



## **The Impact of Drought and Heat Waves on Romanian Agriculture**

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Sustainable development, management, and planning in agriculture benefit from scientific fundamentals by using methodologies based on crop-weather relationships and assessment of climate impact on crop production. The negative effects of meteorological extreme events on crop production require specific monitoring methods in order to forecast the evolution of risk factors. The paper presents aspects of climate variability impact on agriculture during 2000-2007 period in Romania, emphasizing the effects of extreme drought and heat waves periods (characterized by intensity and duration) on vegetative development of agricultural crops. Analysis of drought frequency and intensity during the 20<sup>th</sup> century shows the crucial importance of agrometeorological monitoring for early-warning systems and for efficient mitigation measures. The drought phenomena and heat waves that affected agricultural areas in Romania during 2000, 2002, 2003, 2006 and 2007 years are analyzed in a more comprehensive manner, stressing the importance of multiple factors effects on soil moisture and crop development. The complex interaction among soil, plants and atmosphere is described here using climatic data (temperature, heat units, precipitation), crop water requirements (depending on vegetation stage), and soil moisture data (measured and modeled). In addition, the spatial extent of the drought phenomenon, as well as the dynamics throughout the growing season, are presented in form of thematic maps using Geographical Information Systems (GIS) techniques. Such detailed and integrated analysis provides crucial information for delineation of areas most vulnerable to drought and is a useful tool for risk assessment and early-warning.