

RAPE CULTURE WITHIN THE NEW CLIMATE CHANGES CONTEXT

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Abstract. *The limitation of the environmental pollution and the problem of the fossil fuels depletion have determined the world scientific community to focalize on finding energetic alternatives that could solve these urgent problems. The research aimed at the energetic cultures, represented by the oilseeds, with the goal of using the biomass as an alternative source of energy. Obtaining bio fuels from vegetable oils is a viable solution because it uses renewable resources and it does not pollute the environment. The canola culture used to rank fourth, at the global level and it is the third among the oil cultures, at the present moment. Thus, it is needed an intensification of the research regarding the influence of the technological factors on the qualitative and quantitative parameters of the canola culture, under the circumstances of the climate changes, determined by the intensification of the pollution phenomenon. This kind of research has been initiated, starting with 2008, in Turda area (Vișoara, Cluj county), in the specific conditions of the Transylvanian Plain.*

Keywords: bio fuels, energetic cultures, canola, renewable energy resources, biomass, global warming.

INTRODUCTION

As a reaction to the deterioration of environmental conditions, the representatives of most of the United Nations member states, gathered for the *United Nations Framework Convention on Climate Change, UNFCCC*, have elaborated in December 1997, at Kyoto, a document of major importance called Kyoto Protocol – Convention on climate change, which stipulates the massive reduction of the polluting emissions, confirming the unbreakable connection between life quality and the quality of producing and consuming energy.

The Kyoto Protocol was signed by the European Union member states on 20th April 1998 and it compels the signatory states to reduce the emissions of Greenhouse gases by at least 5% under the level of the 1990 emissions, between 2008 and 2012, and the European Union committed to reduce the emissions by 8%.

The United Nations Environment Program promotes the sustainable development, which is based on the following principles: resizing growth, in the sense of preserving natural resources; the qualitative modification of the economic growth processes; the satisfaction of the essential needs such as work, food, energy, water, residence and social assistance; the preservation and the development of the resource base; technological restructuring and keeping under control its risks; enforcement of the international cooperation, with the goal of solving the global problems that our human kind is facing.

Under these circumstances, turning towards renewable and ecologic sources, which are due to replace the fossil fuels, is one of the main actions included in E.U. countries' energetic strategies. The surface and the production of energy plants within the E.U., for bioethanol and biodiesel production from renewable biomass is increasing as compared to the 1990s, thus, it has been noticed that more land is being cultivated with canola.

1.1. The evolution of canola culture in Romania

The agricultural and socio-economic potential of our country and the climate conditions it offers meet the demands of the canola culture, its oil and derivatives being among the most suitable biofuels, together with the sun-flower oil and the soybean oil.

The surfaces that have been cultivated with oilseeds between 1996 and 2006 (Fig.1) show that the sun flower occupies the largest area, since the canola oil hadn't yet been paid attention for feeding, thus the efforts focused upon the sun-flower production; nevertheless, starting with 2007, the canola cultivated surfaces began to increase in number.

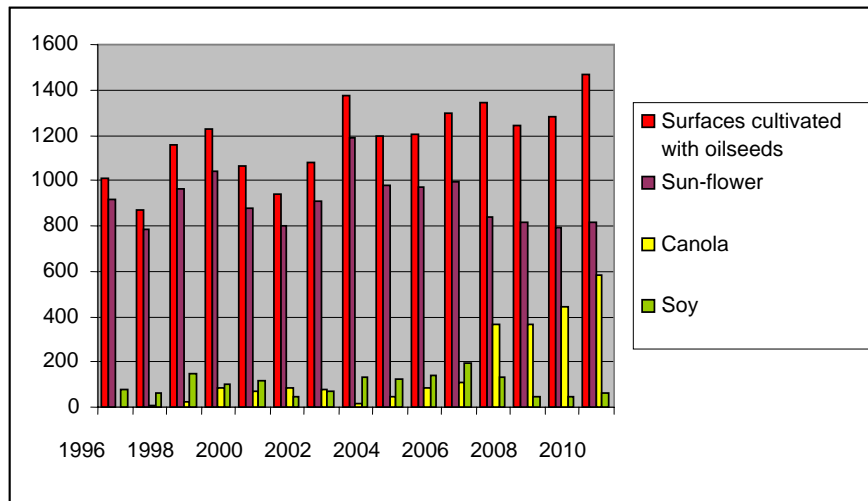


Fig.1. Dynamics of the oilseeds plants cultivated surfaces in Romania (source: MAPDR)

