

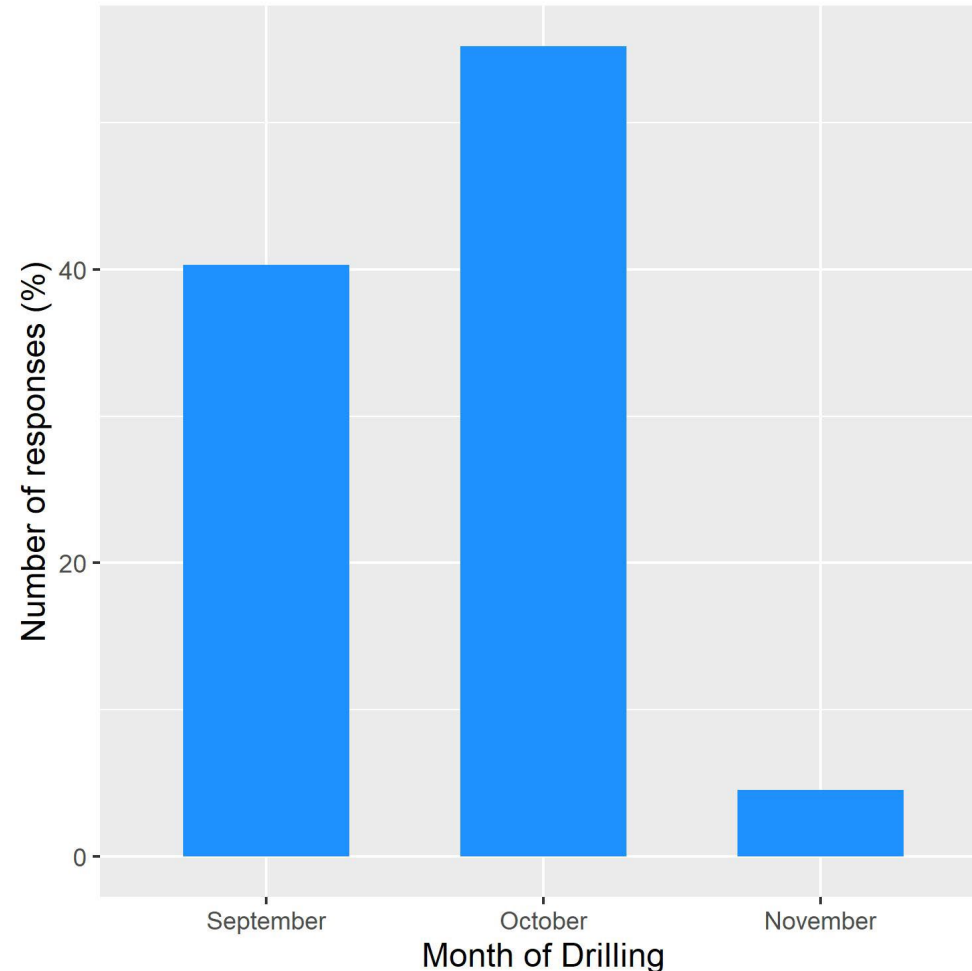


Integrating mechanical weed control into arable crops

Will Smith

Current state of weed management for UK arable

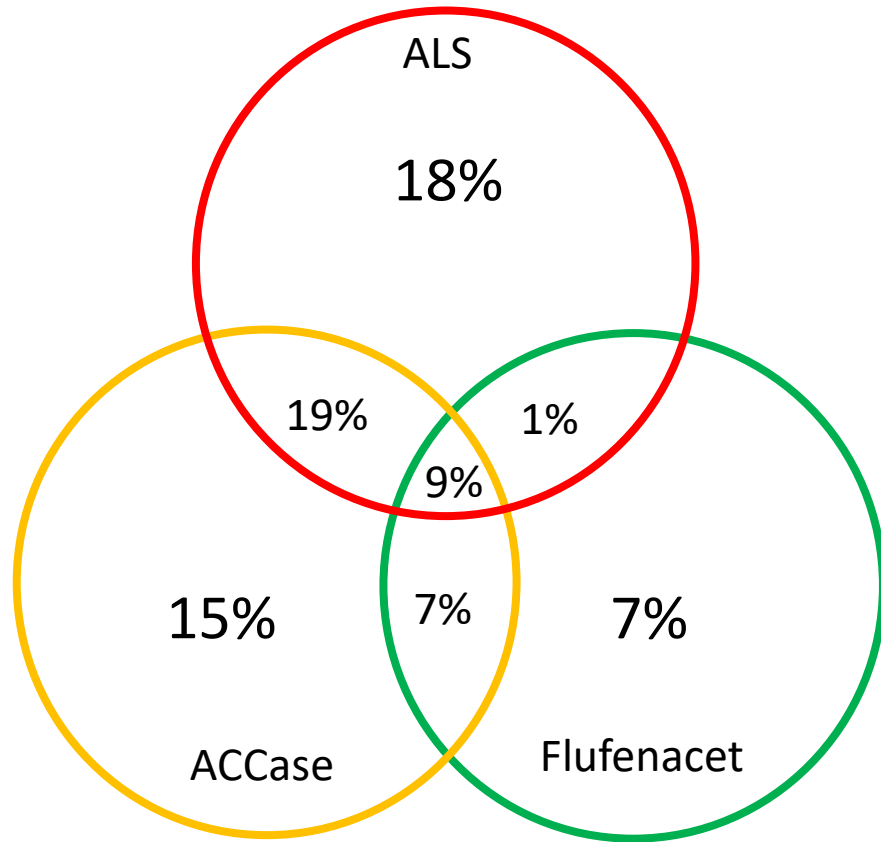
- Significant dependence on synthetic herbicides for effective control
- Pressure on these compounds from resistance, regulation and market preferences
- Evidence of uptake of IWM messaging e.g. drilling date, although often reactive to issues
- Alternative in-crop tools are going to be needed in the future



