

**DRAUGHT IMPACT ON AGRICULTURE. CASE STUDY:
TELEORMAN COUNTY**

**IMPACTUL SECETEI ASUPRA AGRICULTURII. STUDIU DE
CAZ: JUDEȚUL TELEORMAN**

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Abstract: The paper aims at analyzing the draught effects on the agriculture in Teleorman county. The draught phenomenon was registered quite frequently during the last years in Teleorman county, triggering a series of negative effects on agriculture, such as considerable diminution of main agricultural crops production and decrease of the income of the big agricultural producers.

Key-words: draught, agriculture, Teleorman county

Cuvinte cheie: seceta, agricultura, judetul Teleorman

1. INTRODUCTION

In Teleorman county, the agriculture is an economic branch of utmost importance, with an old tradition, and the main activity for most part of the local population. The importance of agriculture as activity branch is the result of the agricultural potential of Teleorman county, with 499,844 hectares of agricultural fields, out of which 454,872 hectares are arable land (Teleorman Direction for Agriculture and Rural Development, 2008). Secondly, it is worth noticing the presence of the broad fields situated between the shallow valleys and fertile soils that together with the temperate-continental climate are the premises for important agricultural productions that meet the demands of the entire population within the county.

The agricultural production, unlike the industrial one, is highly insecure, greatly relying on the climatic conditions. From this point of view, Teleorman county presents a high climatic risk especially for the rainfall regime; consequently, both draughts and floods are frequent phenomena that affects the agricultural production.

For the last 10 years, draught had a major impact in the county, compared to floods, causing great material losses for the main agricultural productions.

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The studies of agriculture economy point out to the fact that the structural changes that took place after 1989 in Teleorman agriculture have triggered great changes in the crop structure. Consequently, the little peasant household became predominant with respect to the private ownership of the plot of land, being based mostly on auto consumption and to a lesser extent on the commerce of the products. This is why the agriculture became oriented mostly towards wheat and corn productions (Sima E., 2002, p. 8-9).

2. DRAUGHT IMPACT ON THE MAIN CROPS

At present, the cereals cultures, done predominantly by the private agricultural sector, are found on small areas, implying the minimum amount of money for ploughing and maintenance; hence, crops are not consistent, being directly influenced by the climatic conditions, and especially by draught. Consequently, the incomes of agricultural producers are in accordance with the low productivity, and the draught that extends from one year to another brings the impossibility for beginning the agricultural cycle.

The analysis of the data rendered in Table no. 1 and Fig. 1 indicates the following things: the wheat and rye production oscillated during the analyzed period between 5,373 kg/ha in 2006 (the most favorable year for wheat and rye during this period) and 719 kg/ha in 2003 (the draughty year for wheat during the analyzed period); the biggest production of barley and two-row barley was registered in 1989 – 5,337 kg/ha, while the lowest production was in 2003 – 967 kg/ha; the highest corn production was registered in 1982 – 5,049 kg/ha, while the lowest in 2000 – 355 kg/ha, this being the most draughty during the last 10 years; the production of sun-flower was the biggest in 1986 – 2,298 kg/ha, and the lowest in 1996 – 133 kg/ha, this year being the most unfavorable for this crop (Statistical Bureau, Teleorman County, 2008).

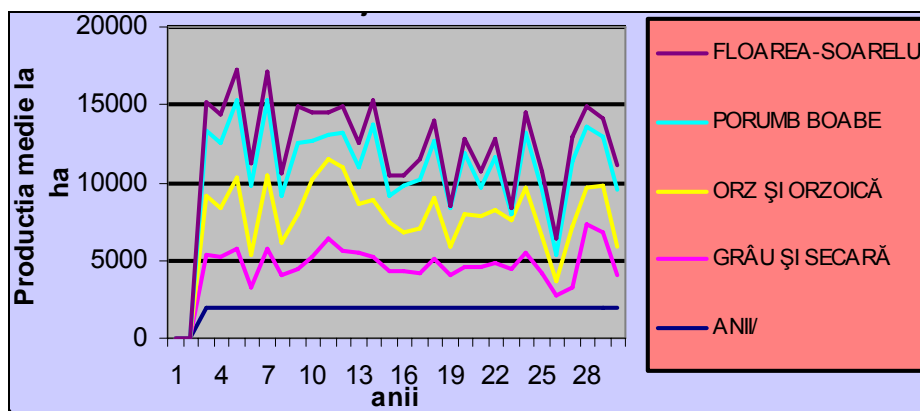


Fig. 1. The evolution of mean production per hectare for the main crops within Teleorman county

