SUSTAINABLE PRODUCTION

Session 2

THE 2019
EU AGRICULTURAL OUTLOOK CONFERENCE

Sustainability from Farm to Fork

European Commission

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European Commission

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Biological technologies - role in EU farming

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Plant protection problem

Food security

30 – 40 % crops
lost before harvest

>10 %
after harvest

To meet the challenges

we need
'Best Practice'
crop protection

Biological technologies

increasingly
the
mainstay of
sustainable
crop protection

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INTERNATIONAL BIOCONTROL MANUFACTURERS ASSOCIATION

Biological technologies for crop protection - IPM

Macroorganisms

Microorganisms

Natural substances

Semio-chemicals

Biological technologies have multiple modes of action against pests and interactions with plants

* Dunham trimmer

EU Regulatory groupings for plant protection products

Registered EU PPP
(EC 1107/2009)

Conventional chemicals
Microorganism
Semio-chemicals
Botanicals
Biorationals

Basic substances PPP

Low Risk PPP

Out of scope

Natural enemies

Entomopathogenic nematodes

Root symbionts

Approved PPP

> 30% approved PPP
= biological technologies

Since early 2016 more new applications for PPP are biological technologies than conventional chemicals

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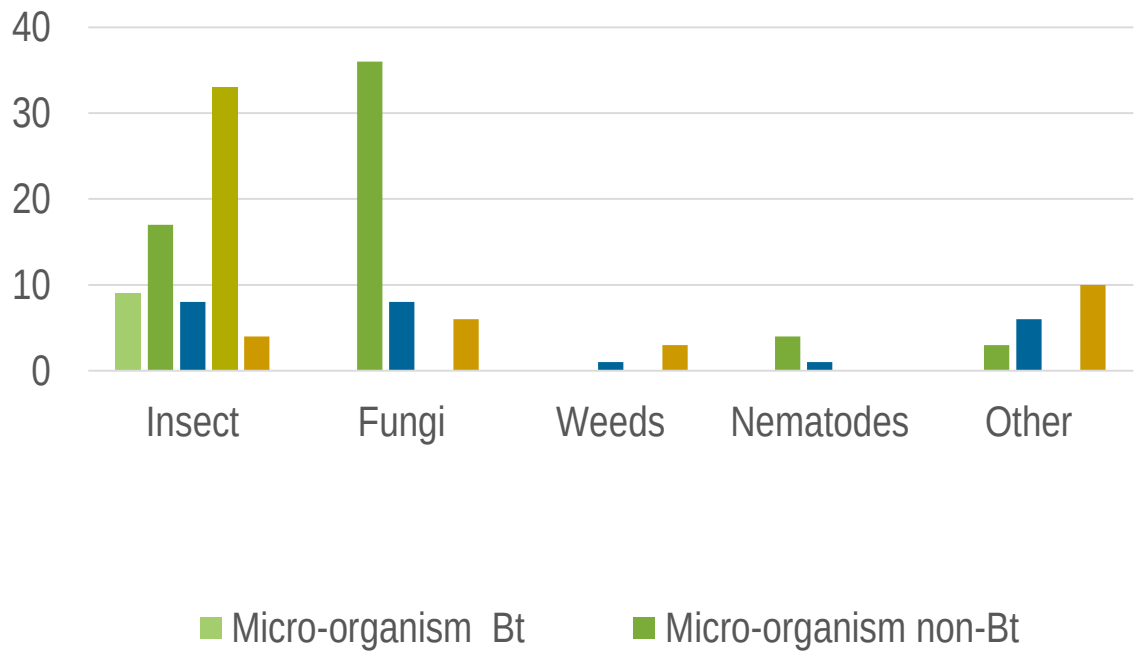
EU approved biological technology plant protection products



Approved PPP

> 30% approved PPP
= biological technologies

Since early 2016 more new applications for PPP are biological technologies than conventional chemicals

Total all PPP = 493

EU active substances (updated February 2019)*

* Definition of bioprotectant PPP not fixed so approximate numbers only

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Strategy for using biological technologies

+

=

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Biocontrol technology – from speciality horticulture to open field uses

Micro SME, spinoff from the University of Barcelona, started 2005.

