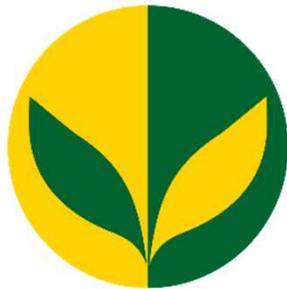


# Integrated weed management (IWM)

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Richard Hull  
Rothamsted Research



ROTHAMSTED  
RESEARCH



# Selection of troublesome weeds



# Integrated weed management

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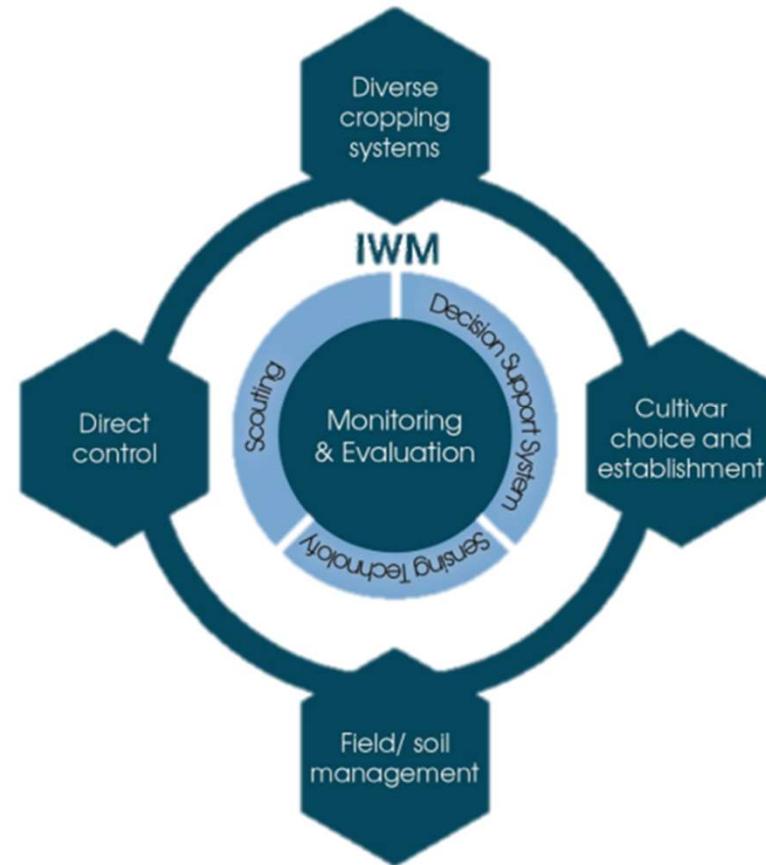
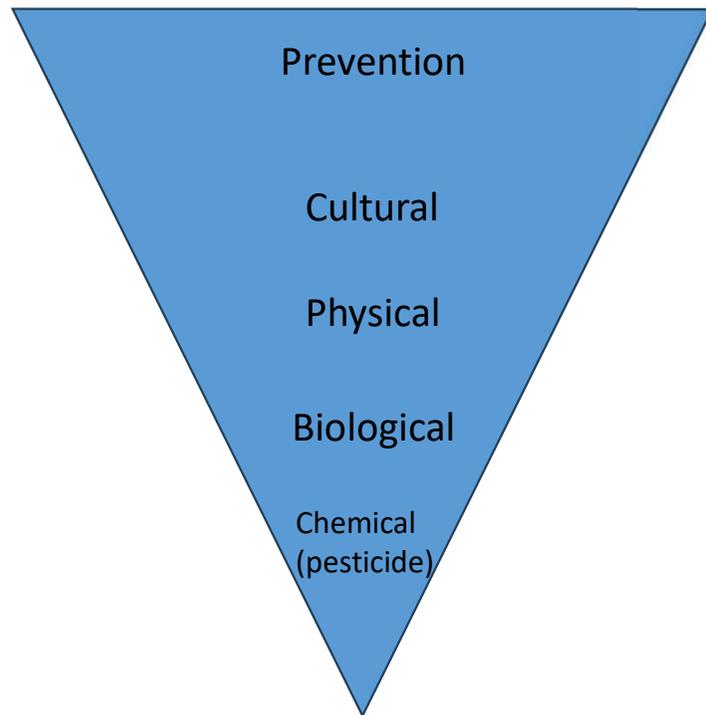
Integrated Weed Management (IWM) is a sustainable, holistic approach to controlling weeds by combining multiple methods—cultural, mechanical, biological, and chemical—rather than relying solely on herbicides. It aims to manage weed populations below economically damaging levels while minimizing environmental impact and reducing the risk of herbicide resistance.

