# Grower Summary

## **FV 219b** (HL 01108)

Optimising field-scale control of Fusarium basal rot and white rot of onion using Trichoderma amended substrates and pellets, and onion residues

Annual 2012

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The results and conclusions in this report may be based on an investigation conducted over one year. Therefore, care must be taken with the interpretation of the results.

## Use of pesticides

Only officially approved pesticides may be used in the UK. Approvals are normally granted only in relation to individual products and for specified uses. It is an offence to use non-approved products or to use approved products in a manner that does not comply with the statutory conditions of use, except where the crop or situation is the subject of an off-label extension of use.

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

The following are members of the Consortium for LINK project HL 01108:

East Malling Research

and

Agriculture and Horticulture Development Board (via the HDC division)

and

Allium & Brassica Agronomy Limited

and

Elsoms Seeds Limited

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Barway Farms Limited

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Moulton Bulb Company Limited

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Organic Recycling Limited

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PG Rix Farms Ltd

and

Produce World Rustler

and

Rationale Biopesticide Strategists

and

South Eastern Produce Limited

and

Sylvan Spawn Limited.

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| **Project Number:** | FV 219b (HL 01108) |
| **Project Title:** | Optimising field-scale control of Fusarium basal rot and white rot of onion using Trichoderma amended substrates and pellets, and onion residues |
| **Project Leader:** | Dr Ralph Noble |
| **Report:** | Annual, February 2012 |
| **Publication Date:** | 26/04/2012 |
| **Start Date:** | 1st March 2011 |
| **End Date:** | 31st August 2013 |
| **Project Cost:** | £68,000 |

## Headline

Potential new biological treatments are evaluated for the control of Fusarium and white rot in onions.

## Background and expected deliverables

White rot is still a major problem in the UK bulb and salad onion industry, and Fusarium basal rot of onion is an increasing problem, and is likely to increase further with predicted climate change.The only approved fungicide for Fusarium of onion is a seed treatment with thiram, which is aimed at controlling seedling blight rather than basal rot. All commercial onion varieties are susceptible to white rot, and varieties that show resistance or tolerance to Fusarium basal rot do not have the same quality attributes of susceptible varieties. *Trichoderma* species have been used successfully to suppress diseases caused by *Fusarium oxysporum*, including onion basal rot. The main problem has been the development of a cheap delivery method that can achieve sufficiently high *Trichoderma* inoculum levels in soil.

## Summary of the project and main conclusions

### *Pellet seed development*

- Pelleted onion seed with spores of the biocontrol agents HDC F39 and HDC F41 was produced by Incotec/Elsoms. High populations (>$10^6$ cfu/g pellet) of propagules were detected in the HDC F39 and HDC F41 treated pellets respectively.

### *Pot Experiments*

- HDC F35 amended compost ora dip and/or drench treatment of HDC F41 suppressed Fusarium by 25-60% in two pot bioassays. HDC F42 which was only used in the first bioassay, also suppressed Fusarium by 50%.
- HDC F39 and HDC F40 suppressed Fusarium by 25% in the second pot bioassay but not in the first.

- HDC F35 amended compost or a dip and/or drench treatment of HDC F39 suppressed white rot by 40-60% in two pot bioassays. HDC F40 or HDC F38 granules, or drench treatments of HDC F37 or HDC F42, which were only used in one of the pot bioassays, suppressed white rot by 30-50%.
- An HDC F41 drench treatment suppressed white rot by 30% in the second pot bioassay but not in the first.
- HDC F35 granules or HDC F36, HDC F43 or HDC F44 drench treatments were ineffective against Fusarium or white rot. HDC F38 granules or a HDC F37 drench were also ineffective against Fusarium.
- Unamended compost suppressed white rot by 25-30% but had no effect on Fusarium
- A fungicide (thiabendazole + Folicur) set treatment controlled Fusarium and white rot in the first pot bioassay but not in the second.

### *Field Experiments*

- Preliminary field tests in 2009 and 2010 showed that screened green waste compost amended with HDC F35 could be applied along the planting row with a converted onion set planter at an application rate of 7 tonnes/ha.
- Composted onion waste was amended with grain inoculum of HDC F35 and then broadcast at 50 tonne/ha.
- The above application methods achieved some reduction in white rot compared with unamended soil and increased the soil *Trichoderma* propagule population at harvest by times 20 compared with the natural background soil population; however, this was less than that obtained in the pot experiments.
- Application of HDC F39 as a drench or granule application one month after sowing or planting resulted in a zero to times10 increase in soil *Trichoderma* propagule population at harvest and reduced white rot in one out of two field sites but had no significant effect on Fusarium on one field site.

## Financial benefits

None at this stage.

## Action points for growers

None at this stage.