

Influence of seeding scheme and density on ligulate flowers production and dry inflorescences of *Tagetes patula* L. and *Calendula officinalis* L. in the agroecological area of Arad

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Abstract

The accomplished researches from Arad agro-ecological area aimed to determine the proper densities and seeding schemes for the two medicinal plants crops in order to obtain best quantities and qualities, on the one hand for ligulate flowers of *Tagetes patula* L., on the other hand for dry inflorescences of *Calendula officinalis* L..

Key words: densities, dissemination, marigold

Introduction

Plants have always represented the most important and at hand mode which man has ever possessed. List of modern medicine includes a huge number of medicines plants-based. Today, modern science demonstrates, through the agency of some proper means, high precision in remarking which natural chemical compounds group from plants is eliminatory for some symptoms of human sufferings.

Material and methods

This study regarding the influence of seeding schemes and densities, as technological sequences for these two medicine plants (*Tagetes patula* L. and *Calendula officinalis* L.), was carried out between 1997 and 2003 in agro-ecological Arad area, area representative for the western side of the country. As part of bifactorial structured experiments, disposed on field in subdivided parcels with four repetitions, on the background of recommended cultivation technology for these species were introduced the two studied factors.

Results and discussions

Referring to *Tagetes patula* L., during studied period were tested three foundation schemes on L-445 tractor traces formed on a ground prepared as germinal bed (50x50x50 cm; 40x40x70 cm; 60x70 cm) and four densities (40, 50, 60 and 70 plants/sq m). Very significant results were obtained, during all studied years, by using 50 and 60 plants/sq m densities, 50x50x50 cm and 40x40x70 cm dissemination schemes, directly on field (Table no. 1).

Discussing about *Calendula officinalis* L., Petrana variety (of USAMV Bucharest origin), were studied as technological sequences six cultivation densities (25, 30, 35, 40, 45, 50 plants/sq m) and three foundation schemes (70x80 cm; 50x50x50 cm and 40x40x70 cm), also on L-445 tractor traces formed on a ground prepared as germinal bed. Accomplished studies from Arad agro-ecological area point out very significant results when are observed the 2 cm depth and middle of March dissemination moment, using 40-45 plants/sq m density and 50x50x50 cm or 40x40x70 cm seeding schemes (Table no. 2).

Both during vegetation and ligulate flowers harvesting period (for *Tagetes patula* L.), inflorescences harvesting period respectively (for *Calendula officinalis* L.) were carried out some morpho-physiological determinations which sustain the other obtained results.

Conclusions

By using 50-60 plants/sq m density and 50x50x50 cm dissemination scheme for *Tagetes patula* L. crop, obtained results recommend these technological sequences.

For *Calendula officinalis* L., accomplished studies in Arad agro-ecological area recommend 45 plants/sq m density and 50x50x50 cm seeding scheme.

By following technological elements which refer to crop rotation, crop's fertilization, soil's preparing works, best foundation moments by seeding directly on field, crop maintenance, integrated control of diseases and pests, harvesting-drying-conditioning, the new introduced technological elements produce a significant increasing of main active chemical compounds.

Table 1. Experimental results' synthesis (1997-2003) regarding density and seeding schemes at *Tagetes patula* L. in Arad agro-ecological area

A	A ₁	A ₂	A ₃	B					
	50x50x50 cm	40x40x70 cm	60x70 cm	Densities (pl/sq m)				B	
B	t/ha	D (t/ha)	t/ha	D (t/ha)	(t/ha)	D (t/ha)	t/ha	D	S
				(t/ha)		t/ha	D		
40 (B ₁)	1,455	Mt	1,456	Mt	1,303	Mt	1,405	Mt	
50 (B ₂)	1,582	0,127	1,603	0,147	1,544	0,241	1,576	0,171	xxx
60 (B ₃)	1,596	0,141	1,611	0,155	1,537	0,234	1,581	0,176	xxx
70 (B ₄)	1,603	0,048	1,501	0,045	1,480	0,177	1,495	0,090	xxx
A	-								
Seeding schemes	1,534	1,543	1,466			1,514	-	-	
Dif. (t/ha)	0,068	0,077	Mt						
%	104,6	105,3	100						
Significance	xx	xx							
DL5%;	A – t/ha	B – t/ha	BxA – t/ha	AxB – t/ha					
DL1%;	0,050; 0,083;	0,046; 0,063;	0,002;	0,088; 0,120;					
DL0,1%	0,155	0,086	0,003;	0,189					
			0,004						

Table 2. Densities' and seeding schemes' influence (1997-2003) on the dry inflorescences of *Calendula officinalis* L. in Arad agro-ecological area

A B	B ₁ – 70x80 cm		B ₂ – 50x50x50 cm		B ₃ – 40x40x70 cm		A – Densities (pl/sq m)					
	t/ha	D (t/ha)	t/ha	D (t/ha)	t/ha	D (t/ha)	t/ha	D (t/ha)				
25 (A ₁)	1,002	Mt	1,028	Mt	1,044	Mt	1,025	Mt				
30 (A ₂)	1,072	0,070	1,111	0,083	1,127	0,083	1,103	0,078				
35 (A ₃)	1,097	0,095	1,379	0,351	1,387	0,343	1,288	0,263				
40 (A ₄)	1,108	0,106	1,472	0,444	1,486	0,442	1,355	0,330				
45 (A ₅)	1,333	0,331	1,409	0,381	1,443	0,399	1,395	0,370				
50 (A ₆)	1,184	0,182	1,351	0,323	1,262	0,218	1,266	0,241				
B – Seeding schemes	1,133		1,292		1,292		DL t/ha		A	B	BxA	AxB
Dif. (t/ha)	Mt		0,159		0,159		5%		0,033	0,043	0,107	0,091
%	100		114,0		114,0		1%		0,048	0,059	0,146	0,126
Significance			xxx		xxx		0,1%		0,069	0,079	0,195	0,175

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