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**ASSESSMENT OF CORIANDER (*CORIANDER SATIVUM* L.) CULTIVARS FOR YIELD AND YIELD-RELATED PARAMETERS UNDER THE AGROECOLOGICAL CONDITIONS OF SOUTH-CENTRAL BULGARIA**

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**Abstract:** Coriander (*Coriandrum sativum* L.) is a valuable essential oil and spice crop, widely cultivated under various agroecological conditions due to its high economic importance. The optimal selection of cultivars is crucial for achieving high yields and good product quality, especially in the context of changing climatic conditions. The objective of this study was to assess the seed yield and its components, along with certain qualitative traits, of five coriander varieties —Yantar, Moroccan, Mesten Drebnoploden, Thüringen, and Marino—cultivated under the agroecological conditions of south-central Bulgaria. A field experiment was conducted in region of Plovdiv from 2020 to 2022 on alluvial-meadow soil, following winter wheat as a preceding crop. The results showed that the variety Mesten Drebnoploden exhibited the highest plant height, averaging 81.9 cm, followed by Thüringen at 72.6 cm. The cultivar Moroccan was distinguished by superior reproductive performance, recording averagely the highest number of umbels per plant (22.3), the highest number of seeds per plant (279), and the greatest seed weight per plant (1.19 g) average over the study period. Additionally, it had the highest mass per 1000 seeds and a test weight of 30.4 kg. The Moroccan variety also demonstrated the highest productivity, yielding 2137 kg/ha, while the Yantar variety had the lowest average yield for the period at 1454 kg/ha.

**Introduction:** Coriander (*Coriandrum sativum* L.) is a widely cultivated oilseed crop valued for its seeds, which possess considerable quantities of oil and protein. The seeds are primarily used as a spice, because of their mild, sweet, slightly pungent flavor reminiscent of citrus, accompanied by an aroma of sage. Coriander seeds, whether whole or ground, serve as an element in pickling spices and are utilized to enhance the flavor of numerous commercial goods, including quick soups, cakes, breads, pastries, alcoholic beverages, frozen dairy desserts, confections, and puddingc (AKGÜL, 1993). Nowadays, their successful cultivation necessitates a comprehensive evaluation of production metrics and their fluctuations under various technological methods and resource allocations. This study aimed to determine the seed yield and components, as well as some qualitative parameters, of five newly introduced coriander varieties grown in South-Central Bulgaria.

**Material and method:** The field experiment was carried out in a specified area in Voivodinovo village, Plovdiv region (South-Central Bulgaria) between 2020 and 2022. It was conducted on alluvial-meadow soil using a block design method with four replications. The experimental plot covered an area of 15 m<sup>2</sup> and followed winter wheat as the preceding crop. The study tested the following cultivars: Yantar, Moroccan, Mesten Drebnoploden, Thüringen, and Marino.

Figures 1 and 2 illustrate the monthly precipitation levels and average air temperatures recorded between February 2020 and July 2022. Throughout three growing seasons, average daily air temperatures were slightly above the long-term averages, meeting coriander's thermal requirements from germination to ripening. No major deviations from optimal temperature conditions were observed. However, notable differences between the three years were found in precipitation levels during the vegetation period.

