

LUSITANEAN

RESPONSIBLE PARTNER

UVIGO, (Spain)

COORDINATION



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Objective

Potato and cereals are the most extensive crops cultivated at Lusitanian region. However, climatological and soil conditions disfavor their sustainable development. Potato crops are threatened by a high incidence of cyst nematode, the common scab and fungi attack, while cereal crops are also highly attacked by fungi. All these diseases make the need to apply great agrochemical amounts to control them. For instance, nematicides, fungicides and fertilizers are highly applied in the area. To control the common scab, potato cultivation is performed at $\text{pH} < 5$. That makes the P availability is very low despite high amount of P in soils. To solve this, P-fertilizers are added to the soil. In addition, the absence of proper rotations contributes to apply N-fertilizers in order to avoid nutrient deficiency in crops. All these issues make the area is highly polluted due to the application of great amount of inputs, both pesticides and fertilizers, contributing to water pollution and decrease soil biodiversity. Moreover, farmers are concern about profitability of crops, due to low potato values because of bad appearance, and expensive costs of inputs.

In SoildiverAgro, we aim to apply different management practices, pest alert systems and biotechnological products based on microorganisms to improve all those issues by reducing pest diseases, increasing nutrient availability to get a reduction of agricultural inputs, and to enhance soil biodiversity. All these challenges will be tested in SoildiverAgro in cooperation with local farmers and results could make the agriculture in Lusitanian region is more sustainable, profitable and environmental-friendly.

Stakeholders consultations



DISCUSSION GROUP

📅 11.03.2020 | Xinzo de Limia, Spain

Implementation of possible more sustainable agricultural management practices

39 PARTICIPANTS: Farmers, researchers, agribusiness, policymakers, industry advisors



REGIONAL MEETING

📅 18.11.2020 | Galiza, Spain (Online)

Presentation of SoildiverAgro project, current status of SoildiverAgro and presentation of Lusitanean case studies and discussion

22 PARTICIPANTS: Farmers, researchers, agribusiness, policymakers, industry advisors



FIELD DAYS

To be confirmed



TRAINING DAYS

To be confirmed



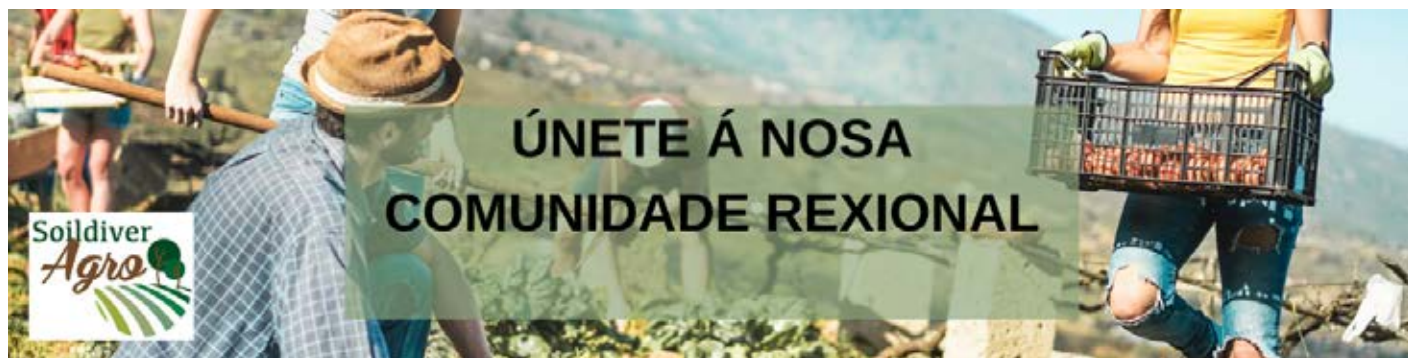
OTHERS


To be confirmed



NEXT STEPS

A minimum of 2 field days per year will be organised to inform and consult stakeholders and everybody interested.





