Grower Summary

FV 367

Spinach: biology and management of damping-off disease

Annual 2011

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Before using all pesticides check the approval status and conditions of use.

Read the label before use: use pesticides safely.

Further information

If you would like a copy of the full report, please email the HDC office (hdc@hdc.ahdb.org.uk), quoting your HDC number, alternatively contact the HDC at the address below.

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Project Number:	FV 367
Project Title:	Spinach: biology and management of damping-off disease
Project Leader:	Dr Kim Green & Dr Peter Gladders
Contractor:	ADAS UK Ltd
Industry Representative:	John Allan, Emmetts UK Ltd
Report:	Annual 2011
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Previous report/(s):	None
Start Date:	April 2010
End Date:	June 2012
Project Cost:	£55,165

Headline

- Spinach crops can be severely affected by damping-off diseases during or soon after periods of heavy rainfall. *Pythium* and *Fusarium* species were the likely causes identified in affected crops in 2010. Damping-off has occurred despite the use of seed treatments and on a range of varieties and rotations; options for control will examined within the project.

Background and expected deliverables

Damping-off was identified as a major problem on UK baby-leaf spinach in late summer 2008. Crops were affected particularly at the cotyledon stage and at canopy closure. In some cases losses were severe, with one grower losing a whole planting of a particular variety. Problems were less severe in 2009 (following a largely dry season) but growers remain concerned that management options are limited.

The overall aim of the work is to provide a clearer understanding of the factors that can contribute to outbreaks of spinach damping-off, and to evaluate management practices. The expected deliverables are:

1. Knowledge of which pathogens most commonly causing damping-off disease on spinach in the UK;
2. Increased understanding of the effect of cultivation and environmental factors on the development of damping-off on spinach;
3. Information on the efficacy and persistence of seed treatments and pre-emergence fungicide soil treatments against spinach damping-off.

Summary of the project and main conclusions

Sample collection

Samples were obtained from 11 growers in September 2010 and problems were found to be associated with heavy rainfall in August. Losses reached 70-80% in the most severely affected areas. Earlier in the season, few problems were encountered. Damping off occurred in various crop rotations and despite the use of seed treatments.

Isolations and identification

Pythium and *Fusarium* species were frequently isolated from seedlings with damping off and are likely to be the main pathogens in the 2010 crops. Growers need to be aware that other pathogens could also cause problems.

Pathogenicity tests

Several *Fusarium* isolates and one *Pythium* isolate caused leaf rotting in pathogenicity tests. Both *Pythium* and *Fusarium* isolates when added to soil-based compost did not show strong pathogenicity. Further work will be done with modifications to the inoculation technique.

Financial benefits

Experience from 2008 shows that damping-off can cause significant economic loss even in a single planting (grower estimated loss of £42 k at one farm). From the project, growers will have a clearer understanding of the factors that can contribute to outbreaks of spinach damping-off, enabling them to reduce risk and improve management practices. The findings may also be of more generic use for management of damping-off on other field vegetable crops.

Action points for growers

- Maintain a record of spinach cultivars that appear susceptible to damping-off, and environmental conditions that are high risk for the disease.
- Ensure cropping areas have good drainage.