2021 IRG Survey (NIAB-Bayer)

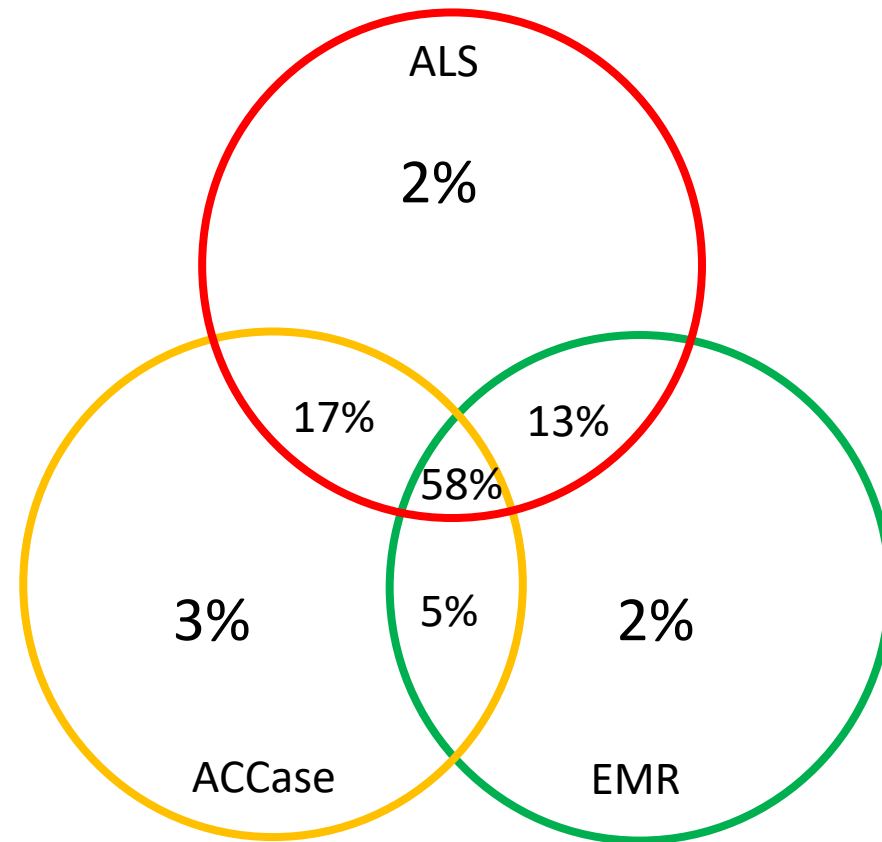
What is the status of weed control in the UK?

