

SOIL TEMPERATURE, MOISTURE MONITORING AND RECOMMENDATIONS ON THE OPTIMUM SOWING PERIOD FOR THE MAIN CROPS IN THE TRANSYLVANIAN PLAIN

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Abstract

The Transylvanian Plain (TP) is a geographical region located in north-central Romania and is bordered by large rivers to the north and south, the Someş and the Mureş, respectively. The TP is 395,616 ha and ranges from 231-662 m in elevation, with some of the highest elevations occurring in the NW region. Contrary to the name, the TP consists of rolling hills with patches of forests located on the tops of hills. Soil temperatures of the TP were evaluated using a set of 20 datalogging stations positioned throughout the plain. Soil temperatures were monitored at the surface and at depths of 10, 30, and 50 cm. Soil moisture was monitored at 10 cm. The presence of the Carpathian mountains ring and the arrangement, almost concentric, of the relief from Transylvanian Depression, determines the development of a zonal sequence of soil types, a horizontal zonality as a direct influence of lithology and indirect of the relief, by changing climate and vegetation. Diversity of the pedogenetical factors - highly fragmented relief, forest and herbaceous vegetation grafted on a lithological background predominantly acid in the north – west and predominantly basic in south – east, parent rock composition and especially their combination in the contact zones, have conditioned in this hilly area of TP a tessellated soil cover. During soil pedogenesis, soil properties and features developed in response to differential lithology and macro/microrelief. Evaluated soils were found to largely be a complex mix of Cernisols, Luvisols and Antrisol. Soil temperatures of the TP are mesic, with small differences between the northern and southern extents. However, differences in seasonal warming and cooling trends across the plain were noted. These have important implications for planting recommendations. Recorded data allow us to say that towards the optimal sowing period known from the literature, during 2010, for all cultures were recorded minimum temperatures for germination with approx. 5-10 days earlier. The optimum sowing period was recorded 15 days earlier at soybeans, with 10-12 days earlier at corn and beans, 2-3 days earlier at potato, sunflower and sugar beet.

Key words: soil temperature, sowing recommendations, Transylvanian Plain

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