Rather than relying on a single "silver bullet" like herbicides, IWM aims to keep weeds "off-balance" so they cannot easily adapt or develop resistance.

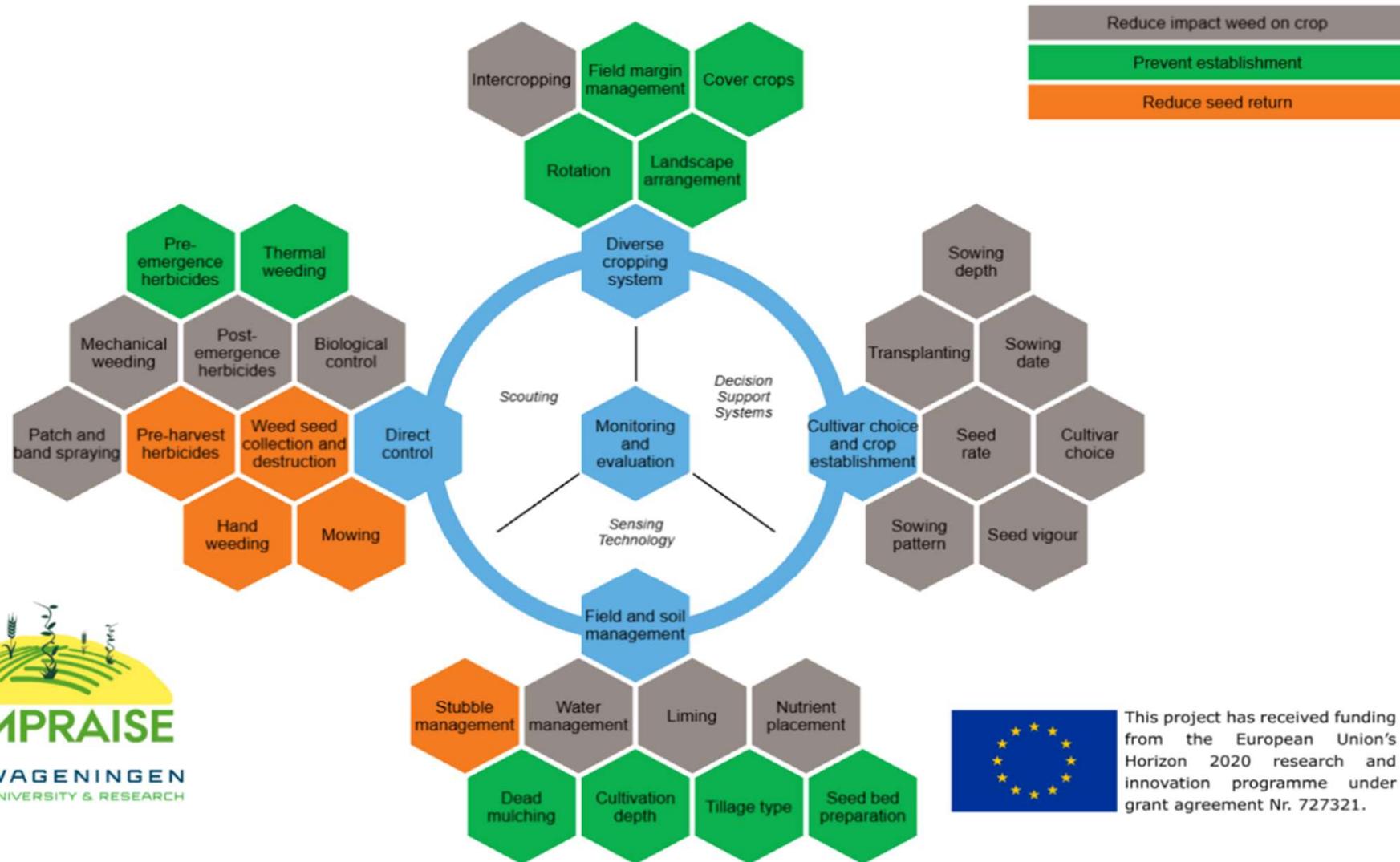
Benefits:

