

From Organic to Conventional: A Shared Path Toward Reduced Pesticides in Agriculture

Julia Cooper, Head of Research, Organic Research
Centre, UK

Policy for sustainable crop
protection – options, experiences,
and development

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German Environment Agency,
Dessau, Germany

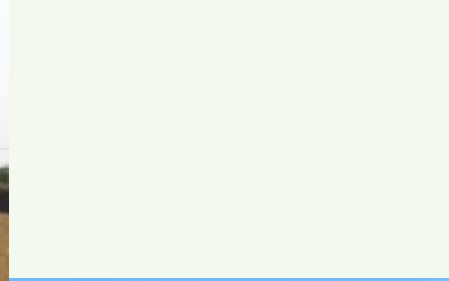
Organic perspectives on crop protection

- Living mulches – the holy grail for organic and conventional farmers
- Companion planting – farmer-led research to reduce insecticide use
- Crop variety selection for organic systems – GxM interactions?
- Strategies for uptake



Living mulches

- Perennial cover in an arable rotation
- Conventional farmers – reduce glyphosate use and N inputs
- Organic farmers – reduce tillage and enhance biological N fixation



18th October 2021
Champion wheat 156 kg/ha

Herbicides

- Glyphosate pre-drilling grass weed control
- 0.5l/ha of Fence (240g/ha flufenacet)
- 30g Eagle (broadleaf control)
- Headland treated with Easel -MCPA (1.5L/ha) for hemp weed-didn't kill the clover -thought it might

**Thanks to Jake Freestone,
@No1FarmerJake**



Final yield

10.93 t/ha using 132 kg N/ha



Fertiliser



Chemicals



Soil health



Climate
resilience





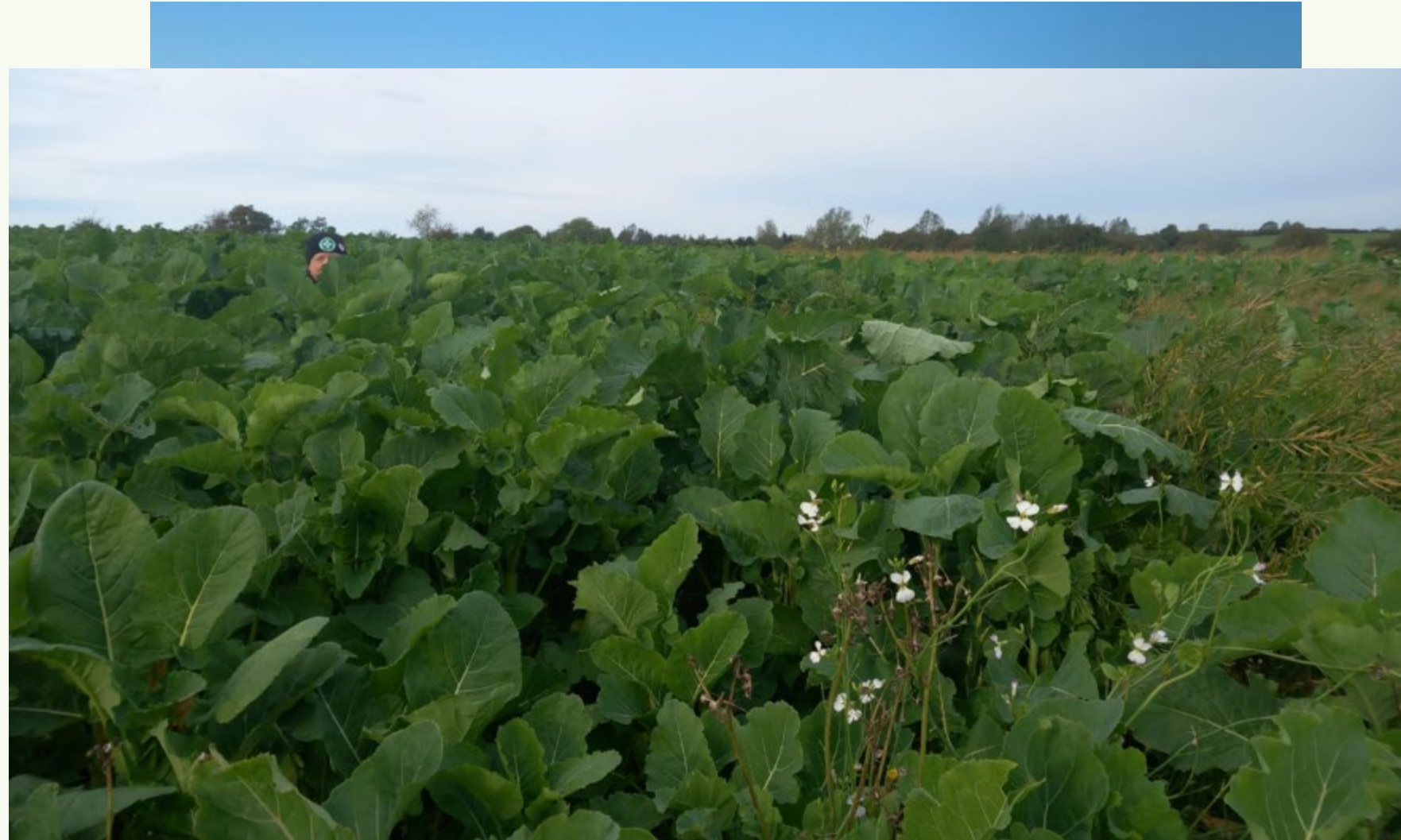
Organic fields
No herbicides, chicken pellets for N



