PRODUCTION RESULTS OBTAINED DEPENDING ON RISK CLIMATE CONDITIONS IN CAMPIA LOCATION, CARAS SEVERIN COUNTY, IN THE PERIOD 2019-2022

V. S. IOVANOVICI, Gh. SUCIU, D. V. MIRCOV, Casiana MIHUT
University of Life Sciences "King Mihai I" from Timişoara
Corresponding author: vlad.mircov@yahoo.com, casiana_mihut@usvt.ro

Abstract. *In the present work, the production results obtained in the area of Langovet were presented, over a period of four years, in the period 2019-2022, a locality located in the immediate vicinity of the border with Serbia. The data used in this work were provided by the Banat Crisana Regional Meteorological Center, data that reported the meteorological aspects of risk reported at two meteorological stations in Caras Severin county, the meteorological station from Oravita and the one from Moldova Noua, for the analyzed period. At the beginning of the work, I presented the geographical location of Campia (Langovet), a village belonging to Socol commune, and then I carried out a climatological description of certain risk factors prevalent in this area of Caras Severin county. The Danube gorge is under the influence of the air masses that circulate towards the northeast, it is distinct and contributes to the increase of the originality of the landscape. We thus emphasize the presence of more abundant precipitation if we consider the temperate continental climate of our country's territory. In addition, precipitation manifests itself with a spasmodic character, recording the highest values during autumn and spring with variables registered by the exposure of the slopes. Regarding the average annual temperature of the area, we mention that it is higher. The average annual isotherm of 110 delimits the Danube corridor. Thanks to these evaluations, we signal the presence of biocenoses specific to the area. For several decades, our family has been working in the field of agriculture in the town of Langovet, being among the first to purchase machinery in our town. In total, we cultivate 95 ha, of which 40 ha are our property, the remaining 55 ha are leased, the surfaces being cultivated with corn, sunflower and wheat. Regarding the share held by the three crops, in the last year, in 2022, we have 20 ha of sunflower, the remaining 75 ha being almost equally divided between the other two crops, corn and wheat. The paper presents the production results obtained during the four analyzed years, 2019-2022.*

Key words: *weather station, risk aspects, average annual temperature, isotherm, slopes, production*

INTRODUCTION

In the order of their altitude and location from south to north, the main landforms in the studied area are made up of a part of the Locvea Mountains, the Piedmont Hills, the Piedmont Terrace Plain of the Socol and the Nera Meadow. The altitude oscillates between the maximum in the Locvei Mountains (537 m), passing through the average of 250 m in the erosion piedmont of Locvei and the lowest, of 150 m, in the Nera meadow. (DUMA COPCEA ET AL.,2021; MIHUȚ, C., NIȚĂ, L. 2018). We must note the Danube Gorge, which runs for a length of 130 km between Baziaș and Gura Văii, being dug in rocks with very varied lithology and structure, which has left its mark on the whole of its morphological characters.(OKROS, A. ET AL., 2021).

The general exposure is the north-western one, the peaks are elongated and fall gradually towards the terraces and the Nera meadow, being very narrow, rarely with flat portions and this especially in the western Piedmont of Locvea. (BARBU, I., POPA, I., 2003), (ONCESCU, N., 1965). The mountains are short with ridges and peaks of a residual character partially drowned in hollows and leosoid deposits, with strong central European and Mediterranean climatic influences (MOLDOVAN, F., 2003; NICHITA, C., HAUER, ELZA, 2010).

The western sector is made up of crystalline schists, and this hill from the Socol commune descends towards Nera in the form of a 200-300 m high stream, forming a piedmont

area, heavily anthropized, mostly occupied by agricultural land, orchards and wooded areas. Towards Buziaş, the entry point of the Danube into Romanian territory, the piedmont ends with a steep, directly into the river, highlighting the crystalline foundation (MIHUT C. ET AL., 2018, 2023).

The purpose of this paper is to report certain production values obtained by agricultural crops over a period of four years. In order to best describe this aspect, we took into account the meteorological data provided by the Banat Crisana Regional Meteorological Center, more precisely, the data from the Oravita and Moldova Noua stations. The more detailed analysis of certain phenomena was done to capture exceptions, special situations or more significant meteorological elements.

The springs are early, with high temperatures, the summers are drier and hotter, and the winters are generally mild with little snow. The surrounding relief and the large surface of the Portile de Fier reservoir (700 km^2). causes a slight increase in the average annual temperature, from west to east, registering 11.2ºC in Moldova Nouă, 11.4°C in Berzasca, 11.5°C in Svinița.

