Abstract

Implication of Regional Climate Models (RCMs) climate change scenarios on agriculture over southern Africa.

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There is substantial evidence to indicate that significant global warming will occur during the 21st century which will lead to more droughts over most parts of southern Africa. This study investigates the impacts of climate change on crop production over the region. Regional Climate Model (RCM) output will provide an input to a crop model (Agrometshell), which will be used to assess present and future crop behaviour over southern Africa. The RCM data used in this study is from the recently completed Assessment of Impacts and Adaptation to Climate Change (AIACC) project, based at the University of Cape Town (UCT). Two different RCMs (the Hadley Centre PRECIS and Pennsylvania State MM5 models) are currently being used. The PRECIS data has a control period 1960-1979 with 0.44° horizontal resolution and future period 2070-2089 with a 0.44° horizontal resolution. The MM5 has control period 1975-1984 and future 2070-2079 with a 50 km horizontal resolution.

The climate change impacts will focus on crop development, grain yield and evapotranspiration by assessing precipitation, soil moisture and temperature conditions. The onset and duration of the growing season including the number of dry spells and rainy days during the peak season will be analyzed for both the control and future climates. These parameters are more relevant to farmers than seasonal totals as they give detailed statistics necessary for a good crop yield.

This study focuses on maize production as it is the staple food for the region. The seasonal maize crop in southern Africa usually flowers between December and February, after being planted in late October or November and it requires on average 120 growing days from planting to harvesting.