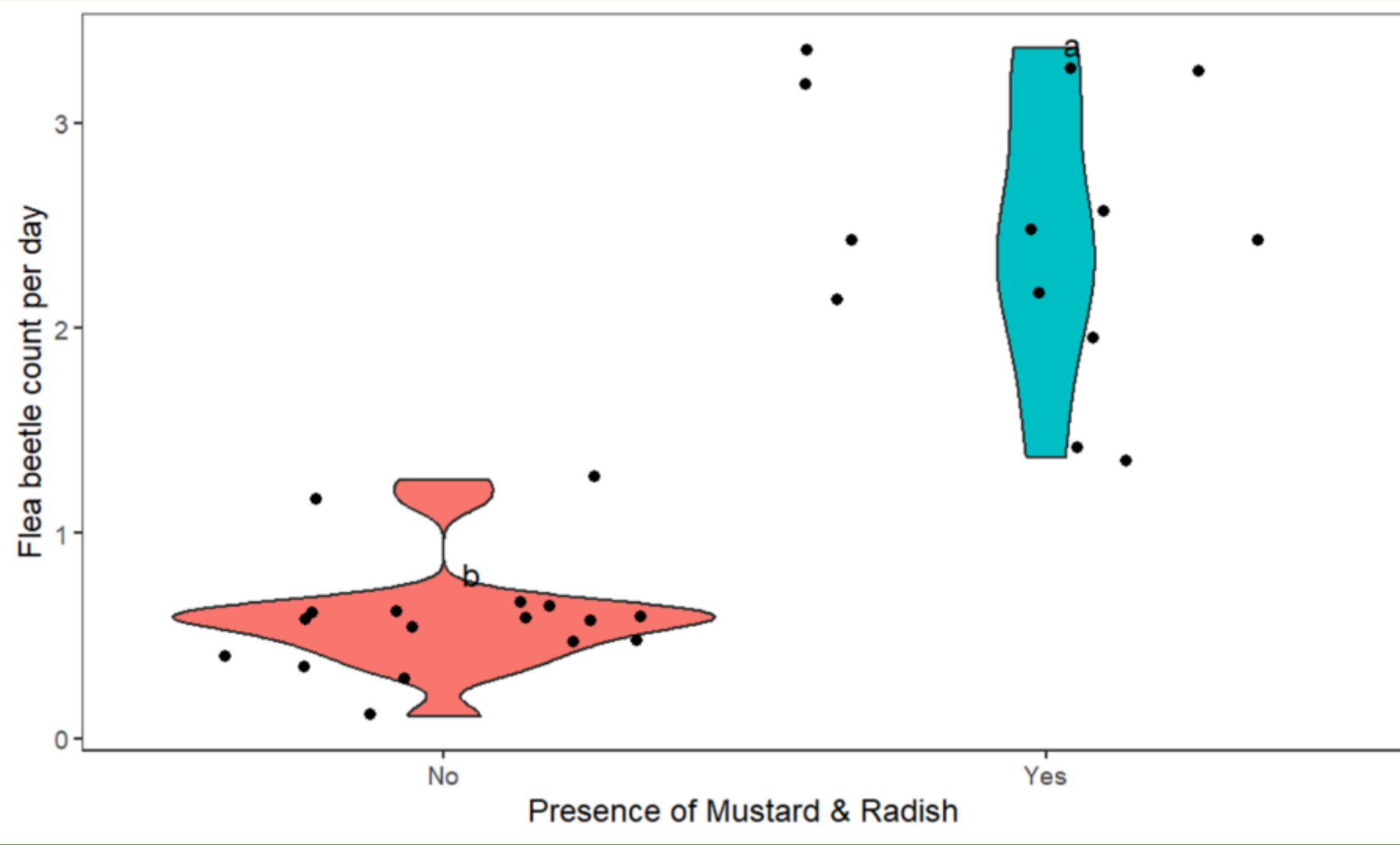
Final yield
~6.1 t/ha, 11-12% protein (too low for bread)

