



# CORE organic II



## IMPROVE-P

– Assessing the suitability of recycling phosphorus fertilizers for organic farming

IMPROVE-P



Aim of the project:

To develop and evaluate sustainable strategies for increased recycling of phosphorus and other nutrients

## Introduction

The purpose of the project is to develop strategies to balance P cycles in organic farming with recycling fertilizers.

The background is that many long term organic managed farms show a strong decrease in soil P levels affecting long term sustainability.

The main regions of investigation are Central and Northern European countries

## Background

Organic farming systems rely on the efficient use and recycling of available resources. Currently, some mineral nutrients like phosphorus are used only once to produce food. Subsequently, they are lost due to poor recycling of organic wastes back to farmland. Simultaneously, P balances calculated for organic farming indicate that often more P is removed with the products than applied as fertilizer. Consequently, this leads to decreasing amounts of plant available soil P. There is an urgent need to improve the recycling of P from urban areas and the food industry, back to cropland.



*Differences in early root growth vigor in spring wheat*

## Benefits of the project

The main impact of the project will be the improved cycling of P at a regional scale which is (in principle) in full accordance with the goals of organic farming. Furthermore, the long term P status of organic farming soils will be improved by the implementation of management measures aimed at balancing P budgets.

This project will address farmer concerns about the agronomic and economic viability of optimized systems that ensure efficient P recycling back to agriculture through the use of alternative P fertilizers (APF). Moreover P nutrient use efficiency will be increased through stimulating biological soil processes. In addition, potential environmental issues arising from the use of APF will be assessed. Recommendations about the suitability of improved crop production practices and the use of APF will be formulated based on a broad base of stakeholder input.

Farmers will get benefits from information about APFs and their agronomic efficiency, the organic movement will get tools to increase their credibility and consumers/politicians a compilation of information assessing the potential benefits and risks of their use.



*The Improve-P project partners*

## Expected results

1. IMPROVE-P will help to halt the decline in P availability of organically farmed soils by identifying sustainable agronomic practices in organic farming and suitable APF.
2. By addressing the issue of P availability in OF systems, IMPROVE-P will contribute to the development of more resilient cropping systems with higher yields and yield stability.
3. IMPROVE-P will make a valuable contribution to the body of knowledge on APF that will be applicable in the conventional sector as well as the organic farming sector. Trials will generate data on plant growth after application of APF and plant bio-availability of P in APF in soils. This will be a major scientific innovation since such data are scarce in Europe.
4. IMPROVE-P will deliver scientifically validated recommendations on: a) the most suitable APF b) the best approaches to assess the quality of APF in relation to the benefits from their use, and c) optimized agronomic practices, techniques and technologies adapted to different crop production systems under different pedo-climatic conditions in the participating countries.
5. IMPROVE-P will deliver a ranking of plant growth promoting rhizobacteria (PGPRs) able to mobilize soil P under different pedo-climatic conditions and crops.
6. IMPROVE-P will contribute to developing sustainable approaches to close nutrient cycles between urban and agricultural areas in Europe.
7. IMPROVE-P will generate science-based knowledge on APFs and PGPRs suitable for organic farming, and provide a solid basis for a discussion of EU regulations.

## Expected long-term impacts

Impulses for an implementation of improved nutrient recycling. Long term increase of the credibility of organic farming systems by improving the nutrient efficiency, the sustainability and increased productivity.

### Target groups

- Farmers, consumers, researcher, politicians, farming associations.
- All targets are also relevant for all other countries outside the partner countries, as an effective and improved P recycling is of worldwide relevance.



## Coordinator

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## Partners

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## Main activities

- ▶ Compilation and evaluation of the current knowledge on P management in organic farming and alternative P fertilizer
- ▶ Experiments about the P efficiency of alternative P fertilizers
- ▶ Experiments about the impact of agronomic and biological means to improve plant P efficiency
- ▶ Evaluation of stakeholder perceptions in the participating countries

## Related projects

<http://www.phosphaterecovery.com/>,

<http://www.p-rex.eu/>,

<http://www.recophos.org/>,

<http://www.phosphorusplatform.eu/>,

<http://www.phosphorrecycling.de/>

## Project dissemination

Articles in farmers journals, scientific journals, congresses, presentation of experiments and results on field days, webpage, technical leaflets in national languages, stakeholder workshops, workshops on national and international congresses

## How to reach the endusers

Contributions in farmers' journals, in national and transnational conferences, in stakeholder meetings in national and transnational meetings.

Publications in peer-reviewed international publications.

Tailoring of key messages will be achieved by publication of technical leaflets for farmers and advisers, recompiling the most important information relevant for organic farmers.



## Further information

This project is funded via the ERA-net CORE Organic II by national funds to each partner. CORE Organic II is a collaboration between 21 countries on initiating transnational research projects in the area of organic food and farming. CORE Organic II is funding 14 transnational research projects.

Read more about the project at the CORE Organic II website:

<http://www.coreorganic2.org/improve-p> and in

Organic Eprints: <http://orgprints.org/view/projects/IMPROVE-P.html>