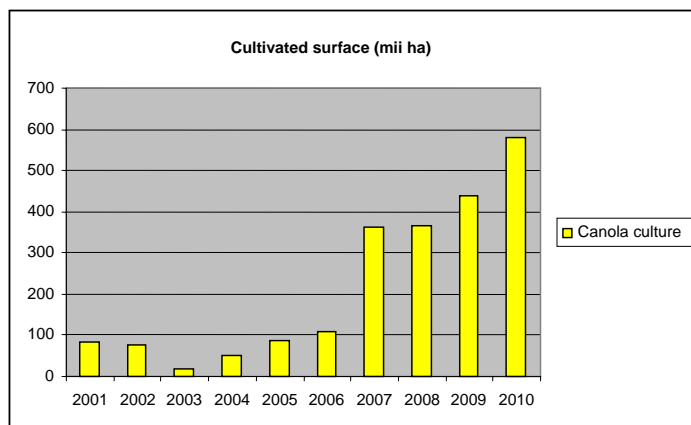


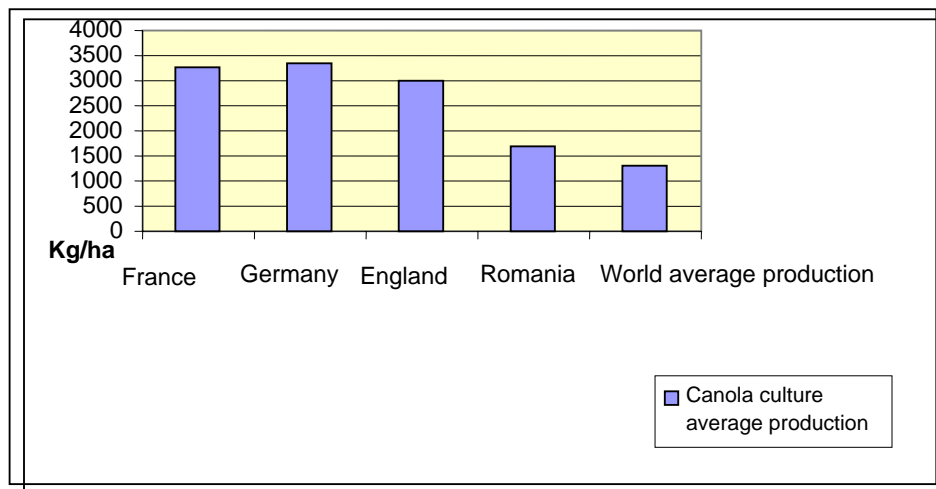
Fig.2. Dynamics of canola culture in Romania (source: INS)

The expansion of canola cultivated surfaces is due to the economic and agro technical advantages, to genetic and improvement research, which have created very valuable varieties, but also to development of technology for vegetable oil fuels production.

Romania produces each year over one million tons of oilseeds oil and, according to the statistics, only 250 000 – 300 000 tons of oil are used for food effect, which means that an important amount of oil could be used for the production of first generation biodiesel. (Guș, 2003).

The canola oil, used as biofuel, is superior as compared to the sun-flower oil, while as compared to diesel, it has a poorer content of carbon and hydrogen, it contains oxygen, which favors burning and it does not contain sulfur, thus reduces the pollution.

The average production of canola culture in the EU states is 3200 kg/ha, as compared to the world average production of 1300 kg/ha. In Romania, the average production is higher than the world average production (Fig.3), but it is lower than that of the main EU canola cultivating countries.

Canola culture average production**Fig.3. The average production of canola culture, at the global level and in Romania**

(source: Calculații pe baza datelor FAO)

Due to these considerations, the study of the way some technological factors influence canola production it is necessary, in order to set the action mode upon the quantity and quality of canola production.