- Delays Resistance
- Economic Sustainability
- Environmental Protection
- Holistic Health

# Integrated weed management



# Current methods of weed control (IWM)



# Rothamsted's blackgrass field network

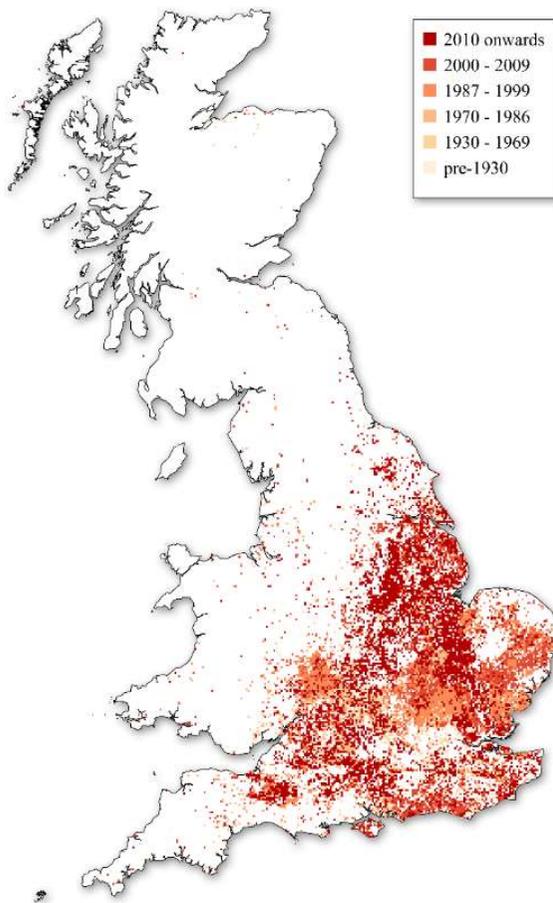
- Set up in 2014
- Currently have 60 farms, 170 fields
- We map every field that is in WW or WB
- We collect:
  - Field abundance / distribution data
  - Seed for resistance testing
  - Agronomy data
  - Soil properties from a subset of fields

What is driving the populations in the field?

