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Category: Research: Project Summary

Key words: Ergot, cereals, grasses, field margins, wheat, barley, *Claviceps purpurea*, Defra LINK, NIAB

Project Title: Towards a sustainable whole-farm approach to the control of Ergot



ROTHAMSTED
RESEARCH



MONSANTO



BASF



Short Title: Ergot LINK

Project Code:

Project Leader: Rosemary Bales, NIAB

Project Partners:

Research:

NIAB
Rothamsted Research
ADAS
Velcourt (R&D)

Industry:

HGCA
Advanta Seeds Ltd

Agrovista
Banks Cargill
BASF plc
Farmlink
Monsanto
Unilever
Velcourt Farm Management

Start Date: July 2004

End Date: July 2008

Funder: Sustainable arable LINK project (Defra)

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EFRC Programme: Cereals

Project Aim: The overall aim of the project is to develop an integrated package of measures aimed at reducing the risk of ergot infection in wheat crops whilst retaining the environmental benefits of grass margins.

Specific aims are:

- 1) To establish the importance grass field margins as a source of ergot inoculum for wheat crops
- 2) To reduce the ergot risk posed by field margins by identifying:
 - i. grass species that represent a low risk to wheat as sources of ergot infection
 - ii. margin management regimes that reduce the risk of ergot infection spreading from margin to crop
- 3) To identify low risk wheat varieties with flowering characteristics that confer escape from ergot infection or with post-infection resistance to ergot.

Abstract of Research: A sustainable solution to the ergot problem must be one that minimises the risk of ergot infection in cereal crops whilst retaining the environmental benefits of grass field margins. Key requirements will be (i) to reduce the potential for ergot inoculum production in grass margins by identifying low risk grass species and management regimes and (ii) to integrate wheat variety selection and agronomic practices into effective crop management strategies.

Objectives:

- 1) Establish the ergot status of representative country stewardship field margins in relation to their grass species composition and management

- 2) Determine whether populations of *Claviceps purpurea* supported by different margin grass species differ consistently in their pathogenicity for wheat
- 3) Determine the extent to which field margins contribute to ergot infection in cereal crops (using wheat as a model)
- 4) Quantify spatial distributions of *C. purpurea* resulting from primary spread (ascospores) and secondary spread (condia)
- 5) Examine variation in 'field resistance' to ergot amongst current UK wheat varieties
- 6) Determine the degree to which this is attributable to 'escape' (as conferred by flowering biology) or to post infection resistance
- 7) Develop a PCR diagnostic for quantitative detection of *C. purpurea*.

Expected Benefits: The arable farming environment of the UK is undergoing radical change, including an increase in non-crop area dominated by grass. This project presents the opportunity to assess the likely long term impact of this trend on the problem of ergot in wheat crops.

The research will enable ergot control strategies compatible with the demands of environmental management to be devised and will lead practical information and advice to farmers.

The project will also encourage a gradual improvement in the resistance of wheat varieties available to the farmer, by providing information to breeders on the resistance of current varieties, on mechanisms of resistance (escape v tissue resistance) and on appropriate screening methods.

Output: Poster for Cereals 2005 event