1.2. The evolution of the climate conditions in the area of Turda

The periodical analysis of the climate factors' evolution is very important because the data from the specific literature draw attention upon the global warming phenomenon. The efficient use of the climate resources favors the growth of the agricultural production, without extra energetic consumption. This can happen through the correlation of the technological elements and the judicious zoning of the varieties and hybrids at ecological parameters of the zones to be cultivated.

Through the analysis of the temperature control in Turda, between 1978 and 2010 - as far as the evolution of the annual average temperature is concerned – there has been noticed a growth tendency, more obvious in the period of time between 2002 and 2010 (Fig. 4).

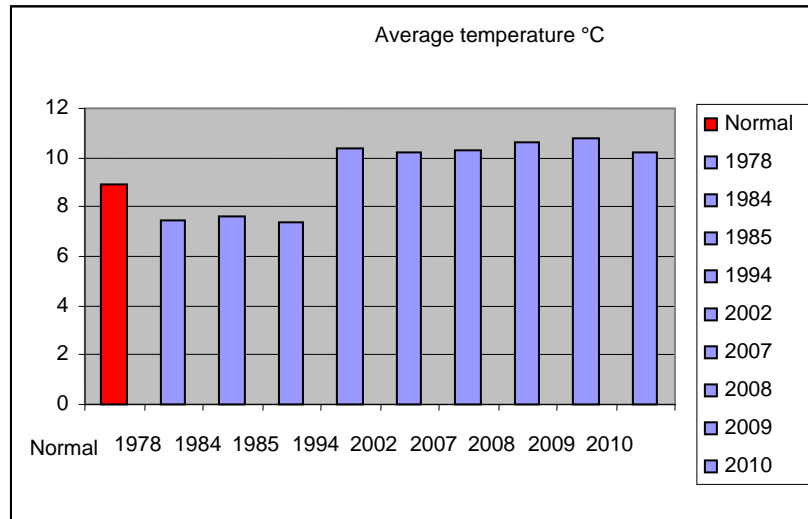


Fig.4. The evolution of the annual average temperatures in Turda, 1978 – 2010 (°C)
(Primary data source: Stația Meteorologică Turda)

The changes of the climate regime fit within the global context, but with customizations from the geographic region where our country is situated (Stanciu și col., 2007). The climate data highlight a progressive warming of the atmosphere and a significant reduction of the precipitation amounts. Monitoring the temperature values, as compared to the normal, a significant growth of the values can be seen, especially during summer time (Fig. 5).

In terms of rainfall, at national level, between 1901 and 2000, a general downward trend of the annual rainfall quantities was highlighted and after 1960 an enhanced rainfall deficit was also underlined, especially in the southern part of the country.

As for the rainfall evolution in Turda (Fig. 7), there has been noticed a high level of rainfall between 2006 and 2010, as compared to the average level, between 1960 and 1990, as an effect of the climate imbalances, determined by the global warming. At national level, the chaotic intervention to the forestry fund, the inappropriate administration of the arable land led to sudden modification of the

rainfall quantities, the drought periods being followed by excessive rainfall periods, extremely unfavorable to the agricultural cultures.

