



Seasonal Changes in Crop Phenology and Crop Water Requirements during Extremely Dry Years and Effects on the Yield Production

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Crop development and yield production are strongly related to weather variables and soil water availability. The climate change impact on agriculture is of high interest for scientists, due to the complexity of crop-weather interactions and of the uncertainties related to a constant production of high quality and quantity yield. Recent cases of extremely dry years (i.e. 2000, 2003, and 2007) provide critical insights into the availability of water and thermal resources for plants, as well as possible shifts in occurrence date of phenological phases. The main objective of this paper is to determine the magnitude of changes in crop development and yield during droughty years, compared to multi-annual average, in order to better understand the timing of the most demanding phases. Agro-meteorological indices (i.e. degree-days sum) for two major crops in Romania, winter wheat and maize, were computed from long-term meteorological observations at two stations with agro-meteorological program, representative for regions with different agro-climatic conditions: Alexandria for the southern warmer region and Targu Mures for the central region, respectively. Calculated dates of occurrence and real observations for different phenological phases in the extremely dry years are then compared with multi-annual averages, in order to observe the impact of hot and dry years on the stages of crop development. In addition, are analyzed the crop water requirements and yield productions in droughty years compared with multi-annual averages, for the assessment of correlations between local agro-climatic conditions and crop production.