Work Package 2: Decision Support

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- Potato cyst nematodes or PCN are an important pest of potato crops and across Europe, PCN reduces potato yields and quality.
- In Scotland, the PCN infested land area is doubling every 7 years[1].
- This is occurring while the options for controlling them are decreasing.
- Resistant varieties limit PCN multiplication, but these can lack other marketable benefits therefore growers can be reluctant to grow them.
- The effectiveness of approaches such as trap cropping and biofumigation in Scotland is not yet fully understood and therefore not widely used.
- A PCN Decision Support System would indicate what options are available to growers and other industry stakeholders for controlling PCN and their potential costs and impact.

Figure 1: PCN cysts on potato roots (courtesy of Scottish Agronomy Ltd)

Aim
To develop a PCN Decision Support System.

Decision Support Systems (DSS) are Integrated Pest Management (IPM) tools that growers use to support decision making. This Work Package will create a digital platform to support decision making activities using analysed data from growers and other sources.

This will benefit the potato industry by:

- Helping growers, agronomists and landowners make informed decisions on the best ways to manage PCN.
- Providing different options specific to their situation.
- Reducing risks by highlighting the implications of different approaches.

How will the DSS work?

The PCN DSS will be built on UK data and initially based on the AHDB PCN calculator, but with improved functionality. Some features of NemaDecide, a DSS developed in the Netherlands for Dutch potato growers, will be incorporated if appropriate.

NemaDecide currently includes:
- A large variety database
- Cost benefit analysis for different scenarios
- Control of different nematodes species
- A geographic interface to display exactly where nematode infestations are within fields, enabling precision farming techniques to be used.

NemaDecide is not appropriate for Scottish growers because it is based on Dutch growing conditions and control methods which may not be effective or available in the UK.
In developing a DSS for use in Scotland, the opportunity to link to the SASA SPUDs database and Hutton-hosted soils database will be explored.

The DSS would be available to all and is being created with end-users in mind. The development programme includes early testing with potato growers. It is intended to be beneficial to different user groups, such as those where PCN has not yet been detected who can use the tool to mitigate against the risk of PCN becoming a problem, and for those with PCN who are looking to understand the effect of different management strategies.

Figure 2: An agronomist and grower discussing PCN in a potato field.

So far…

A desk study has been undertaken to review the AHDB PCN calculator and to assess the extent of new data that has become available since its development.

A survey of growers and agronomists was conducted, and the results will be used to help determine what attributes the sector wants from a DSS.

A group of experts and industry representatives has reviewed the baseline parameters for the development of a new tool.
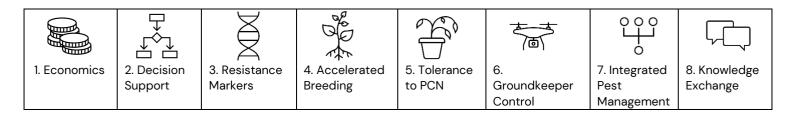
The findings and results of the other packages of work within this project will be used and included within the DSS.

Figure 3: Seed potatoes on the roller table for grading.

Work Package Success

1. Gather data which will be incorporated into a PCN Decision Support System for the potato industry.
2. Development of an accessible, specific and up-to-date tool that is used for PCN-related decision making by identifying different options and outlining their implications.
3. Use feedback from growers and other industry stakeholders to enhance and improve the PCN DSS, ensuring the effectiveness and relevance of the tool.

1. Economics	2. Decision Support	3. Resistance Markers	4. Accelerated Breeding	5. Tolerance to PCN	6. Groundkeeper Control	7. Integrated Pest Management	8. Knowledge Exchange

More information and factsheets about each work package can be found on **pcnhub.ac.uk**