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New research untangling the nematode knot

Following the removal of chemical nematicide products from the market in recent years due to concerns about toxicity impacting on human and environmental health, the agricultural industry and in particular the sweet potato industry has become increasingly threatened by the invasion of the root-knot nematode (RKN).

The worm-like parasite found in the soil is estimated to cause more than \$100 million in losses per annum losses to the Australian agricultural industry.

The urgent need for growers to access effective and reliable treatment to combat this costly challenge has led CQUniversity researcher Dr Yujuan 'Jady' Li to collaborate with the Queensland Department of Agriculture and Fisheries and Australian Sweetpotato Growers to determine new insights into control methods.

Dr Li, who has also worked with industry bodies including Syngenta, Organic Crop Protectants and Bio John Rural, has been leading three research projects regarding the RKN management in vegetables. The research has assessed the effectiveness of alternative management practices including the use of fungal biocontrol agents to control root-knot nematodes in both sweetpotato and ginger crops.

The products trialled included three chemicals, Tervigo, Vydate and Nimitz; and two organic products, Nemguard and Compost-Aid applied with Soil-Set.

The crop was harvested and assessed for nematode damage at 160 days after planting of the Orleans variety of sweet potato.

The results of the six month trial have presented a complex picture of the variability faced by producers when determining the most suitable control product for their crop, with the effectiveness of the chemical products varying based on the preplanting density of RKN..

"Of the three chemicals, Nimitz provided the highest and most consistent control in this trial, followed by Vydate and Tervigo respectively," Dr. Li said.

"Compared to the chemical products, the effectiveness of both organic products was lower regardless of nematode numbers."

Sweet potato growers have been eager for new insights with more than 50 Bundaberg-region growers, as well as state and national industry representatives recently turning out to inspect the progress of the collaborative trial between CQUniversity and the Department of Agriculture and Fisheries.

Key Points

Description: The research is trialling new control methods of the highly damaging root-knot nematode in sweet potato and ginger crops by surveying the presence of different plant-parasitic nematode species in sweet potato growing areas and assessing the effectiveness of alternative management practices including the use of fungal applications.

Partners: Co-funded by the Department of Agriculture and Fisheries. Dr Li has also collaborated with CQUniversity research student Upamali Peiris and technician Karli Groves, Australian Sweetpotato Growers Association, Syngenta, Organic Crop Protectants and Bio John Rural.

Impact: The critical review on the effectiveness of control methods has produced a complex picture of the variability faced by producers when determining the most suitable control product for their crops. The research is the first step in providing growers with a wider range of options however more research is needed to determine the causes of such variability in product performance.



With limited nematology expertise in Australia, the research collaboration between Dr Li and key industry partners is of vital importance to Queensland's \$2.4 billion horticulture sector.

"As root-knot nematodes have such a wide range of hosts, finding an effective treatment has the potential to have a big benefit, not only for sweet potato and ginger growers, but for the whole horticultural industry," she said.

Dr Li said this trial was the first step in providing growers with a variety of crop protection options to control the damage of RKN but the results are indicative of the need for further research.

"The results of this trial will help to guide growers in their search for nematode protection, however more research will be required to provide understanding into the causes of such variability in product performance."

The next stage of the research will investigate the causes of this variability, with further products and applications rates to be tested before best practice recommendations can be made to growers.

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