Companion planting - managing flea beetle damage in kale

Thanks to Paul Allison, PhD
student, Newcastle
University



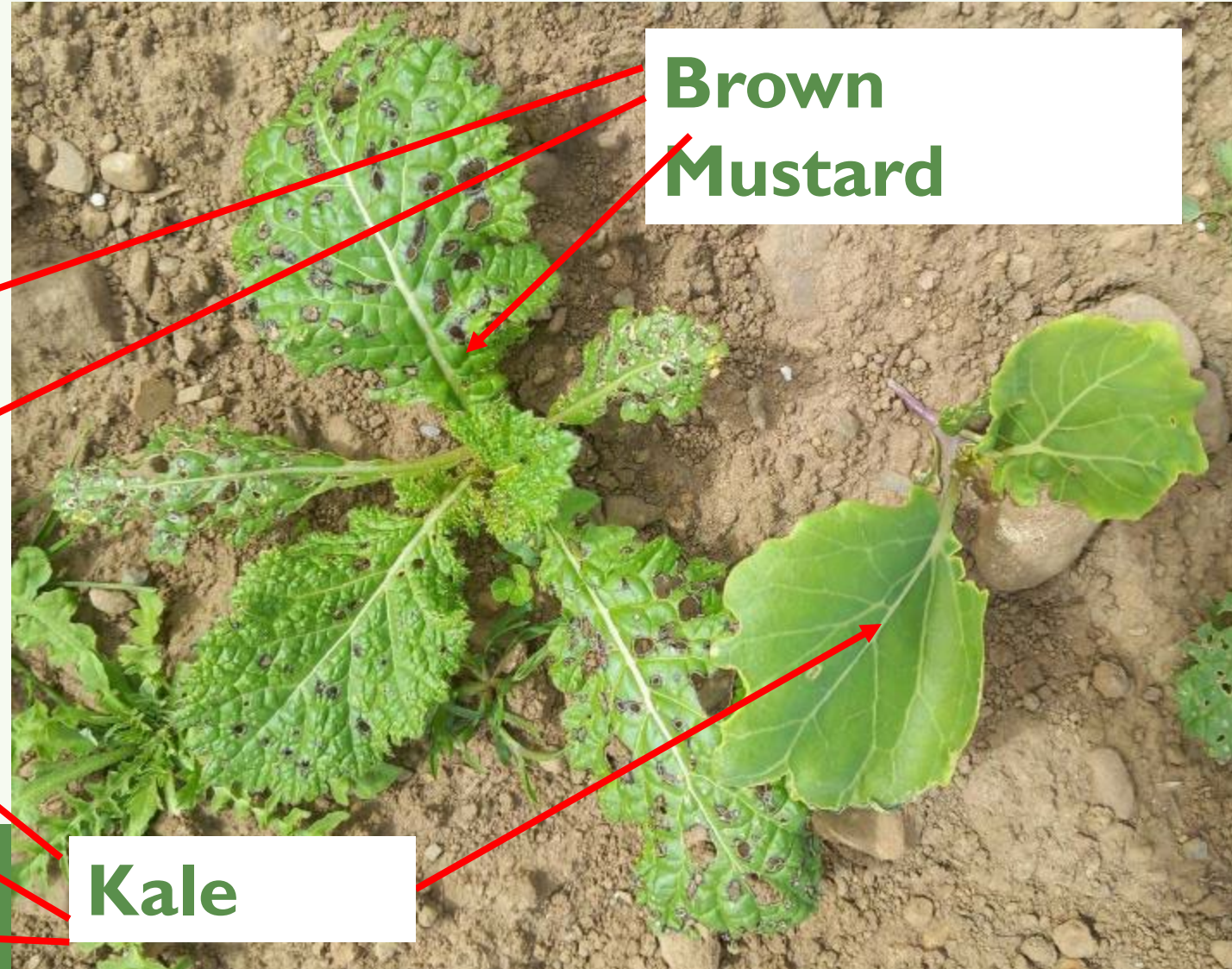
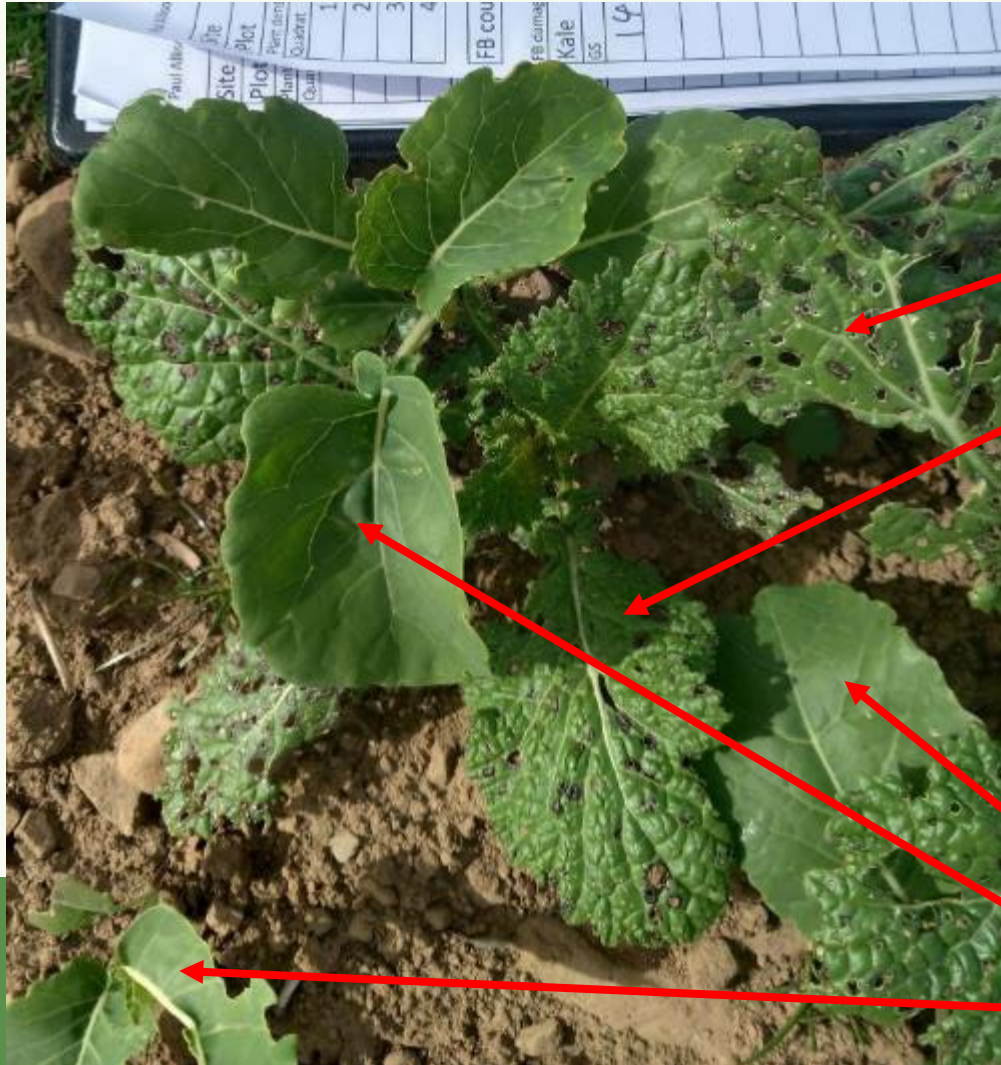
Companion planting mustard with forage kale



