

Redesigning European cropping systems
based on species mixtures

Reduction of nutrient losses and fertiliser needs

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Project start date: May 1st 2017



THIS PROJECT HAS RECEIVED FUNDING FROM
THE EUROPEAN UNION'S HORIZON 2020 RESEARCH
AND INNOVATION PROGRAMME UNDER GRANT
AGREEMENT N. 727217

Improved support for intercropping will reduce fertiliser inputs and nutrient losses

Mitigating agriculture's impact on climate change and eutrophication



Lentil-oat intercrop.. Photo: Georg Carlsson

Challenges

- Current practices are shaped by goals to maximise productivity
- High dependency on N and P fertilisers
- Intercropping is a relatively un-adopted practice in Europe
- Lack of specific support for intercropping

Winter wheat in southern Sweden
Photo: Mårten Svensson

Solutions offered by intercropping

Complementarity between species

Intercropping combines different plant traits: growth rate, rooting patterns, canopy structure, symbioses.

Complementarity between traits leads to more efficient use of plant growth resources such as light, water and nutrients (N and P).

This presentation focuses on N



Pea-oat intercrop
Photo: Georg Carlsson

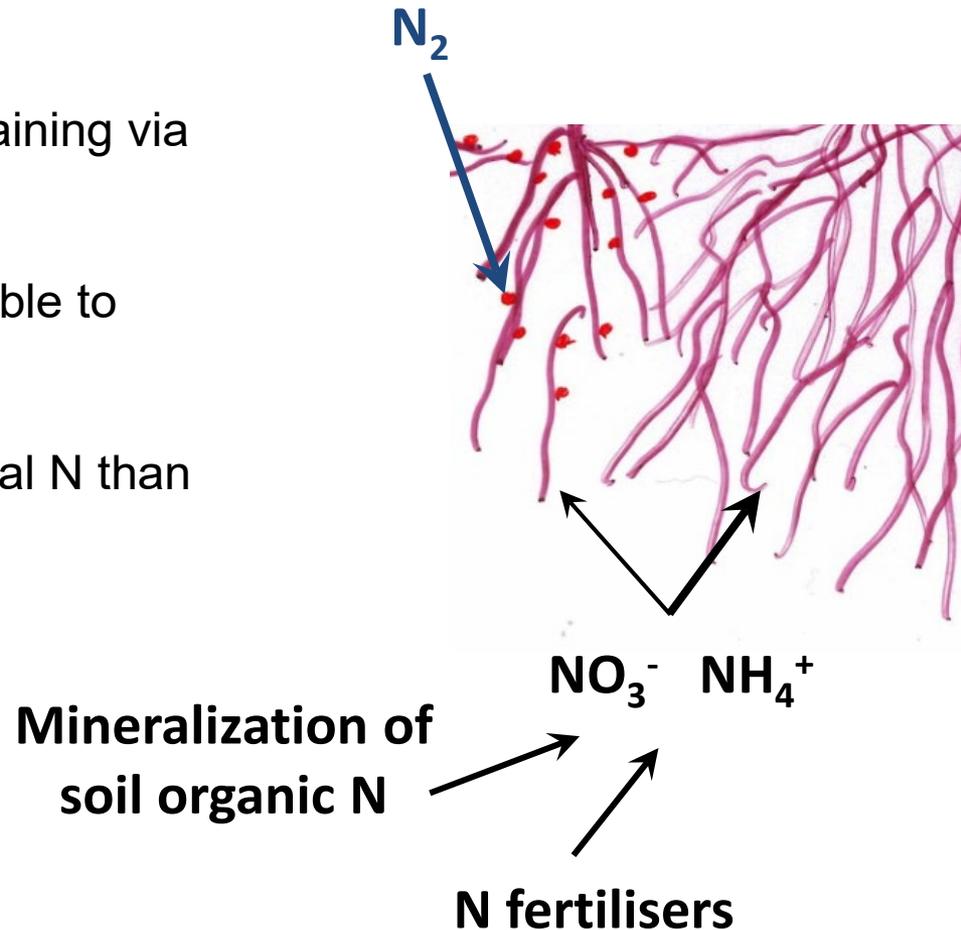
Solutions offered by intercropping

Efficient use of N

The legume is nearly self-sustaining via symbiotic N_2 fixation.

