THE WATER SHORTAGE IN THE SOIL AND ITS INFLUENCE UPON THE CULTIVATED PLANTS

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Key words: drought, period, cultivated plants, Barlad.

INTRODUCTION

Cultivated plants need special climatic conditions in order to develop and, implicitly, in order to offer a more substantial and qualitative crop.

The environmental factors that influence the culture of the plants are: the water, the soil, the air, the nutritive substances, but also some other factors that have an important effect upon the plants and which are represented by: the relief, the wind, the animals, other plants, and, of course, the anthropic factors.

Light represents one of the environmental factors that are indispensable to all plants, in its presence being possible the process of photosynthesis.

The oxygen from the air is necessary to the plants' breath, and water is undoubtedly the one that maintains life, having an active participation to all the vital processes of the plant and adjusting the body temperature. It also stands for the developmental environment of the nutritive substances, conferring to the cells and to the plants' texture the so called turgescence.

There have been numerous researches during the last few years in what concerns the influence of these environmental factors upon plants and it was proved that the excess, as well as the deficit of one or another of these elements spoils the plant' s existence, the plant manifesting different symptoms that strengthen in time. The most frequent of all these are: the slowing down or the cease of growing; the yellow coloring and falling of the leaves; the spinning and drying of the leaves; the blossoms' falling; the flowers' falling before being withered.

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Of course, researchers have described minutely in diploma papers or in other special work those factors, which have, in the same measure, a distinct impact upon the growing and development of plants, especially when they act simultaneously.

In this paper it is taken into consideration the quantity of water from the soil and the influence of the water shortage upon the plants in Barlad area, component of Vaslui district.

Water's role

The photosynthesis phenomenon has been clarified and described in chemical terms since 1804 by the chemist Saussure. He was the one who also observed and proved that plants cannot live either in the absence of CO2 or in the absence of O2, and he underlined the importance of water in the process of photosynthesis, a role which had been ignored by other researchers.

Even though water has an active place in photosynthesis, it does not represent a limiting factor for the latter, not even when being in reduced quantities. Its role is that of an important participant in keeping a high water potential in the protoplasm. In this respect, all the metabolic processes depend on the quantity of water from the textures. A shortage of water from the assimilating textures affects directly the photosynthesis process, provoking its inhibition. Due to the fact that the main reason for the loss of turgescence is represented by the stomata's closing, the gas exchange that takes place in the photosynthesis is burdened. As long as there is a deficit of water, the plant is not capable of serving itself with the necessary quantity, so the leaves start to dry, starting from the edges.

Each agricultural year, in the spring, the cultivators ask themselves many questions: which seems to be the situation of the culture (especially the wheat culture - Triticum aestivum), which

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seem to be the humidity supplies, what kind of harvest could be obtained at a lower level of humidity, as well as what procedures must be put into action in order to obtain the maximum profit. Specialists in the agricultural domain, biologists or meteorologists, can correlate data obtained through exact measurements with the help of different machines, and, using these data, they can give clues with regard to the type of culture that is appropriate for a certain area, as well as to the measures of fighting drought during a crisis.

MATERIALS AND METHODS

During the last few decades, at international scale, the most numerous researches in the hydrological domain showed strong connections with the elaboration and the practicality of some mathematic norms having various purposes. They were concerned especially with the water resources management, due to the fact that we face, like many other countries, the global warmth and its effect-the drought.

Mathematic calculi of the soil's water content allowed a great difference among theory and practice. Some researchers proposed an agro-meteorological project that shall realize equilibrium between the physical description and the operational application, that is, a way of combining the standard meteorological data (temperature, relative air humidity, wind's speed and direction), simple topographical characteristics of the mentioned area (slope, height, hill' s length and shape) and the culture's characteristics. On the ground of this example it can be made a difference between the soil's humidity at a hydrological basin scale, anticipating this way the development of water content for a certain depth.

In the terms of a restrictive economy, at the level of Barlad (the area that the data are reported to), there had been used the following tools for measuring the air's temperature and humidity:

- Direct reading thermometer- the reading is being effectuated every hour;
- Maximum temperature thermometer- the reading is being effectuated at every six hours;
- Minimum temperature thermometer- the reading is being effectuated at every six hours.

