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## Check sowing date and seed priming on the essential oil *Dracocephalum moldavica* L.

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**Key words:** Moldavian balm (*Dracocephalum moldavica* L.), Priming, Potassium nitrate, High putte, Essence percent.

### Abstract

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Moldavian balm (*Dracocephalum moldavica* L.) grasses, annuals, belonging to the mint family. Vegetative body of the plant contain essential oil has antiseptic, antiviral, antibacterial, antifungal, is And to relieve headaches and colds, and spasms of the kidney and used in the food industry and cosmetics. In order to evaluate the agronomic characteristics *Dracocephalum moldavica* influenced by planting time and priming, Agricultural Experiment Station, Agricultural and Natural Resources Research Station in 2013 in the city of West Azarbaijan province was conducted in Sect. The experiment was a split plot in a randomized complete block design with three replications. Main plots consisted of three sowing dates (15 May, May 31 and 15 June) and sub-plots included four levels of priming (Zn (0/02 percent), potassium nitrate (0/4 percent), tap water and control (without priming) were studied. According to the data, it is observed that the maximum height of plants treated with potassium nitrate is Moldavian balm And a minimum height of 78 cm and an average value for the control. The most essential Moldavian balm (0/7%) of potassium nitrate is priming. Thus it can be concluded that the time of planting and priming with potassium nitrate can be improved morphological characteristics and performance of the plant.

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## Introduction

Moldavian balm (*Dracocephalum moldavica* L.) grasses, annuals and belongs to the mint family. The plant originated in southern Siberia and the Himalayan range have been reported. Vegetative body of the plant ingredients are relaxing and appetizing. It has antibacterial properties and is essential for the treatment of abdominal pain and bloating, as well as in the food, beverage, and health and beauty industry is used (Hassani, 2010). Moldavian balm very similar chemical components of essential oil of lemon balm is a plant native to the Mediterranean region, and the full body of the plant contain essential And its value is different in different parts. Flowers and configuration Moldavian balm vegetative (leaves and young stems) is the most essential. Moldavian balm essence percent, is variable and depends on different parts of the plant and ecological factors. The essential of the 0/1 percent to 0/8 percent Moldavian balm during the growing season varies (Barimani, 2007). Glzany Ghasemi *et al* (2008) demonstrated that the benefits of seed priming to improve germination, seedlings faster and more uniform withdrawal, maturity, wider temperature range for germination, regeneration of damaged cells, reduce barriers to growth fetus, increasing the quality and quantity of protein synthesis, removal of seed dormancy and increase the plant's power. The impact of planting date on medicinal plants moldavian balm various experiments conducted on the date of planting moldavian balm Due to the climatic conditions of the experiment, different results were obtained, Halasz-zelnik and colleagues so that the best time to plant late March or early April (early April) and Suchorska and colleagues considered the best time of the month (May) have introduced (Halasz-zelnik, *et al.*, 2010; Suchorska, *et al.*, 2010).

Since one of the goals of aromatic plants cultivation, it is essential to enhance performance And since the Vegetative yield and essential oil yield in the body there is a direct relationship, So picked up the vegetative body can achieve the maximum yield of essential oil (Brenna nasrabadi, 2009). Therefore, the aim of this study was to examine the effect of sowing

time on the growth and influence of seed priming Performance and the effects on component performance.

## Materials and methods

The experiment in 2013 at the Agricultural Research Station And natural resources located 5 km North West of the city mentioned in H. Kennedy Road in West Azarbaijan Province was conducted.

Before running the test preparation work including watering, weeding, pest control, irrigation, land preparation work before running the tests, Weeding, pest control, thinning (at the 6-leaf stage), fertilization and... Due to the growing need for all plots were alike. And sandy loam soils with PH was equal to 7/52. Soil analysis showed that 4/2 mg per kg of phosphorus and potassium levels of 315 milligrams per kilogram of total nitrogen content was 0/05 percent. The test for 1 year as a split plot design in randomized complete block design with 3 replications and 12 treatments were performed. Treatments consisted of different planting dates were 15 May, 31 May, 15 June and priming treatments with zinc sulfate solution (0/02 percent), potassium nitrate (0/4 percent), and tap water control. After priming the seeds after this period were in the open air to dry the surface moisture. The more seeds primed with no priming treatment (control) in the grooves created manually on ridges were planted at a depth of 3 cm. Each plot size of 1 to 1.5 m were considered. Other plots within a distance of one meter and two meters were taken from each block. 4 rows of plants in each plot were cultured in 35 cm planting distance.

