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CASE STUDY 3

Use of crop diversification and trap crops in potato fields to reduce the incidence of cyst nematode, reduce nematicides and increase yield and soil biodiversity

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This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 817819

Introduction

The potatoes cultivation in the Lusitanean area is mainly threatened by the high incidence of cyst nematode which lead to important yield decreased, and hence, the high uses of nematicides to try to save crops. This high use of nematicides by farmers can be an important cost for potatoes production, contribute to soil and surrounding waters pollution and also to decrease soil biodiversity..

Objectives

1. Reduce the incidence of cyst nematode
2. Decrease the nematicide inputs
3. Increase crop yields
4. Increase soil biodiversity

State of the art

The potatoes cultivation in the area is highly intense in nematicides use and absence of developed rotations. Also the use of trap crops (Solanum sisymbriifolium) for pest control is very low developed.

Problems to solve

- Low below and aboveground biodiversity
- High incidence of cyst nematode
- Low yield
- High use of nematicides
- High production costs
- Soil and water pollution

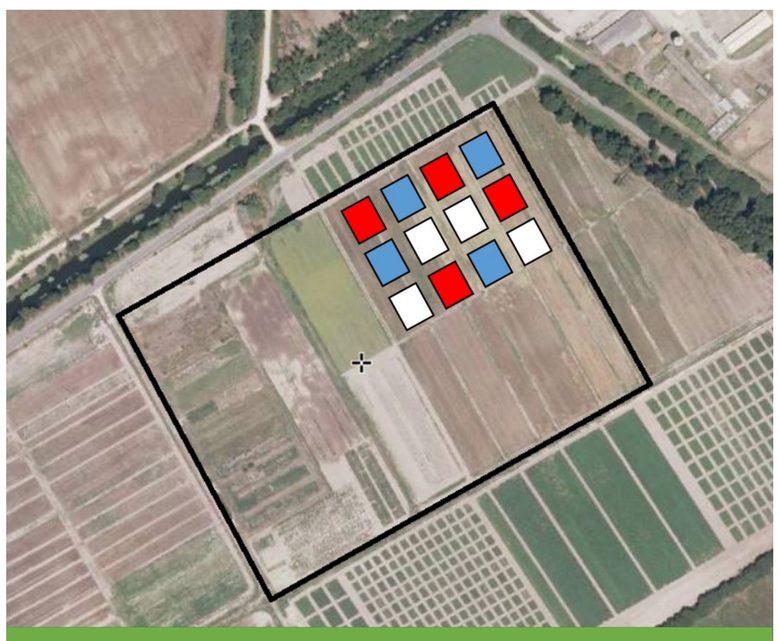
Proposed practices

We are testing the introduction of suitable crop rotations to increase the soil biodiversity and together with and adequate management of trap crops reduce the incidence of cyst nematodes for potatoes production. Finding adequate crop rotations and a suitable trap crop management, the soil biodiversity will be increased due to the existence of a higher plant diversity and reductions into pesticide use. The incidence of cyst nematode will be reduced without the employment of nematicides, decreasing the farm costs and increasing the crop yields.

The potential damages of nematicides on soil biodiversity will disappear together with a reduction on soil and water pollution. Moreover, the introduction of legumes in the crop rotation contribute to decreases in the N fertilization and trap crops burial will contribute to increase the C storage in soils.

- Pedoclimatic region: Lusitanean
- Country: Spain
- Location: Xinzo da Limia (Ourense, Galicia)

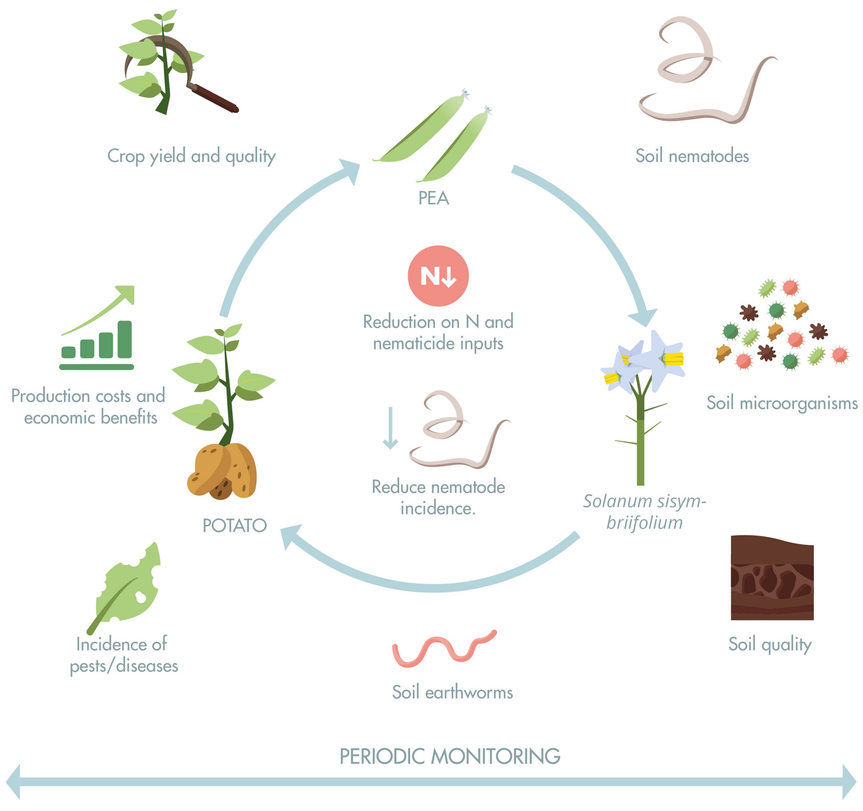
Experimental design and layout



- **CONTROL:** Conventional crop rotation: POT – CER – POT
- **Crop diversification**: CER – LEG – POT
- **Trap crop**: POT – TC – POT

POT: potatoes
CER: wheat
LEG: legumes (pea)
TC: trap crop

Crop rotation	Cycle 1	Cycle 2	Cycle 3
CONTROL	**Potatos**	**Cereal (wheat)**	**Potatos**
	MAY – SEP 21	OCT 21 – JUL 22	MAY – SEP 23
DIVERSIFICATION	**Cereal (wheat)**	**Leguminous (peas)**	**Potatos**
	ABR – JUL 21	ABR – JUL 22	MAY – SEP 23
TRAP CROP	**Potatos**	**Trap crop**	**Potatos**
	MAY – SEP 21	ABR – JUL 22	MAY – SEP 23



Analyses

- Environmental variables
- Crop growth
- Pests incidence
- Crop quality
- Crop nutritional evaluation
- Soil biodiversity
- Soil fertility
- Pollution extent

Preliminary results

During the first year, no relevant results were achieved. We have 2 potatoes treatments with equal management and the same production. Other treatment was with wheat.

No relevant results are expected until the end of the experiment.

Future perspectives

During 2022 crop cycle legumes and trap crop will be introduced.