

# The 7th Circumpolar Agricultural Conference

Circumpolar Agricultural and Land Use Resources - Prospects and Perspectives for Circumpolar Productions and Industries



The world northernmost sheep farmer at 70.9°N

photo: Oskar Puschmann

## Abstract booklet

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**Abstract:**

In the last few years the consequences of climate change and political measures to deal with such changes have emerged at all levels of society. For the agricultural sector, climate change is expected to have both negative and positive consequences. In Northern Norway the overall consequences are thought to be positive, but there are challenges to be met and also regional differences. The effects are already observed and are likely to be intensified in the years to come. The mean temperature is expected to raise most in Northern Norway, as is precipitation. This may increase crop yields. However, more frequent and intense precipitation may increase the risk of leaching and erosion of susceptible soils, and frequent freeze-thaw events and more precipitation during winter may cause ice encasement or dehardening of plants.

This study will focus on the consequences of climate change for the agricultural sector in Northern Norway and the adaptive capacity of the sector to such changes. We will analyze the expected changes based on down scaled climate scenarios and biological factors as well as political and economic conditions. As climate change occurs in the context of wider ongoing social, economic and political transformations at the community level, it is necessary to take a cross disciplinary and integrated approach to assess the vulnerability and adaptive capacity of individual farmers in Northern Norway. This study aims to give policy makers and the industry a better foundation for future decisions on adaptation strategies to future climate change.

**Better possibilities in agriculture due to climate change– but will there be framers left in Finnish Lapland in 2039?**

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**Abstract:**

At the moment the agriculture in Finnish Lapland is based on animal production, especially on ruminants, dairy cows, beef cattle and sheep. So this dominates the use of fields, of 45000 hectares total field area, 38000 ha are grasslands and only 3000 ha cereals. According to best guess climate change scenarios the growing season will be about two weeks longer, 1 – 2 °C warmer and the winters two three weeks shorter by 2039 than it is today. That means the growing conditions could improve thus increase yields and bring new plants and production possibilities into Northern agriculture. In the other hand the winters would be more variable changing the overwintering requirements. This is enhanced by longer growing season in the autumn, which may be harmful for the hardening processed, especially because the light conditions will rain the same.

The relative decrease in dairy farms has been even bigger, from 934 in 2001 to 550 in 2008. The average age of farmers 2009 was 49,8 years compared to 46,7 years in 2001. At the same time the proportion of farmers under 40 years of age has dropped from 24,3 % to 16,2 % of all active farmers. If nothing is done that means after a generation there are very few farms to meet the challenges and possibilities of future climate in Finnish Lapland.

## **Forage breeding in a Northern changing climate**

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**Abstract**

The climatic conditions for plant growth and wintering in the northern areas are changing as an affect of global warming. The situation influences the forage production and agriculture in Northern Norway. Special for the northern conditions are long photoperiod during the growth period with low temperature and a long wintering period. With changing climate the temperature and the precipitation pattern will change, while the photoperiod will remind. Higher temperature at short photoperiod in spring and autumn will occur. The overall outcomes of climate change are unpredictable and breeders must be able to react on different conditions by having a range of well-characterised germplasm available. It is important to continuously test new plant materials and develop new cultivars for the changing growth conditions. Plants well adapted to the north seems to regulate growth and acclimation to the change in photoperiod, while more southern adapted plants change from active growth to acclimation with fall in temperature. The change to milder a winter climate makes it possible to use more southern adapted and more productive forage cultivars. The present winter hardy cultivars have been shown to lose in competition with less winter hardy, but more productive cultivars. Most forage cultivars are populations with genetic variability. By selection under northern growing conditions, both between and within southern varieties, it will be possible to obtain new populations which combine winter adaptation and productivity. New cultivars in the last stage of testing before registration are produced after such a breeding scheme.