

**Medclivar 2014 Conference**  
**Cultural and Congress Center**  
**Middle East Technical University (METU)**  
**Ankara, Turkey, 23-25 June 2014**



## **DYNAMICAL INFLUENCES OF EL NIÑO ON MAIZE YIELD IN SPAIN**

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Climate variability and changes in the frequency of extremes events have a direct impact on crop damages and yield. In a former work of Capa et al. (2013) the crop yield variability has been studied using different reanalyses datasets with the aim of extending the time series of potential yield. The reliability of these time series have been checked using observational data. The influence of the sea surface temperature on the crop yield variability has been studied, finding a relation with El Niño phenomenon. The highest correlation between El Niño and yield was during 1960-1980. This study aims to analyse the dynamical mechanism of El Niño impacts on maize yield in Spain during 1960-1980 by comparison with atmospheric circulation patterns.

This study uses crop yield data simulated with the ecophysiological crop model CERES-maize included in DSSAT v.4.5 (Decision Support System for Agrotechnology Transfer). The model requires daily data of radiation, maximum and minimum temperature and precipitation. These data are obtained from different sources: observed and reanalyses datasets. The model was calibrated and validated with observed climate data and independent crop data from field experiments at five locations in Spain covering the whole territory: Lugo (northwestern), Lerida (northeastern), Madrid (centre), Albacete (southeastern) and Córdoba (southern). Then, crop simulations were run with reanalysis climate data. From these simulations, the computed standardized anomalies yields were projected on different atmospheric anomalous fields and the resulting patterns were compared with a set of documented patterns from the National Oceanic and Atmospheric Administration (NOAA).

The results are useful to understand how El Niño influences yield in Spain and to give the first steps on crop forecasting in Iberian Peninsula. Improving such forecasting is needed to establish early warning systems and to design crop management adaptations that take advantage of favorable conditions or reduce the effect of adverse conditions. This is especially true in the Iberian Peninsula, which has large climate variability in spatial and time scales.