Italian rye-grass



NIAB 2021

Black-grass



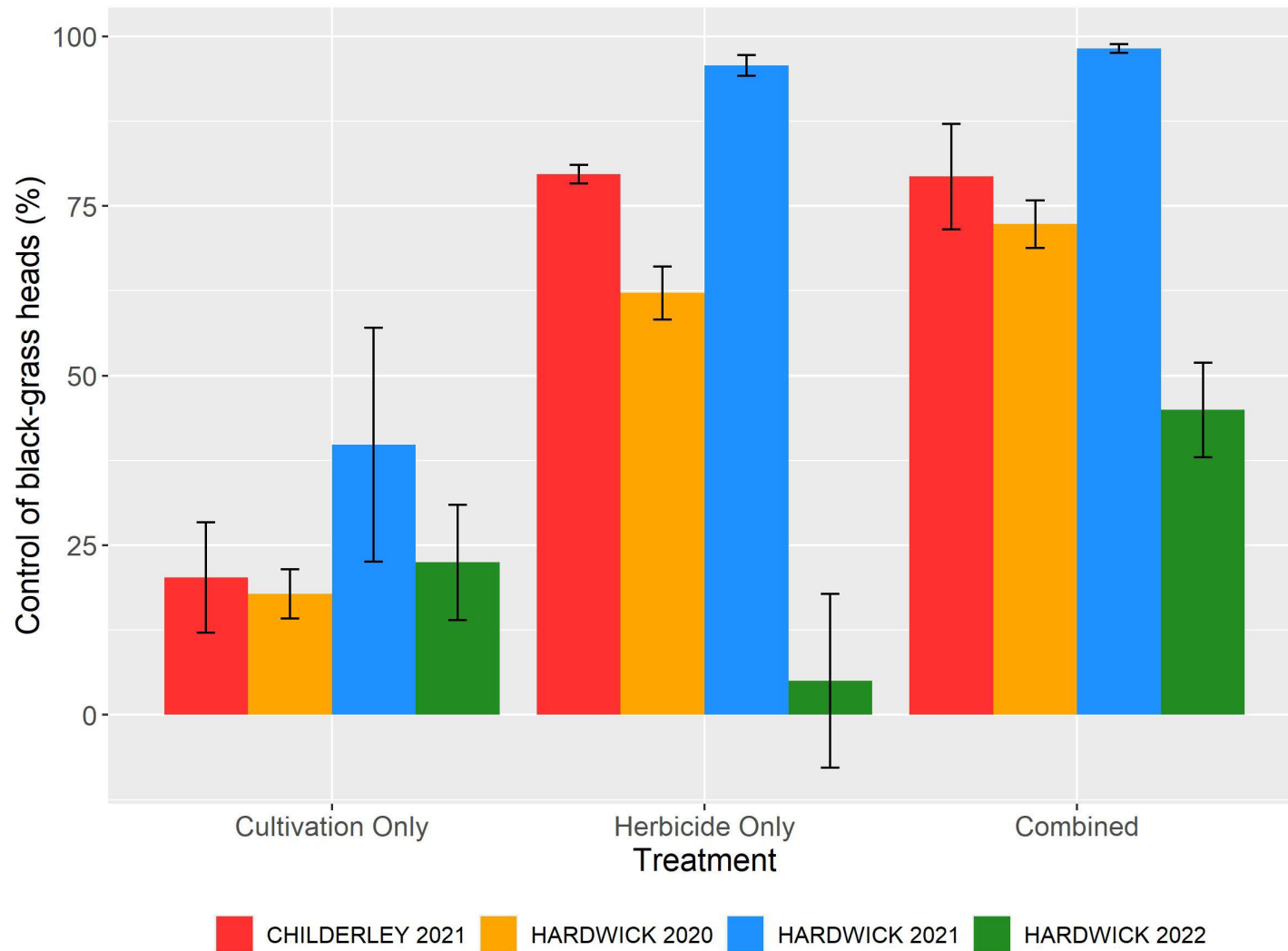
BASF/ADAS 2021

Mechanical weeding

- Mechanical removal and burial of weeds
 - Range of options available;
 - Pre-sowing cultivation
 - Primary cultivations
 - Secondary cultivation to produce stale seedbeds
 - Weed harrowing
 - Early in crop stages
 - Requires crop to be better rooted than the weed
- Inter-row cultivation
 - Spatially selective to minimise crop damage
 - Enables more aggressive cultivation, so removing established weeds

