PRODUCTIVITY ELEMENTS VARIATION IN RELATION TO SOWING DENSITY ON CHAMOMILE IN THE PEDOCLIMATIC CONDITIONS OF THE CÂMPULUNG MOLDOVENESC AREA

VARIAȚIA UNOR ELEMENTE DE PRODUCTIVITATE ÎN FUNCȚIE DE DESIMEA DE SEMĂNAT LA MUȘEȚEL ÎN CONDIȚIILE PEDOCLIMATICE DIN TERITORIUL CÂMPULUNG MOLDOVENESC

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Abstract: *Research has pointed out the influence of sowing density on productivity elements in the Mărgăritar chamomile cultivar. Sowing density has a big impact on productivity elements followed by the climatic conditions. The fact that the plants had larger place to develop (200 plants/m^2) favoured the differences in plant size, number of ramifications and number of inflorescences.*

Rezumat: *Cercetările au evidențiat influența desimii de semănat asupra elementelor de productivitate la soiul de mușețel Mărgăritar. Desimea de semănat are un impact mare asupra elementelor de productivitate urmată îndeaproape de condițiile climatice. Faptul că plantele au avut spațiu mai mare de dezvoltare (200 plante/m^2) a favorizat diferențierea pe densități a lungimii plantelor, numărului de ramificații și numărului de inflorescențe.*

Key words**:** *chamomile, productivity elements, sowing density*
Cuvinte cheie: *mușețel, elemente de productivitate, desimea de semănat*

INTRODUCTION

Chamomile is one of the best-known medicinal plants with a large range of uses from tea and medicine to cosmetics and natural dies. Its curing effects are due in particular to the volatile oil it contains.

Original from South and South-East Europe, chamomile is a plant spread all over the country, in uncultivated areas, on lime soils, on salty soils close to waters. In Europe, it can be met in almost all countries, with a higher density in former Yugoslavia, in Hungary and Romania, much cultivated in other countries, as in Belgium, France, and Germany (Bilteanu 2001). In Romania, it grows in sunny and moist places, along village fences, along roads and railways, close to houses, on fields, on meadows, particularly on light sandy soils. It is often met in the plain, on salty soils.

By cultivation, one can get a more even produce and of better quality. It is cultivate in all area in Romania.

The cultivated species is *Matricaria chamomilla* L. synonymous of *Chamomilla recutita* L. It has been used since ancient times in traditional pharmacy and nowadays it is indispensable in modern naturist pharmacy.

MATERIAL AND METHOD

The experimental plot was established in Câmpulung Moldovenesc (County of Suceava) on a soil that has not been treated with chemical solutions the last 10 years: fertilizing has been done here only biologically. In order to point out the yielding capacity in chamomile,

we organized mono-factorial experiments with four variants, after the randomized block method, in a single series, with three replications.

The densities under study were:

v1 = 200 plants/m^2

v2 = 300 plants/m^2

v3 = 400 plants/m^2

v4 = 300 plants/m^2 sowed by spreading

Potato was the pre-emergent plant.

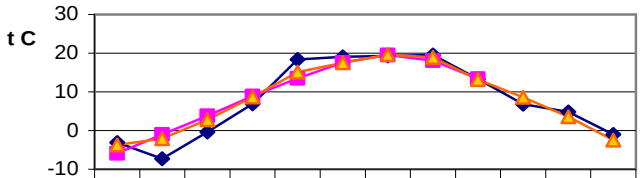
Fertilisation was done evenly with manure in doses of 50 kg/ha applied on the pre-emergent plant.

Basic tillage was done 20 cm deep in the soil. The germination bed was worked and levelled manually because of the very small size of the seeds.

Sowing was done in the first decade of April, at a 25-cm row distance, except for the variant 4 and a 2-3 cm depth.

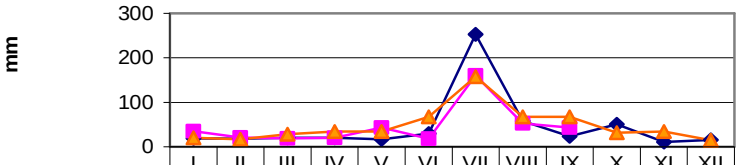
The biological material was the Mărgăritar cultivar from the Fundulea Research Institute.

From a climate point of view, Campulung Moldovenesc in the year 2005-2006 is characterised by particularly favourable climate conditions for the growing and development of chamomile.



