

The Influence of Plants Layout on a Stratum upon the Production of Cauliflower (*Brassica oleracea*, convar. *botrytis*, L.)

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Abstract. Cauliflower is a well known and appreciated vegetable in Romania. It has only 24 calories/100g and contains high quantities of vitamin C (60g/100g of cauliflower), vitamins from the B complex, vitamin K and E. It also contains a lot of minerals, calcium, potassium, zinc, copper, magnesium, selenium. Cauliflower can be grown in spring or in autumn, in protected culture or in open field. Cauliflower culture can be started by direct sowing or by seedlings. The experiment took place in 2011, in a polyethylene tunnel, from USAMV Cluj-Napoca. The culture was started in March, with small seedlings. Three cauliflower hybrids were used, Stargate, Diadom and Opal. The plants were placed on the stratum on two or three rows. The highest yields were obtained on the variants on two rows, of 28.82 t/ha compared to the variants placed on three rows, that average a yield of 23.76.

Keywords: cauliflower, hybrid, stratum, production, polyethylene tunnel

Introduction. Cauliflower is a well known and appreciated vegetable in Romania (Stan and Muntean, 2001). It is grown for the hypertrophied inflorescences which can differ in colour and size (Sima, 2009). Cauliflower has only 24 calories/100 g and contains high quantities of vitamin C (60 g/100 g of fresh matter), vitamins from the B complex, vitamin K and E (Feller and Fink, 2005). It also contains a lot of minerals, calcium, potassium, zinc, copper, magnesium, selenium. Cauliflower can be grown in spring or in autumn, in protected culture or in open field. Cauliflower culture can be started by direct sowing or by seedlings (Ciofu *et al.*, 2003).

Aims and objectives. The research aims to establish how the plant's layout influences cauliflower production in polyethylene tunnels. The objective of this research is to establish which of the two layouts used (on 2 rows/stratum and 3 rows/stratum) obtains the higher production of cauliflower, in a polyethylene tunnel.

Materials and methods. The experiment took place in the spring of 2011, in a polyethylene tunnel, from USAMV Cluj-Napoca. The culture started in March, with small seedlings. Three cauliflower hybrids suitable for early growing (Stargate, Diadom and Opal) were used.

The seeds were sown in alveolar trays, in 16.01.2011. After a month from sowing, the small seedlings were transplanted in bigger pots and they were finally planted in the polyethylene tunnel on the 17.03.2011. The plant density that was used was 40 000 pl/ha at all densities. The plants were placed on the stratum on two or three rows. After a month from planting and before harvesting growth measurements were done.

Results and Discussion. After a month from planting, growth measurements were done to see any differences between hybrids. Stargate was the most vigorous of them all and it also results that all of the hybrids have vigorous growths when the plants were layout on 3 rows/stratum (Tab. 1). Regarding plant development before harvesting, the most vigorous growths are still presented at the variants placed on 3 rows/stratum (Tab. 2). Only leaf numbers are smaller when the plants are placed on 3 rows/stratum. Production is also influenced by the placement of plants/stratum. By increasing the number of rows/stratum,

from 2 to 3, the production drops from 28.82 t/ha (when the plants are placed on 2 rows/stratum, to 23.76 t/ha (on 3 rows/stratum). The obtained production is very significant negative compared to control (Tab. 3).

Tab. 1

Growth measurements done after a month from planting in the polyethylene tunnel

Hybrid	Plant layout/stratum	Plant height (cm)	Rosette diameter(cm)	Number of leaves
Stargate	2 rows	40.4	46.6	12.0
Stargate	3 rows	42.0	48.0	12.0
Diadom	2 rows	37.4	45.0	13.2
Diadom	3 rows	38.2	46.8	13.8
Opal	2 rows	35.6	40.4	11.8
Opal	3 rows	35.8	42.6	10.8

Tab. 2

Growth measurements done before harvesting in the polyethylene tunnel

Hybrid	Plant layout/stratum	Plant height (cm)	Rosette diameter (cm)	Number of leafs
Stargate	2 rows	65.0	72.4	17.2
Stargate	3 rows	66.0	68.4	16.6
Diadom	2 rows	70.8	74.0	16.6
Diadom	3 rows	82.2	77.0	14.7
Opal	2 rows	60.0	69.6	14.2
Opal	3 rows	63.6	68.6	13.0

Tab. 3

Growth measurements done before harvesting in the polyethylene tunnel

Plant layout/stratum	Production		Difference	Significance
	t/ha	%		
2 rows	28.82	100.0	+0.00	-
3 rows	23.76	90.4	-5.06	000
DL (p 5%)			+1.91	
DL (p 1%)			+2.72	
DL (0.1%)			+3.84	

Conclusion. By increasing the number of rows/stratum, when using the density of 40 000 pl/ha, the plants become more vigorous but the production of early cauliflower drops significantly, from 28.82 t/ha at 2 rows/stratum, to 23.76 t/ha at 3 rows/stratum. It isn't recommended to place plants on 3 rows/stratum at cauliflower culture.

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