



Grower Summary

CP 104

Novel approaches for the management of leaf and bud nematodes (*Aphelenchoides* spp.) in hardy nursery stock

Annual 2014

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HDC is a division of the Agriculture and Horticulture Development Board.

Project Number: CP 104

Project Title: Novel approaches for the management of leaf and bud nematodes (Aphelenchoides spp.) in hardy nursery stock

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GROWER SUMMARY

Headline

Research is on-going to identify novel and suitable approaches to manage leaf and bud nematodes (eelworms) in hardy nursery stock. These novel methods will potentially serve as alternatives to Vydate 10G.

Background

Foliar nematodes, also called leaf and bud nematodes (LBN), *Aphelenchoides* spp. cause serious damage to many ornamental plants grown in greenhouses, nurseries, and in the landscape settings throughout the United States, Canada, and Europe. They are a significant foliar pest of hardy nursery stock plants (over 700 host species) whose feeding results in angular-shaped blotches on the leaves which are delineated by the veins and often accompanied by leaf distortion. In the UK, *Aphelenchoides ritzemabosi* and *A. fragariae* are the two main foliar nematode species of economic importance.

The infestation usually starts at the base of the lower leaves, where humidity is highest, and spreads upward. LBN cause brown to black, or chlorotic, vein-delineated angular lesions that can become necrotic. The lesion eventually turns blackish-brown and affected parts may shrivel. If buds or young leaves are infested, they may not develop properly and may become deformed. Flower development may also be affected. As ornamentals are sold for their aesthetic value, these plants are often unsaleable, making foliar nematode damage very costly for ornamental growers.

Cultural control methods are an important component of the management of LBN within integrated pest management (IPM) programmes. The most effective of these is a programme of high crop hygiene as foliar nematodes can survive for several years in infested dried leaf debris. Cultural control programmes should include the removal and destruction of infested plants and debris, avoiding replanting in contaminated land, sterilisation of pots and equipment, and if possible avoiding the use of overhead irrigation and misting systems which create ideal conditions for nematode infection.

LBN problems have become important because of the revocation and subsequent loss of systemic nematicides, increased nursery production of these vegetatively propagated plants and long distance movement of plants. A range of alternatives for the control and management of LBN have been evaluated previously, the results suggesting that Dynamec (abamectin) was found to be ineffective against LBN and it was proposed that Vydate 10G (oxamyl) was the most effective available product.

Vydate 10G has an extension of authorisation for minor use (EAMU) for use on protected ornamental plants. However, oxamyl is not compatible with IPM programmes. Its use also requires precautions for operator and environmental protection, with a re-entry time to treated glasshouses and a harvest interval. In addition, its continued availability is uncertain.

This project therefore, aims to develop new approaches for the management of these nematodes in hardy nursery stock by evaluating individually, and in combination, the efficacy of products derived from plant extracts and currently approved pesticides to reduce nematode infestation on plants. The project will also evaluate the application of products that act as elicitors of plant defences to determine whether they can confer levels of resistance to nematodes. These studies are being carried out in the laboratory, glasshouse and thereafter at grower's nurseries. For this project - (guided by advice from UK industry), the focus will be on Japanese anemone, Hosta and Weigela plants.

The overall aim of this study will be to develop new guidelines for the integrated management of foliar nematodes in hardy nursery stock utilising existing and novel methods.

Summary

This research project aims to target stages of the routes of nematode invasion into plants, investigate the efficacy of some potential plant protection products and characterise the defence mechanisms induced by elicitors against nematodes.

Laboratory bioassays were conducted to evaluate contact mortality of *Aphelenchoides fragariae* using biological and chemical products including Movento, Jet 5, Vydate 10G, Cercobin and Dynamec and three experimental products. Results after 72 hours of exposure showed that HDCI 68, HDCI 70 and Dynamec had high significant mortality rates of foliar nematodes. This was followed by Movento, HDCI 69 and Vydate 10G with average mortality while Cercobin, Jet 5 and Control (Water) had less contact effect. This project therefore aims to utilise the results of the above laboratory bioassay in a glasshouse study in order to evaluate protection against LBN movement from the soil into plants.

The promising and potential products will be used either as contact or systemic form on plants to prevent nematode infection. This will be evaluated as soil and foliar treatments to assess efficacy.

In addition, the results from on-going tests of 'elicitors' will be incorporated as part of the integrated pest management approaches on foliar nematode control.

Financial Benefits

At this stage in the project we are not yet at a stage to be able to give an accurate estimate of financial benefit to growers. However, the financial benefits will become clearer once data from glasshouse and nursery trials in Years 2 & 3 have been obtained.

Action Points

It is too early to offer growers specific action points to achieve significant benefits for leaf and bud nematode management. The current best practice of crop hygiene, destruction of infested plants, sterilising pots and containers and minimising overhead irrigation and misting should be maintained by growers, with use of oxamyl where necessary.