Table no. 1

Mean production per hectare (kg/ha) for the main crops within Teleorman county

Year	Wheat and rye	Barley and two-row barley	Corn beans	Sun-flower
1980	3,336	3,855	4,213	1,771
1981	3,215	3,223	4,160	1,741
1982	3,758	4,565	5,049	1,957
1983	1,306	2,027	4,489	1,483
1984	3,729	4,681	4,861	1,813
1985	2,076	2,089	2,978	1,398
1986	2,448	3,542	4,630	2,298
1987	3,295	4,972	2,421	1,864
1988	4,406	5,129	1,497	1,470
1989	3,670	5,337	2,216	1,651
1990	3,462	3,167	2,358	1,586
1991	3,295	3,624	4,755	1,602
1992	2,375	3,051	1,736	1,263
1993	2,305	2,524	3,030	647
1994	2,126	2,886	3,222	1,263
1995	3,120	3,943	3,637	1,244
1996	1,999	1,837	2,528	133
1997	2,568	3,401	3,900	974
1998	2,602	3,235	1,859	999
1999	2,871	3,316	3,471	1,150
2000	2,386	3,229	355	450
2001	3,510	4,139	3,502	1,414
2002	2,194	2,306	3,093	1,076
2003	719	967	1,662	1,001
2004	1,234	3,992	4,109	1,583
2005	5,373	2,351	3,848	1,345
2006	4,808	2,990	3,160	1,191
2007	2,072	1,810	3,695	1,542

Source: Statistical Bureau, Teleorman County, 2008

According to the data in table no. 1, the draughtiest years for the analysed years are 2000, 2003, and 2007, when there were registered the lowest productions per hectare. The reasons for such production, way too low for the potential of the agricultural land in Teleorman county are related to the unfavourable climatic changes during the last years: low quantity of precipitation in spring and prolonged draught during summer, the water deficit in the soil affecting the productions of cereals as well as other crops, small amounts of snow, correlated with the lack of necessary chemical fertilizers, as a result of their high price, as well as with the hail

that destroyed the cereal crops and other crops on thousands of hectares. There are also agricultural units that have so far productions of more than 4,000 kg of wheat and barley per hectare, because unlike most of the farmers and individual producers, the former strictly followed the specific technologies, ensured proper irrigation and administration of chemical fertilizers and treatments characteristic for each crop.

As a result of rainfalls that fall for several consecutive days during the summer of 2007, the high degree of moisture needed for wheat, exceeding 20%, the agricultural machineries could not begin the thrashing triggering a significant delay of the campaign for gathering wheat and rape. Apart from this delay, it is also worth mentioning the danger of the degradation of wheat fields due to the appearance of herbs among ears (Photo 1), especially on the lands where no herbicides were spread, on the one hand, and the overripping and fall of the wheat grains on the ground, due to high temperatures, which caused a significant diminution of wheat and rape production.

Farmers are ready to work at the maximum capacity of their machineries, using, as they say, 'every hour good for work', depending on the weather and ripping of wheat fields.



Photo 1. Wheat field with herbs near Saceni, Teleorman

In these conditions, the Teleorman farmers and individual producers add to the previous experience one more year: low productions of wheat, barley, two-row barley and rape per hectare, credits with extremely high interest offered by the banks, not to mention the extremely cheap price of wheat and barley offered by the processing companies, that do not cover the mere costs for the cereal production.

The mean annual temperatures registered at the 5 meteorological stations within Teleorman county during 30 years (Table no. 2), graphically presented in Fig. 2, point out to the evolution of this parameter during the analysed period.

