

Fight against Golden nematode intensifies in U.S.

Potatoes

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Golden nematode cysts.

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New York's Cornell University has received a USD\$1.2 million boost as it ramps up its battle against a major potato pest.

First detected in 1941, Golden nematode is only present in New York State - in fields on Long Island and in upstate New York. It is currently quarantined to eight counties. Cornell University, the US Department of Agriculture's (USDA) Animal and Plant Health Inspection Service and Agricultural Research Service, in addition to the New York Department of Agriculture and Markets have managed to contain the pest to about 6,000 acres.

Dr Walter De Jong, Associate Professor in Plant Breeding and Genetics at Cornell University, is involved in breeding Golden nematode resistant varieties of potato. Dr De Jong explained what work is being undertaken at the Federal Golden Nematode Lab at the university.

"Golden nematode research at Cornell has two components: basic research into Golden nematode, conducted by USDA scientist Dr Xiaohong Wang, and breeding Golden nematode resistant varieties, which is done by me," he said.

"The two intersect in that Dr Wang's lab tests potatoes from my breeding program to determine which are resistant.

"For the past few decades, almost every potato variety Cornell has released has been Golden

nematode resistant. It's a high priority trait for us."

Cornell's Federal Golden Nematode Lab is the only research program in the US with expertise in the biology, resistance breeding and management of Potato cyst nematodes.

The state funding grant, announced on 14 October 2016, will be used to repurpose an existing lab to make it suitable for Golden nematode research.

Control Strategies

Dr De Jong said the spread of Golden nematode in New York has been negligible for many decades.

"This is largely because so much effort is put into controlling it," he said.

"There are two aspects of control: growers with infested land are required to grow resistant varieties (if they want to grow potatoes), and the Federal Government washes (at no cost to the grower) all equipment leaving infested fields. The Federal Government also takes soil samples from many fields each year to make sure no new spread has occurred."

Meanwhile Dr Wang is working to understand, at a molecular level, how Golden nematode attacks potatoes.

"If you understand how Golden nematode works, you might be able to develop novel control strategies," Dr De Jong said.

"One thing Dr Wang has found is that Golden nematode secretes a peptide hormone, very similar to one that plants use in their own development, to trick potato into acting as a host."

Golden nematode is so destructive that high levels of infestation can result in 100 per cent yield loss. The microscopic worm attacks the roots of potatoes and other crops.

"Golden nematode cysts (and the eggs they harbour) can survive in the soil for 20 to 30 years. Some nematicides can knock population levels down a bit, but they soon bounce back," Dr De Jong said.

"In New York, where nematicides have contaminated groundwater in the past, the strong preference is to use resistant potato varieties for Golden nematode control.

"Containment is the critical issue. If Golden nematode is not controlled, the entire US potato crop is at risk. In addition, if our trading partners perceive that it is not being controlled, exports of any crop associated with soil will be halted."

There could be benefits for Australian potato growers as a result of the research conducted at the Federal Golden Nematode Lab, according to Dr De Jong.

"In the short-term, the impact is most likely to happen if you find that any of our resistant potato varieties grow well in Australia (for example, the crisping varieties Lamoka or Waneta).

“However, in the long-term, it all depends on what Dr Wang discovers. The impact of basic research is hard to predict,” he said.

For more information, please contact Walter De Jong at wsd2@cornell.edu.

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