

THE WATER CONSUMPTION AT RAPE IN THE SOMES PLAIN'S CONDITIONS

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Abstract. *The paper presents the results regarding the water consumption at rape crop, irrigated and unirrigated, in the conditions of the Satu Mare (Romania) area. Data analysis on the average monthly consumption of three years shows that the total value is higher for irrigated culture (5154.66 m³) compared with non-irrigated variant (4678.66 m³). During the growing culture of rapeseed, the highest values of total water consumption were recorded during May, June and July.*

Keywords: water consumption, rape crop, irrigated, unirrigated.

INTRODUCTION

Globally, the rape crop is one of the most important energetic crops. The expansion of the rape crop cultivated areas came as a normal consequence of the genetic and ameliorate researches conducted. They created valuable species and varieties, both for their use in the food industry and as a source of biofuels.

Considering Romania's agricultural and social-economic potential, as well as the country's climate conditions, rape crop meets the criteria to be cultivated on extensive areas.

A good rape crop production is conditioned upon the ecological potential of a specific area, climate conditions, biotope characteristics, as well as the rape crop favourable and unfavourable conditions.

The research regarding the impact of the technological factors on the rape crop production is vital in order to identify the right solutions to improve the quantity and the quality of the rape crop production.

The main focus of our paper is a profound study regarding the importance of water for the rape evolution in the Satu Mare (Romania) area.

For the autumn rape, the value of total consumption results from summing the consumption due to autumn with the value of the consumptions due to spring and summer (Luca and Nagy, 1999; Oncia Silvica, 2004; Luca *et al.*, 2008; Boar Felicia, 2011).

MATERIAL AND METHOD

The research regarding the water consumption on which this paper is based have been organized during 2009 and 2011, in the Ardud village, near the Satu-Mare city.

During the experiment, the behavior of three rape varieties has been observed, under irrigation and non-irrigation conditions, as follows: Capitol, created

at Cargill company, in France, Contact, created by Monsanto SAS, France and Bristol, created by Monsanto SAS, France.

The technology recommended by the companies producing the biological material was applied, adapted to the specific conditions of the experimentation area. The water consumption was determined about a direct method, the ballance of water in the soil.

In the experimental lots from Satu-Mare, during 2009-2010, the water consumption in rape cultures was determined in non-irrigation and irrigation conditions.

The recorded temperatures during the research period of time and the level of rainfalls have been taken by the Satu-Mare Weather Station.

RESULTS AND DISCUSSION

The climatic data (the level of precipitations are presented in fig. 1, 2, 3) shows that, during the period of time under discussion, the thermal regime has been a relatively normal one. As for the monthly average distribution of temperature per season, the 2008 – 2009 winter was characterized by a cool to normal thermal regime, with negative deviations.

2009 was characterized by alternating severe drought periods of time with excessively rainy periods of time.

2010 has been an year of excessively rainy months alternating with drought months.

2011, from the recorded temperatures point of view, has been a normal one, the recorded values within the area where the experiments took place having relatively reduced limits, while the values of the recorded deviations compared to the climatological normal being slightly higher.

When it comes to the analyzed area, the average amount of precipitation which fell during the third year of experiments has been of 422,7 mm.

Scarce amounts of precipitations have been recorded almost every month of the year, except the months of June and July, characterized by amounts of precipitations in excess, the alternation between extremely dry months and extremely rainy ones being noticed.