MATERIAL AND METHOD

The southwest of Romania, like the whole country, due to its geographical position - in the temperate zone, is exposed to a wide range of risk weather and climate phenomena with the potential to occur throughout the year. The purpose of this paper is to report certain production values obtained by agricultural crops over a period of four years. In order to best describe this aspect, we took into account the meteorological data provided by the Banat Crisana Regional Meteorological Center, (MIRCOV V.D., ET AL., 2022), more precisely, the data from the Oravita and Moldova Noua stations. The more detailed analysis of certain phenomena was done to capture exceptions, special situations or more significant meteorological elements.

The springs are early, with high temperatures, the summers are drier and hotter, and the winters are generally mild with little snow. The surrounding relief and the large surface of the Portile de Fier reservoir (700 km^2). causes a slight increase in the average annual temperature, from west to east, registering 11.2ºC in Moldova Nouă, 11.4°C in Berzasca, 11.5°C in Svinița (14,16).

The Danube Gorge is under the influence of the air masses that circulate to the northeast. it is distinct and contributes to increasing the originality of the landscape. We thus emphasize the presence of more abundant precipitation if we consider the temperate continental climate of our country's territory. In addition, precipitation manifests itself with a spasmodic character, recording the highest values during autumn and spring with variables registered by the exposure of the slopes.

The movement of sub-Mediterranean air masses leads to their channeling on the Danube corridor where it is also known as Coșava or locally Năidășan (it flows from the direction of the town of Naidaș). The effects of this circulation condition the sudden melting of snow during the winter, reflected by small increases in level but which occur over a short period of time. The air temperature is a basic element in characterizing the climate under the ratio of values, variables, averages and extremes.

Regarding the average annual temperature of the area, we mention that it is higher (MIRCOV, V.D. ET AL., 2019). The average annual isotherm of 110 delimits the Danube corridor (PATRICHE C.V., 2009). Thanks to these evaluations, we signal the presence of biocenoses specific to the area.

In October, the characteristic month of autumn, the average temperatures are generally reduced to around 12°C due to the reduction of solar radiation, on the one hand, and the more frequent penetration of cold air masses from northern areas, on the other (MIHUȚ, C. ET AL., 2022, 2023). Compared to the previous month and the one following it, the month of October is minus and respectively plus by approximately the same number of degrees (5-6°C) and therefore the distribution characteristics mentioned above are specific for the entire autumn season.

In this way, particularly intense air currents develop, of the "bora" type, locally called "Coşava" (15). The "Coşava" wind has a turbulent character, and according to the wind rose, the predominant directions are east and west. The speed can reach up to 85 km/h, with gusts up to about 140 km/h and 145 km/h, with an average duration of up to one day, sometimes even two days (BOGDAN OCTAVIA, ET AL., 1998). Approximately half of the days of the year are windy, the other days presenting an atmospheric calm, a fact that is of particular importance in the context of "green energy", as a source of renewable energy.

RESULTS AND DISCUSSIONS

In this work, we took into account the basic meteorological indicators specific to the area of Campia village (Langovet), a village that belongs to Socol commune in Caras-Severin county, located close to the border with Serbia. In order to highlight the production results obtained in the hometown, we took into account the meteorological data obtained from two nearby meteorological stations, the Moldova Veche meteorological station and the one from Oravita.

For several decades, our family has been working in the field of agriculture in the town of Langovet, being among the first to purchase machinery in our town. The agricultural machinery and machines at our disposal are a Fendt Farmer LSA/312 tractor, the tractor with which we do most of the hard work in the field and the Zmaj 142 combine, with a 4.20m header, which is an advantage for us because we do not have many hectares combined and we have to move from one plot to another. We also have a Naud 005 plough, with four bodies, kverneland disc, leaf seeders and amazon corn (table 1).

Table 1.

The productions obtained from the main cultivated crops in the period 2019-2022

Culture/Production (t/ha)	Years			
	2019	2020	2021	2022
Maize	9.2	10.0	8.0	4.5
Sunflower	2.0	2.5	2.5	2.5
Wheat	5.0	6.3	8.1	5.0

As can be seen from the table above, in almost all the four analyzed, in the period 2019-2022, the production of the sunflower crop did not exceed 2.5 t/ha, only in 2019 we obtained a lower production, more exactly 2t/ha.

