



Nordic potato collection

at NordGen



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Senior scientist
potato conservation

Nordic Genetic Resource Center - NordGen

Knowledge center for genetic resources and genebank conserving and distributing plant genetic resources



- Building on more than 50 years of Nordic cooperation
- Established in 1978 as Nordic Gene Bank
- Offices in Sweden, and Norway



Nordic potato collection at NordGen

Initiated in **1979**, led by **NordGen's Potato Working Group**

NordGen is responsible for long-term conservation of:

- **Landraces, farmer varieties** grown in Nordic countries
- **Nordic improved varieties** from Nordic plant breeding institutes
- **Nordic breeding lines** with valuable traits
- **old non-Nordic improved varieties** cultivated over large areas in the Nordic countries



The Nordic Gene Bank's Working Group on Potato 2001

Nordic potato collection at NordGen

criteria for conservation

- The potato accession should be of Nordic origin or Nordic relevance
- The accession have one or several valuable agronomical, resistance or quality traits
- The accession is of cultural or historical value.
- The accession is not preserved elsewhere
- The accession is unique and can be documented



NGB 31472 Kalmar röd, Sweden, morfologisk karakterisering i Bodaholms gård

Nordic potato collection at NordGen

number of accessions and mandates

Mandate	No acc 2024	Conservation method
Active, core	95	<i>In vitro</i>
Pending	4	Field
Active, no core	0	Field/ <i>In vitro</i>
Inactive	535	-
Total	634	-



Photo: NGB 3304 Bláar íslenskar, Iceland

Nordic potato collection at NordGen

in numbers

Numbers	Active
Number accessions in 2020	77
Number accessions in 2021	92
Number accessions in 2024	95

Cultivar type	Active
Landrace	40
Improved varieties	46
Breeding material	9
Total	95

Donor country	Active
Denmark	16
Finland	17
Iceland	3
Norway	14
Sweden	41
Faroe Islands	1
Other	3
Total	95



Nordic *in vitro* collection at NordGen

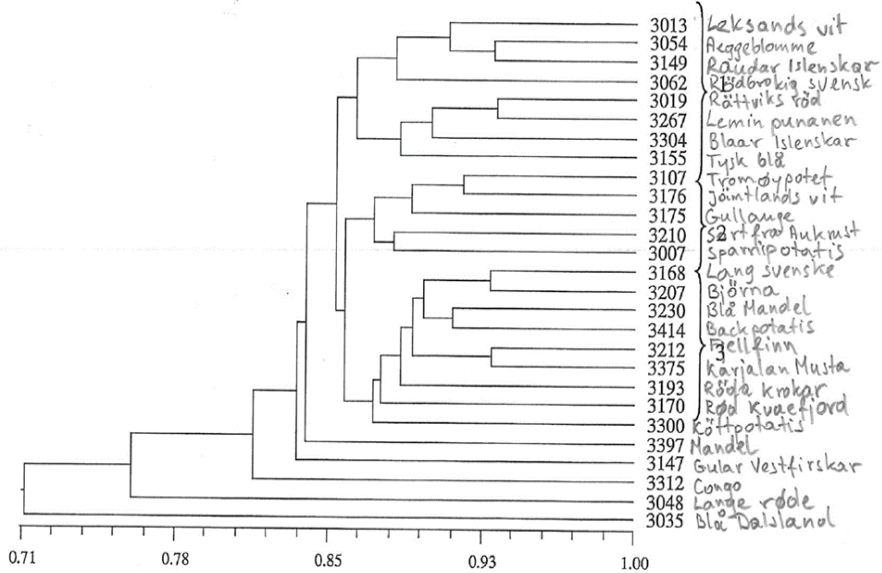
- **Active collection** is located in Alnarp, Sweden, 95 accessions – 694 single *in vitro* plants
- **Conditions:** plants are grown in glass tubes in medium, in incubators: 15°C, 16 hours light
- **Transfer** of plants to new medium is done 3 times a year



Backup collection in Finland (since 2021)



DNA fingerprinting projects on Nordic potatoes:



AFLP

Veteläinen M., Gammelgård E., Valkonen J. (2005). Diversity of Nordic landrace potatoes (*Solanum tuberosum* L.) revealed by ALFPs and morphological characters. Genetic Resources and Crop Evolution, 52, 999-1010.

