

Modeling the Effect of Temperature and Precipitation Change Signals to the Irrigation Requirements of Peaches in Southern Ontario

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A simulation study was carried out to describe the effects of climate change on the irrigation needs of peaches *{Prunus persicae}* in Southern Ontario. Irrigation water requirements vary according to the balance between precipitation and evapotranspiration and the resultant fluctuations in the soil moisture status. Accurate quantification of these factors is a cornerstone to help minimize risks associated with insufficient as well as excessive irrigation applications. Fine resolution climate change information used in the study was obtained using the statistical downscaling model (SDSM). Three sets of independent climate predictors from the output of two Global Circulation Models (GCMs), the Canadian Global Climate Model 1st generation (CGCM1) and the Hadley Centre coupled Model (HadCM3) and using two emission scenarios, A2 and B2 were used by SDSM to construct climate scenario information over the period of 2070-2099. Resulting climate information was used as input to the irrigation requirements model (IRM) developed based on simple daily soil water balance. The (IRM) was calibrated and validated at two orchard fields, one in Vineland and the other in Ridgetown, representing the two regions, Niagara and Chatham Kent of Southern Ontario. Results of the model were very promising when validated to 2005 and 2006 growing seasons. An understanding of the changes of the mean and variability of temperature and precipitation is very critical in modeling the amount and timing of irrigation applications. IRM offers an alternative approach and a tool to estimate the potential future plant water use and to carry on the proper irrigation scheduling that can optimize water use and adapt to climate change.