Relatively more soil N is available to the intercropped cereal.

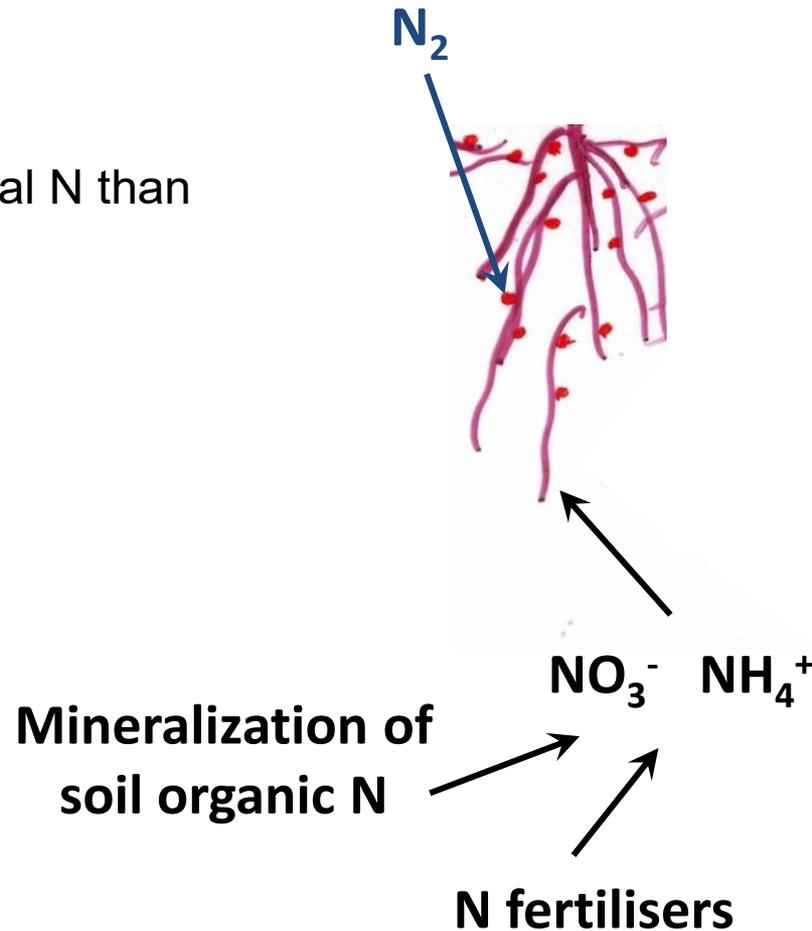
More efficient use of soil mineral N than in grain legume sole crops.



