Geophysical Research Abstracts,
Vol. 11, EGU2009-12877, 2009
EGU General Assembly 2009

A comparison of the climate risks of cereal, citrus, grapevine and olive production in Spain

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The landscape of Mediterranean rural areas is shaped with crops well adapted to semi-arid zones. In this paper we aim to understand the interactions between factors that impact agriculture and management interventions of agricultural systems that include cereal, citrus, olives and grapevine, with a special focus on climate risks. We use statistical models of yield response functions to address how temperature and precipitation variability differently affect the crops of a traditional Mediterranean farming system. While simple functions will never provide the level of detail possible with more complex models, the direct interpretation of the results by farmers and policy-makers may be of great value to the risk management and decision-making process. Our results show that observed yield patterns contain substantial information on the relative importance of the climate and management variables for yield variability, in consequence responding to the critical need for knowledge on crop response to extreme precipitation and temperature events with implications for the risk management of agricultural systems. Our method was applied to address policy and management factors affecting the risk level of Mediterranean farming systems in Spain, such as the role of EU agricultural and environmental policy in yield output, as well as the risk management implications in drought conditions