The machine that had been used for recording was a thermograph.

The humidity had been measured with the help of a pluviometer, the machine for recording being the pluviograph.

As a research area there were taken into consideration the areas around Barlad, an Eastern town, having a temperate climate with a strong continental characteristic.

RESULTS AND DISCUSSIONS

In the present paper there had been inserted data regarding only the relative temperature and humidity of the air, data belonging to the years 1941-2006, from the Barlad area, in order to underline the years when the temperatures were more advanced. These years stood for periods when the number of tropical days (temperatures over 30C) was greater, coinciding with the highest drought moments from this temporal distance.

Table 1. The air temperature\Monthly averages and the multi-annual average - 1941-2006

Anul	I	II	II	IV	V	VI	VII	VII	IX	X	XI	XII	Media
1941	-7.1	0.5	4.0	11.7	14.1	17.9	20.7	23.3	13.2	8.3	0.7	-1.5	8.6
1942	-11.5	-3.6	-0.9	7.9	16.6	19.5	20.9	20.8	17.0	10.8	0.8	-2.6	8.6
1943	-7.2	-0.8	2.9	11.7	14.2	18.5	20.0	21.3	16.9	11.0	6.1	0.6	9.6
1944	-1.5	-0.5	4.1	10.8	11.5	19.6	21.4	22.3	17.5	12.3	6.1	1.2	10.3
1945	-4.6	-2.6	4.1	8.9	16.3	20.3	20.5	21.9	17.4	9.6	3.8	-2.5	9.6
1946	-4.3	0.4	4.5	11.6	18.5	22.9	24.5	25.5	19.3	6.7	4.3	-4.2	10.8
1947	-9.5	-3.4	6.9	13.0	17.4	20.8	22.4	20.0	16.6	6.7	4.5	1.7	9.8
1948	3.2	-1.1	6.9	12.2	16.0	19.3	20.0	21.2	15.7	10.9	2.7	-6.4	10.1
1949	-0.2	0.2	1.3	9.9	18.6	17.7	20.8	19.3	15.5	8.4	6.4	3.2	10.1
1950	-7.7	0.4	3.9	13.8	17.7	19.7	23.0	23.6	17.8	9.5	5.2	3.3	10.6
1951	-1.3	-0.2	6.1	12.2	16.8	20.8	22.5	23.2	17.7	6.7	7.5	0.4	11.0
1952	1.2	0.1	-0.8	12.2	14.5	18.9	21.8	23.5	19.1	12.1	4.3	0.3	10.6
1953	-3.1	-2.6	2.8	9.7	14.4	21.6	23.1	21.5	17.2	10.4	0.1	-2.3	9.4

