



## **The impact of Climate on potato crop in Ireland: A case study**

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There are numerous reasons for changing annual potato yields in Ireland, in particular seasonal variations in temperature and rainfall. Peak potato growing season is from April to September. For this study, actual potato yields and observed weather from 1985 to 2014 were analysed. The highest potato yield was 41.4 tonnes in the year 2004; an increase of 20% compared to 2003 and 2005.

It is noticed that the annual average maximum temperature anomaly is just -0.07 Deg C during 2004 and during the peak potato season (April to September) is just 0.08 Deg C. The monthly temperature anomaly from April to September for the year 2004 was near normal as compared to other years. Furthermore, monthly rainfall departure from the climatological normal for the year 2004 remained flat as compared to other years. In general, potato thrives in cool climate conditions. Best yields are recorded when temperature during the cultivation period is even, without fluctuations and with moderate to frequent rainfalls. These weather conditions were found during the year 2004 when near normal maximum temperature and rainfall during the seasons led to a substantial rise in potato yield.

The steady growing yield of potato since 1985 saw a major fall in 2012 (25.8 tonnes per hectare). An analysis of the weather data for 2012 showed that both temperature and rainfall deviations are very high compared to the climatological normal. Annual average temperatures were above average for the country during 2012. A major potential reason for the failure of potato yield during 2012 was that rainfall amounts during June were 126% more than the climatological normal. June 2012 was the wettest on record since 1981 and was the wettest on record for many places ranging well above 300% in the eastern half of the country. Similar to potato crop yields, total wheat, oats and barley crop yield per hectare showed a substantial rise during 2004 (8.2 tonnes, record high between 1985 to 2010) and substantial fall during 2012 (6.8 tonnes, record low since 2003).

The analysis will be extended to analyse the potential impacts on future climate change on crop yields in Ireland. This will be achieved by applying the methods to high-resolution regional climate projection datasets for Ireland under different greenhouse emission scenarios. Preliminarily climate change results will be presented.