SSR genotyping of old potato varieties to identify mislabelling & synonyms for AEGIS

R. Hoekstra¹, A. Reid², K.J. Dehmer³, J. Domkárová⁴, S. Solberg⁵, G. Doherty⁶, J.-E. Chauvin⁷, E. Droz⁸, K. Kotkas⁹, I. Skrabule¹⁰

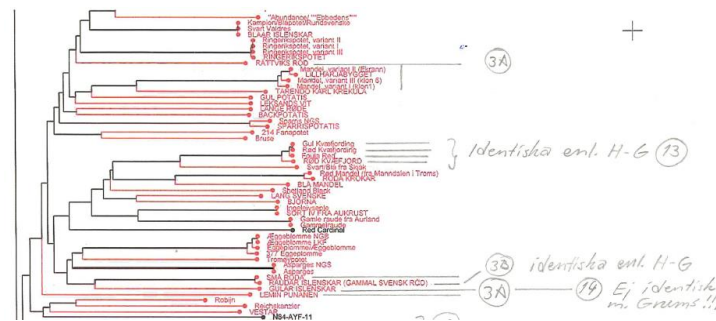


Table 1. Clones with identical profiles for 12 SSRs

Key	Variety denomination	sample	profile
AEG-10381	Flamina	DEU	12
AEG-0056	Flamina	FRA	12
AEG-0033	Monika	CZE	50
AEG-0034	Monika	CZE	50
AEG-12139	Adelheid	DEU	67
AEG-10522	Oberambacher_Adelheid	DEU	67
06308	Aura	GBR	80
AEG-0046	Aura	FRA	80
DAFF-C-146	Tecka	IRL	90
AEG-10452	Wekragis	DEU	90
AEG-10775-1	Atlas (1960)	DEU	107
AEG-10775-2	Atlas (1960)	DEU	107

SSR

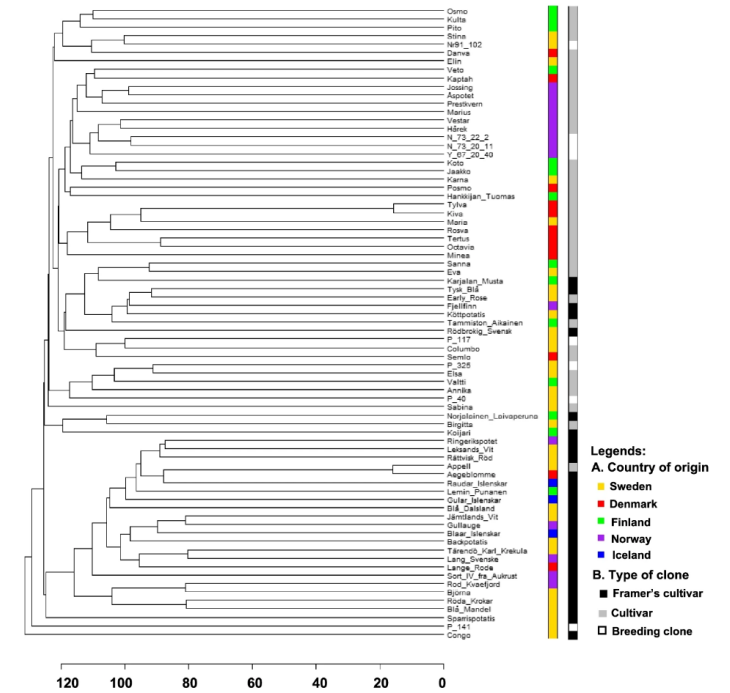
AEGIS is a European Genebank Integrated System, to establish a virtual European plant genetic resources collection of genetically unique accessions, maintained with agreed quality standards independent of where the accessions are physically located, and freely available in accordance with the ITPGRFA (International Treaty on Plant Genetic Resources for Food and Agriculture).



SSR

Hoekstra, R., and Reid, A. (2014). Final report of the AEGIS project: identification of old potato clones having unreliable variety names by means of fingerprinting using microsatellite (SSR) markers to assist in setting up the AEGIS collection for potato cultivars.