More flea beetles in plots with mustard...

What about damage?

Next steps - optimum seeding rates... but "I'll never plant kale without a bit of brown mustard and radish again"



Brown Mustard

Kale

Selecting varieties for organic management – exploring GxM in the UK recommended lists (RL)



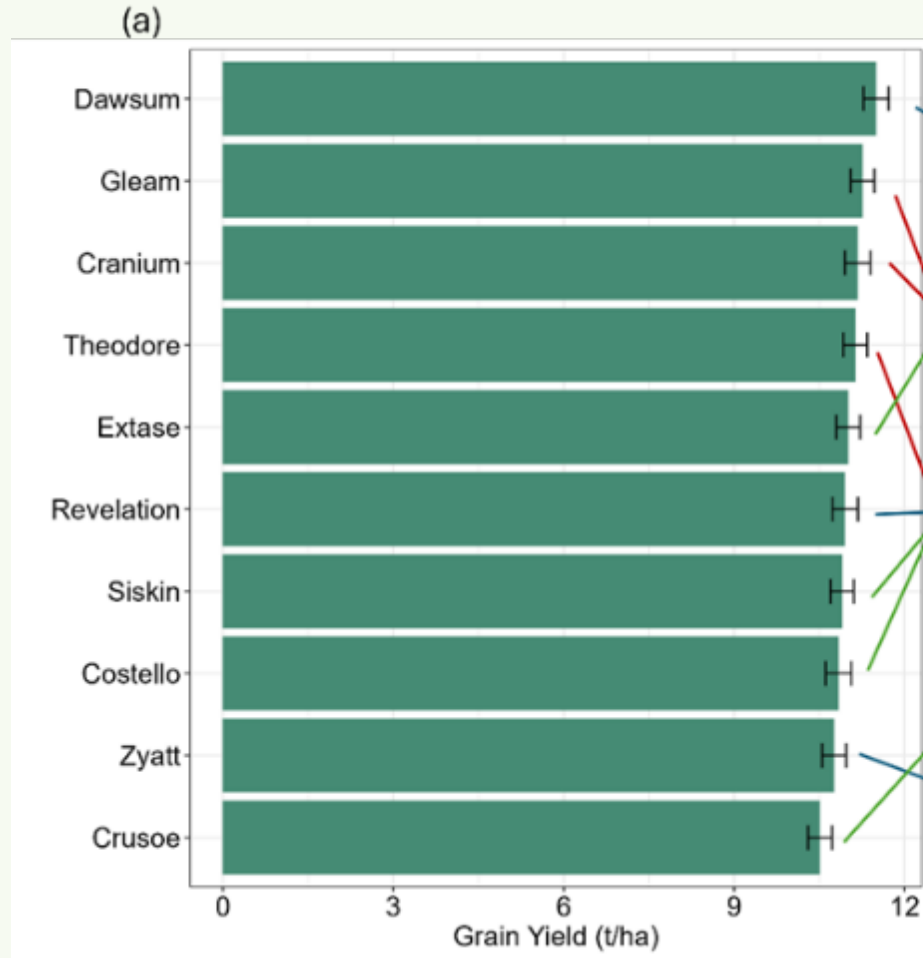
- Strip trials in organic farmers' fields
- Comparing “modern” high yielding varieties with blends and populations
- Answering the question – are some varieties more weed-suppressive than others?



