

THE EFFECT OF SOME TECHNOLOGICAL ASPECTS ON THE *CORIANDRUM SATIVUM* L. CROP AND FRUIT QUANTITY

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ABSTRACT

The researches were carried out on Timis Plain, Timișoara region, on a moderate gleyed molic eutricambosol. According to Köppen the climate of the researched perimeter is framed into the climatic province c.f.b.x. The studied factors are the effect of using nitrogen fertilizers in variable doses on a constant base of P₆₀K₆₀ and the distance between rows and the density of seeding on the diachene crop as well as on the volatile oil production. As an average, the nitrogen fertilizers increased the crop by 36% for the fertilizer variant N₃₀ and by 42%, for the fertilizer variant N₆₀ in the researched perimeter. The optimal density is of 200 germinable seeds / m². By increasing the density to 300 germinable seeds / m² the crop results decreases with 4 %, and for the variant seeded with a density of 400 germinable seeds / m² the crop decrease is of 15 %. The optimal distance between rows is 12.5 cm. The nitrogen fertilizers reduce the volatile oil content by 0.10 % to 0.20 %, but increase the volatile oil production with up to 6.5 kg/ha, as a result of the increase of the yield.

Keywords: (*Coriandrum sativum* L.), fertilization, seeding.

INTRODUCTION

Coriandrum sativum L. is an annual herbaceous plant, belonging to the Apiaceae family, which contains in its fruits 0.5 to 1.8% volatile oil, is rich in linalool (about 70-90%) and is used in the perfume industry, in the food industry, in medicine etc. (MUNTEAN ET AL., 2007). Originating from the Eastern Mediterranean regions, it can be met in almost all European countries today, as well as in counties from Asia (China, Mongolia, India, Afghanistan, Thailand), on the American continent (USA, Canada, Mexico, Columbia, Peru, Guatemala) and on the African continent (Algeria, Morocco) the surface cultivated with this plant being of more than 300 tds hectares and the production of more than 200 tds tones. The researches regarding this plant fertilization in Romania recommend following doses: N₅₀₋₇₀, P₂O₅, 40-50 and K₂O, 30 – 50 kg/ha (BÎLTEANU GH., 2001, COICIU ET AL., 1962, PĂUN ET AL., 1988). The cultivation density resulted from the mentioned researches is of 200 plants/m². It is recommended to seed the plants in closed rows of 12.5 – 25 cm on weed cleaned fields. On weeded fields it is recommended the distance of 50 cm.

MATERIAL AND METHOD

The researches were trifactorial, with three repetitions and the following factor graduations:

A Factor – the N dozes applied on a constant base of P₆₀K₆₀ – a₁N₀P₆₀K₆₀; a₂N₃₀P₆₀K₆₀; a₃N₆₀P₈₀K₆₀;

B Factor – the seeding distance between rows – b₁ – 12,5 cm; b₂ – 25 cm; b₃ – 37,5 cm; b₄ – 50 cm.

C Factor – the seeding density – c_1 – 200 b.g./m²; c_2 – 300 b.g./m²; c_3 – 400 b.g./m².

The cultivated variety was Sandra.

The foregoing plant was the wheat. Analyzes regarding the volatile oil content in fruits were done when the plants reached their maturity.

The crop data were calculated according to the field research method.

RESULTS

The crop results obtained during the experimental series are mentioned in *Table 1*, out of which it results that the crop results were of between 1136 kg/ha and 2335 kg/ha in the researched area.

Table 1. Crop results obtained for *Coriandrum sativum* L. in Western Romania

A Factor Agrifond	B Factor Distance between rows cm	C Factor – Density of germinable seeds/m ²			Averages of the A Factor			
		200	300	400	Kg/ha	%	Dif. Kg/ha	Significance
A ₁ N ₀ P ₆₀ K ₆₀	12.5	1440	1573	1241	1344	100		
	25	1425	1363	1136				
	37.5	1347	1330	1345				
	50	1341	1356	1236				
A ₁ N ₃₀ P ₆₀ K ₆₀	12.5	2101	2001	1662	1827	136	483	XXX
	25	1960	1945	1737				
	37.5	1826	1790	1554				
	50	1961	1794	1633				
A ₁ N ₆₀ P ₆₀ K ₆₀	12.5	2335	2142	2032	1909	142	565	XXX
	25	2374	2295	1905				
	37.5	1837	1693	1558				
	50	1700	1625	1385				

DL5% =41 DL1%= 55 DL0,1%= 70

Averages of the C factor

Specification	200	300	400
Kg/ha	1804	1742	1535
%	100	96	85
Difference kg/ha		-62	-269
Signification		000	000

DL5% =7 DL1%= 9 DL0.1%= 12

Averages of the B factor

Specification	12.5	25	37.5	50
Kg/ha	1836	1793	1586	1559
%	100	97	86	85
Difference kg/ha		-43	-250	-277
Significance		000	000	000