Table no. 2

Mean temperature of the air (°C) – Annual means (1978-2007)

Year	Meteorological station				
	Alexandria	Roşiorii de Vede	Turnu-Măgurele	Videle	Zimnicea
1978	10.3	10.1	10.2	10	10.2
1979	11	10.9	12.2	10.7	10.8
1980	9.9	10	10.4	9.8	10.6
1981	11	10.9	11.4	10.8	11.6
1982	10.7	10.8	11.1	10.7	10.8
1983	11.1	11.2	11.7	11.3	11.4
1984	10.7	10.8	11.3	10.3	11.1
1985	10	10.1	10.6	9.8	10.5
1986	10.7	10.6	11.3	10.6	11.2
1987	10.4	10.2	11	10	11
1988	10.9	10.7	11.4	10.8	11.5
1989	11.7	17.8	11.9	11.7	12.2
1990	11.8	11.6	12	11.7	12.3
1991	10.2	10	10.8	10	10.7
1992	11.6	11.3	12	11.1	11.9
1993	10.8	10.5	11.1	10.5	11.3
1994	12.6	12.2	13	10.4	12.9
1995	10.9	10.6	11.4	11.1	11.4
1996	10.6	10.2	10.8	10.2	10.8
1997	10.3	10.6	10.6	9.9	10.5
1998	10.8	10.7	10.8	11.3	11.2
1999	10.8	11.6	11.9	11.7	12.1
2000	10.8	12.3	12.2	11.9	12.4
2001	10.9	11.7	11.6	10.8	11.3
2002	10.9	11.6	11.8	10.5	11.7
2003	10.9	11.1	11.4	11.4	11
2004	10.9	11	12.5	11.8	12
2005	10.9	10.7	11.2	10.6	11.1
2006	10.9	11.3	11.1	11.6	11.8
2007	10.9	12.7	12.3	12.6	12.8
Multiannual mean	10.8	11.1	11.4	10.8	11.4

The analysis of data in Table no. 2 and Fig. 2 indicates that the temperature oscillated between 9.8°C and 13°C during 1978 and 2007. In 1978, the air temperatures varied around 10°C, and in 1980 and 1985, the mean annual temperatures were below 10°C, while in other years (1981, 1982, 1983, 1988, 1989, 1990, 1992, 1993, 1995) they exceeded 11-12°C, reaching even 13°C in 1994

at Turnu-Magurele meteorological station. During the 2000-2007 period, the mean annual temperatures oscillated between 10 and 12°C.

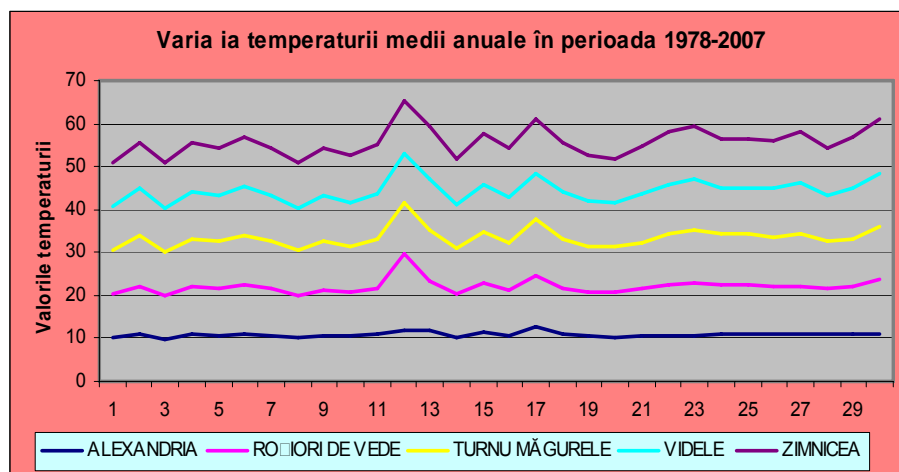


Fig. 2. Variation of mean annual temperature during the 1979-2007 period

Compared to these values, which give us a general background of the thermal potential, there are variations of the mean annual values, in this area, the hottest years being 2000 (12.4°C), 2004 (12.5°C), 2007 (12.8°C) and 1936 (12.2°C), while the coldest were 1942 (9.0°C) and 1980 (9.9°C). The mean multiannual temperature oscillates between 10.8 and 11.4°C (Table no. 2).

The mean annual quantities of rainfall oscillate between 300 and 550 mm, reaching 600 mm in the northern part of the county.

