

**Abstrac:** Rosemary (*Rosmarinus officinalis* L.) is used in pharmaceutical, perfumery and cosmetic industries. Spraying with biofertilizers containing amino acids, hormones and vermiwash and soil application of biological fertilizers containing bacteria symbiosis, due to it improving and facilitating the absorption of nutrients, Additionally, it immediatly effects and causes environmental protection. Also, the quantity and quality of secondary compounds of medicinal plants are affected by harvest time. Considering the need to manage plant nutrition in order to increase and sustain production and preserve the environment, the present experiment was carried out in split plot based on Randomized Complete Block Design with three replications during 2014-2016, to investigate some characteristics of Rosemary under the influence of various nutritional compounds and different harvesting time. Aminolforte (1 liter.ha<sup>-1</sup>), Hiumeforte (1.5 lit.ha<sup>-1</sup>), Salicylic acid (200 mgr.litr<sup>-1</sup>), Gibberellin (300 mgr.litr<sup>-1</sup>), Vermiwash (1:1 with pure water), Azetobarvar, Phosphate barvar-2 and Petabarvar (100 gr.ha<sup>-1</sup>), NPK (10 kg/ha<sup>-1</sup>) as well as the control were considered as a major factor. The subplot factors were autumn and spring's cut, which one were done three months after applying the main treatments in the late fall and spring each year. The results showed that the highest levels of chlorophyll a and b were from interactions of Azetobarvar and spring's cut and gibberellin, and the highest amounts of carotenoids were obtained from vermiwash spraying. The interaction of Hiumeforte and Azotobarvar in spring's cut had the highest protein, and the interaction of salicylic acid and Petabarvar in spring's cut had the highest soluble carbohydrate. The highest oil content (96.1%) produced from the interaction of Aztobarvar in spring's cut. From the interaction of Aztobarvar and Hiumeforte in spring's cut the highest nitrogen (11458.3 and 11355.7 ppm) and the interaction of Phosphate barvar-2 in spring's cut the highest amount of phosphorus (7845.3 ppm) and the application of Petabarvar (6258.3 ppm) the highest potassium were obtained. The highest leaf dry weight (310 and 304 g.m<sup>2</sup>) and dry shoot yield (3683.3 and 3560 kg.ha<sup>-1</sup>) of the interplay of Hiumeforte and vermiwash at spring's cut, the highest amount of stem dry weight with the use of Petabarvar (84.1 g.m<sup>-2</sup>) and the most fresh shoot yield (7545.7 and 7529 kg.ha<sup>-1</sup>) of the interplay between Petabarvar and Hiumeforte at spring's cut were achieved. The highest amount of essential oil were produced from the interaction of gibberellin and Azetobarvar in spring's cut (1.6 and 1.5%), and the highest essential oil yield was obtained from gibberellin and Hiumeforte interaction in spring's cut (7.9 and 7.6 gr.m<sup>-2</sup>), respectively. Chemical fertilizer and Hiumeforte produced the highest average of essential oil compounds in autumn and spring's cut. Interaction of Azetobarvar and Hiumeforte in the last harvest had the highest relative leaf area, number of branches and canopy covering. With application of gibberellin, the greatest length of branches, plant height and canopy bulk and with salicylic acid application the most stem diameter were observed. The interactions of year in nutrient compounds and cutting time were significantly different in some features like chlorophyll, carotenoids, proteins, soluble carbohydrate, percentage and oil yield, phosphorus, dry weight of leaves and dry shoot yields. In general, the spring's cut and the aplication of nutrient compounds like Hiumeforte, Azetobarvar, gibberellin, Petabarvar, Vermiwash and salicylic acid due to fresh leaves and optimum environmental conditions for growth and development, had the greatest impact on quantitative, qualitative, physiological, and phenological characteristics, as well as the amount and the quality of essential oil of Rosemary.

**Key word:** Amino acids, Bio-fertilizer, cutting time, Hormones, yield.



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**Evaluation of different nutrition compounds application on Rosemary  
(*Rosmarinus officinalis* L.) morphophysiological traits and essential oil  
quality at harvesting stages**

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