CASE STUDY 3

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

OBJECTIVE

The objective of this case study is to reduce the incidence of cyst nematodes in potatoes crops, the use of nematicides and increase the crops yields and soil biodiversity.

PROPOSED PRACTICES

We will introduce 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.

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 and many complications must be solved before trap crops use, specially the adequate conditions for the trap crops germination.

PROGRESS WITH THE CASE STUDY IN
RELATION WITH THE STATE OF THE ART

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.

PROBLEM TO SOLVE

The potatoes cultivation in the 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.



CROPS



LOCATION

Sandiás (Spain)

PARTNERS

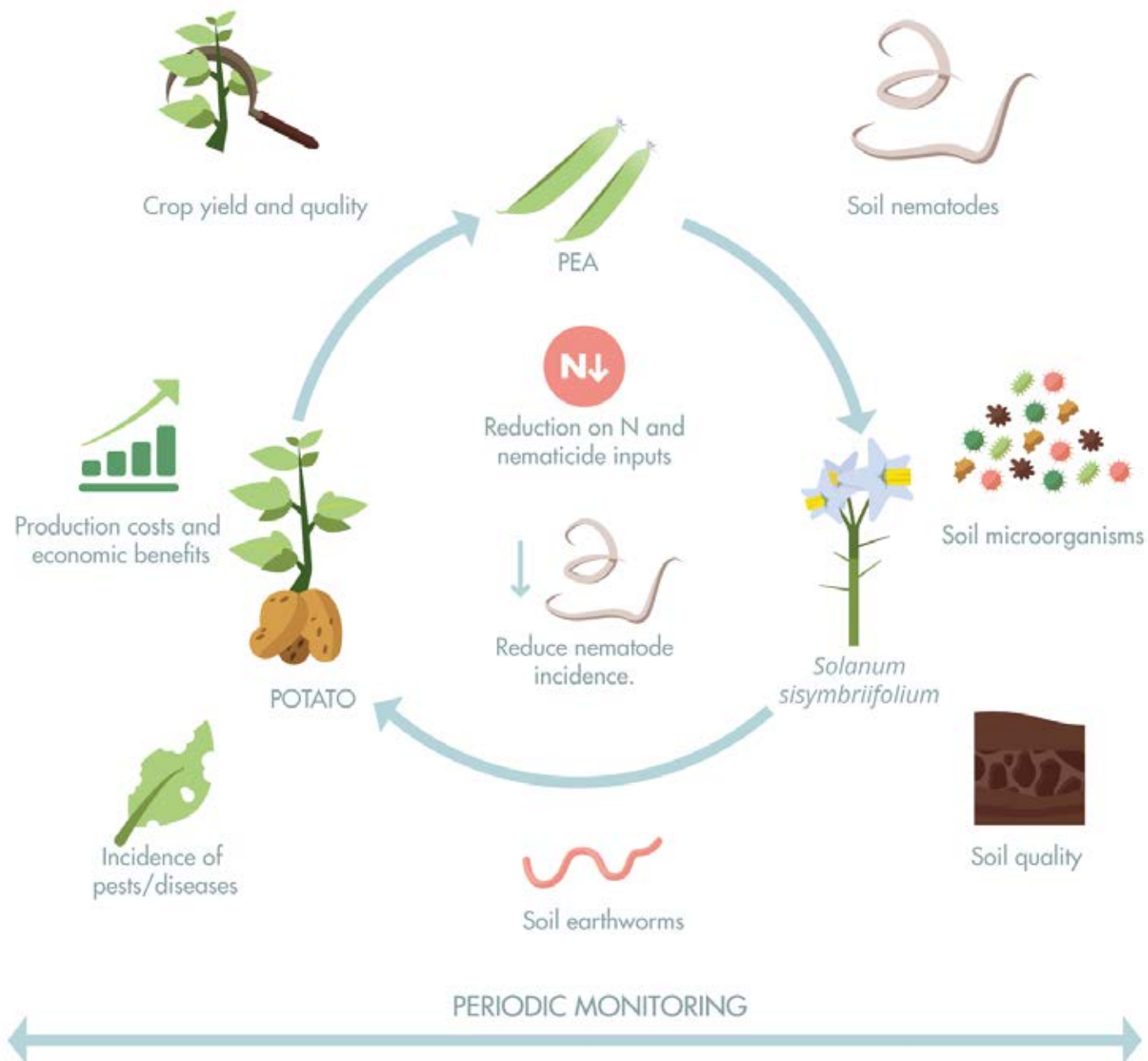
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INORDE

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CROPPING SYSTEMS

Crop diversification and trap crop.