The data in Table 3 indicate that the highest annual quantities of rainfalls were registered in 1984, 1991 and 1997, while the lowest ones in 1985 and 1992.

The rainiest years during the 1978-1997 period were 1978, 1979, 1984, 1991, 1997, and the draughtiest were 1985, 1989, 1992.

The mean multiannual rainfall quantity at Alexandria meteorological station during the 1997-2006 reached 549 mm/year. Compared to the multi-annual mean, there may be variations of the rainfall quantity from one year to another.

During the draught years, the multiannual mean rainfall quantity may drop below 300 mm/year. Thus, in the year 2000, there were registered only 290.8 mm/year (Fig. 3). There were also some years when the mean annual rainfall quantity was double than the multiannual mean. This was the case in 1906 (843.5 mm) and 2005 (1061.1 mm).

For the 1997-2006 period, 2000 was the draughtiest year; it fell only 290.8 mm (the Archive of Pitesti Meteorological Service).

For the cereal crops, draught had a great impact on the wheat and corn fields, which are the main cereal plants related to the food safety of the population within the Teleorman county.

Table no. 3

Annual rainfall regime during the 1978-1997 period

Year	Meteorological station				
	Alexandria	Roşiori de Vede	Turnu Magurele	Videle	Zimnicea
1978	44.1	40.3	44.2	41.3	44.6
1979	54.8	47.5	50.8	57.4	51.4
1980	52.1	42.4	53.9	51	51.4
1981	47.7	43.5	42.3	45.3	38.8
1982	34.6	29.2	28.3	38.6	40.3
1983	39.1	35.3	35.6	35.7	42.5
1984	51	52.9	59	61.9	58.1
1985	28.7	31.3	25.9	27	33.7
1986	39.7	40.5	40.5	39.1	43.6
1987	46	46.6	46.2	48.1	46.7
1988	34.0	35.3	37.5	35.4	42.9
1989	34.2	35.2	31.6	27.8	36.2
1990	28.8	31.6	29.7	26.4	29.7
1991	51.5	42	54.1	60.8	51.6
1992	13.7	21.2	27.4	26.5	28.6
1993	36.5	28.6	35.3	34.9	33.8
1994	43.2	42.7	38.7	38.4	41.5
1995	50.9	47.4	44.7	30.7	48.7
1996	34.6	39.9	38.9	40.2	42.7
1997	53.2	44.8	45.2	58.3	62

Source: Archive of Pitesti Meteorological Service

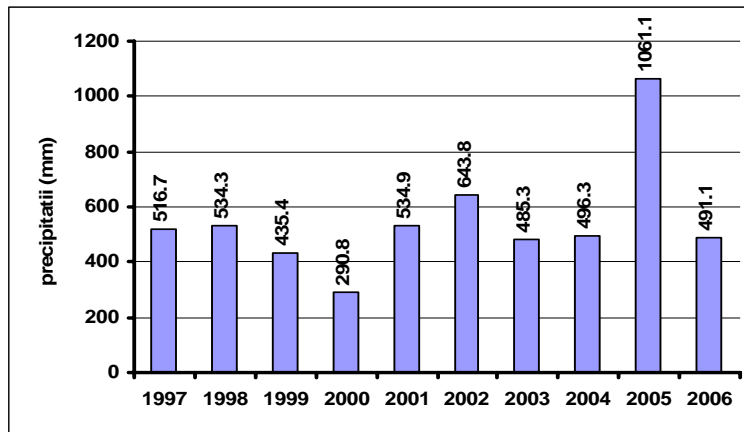


Fig. 3. Mean multiannual precipitations (mm/year). Alexandria meteorological station (1997-2006)

Since draught may appear in various periods during the year, and since the two crops have different vegetation cycles and water necessities, this extreme meteorological phenomenon may affect, during a year, only the wheat crops, or only the corn crop. Exceptionally, both crops may be compromised, as it happened in 2000, when draught extended over a longer period.

