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# TEAGASC National Tillage Conference (Jan 2026)

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# What are the important things we can learn from the UK's experience with herbicide resistant grass weeds?

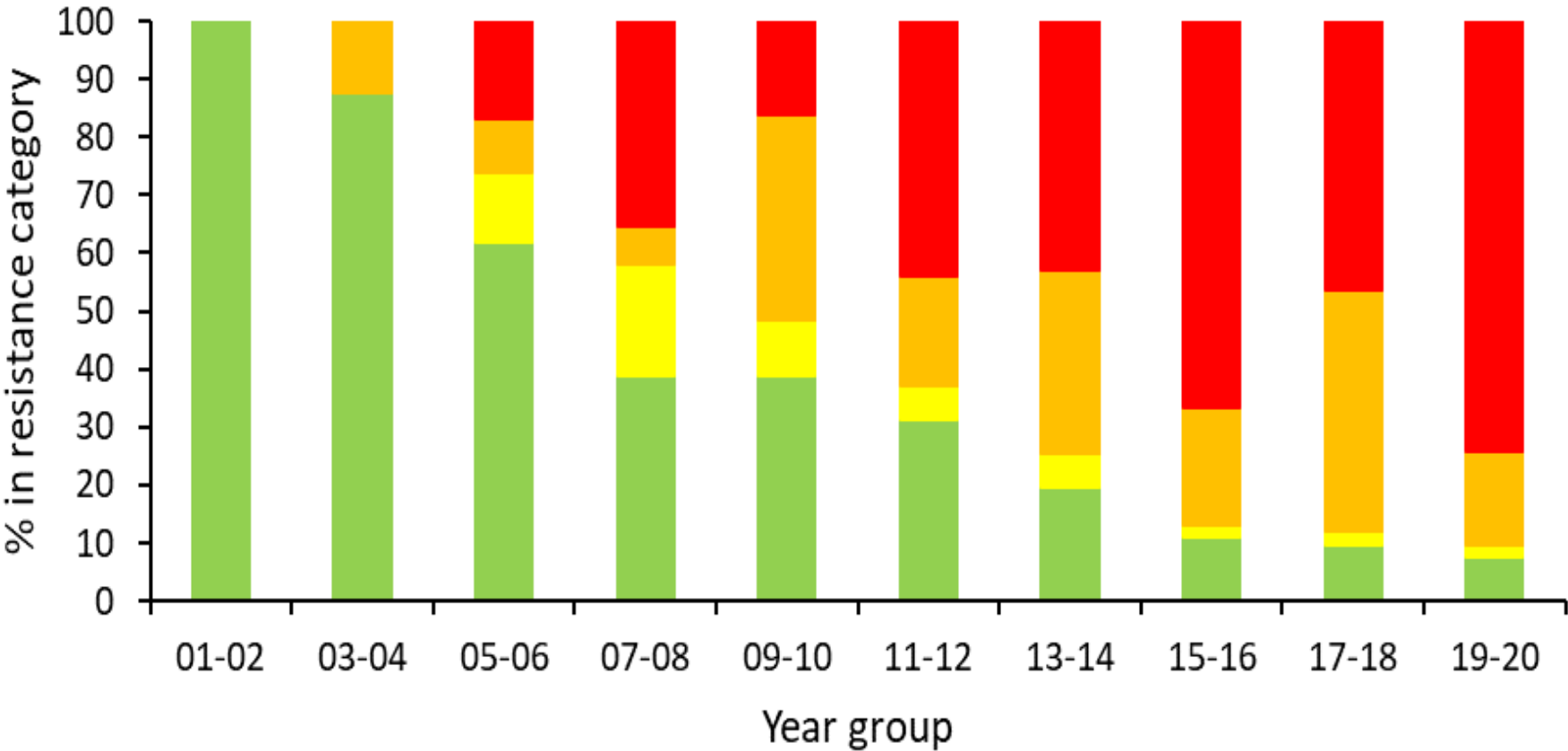
- Resistance testing – the importance of ***comprehensive resistance testing***
- ***Herbicide resistance is not inevitable*** - even if resistance is present locally you control your own fate
- Biosecurity – ***protecting yourself*** from other people's mistakes

