VG16078 – Soil Wealth ICP Phase 2

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Facilitators

Project VG16078 is being led by Dr Gordon Rogers from Applied Horticultural Research and Anne-Maree Boland from RM Consulting Group.

Introduction

Soil Wealth and Integrated Crop Protection (ICP) is a national extension project aimed at communicating the latest findings from soil and plant health management studies being undertaken in Australia and throughout the world to growers and advisors.

Phase 1 of the project ran from 2014 to 2017, succeeding far beyond what was anticipated, according to Dr Gordon Rogers from Applied Horticultural Research (AHR).

"At the start of the project, we aimed to connect with 200 growers as well as about 50 per cent of advisors in the industry. Three years in, we had connected with around 2,000 growers and reached 50 per cent of advisors," he said.

Phase 2 of the project began in 2017 and will run until 2022, continuing to provide relevant and accessible information about soil management and crop protection research to the Australian vegetable industry.

About the project

Like Phase 1, the second phase of the project will use a wide variety of extension methods to communicate key research findings to the industry. Methods include demonstration sites, guides and fact sheets, webinars, podcasts, field days and farm walks, workshops and seminars, master classes, videos and social media.

"It's a really unique approach, combining traditional extension methods with newer methods that make use of electronic platforms," RM Consulting Group's Carl Larsen said.

While the methods of communication have largely remained the same, Phase 2 has responded to the increasing economic, consumer, environmental and technological demands on vegetable producers, and is guided by the challenges the industry is currently facing.

"Growers wanted a more system-based approach that didn't look at issues in isolation," Mr Larsen explained.

"For that reason, we've broadened our focus topics to include things like nutrition management, irrigation and equipment, because they're all linked to soil and plant health.

"There are a number of new activities underway during Phase 2. These include the broadening of the master classes to cover crop nutrition, as well as global scans and reviews that bring the latest research from overseas and apply it through the lens of Australian farming. Some recent scans have covered weed technology, as well as recycled organics."

The project is also focusing on new developments in technological fields, such as the use of drones, satellite data and robots, as well as innovations in soil and crop health management and ways to improve sustainability and the robustness of vegetable farming systems, especially under adverse conditions that result from increased climate variability and extreme weather events.

Major findings

Throughout Phase 1 and into Phase 2, the team has been monitoring the impact the project is having on the industry through a Project Reference Group, which meets regularly throughout the year, as well as feedback from the demonstration site growers and their agronomists.

"The feedback from the vegetable industry has been strong and positive, with 25 per cent of the industry engaged directly and 80 per cent of those reporting that they have been able to make better-informed decisions as a result of the project in its first three years."
Mr Larsen said.

"The demonstration sites have showcased everything from cover crops, reduced tillage and compost, through to Integrated Pest Management, weeds and soilborne disease management to allow growers to see research in practice."

The strength of the Soil Wealth and ICP delivery model lies in its partnerships, Mr Larsen noted.

"This includes partnerships with demonstration site growers, all the way to value chain participants. AHR and RM Consulting Group continue to work in partnership to provide an integrated service to the industry around Australia."

Conclusion

Growers, advisors and other industry service providers are encouraged to get involved and stay connected to the project, which will keep them informed of the latest findings and ensure they are ready to adopt any new technologies and innovations that are supported by research.

Mr Larsen advised that there are many ways for growers to get involved with the project.

"Attend one of our many events around the country, which include farm walks at the regional demonstration sites, as well as taking advantage of our master classes, webinars and other workshops and forums," he said.

"You can also sign up for our monthly e-newsletter, the Bulletin, on our project website or join the Partnership Network – another new initiative developed under Phase 2 – which connects growers and service providers.

"Stay connected through social media for all the latest news, updates and resources."

Buckwheat cover crop in East Gippsland. Images courtesy of Applied Horticultural Research.

Dr Len Tesoriero from Applied Horticultural Research and grower Val Micallef inspecting diseased foliage.

Further information

For more information, please contact Dr Gordon Rogers on 02 8627 1040 or gordon@ahr.com.au; Dr Anne-Maree Boland on 03 9882 2670 or anne-mareeb@rmcg.com.au; or Carl Larsen on 0419 622 393 or carll@rmcg.com.au. Resources, news and details about events can be found at soilwealth.com.au, and you can follow the project on Twitter: @SoilWealth and @ProtectingCrops and on Facebook by searching 'Soil Wealth and ICP'.

VG00048 – Development of Biological Controls for Sclerotinia Diseases of Horticultural Crops in Australia

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Facilitators

Project VG00048 was undertaken by the Department of Primary Industries, Victoria (now known as Agriculture Victoria within the Department of Jobs, Precincts and Regions).

