

## ASPECTS OF THE INFLUENCE OF DENSITY IN NON-IRRIGATED AND IRRIGATED MAIZE CROP IN TRANSILVANIA LAND

**Pandrea R., E. Luca**

*Universitatea de Științe Agricole și Medicină Veterinară, Facultatea de Horticultură, str. Mănăștur, nr. 3-5, 400372, Cluj-Napoca, România, viitorsanatosgrup@yahoo.com*

**Abstract.** *In the experiences organized at Suatu, Cluj, it was proved that for achieving high levels of production for the corn crop, it is absolutely necessary to maintain a good water supply during the whole vegetation period.*

**Keywords:** irrigation, maize, crops, density

### INTRODUCTION

Irrigation is a technological measure which influence the level, consistency and quality of the crop. By setting and by applying a rational irrigation regime is known for its supply of water under the soil, plant requirements.

The study development of thermal regime and pluviometric regime evolution in the ecological conditions of the plain area of Transylvania, showed an increase in moisture deficit together with heat above the average multi-annual values. (Botzan M., 1972; Grumeza N. si colab., 1989; Rieul L., 1992; Nagy Z., E. Luca, 1994; Luca E., 1994, 1997; Luca E., Z. Nagy, 1999; Luca E., V. Budiú, Ana Ciotlăus, 2008).

The main objective of the authors, is as high level production of grain. Increasingly, however, this priority is dependent upon the elements of technology, which in turn are constantly improving.

### MATERIAL AND METHOD

The experience was organized in Suatu Cluj. It was shown that for achieving high levels of corn crop production, it is necessary to maintain a good supply of water during the growing season. Experiences have been placed in the camp after method plots subdivided with three factors

Factor A - the irrigation, with a1- non-irrigated; a2-irrigated land to 50% of the active humidity range (I.U.A); Factor B - Density, with: b1-60,000 plants/hectare; b2-80,000 plants/hectare; c3-100,000 plants/hectare

One of the important objectives of the experience was the determination of the total water consumption from the cultivation of maize for grain in terms of irrigation, and non irrigation in climatic conditions of the year 2009. The methodology used for the calculation of the consumption of water has been the balance of water in the soil.

Because experiments have been carried out in the plain of Transylvania, GPS coordinates on N-46,79 23,97 E, I chose the early hybrid PR39D81, mark Pioneer. A hybrid is resistant to drought, with a high capacity of production employed in conventional FAO maturity class 260-270. Seeding was done by car for sowing SPC6 in April. Irrigation was performed in times when the humidity field was close to the minimum limit

## RESULTS AND DISCUSSION

Irrigation has led to significant increases in production compared with non-irrigated variants. It was found a favorable reaction of density irrigation. In all variations, every density irrigated has achieved superior productions compared with non-irrigated variants. Optimum density has proved to be of 80 000 plants per hectare. In this density there has been a rise in production of 373 kg/ha, very significant positive compared with the production obtained from version control. (Table 1). A very significant increase of production was obtained at density of 80 000 plants/ha irrigated land. (Table 2).

Table 1  
Influence of density on the production of grain from maize in 2007 in Cluj County Suatu conditions

Density(plant/ha)	Grain yield (kg/ha)	Grain yield (%)	Difference (t/ha)	Significance of difference
60 000 plant/ha	8,311	100	-	Mt
80 000 plant/ha	8,684	105,1	0,37	***
100 000 plant/ha	8,275	99,51	-0,030	n.s.
D.L. 5% =		0,100		
D.L. 1% =		0,135		
D.L. 0,1 % =		0,178		

Table 2  
Influence of irrigation x density on the production of grain from maize in 2007 in Cluj County Suatu conditions

Irrigation norm	Density(plant/ha)	Grain yield (kg/ha)	Grain yield (%)	Significance of difference
Non irrigation	60 000 plant/ha	7,384	100	-
	80 000 plant/ha	7,817	106,416	0,433 *
	100 000 plant/ha	7,188	96,601	-0,196
Irrigation	60 000 plant/ha	9,190	131,581	1,806***
	80 000 plant/ha	9,633	138,949	2,249***
	100 000 plant/ha	9461	135,204	2,077***
D.L. 5% =			0,256	
D.L. 1% =			0,450	
D.L. 0,1 % =			1,070	

## CONCLUSIONS

Water from rainfall has proven to be insufficient to obtain high yields in relation to consumer needs for maize in the Transylvanian plain.

Thus, the expediency of introduction and maintenance of irrigation, where possible, in the Transylvanian Plain conditions is evident.

Promotion of the irrigation culture technology of products with the purpose of realization of superior production in comparison with non-irrigated yields obtained in the system calls for heat evolution, water regime and rigorous monitoring of soil moisture dynamics.

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