# Comprehensive resistance testing – monitoring on a national scale



Knowing that herbicide resistance present and is a risk is valuable

## Post-emergence: Mesosulfuron + Iodosulfuron



- Decline in herbicide efficacy of 3.7%/year since the start of testing with Atlantis in 2001/2002.
- RR (orange) and RRR (red) indicates a resistant sample (<~75% control).
- Progressive, and rapid, increase in the proportion of samples rated as RR or RRR, from zero in 2001/02 to 63% by 2011/12 and 90% by 2019/20.

e) mesosulfuron + iodosulfuron

■ S ■ R ■ RR ■ RRR

Cook *et al.*, 2023

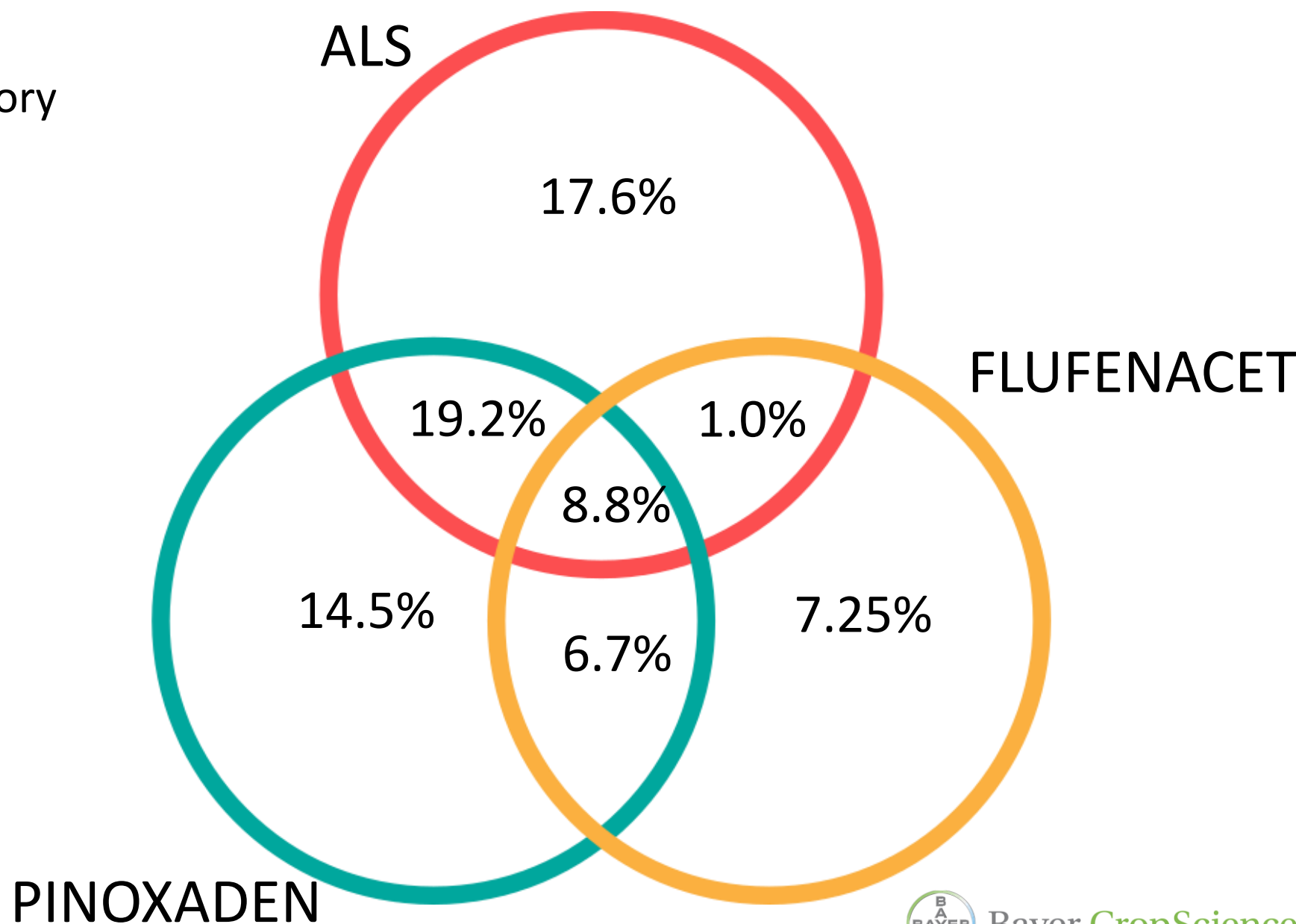
# Comprehensive resistance testing – making decision on you farm

