

Potatoes Sustainability in Prince Edward Island: Climate Change Risks and Challenges

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Abstract

Potato is the major food crop in Prince Edward Island, Canada and agriculture is highly dependent on local weather and climate especially in rain-fed areas. This research focuses on finding different climate extreme indices for growing season (May-October) and examining their impacts on tuber yield in Island. Changing patterns of different temperature and precipitation extreme indices for 30 years period (1989-2018) from data of five meteorological stations (East Point, Charlottetown, New Glasgow, Summerside and Alberton) were calculated using ClimPACT2. Statistically significance of the trends and their slope magnitude were determined by using Mann-Kendall test and Sen's slope estimates respectively. Data of the selected meteorological stations were averaged to calculate the climate extreme indices for the whole Island. There were increasing trends at most of the stations for continuous dry days, warm and warmest nights, summer days, tropical nights and decreasing trends for total precipitation, daily temperature range, frost days, cold days and cold nights. The patterns of climate extreme indices in the growing season helped in examining the effects of the climate change on tuber yield. The stepwise regression (forward selection) model showed that 43.99% of tuber yield variance was attributed to Continuous Dry Days (CDD), Daily Temperature Range (DTR), Daily Maximum Temperature (TXx) and Tropical Nights (TR) climatic factors.

Keys words: Climate change; ClimPACT2, Climate extreme indices, Tuber yield