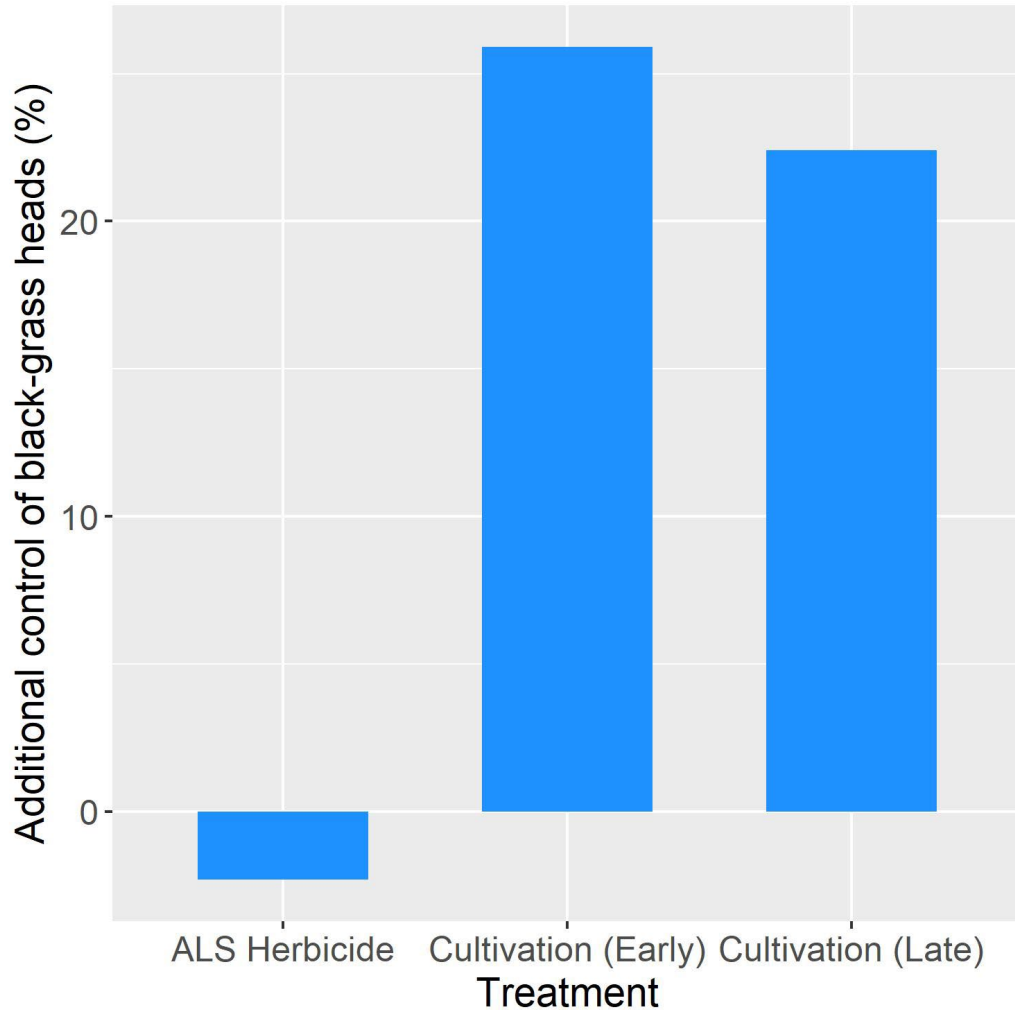


Control of black-grass



- IRC adds consistency to overall control, although remains strongly reliant on herbicide activity
- In some years IRC > herbicide, but control is only 20-40% so not a complete solution
- Future – understand the mechanism as to why control is poorer for grass-weeds and overcome this

Perspective?



- ALS herbicides are still largely used in the spring, to target other weed species
- Balance available options for black-grass control in the spring – herbicides are an inappropriate use, significantly better to use alternative tools



Stacking options...



Untreated
13/10/2022



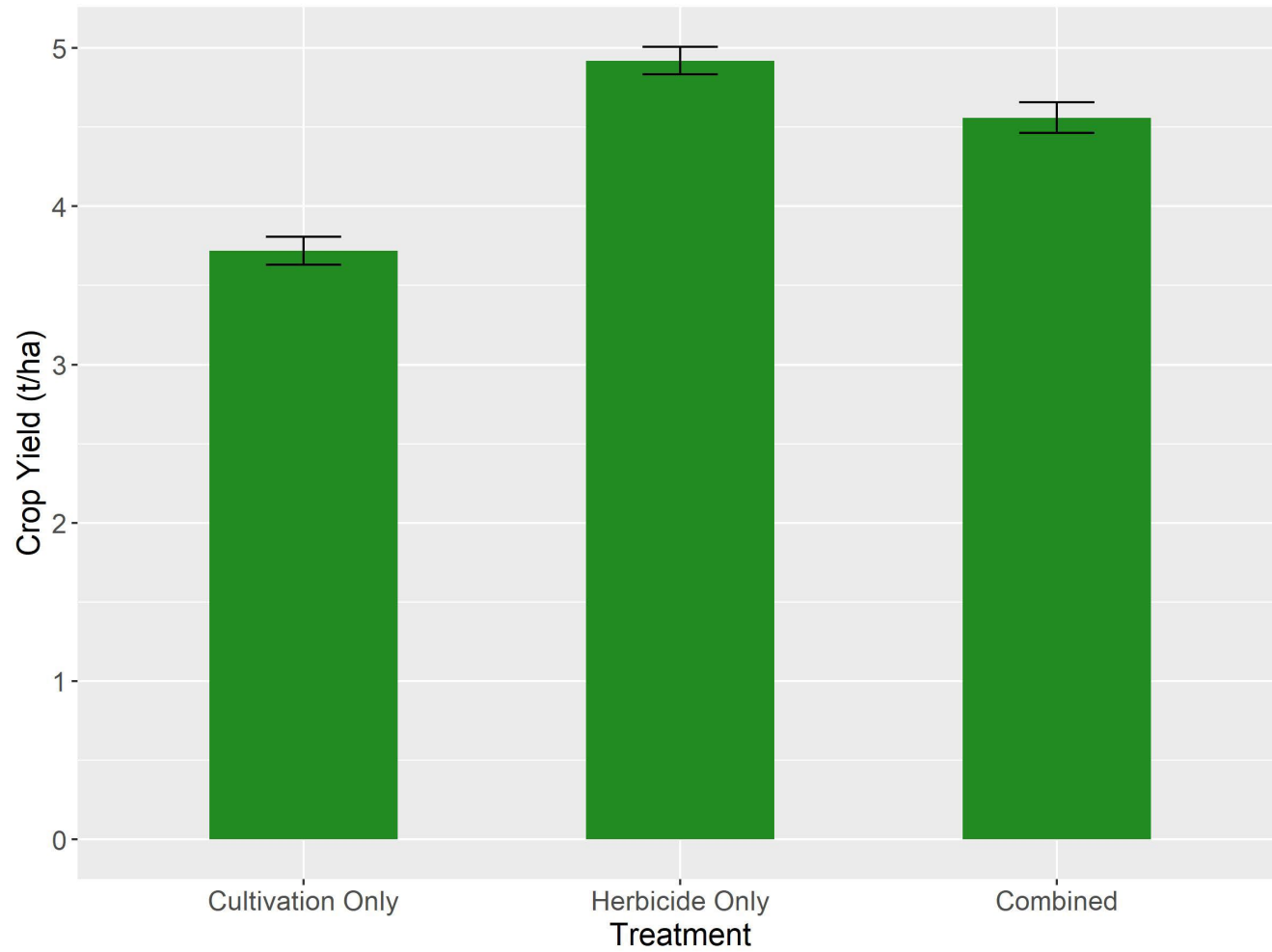
Luxinum Plus (0.7
l/ha) + Stomp Aqua
(2.0 l/ha)