→ Infographic for case
study 3 made by UVIGO



CASE STUDY 4

Use of mycorrhiza in potato fields to reduce the incidence of common scab, decrease the use of phosphorus fertilizers, increase the crop yields and increase the soil biodiversity.



OBJECTIVE

The objective of this case study is to reduce the common scab incidence in potatoes crops, decrease P fertilization, allow potatoes cultivation at higher pH, and hence increase the crops yields and soil biodiversity.

PROPOSED PRACTICES

We will introduce mycorrhiza associated to potatoes crop to plant protection against common scab and increase P uptake by plants. Also we will perform soil sampling and establish the trap cultures to isolate the native AMF species from the target field sites.

STATE OF THE ART

The use of mycorrhiza associated to potatoes cultivation in the area was negligible and research on native mycorrhiza to be used for potatoes production increases and protection against diseases was not performed yet.

PROGRESS WITH THE CASE STUDY IN RELATION WITH THE STATE OF THE ART

An adequate potatoes colonization by mycorrhiza will protect crops against common scab, provide a better P nutrition, and allow cultivation at higher soil pH. Therefore, production and value will increased, P inputs decreased and soil biodiversity increased.

PROBLEM TO SOLVE

The potatoes cultivation must be performed in very acid conditions (pH <5.0) to avoid the common scab disease due to the high organic matter contents in the soils. Under these conditions, P availability is very low and despite the presence of high amounts of phosphorus in the soils, the farmers in the area use big amounts of P fertilizers annually. Also in very acid soils the diversity of microorganisms and soil fauna is generally low. The common scab caused bad appearance in potatoes, and hence they can be only used for industrial uses, not for direct commercialization, decreasing the potatoes value.



CROPS



LOCATION

Xinzo da Limia (Spain)

