RESEARCHES CONCERNING YIELD AND OIL CONTENT IN CHAMOMILE (*MATRICARIA CHAMOMILLA* L.) IN THE CONDITIONS OF THE SDE TIMIŞOARA

CERCETĂRI PRIVIND PRODUCŢIA ŞI CONŢINUTUL DE ULEI LA MUŞEŢEL (*MATRICARIA CHAMOMILA* L.) ÎN CONDIŢIILE DE LA SDE TIMIŞOARA

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Abstract: *Research has pointed out the impact of sowing density on green inflorescence yield and oil content in the Mărgăritar chamomile cultivar. Results point out that the most favourable sowing density is 300 pl/m^2 sowed by spreading. The fact that seeds were spread over the plot without being incorporated in the soil favoured rapid development of the plants and thus increased the yield with 48% compared to sowing with a lower density (200 pl/m^2) and implicitly the content of oil and oil yield.*

Rezumat: *Cercetările au evidenţiat impactul densităţilor de semănat asupra producţiei de inflorescenţe verzi şi asupra conţinutului de ulei la soiul de muşeţel Mărgăritar. Rezultatele au scos în evidenţă faptul că cea mai favorabilă densitate este cea de 300 plante/m^2, semănate prin împrăştiere. Faptul că seminţele au fost distribuite împrăştiat pe parcelă fără a fi încorporate în sol a favorizat dezvoltarea rapidă a plantelor şi aceasta a dus la creşterea producţiei cu 48% faţă de semănatul la densitatea de 200 pl/m^2 şi implicit a crescut conţinutul şi producţia de ulei.*

Key words**:** *chamomile, yield, sowing density, oil content*
Cuvinte cheie: *muşeţel, producţie, desimea de semănat, conţinut de ulei*

INTRODUCTION

The most important element in chamomile is the volatile oil that also has the largest share of the active components of wild chamomile.

It can be obtained through hydro-distilling, and its amount and quality depend on the plant's chemo-type, on climate conditions, on harvesting and conditioning time and way. It is a blue, dense, very scented, aromatic, and bitter liquid. Upon contact with air and light, it turns to green then to brown.

Oil from flowers alone is blue, while oil from receptacles alone is greenish. Camazulene concentration gives this oil an intense blue coloration (Janackovic-Milojevic, 1968).

Optimal growth and oil accumulation temperature is 20-25^{0}C.

Chamomile volatile oil is used for its antiseptic, anti-inflammatory, and carminative properties. It has an anti-toxic action, as it inactivates staphylococcus and streptococcus bacteria as well as microbial toxins.

MATERIAL AND METHOD

The experience is at the Experimental Didactic Station of the Agricultural and Veterinary University of the Banat, Timişoara, on a cernosiomic soil. Fertilizing the crop was done evenly with $N_{15}P_{15}K_{15}$.

Basic tillage was done 20-22 cm deep in the soil. Germination bed was prepared and levelled due to the very small size of the seeds. It was a monofactorial experience with density variation:

V1=200pl/m2
V2=300pl/m2
V3=400pl/m2
V4=300pl/m2 by spreading

Biological material used was the Margaritar cultivar, from the Research Institute in Fundulea.

Harvesting the inflorescences was done gradually, following blooming time and duration of blooming. In the field, we made measurements with the metrical frame in order to establish density.

Qualitative experiments and amount of volatile oil were done in the speciality laboratories (O.S.P.A.).

RESULTS AND DISCUSSIONS

Table 1 shows that sowing by spreading without row distance led to an increase in green inflorescence yield with 1705 kg/ha compared to the control.

We can also say that a density of 400 plants per m^2 also led to important yield increase.

Table 1

Green inflorescence yield (kg/ha) obtained in Timişoara 2005-2006

Density	Yield (Kg/ha)	%	Difference	Signification
200 pl/m^2	3586	100	-	-
300 pl/m^2	4009	112	423	XX
400 pl/m^2	4700	131	1114	XXX
300 pl/m^2 *spread*	5291	148	1705	XXX

DL 5%= 79kg/ha; DL 1% = 115kg/ha; DL 0.1% = 173kg/ha.

Green inflorescence yield is distinctly significantly positive (Table 1) in almost all the variants, though the variant sowed with 300 pl./m^2 yielded 4009 kg/ha green inflorescences, i.e. a difference of 423 kg/ha compared to the variant sowed with 200 pl./m^2.