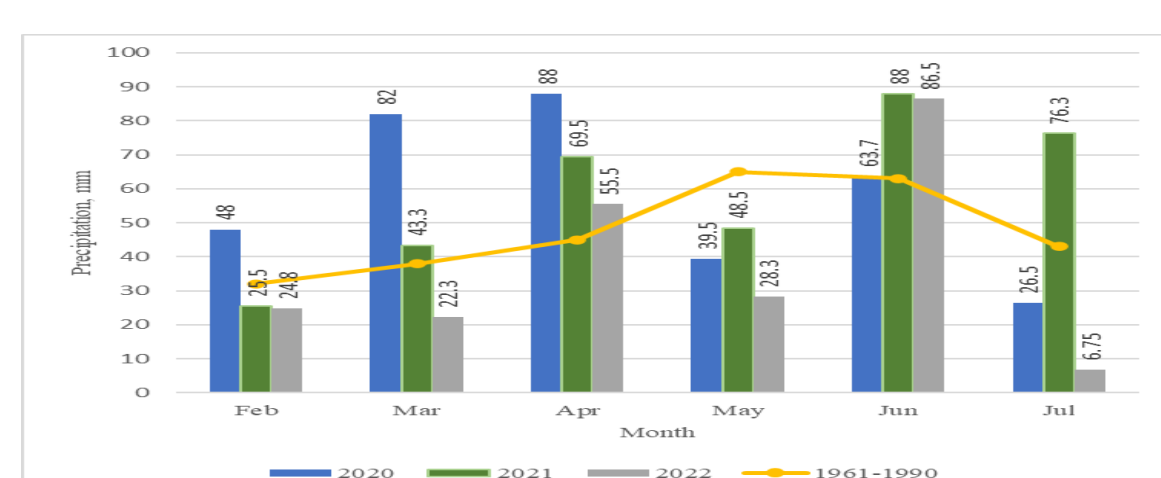


Figure 1. Precipitation, mm

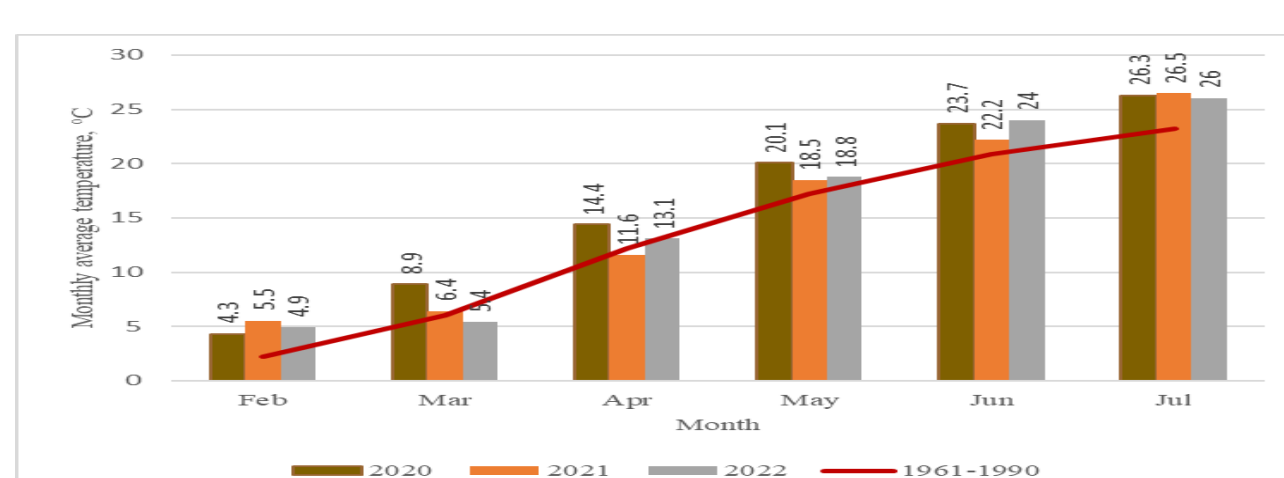


Figure 2. Average monthly air temperature, °C

**Results and discussions:** The advantageous combination of meteorological conditions, particularly the uniform distribution of precipitation during the coriander growing season in 2021, compared to 2020 and 2022, is essential for achieving higher seed yields from the examined types. The results of the research on seed yield (Table 1) demonstrate that, both annually and on average during the experimental period, the Moroccan variety exceeded the seed yields of every other variety examined in the study.