	I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII
Year 2005	-3,1	-7,3	-0,4	6,9	18	19	19	20	13	6,8	4,8	-1
Year 2006	-5,9	-1	3,8	8,9	14	18	20	18	13			
Multi-annual averages	-3,7	-2,1	2,8	8,7	15	18	20	19	13	8,6	3,6	-2,5

Figure 1. Monthly average temperatures (^{0}C) in Câmpulung Moldovenesc compared to multi-annual averages



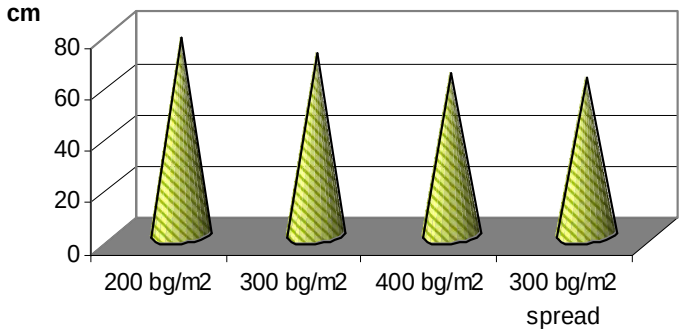
	I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII
Year 2005	19	18	20	20	17	30	253	58	24	51	11	16
Year 2006	35	21	19	20	43	18	161	53	43			
Multi-annual averages	20	17	28	34	34	67	158	67	68	32	34	15

Figure 2. Monthly rainfall (mm) in Câmpulung Moldovenesc compared to multi-annual averages

RESULTS AND DISCUSSIONS

Upon biometrical measurements we could see significant differences in plant size, number of ramifications and number of inflorescences.

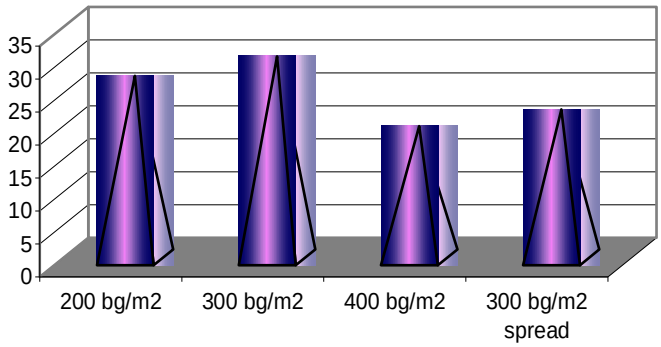
Figure 3 is showing the influence of the sowing density on chamomile plants size. The highest plants (**77**cm) were unregistered on 200pl/m^2 density followed closely by the density 300pl/m^2.



X	**77**	**70,9**	**63,2**	**61,8**
S^2	2,00	2,49	2,76	1,96
S	1,41	1,58	1,66	1,40
Sx	0,14	0,16	0,17	0,14
S%	1,83	2,23	2,63	2,27

Figure 3. Variation of the plant size depending on sowing density *(synthesis 2005-2006)*

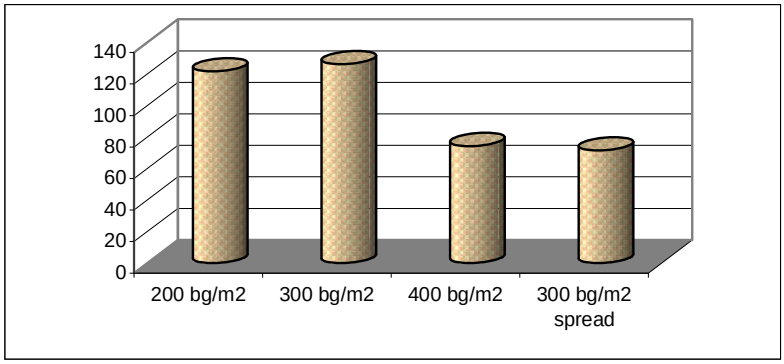
As for the number of ramifications the best results were at the 300 pl/m^2 density (31 ramifications). The lowest number of ramifications is unregistered at the density of 400pl/m^2 (20 ramifications).



X	**28**	**31**	**20**	**22**
S^2	1.85	2.25	1.49	2.64
S	1.36	1.5	1.22	1.62
Sx	0.14	0.15	0.12	0.16
S%	4.95	4.92	6.13	7.23

Figure 4. Variation of the number of ramifications depending on sowing density *(synthesis 2005-2006)*

Figure 5 is showing the influence of the sowing density on chamomile number of inflorescences.



X	**122**	**126**	**74**	**72**
S^2	2.81	2.81	6.41	5.25
S	1.68	1.68	2.53	1.29
Sx	0.17	0.17	0.25	0.13
S%	1.38	1.33	3.41	1.8

Figure 5. Variation of the number of inflorescences depending on sowing density *(Synthesis 2005-2006)*

A low number of inflorescences were obtained at the highest densities, more exactly 74 inflorescences at 400pl/m2 density and 72 inflorescences at 300 pl/m2 spread over the plot. The best results were obtained at the density of 300pl/m2 sowed on rows (126 inflorescences).

CONCLUSIONS

Experimental research showed the following:

Climate conditions were particularly favourable to the growth and development of chamomile plants.

Productivity elements show that Margaritar cultivar has a high yielding potential.

Chamomile is little demanding to vegetation factors, which gives it a large ecological plasticity.

The sowing density had great influence on productivity elements.

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