Fig. 1 Sunflower production in 2022

Next, we presented the distribution of the rainfall regime in 2020 and 2021 at the two weather stations, Moldova Veche and Oravita. It is also worth noting the decrease in the rainfall regime in the fall of 2021, compared to 2020, which led to a decrease in both wheat and lead production, the first three months of 2021 weredeficient compared to the same period of 2020 For corn we had a decrease of 3.5 t/ha, whilefor wheat of 3.1 t/ha, in 2022.We also carried out a brief analysis of precipitation and the thermal regime in 2021 and the year 2022.

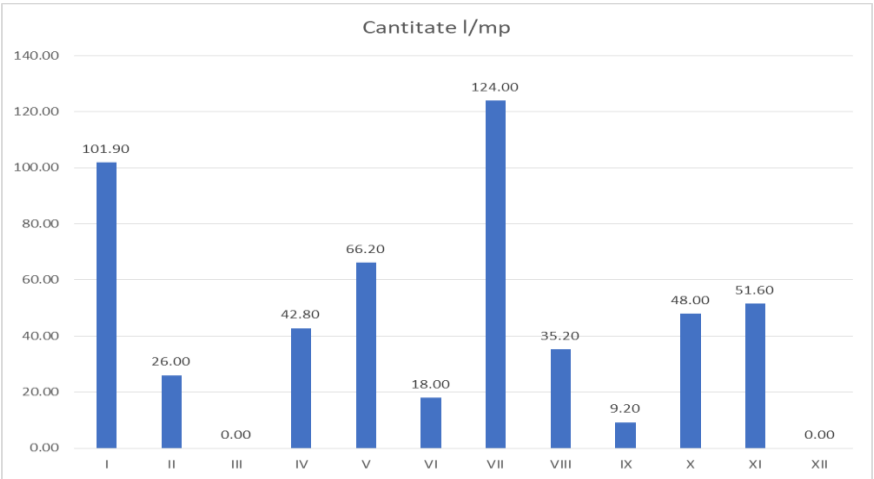

Fig.2 The rainfall regime recorded in Old Moldova in 2021

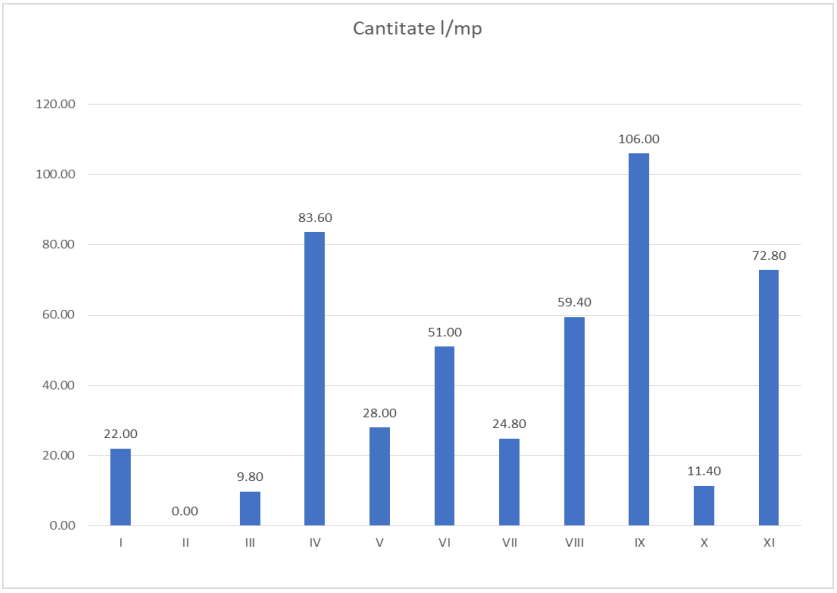

Fig.3 The rainfall regime recorded in Old Moldova in 2022

It is also worth noting the favorable thermal regime in this area and it should be noted that, only in January of 2022, the value of the monthly average was negative, of -0.1 degrees C, in Oravita, the monthly maximum being 3.6 degrees C At the other meteorological station studied, in old Moldova, there were 24.9 degrees C, in July, and 24.2 degrees C, the monthly value recorded in August. In 2022, July was the warmest month, with an average of 24.4 degrees C, the maximum being 31.5 degrees C. In 2021, also in July, 24.3 degrees C were recorded in Oravita, with a maximum of 30.7 degrees C, while in Old Moldova there was a monthly average of 25.8 degrees C, with a maximum value of 32.4 degrees C.

