



The impact of drought and rainfall deficit on Romanian agriculture

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Abstract

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 main agricultural crops in Romania, winter wheat and maize, being considerably affected by the occurrence of the drought periods and precipitation deficit. Due to different crop water requirements and initial soil water storage at the beginning of the growing season, it is not sufficient to look at the precipitation amount only. The dynamics of soil water balance is specific to each agricultural field and crop, due to differences in precipitation, evapotranspiration, and soil water retention capacity.

We consider that the amount of precipitation cumulated during the agricultural year (September-August) and during the intervals with maximum plant water requirement (May and June for winter wheat and July and August for maize). It is important to note that while reduced amounts of precipitation indicate a limitation to the crop development, a normal or above multi-annual sum of precipitation doesn't necessarily guarantee the normal crop evolution, the risk of drought occurrence being still high if other meteorological parameters are increasing the water use of plants.

This work aims to present the spatial variability of the agro-meteorological characteristics in Romania during 2001-2008, emphasizing the extent and intensity of the drought and rainfall deficit and their impact on main crop. Direct, cumulative, and long-term effects of water stress on crop vegetative development and production it is described in the paper.

Key words: climate, precipitation deficit, drought, agriculture