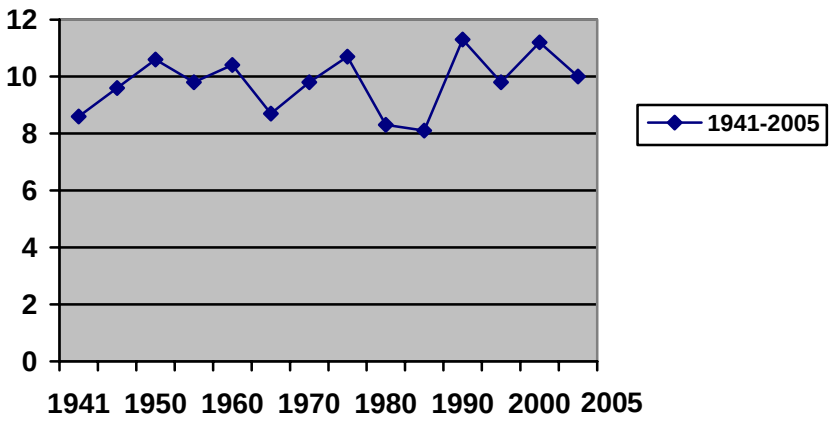
1954	-9.9	-10.7	2.7	7.9	16.4	22.4	22.5	22.7	18.7	10.6	4.1	1.8	9.1
1955	-1.4	-0.3	2.7	7.3	15,7	19.3	21.4	19.8	17.0	12.1	3.4	1.4	9.8
1956	-1.0	-9.2	1.08	10.9	15.1	19.4	20.9	21.3	18.2	10.6	0.0	-0.5	8.5
1957	-2.4-	2.8	3.7	10.6	14.9	21.1	23.2	21.4	16.8	9.3	5.3	-4.3	10.2
1958	-2.0	3.4	2.0	8.2	20.1	18.5	21.5	21.5	15.0	10.3	5.2	1.9	10.5
1959	-2.1	-1.3	4.6	9.7	14.9	18.6	23.5	20.4	13.9	8.0	3.5	0.8	9.5
1960	0.4	0.8	2.5	10.1	14.8	20.0	21.5	20.0	14.9	14.0	9.2	4.7	10.4
1961	-2.8	0.6	6.6	12.9	14.3	20.6	20.8	20.6	15.6	9.9	6.4	-1.9	10.3
1962	-2.2	-2.0	1.4	11.4	16.6	18.9	20.5	22.6	16.4	11.1	7.6	-3.0	9.9
1963	10.4	-2.8	0.2	8.7	17.6	19.8	22.3	22.3	18.0	11.0	7.8	-4.6	9.2
1964	-6.3	-2.8	0.5	10.3	14.0	22.0	21.0	19.4	15.5	11.7	4.8	1.2	9.3
1965	-1.7	-4.6	2.9	5.8	14.6	19.2	20.5	18.9	17.5	9.2	1.6	0.8	8.7
1966	-3.6	2.8	4.6	12.1	15.7	16.9	21.5	20.5	15.7	14.2	4.4	-1.2	10.3
1967	-6.4	-2.7	4.0	10.2	14.6	18.6	21.5	21.0	18.0	12.8	5.4	-1.5	9.7
1968	-4.1	0.2	2.9	13.1	18.2	20.4	19.6	19.1	18.2	9.7	5.4	-2.1	9.9
1969	-7.4	-4.2	-2.2	8.6	17.2	18.6	19.0	20.8	15.8	9.7	5.8	-2.1	8.6
1970	-1.8	-1.4	4.0	11.5	13.7	18.4	22.0	19.5	16.3	8.6	6.2	1.0	9.8
1971	-0.1	0.3	2.2	10.0	17.0	19.2	19-5,	20.8	13.9	9.0	4.7	2.5	9.9
1972	-5.5	-0.9	3.9	13.0	16.2	20.1	22.0	2021	14.5	8.0	5.6	0.6	9.8
1973	-3.2	1.7	1.3	11.3	15.6	18.8	21.0	19.0	16.4	10.0	2.7	-1.2	9.4
1974	-3.7	1.7	4.3	8.0	14.7	18.4	19.4	20.7	16.4	12.1	3.8	1.8	9.8
1975	1.2	-0.9	6.8	11.2	17.3	20.0	21.3	20.6	18.7	10.4	2.1	8.9	10.7
1976	-2.2	-6.8	1.8	10.8	14.8	17.4	20.1	16.8	15.0	8.2	5.5	9.8	8.5
1977	-2.5	3.2	4.6	8.8	15.4	18.3	20.9	19.6	14.2	9.2	6.9	-2.6	9.7
1978	-2.8	-3.0	4.8	9.4	13.7	18.7	19.6	18.9	14.8	10.2	3.9	-1.7	8.9
1979	-3.4	-1.8	5.8	9.5	17.3	21.5	18.9	19.5	16.7	7.4	4.6	2.0	9.8