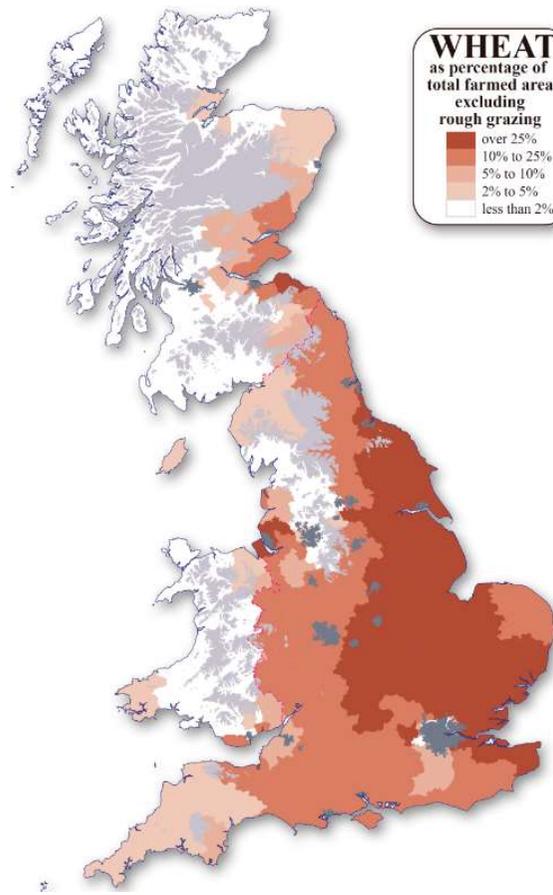


# Rothamsted's blackgrass field network

UK Blackgrass distribution



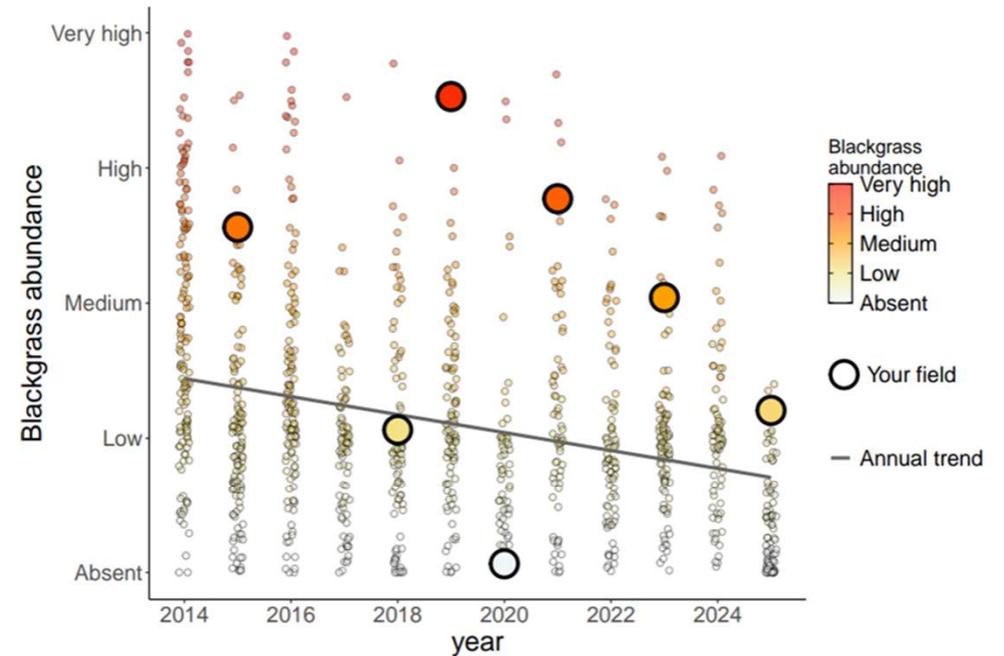
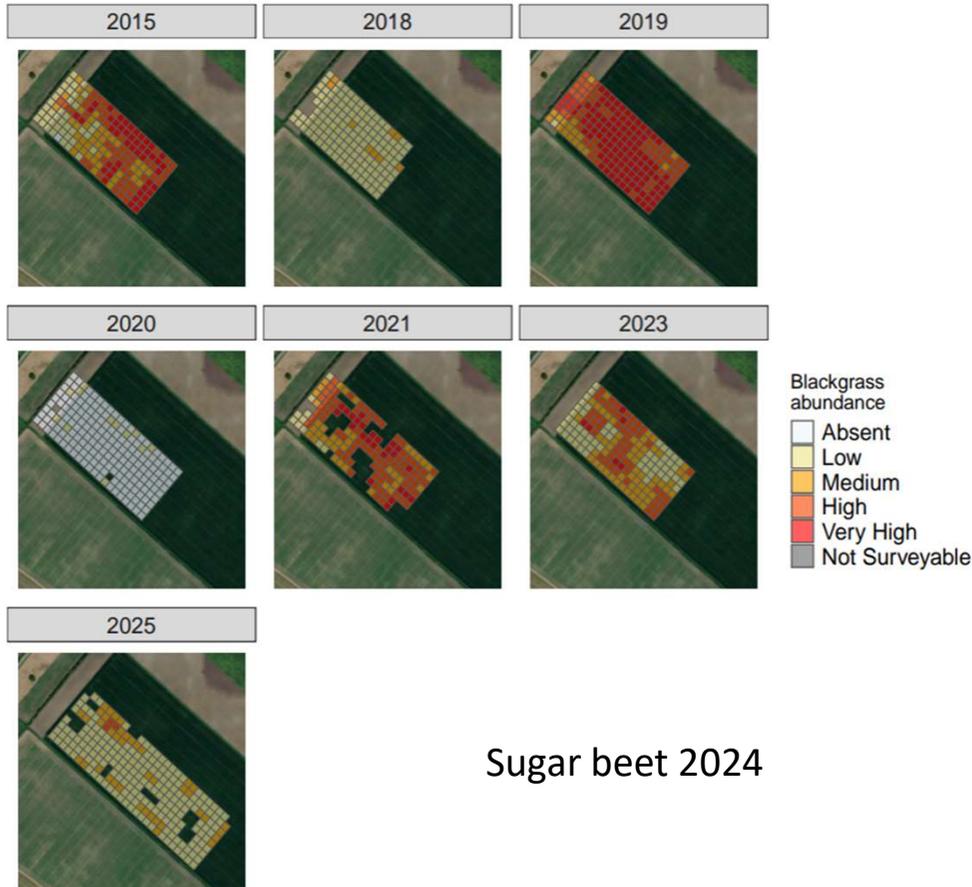
Distribution of wheat cropping