Herbicide plus
inter-row
cultivation

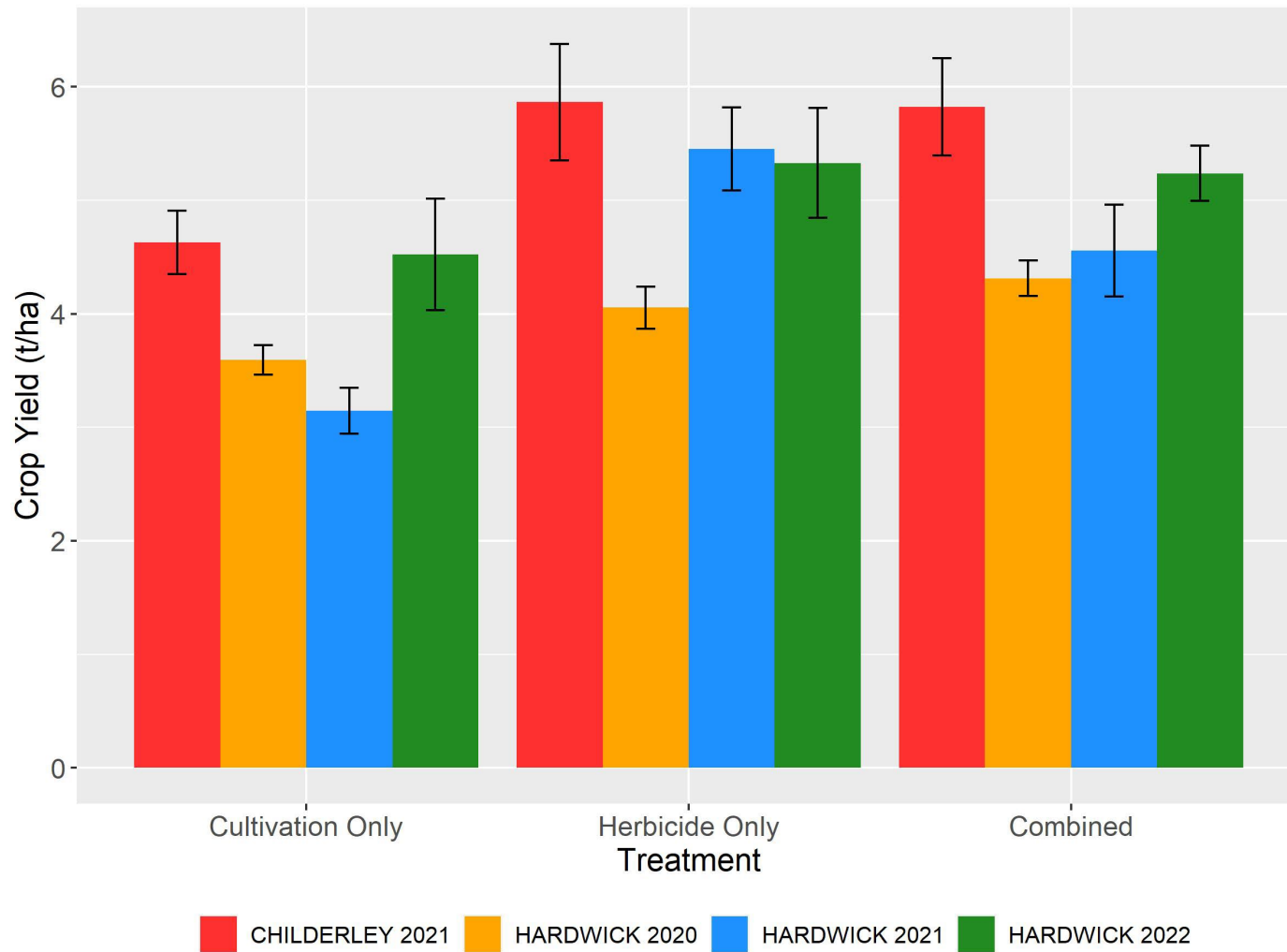


Crop Yield



- Yield penalty from insufficient weed control early in the season
- Small yield reduction in reaction to inter-row hoeing