Introduction

Sclerotinia diseases cause significant losses of horticultural crops, such as lettuce, beans, carrots, crucifers, peas and others. These losses have been particularly visible in regions where lettuce (or other crops) are sown every year. In some regions of Victoria and Tasmania, growers have, at times, reported losses as high as 10 to 45 per cent due to Sclerotinia lettuce drop (SLD), despite the widespread use of fungicide sprays.

These issues can be the result of intensive cropping on farms along with narrow rotation of crops that are susceptible to Sclerotinia, as these practices lead to a build-up of disease and sclerotia (the part of a pathogen that causes disease) in the soil.

As well as the devastating consequences of crop losses for growers, concerns for the industry have included the potential consequences of inconsistent chemical control and fungicide residues.

About the project

Completed in 2004, Project VG00048 examined the effectiveness of well-developed biological control agents (BCAs) for reducing inoculum and controlling disease. Because lettuce is the crop that is most susceptible to Sclerotinia, the researchers used it as a model for evaluating various biological and fungicide alternatives, and compared a range of application methods.

The overall aim of the project was to provide growers with new options for more sustainable and effective control of Sclerotinia diseases and to inform them of the most appropriate use of fungicide treatments to control disease on their farms.

A range of BCAs were evaluated for their potential to reduce inoculum in soil and control SLD. Several of these contained isolates of *Trichoderma* spp.

Different methods for delivering the BCAs into a lettuce cropping system were examined in glasshouse, nursery and field experiments, and the effectiveness of the biocontrol treatments was investigated in 12 field trials across Victoria and Tasmania over several growing seasons and at sites with different disease pressures.

Also investigated was strategic (plant-targeted) application of fungicides for improving SLD control, along with the effectiveness of the then-new fungicide BAS 510 (Boscalid).

Researchers rounded off their investigations by also examining soil amendment strategies and green manure crops for use in Sclerotinia control.

Major findings

At the conclusion of the project, several major findings had been made.

The treatment of seedling growing mixes in nurseries was the most effective method for delivering *Trichoderma* biocontrol agents into a seedling transplant system. Two commercial composted pine bark mixes were identified as suitable substrates to incorporate *Trichoderma*.

Despite these findings in the nurseries, biocontrol treatments did not give the same consistent and effective control of SLD in the field as fungicide treatments, and were not effective in reducing inoculum in the soil. This was due to the inability of BCAs to establish in soil at high enough levels. The researchers concluded that a better understanding of the compatibility of BCAs with farm practices and soil characteristics is required to improve the efficacy of biological treatments in the field.

The investigation into the effectiveness of strategic application of fungicides had a successful outcome, with control of SLD found to be improved on farms by 80 to 90 per cent with the strategic (plant-targeted) application of procymidone (sold as Sumisclex™ and Fortress™) sprays.

The fungicide BAS 510 was shown to be as effective as procymidone in controlling SLD and white bean mould. The researchers advised that BAS 510 had the potential to replace or be used in alternation with procymidone and this is now registered as Filan® (boscalid) for control of Sclerotinia (and other diseases) on a range of horticultural crops in Australia.

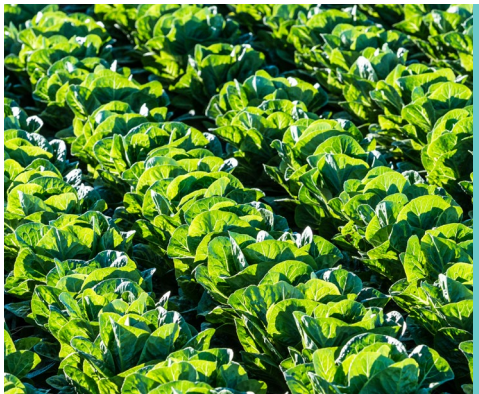
The effectiveness of the green manure crop BQ-Mulch was investigated in Tasmania and was found to reduce Sclerotinia disease when used in rotation with lettuce. It does this by suppressing infection and improving soil characteristics.

Finally, it was found that the architecture of plants was closely associated with susceptibility to Sclerotinia infection. Young seedlings of onions, beets and spinach, which have upright foliage, are less susceptible and can therefore be selected for crop rotations in high Sclerotinia pressure sites.

Conclusion

The project showed that control of SLD in farms can be improved with a variety of methods, including the improved application and timing of the fungicides procymidone and the use of the then new fungicide BAS 510 (Filan), the use of green manure crops in rotations, and the selection of crops that are less susceptible to Sclerotinia infection in rotations with lettuce at high disease pressure sites.

Researchers advised an integrated disease management strategy, which combines these methods, as the most effective control of SLD in farms.



Further information

The final report for this project is available on InfoVeg. Readers can search 'VG00048' on the InfoVeg database: ausveg.com.au/infoveg/infoveg-database.