PARTNERS

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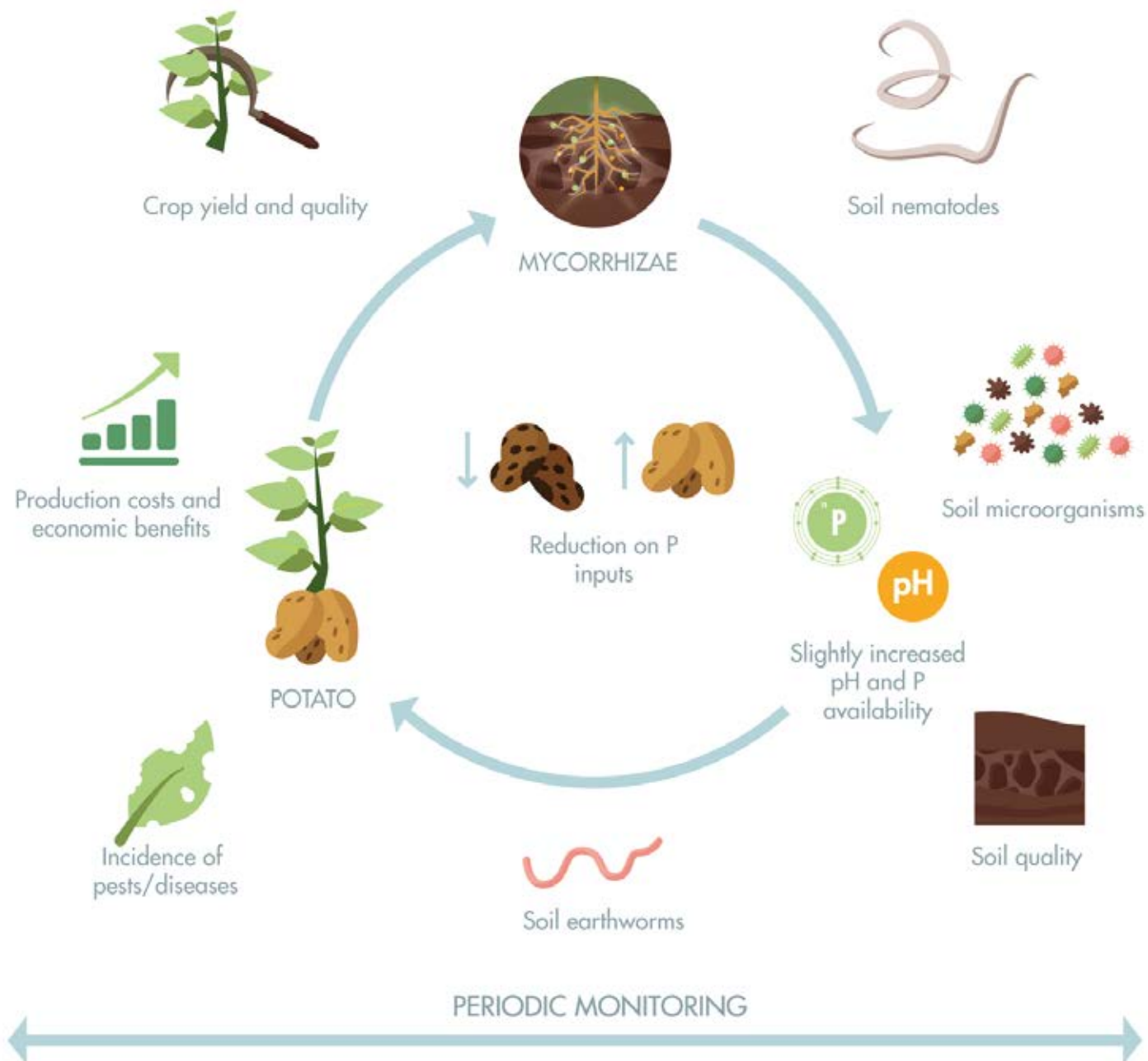
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SYMBIOM

CROPPING SYSTEMS

Use of mycorrhiza.



→ Infographic for case
study 4 made by UVIGO



CASE STUDY 5

Implementation of the Decision Support Systems (pest alert system) to reduce the use of fungicides in potato and wheat crops and their impact in biodiversity.



OBJECTIVE

The objective of this case study is the reduction of the use of these fungicide treatments, improving the forecast of the risk of the disease.

PROPOSED PRACTICES

The proposal will consider phenology, aerobiological data and meteorology to obtain the best decision support systems to the management of some potato and cereal fungal diseases.

STATE OF THE ART

The use of fungicides is often with a schedule calendar, which marks the onset of the first application and the frequency of the consecutive ones, applied independently of the risk of infection. This system allows farmers an inadequate control of the disease with great weaknesses. Mainly the economic cost of acquiring and applying these treatments and the negative and costly environmental footprint in water, soil, and air and as a consequence in biodiversity.

PROGRESS WITH THE CASE STUDY IN RELATION WITH THE STATE OF THE ART

An efficient forecast of the risk of infection by a pathogen in a crop is indispensable for a sustainable use of the agricultural systems. This help farms to save production costs, decrease fungicides and fuel consumption, reduce soil and surrounding water pollution and increase soil biodiversity.

PROBLEM TO SOLVE

The environmental conditions of this region favors the attack of fungi to potatoes and cereal crops. The control of these plant diseases is based mainly on the application of high amounts preventive fungicide treatments. The high amounts of fungicide treatments require an important number of machinery passes on field contributing to soil compaction and together with fungicides to decreases in soil biodiversity.