Solutions offered by intercropping

Efficient use of N

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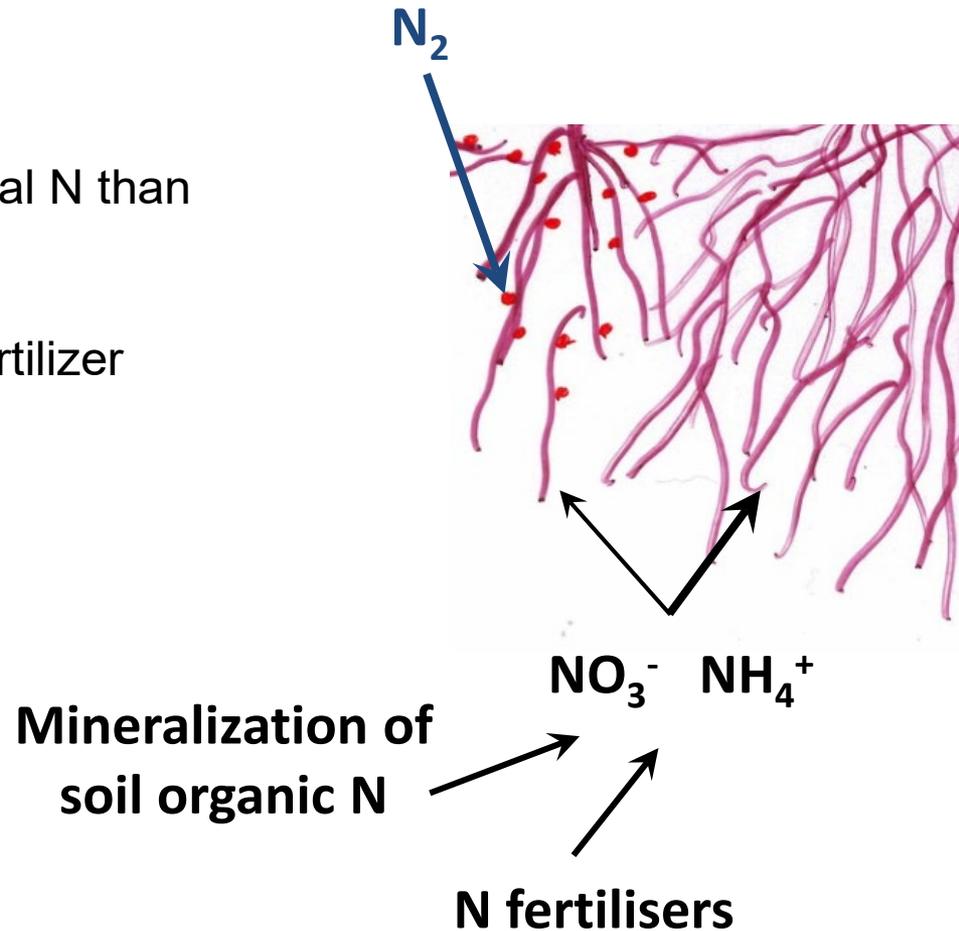


Solutions offered by intercropping

Efficient use of N

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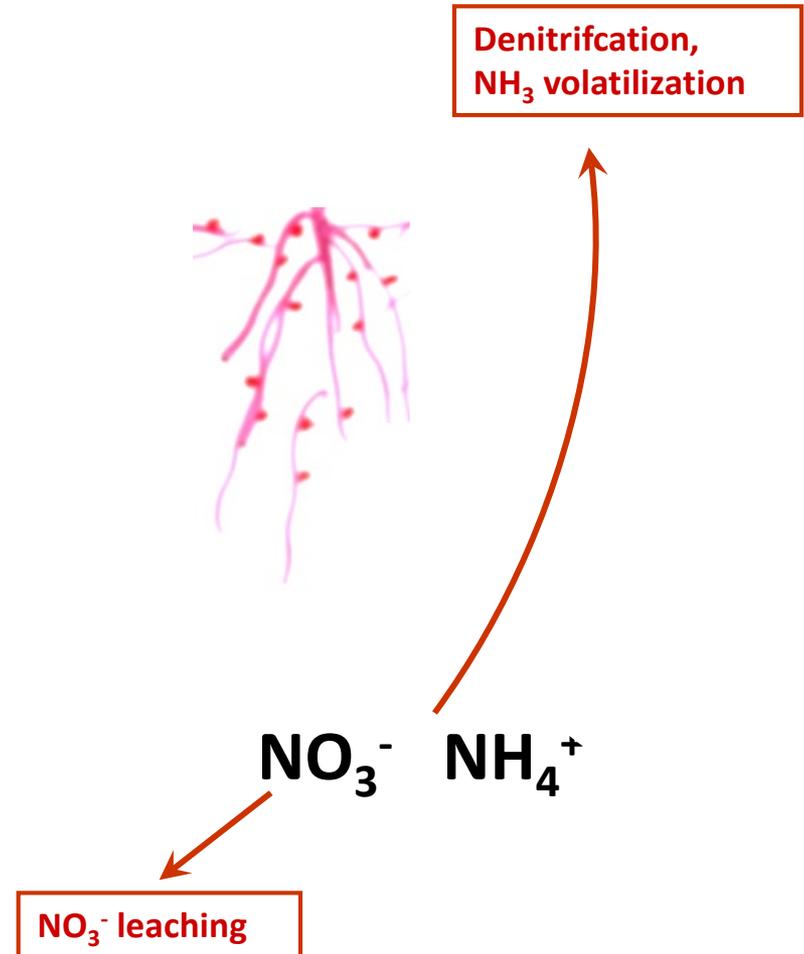
→ Large potential to save N fertilizer inputs



