Projections of Mountain Climate Changes Associated with Highland Crops in Korea

Gwangyong Choi*, NN

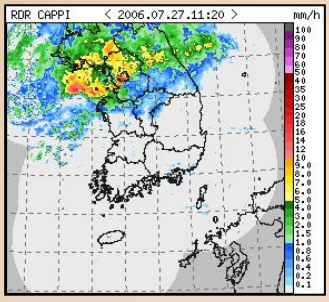
Jeju National University

* Correspondence: tribute@hanmail.net

9

Problem Statement:

Changing climate is one of challenges that farmers in the highland regions of Korea are facing in the 21st century. Highland crops including napa and radish, which currently have competitiveness in markets due to their different seasonal development, can suffer from diseases in a wamer climate. To date, however, little information of mountain climate changes associated with highland crops have been documented in Korea due to relatively poor climate observation networks over complex terrain. To improve ecosystem services for local residents living in mountainous terrain, which is a goal consistent withTERRECO research, projections under climate change for optimal growing seasons in specific regions with highland crops are needed.



Overall Goals, Methodology and Data

- Provide information on the on-going changes in spatio-temporal patterns of agro-climatic indices derived from statistically-downscaled reanalysis data and based on automatic synoptic observational systems (1973~2012) and automatic weather station networks (2001~2010) in Korea

- Project future mountain climate change associated with highland crops in Korea using high resolution (1km by 1km) dynamically-downscaled climate change scenario data, based on both Global Climate Models (GCMs) and Regional Climate Models (RCMs).

Mountain Climate Changes in Korea and Directions of This Study

On-going Climate Change in Korea (Choi&Kwon, 2001, Choi et al., 2006; Choi et al., 2008)

• More warming signals are observed in the order of winter>spring>fall, while summer temperature does not show any significant changes across Korea. This leads to changes in seasonal cycles such as extended summer versus shortened winter.

• Changes in the East Asian monsoon system, such as more intense, frequent extreme rainfall events in summer and changes in the wintertime precipitation type from snow to rain, are observed along the mountain ridges in Korea.

Projections of Future Mountain Climate Changes in Korea:

• Optimal climatic zones for agricultural crops as well as for mountain ecosystems will shift toward high latitudes and high altitudes due to the continuing global warming.

• More occurrences of intense climatic events will provide harsh growing environments for highland agricultural crops and mountain ecosystems.

Abies Koreana on Halla Mountain in the danger of extinction due to climate change

Projection of reduction in the optimal growing area of napa in a warmer climate