

## FARMING ON PERMAFROST PERMAFROST GROWN

### TO MAKE THE MOST OUT OF THIS SCRIPT, YOU COULD:

- Stick it in your book as a record of watching the Permafrost Grown animation
- Pause the animation and make notes as you go
- Add your own illustrations to the sheet
- Create your own animation to accompany it
- Add notes from classroom discussions
- Make notes of areas you will investigate further
- Make notes of key words and definitions
- Add questions you would like answered – you can message the Permafrost Grown team members through the comments box at the bottom of their article:

[www.futurumcareers.com/farming-on-permafrost](http://www.futurumcareers.com/farming-on-permafrost)

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## SCRIPT:

Soil subsidence is a significant challenge for farmers in Alaska. Water-filled depressions appear in fields, crops die, fences collapse, and it becomes difficult to use farming equipment. This subsidence is caused by thawing ice-rich permafrost. Permafrost is ground material, such as rock, soil or ice, that remains frozen for two or more consecutive years.

There are different types of permafrost, depending on the ground-ice content and distribution, and this influences the ground's response when the permafrost thaws. Ice-rich permafrost commonly contains wedges of ice that extend deep into the ground. When these melt, the ground above the ice wedge will collapse.

Despite this risk of soil subsidence, there are advantages to farming in Alaska. At the height of summer, there are over 20 hours of daylight every day. This allows plants to produce more sugars, so many Alaskan vegetables taste sweeter. This also allows Alaska's main agricultural export crop, peony flowers, to bloom at the peak of the global wedding season. Increasing Alaskan agriculture would increase food security and access to fresh produce as the state currently imports 95% of its food.

The Permafrost Grown team, at the University of Alaska Fairbanks, is examining the interactions between farming and permafrost. Dr Melissa Ward Jones, Dr Benjamin Jones, Glenna Gannon, Dr Tobias Schwoerer and Dr Mikhail Kanevskiy are working with local farmers to study the impacts of permafrost on agriculture, and the impacts of agriculture on permafrost. Permafrost Grown aims to better understand the interactions between permafrost and agriculture and to provide management strategies to help farmers deal with the associated challenges.

Some farming practices may be increasing the rate of permafrost thaw. When forests are cut down to make fields, the ground temperature rises because the insulating trees are removed. Farmers often attempt to warm the soil in Alaska to make it more favourable for plant growth or to get a head start on the growing season.

The team is conducting agricultural experiments on farms to test the impacts of different farming and management practices. For example, they are testing whether different crops have different effects on soil temperature. The team also conducts ground penetrating radar surveys and collects ground cores to identify the types of permafrost below different fields. The researchers use drones to measure and monitor subsidence and they interview farmers to understand their attitudes towards different permafrost mitigation strategies and the socioeconomic aspects of farming on permafrost.

With the knowledge obtained from these investigations, Permafrost Grown hopes the dream of fresh, local produce will become a sustainable reality in Alaska. What could you achieve with a career in permafrost science, agricultural science, remote sensing, sustainable food systems or natural resource economics?