### *Essential oil extraction*

The essential oil is extracted by steam distillation was conducted by using a Clevenger. For this purpose, 30 g of dried sample from each plot was weighed and After grinding briefly in 600 ml of water in Clevenger apparatus was boiled for 2 hours until the oil is extracted Hungary Pharmacopoeia.

### *Statistical analysis of the data*

To analyze the data obtained were analyzed by SPSS

statistical software. Comparison of the results was performed by Duncan test.

## Results

Analysis of variance (Table 1) And the means for plant height and number of branches showed a non-significant effect of priming treatments at planting time and a significant percentage of the show, The highest plant height, number of branches is moldavian balm of potassium nitrate treatment, Although the difference was not significant with the application of zinc and tap water. Minimum plant

height and number of branches to 78 cm long and 7, respectively, related to the control (Fig. 1 and 2).

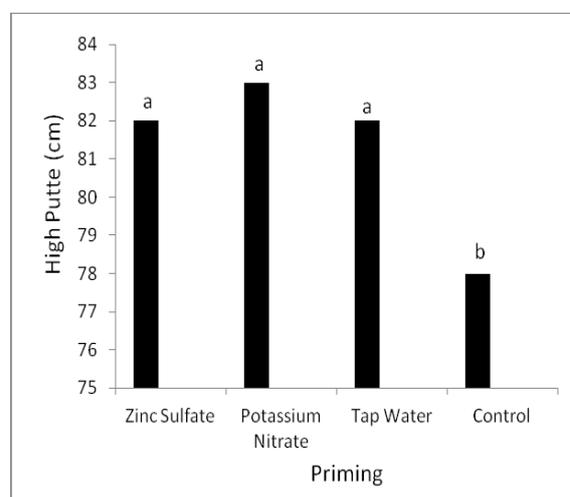
In a greenhouse study was conducted in the papaya plant, Observations showed that plant height treated with features such as priming, has significant advantages compared to the control (Acevedo and pire, 2004). Rahim Zadeh *et al* (2010), the highest number of branches, sub-branches of ammonium nitrate treatment was primed and the lowest number of branches shoot branching control.

**Table 1.** Analysis of variance for plant height, number of branches, seed yield, Essential oil content and essential oil yield.

SOV	df	Mean-square			
		High Putte	Number of branches	Essential oil percent	Essential oil yield
Block	2	133/87	0/89	0/002	10/67
Planting time (a)	2	230/27 <sup>ns</sup>	2/53 <sup>ns</sup>	0/005 <sup>ns</sup>	33/38 <sup>**</sup>
Error (a)	4	114/37	4/43	0/0007	8/77
Priming (b)	3	210/80 <sup>**</sup>	11/93 <sup>**</sup>	0/0304 <sup>**</sup>	194/34 <sup>ns</sup>
Implant*Priming	6	14/30 <sup>ns</sup>	2/04 <sup>ns</sup>	0/0001 <sup>ns</sup>	8/48 <sup>ns</sup>
Pilot error	18	26/68	1/72	0/0002	7/44
CV%		6/42	15/57	7/31	18/99

Analysis of variance (Table 1) indicates that the priming effect of different treatments on plant essential oil content and yield of essential oil treatments moldavian balm planting time were significant at one percent. Comparison of the results showed that the most essential method Duncan moldavian balm (0/7%) of potassium nitrate priming and also can be seen that the control (without priming) has the lowest percentage of oil (0/2 percent) which is due to disuse priming (Figure 3). The yield of essential oil of the plant is likely to be influenced by environmental conditions and management moldavian balm tested Location And appropriate environmental conditions and farm management in higher yield of essential oil is effective moldavian balm And this increase was more significant effect of planting date 15 and 31 May and minimum performance moldavian balm oil treatment plant since 15 June, respectively (Figure 4). Sharma (2002) also emphasize the use of priming in plants,