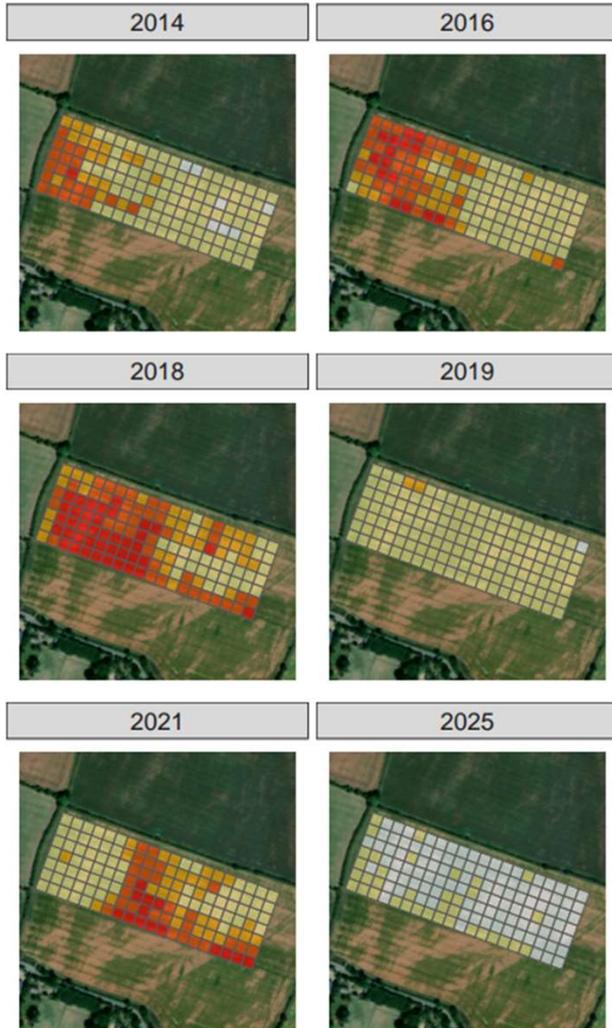
Field populations collected



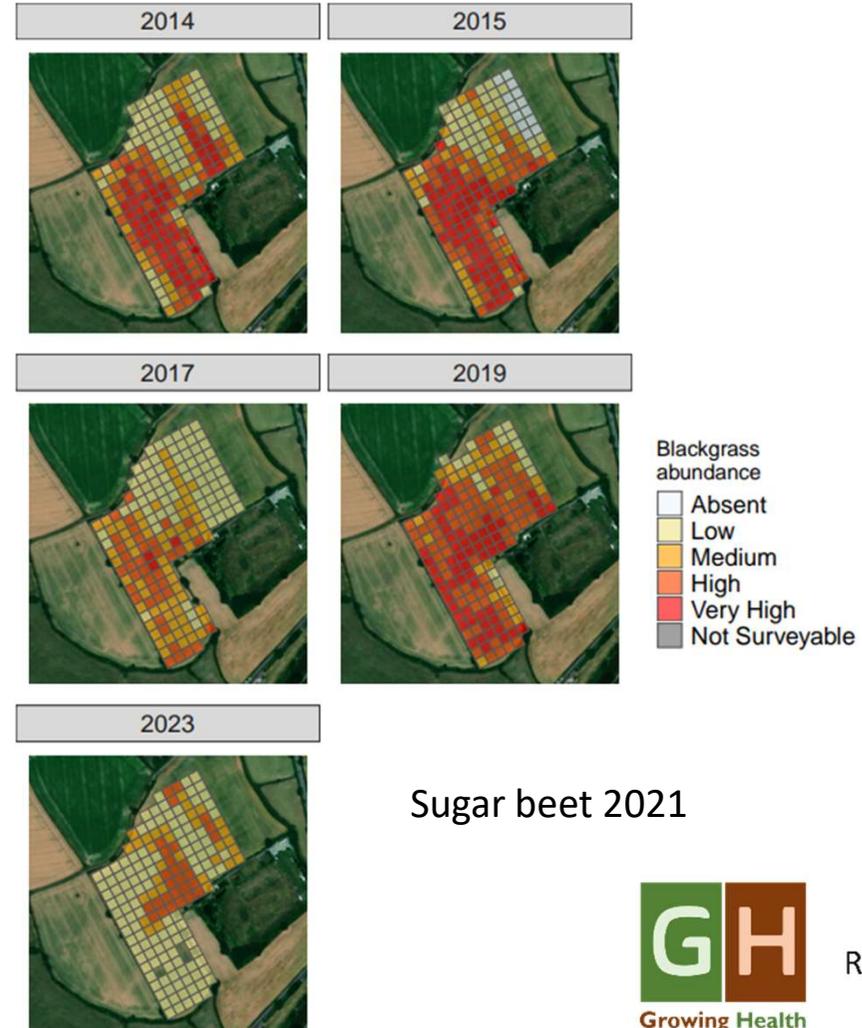
# Rothamsted's black-grass farm network



# Rothamsted's black-grass farm network

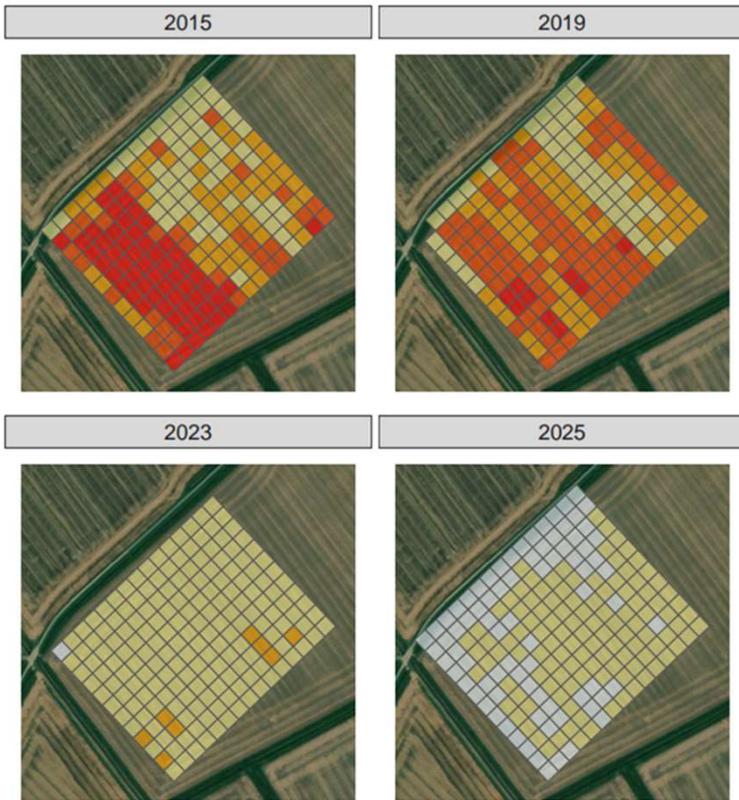


Sugar beet:  
