RESEARCH REGARDING THE CULTIVATION TECHNOLOGY OF *CYNARA SCOLYMUS* L. IN THE CULTIVATION CONDITIONS IN CLUJ-NAPOCA (ROMANIA)

CERCETĂRI PRIVIND TEHNOLOGIA DE CULTIVARE A SPECIEI *CYNARA SCOLYMUS* L. ÎN CONDIȚIILE DE CULTURĂ DE LA CLUJ-NAPOCA (ROMANIA)

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***Abstract**: Artichoke is a valuable medicinal plant from its leaves are extracted the substances which are used in hepatic biliary, with a biliary secretion and diuretic effect. The highest production of fresh leaves was registered at the variant of 70 cm between rows x 30 cm between plants/row) with a production of 41.476 kg/ha. It is recommendable that on sowing Cynara scolymus L., seeds of up to 8 months after harvest to be used.*

***Rezumat**: Anghinarea este o plantă medicinală valoroasă, din frunzele căreia sunt extrase substanțe utilizate în afecțiuni biliare cu efect diuretic şi de secreție biliară. Cea mai mare producție de frunze proaspete a fost înregistrată la varianta cu 70 cm între rânduri x30 cm între plante/rând, cu o producție de 41.476 kg/ha. Este recomandat ca la semănarea anghinării să fie utilizate semințe cu o vechime de până la 8 luni de la recoltare.*

Key words: *nutrition space, germination, seedling, Cynara scolymus L.*
Cuvinte cheie:*spațiul de nutriție, germinație, răsaduri, anghinare*

INTRODUCTION

The specie is known since ancient time, only in renaissance period (15th century) began to be consummated as aliment. It is native of Mediterranean Sea and north of Africa. The name of *Cynara* was attributed by Columella (II Century B.C.) because of its grey colour; *scolymus*, in Greek language means thorn, thorny (Păun E., 1986).

Artichoke is a valuable medicinal plant from its leaves are extracted the substances which are used in hepatic biliary, with a biliary secretion and diuretic effect

The plant is a kind of "queen" of plants regarding its therapeutic value in case of renal and hepatic insufficiency.

Artichoke is consumed fresh or as vegetable in different salads (floral scales and receptacle), or dry as tea (leaves).

By stimulating the hepatic function the plant contributes to a better elimination of toxins from blood, and also the cholesterol in excess. It has also a diuretic activity with the help of which it eliminates urea and ureic acid, being indicated in calming acute rheumatism and gout. By amelioration of biliar secretion, it is useful in intestinal infection. Also, it is a general tonic of the body, being recommended to stimulate the growing and a good cardiac tonic.

MATERIAL AND METHODS

The researches were carried out on the experimental field of *University of Agricultural Sciences and Veterinary Medicine Cluj-Napoca* in 2005-2006, on a typical

carbonate alluvial soil of alkaline reaction, moderate to poorly moldiferous, not too rich in nitrogen but so is phosphorus and potassium within the frames of a sub humid climate.

1. The study of seeds germination of *Cynara scolymus L.*

The experience began in the year 2001, when we put seed to germinate from *Cynara scolymus* L, all the work methodology were respected, in four repetition of 100 seeds each.

The experience was taken on T.P. (top of paper) or B.P. (between paper), at 20^0C and 25.5^0C, at which these plants germinate best. The germinative faculty was established at 21 days and was determined the period of time after which the seeds loose their germination.

The variants taken in study are **V**1= 2 months of age (November 2001) – **control; V**2= 4 months of age (January 2002); **V**3= 7 months of age (April 2002); **V**4= 8 months of age (May 2002); **V**5= 17 months of age (February 2003); **V**6= 21 months of age (June 2003); **V**7= 36 months of age (September 2004).

2. The study of nutrition space upon leaf production at *Cynara scolymus* L, planted through seedling.

The seedling production was made in green house , in plastic glasses (with a diameter of 6 cm and 10 cm high), filled with 3 parts soil, 3 parts natural fertilizer, 3 parts peat and 1 part sand

When the seedling reached 12-15 cm high, planting was done in the first decade of May, in both years of experience 2005 and 2006. In experience done by us we used Unirea cultivar.