1980	-5.7	-1.9	0.4	8.5	13.2	17.9	20.2	18.8	14.6	11.0	2.7	-0.2	8.3
1981	-3.6	-0.6	4.7	7.5	14.5	12.8	20.1	19.7	15.6	12.3	2.2	0.7	9.5
1982	-3.5	-3.4	2.8	8.2	17.0	19.3	19.5	20.5	16.1	10.6	3.9	3.1	9.7
1983	1.2	-0.4	5.6	12.4	17.8	19.0	21.1	19.3	17.2	10.2	1.2	-1.9	10.2
1984	0.7	-2.5	1.7	8.5	15.6	17.7	18.4	18.3	17.6	13.0	2.8	-1.6	9.2
1985	-8.2	-9.9	-0.3	11.3	17.9	17.9	20.0	21.1	15.2	9.2	2.9	0.4	8.1
1986	-0.9	-5.0	2.5	12.4	17.5	19.9	20.5	22.9	17.6	9.0	3.8	-2.7	9.8
1987	-7.5	-2.4	-1.7	7.8	14.9	20.9	23.6	18.7	17.8	9.2	5.9	-1.3	8.8
1988	-0.8	-1.6	3.9	8.2	15.7	18.8	22.7	21.3	16.2	8.5	-1.1	-1.1	9.2
1989	0.6	3.5	7.2	12.6	15.5	18.0	20.8	21.4	14.9	10.8	3.0	1.1	10.8
1990	-1.2	4.1	8.8	10.4	16.0	19.7	21.8	21.6	15.7	10.8	7.6	0.5	11.3
1991	-0,3	-2.9	3.6	9.6	13.1	18.8	21.5	19.7	15.9	10.1	5.0	-2.4	9.3
1992	-2.2	-0.4	4.8	10.1	14.4	18.9	21.5	24.5	15.0J	10.8	5.3	-1.7	10.1
1993	-0.6	-2.2	0.8	8.7	16.7	19.0	20.1	20.6	15.7	11.7	-2.5	1.0	9.1
1994	2.0	-0.3	6.3	12.2	17.2	19.8	23,3	22.4	20.6	10.3	3.7	-0.8	11.4
1995	-3.1	3.8	4.6	10.3	14.5	20.7	23.5	21.3	15.5	10.3	0.1	-4.2	9.8
1996	-5.4	-4.6	-1.9	9.2	19.1	20.9	21.1	19.9	12.8	10.2	7.7	-1.9	8.9
1997	-4.2	-0.3	3.7	6.4	17.5	20.0	21.1	19.5	13.5	8.3	4.8	-1.4	9.1
1998	-0.6	2.3	2.6	13.3	15.0	21.0	22.1	21.1	15.5	10.4	1.1	-5.7	9.8
1999	-1.4	0.6	5.5	11.4	14.5	21.6	23.2	21.1	17.5	10.4	6.6	1.0	10.8
2000	-4.2	1.3	4.5	13.5	17.5	20.5	22.5	22.7	16.0	10.5	6.7	2.1	11.2
2001	-0.2	1.0	6.7	10.8	15.7	18.6	24.2	23.3	16.6	12.4	6.1	-6.1	10.5
2002	-2.3	5.0	6.7	9.8	17.9	20.1	23.3	20.6	16.0	9.9	6.7	-6.6	10.6
2003	-2.9	5.4	0.9	8.9	20.1	21.2	21.2	22.4	15.2	9.0	5.8	-0.4	9.7
2004	-4.3	-0.2	5.5	10.7	15.3	19.5	21.5	20.5	5.8	11.6	5.5	1.7	10.3
2005	0.3	-2.6	3.1	9.9	16.0	18.2	21.6	20.7	17.1	10.4	3.9	0.9	10.0
2006	-6.2	-1.6	2.9	10.9	15.3	19.5	21.4	21.3	16.9	11.7	6.4	1.8	10.0

