

THE CELERY CULTURE IN THE CONTEXT OF DEJ AREA CLIMATE CONDITIONS

Tamas Dorina Victoria, E Luca, Laura Cristina Luca, Adela Hoble

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

Abstract. *In the present work is realized a complex analysis of climatic conditions in the agricultural Plain of Transylvania, in the context of climate change, which is one of my biggest threats in terms of environmental referring to social and economical aspects.*

Keywords: celery, Dej, temperatures

INTRODUCTION

The latest evaluations of the Intergovernmental Panel on Climate Change (IPCC) have highlighted the following: the increase by about 3 ° C average temperature this century ; in the last 100 years, Earth has experienced a warming of 0.71 ° C, growth being pronounced in the last 50 years ; Arctic temperatures have increased twice as much ; atmospheric carbon dioxide concentrations increased from pre-industrial value of 278 particles per million to 379 particles per million in 2005.

Research conducted by climatologists specialists of National Meteorological Administration, have shown, concerning our country, an average warming of 0.30C during 1901-2000 and of 0.50C during 1901-2007, statistically significant in the Extra Carpathian regions (Fig. 1). Analysis based on data from a greater number of weather stations (94), has revealed an increase in warming in recent decades. Thus, during 1961-2007, was revealed a significant warming of about 2 ° C throughout the country during summer, in the Extra Carpathian regions during winter and spring, with higher values in Modova, exceeding 2 ° C (winter) and 1° C (spring) ; during autumn was noticed a slight cooling trend across the country which is not statistically significant.

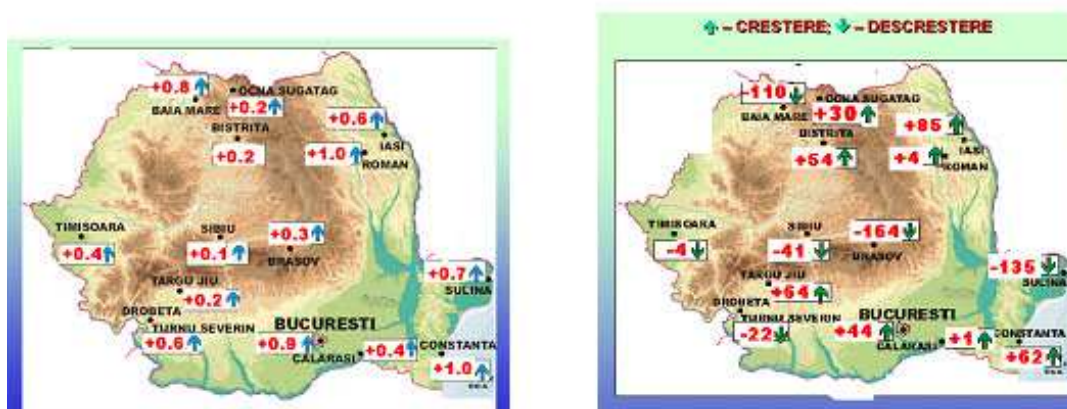


Fig. 1. Linear trends for mean annual air temperature (0C) during 1901-2007 (a) and yearly precipitation (mm) during 1891-2007 (b).

In terms of rainfall, was revealed a general trend of decreasing annual rainfall amounts, more pronounced in the center regions of the country, with slight increases in some areas northeast and south. After 1961, the deficit trend is increasing toward the south. Concerning the seasonal level, was identified a significant upward trend in precipitation during the autumn.

MATERIAL AND METHOD

To give good results, celery needs a hot and humid microclimate. Biological threshold is 5 ° C, but young plants can withstand negative temperatures of -3 ° C. The edible part is affected by temperatures below 0 ° C, so it should be harvested before frost coming.

Optimum temperature for germination is 20-25 ° C (when plants spring up in 9-12 days) and the minimum of 4-5 degrees C. Young plants resist to minus 4-5 degrees C and the mature ones at minus 7-9 degrees C. The roots are less resistant because of their high water content. Optimum temperature for vegetation is 18-22 degrees C , and the minimum temperature, 7-8 degrees C. Low temperatures (below 14 degrees C) during the seedling plants production, can result in a shorter vegetation period, as the floriferous stems are forming in the first year of culture. Concerning the light intensity, celery root has moderate requirements ; instead is requesting moisture, without which roots branch a lot and the flesh becomes thicker.