Knowing that herbicide resistance present and is a risk is valuable BUT it doesn't tell you what herbicides work and don't work on your farm

%age of samples in each R Rating category

	Atlantis	Axial
S	45.6	45.6
R?	7.7	6.2
RR	24.1	32.3
RRR	22.6	15.9

	Flufenacet
Sensitive	70.6
Significantly Reduced	17.3
No control	9.6

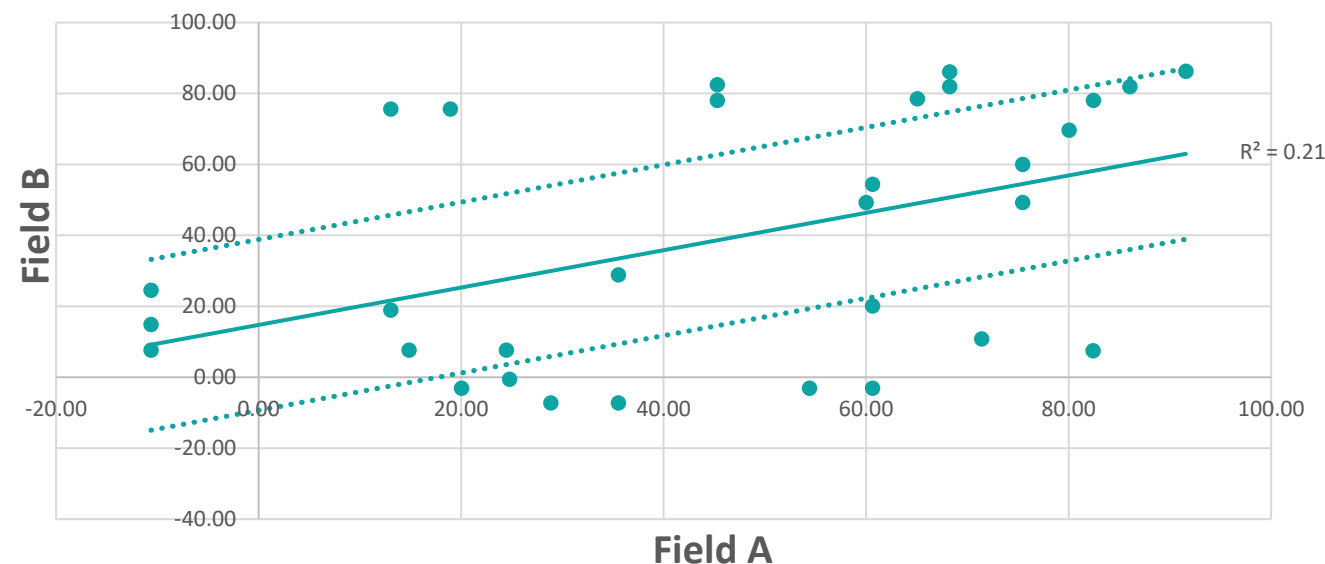


# Herbicide resistance is not inevitable

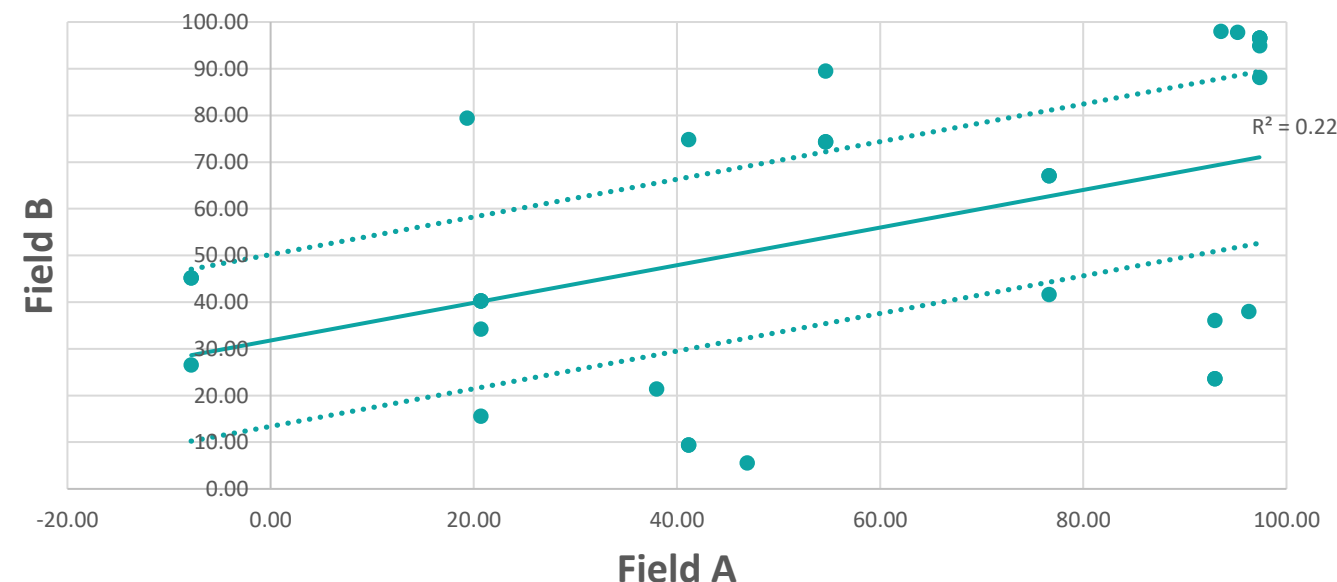
- Herbicide resistance occurs on an individual field basis .. Without spread between fields and farms the management of weeds in a field determines the level of resistance.