The continental characteristic with excessive nuances of Barlad climate is given by the absolute maximum height, which has the value of 70.2C.

Other maximum values: 39.3C- 1946, 39.2C- 2000; minimum values: -28.5C- 1954.

Temperatures over 0C happen to delay even after the 1st of March, while their regressing under 0C takes place in the first decade of December.

There have existed situations when the winter months had a maximum temperature of over 10C, just like it happened in January 1993= 15.4C; December 1989=18C; February 1990= 21.0C.



Graphic 1. The temperature average (1941-2005)

Another environmental factor that influences the growth and development of plants is represented by water. For the period 1941-2006, the annual average of atmospheric precipitations has the value of 492.2mm\ mp, moderate value.

The relative humidity has an average value of 78%. The annual regime of relative humidity presents a maximum value in December (88%) and a minimum value in May (70%). Starting from January, the values of the relative humidity decrease until May and they start to increase in the summer period. A great relative humidity is due to the evapo-perspiration and to the abounding precipitations that take place during this period.

In the extremely hot days the humidity value decreases frequently, lower than 30% and even lower than 20%.

The relative humidity is in a counter- proportional ratio with the temperature.

Table 2. Relative humidity %

Luna	I	II	III	IV	V	VI	VII	VIII	IX	X	XI .	XII	Media
Valoare	87	84	79	74	70	74	75	72	76	79	85	88	78

When the air humidity touches the saturation level, there frequently appears fog or foggy air.

Analyzing the data from the former table, it is proved that there had been high temperatures in the period 1940-1945, having maximums of 40C, a fact that led to a period of excessive drought, especially if we take into consideration the lack of precipitations.

Table 3. Atmospheric precipitations\Monthly quantities and the multi-annually average-mm 1941-2006

Anul	I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII	Total
1941	24.2	35.7	18.1	40.4	53.7	120.4	88.7	39.8	97.4	65.9	47.0	12.5	643.8
1942	34.6	25.0	0.5	44.0	38.3	108.6	18.2	17.8	16.6	54.4	85.3	2.5	445.8
1943	28.8	22.0	2.1	13.03	45.6	23.5	122.8	15.2	65.1	13.9	29.4	143.3	424.6
1944	9.4	58.4	31.0	44.2	56.4	19.9	31.6	22.3	0.0	85.2	23.3.	7.5	389.2
1945	47.0	4.8	3.3	48.0	24.8	16.6	29.8	23.8	0.6	40.6	8.5	12..1	259.8
1946	1.6	5.6	3.4	28.0	33.2	49.5	11.1	4.1	14.6	74.8	29.4	65.7	321.0
1947	43.1	25.5	15.6	5.2	26.9	123.1	62.4	61.7	17.0	24.5	71.6	34.0	502.2
1948	41.8	2.2	19.9	0.7	82.6	85.0	103.6	21.7	15.0 J	5.3	1.6	1.5	380.9
1949	7.8	6.7	22.9	11.2	22.6	129.5	81.31	60.2	19.9 1	0.8	54.2	27.5	444.6