Chrominski, P., Carlson-Nilsson, U., Palmé, A., Ansebo, L., Asdal, Å., Kirk, H.G. (2024). Genetic markers identify duplicates in Nordic potato collections. Submitted to Frontiers in Plant Science.



SNP

Selga C., Chrominski P., Carlson-Nilsson U., Andersson M., Chawade A., Ortiz R. (2022). Diversity and population structure of Nordic potato cultivars and breeding clones. BMC Plant Biol 22, 350.

Characterization and evaluation of the collection

Morphological characterization

- field trials
- 56 morphological descriptors
- photo documentation



Characterization and evaluation of the collection

Resistance to diseases

- Late blight (foliage and tubers)
- Common scab
- Wart disease
- Gangrene
- Fusarium
- Viruses (PVY, PLRV, PMTV, TRV)



Characterization and evaluation of the collection

Culinary value

- Enzymatic darkening of raw tubers
- Cooking type
- Darkening after cooking
- Chipping quality

Chemical composition

- Dry matter (starch) content
- Glycoalkaloids (chaconine, solanine)
- Chlorogenic acid
- Nitrates



Project: PPP Sustain Potato

Partners: Danespo, Graminor, SLU-Swedish Agricultural University, NIBIO-Norwegian Institut of Bioeconomy Research, NordGen, METK-Center of Estonian Rural Research and Knowledge

Financing: PPP for pre-breeding (all Nordic countries)

Time:

Phase 1: 2021-2023

Phase 2: 2024-2026

Main goal:

To facilitate efficient development of robust potato varieties with better adaptation for the changing climate and better resistance to diseases

Subgoals:

- To expand the genetic base for the Nordic potato breeding
- To develop modern methods for more efficient characterization and evaluation (high-throughput phenotyping and genotyping)
- To discover interesting potato varieties that have better resistance against diseases for further use in crosses.
- To establish a Nordic potato network



Nordic Baltic Genebanks Information System – GENBIS (GRIN-Global)

<https://www.nordic-baltic-genebanks.org/>

- Passport data, pedigree, C&E data, images are saved in GENBIS
- All NordGen's accessions (630) are present in the EURISCO Web catalogue.
- 70 of 95 the long-term conserved accessions are part of the European Collection AEGIS

Nordic Baltic Genebanks Information System (GeNBIS)

Accessions Descriptors Reports GRIN Taxonomy ▾ GRIN ▾ Help Contact Us Your Profile ▾

Details for: NGB 3312, *Solanum tuberosum* L., CONGO (SWE)

Summary Passport Taxonomy Other Pedigree IPR Observation


Summary Data








Taxonomy:	Solanum tuberosum L.
Top Name:	CONGO (SWE)
Cultonomy:	<i>Solanum tuberosum</i> L. 'CONGO'
Origin:	Collected – Sweden
Maintained:	Nordic Genetic Resource Center
Received by GENBIS:	1995
Improvement Status:	300 - Traditional cultivar/landrace
Form Received:	In-vitro

