ASSESSMENT OF CLIMATIC RESOURCES AND RECOMMENDED AGROTECHNICS PRACTICES IN THE TRANSYLVANIAN PLAIN, ROMANIA

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Abstract

The Transylvanian Plain (TP), with an area of 395,616 hectares is an important agricultural production area of Romania. During the last two hundred years, TP has been undergoing considerable anthropic impact, currently being a hilly area with serious issues of sustainability of soils, scarce in water resources, with deficient rainfall and an extremely low degree of afforestation: 6.8%. Monitoring the thermal and hydric regime of the area is essential in order to identify and implement sets of measures of adjustment to the impact of climatic changes. Soil moisture and temperature regimes have been evaluated on a basis of a set of 20 data logging stations positioned throughout the plain. Each station stores electronic data of ground temperature on 3 different levels of depth (10, 30 and 50 cm), of soil humidity at a depth of 10 cm, of the air temperature at 1 meter and of precipitation. The multiannual average air temperature situates between 9.35-12.04^{0}C and grow in the soil with increasing depth to 9.89-12.82°C – at 10 cm; 10.05-12.85°C – at 30 cm; 10.03-12.86°C – at 50 cm. The multiannual average air temperatures during the period 2008-2012 increased with 0.15(north) - 2.84(south) C as compared to the multiannual average temperature of the area (9.2°C). The thermal regime of the ground is of the mesic type, multiannual average soil temperature at 50 cm depth situating between 10.03-12.86°C and the differences between the average summer temperatures and average winter temperatures range between 11.35-17.72°C. Monitoring the hydric regime of the soils in TP demonstrate that the moisture regime is of the ustic type for the northern and north-western part, whereas for the southern and south-eastern part the hydric regime is of the xeric type; the soil being dry over 45 consecutive days following the summer solstice. The analysis of recorded data results in a situation similar to the southern, south-eastern and eastern slopes- lower rainfall with approx. 43.8 mm, higher temperatures with 0.37^{0}C in air, with 1.91^{0}C at 10 cm, with 2.22^{0}C at 20 cm and with 2.43^{0}C at 30 cm in soil, compared to northern, north-western and western slopes. These issues, supplemented by those of slope require special agrotechnical measures generated by TP relief.

Key words: soil temperature, soil moisture, precipitation, Transylvanian Plain.