



Frost days in start of growing season for Norway

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Due to increasing temperature, the growing season is expanding in Norway, with the exception of glaciers and high mountains. The growing season starts earlier or ends later in the year, when temperatures during night can be low. Therefore, a longer growing season, despite a decreasing number of frost days in a generally warmer climate, may lead to an increased risk of frost early or late in the growing season.

Frost early in the growing season can be a risk for several plant species. There have been incidents in Norway where fruit farmers have had their crops destroyed after an unusually warm period followed by a cold spell.

This is the first study on frost days at the start of the growing season where all of mainland Norway is included.

To study frost days in the growing season, observation based gridded data at daily resolution is used for two historical normal periods (1961-1990 and 1991-2020) with a 1 km grid resolution covering mainland Norway. Additionally, bias-adjusted daily climate projections are analysed for the periods 2041-2070 and 2071-2100, following three different future climate scenarios (RCP2.6, RCP4.5 and SSP3-7.0).

Frost in the growing season is a risk factor in the lower areas in Southern Norway today, with the highest risk in the southeast. Changes between the historical normal periods show the highest increase of days along the coast in the west of Southern Norway. This is the same area where the growing season has increased the most. Future scenarios show an even higher risk of frost days in the growing season along the coast of Norway except for the northern most areas. Again the increase of the risk is highest in the same areas where the growing season is calculated to increase the most.

This work is done within the Norwegian Centre for Climate Services (NCCS). NCCS provides information for climate adaptation and helps municipalities to be robust in a changing climate. Information on the changing growing season and risk of frost days in the growing season can be of help to farmers and used as background information for climate adaptation. All authors in this abstract are connected to NCCS.