

# Development of Organic High-Quality Rye and Lupin for Human Consumption (RUPIN)

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## Background

The "Development of Organic High-Quality Rye and Lupin for Human Consumption (RUPIN)" is a four-year research project funded by International Centre for Research in Organic Food System (ICROFS) of GUDP, Denmark. The project is led by Nordic Seed in collaboration with Danish Technological Institute, University of Copenhagen, and Aarhus University. Rye is the central focus of the project, given its significance in the organic market and its nutritional benefits.

## Objective

The project aims to improve the quality and yield of rye and lupin cultivars specifically suited for organic farming. With its high fiber content, rye is ideal for whole grain products, yet current methods for assessing its baking quality are inadequate. Therefore, this project aims to improve the rye quality for human consumption and develop cultivars suitable for organic farming.

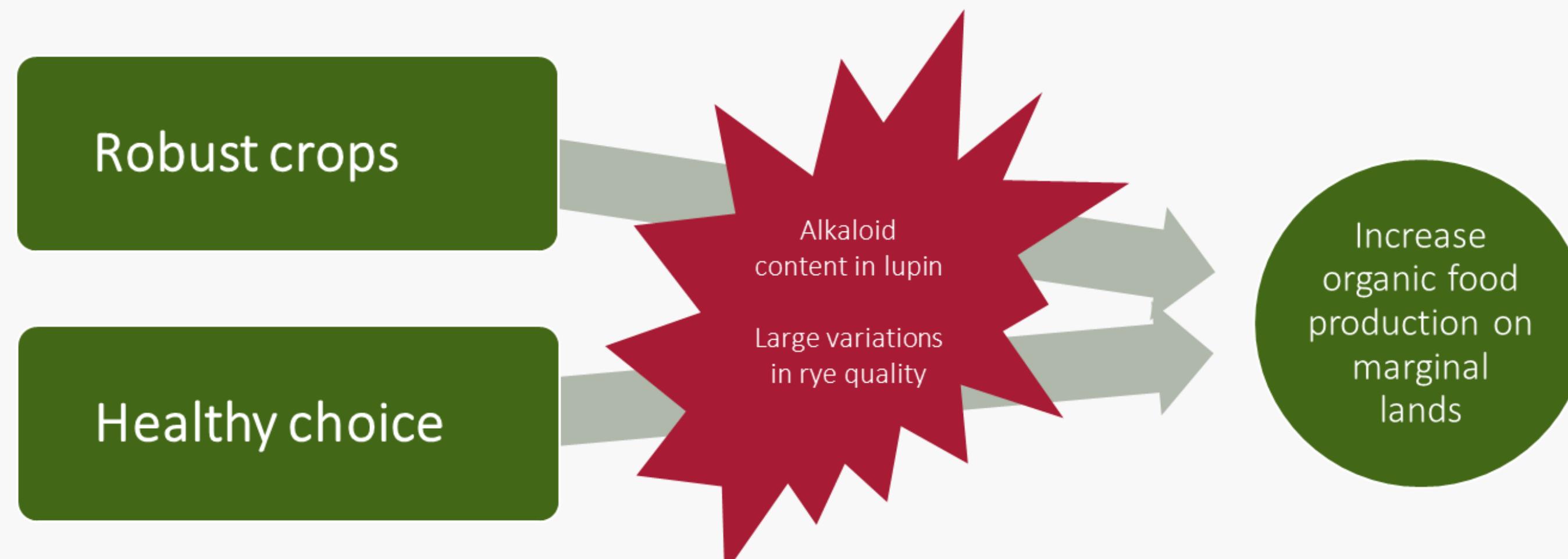
## Methodology

In this project, we already started the production of 194 hybrids and 6 population that will be sown in Autumn, 2025. This project is structured into four work packages (WPs).

**WP1** emphasizes field trials of rye hybrids and populations under organic and semi-organic conditions. The field trials will be conducted at three locations - Nienstädt (semi-organic) and two Danish sites (organic) - over two years. Along with quality related traits, we will also assess several other traits that include agronomic (lodging, straw strength, plant height), disease resistance (Scald, Brown Rust, Stem Rust, Mildew), and yield.

In **WP2** seeds from trials will be pooled per replicate for comprehensive quality analysis. This work package will focus on rye quality, evaluating baking-related traits such as falling number, amylography, starch composition, protein, fiber, and water absorption capacity.