- Management is not just herbicides but cultural control (like crop rotation, sowing date) and non-chemical (like cultivation)

**Even when you compare resistance in two fields on the same farm it's very different**

Atlantis



Axial



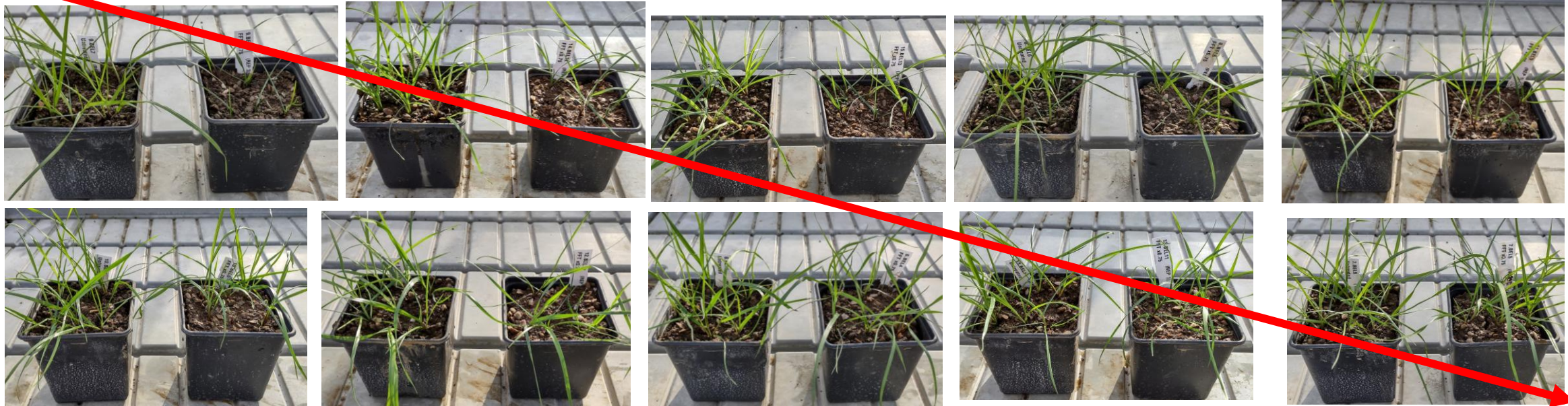
When comparing populations collected from two fields on the same farm well over half are significantly different in herbicide sensitivity.

This is important to understand when planning resistance testing/monitoring.

# Herbicide resistance is not inevitable

This is flufenacet testing for 10 fields on a single farm .. We saw everything from totally susceptible to resistant.

