



Nordic Flax

– A Report on the Evaluation and
Characterization of 436 Flax
Accessions Conducted in Southern
Sweden 2024



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Nordic Genetic Resource Centre – NordGen

Nordic Genetic Resource Centre is the Nordic countries' genebank and knowledge centre for genetic resources. As an institution under the Nordic Council of Ministers, our mission is to conserve and promote a sustainable use of plant-, farm animal-, and forest genetic resources of relevance for the Nordic agriculture and forestry.

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Introduction

NordGen, the Nordic Genetic Resource Center, is an organization dedicated to safeguarding the genetic resources of the Nordic region, with a focus on conservation and sustainable use in agriculture. NordGen manages a genebank that stores approximately 33,000 accessions (seed samples) from nearly 450 different plant species, including a notable collection of 436 flax accessions.

Flax (*Linum usitatissimum* L.) has been an essential crop for centuries, with uses ranging from textiles to oil and industrial fibers. In the Nordic region, flax historically played a key role in linen production. However, the rise of industrialization, synthetic fibers, and cheaper cotton led to a decline in flax farming. Today, renewed interest in flax is driven by its potential for sustainable agriculture and eco-friendly textile production.

NordGen's flax collection represents a valuable and diverse genetic resource that can contribute to the revival of flax cultivation. This report presents an overview of the evaluation and characterization of 436 flax accessions conducted in southern Sweden in 2024. The aim is to support the sustainable use and revival of flax cultivation in the Nordic region.

Materials and methods

A total of 436 flax accessions were evaluated and characterized in 2024. These were categorized as follows:

- **41 Nordic cultivars and landraces**
- **177 Nordic breeding lines**
 - 149 donated by Svalöv AB (1982)
 - 28 donated by The Royal Veterinary and Agricultural University, Denmark (1991)
- **144 non-Nordic cultivars, landraces, and breeding lines**
- **74 repatriated Nordic cultivars, landraces, and breeding lines**
 - 21 from the Czech genebank
 - 25 from the CGN genebank (Netherlands)
 - 28 from the Polish genebank

Each accession was sown in rows within a 1 m² plot. The soil was slightly sandy, with a sowing date of May 2, 2024. Supplemental irrigation was applied as needed.



Photos of the flax field, June 2024.

Results

The evaluation revealed significant variation among the accessions across all measured traits:

- **Flowering Time:** Accessions ranged from very early flowering (33–36 days after sowing; e.g., Aino, Martta, Helmi, Kastlösa, Hjulsbro) to very late (55–57 days; e.g., Svapo, Tadorna, Trifolium).
- **Flower Color:** A wide range of flower colors was observed, including white, violet, blue-violet, medium blue, and light blue. The majority of accessions had medium blue flowers.
- **Flower Size:** Flower diameter varied from 18 mm to 27.5 mm, corresponding to categories from small to very large.
- **Plant Height:** Heights ranged from 36 cm (notably in some non-Nordic accessions) to 131 cm (e.g., SV 64184, a breeding line), indicating considerable variation in growth habit.
- **Seed Color:** Seeds exhibited various colors—yellow, brown, and orange—with differing intensity levels.
- **Seed Size (Length/Width Ratio):** Ranged between 1.8 and 2.2, indicating a spectrum from small to large seeds.
- **Thousand Kernel Weight (TKW):** Varied from 4.25 g to 10.33 g across accessions.
- **Yield:** Seed yield per square meter ranged widely from 70 g to 450 g.



"Aino" (fiber type.)



"Henryk" (fiber type).



"Adoptiv" (oil type).

Conclusion and recommendations

This project successfully characterized a broad range of flax accessions, revealing valuable genetic diversity in key traits such as flowering time, seed size, and yield. The findings indicate that certain accessions are well-suited for cultivation in the Nordic climate.

Further field trials are recommended to evaluate the commercial potential of these accessions. Particular attention should be given to breeding lines from Svalöv AB, which showed strong promise for fiber production. Other accessions demonstrated potential for seed production. These lines represent a solid foundation for future flax breeding programs in the Nordic region.



The flax field, June 2024.