

How well do we understand and manage multiple herbicide resistance in wild radish with the existing chemistries?

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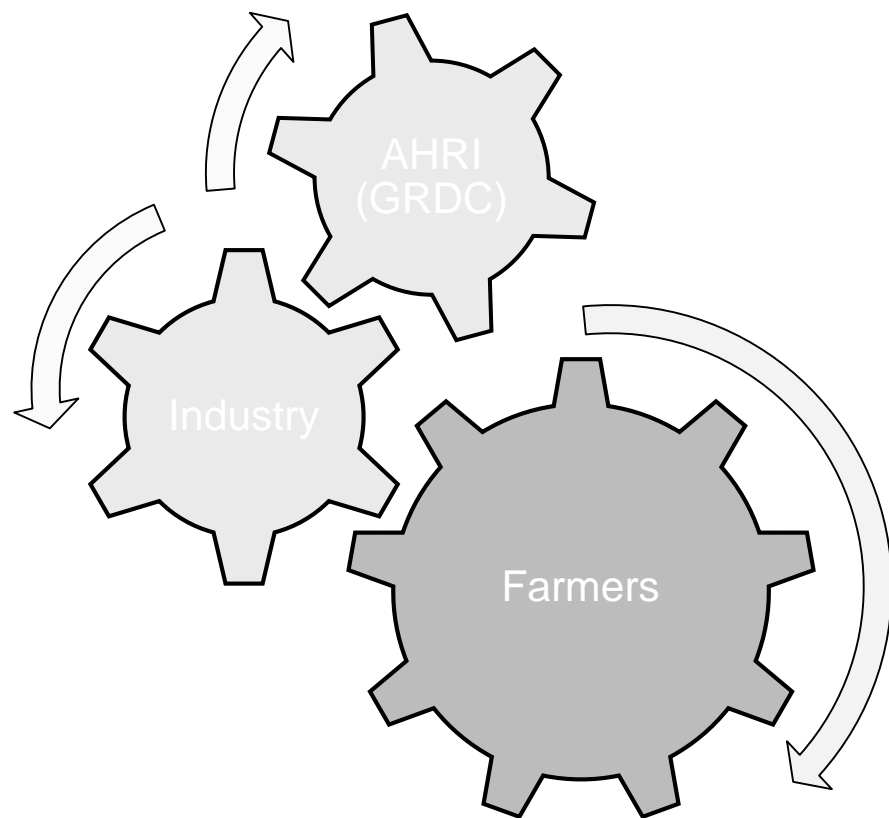


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Development of new herbicides for resistant wild radish



Wild radish

- ❑ WWW – high seed production, persistence in a range of conditions.
- ❑ Particularly competitive and difficult to control in dicot crops
- ❑ In Australia 5m ha infested causing 53m pa (\$10/ha revenue loss)



Post-emergent herbicides for wild radish control

❑ Wheat: SU (B), Bromoxynil (C), Phenoxy (I), 'Bleachers' (F or H) in mixtures

❑ Pulses: 'Bleachers' PDS (F)



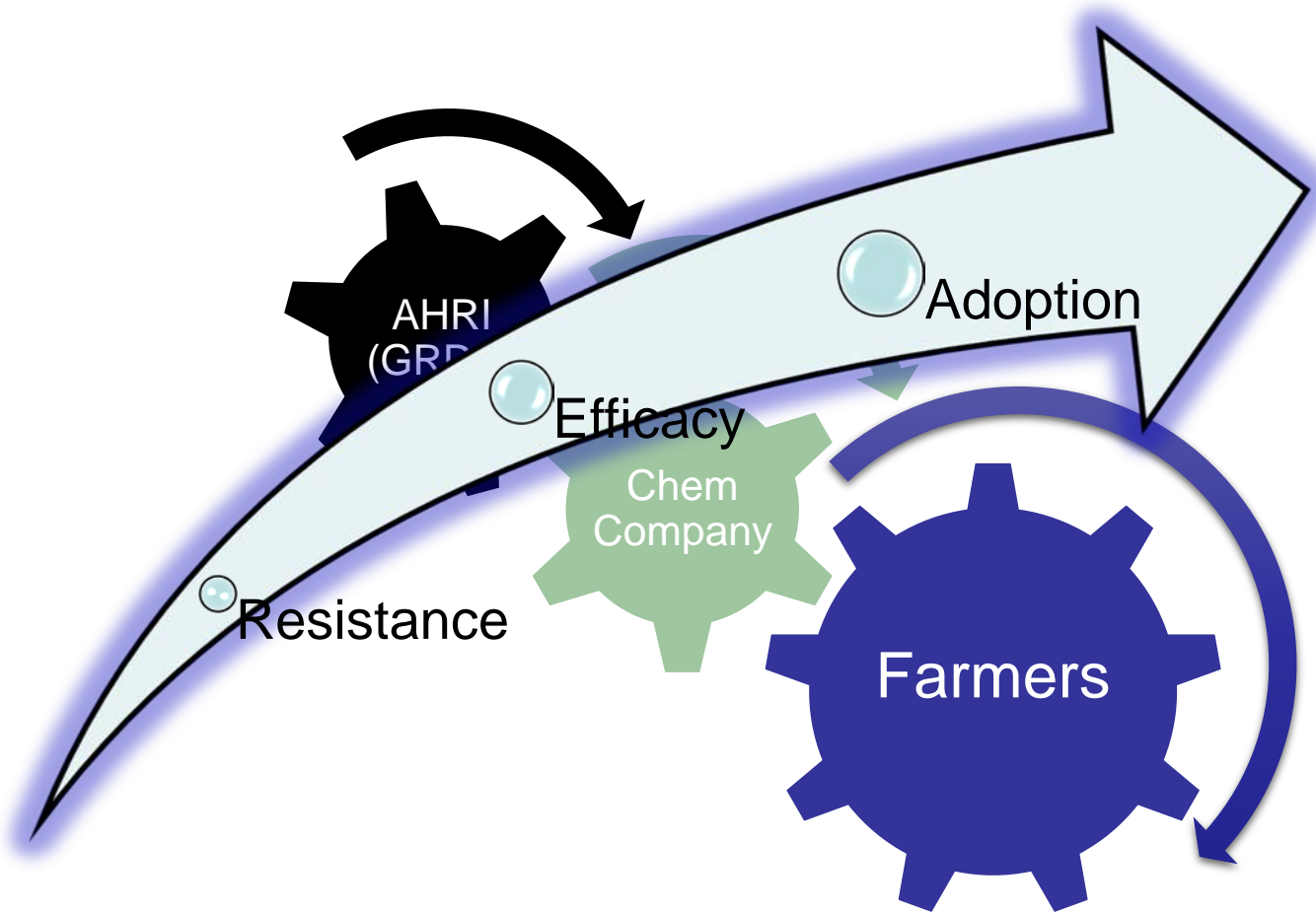
❑ CF or RR Canola: IMI (B), Glyphosate (M)

