



# Grower Summary

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## **CP 140**

**OPTIMISING THE USE OF BIOCONTROL  
AGENTS TO IMPROVE THE CONTROL OF  
*B. CINEREA* IN KEY VEGETABLE AND  
FRUIT CROPS**

**Annual 2017**

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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 AHDB Horticulture office (hort.info.@ahdb.org.uk), quoting your AHDB Horticulture number, alternatively contact AHDB Horticulture at the address below.

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**Project title:** OPTIMISING THE USE OF BIOCONTROL AGENTS TO IMPROVE THE CONTROL OF *B. CINEREA* IN KEY VEGETABLE AND FRUIT CROPS

**Project number:** CP 140

**Project leader:** Prof. Xiangming Xu, NIAB EMR

**Report:** Annual 11/2017

**Previous report:** Annual 11/2016

**Key staff:** Prof. Xiangming Xu  
Prof. Naresh Magan

**Location of project:** NIAB EMR

**Industry Representative:** Richard Pett, JEPCO, JEPCO (Marketing) Ltd, Norfolk House Farm, Gedney Marsh, Holbeach, Spalding, Lincolnshire PE12 9PB

**Date project commenced:** 05/10/2015

**Date project completed (or expected completion date):** 05/10/2018

# GROWER SUMMARY

## Headline

- Studying the effect of climatic conditions on the efficacy of Serenade and Prestop.

## Background and expected deliverables

Biocontrol agents (BCAs) are living organisms and as with every organism, reproduction is critical to its survival. Understanding how environmental conditions affect their survival, reproduction, dispersal and biocontrol efficacy is crucial to expanding their use. The overall aim of the study is to obtain ecological knowledge on BCAs available in the UK and utilize the knowledge to produce strategies for effective application of such BCAs to improve control consistency and efficacy against *Botrytis cinerea* on lettuce and strawberry crops.

## Summary of the project and main conclusions

The second year of the PhD project focused on characterizing the dose response curves of *B. cinerea* to Serenade and Prestop on lettuce (*Lactuca sativa*) leaves. Characterisation of the relationship allowed determination of the LD<sub>50</sub> values, and guided testing on how long *Bacillus subtilis* (biologically active ingredient in Serenade) and *Gliocladium catenulatum* (biologically active ingredient in Prestop) propagules survive in polytunnel and glasshouse systems during the winter. The research primarily focused on testing the effect of climatic conditions on the temporal dynamics of *B. subtilis* and *G. catenulatum* viable populations.

Determining the dose response curve for control of *B. cinerea* by Serenade and Prestop on lettuce leaves was critical for identifying the LD<sub>50</sub> dose. This was important because a relationship between the BCA and the target pathogen is often very complicated. The concentration of *B. subtilis* within Serenade required a mean inoculum of  $3 \times 10^8$  cfu/ml, and for *G. catenulatum* within Prestop a mean of  $3 \times 10^8$  spores/ml for controlling a high pathogen inoculum load of *B. cinerea* macroconidia.

The PMA-qPCR method was used to monitor viable BCA propagules in a polytunnel and glasshouse compartment during the winter. *B. subtilis* viable populations necessary for controlling *B. cinerea* survived for four days in the polytunnel and six days in the glasshouse. For *G. catenulatum*, survival was eight days in the polytunnel and glasshouse. A countable viable population existed for up to at least ten days for both BCAs.

Gaining ecological knowledge on how commercial growing climates affect the BCA viable populations is critical for understanding the timing of the BCA application for successful control

of *B. cinerea*, and the reliability period of the application. A total of eighteen climatic treatments were tested for each BCA. Currently all samples have been collected and the DNA extracted and the samples stored at -20°C. qPCR will be applied to determine viable population sizes for each climatic treatment.

The data from these analyses will form the basis for the construction of a leaflet to inform growers of the conditions under which Serenade and PreStop can be applied for consistent control of *B. cinerea*. In addition, the data will have potential use in development of models to predict the efficacy under different climatic conditions in relation to the efficacy of the biocontrol treatment used. This should provide more confidence for growers in terms of expected and actual control achieved.

### **Financial benefits**

It is too early in the project to identify any financial benefits from the work.

### **Action points for growers**

- No action points have been generated from the work so far.