Due to the favorable climatic conditions in the fall of 2020 and the first months of 2021, we obtained the highest wheat production in 2021, a quantity of 8.10t/ha. It is worth noting the excess rainfall regime recorded in the first two months of 2021, in Oravita 157 l/m^2, while in Moldova Noua, in the two months, 128 l/m2 accumulated. In January of 2021, the most rain fell on January 2, an amount of 18.9 l/m2, in Moldova Noua, and also on January 2, 20.6 l/m^2 accumulated in Oravita. In February, 10.0 l/m^2 rained in Moldova Noua, on February 26, while in Oravita, on February 17, 26.0 l/m^2 accumulated

CONCLUSIONS

The Danube gorge is under the influence of the air masses that circulate towards the northeast, it is distinct and contributes to the increase of the originality of the landscape. We thus emphasize the presence of more abundant precipitation if we consider the temperate continental climate of our country's territory. In addition, precipitation manifests itself with a spasmodic character, recording the highest values during autumn and spring with variables registered by the exposure of the slopes.

Regarding the average annual temperature of the area, we mention that it is higher. The average annual isotherm of 110 delimits the Danube corridor. Thanks to these evaluations, we signal the presence of biocenoses specific to the area.

In October, the characteristic month of autumn, the average temperatures are generally reduced to around 12°C due to the reduction of solar radiation, on the one hand, and the more frequent penetration of cold air masses from northern areas, on the other.

In this area, particularly intense air currents develop, of the "bora" type, locally called "Coşava". The "Coşava" wind has a turbulent character, and according to the wind rose, the predominant directions are east and west. The speed can reach up to 85 km/h, with gusts up to about 140 km/h and 145 km/h, with an average duration of up to one day, sometimes even two days. Approximately half of the days of the year are windy, the other days presenting an atmospheric calm, a fact that is of particular importance in the context of "green energy", as a source of renewable energy.

It is also worth noting the favorable thermal regime in this area and it should be noted that, only in January of 2022, the value of the monthly average was negative, of -0.1 degrees C, in Oravita, the monthly maximum being 3.6 degrees C At the other meteorological station studied, in old Moldova, there were 24.9 degrees C, in July, and 24.2 degrees C, the monthly value recorded in August. In 2022, July was the warmest month, with an average of 24.4 degrees C, the maximum being 31.5 degrees C. In 2021, also in July, 24.3 degrees C were recorded in Oravita, with a maximum of 30.7 degrees C, while in Old Moldova there was a monthly average of 25.8 degrees C, with a maximum value of 32.4 degreesC.

Due to the favorable climatic conditions in the fall of 2020 and the first months of 2021, we obtained the highest wheat production in 2021, a quantity of 8.10t/ha.

It is also worth noting the favorable thermal regime in this area and it should be noted that, only in January of 2022, the value of the monthly average was negative, of -0.1 degrees C, in Oravita, the monthly maximum being 3.6 degrees C At the other meteorological station studied, in old Moldova, there were 24.9 degrees C, in July, and 24.2 degrees C, the monthly value recorded in August. In 2022, July was the warmest month, with an average of 24.4 degrees C, the maximum being 31.5 degrees C. In 2021, also in July, 24.3 degrees C were recorded in Oravita, with a maximum of 30.7 degrees C, while in Old Moldova there was a monthly average of 25.8 degrees C, with a maximum value of 32.4 degreesC.

Due to the favorable climatic conditions in the fall of 2020 and the first months of 2021, we obtained the highest wheat production in 2021, a quantity of 8.10t/ha. It is worth noting the excess rainfall regime recorded in the first two months of 2021, in Oravita 157 l/m^2, while in Moldova Noua, in the two months, 128 l/m2 accumulated. In January of 2021, the most rain fell on January 2, an amount of 18.9 l/m2, in Moldova Noua, and also on January 2, 20.6 l/m^2 accumulated in Oravita. In February, 10.0 l/m^2 rained in Moldova Noua, on February 26, while in Oravita, on February 17, 26.0 l/m^2 accumulated. Regarding the corn crop, we obtained the lowest amount in 2022, precisely 4.5 t/ha, due to the poor rainfall regime, and in 2021 we obtained 8 t/ha, while the highest quantity we had in 2020, 10t/ha.

BIBLIOGRAPHY

BARBU, I., POPA, I., 2003 - Monitoringul secetei în padurile din România. Edit.Tehnica Silvica, Câmpulung Moldovenesc, 128 p.