Which mixture is more effective?

Group	Early Post Emergent	Group	Late Post Emergent
C I	Diuron + MCPA		
I	MCPA	I	2,4-D's
B	Glean/Logran	I B	2,4-D's + Logran
I B	MCPA + Logran	B	Logran + Oil
I B	MCPA + Ally®	M	Roundup PowerMAX®
G I	Affinity® + MCPA		
C	Bromoxynil		
C I	Bromicide® MA		
C I B	Bromicide MA + Eclipse®		
C I I	Broadside®		
F I	Paragon®		
F I	Nugrex® / Tigrex®		
F C	Minder® / Jaguar®		
I	Dicamba		
I I	Kamba M		
I	2,4-D's		
B I	Midas®		
H I / HC	Precept®/Velocity®		

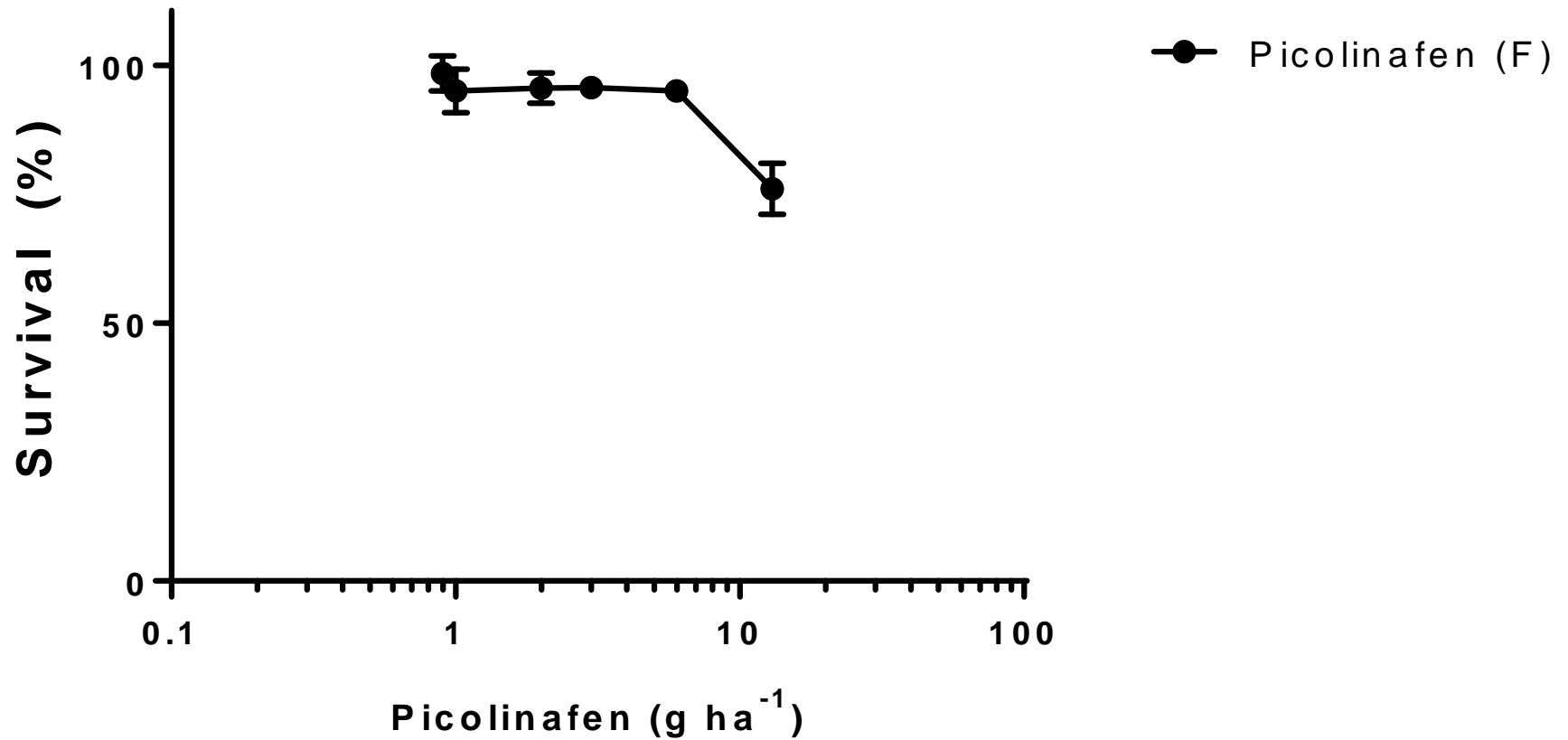


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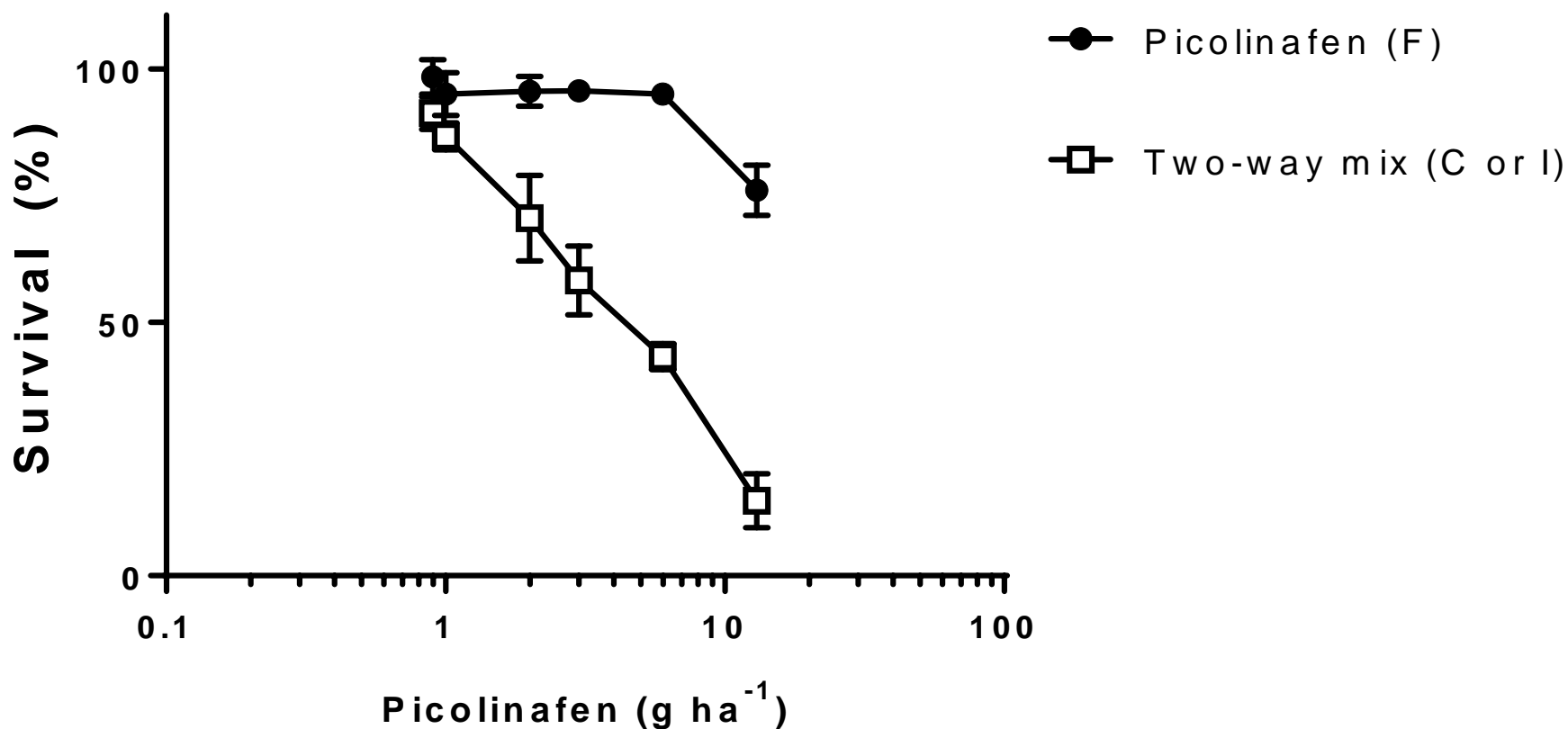
Additive interaction F, C, I?