1950	8.9	0.7	30.6	32.6	16.6	39.2	33.1	31.7	5.3	30.5	14.0	30.0	297.2
1951	8.5	10.1	26.8	40.5	24.2	28.6	23.9	63.3	22.9	17.1	10.8	5.7	282.4
1952	15.7	59.2	27.9	4.9	47.1	131.0	21.8	25.5	3.1	56.4	72.5	49.3	514.4
1953	44.6	80.3	2.8	34.2	61.7	63.8	17.9	30.6	2.6	2.4	3.5	16.0	360.4
1954	20.2	46.1	3.1	19.9	60.8	34.2	42.6	23.6	37.4	19.2	61.7	17.2	386.0
1955	17.5	24.8	28.2	66.4	91.2	24.4	119.9	40.9	65.9	6.8	29.0	18.7	533.7
1956	20.3	50.2	32.7	34.4	40.4	142.1	21.3	63.7	59.4	13.2	11.9	48.4	538.0
1957	21.5	5.2	0.8	33.7	76.6	36.6	16.5	73.1	47.3	19.8	53.9	24.8	409.8
1958	30.6	26.4	21.8	135.6	3.1	171.2	35.8	27.7	71.8	31.6	101.9	3.2	659.9
1959	42.6	6.3	7.9	2.8	74.9	122.0	45.7	75.0	73.4	8.1	57.0	25.0	540.6
1960	27.0	19.2	3.5	15.6	76.0	72,4	4.3	6.2	44.8	31.2	95.5	53.6	449.3
1961	56.2	13.3	8.7	103.9	88.6	75.5	50.1	42.7	0.0	12.2	133. 3	34.7	519.2
1962	15.2	39.3	62.8	50.4	31.8	73.6	66.1	29.2	30.1	1.3	82.7	19.9	502.4
1963	50,5	31.0	38.8	25.9	9231	60.8	115.3	50.6	4.51	0.9	1.2	60.9	532.7
1964	7.1	13.4	43.1	25.9	20.3	100.3	65.0	43.0	119.0	43.3	44.1	40.8	565.3
1965	48.1	27.3	19.5	45.5	66.8	120.2	45.6	11.3	29.3	13.6	30.8	46.1	504.1
1966	129.3	34.9	65.7	27.5	54.8	118.3	76.9	74.5	18.1	45.3	102.9	22.7	77.09
1967	27.3	44.6	17.4	45.8	44.6	81.8	28.0	9.4	13.8	25.2	18.5	31.5	388.1
1968	53.7	26.0	34.4	3.0	48.9	106.7	153.2	141.0	105.8	28.0	58.6	31.5	790.8
1969	64.0	89.5	41.9	48.1	22.1	82.1	136.8	36.6	22.2	3.9	15.9	98.6	661.7
1970	35.5	56.3	25.8	45.9	147.3	41.2	63.9	96.5	12.4	10.5	15.2	31.1	581.6
1971	15.1	26.0	49.5	13.8	93.3	89.6	125.0	6.7	114.1	10.9	17.0	33.4	594.4
1972	11.2	14.9	9.7	31.0	84.3	138.9	43.5	143.3	123.1	144.1	27.2	7.7	778.9
1973	21.7	45.7	76.3	29.7	50.1	19.8	102.7	66.5	5.4	6.5	8.4	16.2	448.8
1974	8.9	16.4	11.9	27.5	68.7	61.4	150.9	48.0	86.8	36.8	32.3	16.6	566.2
1975	16.9	12.1	7.6	54.3	82.8	66.7	127.5	12.8	2.6	81.3	45.1	1.0	510.7
1976	37.1	9.6	14.0	57.6	38.2	46.5	23.1	1:10.9	79.5	22.3	48.3	48.8	535.9
1977	28.9	37.9	12.2	59.3	42.8	98.7	16.6	91.8	15.5	78.3	16.6	11.8	450.4
1978	4.4	52.0	53.8	93.2	95.5	101.9	103.5	57.6 .	43.7	15.9	15.5	13.2	650.2
1979	48.2	24.7	16.9	68.5	68.9	71.9	87.0	31.0	32.9	15.6	72.4	14.8	552.8
1980	17,7	5.1	44.0	62.7	78.9	93.4	99.1	25.2	2L2J	30.7	69.2	70.8	618.0
1981	27.9	18.0	28.7	46.8	85.4	77.2	20.3	27.1	69.1,	37.0	61.2	19.7	518.4
1982	4.8	26.0	37.6	28.4	23.2	69.5	66.5	65.1	6.6	29.9	10.0	45.5	414.0
1983	5.2	10.7	1.9	21.8	38.2	54.1	65,5	76.8	3.5	13.9	23.8	14.9	329.5
1984	36.9	55.1	54.9	95.0	61.7	76.9	61.6	23.1	20.4	13.2	29.0	39.2	566.7
1985	35.3	23.1	2.0	20.1	14.7	134.5	29.4	38.5	33.5	2.9	29.6	5.1	368.8
1986	25.6	56.9	6.2	7.0	4.5	77.3	52.1	7.1	5.1	25.7	3.7	8.2	279.4
1987	18.8	4.5	7.3	25.1	17.2	51.2	60.6	79.7	27.5	36.2	44.8	24.3	388.2
1988	24.5	19.6	58.0	62.4	93.6	93.2	43.2	12.1	65.3	26.6	10.5	37.0	546.9
1989	2.9	8.4	11.0	21.0	36.0	114.9	35.1	91.7	104.9	36.7	10.8	1.6	475.0
1990	8.3	16.6	1.0	50.3	59.1	19.6	47.1	18.5	20.0	28.8	0.6	53.9	323.7
1991	6.0	16.7	5.7	54.3	146.4	161.6	97.7	113.7	19.8	68.1	7.8	12.3	710.1
1992	1.0	16.5	61.9	16.9	42.7	100.9	17.8	29.3	49.01	90.5	10.0	16.7	443.2
1993	2.8	36.9	57.7	68.3	70.0	68.4	47.6	15.1	37.3	20.1	53.2	24.7	503.0
1994	9.6	9.7	2.6	22.7	24.3	42.3	35.6	42.6	0.5	39.7	9.2	31.6	270.4
1995	25.8	8.4	31.7	19.2	69.7	74.6	38.2	50.8	93.71	5.0	36.3	28.7	482.1
1996	26.6	24.7	25.3	48.9	37.3	74.3	41.4	87.7	110.0	15.9	54.9	41.9	588.9
1997	6.9	10.6	15.2	51.4	41.5	64.7	82.0	135.2	23.6	61.9	38.3	83.1	614.4
1998	25.8	6.8	22.5	59.5	60.2	40.1	73.8	60.5	43.2	104.8	48.1	7.4	552.7
1999	17.8	18.8	21.4	55.1	32.8	134.0	41.1	52.2	39.2	39.5	18.2	36.4	506.3
2000	16.5	20.5	67.4	23.9	1.9	15.9	50.3	33.2	65.7	2.4	50.8	14.7	323.2
2001	9.4	16.7	24.1	24.2	38.2	66.9	52.4	7.8	64.9	9.0	23.8	15.5	382.9
2002	2.0	1.4	41.8	37.7	6.2	91.5	140.9	98.1	15.5	74.7	59.3	7.0	632.1
2003	42.3	14.5	8.3	21.9	51.3	17.3	90.8	34.2	57.3	56.2	6.2	10.7	411.0
2004	33.9	28.0	32.1	78.1	37.0	22.5	110.5	103.7	45.1	9.9	38.2	8.5	548.0
2005	14.6	35.1	17.7	38.0	106.7	77.1	93.4	63.3	5.5	13.8	52.0	28.4	545.9
2006	34.1	9.1	28.6	34.8	69.6	60.8	59.6	110.4	23.3	10.3	5.1	10.0	455.7
Media	24.7	25.0	24.2	39.8	54.2	78.7	61.3	48.6	46.3	31.5	36.3	27.8	492.2

