



Agriculture & Horticulture
DEVELOPMENT BOARD



Grower Summary

BOF 069

Narcissus: Suppression of
Fusarium basal rot using
composts amended with
specific biocontrol agents

Final 2012

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

Project Number: BOF 069

Project Title: Narcissus: Suppression of Fusarium basal rot using composts amended with specific biocontrol agents

Project Leader: Professor Ralph Noble

Contractor: East Malling Research

Industry Representative: Adrian Jansen, Lingarden Bulbs Ltd

Report: Final Report

Publication Date: 07 February 2013

Previous report/(s): None

Start Date: 01 July 2011

End Date: December 2012

Project Cost: £11,686

Headline

- Granules of HDC F106 or HDC F108, or bulb spray treatment with HDC F110 significantly reduced the percentages of wilted plants and bulbs with external and/or internal basal rot symptoms compared with the control treatment in a pot bioassay
- Amendment of soil with 25% compost, with or without inocula of biocontrol agents, was ineffective in reducing total basal rot symptoms. A bulb dip treatment with fungicide Storite was also ineffective

Background and expected deliverables

Basal rot control remains an intractable problem of narcissus in the UK. Current chemical bulb dips for controlling narcissus basal rot have been withdrawn (formaldehyde), and are expensive, prone to pathogen resistance (thiabendazole), and ineffective over several seasons. Varieties of narcissus that show resistance or tolerance to *Fusarium* basal rot do not have the same quality attributes of susceptible varieties, and breeding new varieties is too long-term.

Fungal species have been used to suppress diseases caused by *Fusarium oxysporum*, including narcissus basal rot. In HDC project FV 219b, compost amended with HDC F35 and incorporated in soil at 25% or HDC F41 applied as an onion set treatment reduced *Fusarium* in onion plants. HDC F39 applied as a set treatment controlled white rot. HDC F39 and F41 did not grow on compost and were better applied as set treatments. Previous work has shown that fungal and bacterial biocontrol agents have the potential to control basal rot when applied as a spray to the soil during planting.

Following application to soil, fungal spores of biocontrol agents can persist in the field and control white rot in onions from one year to the next. This could potentially avoid the need for repeated applications to a longer term narcissus crop.

Commercial Objectives

To examine the efficacy of composts amended with HDC F106 for the control of *Fusarium* basal rot of narcissus

To examine the efficacy of other commercial biopesticide products (including fungal and bacterial biocontrol products) in controlling basal rot of narcissus, applied with composts and as sprays and bulb dips

Compare disease control efficacy with that obtained with a fungicide (Storite a.i. thiabendazole) bulb dip treatment

Monitor the populations of fungal biocontrol agents and *Fusarium* propagules in the compost amended soil and non-amended soil

Summary of the project and main conclusions

Pot narcissus bioassays were conducted to examine the efficacy of composts, with and without inocula of biocontrol agents, granular, spray and bulb dip treatments of biocontrol agents in controlling *Fusarium* basal rot.

Granules of HDC F106 or HDC F108, or a bulb spray treatment with HDC F110 significantly reduced the percentage of wilted plants and bulbs with external and/or internal basal rot symptoms compared with the control treatment. HDC F107 and HDC F112 spray treatments reduced the percentage of wilted plants but did not affect the total percentage of basal rot bulbs. Amendment of soil with 25% compost, with or without inocula of biocontrol agents, HDC F109 spray treatment of bulbs and bulb dip treatments of HDC F113 and Storite bulb were ineffective in reducing basal rot symptoms.

The fungal biocontrol agent population of the soil at the end of the pot bioassay was significantly increased by amendment with compost containing HDC F106, HDC F107 or HDC F108 inocula or HDC F106 granules without compost. HDC F109 spray treatment of bulbs did not affect the final soil fungal biocontrol agent population. HDC F110 spray treatment of bulbs increased the soil fungal biocontrol agent population at the end of one out of two pot bioassays.

Financial benefits

Biocontrol products have been identified that can control basal rot of narcissus in a pot bioassay. Further field trials are needed before the commercial viability of these treatments can be assessed. If successful in field trials, one or more of these products could potentially be taken forward for registration, thus increasing the armoury of fungicidal products available to growers to control basal rot.

Action points for growers

- None at this stage