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NORWEGIAN INSTITUTE OF
BIOECONOMY RESEARCH

Cryopreservation in Norway

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Background

Germplasm conservation has an important role to play in the maintenance of biodiversity and in avoidance of genetic erosion. Cryopreservation is considered an ideal means of the long-term conservation of plant genetic resources. The safeguarding of pathogen-free collections is an important aspect of cryopreservation. In Norway, we have been working with cryopreservation of vegetative propagated crops since 2010. We have been focusing on cryopreservation of *Argyranthemum*, strawberry, potato, begonia, raspberry, blackberry and shallot onions.



Norwegian projects related to cryopreservation

Project Name	Period	Plant	Topic
KryoFrisk	2011-2013	Strawberry and Argyranthemum	Establish cryopreservation method and elimination viroid
KryoVir	2014-2017	Potato	Cryopreservation, virus diagnosis, test process, database
KryoLang	2014-2016	Potato, Strawberry and Argyranthemum	Co-cryopreservation of plant germplasm and their related digital data and visual information
Rub&AI	2016-2019	Raspberry, blackberry and shallot onion	Virus diagnosis and cryopreservation
KryoBeg	2016-2020	Begonia	Endophytes and cryopreservation
FutureFood	2016-2017	-	Design cryobox for co-cryopreservation of plant germplasm and their related digital data and visual information

Outcomes

- ❖ Collaboration between research institutions, universities, the industry and growers
- ❖ Establishment of cryopreservation methods for *Argyranthemum*, strawberry, potato, begonia, raspberry and shallot onions
- ❖ Cryopreservation of 60 potato cultivars, 26 strawberry cultivars, 3 raspberry cultivars and other plant species
- ❖ Field performance testing of cryopreserved strawberry, potato and *Argyranthemum* and begonia



Cryopreserved and non-cryopreserved *Argyranthemum*

Overview of Cryopreservation bank in Norway (Sagaplant)

Plants	Total number of cryopreserved tubes	Number of cryopreserved tubes each year			
		2017	2016	2015	2014
Strawberry	416	136	166	0	250
Raspberry	42	42			
Ribes	6	6			
Potato	573	288	272	120	
Lilac	2	2			
Total number of tubes*	1037	474	438	120	250

*Each tube contains 10 shoot tips

- ❖ Development of technology, methods and equipment for co-cryopreservation of plant germplasm and their related digital data and visual information



- ❖ Establishment of next generation sequencing for plant virus diagnosis.

- ❖ Virus elimination from potato, raspberry and shallot onion. Viroid elimination from *Argyranthemum*. Virus/viroid distribution study



Localization of CSVd infected in *Argyranthemum* with in situ hybridization

Goals

Together with relevant companies and international partners we want to investigate the concept 'Svalbard Green Vault', for cryopreservation of vegetative propagated germplasm resources in Norway.

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