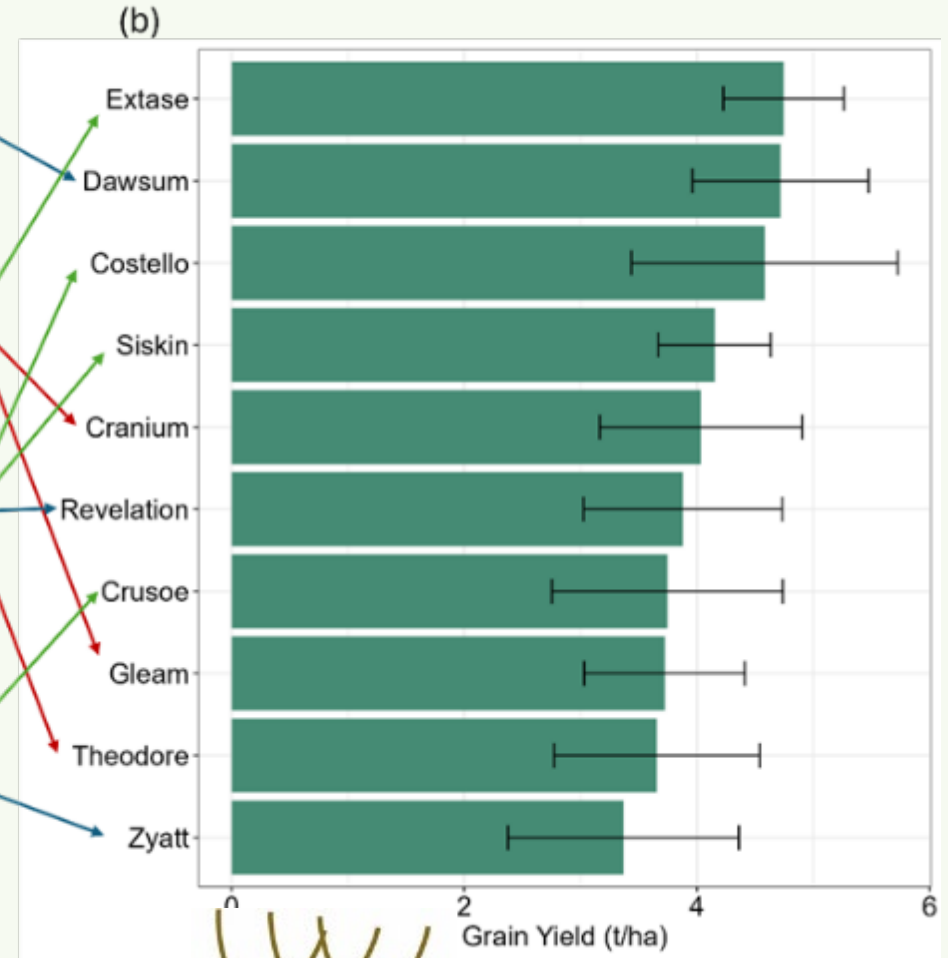
Results from on-farm wheat trials in organic systems