Picolinafen TT canola



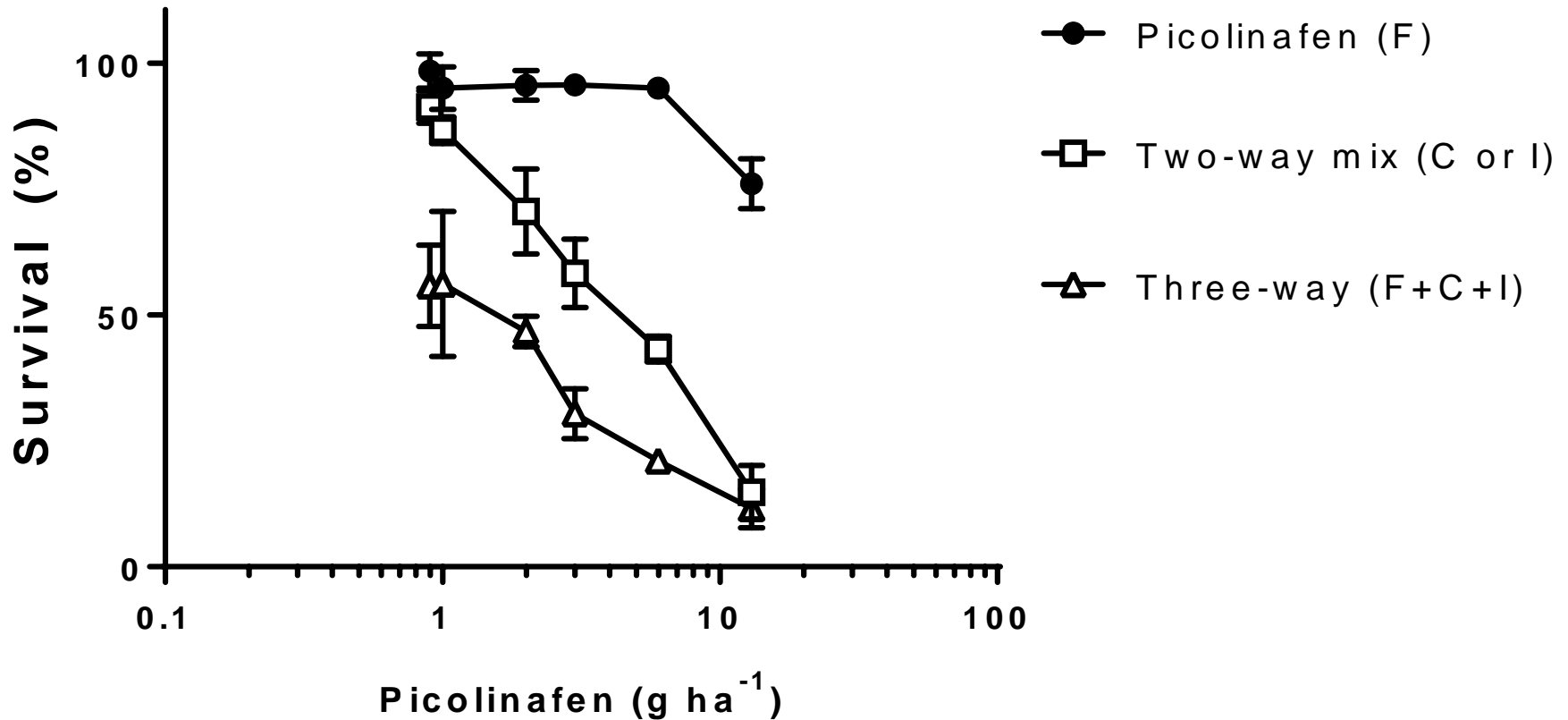
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