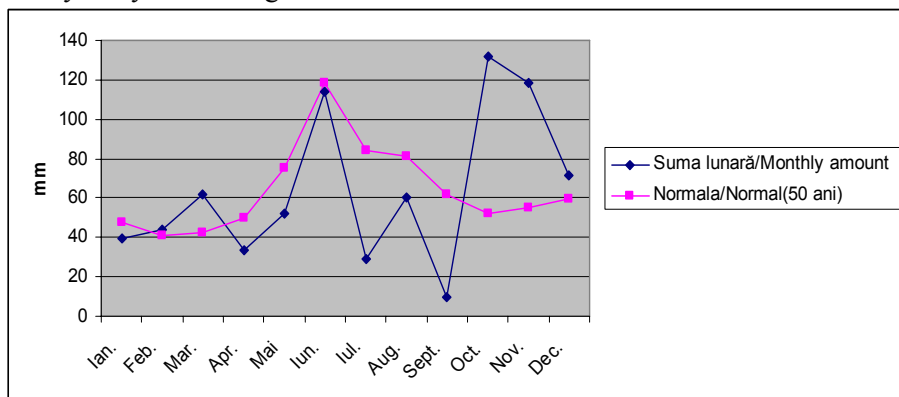


Fig. 1. The variation of the monthly average precipitation (mm), Satu-Mare, 2009

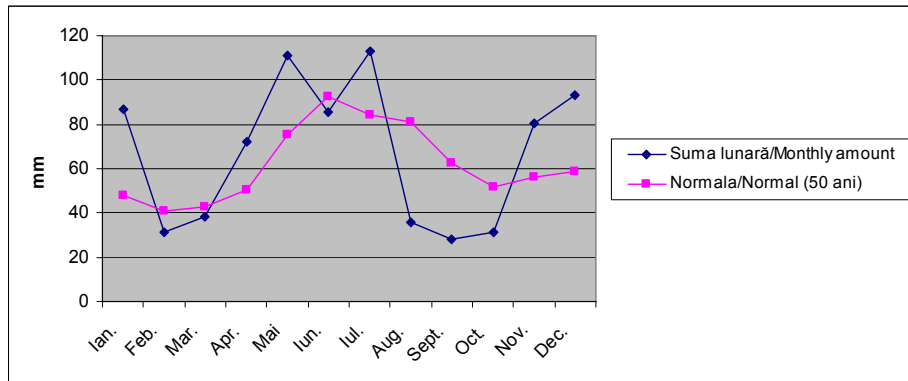


Fig. 2. The variation of the monthly average precipitation (mm), Satu-Mare, 2010

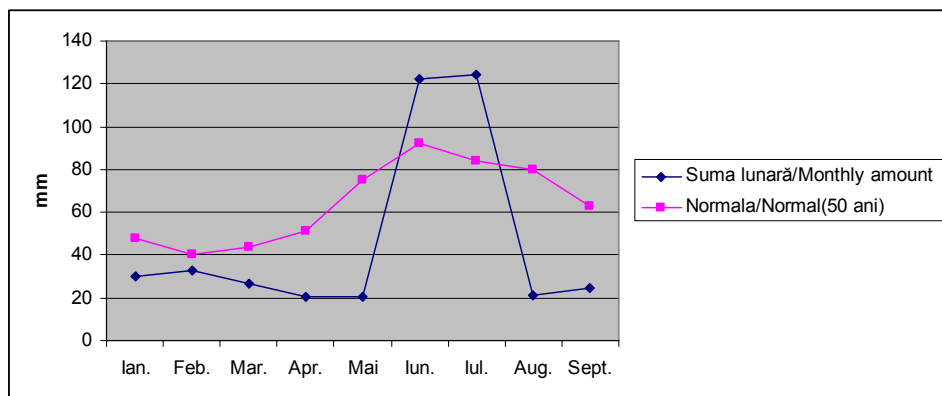


Fig. 3. The variation of the monthly average precipitations (mm), Satu-Mare, 2011

Figure 4 shows the evolution of the total water consumption in non irrigating conditions and figure 5 shows the total water consumption of rape cultures in irrigating conditions, in the 2009 – 2011 period.

During the vegetation period of rapeseed culture, the highest water consumption values were registered in May, June and July.

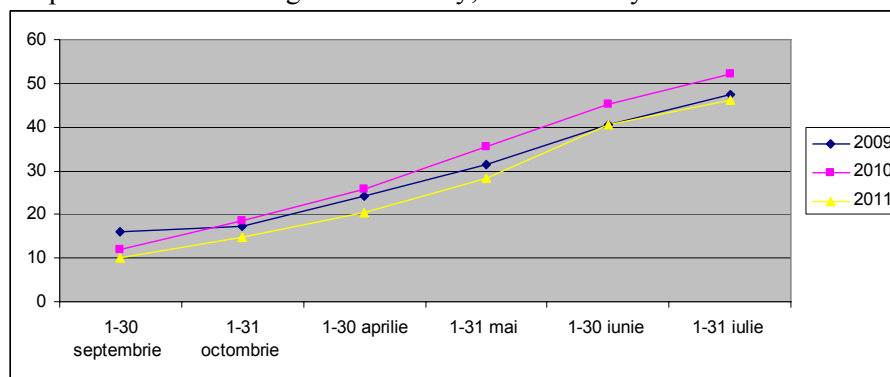


Fig.4. Evolution of the total water consumption in non-irrigated conditions, 2009-2011

For the irrigated culture, the water consumption registered the highest values in July (day 1-day 15), for all experimental years: in 2009-710 m³/ha, in 2010 -786 m³/ha, and in 2011-694 m³/ha. During the three years of experiments, the water consumption of rapeseed cultures presented a normal, ascendant evolution (Fig. 2).

