

Helping plants to help themselves

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PhD topic: Manipulating plant defences for improved control of diseases caused by plasmodiophorids

PhD candidate: Loreto Hernandez

Where: Bio-Protection Research Centre at Lincoln University

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When plants are attacked by diseases, they don't just lie down and die...although sometimes it may seem that way.

PhD researcher Loreto Hernandez is investigating the way plants fight back. Her research is focused on two closely related pathogens: *Spongospora subterranea*, which causes powdery scab in potatoes, and *Plasmodiophora brassicae*, which causes clubroot in brassicas.

Loreto explains that plants attacked by pathogens may develop immune responses at the site of attack, but may also display a range of plant-wide responses known as systemic acquired resistance (SAR).

“SAR is the result of complex interactions between the plant and its invader, but it can also be triggered artificially by specific chemicals called elicitors. I want to know if it is possible to use these elicitors as tools to improve natural defence systems in valuable crop plants.”

Loreto used an elicitor called BABA to induce systemic resistance in potato plants. She has shown that infection by the powdery scab pathogen was greatly reduced in treated plants compared with untreated ones. She has found that several applications of BABA during the life of treated potato plants improved disease control.

She now plans to look more closely at the underlying biochemical mechanisms that are triggered in response to BABA so that she can explain how this elicitor reduces levels of *S. subterranea* infection of potato roots.

To accurately measure infection levels, Loreto has developed new diagnostic tools to quantify the levels of the powdery scab pathogen in the roots of potato plants. This work was presented at a potato disease workshop and in a poster at the Australasian Plant Pathology Society Conference in Darwin in April.