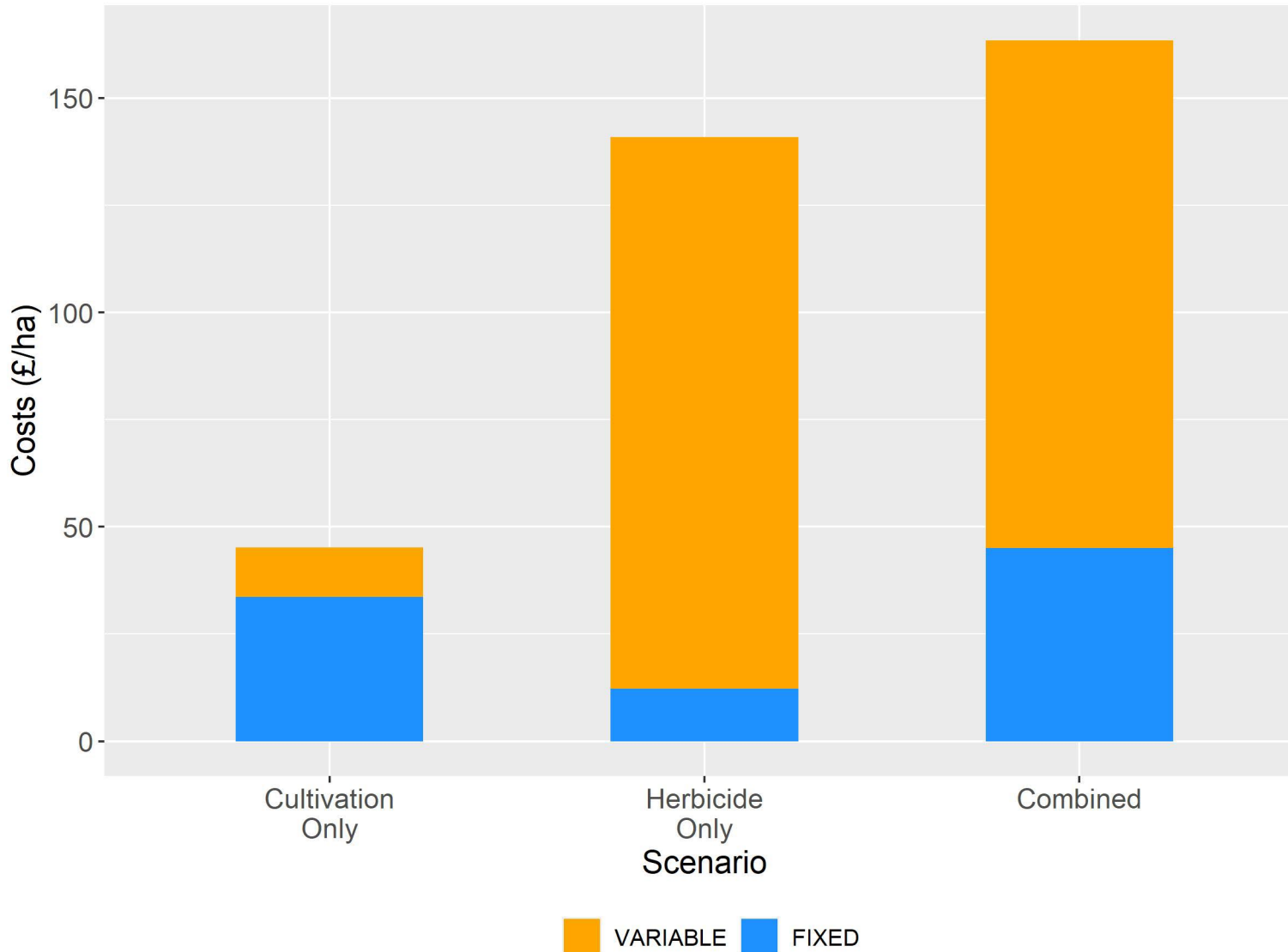




- This is largely as a result of a single season (Hardwick 2021) – when conditions for hoeing early were unsuitable, causing root movement in the crop