RESULTS AND DISCUSSION

DEJ ZONE CLIMATIC CONDITIONS, CONCERNING CELERY VEGETATION DURING THE PERIOD 2009-2011

Main consequences of global warming are increasing of the planetary ocean level and extreme weather events (heat waves, droughts, floods, strong winds). Crop productivity presents fluctuations from year to year, its variability being significantly influenced by climatic conditions and particularly by the extreme weather events.

Characterization of time in terms of temperature, 2009-2011

In this research, the temperatures recorded were taken from the Meteorological Station Dej in Table 1.1. Monthly average temperatures of the air, calculated from May to November (months corresponding to celery growing), 2009-2011.

Table 1
The average monthly air temperature (° C) in Dej

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Year/Month	May	June	July	August	September	October	November
2009	15.6	18.6	20.9	20.1	16.0	9.5	6.1
2010	15.4	19.4	21.0	20.6	14.0	6.3	5.7
2011	14.8	18.8	20.0	19.8	16.4	6.6	-1.3

In table 1.2. monthly average temperatures are calculated, for the period January 2009 - December 2011. Compared with multiannual temperature value in period 1980-2009, which is 8.7 ° C, air average temperature is 10.1 ° C in 2009, with a median of 1.4 ° C, indicating that the time is considered hot for 2010 ; the standard deviation is 0.7,

meaning the weather was warm. Thermal regime in 2011 was normal, these aspects can be seen in Figure 2.

Table 2

Mean monthly and annual average temperature: 2009-2011

	I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII	Annual
2009	-2.1	0	3.6	12.4	15.6	18.6	20.9	20.1	16	9.5	6.1	0.3	10.1
2010	-3	1.3	4.1	10.1	15.4	19.4	21	20.6	14	6.3	5.7	-1.7	9.4
2011	-3.2	-2.9	4.3	10	14.8	18.8	20	19.8	16.4	6.6	-1.3	1	8.7

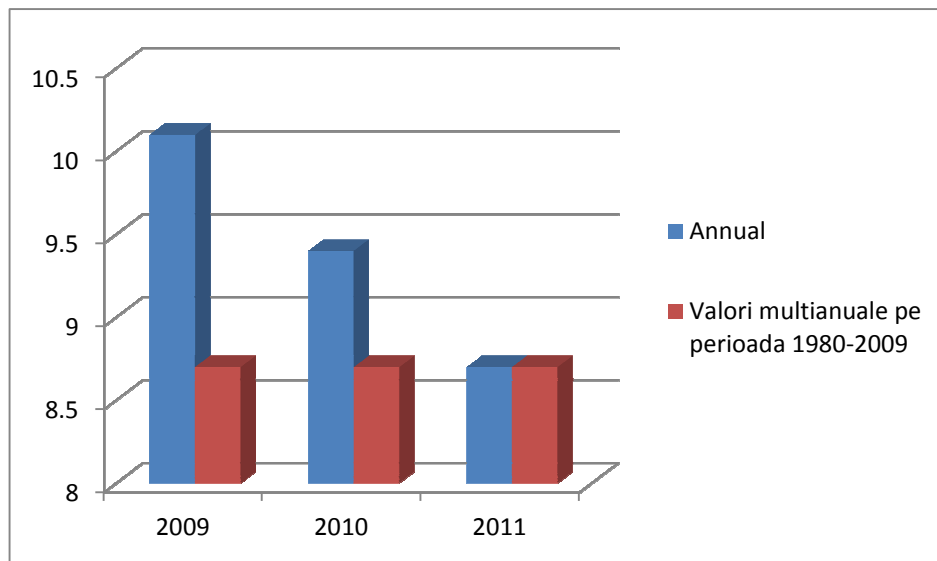


Fig. 2 . The variation of the yearly average temperature (t °C), Dej, 2009-2011

Characterization of time in terms of rainfall, 2009-2011

An important factor in plant development is the moisture provided by precipitation. The most important are the precipitation falling from clouds as rain, snow, hail.

