



ecobreed
IMPROVING CROPS

**Increasing the efficiency and
competitiveness of organic crop breeding**

PRACTICE ABSTRACT No. 7

Cover crops: the potential for reducing pest and disease in potato (*Solanum tuberosum*)

The role of cover crops:

Cover crops have the potential to enable us to move towards more sustainable farming practices by:

- Reducing soil erosion and losses of P to water
- Reduced leaching of N to the environment and thereby increase the supply of N to the following crop
- Improving soil organic matter content, soil structure, soil health, water infiltration and nutrient retention/supply
- Reducing pest and disease levels

PROBLEMS

Potato growers have a clear reliance on the use of extended rotations, soil fumigants, and granular nematicides to control pests and disease but due to the increasing cost, reduced efficiency as well as the withdrawal of an increased number of active ingredients in recent years the use of cover crops has increasing potential.

SOLUTIONS

Cover crops are usually planted as a mixture of species including brassica, legume, and cereal species, whereby the synergistic effects of variation in above and below ground growth of individual species can be matched to their function. A number of cover crop species have been identified to have roles in the reduction of pest and disease in potato:

- Biofumigation crops like Indian mustard (*Brassica juncea*) and oil radish (*Raphanus sativus*) and their role in the control of potato cyst nematode (PCN) (Ngala, 2015).

- Sticky nightshade (*Solanum sisymbriifolium*) and black nightshade (*Solanum nigrum*) in the control of PCN (Ellis & Cook, 2016).
- Oilseed rape (*Brassica napus*) in the control of early blight (*Alternaria solani*) (Runno-Paurson et al., 2019).
- Mustard (*Brassica juncea*), Sudangrass (*Sorghum bicolor*), rye (*Secale cereale*), oilseed rape (*Brassica napus*) in the control of common scab and black scurf (Larkin et al., 2010; Larkin et al., 2014).
- Vetch (*Vicia sativa*) and brassica species in the control of *Rhizoctonia solani*.

Current research:

ECOBREED partners in the UK and Slovenia are currently evaluating the impact of a range of cover crop species, i.e. brown mustard (*Brassica juncea*), oil radish (*Raphanus sativus*), lucerne (*Medicago sativa*), black oat (*Avena strigosa*), vetch (*Vicia sativa*), and a mixture of all five species on the performance and pest and disease levels of 4 potato varieties.



Fig. 1: ECOBREED cover crop trials in Slovenia (green cover crops in autumn 2020 and over-wintering cover crops in spring 2022).

The knowledge arising from ECOBREED will assist farmers in selecting cover crop species with the potential to control pests and diseases in potato.

FURTHER INFORMATION

Ellis S & Cook S (2018). To investigate the potential of both native and non-native *Solanum* species as PCN trap crops. AHDB Reprt No. 2016/4. Available at [AHDB research reports | AHDB](#).

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Larkin RP & Halloran JM (2014). Management effects of disease-suppressive rotation crops on potato yield and soil-borne disease and their economic implications in potato production. *American Journal of Potato Research* 91 (5): 429–439. doi.org/10.1007/s12230-014-9366-z

Ngala BM, Haydock PJ, Woods S & Back MA (2015). Biofumigation with Brassica juncea, Raphanus sativus and Eruca sativa for the management of field populations of the potato cyst nematode Globodera pallida. Pest Management Science 71 (5): 759–769.

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ECOBREED CONSORTIUM



ABOUT ECOBREED:

ECOBREED is a 5-year (2018-2023) project funded by European Union's Horizon 2020 research and innovation programme that will improve the availability of varieties and seed suitable for organic and low-input production. Activities will focus on four crop species i.e. wheat, potato, soybean and common buckwheat, selected for their potential contribution to increasing the competitiveness of the organic sector.

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