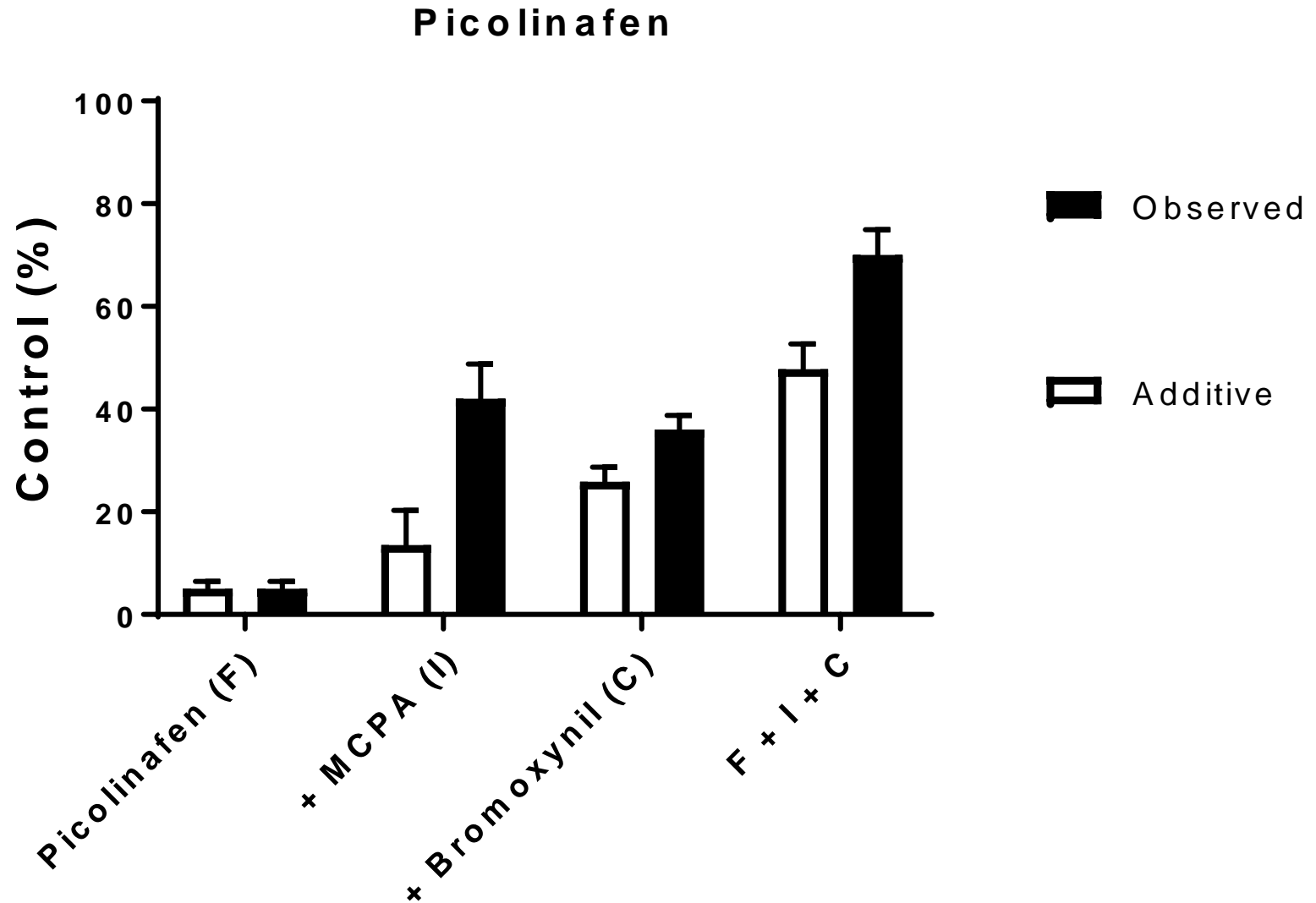
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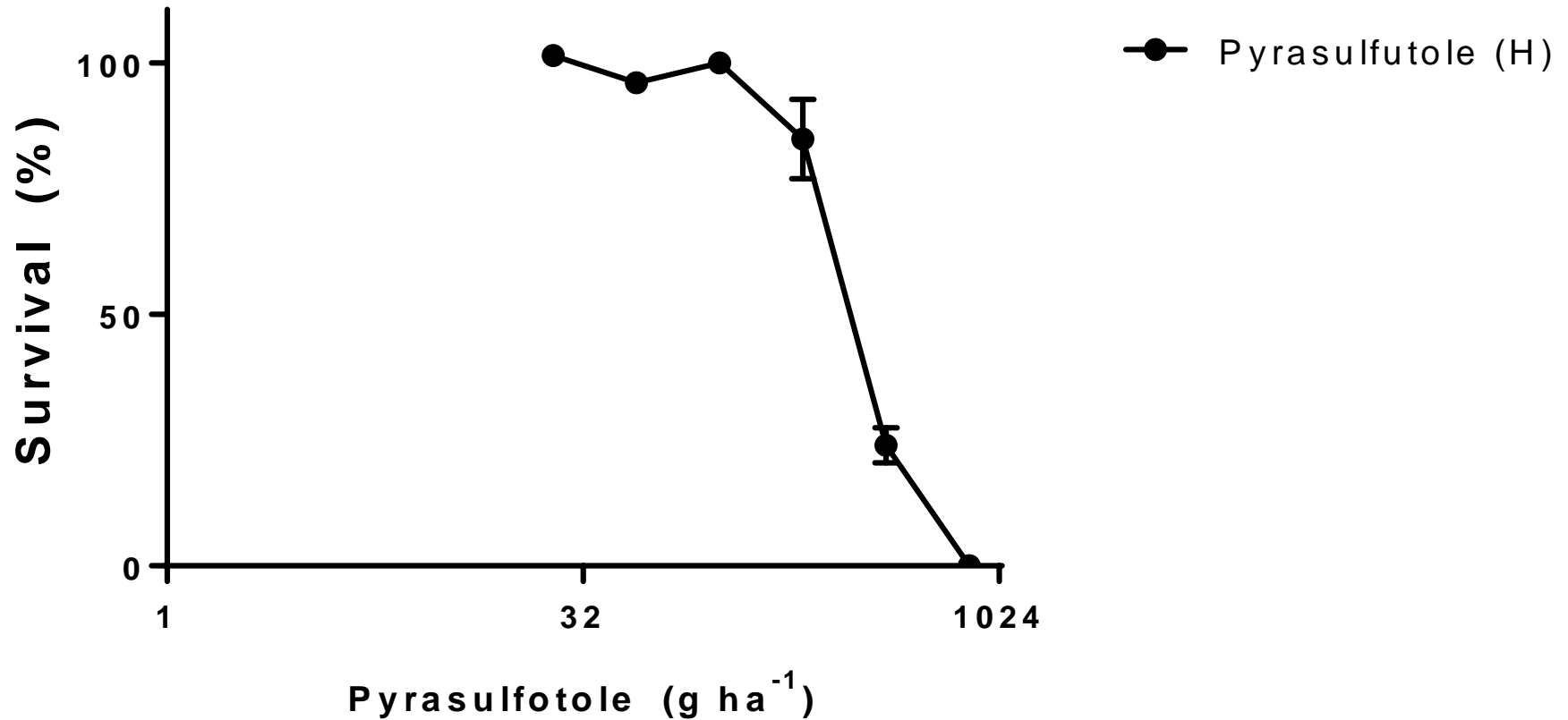