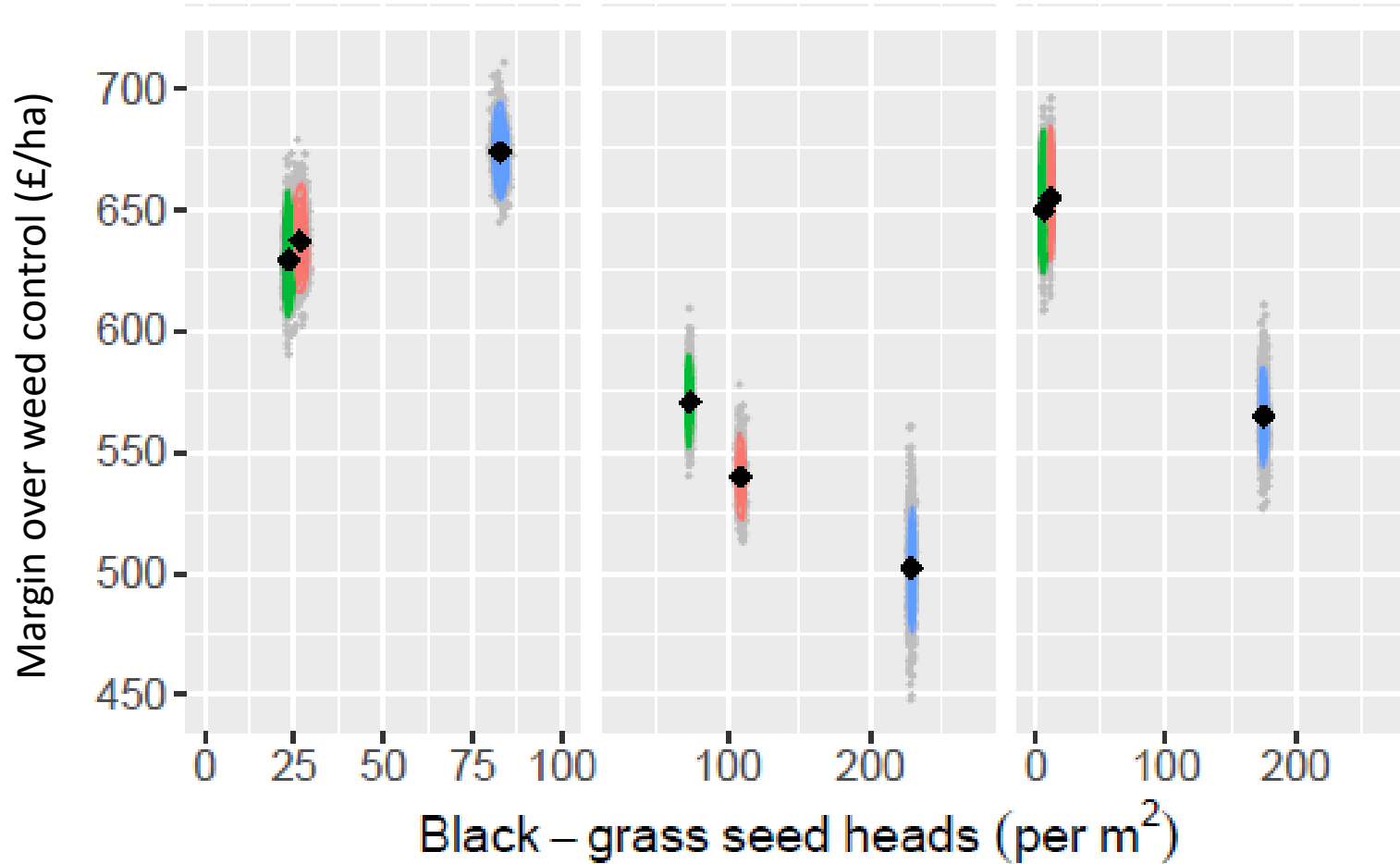


Costing of new tools



- The costs of a combined system are slightly higher
- Purchasing an additional machine, and additional labour costs
- Variable costs remain high, as no reduction in herbicides has been costed in
- Variable costs of hoeing equates to <£10/ha per pass

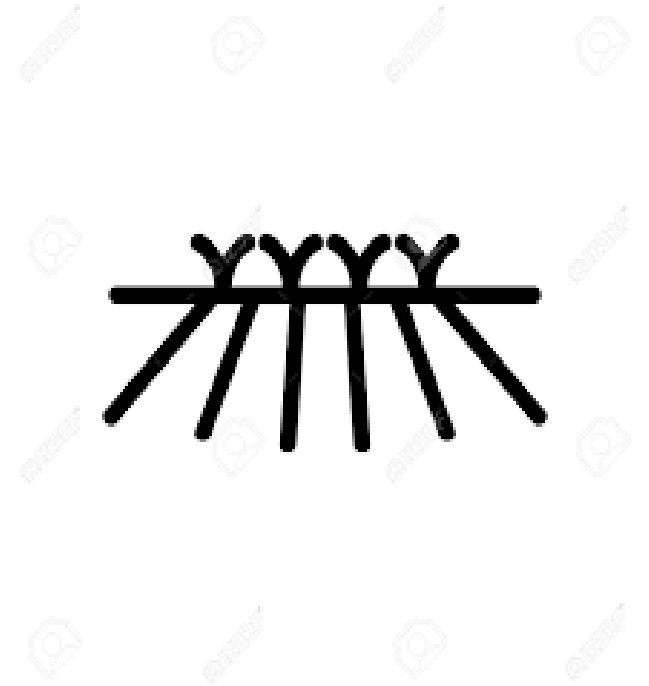
Economic performance



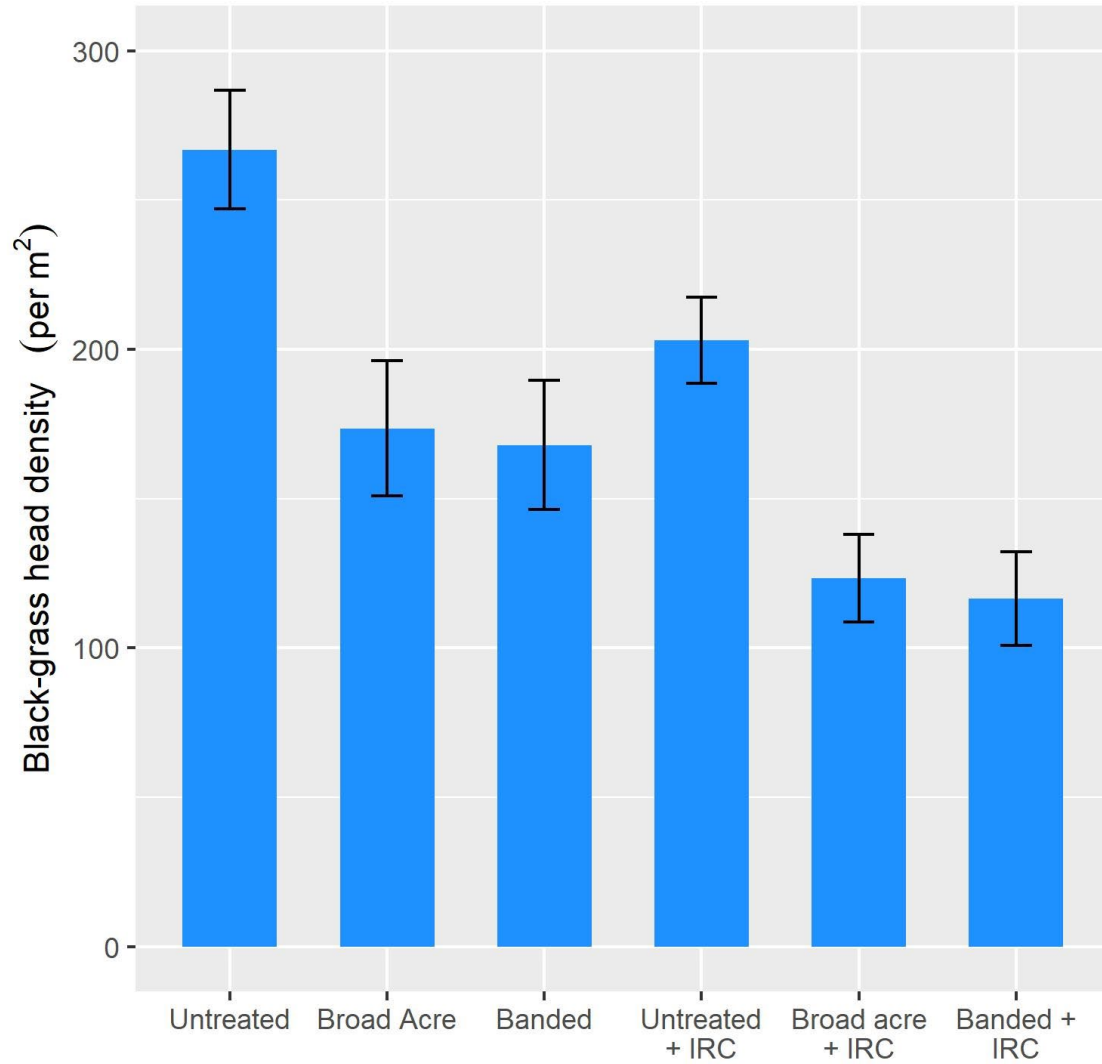
- A combination of IRC and herbicides (green) performs equally to herbicides alone (red)
- At a site where black-grass is low, then IRC alone (blue) may be preferential