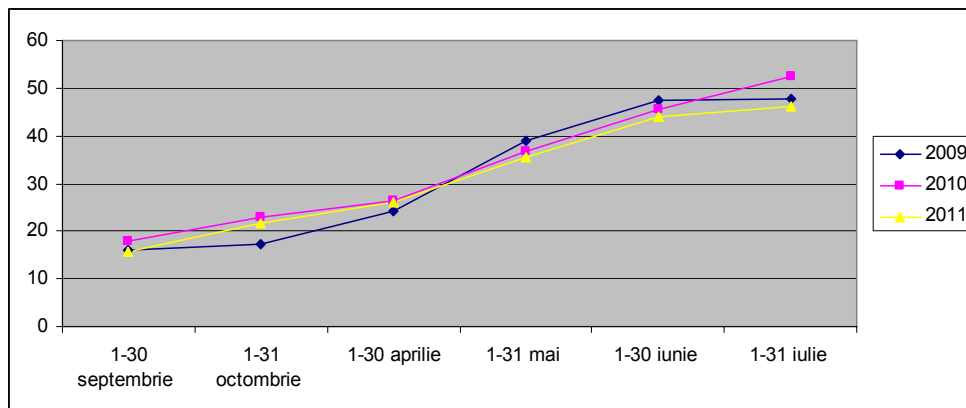


Fig. 5. The evolution of the total water consumption in irrigated conditions, 2009 - 2011

Following the measurements performed to determine water consumption in rape crop in the area of Satu Mare, in experimental conditions, during 2009 - 2011, it was found that values of water daily consumption in plants had an upward trend, water demand is high during the fructification period. Water regime definitely influenced both the quantity and quality of rapeseed production.

The sources to cover the water consumption during the vegetation period, are presented in figures 6, 7 and 8. The principal source of water consumption a trape in 2009, 2010 and 2011 is the water from precipitations (70 % in 2009, 86 % in 2010, 56 % in 2011). The water from soil represented 20 % in 2009, only 6 % in 2010 and 26 % in 2011. The water from irrigation represented 10 % in 2009, 8 % in 2010 and 18 % in 2011.

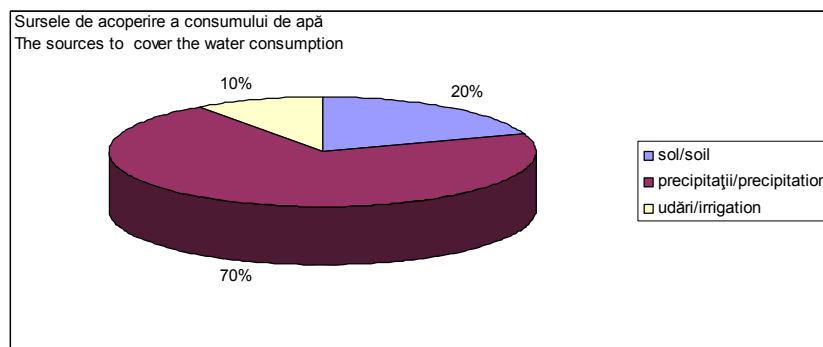


Fig. 6. The experimental field, in irrigation conditions, Satu-Mare, 2009

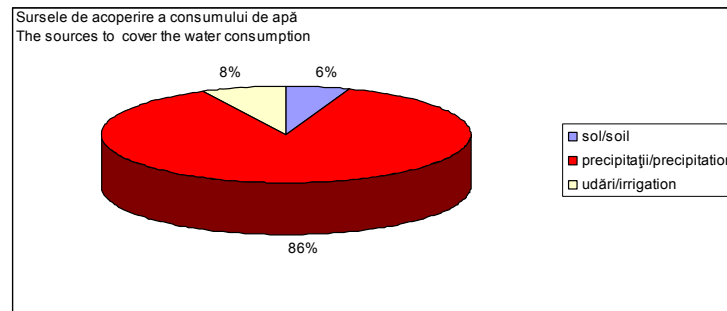


Fig. 7. The sources to cover the water consumption, Satu- Mare, 2010

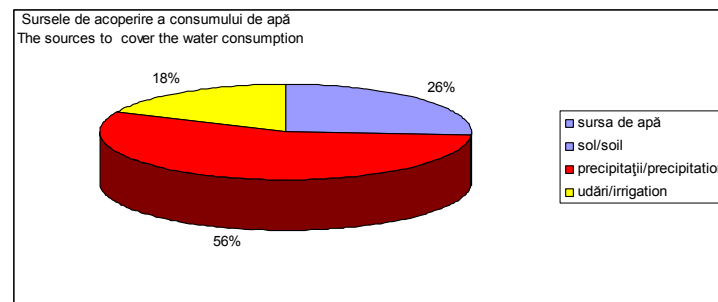


Fig. 8. The sources to cover the water consumption, Satu- Mare, 2011

CONCLUSIONS

During 2009-2011, in the experimental plots located in Satu-Mare, it has been determined the water consumption of rapeseed culture both in irrigated and non-irrigated conditions, using the soil water balance method.

Data analysis on the average monthly consumption of three years shows that the total value is higher for irrigated culture (5154.66 m³) compared with non-irrigated variant (4678.66 m³). During the growing culture of rapeseed, the highest values of total water consumption were recorded during May, June and July.

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