Rankings differ indicating a GxM interaction

Recommended List Yield Ranking



Organic Farm Trials Yield Ranking



Mayflower

Aldiniti

Evidence for weed suppressing varieties from 2023 results



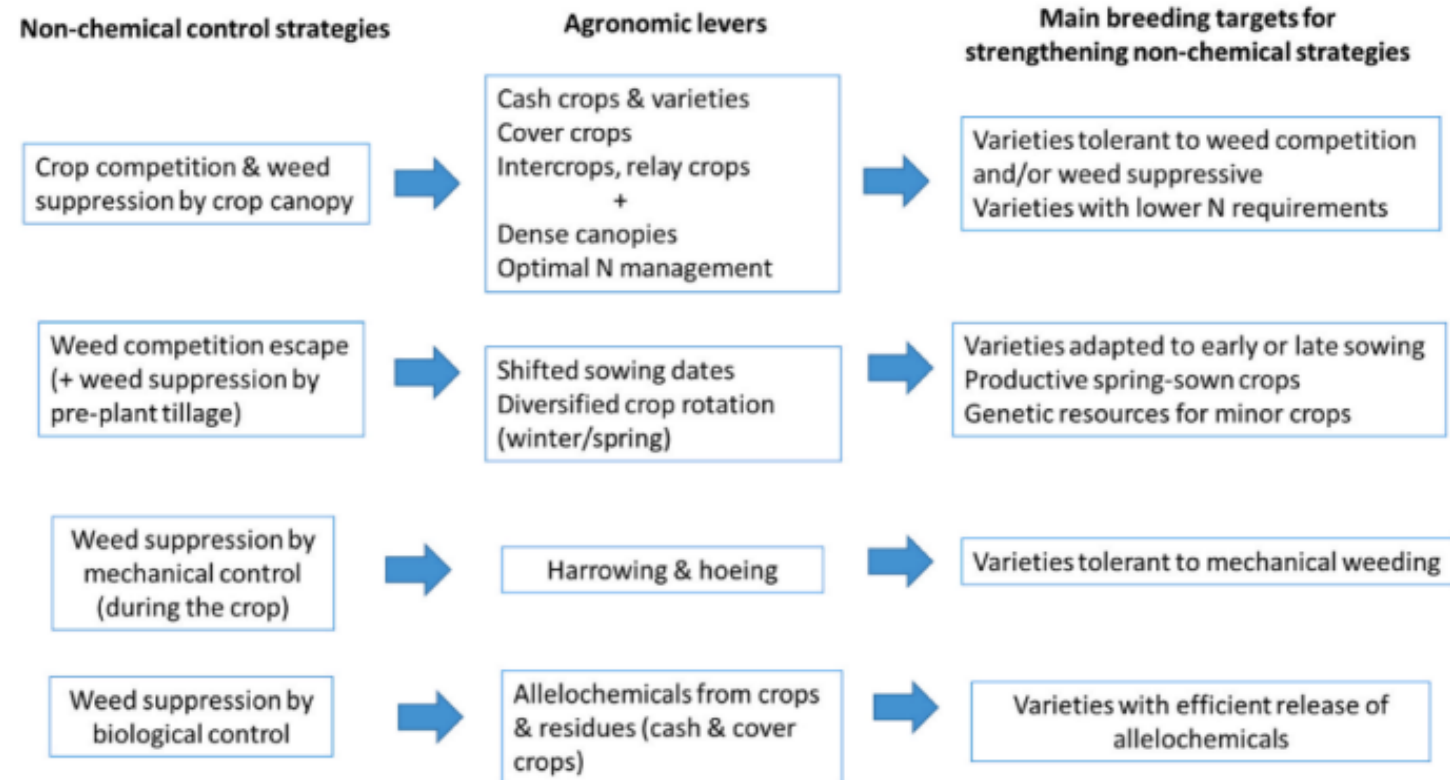
Next steps to scale up agroecological approaches to reduce pesticide use

- Research and evidence
 - Mechanisms of pest suppression in companion planting; breeding of companion plants for specific functions
 - Equipment for living mulch establishment and management
 - Breeding for living mulch varieties; breeding arable crops for better interspecific competition



Breeding targets – reducing herbicide use

Figure 5 Non-chemical weed control strategies, agronomic levers and main breeding targets. From Debaeke et al. 2024



Next steps to scale up agroecological approaches to reduce pesticide use

A network of farmers and growers running on-farm trials, on their own terms.

Welcome to Innovative Farmers



summer.

- Beverley Monitor Farm - Hall Farm, Beverley, East Yorkshire
- Norwich Monitor Farm - Crown Point Estate, Norwich, Norfolk
- Bingham Monitor Farm - Manor Farm, Bingham, Nottinghamshire

AHDB Monitor Farms

Totalling 16 farms, each in a three-year programme, AHDB Cereals & Oilseeds' nationwide **Monitor Farm network** offers support and guidance to growers looking to improve their businesses and learn from others.



Harry Huddart, Hall Farm in Beverley, East Yorkshire

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 **Organic Research Centre** @OrgResCent · Jan 8
The @agricology 'Livestock in the Landscape' session at @OREC #ORFC24 is now viewable online. Chaired by Matt Smoo, with Lindsay Whistance (ORC), Simon Fairlie and Richard Gantlett. youtu.be/ksz50A4KpAY?si...



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Thank you

Any questions?