Availability

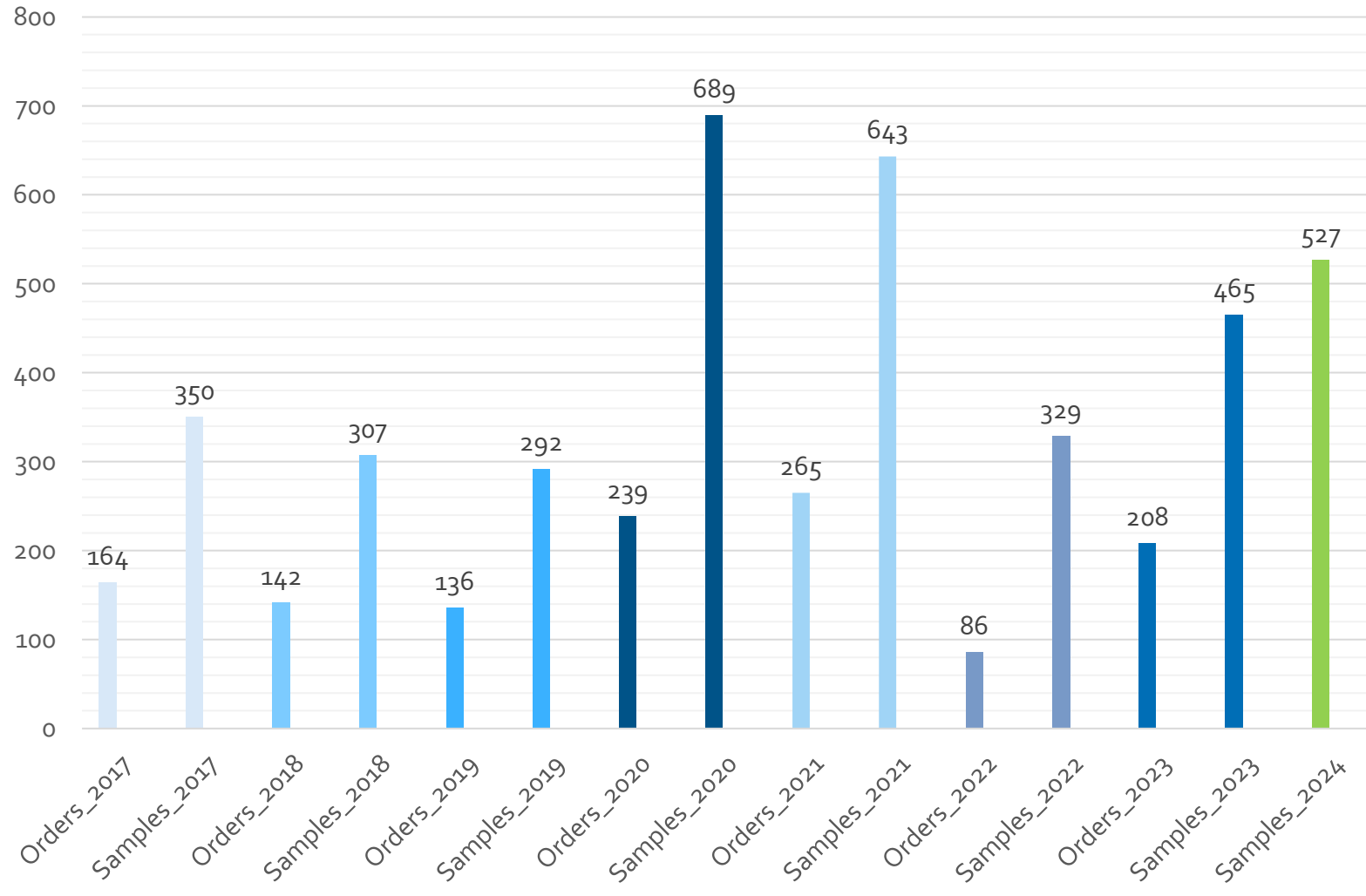
This accession is not available. Contact site for status.
[Nordic Genetic Resource Center](#)

Images (8 total. Click on image for more.)