CROPS



LOCATION

Sandiás (Spain)

PARTNERS

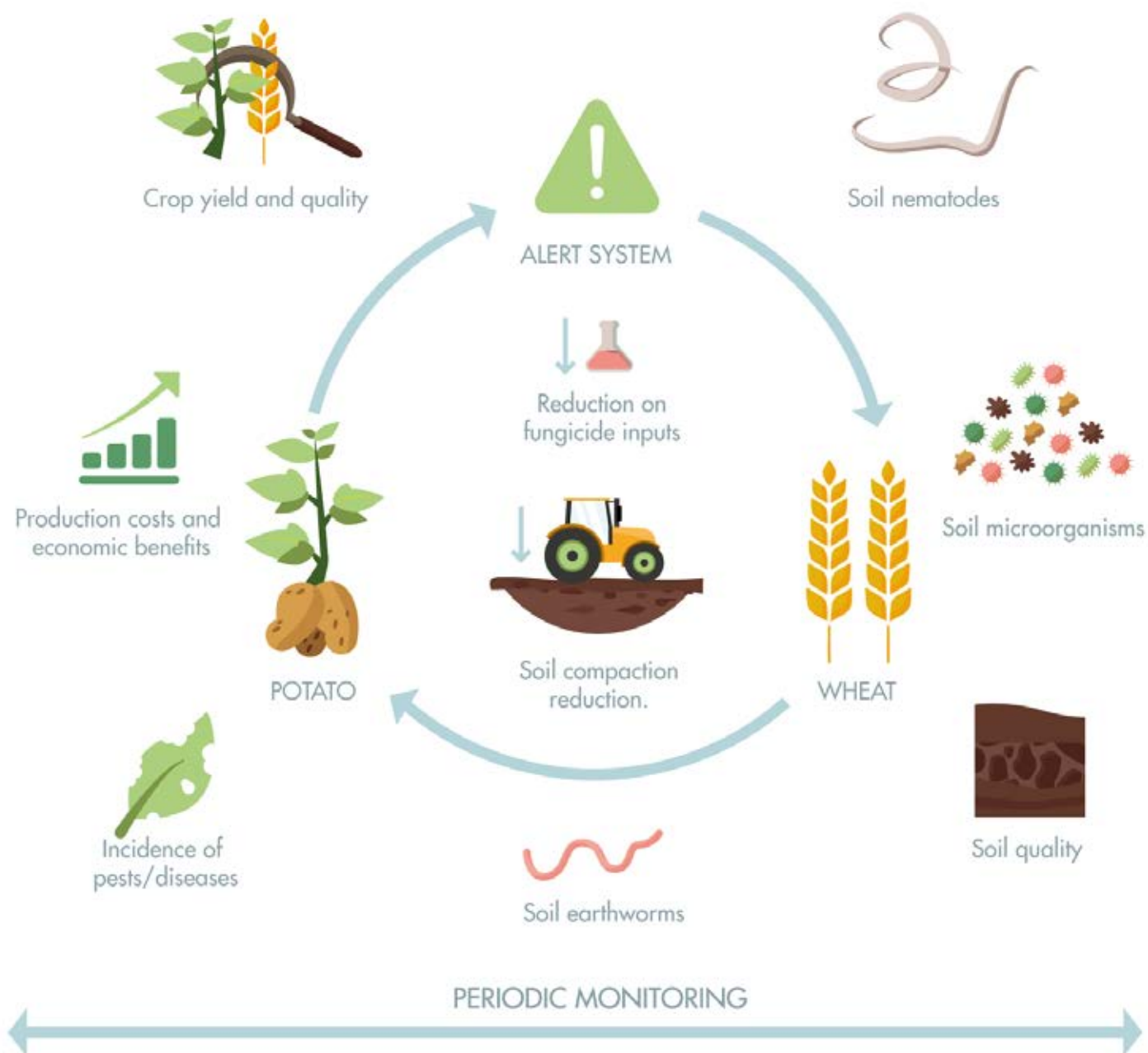
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CROPPING SYSTEMS

Pest Alert System



→ Infographic for case
study 5 made by UVIGO