Additive confirmed (at least)



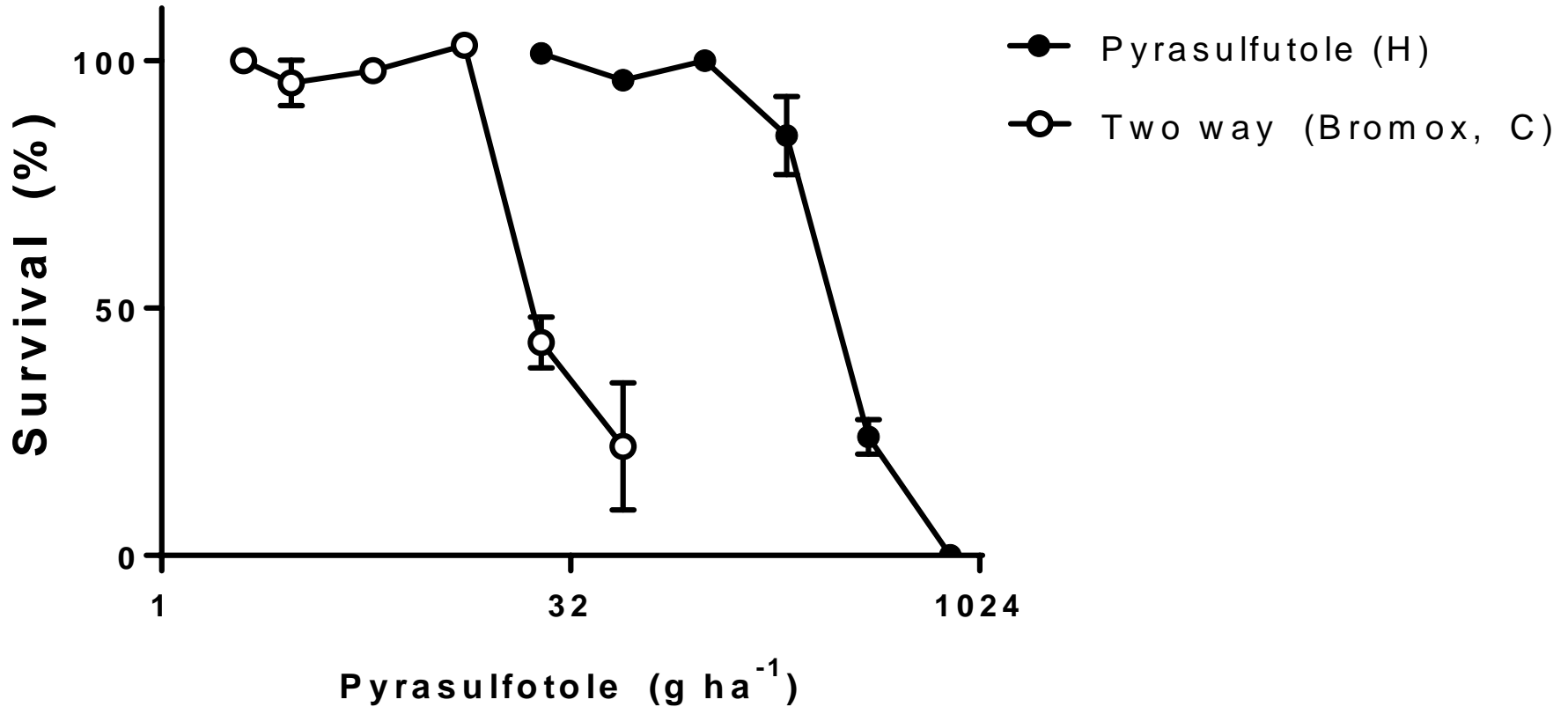
Synergy between H, C, I?