Achieving pesticide reduction targets



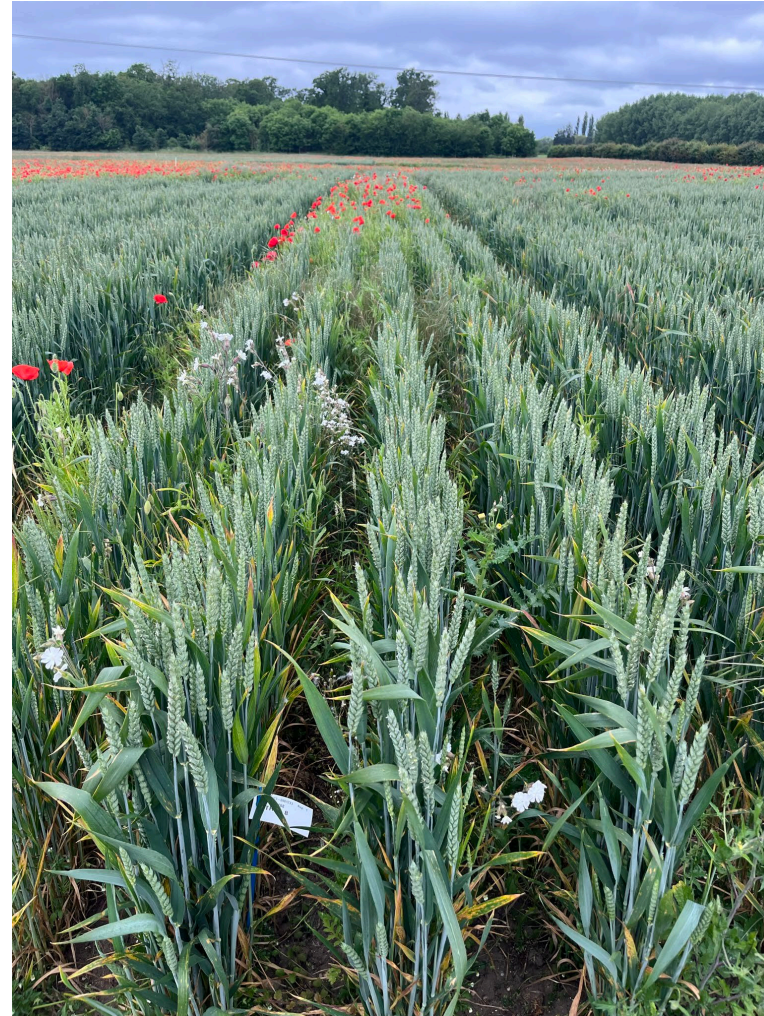
Opportunities exist



- Summary from 4 trials
- The performance of banded and standard herbicides was similar within all years – although this is partially informed from generally poor herbicide efficacy
- The combination of banded herbicide (with a real reduction of 64%) and a single pass of inter-row cultivation was ranked high in effectiveness



Broad-acre herbicide



Banded herbicide +
inter-row cultivation



Summary

- In-crop mechanical cultivation has the potential to significantly improve overall weed control in UK arable crops
- Economic parity – even without consideration for reduction in costs associated with herbicide use
- Significant opportunity to develop solutions that reconcile effective weed management with environmental targets
 - Barriers exist regarding regulation
- Wider barriers to uptake of direct non-chemical weed control require more research
 - Jump before being pushed?



Will Smith

will.smith@niab.com

07525 796082

@AgricWill