Susceptible



Resistant

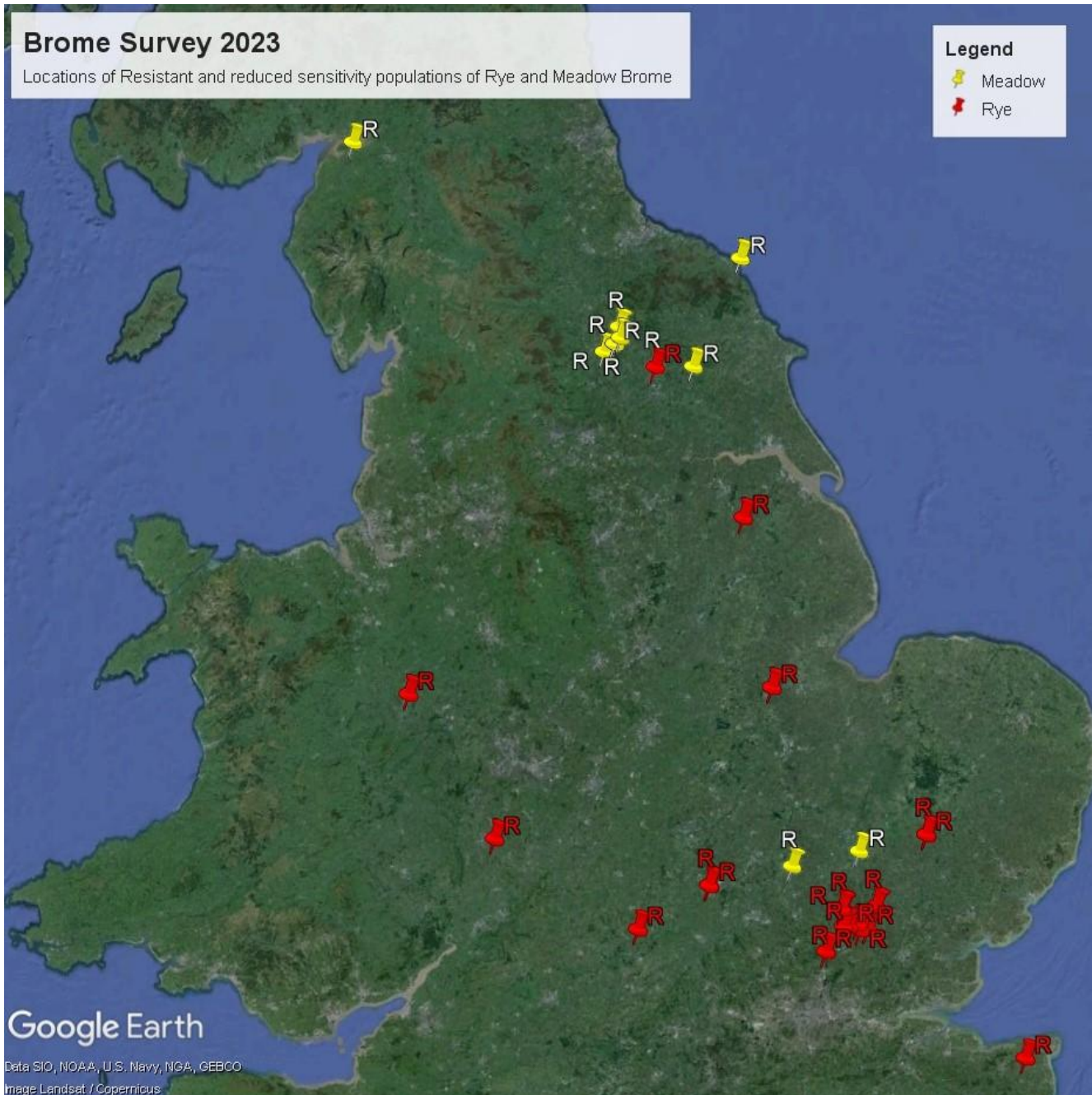
**Untreated (left) vs Flufenacet Treated (right) pots from 10 fields on one farm**

Resistance is different even between fields. Farms are in charge of their own fate when it comes to herbicide resistance

BUT having made all the right decisions on your own farm .. ***Protecting yourself from other people's mistakes is so important***