Pyrasulfotole TTcanola



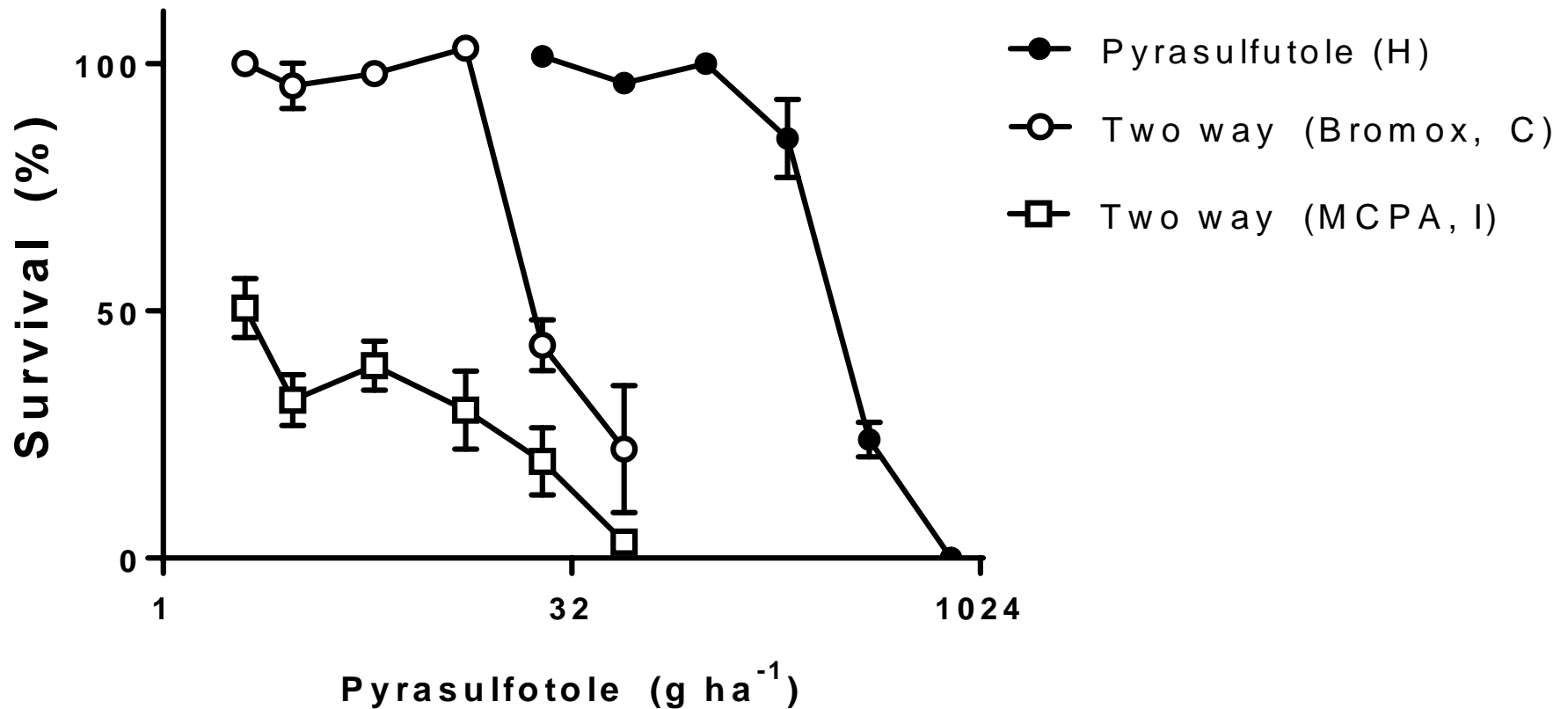
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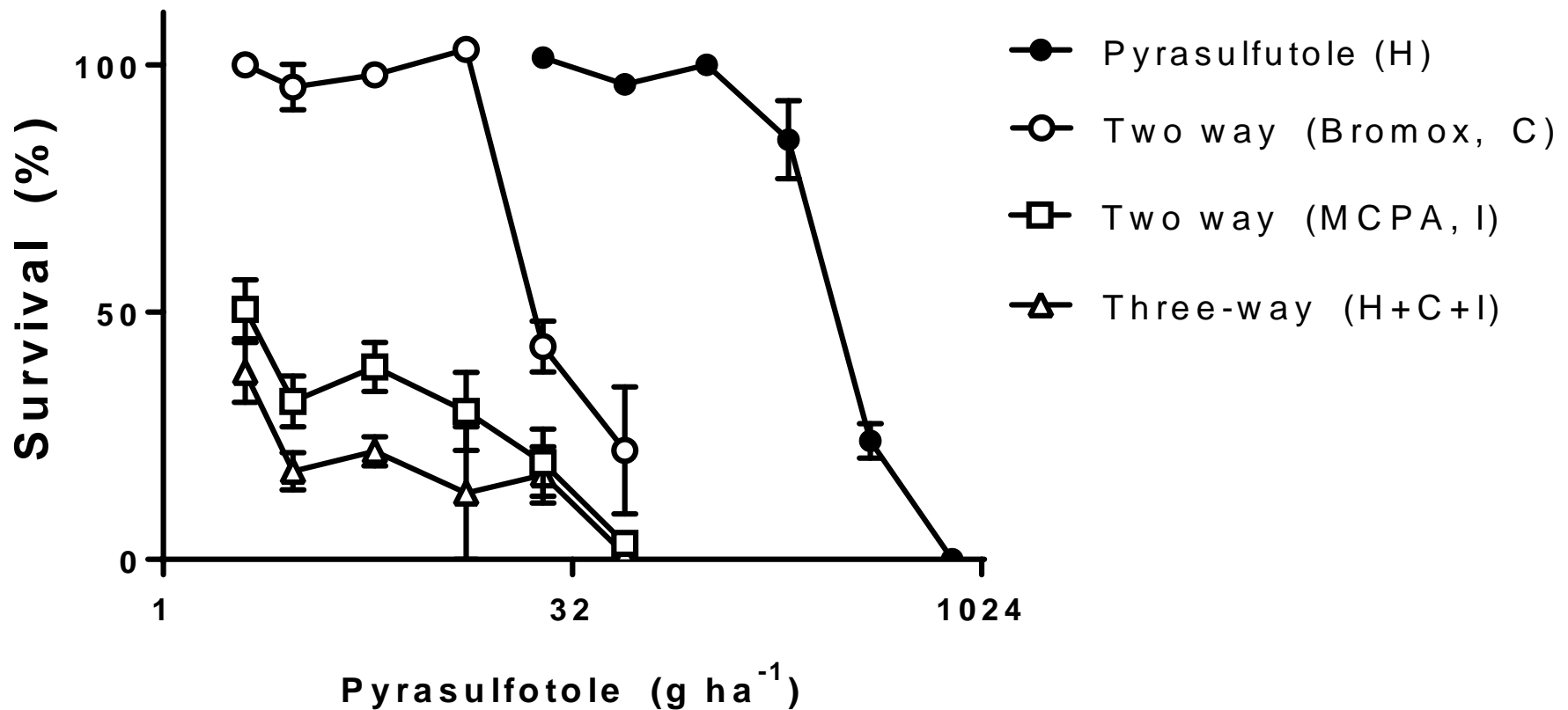