The average pluviometric regime show annually that the greatest quantity of precipitation falls in June-78.8 mm, and the lowest falls in March- 24.2 mm.

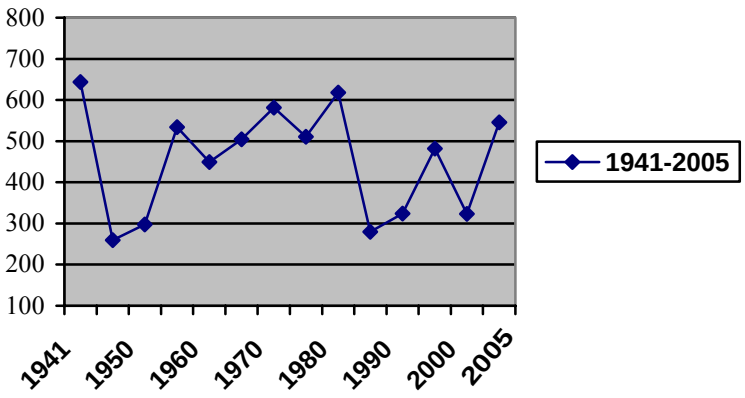
In the interval May- August there is a record of 49 % of the whole quantity of precipitations in a year time, and in the period December- February there is a record of 17%. The greatest quantity of precipitations had been recorded in 1968 and was represented by a score of 790.8 mm, and the lowest was in 1945, represented by 259.8 mm.

The greatest quantity of precipitations that has ever fallen during a month was represented by 171.2 mm, recorded in June 1958, and the lowest was of 0.0 mm in the months of September 1944 and September 1961.

The continental characteristic with excessive nuances of Barlad's climate is emphasized by the big discrepancies between the same quantities of precipitations that fell during the very same month but during different years. This is a fact that determines the development of cultures in different proportions, to which we can add the destructive effect of the torrential rains that destroy the soil, as well as the vegetarian blanket.

The absence of precipitations leads to the phenomenon of drying, whose persistence leads to the installing of drought. The drought is considered to be a period of at least fourteen consecutive days with high temperatures, lack of precipitations, which also extends to the interval when these were in deficit.

The average frequency of drought period is of 7- 8 cases annually, having an average period of almost 20 days. There have existed periods when the drought lasted for 30 days, even more explicitly the years: 1944, 194, 1961, 1971, 1973, 1977, 1982, 1992, 1994, 2002.



Graphic 2. Atmospheric precipitations (1941-2005)

The most secure index that can lead to the determination of the drought's intensity is represented by the water shortage from the soil. This is brought into light by the ratio between the quantity of fallen precipitations and evapo- perspiration.