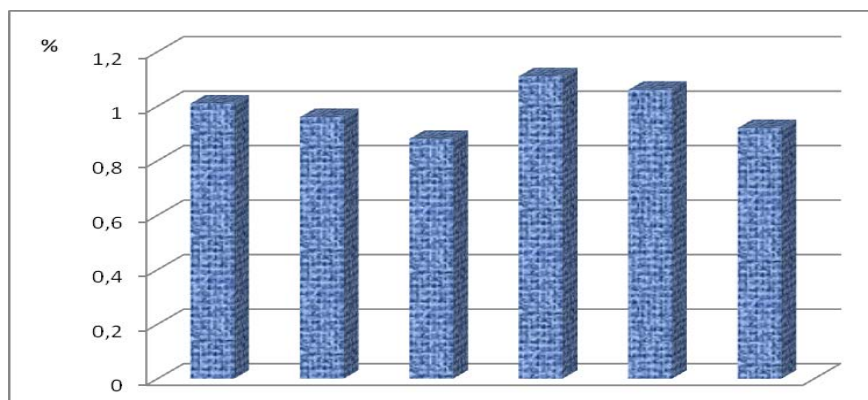
DL5% =15 DL1%= 20 DL0.1%= 26

The analysis of the results underlines the favourable effect of the nitrogen fertilizers applied on a base of P₆₀K₆₀, in the pedoclimatic conditions of the Timis Plain (Câmpia Timișului).

The crop increased together with the applied dose, the statistic differences being very significant and the crop increase being of between 36 % (N₃₀) and 42% (N₆₀).

Seeding on closed rows, that is on rows having between them a distance of 12,5 cm, proved to be more effective than seeding on rows having a larger distance between them, the crop differences being very significant negatively, exceeding 270 kg/ha for the variant seeded at a distance of 50 cm. The optimal cultivation density is of 200 germinable seeds / m², an increase in density being unjustifiable, as the crop decreases with 15% for the variant cultivated with an experimental density of 400 germinable seeds / m².

The variation in volatile oil content according to fertilization and row distance is given in *Figure 1*.



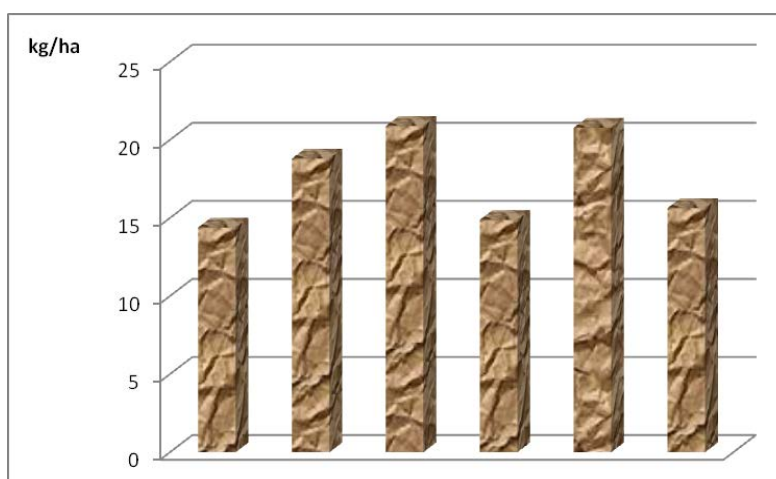
% volatile oil	1.01	0.96	0.88	1.11	1.06	0.92
N doses	N ₀	N ₃₀	N ₆₀	N ₀	N ₃₀	N ₆₀
Row distance	12.5 cm			50 cm		
P and K doses	P ₆₀ K ₆₀					

Figure 1. Volatile oil variation (%) according to fertilization and row distance

During the research period and for the researched fertilization range there has been noticed a tendency of volatile oil decrease if fertilized with nitrogen fertilizers for both variants of seeding, on closed rows (12.5 cm) or on distanced rows (50 cm).

As an average for the three fertilization variants, the volatile oil content was of 0.95% in the variant seeded on closed rows and increased up to 1.03%, in the variants seeded on rows having between them a distance of 50 cm.

The volatile oil production calculated based on the obtained crop and on the volatile oil content is given in *Figure 2*.



Volatile oil kg/ha	14.39	18.81	20.89	14.88	20.78	15.64
%	100	130	145	103	144	109
Distance kg/ha		4.42	6.50	0.49	6.39	1.25
N dose	N ₀	N ₃₀	N ₆₀	N ₀	N ₃₀	N ₆₀
Row distance	12.5 cm			50 cm		

Figure 2. Volatile oil production according to the used N dose on a base of P₆₀K₆₀ and to the row distance

It results that, although the nitrogen fertilizers reduced the volatile oil content, the volatile oil production increased while increasing the used fertilizer dose as result of the favourable effect the fertilizers had on the diachene crop, a fact that has been noticed for both seeding variants.

CONCLUSIONS

The species *Coriandrum sativum* L. responds favourably when fertilized with nitrogen fertilizers applied on a base of P₆₀K₆₀ and cultivated on mollic eutricambosol, ensuring crop increases of 36 % (N₃₀) – 42 % (N₆₀).

The optimal row distance on weed cleaned fields is of 12.5 cm. By increasing the distance to 25 cm the crop decreases with 3 %, by increasing the distance to 37.5 cm it decreases down to 14 %, and by increasing it to 50 cm the crop losses are of 15 %.

The optimal density is of 200 germinable seeds / m². By increasing the density to 300 germinable seeds / m² the crop results decreases with 4 %, and for the variant seeded with a density of 400 germinable seeds / m² the crop decrease is of 15 %.

The nitrogen fertilizers reduce the volatile oil content by 0.10 % to 0.20 %, but increase the volatile oil production with up to 6.5 kg/ha, as a result of the increase of the yield.

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