

Impacts of Climate Change on Field Crops in the Tokachi Plain, Hokkaido, Japan

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The Tokachi Plain in Hokkaido has the largest area of field crops in Japan. It accounts for 254,800 ha (2015), or about 12% of the total crop field in Japan. Crop rotation is practiced in the Tokachi Plains, and wheat, potatoes, beans, sugar beets, and forage crops, which are suitable for the cool summer climate, account for about 86% of the total crop area. The shares of production of red beans, potatoes, sugar beets, and wheat in Japan are 64%, 44%, 33%, and 31% in 2015.

In recent years, the Tokachi Plain has also been affected by climate change, and extreme weather conditions have been observed. In particular, in August 2016, four typhoons caused extremely heavy rainfall in eastern Hokkaido. For example, in Obihiro, the central city of the Tokachi Plain, the normal precipitation in August (1991-2020) was 141.3 mm, while it was 378.0 mm in August 2016, which was an abnormal value of $+3.4\sigma$ in terms of precipitation in August since observations began in 1892. As a result, root crops (potatoes, sugar beet, etc.), which were in their harvesting season, were severely affected, resulting in a drastic decrease in harvest volume and the suspension of production of potato chips, which in turn affected the Japanese food culture. As a risk hedge, food companies in Japan began to diversify their potato growing areas.

Nowadays, Ishizaki (2021) predicts climate change in small areas, and the results of simulations of temperature and precipitation on a 1km mesh and daily basis are available. Using these data, we are now examining the impact of climate change on agriculture in the Tokachi Plain in the future.

(Reference)

Ishizaki, N. N., 2021: Bias corrected climate scenarios over Japan based on CDFDM method using CMIP6, Ver.1, NIES, doi:10.17595/20210501.001, (Reference date: 2022/2/17)

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