T34 Biocontrol® Based on microorganism *Trichoderma asperellum* strain T34

Biocontrol technology – from speciality horticulture to open field uses

Partnership with Kwizda - Xilon GR (based on *Trichoderma asperellum* strain T34)

For use in corn, soy, sunflower and oilseed rape

Targets sclerotinia, fusarium and reduces mycotoxins (DON, ZEA and others).

Authorised in CZ, pending in HU, RO, AT, PO, SI, SL, DE

Untreated

Xilon GR

untreated

Xilon GR

Biological technology for disease and pest control: a farmer led study

(EIP-AGRI funded)

Farmer Scientist Network

YORKSHIRE AGRICULTURAL SOCIETY

Newcastle University

nu-farms
Agrisystems Innovation Platform

RATIONALE
BIOPESTICIDE STRATEGISTS

WARWICK
THE UNIVERSITY OF WARWICK

STC

eurofins

NFU

www.crophealthnorth.co.uk

The EIP-AGRI Project 3 year project

CROP HEALTH NORTH

Project aims:

- Exchange knowledge with, and provide training and education for farmers.
- Be driven by the practical needs of the farmers re: removal from the market of current conventional pesticide disease control agents.
- Encourage new thinking on using biological technologies in integrated pest and disease management systems
- Gain empirical evidence from field trials and monitoring.

The EIP-AGRI Project 3 year project

CROP HEALTH
NORTH

Can we reduce our dependence on conventional chemical fungicides and insecticides in wheat production using biological technologies ?

GEP-standard trials at 3 sites in NE England

CROP HEALTH NORTH

Nafferton

Cockle Park

Stockbridge Technology Centre

Trials year 1

CROP HEALTH
NORTH

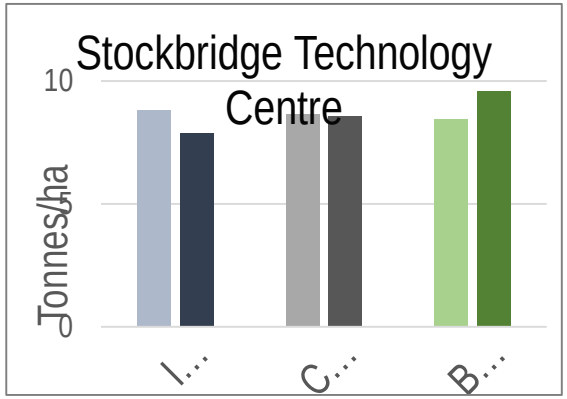
Spring wheat
Strip plots
Conventional chemicals vs IPM vs Biological

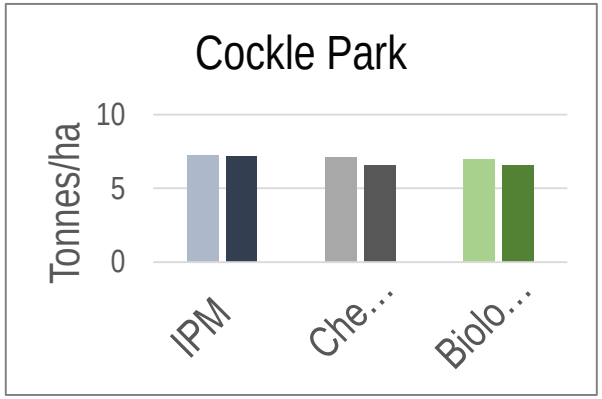
Results: No difference in yield between the treatments, at any of the 3 sites

