

INFLUENCE OF PLANTING PERIOD AND METHOD OF CULTURE ON THE PRODUCTION OF CAULIFLOWER, IN THE CLIMATIC CONDITIONS OF TRANSYLVANIA

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Abstract: Cauliflower is grown for hypertrophied inflorescences that are used to prepare different dishes, to obtain pickles or for canning. The inflorescences have a high water content (90%). Energy value is low cauliflower inflorescences (118.5 kJ / 100g) due to the low level of energetic substances found in it. Cauliflower is grown in open field and in protected areas. Transylvania climatic conditions are favorable for growing cauliflower. Cauliflower cultures are started with seedlings and this is leading to additional costs for seedlings production. Experience was conducted between 2010-2011, in Reghin, Mures County. Experimental factors were the planting period and the culture method. Experimental culture was established at different times (April, May, June) by two methods (by planting seedlings and direct sowing).

Keywords: cauliflower, planting period, culture methods

INTRODUCTION

Cauliflower can be used in cooked condition, preserved, pickled and marinated. Due to low cellulose content and the presence of amino acids, essential to the human body, it can be used as a dietary product, in feeding children and sick persons (Patron, 1992). Cruciferous vegetables contain isothiocyanates that have anticancer effect by inhibiting the formation of tumors (Gheorghe et al., 2002). Some authors noted that the consumption of vegetables from the cabbage family can reduce the risk of cancer, especially the gastrointestinal cancer (Prohens and Nuez, 2008).

Cauliflower is grown around the world, except wet tropics and ranks 13th in the world in the areas it holds. World production of cauliflower and broccoli, in 2010 totaled 18.7 million tons, an increase compared to 2009. China is the largest producer of cauliflower and broccoli from the world with 8.5 million tons. India is second with 6.5 million tons, production of the two countries account for 80% of global production. (FAOSTAT, 2010).

Most cauliflower cultures are started with seedlings (Ciofu et al., 2003, Indre et al., 2007, Mohanty and Srivastava, 2002). Direct sowing culture method is practiced to obtain mini inflorescences (Chaux and Foury, 1994, Selvakumar et al., 2007).

MATERIAL AND METHOD

The research took place during 2010-2011, in Reghin locality from Mureș County.

The aim of the experiment was to determine optimum culture period and the possibility to achieve through direct sowing, yields compared with those achieved by seedlings. Objectives were to determine plant growth (plant height, rosette diameter, inflorescence size), crop production and crop efficiency.

In the experience, the hybrid Avalanche was used, produced by L.Daehnfeldd established since 1850 in Denmark which from 2007 belongs to the Syngenta. Hybrid is

designed for spring-autumn crop, reaching harvest maturity after 60-65 days after planting. Round shaped inflorescences are white and average around 1.0 to 1.5 kg, plants are vigorous and have large leaves standing tall and they ensure good protection for the inflorescences from the sun. It is recommended for fresh harness or industrialization.

Experimental factors were culture method (by planting and direct sowing) and establishing the planting period (April, May and June). By combining experimental factors resulted in six experimental variants, that were placed in three repetitions. During the vegetation period the technology applied was for cauliflower crops grown in open field and observations were made.

RESULTS AND DISCUSSION

Average yields for the three planting periods is 43.37 t / ha (Table 1). Of the three planting periods used to obtain cauliflower, planting period I provides a production increase of nearly 10%, the average output gap is significant compared with the experience average.

Table 1
The influence of cauliflower planting period upon production
Reghin, 2010-2011

Variant	Production		The difference compared to control (t/ha)	Significance
	t/ha	%		
Planting period I (April)	47.99	109.6	4.22	*
Planting period II (May)	39.84	91.0	-3.94	0
Planting period III (June)	43.51	99.4	-0.26	-
Average	43.78	100.0	-	-
DL (p 5%)			4.08	
DL (p 1%)			6.75	
DL (p 0.1 %)			12.63	

Cauliflower production is between 40.38 t / ha obtained when the culture was started by seedlings and 47.18 t / ha when the culture was started by direct sowing. Average production between the two methods is 43.37 t / ha. (Table 2). Compared with the average of the experience, direct sowing method provides a significant production difference compared to seedling method.

Table 2
Influence of the way that cauliflower culture was started upon production
Reghin, 2010-2011

Variant	Production		The difference compared to control (t/ha)	Significance
	t/ha	%		
M1 (direct sowing)	47.18	107.8	3.40	*
M2 (seedlings)	40.38	92.2	-3.40	0
Average	43.78	100.0	-	-
DL (p 5%)			4.16	
DL (p 1%)			6.30	
DL (p 0.1 %)			10.11	

The highest production of two methods of culture was obtained in the third planting period, the variant grown by direct sowing (Table 3). In planting period I crop production was higher in the seedlings grown version, without ensuring significant

differences. In planting periods II and III production was higher in variants grown by direct seeding compared with the seedling, recording significant differences compared to experience average.

Table 3
Combined influence of cauliflower culture method and planting period upon production
Reghin, 2010-2011

Variant		Production		The difference compared to control (t/ha)	Significance
Culture method	Planting period				
Average	E1 (April)	47.99	100.0	-	-
M1 (direct sowing)	E1 (April)	47.05	98.0	-0.94	-
M2 (seedlings)	E1 (April)	48.94	102.0	0.95	-
Average	E2 (May)	39.84	100.0	-	-
M1 (direct sowing)	E2 (May)	45.05	113.1	5.22	*
M2 (seedlings)	E2 (May)	34.62	86.9	-5.22	0
Average	E3 (June)	43.51	100.0	-	-
M1 (direct sowing)	E3 (June)	49.44	113.6	5.93	*
M2 (seedlings)	E3 (June)	37.58	86.4	-5.93	0
DL (p 5%)				6.54	
DL (p 1%)				8.92	
DL (p 0.1 %)				14.51	

Compared with the experience average at the culture method of direct sowing, no significant differences were obtained between the three planting periods while at the seedling culture method, planting period I, obtained a higher production compared to the others planting periods (table 4).

Table 4
Combined influence of planting period and cauliflower culture method upon production
Reghin, 2010-2011

Variant		Production		The difference compared to control (t/ha)	Significance
Planting period	Culture method				
Average	M1 (direct sowing)	47.18	100.0	-	-
E1 (aprilie)	M1 (direct sowing)	47.05	99.7	-0.13	-
E2 (mai)	M1 (direct sowing)	45.05	95.5	-2.13	-
E3 (iunie)	M1 (direct sowing)	49.44	104.8	2.26	-
Average	M2 (seedlings)	40.38	100.0	-	-
E1 (April)	M2 (seedlings)	48.94	121.2	8.56	*
E2 (May)	M2 (seedlings)	34.62	85.7	-5.77	-
E3 (June)	M2 (seedlings)	37.58	93.1	-2.80	-
DL (p 5%)				6.41	
DL (p 1%)				9.69	
DL (p 0.1 %)				15.41	

CONCLUSIONS

Based on the results of research in the two years of culture, in the conditions of Reghin area, Avalanche F1 hybrid, with three planting periods, through direct sowing in the field, or by planting seedlings, following conclusions emerged.

-in terms of culture technology was observed that the method of direct sowing in the field ensured higher production values compared to the seedling culture method, due to a better supply of water from the soil.

-production was higher when crop establishment was made in April, followed by options set in June, because in this way have been avoided high summer temperatures during the formation of inflorescences.

-in the conditions of Transylvania Tableland cauliflower can be grown using direct sowing in open field. This allows technological mechanization in a greater extent compared to the seedling culture method.

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