The draught from 2000 affected approximately 200-300 hectares, in 2001, the losses caused by the excessive and prolonged draught mounting to 1,000 bln lei (Statistical Bureau of Teleorman County, 2008). Regarding the vegetal production, cereal production decreased with almost 30% compared to the one in 1999 because of draught. This phenomenon was registered, with various intensities, from 2001 to 2003 and more recently 2007 (Statistical bureau of Teleorman County, 2008). In many settlements affected by draught from the Teleorman county, where more than 50 per cent of the wheat production was compromised, the harvesting operations were cancelled for some areas, because it would have cost more than the value of the crop itself. In other cases, the wheat dried by the draught was used as fodder for animals.

The losses that the small producers had for each hectare compromised by draught totalled in 2003 almost 6 mil lei/hectare, in case the minimum technology was used and up to 12 mil lei/hectare for larger farms, when the entire technological process was applied (Direction for Agriculture and Rural Development, Teleorman, 2008). Thus, there appears the situation in which, no matter the selling price for cereals, most of the peasants cannot cover the production costs and consequently, they cannot resume the agricultural cycle. Thus, a vicious circle is formed, when 'poverty brings poverty' and 'the Romanian village does not make the transition towards the market economy, but deepens its routes into subsistence'(Berca M., 2000, p. 9).

In the present century, the year 2007 may be considered as an extremely dry year (Photo 2), both as a result of the intensity of water deficit in the soil, and the length of the deficit periods and the large areas affected by soil draught (extreme, strong and moderate) on vast agricultural fields within the entire county.



Photo 2. Corn crop destroyed by draught in Zambreasca settlement, Teleorman county, 2007

‘The complex agricultural draught (atmosphere and soil) that began from the first decade of the month of May (Photo 3) and which lasted throughout the summer, affecting mostly the hoeing cultures that were not irrigated was characteristic for this year. This year, more specific during the interval September, the 1st, 2006 – July, the 31st 2007, the pluviometric regime was critical in almost the entire country, which brings to the character of excessively draughty year’ (Mateescu E., 2007, p. 2).



Photo 3. Field affected by draught in the month of May - Siliştea Gumeşti, Teleorman county, 2007

The president of the Agricultural and Forestry Science, Gh. Ionescu Sisesti and the academician Cristian Hera launched warning signals to the Agriculture Ministry: ‘Unfortunately, in almost all the areas of the country, the agricultural crops are affected by draught... the situation in the country determines us to urge the Agriculture Ministry to declare the emergency situation’ (Marinescu G., 2007, p. 7).

Unfortunately, not only draught affected the Teleorman farmers, but also the prices on the cereal market that do not cover the mere production costs, since so far, nobody was interested to create a wheat exchange market in Romania that should be correlated to the other exchange markets in the world, so that to eliminate the discrepancies during the last years, when the price of the wheat tone differed by dozens EUR or US\$. For instance, in 2008, at Paris cereal exchange market, the wheat price was 168.5 €/tone, meaning 0.713 lei/kg, while in Romania the price for a kilogram varied between 0.3 and 0.45 lei (Mateescu E., 2007, p. 4). This means that for every tone, the Romanian producer in general and the one from Teleorman county in particular, lost almost 60 €. And if we consider the fact that the average wheat production in Teleorman was around 3,300 kg/hectare, it means that only from the price the farmers lost 196 €, which is almost four times higher than the area subsidy given by the European Union.

Taking into consideration the way things go right now, it appears that this year too the Romanian farmers will not have a better fate, the chronic decapitalization that appeared years ago growing stronger. And if the acquisition price for wheat is the lowest in the European Union, the price for 1,000 cubic meters of water, where irrigations are possible, exceeds the value of the production evaluated at the market price. Not to mention the prices for chemical fertilizers, diesel and other inputs. In this way, we can say that draught, hail and prices considerably limit the agricultural productions; in the future, there is the risk that farmers in Teleorman will not be able anymore to set up new crops.

3. CONCLUSIONS

Analyzing the above-mentioned aspects, we can say that Teleorman county faced a series of draughty periods (especially during the last year), that caused numerous losses to farmers, as well as low production of crops (such as wheat, corn and sun-flower).

The draught is representative for Teleorman county (especially the years 2000 2007); that is why there is an urgent need for measures to prevent and cope with the draught (re-establishment of the irrigation systems that were mostly destroyed) in order to diminish the costs.

The losses caused by draught were rather significant in Teleorman county, the cereal crops being the most affected ones.

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