2020, 2023



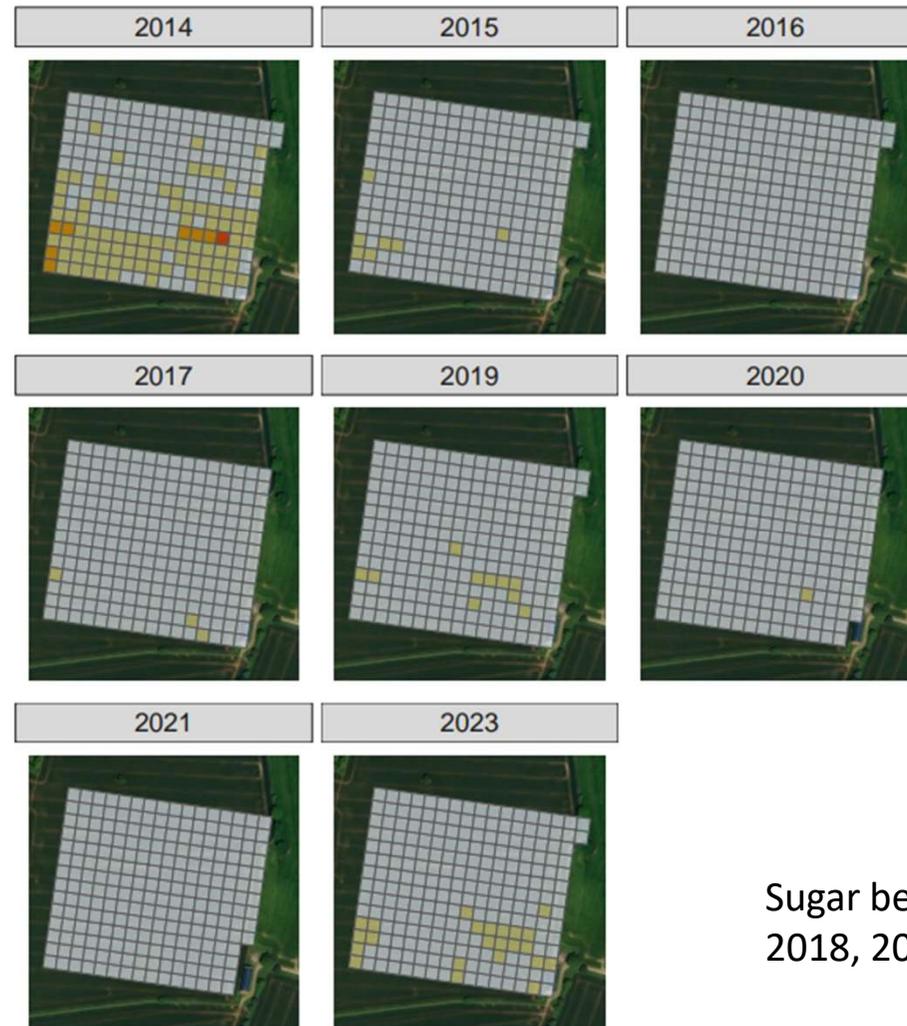
Sugar beet 2021

# Rothamsted's black-grass farm network



Blackgrass abundance

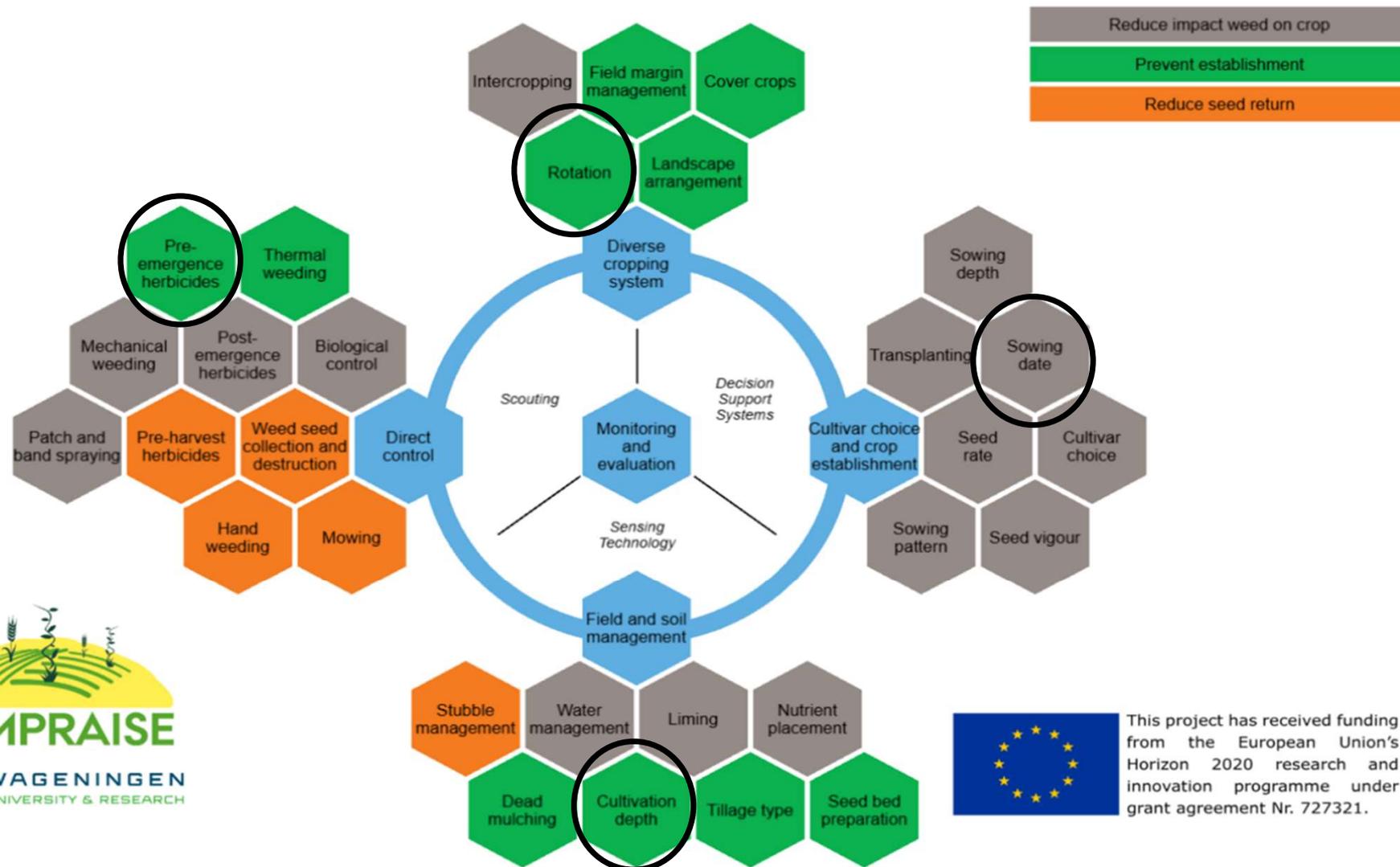
- Absent
- Low
- Medium
- High
- Very High
- Not Surveyable



