, soups, fish, mushrooms, smoked and canned products. It is also used to prepare compote, sauce, milk dishes and minced meat [2,4].

Research Materials and Methods.

In conducting the research, the following methodologies and methodological guidelines were used: Method of conducting experiments with vegetable, melon, and potato crops (Tashkent, 2023), Methodological guidelines for ecological testing of vegetable crops in open ground (M., VNIISSOK, 1987. Part 1), Methodological guidelines for the breeding of green, spicy-flavored, and perennial vegetable crops (M., VIR-VNIISSOK, 1987), Guide to the approbation of vegetable crops and fodder root crops (M., Kolos, 1982), Methodology of State Variety Testing of Agricultural Crops (M., 2019. Part 1), and Methodology of Field Experimentation (Dospekhov B.A., 1985).

As the object of research, the varieties of melissa (Lemonny Aromat, Lemonny Balzam, Svezhest, Dozya, and Kholodok) were studied in detail, and based on the results, the Dozya variety was selected for experimentation. The experiments were carried out in spring and autumn seasons. Seedlings were grown in unheated greenhouses. The planting scheme was 70 × 25 cm. The experiment was conducted with 4 replications. The area of the accounting plot was 4.5 m^2, with each plot consisting of 2 rows. The number of plants per plot was 20.

Results and their analysis. As part of the research on the introduction of lemon balm to the conditions of Uzbekistan, the manifestation of its important characteristics and productivity at different sowing dates were studied.

In the spring, seeds were sown in cassettes on January 25, and in the autumn - on October 15. Taking into account the fact that lemon balm is a perennial crop, phenological observations were carried out in the spring and autumn periods of the first and second year of its life.

The duration of the development periods of lemon balm plants is given in Table 1.

Table 1. The duration of development periods in the melissa plant grown for green products in spring and autumn, 2023-2024.

Periods of development		I	II
In its first year			
Planting-germination, day	10%	11	7
	75%	17	10

From germination to technical ripening, days	10%	90	185
	75%	96	192
In its second year			
Date of regrowth	10%		
	75%		
From germination to technical ripening, days	10%	76	72
	75%	83	78

The duration of the sowing–emergence period in the first year of life was 11–17 days in the spring planting period and 7–10 days in the autumn planting period. From emergence to technical ripening required 90–96 days in the spring period and 185–192 days in the autumn period. In the autumn period, this stage was 95–96 days longer than in spring. In the second year of life, from regrowth to technical ripening required 76–83 days in the spring period and 72–78 days in the autumn period. The difference between the periods for this trait was not significant.

During the harvesting period for green mass, i.e., at the budding stage of the plants, morphobiological characterization was carried out (Table 2). In the first year of life, plant height was 23.0 cm in the spring period and 25.0 cm in the autumn period. The number of lateral branches was 9.0 per plant in the spring period and 16.0 per plant in the autumn period. Leaf sizes were also noticeably higher in autumn-period plants.

Table 2. Manifestation of morphobiological signs in the melissa plant grown for green mass in spring and autumn, 2023-2024

Crop name	Sowing time	Plant height, cm	Number of side branches, pcs/ plant	Leaf size, cm		In one plant, g		
				length	width	weight of one plant, g	leaf weight,g	stems and branches weight, g
Melissa	**In its first year**							
	I	23,0	9,0	4,0	3,1	139,7	107,9	31,8
	II	25,0	16,0	5,1	3,4	157,4	114,1	43,3
	In its second year							
	I	25,0	28,0	5,7	4,0	425,4	327,9	97,5
	II	27,0	36,0	6,1	4,7	471,3	359,1	112,2

The fresh mass weight of a single plant in the first year of life was 139.7 g in the spring period, while in the autumn period the plant weight was 17.7 g higher

compared to spring. The leaf weight per plant in the spring period was 107.9 g (77.2% of plant weight), while the weight of stems and branches was 31.8 g (22.8% of plant weight).

In the second year of life, all indicators were observed to be considerably higher. In particular, plant height in the spring period was 25.0 cm (2 cm higher compared to the first year), and in the autumn period it was 27.0 cm (2 cm higher compared to the first year). The difference in the number of lateral branches was very large: in the spring period, 28.0 branches per plant were formed (19 more than in the first year), and in the autumn period 36.0 branches per plant were formed (20 more than in the first year). A significant difference was also observed in leaf size.

Depending on the age of the plant, the difference in fresh mass productivity was also large. In the second year of life, fresh mass productivity was 425.4 g in the spring period and 471.3 g in the autumn period. This was respectively 285.7 g and 313.9 g higher compared to the first year.

According to average two-year data, in the first year of life, the fresh mass yield was 0.84 kg/m^2 in the spring period and 0.94 kg/m^2 in the autumn period (Table 3).

Table 3. Yield of Melissa cultivated for fresh mass in spring and autumn periods, 2023–2024.

Sowing time	Yield kg/m^2		The average is two years	
	2023	2024	kg/m^2	kg/ha
In its first year				
I	0,80	0,88	0,84	840,0
II	0,91	0,97	0,94	940,0
ЭКМФ$_{05}$				
S $_{x\%}$				
In its second year				
I	2,4	2,7	2,6	26000,0
II	2,6	3,0	2,8	28000,0
ЭКМФ$_{05}$				
S $_{x\%}$				

In the second year of life, these indicators were much higher, amounting to 2.6 kg/m^2 in the spring period and 2.8 kg/m^2 in the autumn period. This means, respectively, 309.5% and 297.9% higher compared to the first year of life.

Conclusions

1. The technical maturity of the Melissa plant in southern Uzbekistan corresponds to the first ten days of May.

2. The fresh mass productivity of Melissa varied depending on the age of the plant and the sowing periods.

The highest fresh mass productivity was obtained in the second year of plant life, amounting to 425.4–471.3 g/plant. This is 297.9–309.5% higher compared to the first year of life.

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