NordGen       

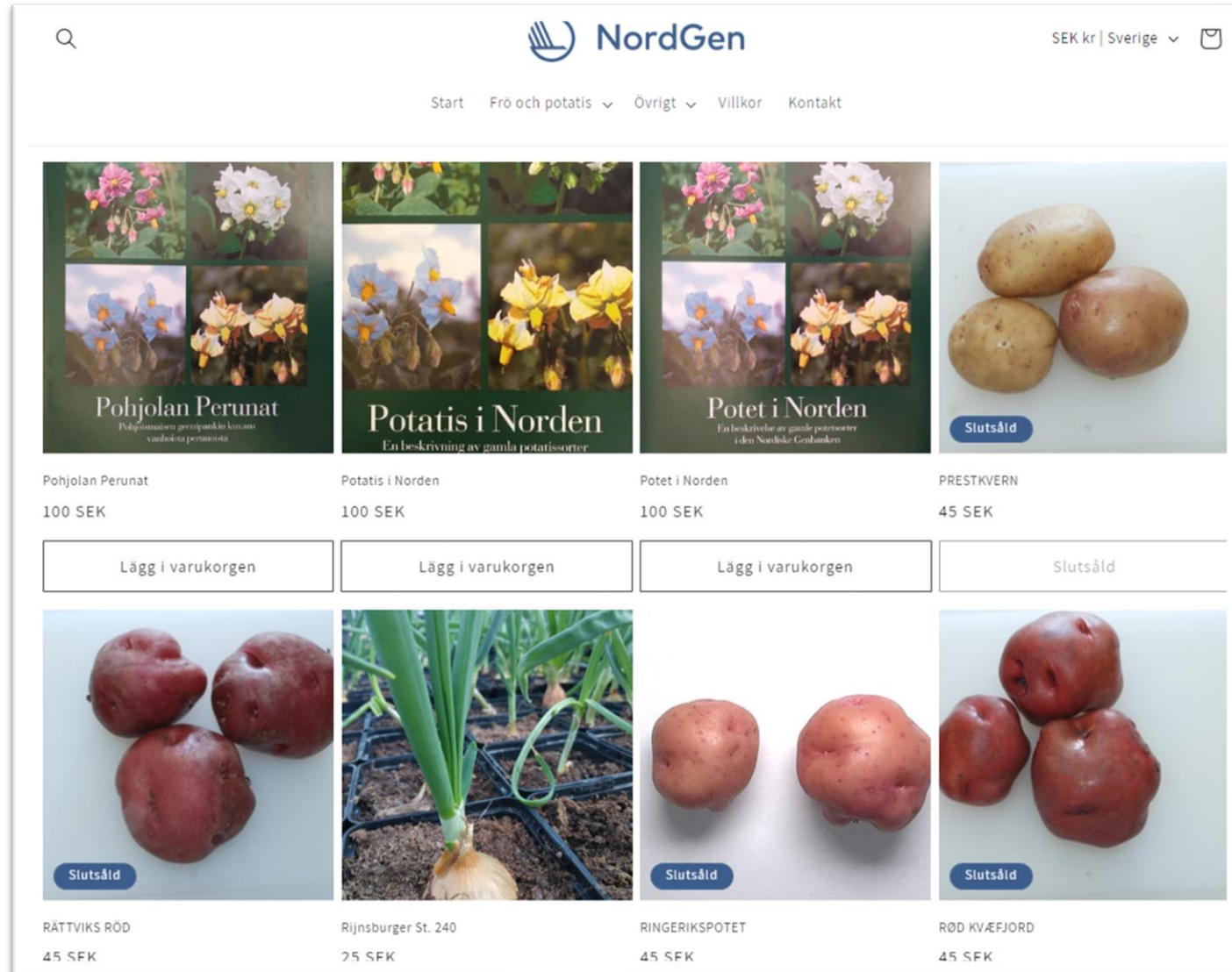
Potato distribution



Ordering potatoes from NordGen

All accessions accepted for long-term conservation are available and can be ordered for research and educational purposes.

Hobby growers can order minitubers in NordGen's online shop, every year from March 1st to May 31st



The screenshot displays the NordGen website's online shop for potatoes. The page features a search bar, the NordGen logo, and navigation links for 'Start', 'Frö och potatis', 'Övrigt', 'Villkor', and 'Kontakt'. The currency is set to SEK kr and the location to Sverige. The shop is organized into a grid of product cards, each featuring a collage of images (flowers, tubers, or growing plants) and a 'Slutsåld' (Sold out) button. The products listed are:

Product Name	Price	Availability
Pohjolan Perunat	100 SEK	Lägg i varukorgen
Potatis i Norden	100 SEK	Lägg i varukorgen
Potet i Norden	100 SEK	Lägg i varukorgen
PRESTKVERN	45 SEK	Slutsåld
RÄTTVIKS RÖD	45 SEK	Slutsåld
Rijnsburger St. 240	25 SEK	Slutsåld
RINGERIKSPOTET	45 SEK	Slutsåld
RÖD KVÆFJORD	45 SEK	Slutsåld

Value of the Nordic potato collection

- Valuable source of potato diversity for future potato breeding.
- Good adaptation to the Nordic climate: long days, short growing season, lower temperatures, unstable weather conditions
- Good storage quality, long tuber dormancy
- Important resistance traits
- Good culinary value
- It is a part of the Nordic history and cultural heritage



Preparing potato tubers for planting, Sweden, late 19th century

Thank you!

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Nordic Genetic Resource Center (NordGen)
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