Blackgrass abundance

- Absent
- Low
- Medium
- High
- Very High
- Not Surveyable

# Current methods of weed control (IWM)



# New control technologies

- Smart sprayers
- Inter-row cultivators
- Lasers
- Lights
- Electricity
- HWSC (harvest weed seed control)
- Cutting

Are these resistance proof????

Herbicides

Bioherbicides

RNAi

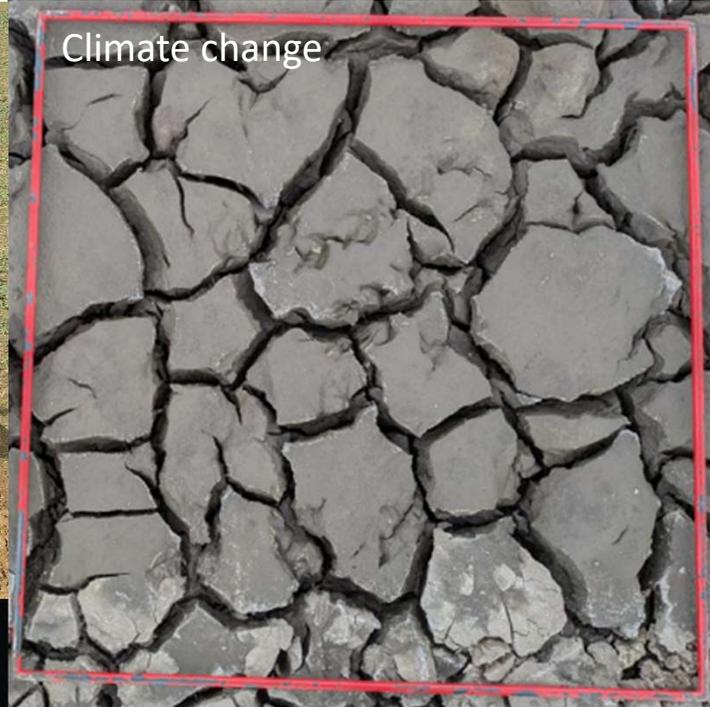


# Future challenges for IWM

Changing agronomy practices



Climate change



Resistance



Policy and regulation