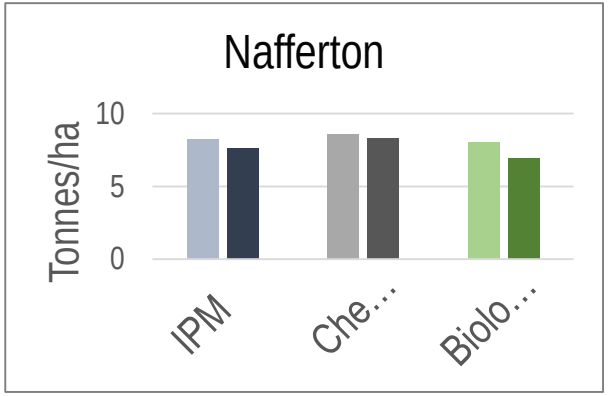
Trials year 2

CROP HEALTH NORTH

Winter wheat – 2 varieties (good and poor disease resistance)
Replicated plots – 6 replicates, randomised
Conventional chemicals vs IPM vs Biological







Results: No significant differences between any managements regimes, varieties or sites

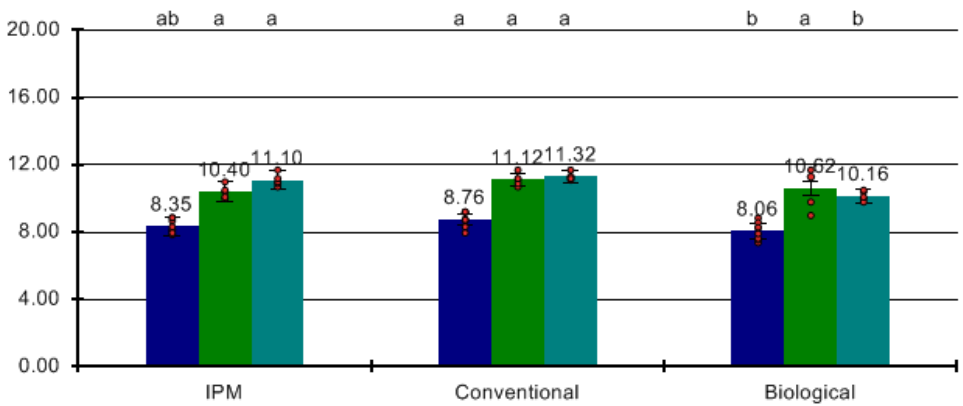
Varieties: Left = Leeds Right = Skyfall

Trials year 3

CROP HEALTH NORTH

Winter wheat
Replicated plots, 0.5 ha plots
Conventional chemicals vs IPM vs Biological (plus low N & high N)

Yield from both sites (t/ha)



Results: indicating some differences between management regimes for yield and there are indications of differences for some quality parameters (biologicals = higher protein)

Are biological technologies for wheat realistic?

CROP HEALTH NORTH

YES

This EIP-AGRI funded project points us to the possibility that using biocontrol technologies to manage wheat pests and diseases is realistic.

BUT

We used already-approved UK biological technology products (from horticulture) - not ones developed specifically for wheat pest and diseases. What would results have been if we had product especially designed for wheat?

Would the results have been better if we used biocontrol technology adapted application timings and methods?

Potential uplift in protein content, interaction with N inputs ?

Costs of biological technologies?

Asterix project: ‘prints’ herbicide droplets onto weeds only

Deep Learning, computer vision system separate crop and weed in real time

State of the art herbicide droplet shooting matrix at an enabling 6x6 mm resolution

Radical reduction in herbicide usage: -95%

Fast payback, reduced manual labour

Enables the use of efficient bioherbicides that would normally harm the crop

Unsprayed crops gives Increased yield

https://www.asterixproject.tech/

Biological technology – challenge to understand and use their complexity

soil ecology, plant ecology, landscape ecology, biology, microbiology, genetics, microbial ecology, population biology, plant physiology, population modelling, landscape modelling, population ecology, engineering, digital technology, etc…….

and maybe, sometimes, even chemistry

RATIONALE
BIOPESTICIDE STRATEGISTS

Thank you for your attention

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