

SCOPING STUDY FOR SOIL BORNE PATHOGENS

A new study funded through Hort Innovation will review the feasibility of a national plan ensuring Australian farmers are on the front foot when it comes to risks from exotic pathogens. **By Paulette Baumgartl**

As an island, Australia has always enjoyed an advantage when it comes to managing biosecurity. Examples are the new, aggressive "A1" strains and sexual "A2" strains of late blight, found in almost every potato growing country of the world but still absent from Australia.

However, globalisation of trade by both air and sea, and the movement of large numbers of people, have increased risk. Added to this is the impact of climate change, which could extend the habitat range of some pathogens.

Nevertheless, Australia remains free of many important plant pathogens. Maintaining this good fortune is critical for continued and profitable market access.

Dr Sophia Callaghan from NSW Department of Primary Industries

provided an overview of this new study (*MT21016, Feasibility/scoping study: Surveillance and diagnostic framework for detecting soil-borne pathogens in vegetable industries*) as part of the 2022 R&D forum, emphasising the importance of quick detection.

"If we cannot prevent the arrival of exotic pathogens, then early detection is our best defence," Dr Callaghan said.

"Early detection, before a crop shows any symptoms, is our greatest chance of containing and eradicating new pests."

The challenge here is that more often than not, pathogens are only detected once a plant starts showing signs of disease. Pathogens may be there long before symptoms manifest. They may be present in soil or in otherwise

GROWER ENGAGEMENT

There is more to this project than sifting through the literature!

The project team is eager to initiate as many conversations as possible with stakeholders, including growers, agronomists, and industry.

They want to know:

- Do you perform any surveillance/crop monitoring on your farm?
- Do you test soil for chemical, physical or biological properties?
- What are your thoughts on a national surveillance scheme for exotic pathogens?

If you have any thoughts, or would like more information on the project, please contact:

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asymptomatic plants (known as sub-clinical).

Through systematic soil sampling, Dr Callaghan believes it might be possible to avoid disease spread.

A nation-wide soil testing program is an ambitious undertaking and there are many considerations.

This 12-month project will explore the feasibility of a national surveillance and diagnostic framework for detecting exotic soil-borne pathogens – including fungi, oomycetes, bacteria, viruses, and nematodes – in the potato, melon, onion, and vegetable industries.

Activity 1 of the study is to determine the best methods for soil sampling and diagnostics for early detection. As part of this activity, the team plans to

update and extend the lists of exotic pathogen threats, including a review of international literature on new and emerging pathogens.

A critical review of current soil tests used to detect pathogens, from traditional to molecular, and novel technologies is also a priority.

“Australia is a huge country, so understanding how this approach could work at scale will be a major factor in determining its feasibility,” Dr Callaghan said.

“Investigating how this could work in practice, as part of a nationally consistent framework for soil surveillance and diagnostics, is our focus for Activity 2.”

“Any surveillance program needs to be practical at scale, while also

being comprehensive enough to be meaningful,” Dr Callaghan added.

The team will look to national and international industries for examples of successful surveillance programs, as well as opportunities to leverage existing infrastructure.

Dr Callaghan emphasised the need for the program to make sense economically, which means making the most of any systems already in place and ensuring any program passes a cost benefit analysis.

Finally, the project team will summarise any gaps in Australia’s knowledge capability and identify priorities for R&D investment.

Watch for future updates on the project through the PotatoLink bulletins and this magazine.



Left. Root knot nematode (*Meloidogyne enterolobii*) has an extensive host range, including potatoes. Source: Wikipedia



Below left: Oomycetes are a group of several hundred organisms that include some of the most devastating plant pathogens. Source: <https://www.apsnet.org>

Below right. Potato infected with late blight pathogen. Source: Dolf de Boer



MT21016 - Feasibility/scoping study: Surveillance and diagnostic framework for detecting soil-borne pathogens in vegetable industries has been funded by Hort Innovation, using the Melon, Onion, Potato - Fresh, Potato - Processing, Sweetpotato and Vegetable Funds with contributions from the Australian Government. Hort Innovation is the grower owned, not-for-profit research and development corporation for Australian horticulture.

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