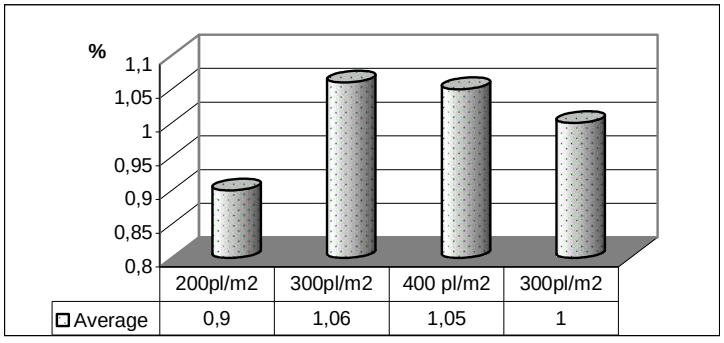

Figure1. Oil content variation depending on sowing density *(synthesis 2005-2006)*

Table 2

Statistic data on oil content

Density	200 bg/m^2	300 bg/m^2	400 bg/m^2	300 bg/m^2 *spread*
X	**0.90**	**1.06**	**1.05**	**1**
S^2	0.09	0	0	0
S	0.3	0.04	0.05	0.03
Sx	0.03	0.00	0.01	0.00
S%	33.33	3.77	4.76	3.00

As for the oil content we can observe in figure 1 that the values are very close. Anyway the best result were 1.06 % at 300 pl/m^2 density. The lowest value was unregistered at 200 pl/m^2 (0,90 %). The same low content we observed on 300 pl/m^2, spread all over the plot (1 %)

Oil yield has unregistered small significance (Table 3) but for all the densities yield value is very high and proves that inflorescence yield has best quality.

Table 3

Oil yield (kg/ha) obtained in Timişoara 2005-2006

Density	Yield Kg/ha	%	Difference	Signification
200 bg/m^2	32	100	-	-
300 bg/m^2	43	132	11	X
400 bg/m^2	49	153	17	XX
300 bg/m^2 *spread*	53	164	21	XX

DL 5%= 1 kg/ha;
DL 1% = 1 kg/ha;
DL 0.1% = 2 kg/ha.

Figure 2 shows that sowing by spreading without row distance led to an increase in green inflorescence yield with 21 kg/ha chamomile oil compared to the control.

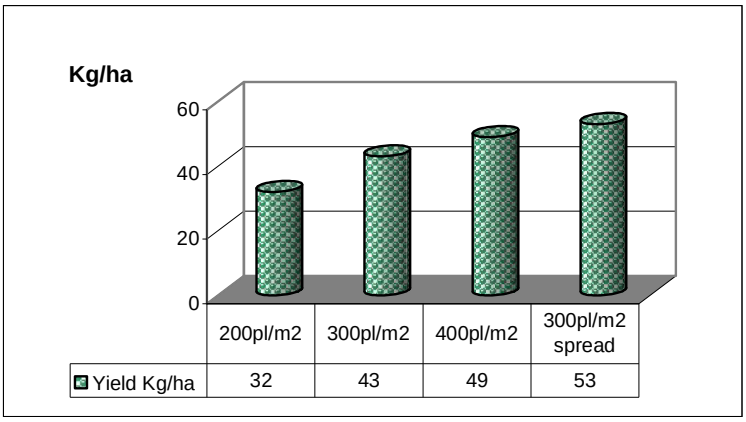

Figure2. Oil yield variation depending on sowing density *(synthesis 2005-2006)*

The lowest results in oil yield were obtained on 200 pl/m^2 density (32 Kg/ha). A low result was obtained also on 300 pl/m^2 density sowed in rows: 43 kg/ha. On 400 pl/m^2 density, we obtained 49 Kg/ha, that is a satisfactory result.

Picture 1. Experimental plot

CONCLUSIONS

Yield capacity of the analysed cultivar was significant influenced by the sowing density.

The quantity of the active principles is influenced by the sowing density and it is very important to take this fact in consideration for best result in oil yield.

Experimental research showed that the oil yield we obtained is a favourable one and the experience succeeded.

Wild chamomile is at this moment one of the most favourites medical plants and the importance of this paper it is given by the significant increased of the international market demand.

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