**WP3** uses the rye quality data to build predictive models for baking quality selection using genomic prediction.



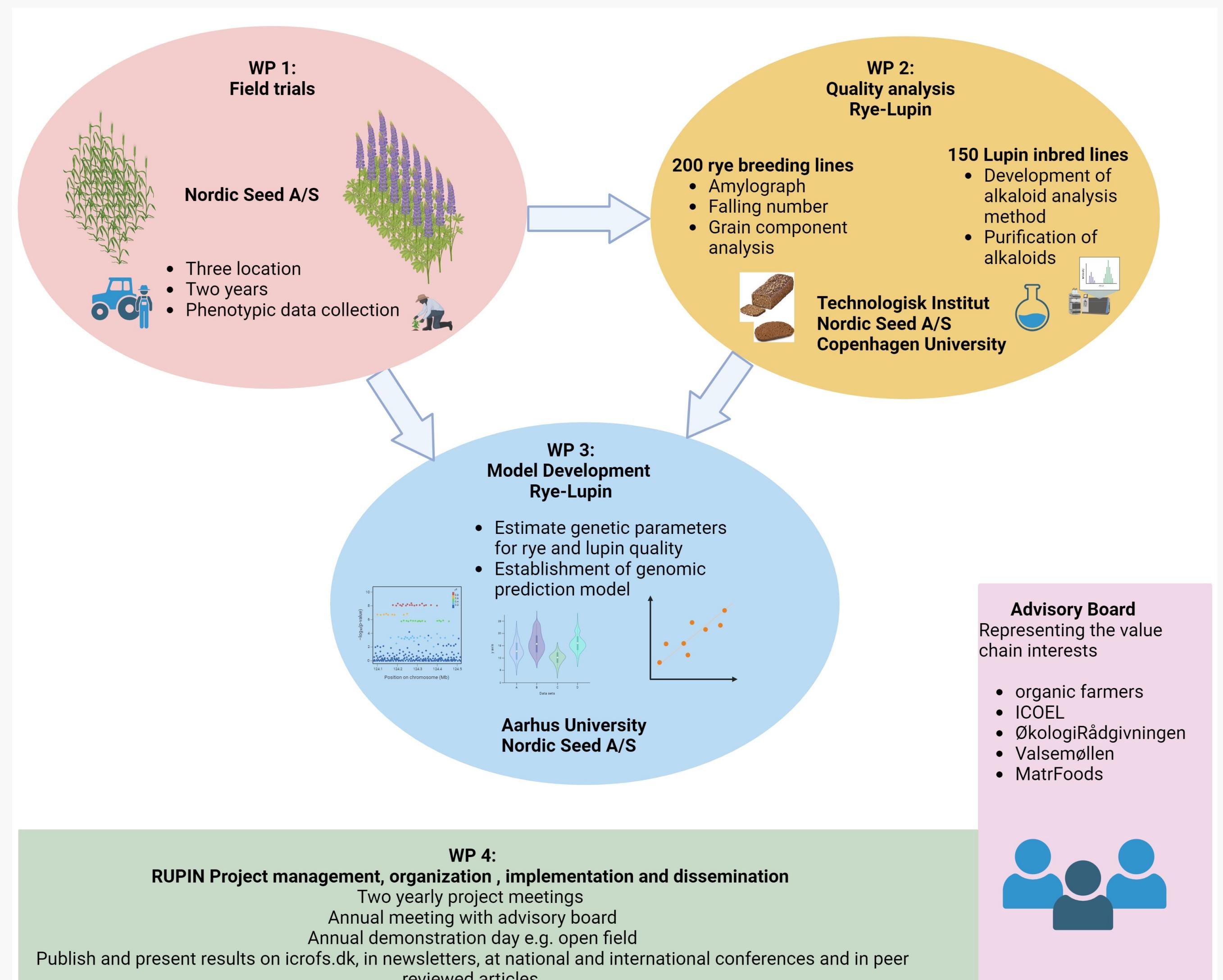
### Project contribution to sustainable farming

The project aims to strengthen and expand the opportunities for organic farmers to:

- 1) contribute to the green transition of our food systems
- 2) by increasing the production of high-quality crops for human consumption,
- 3) and to supply healthy and locally produced crops.

This will be achieved by:

- Developing new rye varieties for the organic market with stable high quality and yield.
- Developing new lupin varieties for organic production with improved quality for human consumption and high yield.



## Conclusion

This integrated, interdisciplinary and rye-focused initiative will provide organic farmers with superior rye varieties that meet quality standards for food production, expand sustainable cultivation on marginal lands, and support the increasing consumer demand for organic and whole grain products.