The variants taken into consideration : $\mathbf{V_1}$, planted at 70 cm between rows and 20 cm between plants, resulting a density of 71.429 plants /ha (**control variant**); $\mathbf{V_2}$, planted at 70 cm between rows and 25 cm between plants on row, resulting the density of 57.143 plants/ha; $\mathbf{V_3}$, planted at 70 cm between rows and 30 cm between plant/row, resulting a density of 47.619 plants/ha; $\mathbf{V_4}$, planted at 70 cm between rows and 40 cm between plants/row resulting a density of 35.714 plants/ha.

The experience was placed after the unrandomised Block method, in three repetitions with an experience surface of $34m^2$.

In both years of experience were made two leaves harvest, when they reached 35 cm length and was determined the total leaves production. The dates were processed with the help of variant analyses method.

RESULTS AND DISCUSSION

Table 1 shows that germinating faculty with *Cynara scolymus* L. increases both in TP and BP layers in the two temperatures, with ageing of the seeds (after 8 months), and decreases in 17 months after harvest inlayer TP and BP, with both temperatures. There follows that in three years after harvest it looses its germination almost entirely.

From table 2 it is obvious that the total fresh leaves production, as an average of the two years of experience 2005 and 2006, was the highest at V_3 - had 70 cm between rows and 30 cm between plants/row with very significant positive values compared to the control variant, V_1 - 70 cm between rows and 20 cm between plants/row (27.131 kg/ha).

Table 1

Results regarding germinating faculty in *Cynara scolymus* L. depending on seed age, on two germinating stratum and at two different temperatures (Cluj-Napoca, 2004)

No	Variant	Top of paper		Between paper	
		Temperature		Temperature	
		20 ^{0} C	25,5 ^{0} C	20 ^{0} C	25,5 ^{0} C
1(Control)	2 month	45.3 -	71.5 -	56.0 -	68.0 -
2	4 month	0.8	5.0	4.5	1.0
3	7 month	18.3**	5.3	16.0*	11.3**
4	8 month	29.5***	15.8	24.5**	17.8***
5	17 month	22.5***	-11.3	14.5*	1.3
6	21 month	2.3	-21.8^{o}	-0.3	-7.8
7	36 month	-37.3^{ooo}	-61.8^{ooo}	-43.0^{ooo}	-54.5^{ooo}
		LSD 5%=11.9	LSD 5%=20.0	LSD 5%=12.4	LSD 5%= 8.2
		1%=16.3	1%=27.5	1%=17.0	1%=11.2
		0.1%=22.2	0.1%=37.4	0.1%=23.1	0.1%=15.2

Table 2

Total fresh leaves production at *Cynara scolymus L.* depending on density and planting distances, Cluj-Napoca, average 2005-2006

Planting distance (cm)	Density (pl/ha)	Total fresh leaves production		± Difference	Significance
		kg/ha	%		
70 x 20 (Control)	71.429	31.012	100	0	-
70 x 25	57.143	32.096	104	1.084	-
70 x 30	47.619	41.476	134	10.464	xxx
70 x 40	35.714	27.131	88	- 3.881	-

LSD 5% = 4.719,20 LSD 1% = 6.616,41 LSD 0,1% = 9.351,77

CONCLUSIONS

In C*ynara scolymus* L. germinating faculty, both on TP and BP layers, at the two temperatures (i.e. 20 and 25.5°C) go up with seed ageing (after 8 months) and come down in 17 months after harvest; there follows that within three years after harvest germination goes almost entirely. It is recommended to determination germinating faculty, on TP and BP layers, at the temperature of 20ºC.

It is recommended to plant *Cynara scolymus* L., seedling in the condition of Cluj-Napoca at 70 cm x 30 cm (density of 47.619 plants/ha)

The content in phenyl-propionic derivates (g% caffeic acid) in leaves was 3.96 g%.

LITERATURE

1. MUNTEAN L., 1990, Plante medicinale şi aromatice cultivate în Romania, Ed.Dacia, 5-21,269 – 273
2. PĂUN, E., MIHALEA, A., DUMITRESCU, A., VERZEA, M., COŞOCARIU, O., Tratat de plante medicinale şi aromatice cultivate. Ed. Academiei R.S.România, Bucureşti, 1986