New Project Summary Report for FV 423: Seed treatments on the occurrence of neck rot disease in onions

Project Number	31304230
Title	Determining the effectiveness of seed treatments on the occurrence of neck rot disease in onions caused by Botrytis spp.
Short Title	FV 423
Lead Contractor	Food and Environment Research Agency (Fera)
Other Contractors	
Start & End Dates	30 April 2013 - 30 August 2013
Industry Representative	Mr Alastair Findlay, Lakes Farm.
Project Budget	£17,214
AHDB Contribution	£17,214

The Problem

Neck rot of onion is a serious and damaging pathogen that may be carried on seed caused by one or several species of Botrytis. Seed treatments are essential part of the management strategy for the control of this disease. Therefore, there is a need to evaluate a range of treatments in order to ensure effective control of these pathogens for the future using a range of potential treatments.

Extensive sampling of around 40,000 tonnes of crop (10% of total UK bulb onion production) by the Allium & Brassica Centre in 2011 showed that around 2% of bulbs sampled had neck rot

symptoms. However infection levels in individual stores were as high as 48% in badly affected crops. Commercially infection levels in excess of 8% in stored samples will lead to the crop either being dumped or downgraded to the lower value processing market. In 2011 it is estimated that 12% of the UK crop was either dumped or downgraded due to neck rot with a total loss of £9 million at farmgate.

Aims and Objectives

(i) Project aim(s): To identify if multiple species of Botrytis are infecting onion seeds and leading to failure of seed treatments for neck rot disease in emerging seedlings.

(ii) Project objective(s):

1. Conduct controlled germination and seven day growth tests of onion seeds treated with up to 11 industry standard products and physical procedures.

2. Identify and quantify the Botrytis species found to be infecting growing seedlings.

3. Analyse the species occurrences between and within the treatments.

4. Inform grower community of the likelihood that seed treatment failures are either due to the presence of Botrytis species which are not controlled or resistance to active ingredients within the established population of the pathogen.

The project objectives are strongly interdependent but there is little risk of getting no results from the project. Seed germination and early growth tests will follow well established procedures. The amount of seed supplied will be easily sufficient to replicate treatments for rigorous statistical analyses. Distinguishing and identifying Botrytis species can be achieved visually but molecular methods are available for unexpected or ill-defined types as well. The experiment may reveal that the Botrytis species profiles between treatments were not significantly different but such a result would suggest the presence of resistant strains of Botrytis.

Approach

Initial evaluation

At the onset of the project, a representative homogeneous sample will be drawn from a known infected seed lot (circa 11 kg, reported as having an internal botrytis infection of 8% but of unknown species). An initial evaluation (blotter test) will confirm the level of infection and following both morphological and molecular characterisation determine the diversity of botrytis species present. Following this initial evaluation results will be discussed with FERA statistical consultant to develop a robust design for the evaluation experiments.

Treatment evaluation

A blotter technique will be used to assess the effectiveness of each treatment as well as an untreated control, the number of seeds tested and number of replicas per treatment will be used following advice from FERA statistician.

Levels of botrytis will be determined using visual techniques followed by culturing of representative isolate of botrytis for species identification using the most appropriate morphological and/or molecular techniques.

Reporting results

Results will be reported as both levels of botrytis and characterisation to species where known.