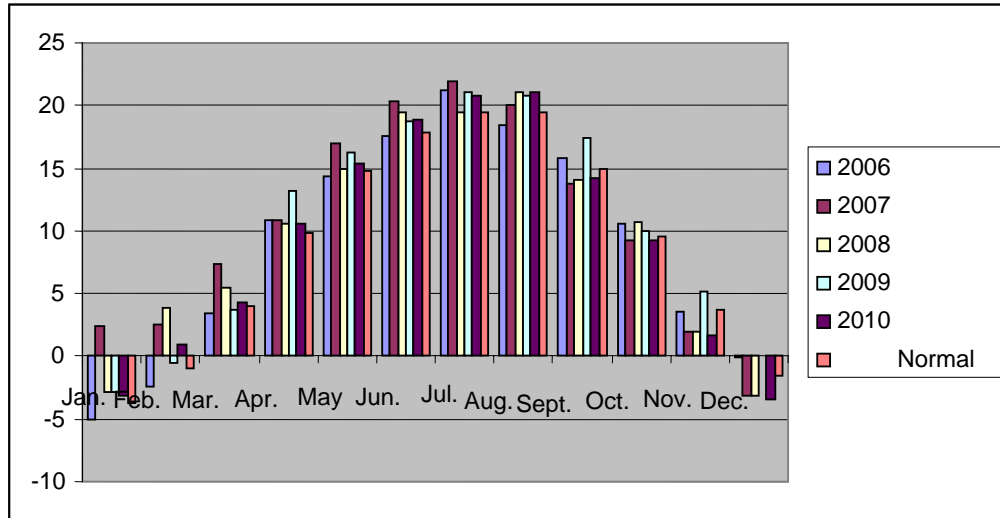


Fig.5. The evolution of the monthly average temperatures, under Turda area conditions, 2006-2010 (°C) (Primary data source: Stația Meteorologică Turda)

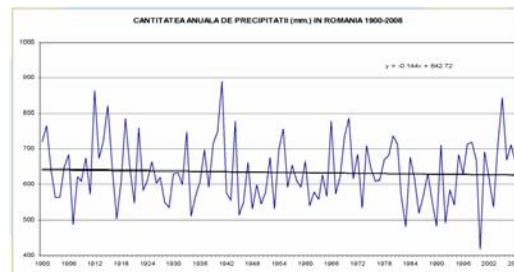


Fig. 6. The evolution of the annual rainfall quantities in Romania, in the 20th century (Stanciu și col., 2007)

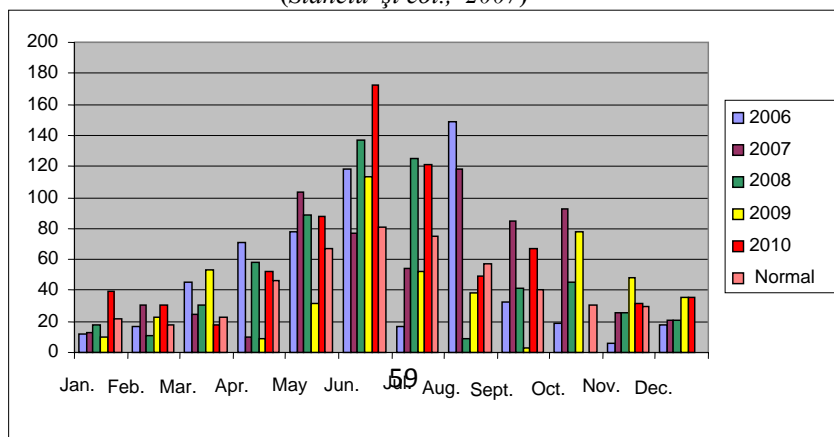


Fig.7. Rainfall quantities in Turda, 2006 - 2010

(Primary data source: Stația Meteorologică Turda)

During the analyzed period, the annual average temperature in Turda has increased by 0.5°C, a specific value nationwide and thus a significant warming has been noticed, seasonally speaking, especially during the winter and summer seasons.

CONCLUSIONS

The study of the climate evolution, nationwide, shows an increase of the average temperature, as a global warming effect, more pronounced during the period between 2001 and 2010. Following the comparative analysis of the climate evolution, 1978-2010, in Turda area, it has been noticed that the annual average temperature falls within the 0.5°C increase value, registered for Romania.

The global warming phenomenon has led to the increasing frequency of the extreme events, the fast alternation between abundant rainfall periods and flooding periods, severe heat and accentuated drought periods, causing major severe effects, at both economic and social level.

The analysis of the average canola production per hectare between 2001 and 2010 shows the fact that the highest values have been obtained during the years with high rainfall.

Knowing the ecological potential of the studied area, of the climate conditions, of the biotope characteristics, of the canola culture favorable and unfavorable factors, allows the achievement of a good agricultural production and the application of proper culture technologies.

In conclusion, the registered climate changes, as well as the future forecasts, require the conduction of judicious studies of the biological material which is due to be cultivated and of the technological factors, which are supposed to meet the requirements of the new climate conditions.

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