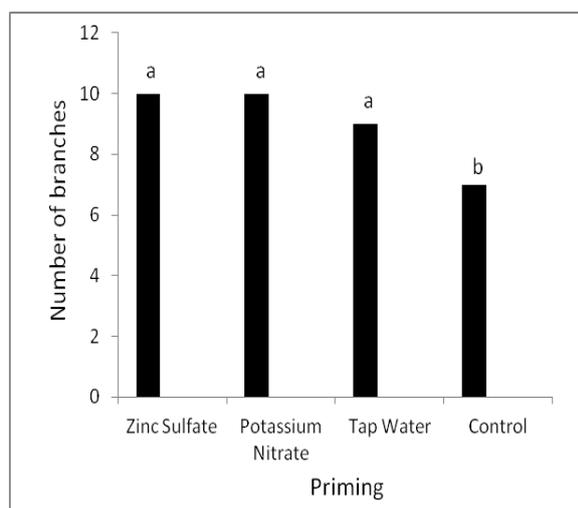
due to the product under test conditions to improve the solution of the appropriate priming properties associated with the percentage. Akbarinia and colleagues (2004) reported that planting date had no effect on the amount of oil Ajowan, while priming led to a significant increase in the seed oil.



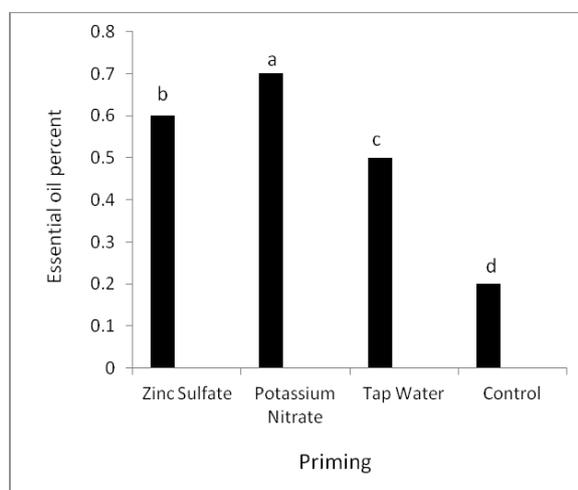
**Fig. 1.** Compares the average height of the plants under the influence of priming moldavian balm.

### Search.

The results of the survey planting and priming on morphological characteristics, the essence and the essential oil showed the greatest height moldavian balm potassium nitrate treatment was associated with a statistically significant difference with control. Most of the essential oil of potassium nitrate moldavian balm priming was obtained. The most essential function of the date of planting 15 May respectively while planting time on 15 and 31 May were not statistically significant.



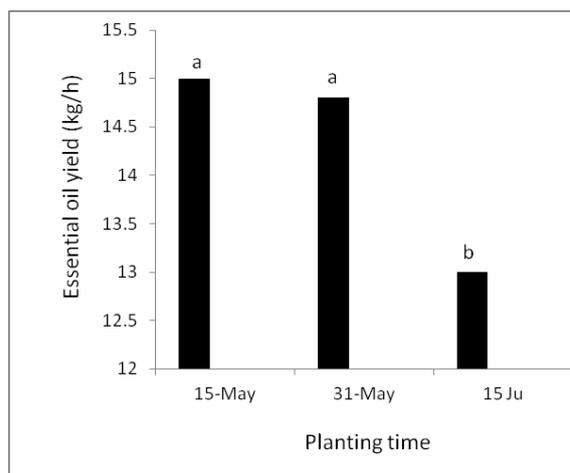
**Fig. 2.** Compares the average number of branches plant moldavian balm influenced by priming.



**Fig. 3.** Comparison of essential oil moldavian balm influenced by priming.

Since the production of medicinal plants, the actual value depends on the quality of the active substance during the investigation it has been observed that most of the active substance can be achieved with the

use of potassium nitrate. And also considering that the maximum amount of oil as the quantitative and qualitative performance of the constituents of the essential oil was applied at planting.



**Fig. 4.** Comparison of the essence moldavian balm influenced by planting time.

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