Solutions offered by intercropping

Efficient use of N

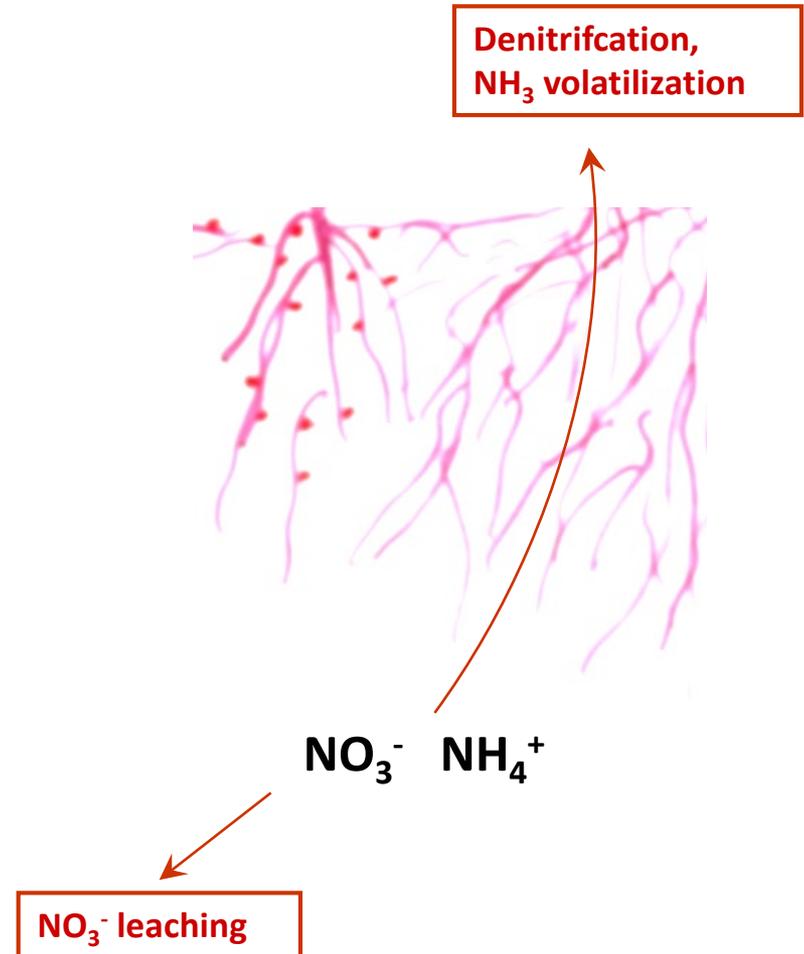
Reduced risk for N losses



Solutions offered by intercropping

Efficient use of N

Reduced risk for N losses



Recommendations

To realize the benefits of intercropping for reduced fertiliser inputs and losses, policies are needed to:

- Support research on management of intercrops to optimize the delivery of ecosystem services
- Improve the information about intercropping and associated benefits to *e.g.* farmers and advisors
- Directly support intercropping by targeted subsidies or incentives for reducing fertiliser inputs
- Indirectly promote intercropping through policies for crop diversification, in particular to increase the cultivation of grain legumes by intercropping

Thanks to the co-authors: Iman Raj Chongtham, Abco de Buck, Christine Watson.
Special thanks to Eric Justes and Ambra de Simone.

Thank you for your attention!



Faba bean-wheat intercrop. Photo: Georg Carlsson



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