Biologicals for disease and pest control in combinable crops: a farmer led case study

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Rationale
A shift to Biologicals - EU plant protection products pending registration

* October 2016
A shift to Biopesticides - Global markets

Global market increased over 300%* 2008-2018

Global market 2019 value over $6 billion*

* DunhamTrimmer, 2018
The end of industrial agrochemical spraying?

Environmental & health concerns

The precautionary principle

Decline in new MoA discovery (commercial)

Resistance
UK projects to support biopesticides traditionally focused in horticulture

SCEPTREPLUS

£1.4m AHDB investment

2017-2021 4 year programme

21 new trials confirmed for 2018

Over 20 Crop protection companies have contributed financially or in-kind

22 trials undertaken in year one

Over 135 products being evaluated so far

104 conventional products

12 botanical products

8 biopesticides

11 biologicals

6 weed trials on 8 different crop targets

9 pest trials

6 disease trials

1 EAMUs secured & further applications submitted to CRD

Getting the best from biopesticides

The number of plant protection products based on micro-organisms, botanicals and semi-synthetic products is gradually increasing. Such biopesticide products generally require a greater deal of attention during use than conventional chemical pesticides to obtain best effects. This guide describes the biopesticides registered as plant protection products and which are available in the UK and provides information on best practice for their application. It discusses the types of beneficial organisms and how they work, and their advantage and limitations. A list of biopesticides currently available in the UK is provided.

Action points

- Follow guidance on product storage, the effectiveness of biopesticides, particularly those based on micro-organisms, may be hampered if they are stored incorrectly.
- Always use the biologicals as described on the label or communication from the supplier, or if guidance is not available, use the biologicals in accordance with the manufacturers' instructions.
- Always use a sprayer at the label or communication from the supplier, or if guidance is not available, use the biologicals in accordance with the manufacturers' instructions.
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Crop Health North – led by YAS, co-designed with arable farmers

Fusarium ear blight

Can we reduce our dependence on synthetic fungicides in wheat production using biologicals?

Farmer Scientist Network

Yellow rust

Powdery mildew

WELCOME TO
CROP HEALTH NORTH

The Farmer Scientist Network has successfully secured grant funding through the European Innovation Partnership (EIP-AGRI) to deliver a spring wheat trial over a two year period.

Septoria tritici
Trials 2017-2019

- GLP trials/ORETO standard

- Multiple winter wheat varieties with varying disease resistances

- Three treatment regimes:
  - IPM – microbial seed treatment, conventional chemistry at high pest pressure, biopesticides at low pest pressure at standard spray timings if needed
  - Biological – microbial seed treatment, biopesticides only at standard spray timings if needed
  - Conventional chemistry – chemical seed treatment, conventional chemicals only at standard spray timings
  - (no untreated)

- Replicated, randomised block design

- Multiple trial sites at NU and STC
Yield data - 2018

Nafferton

Cockle Park

Stockbridge Technology Centre

Variety
Left column = Leeds
Right column = Skyfall
Quality data – 2018 Cockle Park

![Quality data chart](chart.png)
Quality data – 2018 Stockbridge Technology Centre

![Bar chart showing quality data for different crops and methods (IPM, Conventional, Biological).](chart.png)
Disease data – 2018 Stockbridge Technology Centre

% Septoria

- Biological Control Leeds
- Biological Control Skyfall
- IPM Leeds
- IPM Skyfall
- Conventional practice Leeds
- Conventional practice Skyfall

GS 32, GS 37, GS 49, GS 55, GS 61
Disease data – 2019 Cockle Park

% Average Septoria Infection / Plot

- Untreated Check
- IPM
- Conventional
- Biological
Biologicals – knowledge exchange

- Open days – at all three sites in 2017 and 2018 and at STC and Cockle Park in 2019
- Evening meeting in 2017
- Seminar – Great Yorkshire Show
- Website: www.crophealthnorth.co.uk
Education

Knowledge transfer to advisors, farmers, consumers, food suppliers, government, regulators:

- New technology – education / costs / value to business
- Understanding risks (or lack of risks?)
- New approach to crop protection – changing mindsets
Next steps: full data analysis and dissemination
Next steps: incorporating new technology to optimise field use

Next steps: integrating Biopesticides with other biologicals

Next steps: integrating Biologicals with predictive diagnostics

Next steps: considering the benefits of precision placement technology
Thank you for your attention

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