Table 4. The water shortage

An	1986	1987	1988	1989	1990	1991	1992	1993
Precip.	279.4	388.2	546.9	475.0	323.7	710.1	443.2	503.0
E.T.P	776.9	630.05	650.2	733.0	864.0	666.1	791.4	677.9
Deficit	-497.5	-242.3	-1033	-258.0	-5403	44.0	-348.2	-174.9

1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
270.4	482.1	588.9	614.4	553.1	5063	323.2	382.9	632.1	411.0
S50.9	741.0	681.1	6813	716.2	695.9	839.8	798.8	722.2	784.7
-580.5	-25-8:9	-92.2	-66.5	-163.0	-189,6	-516.6	-415.9	-90.1	-373.7

A great water shortage in the soil was recorded in 1990, 1994 and 2002. A great water deficit can lead to the pedologic drought's arrival, which leads to the plants' death.

A great quantity of precipitation will determine a better humidity index, while a lower quantity will determine a weaker humidity index.

The humidity index has the following values:

- < than 0.25- extreme drought;
- 0.25- 0.50- severe drought;
- 0.5- 0.75- moderate drought;
- 0.75- 1.00- mild drought;
- 1.00- 1.50- optimum index;
- 1.50- 2.00- mild surplus\ excedent;
- 2.00- 2.50- moderate surplus;
- 2.50- 3.00- great surplus;
- > than 3.00- strong surplus.

The years 1945, 1983, 1986, 1987, 1990, 1994, 2000, represent years when the humidity index was comprised between 0.25 and 0.50, which points to a severe drought. In 1945, 1990, 1994, 2000, the value of the humidity index was close to an extreme drought.

It was observed that after a period of surplus there follows a period characterized by deficit, and not by normality. The droughty interval 1945- 1950 and the years 1983, 1986, 1990, 1994 and 2000 had been preceded by abundant rainy years (the period of surplus of 1940- 1945, 1982, 1985, 1988 and 1999). The presence of some periods of surplus prepares the ground for a time characterized by deficit.

The drought or drying phenomena are the most complex climactic ones.

Botzan and Cioaca (1963) proved that for a non- irrigated corn (*Zea mays* (Linnaeus 1753) culture the water consumption is of 302 mm for chestnut chernozem, 345 for levigate chernozem, and 422 for forest brown- fair soil.

There is a series of internal factors that underline the drought's effect in the case of cultivated plants: the conditions of air deficit, the depth that the seeds were buried at, the mechanisms through which the water movement were realized, like diffusion, the pellicle way, capillary, gravitational or plants' density.

For example, the densely cultivated corn exhausts the water supply before the maximum consumption period, which leads to a reduction of plants' side, or to an incomplete fecundation or the sterility of the plants. The great density in what concerns the wheat or rape cultures does not represent anymore a factor that underlines the water supplies diminishing or that determines the arrival of drought.

Without knowing the precipitation regime during the vegetation and taking into consideration the fact that droughty years appear more and more often, one must take into consideration that in what concerns the cultivated plants there must be taken technological measures at the level of the water from the soil. Therefore, one must take into consideration the depth of 120-150 m. The water from the soil influences directly and indirectly the cultivated plants.

The direct way is represented by the fact that plants start growing vigorously in vegetation, then they get roots by using, at an incipient phase the humidity that exists in the ploughing layer, and when they reach the phase of functioning, they can value the water from the deeper layers.

Indirectly, plants are influenced by the precipitations during the vegetation period, because they being developed ca value better these resources.

CONCLUSIONS

Function to the quantity of precipitations that fell during the cold period of the year, the water quantity from that certain month and the value of the evepo- perspiration, one can count the humidity index only for the period of vegetation, and it points out the intensity of the drought from this period.

In 2000, Vaslui district faced the greatest drought of the last 30 years, the drought being

amplified by the lack of irrigations.

There is no happy future for the cultivated plants, since there is a permanent fluency of meteorological events that make plants' life be in a permanent change and adjustment to the climate's variability. Each year there are changes in their metabolism, structure and function, especially because of the air's average temperature arousal, or because of the lack of water.

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