

# Grower Summary

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## M 054

Mushroom casings:  
Screening of microbial  
populations in relation to  
mushroom quality

Final 2012

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## Further information

If you would like a copy of the full report, please email the HDC office ([hdc@hdc.ahdb.org.uk](mailto: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.

<b>Project Number:</b>	M 054
<b>Project Title:</b>	Mushroom casings: Screening of microbial populations in relation to mushroom quality
<b>Project Leader:</b>	John Elphinstone
<b>Contractor:</b>	Fera
<b>Industry Representative:</b>	Richard Gaze John Collier, Monaghan Mushrooms
<b>Report:</b>	Final 2012
<b>Publication Date:</b>	23 November 2012
<b>Previous report/(s):</b>	None
<b>Start Date:</b>	01 April 2011
<b>End Date:</b>	30 September 2012
<b>Project Cost:</b>	£23,400

## Headline

Raising humidity to increase mushroom yield must be balanced with the increased risk of bacterial blotch.

## Background

The commercial objectives of this project were:

1. To develop new screening tests for *Pseudomonas* bacteria which may be present in casing materials to help understand how they affect mushroom yield and disease development;
2. To screen casing materials used in the UK for *Pseudomonas* species relate the results to mushroom yield and blotch incidence;
3. To identify practices which reduce the risk of blotch disease and improve mushroom quality.

## Summary

- Bacterial blotch can be caused by a variety of fluorescent *Pseudomonas* species, not all of which have been fully characterized. Although two well known bacteria (*Pseudomonas tolaasii* and *Pseudomonas gingeri*) cause severe blotch symptoms under high humidity (>92% at 18°C), a number of other related but less well characterized *Pseudomonas* species can also induce mild blotch symptoms under these conditions, and equally reduce quality and marketability.
- Mushroom yield and potential for bacterial blotch development were apparently not affected by the source of commercial casing material used.
- Under experimental conditions, the disease was completely controlled by limiting the humidity at 88% during production at 18°C. In some experiments, higher yields and mushroom numbers resulted from increasing the humidity above 92% but this also increased the risk of disease.
- A new diagnostic test was developed which can be used to screen for *P. tolaasii* but further assay development is still needed to detect the other blotch-causing bacteria.
- The test was used to show that blotch symptoms developing under experimental conditions using common commercial casing sources was not caused by *P. tolaasii*.
- New DNA sequencing methods are available to help study the balance between blotch-causing and beneficial bacteria but further characterization of the different bacteria is needed before these can be used to maximum effect.

## **Financial Benefits**

- Potential increase in mushroom numbers and yield in response to increased humidity or longer and more frequent watering regimes needs to be carefully balanced with the increased risk of reducing quality and marketability due to bacterial blotch disease. Cost:benefit studies were not been undertaken during this short technical project.

## **Action Points**

- Control bacterial blotch by maintaining relative humidity at a maximum of 88% during typical production at 18°C.
- Look out for bacterial blotch symptoms during trials of new substrates, casings or production practices.
- If bacterial blotch is suspected, have the cause diagnosed using a new test developed through this project.