BOGDAN, OCTAVIA, NICULESCU, ELENA, 1999 - Riscurile climatice din România, Ed. Sega-International, Bucureşti.

DUMA COPCEA, A., MATEOC SÎRB, N., MIHUȚ C., NIȚĂ L. MATEOC T., NIȚĂ, S, SÎRBU C., STEF R, SCEDEI D., 2021 - Management of soil resources in Giarmata, Timiș county, Scientific Papers Series Management, Economic Engineering in Agriculture and Rural Development, Vol. 21, Issue 1, T ISSN 2284-7995, E-ISSN 2285-3952.

MIHUȚ, C., NIȚĂ, L. 2018- Atmospheric factors used to characterize soil resources, Research Journal of Agricultural Science, 50(1), 2018, 143-146.

CASIANA MIHUȚ, VALERIA CIOLAC, ANIȘOARA DUMA COPCEA, ADALBERT OKROS, DANIELA SCEDEI, 2022 - Analysis of the influence of pedogenesis factors on soil formation using modern methods. International Multidisciplinary Scientific GeoConference : SGEM; Sofia, Vol. 22, Iss. 3.1, (2022)., pp. 219, DOI:10.5593/sgem2022/3.1/s13.27.

MIHUȚ, CASIANA., DUMA, COPCEA, ANISOARA., COZMA ANTOANELA, MIRCOV V. D, SCEDEI DANIELA, 2023 - Limiting factors and measures to restore soil fertility in the town of Biled,Timiș county, International Multidisciplinary Scientific GeoConference: SGEM; Sofia, Vol. 23, Iss. 3.1, (2023). ISSN 1314-2704, pp.257, DOI:10.5593/sgem2023/3.1/s13.31.

CASIANA MIHUȚ, NICOLETA MATEOC-SÎRB, ANIȘOARA DUMA COPCEA, SIMONA NIȚĂ, IAROSLAV LAȚO, VALERIA CIOLAC, ANTOANELA COZMA, ADALBERT OKROS, 2023 - Assessing the state of fertility (Quality) of the soils for sustainable agriculture in Remetea Mare, Timis County, Romania. Scientific Papers Series Management, Economic Engineering in Agriculture and Rural Development Vol. 23, Issue 2, 2023. PRINT ISSN 2284-7995, E-ISSN 2285-3952, pp. 487 WOS:001032377300056.

MIRCOV V. D., MIHUȚ CASIANA D., OKROS A., CHIȘ C., DURĂU C., 2022 - Influence of climate indicators and risk aspects at representative meteorological stations in the western area of Romania, International Multidisciplinary Scientific GeoConference : SGEM; Sofia, Vol. 22, Iss. 4.1, (2022), pp. 303, DOI:10.5593/sgem2022/4.1/s19.39.

MIRCOV, V. D., PIRSAN, P., OKROS, A.; MIHUT, C., BORCEAN, A., 2019 - Extreme meteorological phenomena recorded during winter in 2009 - 2019 in Timisoara,timis county, 19th International Multidisciplinary Scientific GeoConference SGEM 2019, Vol.19, International Multidisciplinary Scientific GeoConference : SGEM; Sofia, Vol. 19, Iss. 4.1, (2019), 121, pp. 955, ISSN 1314-2704, DOI:10.5593/sgem2019/4.1/S19.

MOLDOVAN, F., 2003 - Fenomene climatice de risc, Editura Echinox, Cluj-Napoca;

NICHITA, C., HAUER, ELZA, 2010 - A low level jet case study in the southern part of Banat, Romanian Journal of Meteorology, vol.10, nr.2/2010, București.

OKROS, A., NITĂ, L., MIHUȚ, C, NIȚĂ, S., MIRCOV, V., D., DUMA COPCEA, A., 2021 - Soil resources and their favorability for various cultures in the area of commune Remetea Mare, county Timiş, Research journal of agricultural science, 53 (1), Timisoara

ONCESCU, N.,1965 - Geologia României, Editura Tehnică, București;

PATRICHE, C.V., 2009 - Metode statistice aplicate în climatologie, Editura Terra Nostra, Iași;

ŢARCĂ, M. 1998 - Tratat de statistica aplicata. Edit. Didactica si Pedagogica, Bucuresti, 808 p.

***, 2008, Clima României, Administraţia Naţională de Meteorologie, Bucureşti;

***, Arhiva Centrului Meteorologic Regional Banat-Crișana din Timișoara.

***, Arhiva Primariei Socol.