The distribution of the rainfall during the growing season is presented in Table 3.

Table 3

The amount of precipitation - monthly amount (mm) in Dej

The amount of precipitation - monthly amount (mm) in Dej							
Year/Month	May	June	July	August	September	October	November
2009	63.1	100.7	51.7	70.9	9.1	110.3	67.1
2010	138.1	134.5	89.8	54.3	74.4	27.4	24.5
2011	63.2	64.8	98.2	14.0	12.6	16.4	0.0

In terms of rainfall distribution in 2009-2011, the situation is presented in Table 4. and Figure 3.

Table 4

Monthly and annual average rainfall average: 2009-2011

	I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII	Annual
2009	15.5	32.8	65.9	5.6	63.1	100.7	51.7	70.9	9.1	110.3	67.1	70.4	663.1
2010	75.7	34.9	24.7	61.8	138.1	134.5	89.8	54.3	74.4	27.4	24.5	75.4	815.5
2011	38.6	32.3	14.6	43.2	63.2	64.8	98.2	14	12.6	16.4	0	40.2	438.1

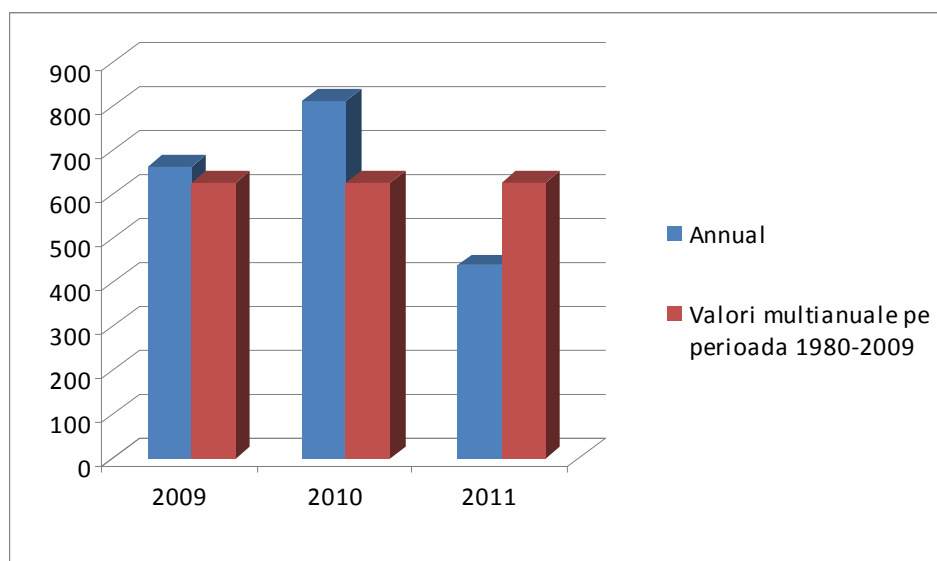


Fig. 3. Average annual rainfall, Dej, 2009-2011

Average rainfall is 627 mm during 1980-200 ; so, in 2009, in Table 1.4. average deviation is 36.1 which show that is a normal period ; in 2010 the standard deviation is 188.5 which denotes a rainy year ; in 2011 the average deviation is -188.9, which mean it was a dry weather .

CONCLUSIONS

Climatic data of the last century shows a progressive heating of the atmosphere and a significant reduction in precipitation amounts, considered limiting factors for the development and crop productivity and also for using the water resources. These changes may have significant consequences on growth and development of agricultural crops during the vegetation period, depending on the degree of intensity of disturbances, manner and duration of action, and plant species vulnerability to extreme weather events.

Long term measures are required for prevention and reducing the climate change; that include reforestation programs, reducing pollution, erosion restoration , modernization works and expanding the development and improvement of sandy soils, etc. Also, educating people and raising awareness on environmental protection are major requirements in developing adaptation strategies to climate change.

Thus, in these weather conditions, which includes the area covered by the research, is required the testing of biological celery material, choice of varieties resistant to these conditions and also completing the necessary water quantity through irrigation. Such research has been conducted since 2009 in the village Nicula (near Dej).

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