# The importance of biosecurity



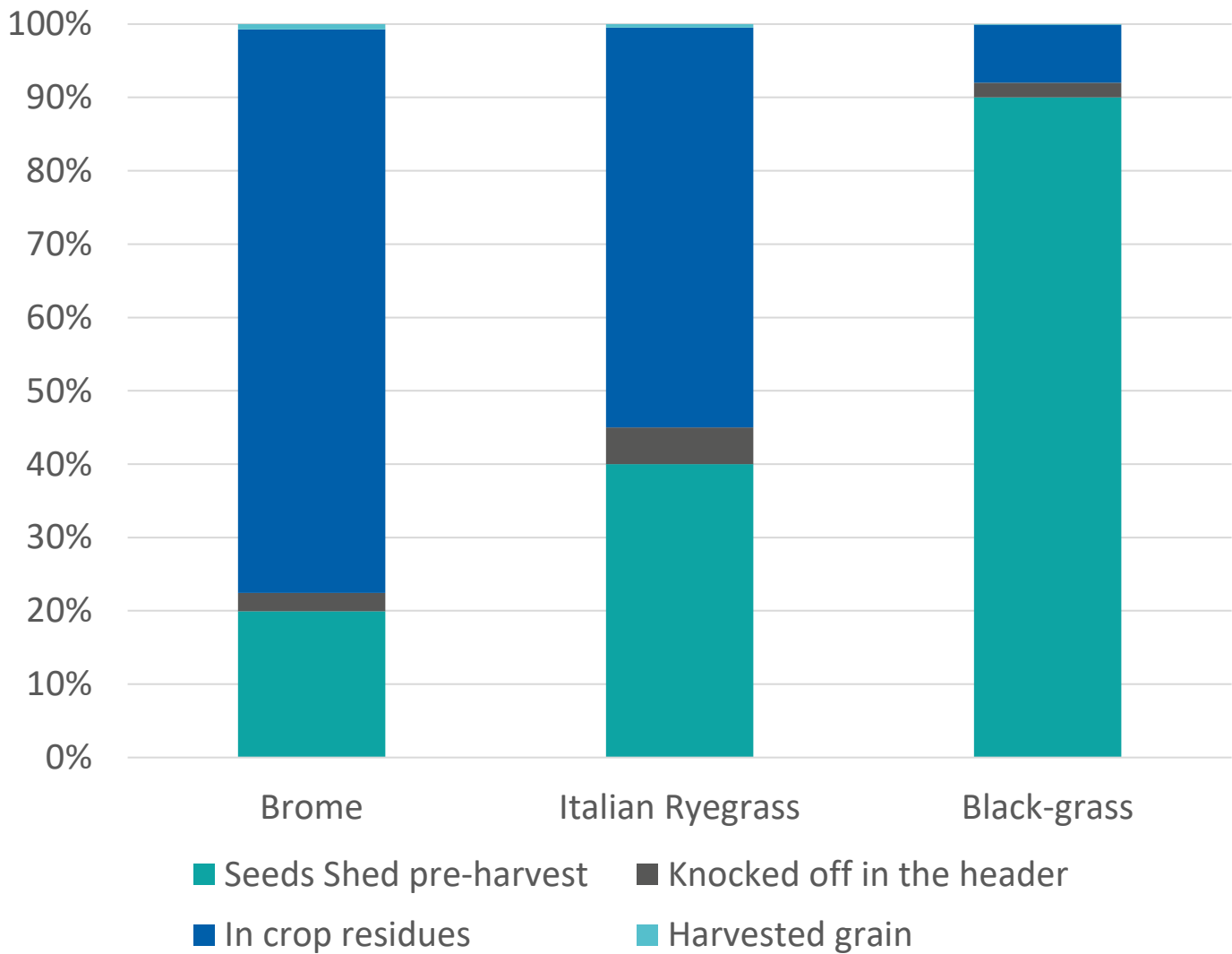
We observe distinct clusters of resistant samples – different cluster in the two *Bromus* species (Meadow Brome and Rye Brome. 25% and 30% respectively were resistant (to ALS herbicides) BUT the majority come from two distinct clusters of cases.

This is important context because it might point to a local biosecurity issue and highlight how important overall IWM messages are in managing herbicide resistance.

# The importance of biosecurity

Seeds at harvest are a particular risk because of grain and straw movement between farms

	Meadow Brome	Italian Ryegrass	Black- grass
Seeds Shed pre-harvest	20.0	40.0	90.0
Knocked off in the header	2.5	5.0	2.0
In crop residues	76.9	54.5	7.9
seeds in grain sample	0.7	0.5	0.1
	Measured	Estimates	





# The importance of biosecurity

Seeds at harvest are a particular risk because of grain and straw movement between farms

BUT great news, black-grass is a relatively low risk weed in terms of biosecurity?

‘Low’ is relative;  
At low infestation level the estimate would be 10 seeds per kg of straw and at high infestations 100 seeds per kg

**10,000 to 1000,000 seeds in a tonne of (wheat) straw**