**Seed yield, kg ha<sup>-1</sup>**

Variety	Years of study			Average for the period (kg ha <sup>-1</sup> )
	2020	2021	2022	
Yantar	1446 <sup>e</sup>	1525 <sup>e</sup>	1390 <sup>e</sup>	1454
Moroccan	2119 <sup>a</sup>	2209 <sup>a</sup>	2141 <sup>a</sup>	2137
Mesten Drebnoploden	2034 <sup>b</sup>	2141 <sup>b</sup>	2062 <sup>b</sup>	2079
Thüringen	1680 <sup>c</sup>	1768 <sup>c</sup>	1596 <sup>d</sup>	1681
Marino	1623 <sup>d</sup>	1712 <sup>d</sup>	1609 <sup>c</sup>	1648

On average, for the study period (2020 – 2022), the height of the plants of the examined cultivars ranged from 55.4 cm to 81.9 cm. The Moroccan variety had the most umbels per plant in the second year of the trial – 23.1, followed by the Mesten drebnoploden variety – 21.0. In the third year, the lowest number of umbels per plant was recorded, varying from 10.9 to 21.8, probably related to reduced storage of moisture in April and May compared to preceding experimental years, which negatively affected the growth and development of coriander, especially with regard to the formation of primary branches and umbels. In the third harvest year, looking at the indicator number of seeds per umbel, it is noticed that the highest values are the Thüringen variety - 14.2, followed by the varieties Moroccan - 12.6, Mesten drebnoploden and Marino - 12.0. In all cultivars, the average number of seeds per umbel during the test period varied from 9.6 to 14.4.

**Biometrical parameters and yield components in coriander cultivars**

Variety	Year	Plant height, cm	Nr of umbels per plant	Nr of seeds per umbel	Nr of seeds per plant	Weight of seeds per plant, g
Yantar	2020	55.9	11.6	9.3	109	0.61
	2021	60.1	12.1	9.9	120	0.66
	2022	50.1	10.9	9.7	106	0.58
	Average for the period	55.4	11.5	9.6	112	0.62
Moroccan	2020	66.0	22.0	12.4	273	1.18
	2021	70.4	23.1	12.5	289	1.24
	2022	65.8	21.8	12.6	276	1.16
	Average for the period	67.4	22.3	12.5	279	1.19
Mesten Drebnoploden	2020	82.0	21.5	11.6	250	1.07
	2021	84.1	21.0	12.9	271	1.13
	2022	79.5	20.9	12.0	252	1.08
	Average for the period	81.9	21.1	12.1	258	1.09
Thüringen	2020	73.6	15.0	14.6	220	0.97
	2021	74.2	15.6	14.7	229	1.05
	2022	69.9	14.4	14.2	204	0.95
	Average for the period	72.6	15.0	14.4	218	0.99
Marino	2020	65.4	12.7	12.2	156	0.70
	2021	70.3	12.9	12.5	162	0.74
	2022	64.5	12.5	12.0	149	0.66
	Average for the period	67.3	12.7	12.2	156	0.70

The findings show that the weight of 1000 seeds (g) varied between 4.53 g and 6.36 g for the five cultivars under experimental conditions and within the parameter under investigation. The Marino and Moroccan cultivars displayed close values for the mass per 1000 seeds across individual studied years: 6.15 g and 5.97 g in 2020; 6.36 and 6.20 g in 2021; and 5.80 g and 6.05 g in 2022. According to Table 5's results, the average mass of the 1000 coriander seeds analyzed in the study varied between 4.75 and 6.19 g. Coriander seed test weight results typically ranged between 28 and 33 kg. Values exceeding 29 kg were recorded for the Moroccan variety over the duration of the three-year period, with measurements of 31 kg in 2020, 31.3 kg in 2021, and 29 kg in 2022. The variety Yantar had the lowest average test weight, measuring 26.9 kg.

**Conclusions:** Based on the study, the productivity and quality parameters of the evaluated coriander varieties are significantly affected by the cultivar's genetic profile, annual environmental conditions, and—above all—the amount and distribution of vegetative rainfall. The Moroccan variety had the highest seed yield due to its higher values of yield structural characteristics. The Thüringen variety had the highest average quantity of seeds per umbel, whereas the Mesten drebnoploden cultivar had the tallest plants. The values of the indicators 1000 seeds weight were highest by the cultivar Marino. With an average test weight of 30.4 kg, the Variety Moroccan has the highest values. The results of the study could be beneficial to select coriander varieties in the region. We anticipate that comprehensive assessments of yield components and qualitative characteristics will enhance the knowledge of yield formation mechanisms and optimize process of the coriander cultivation.