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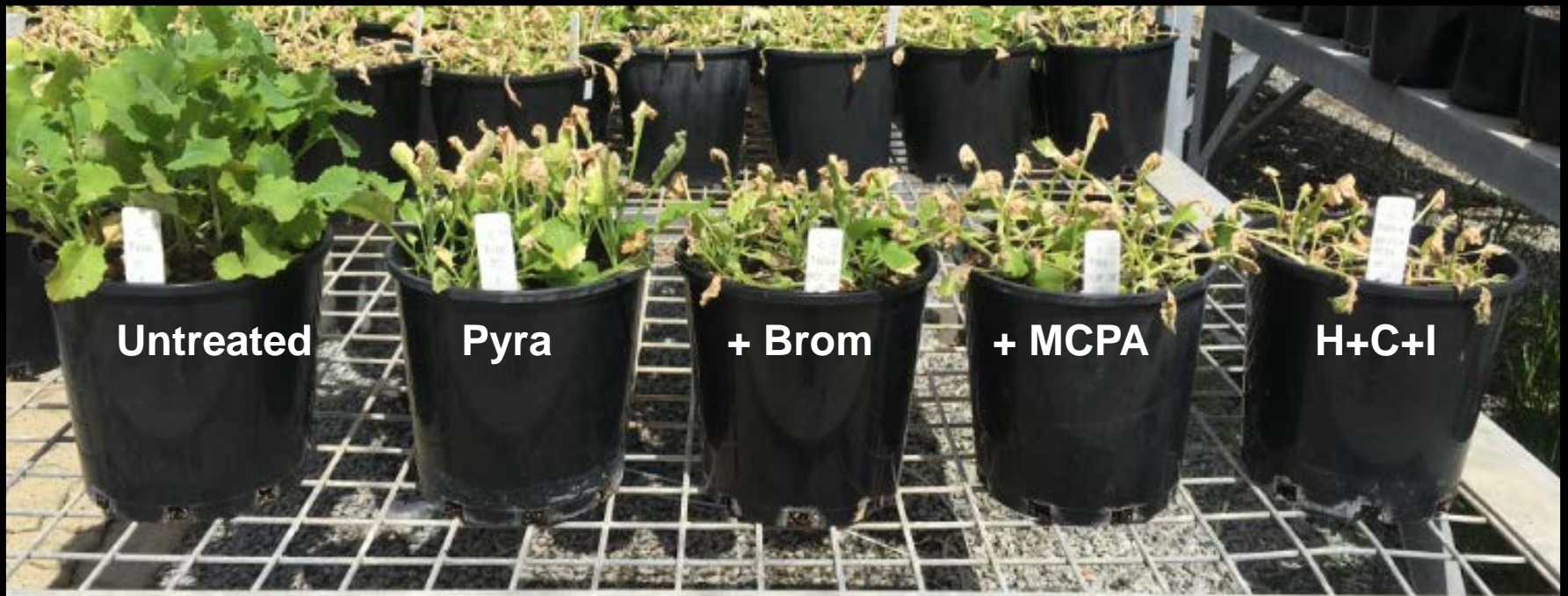


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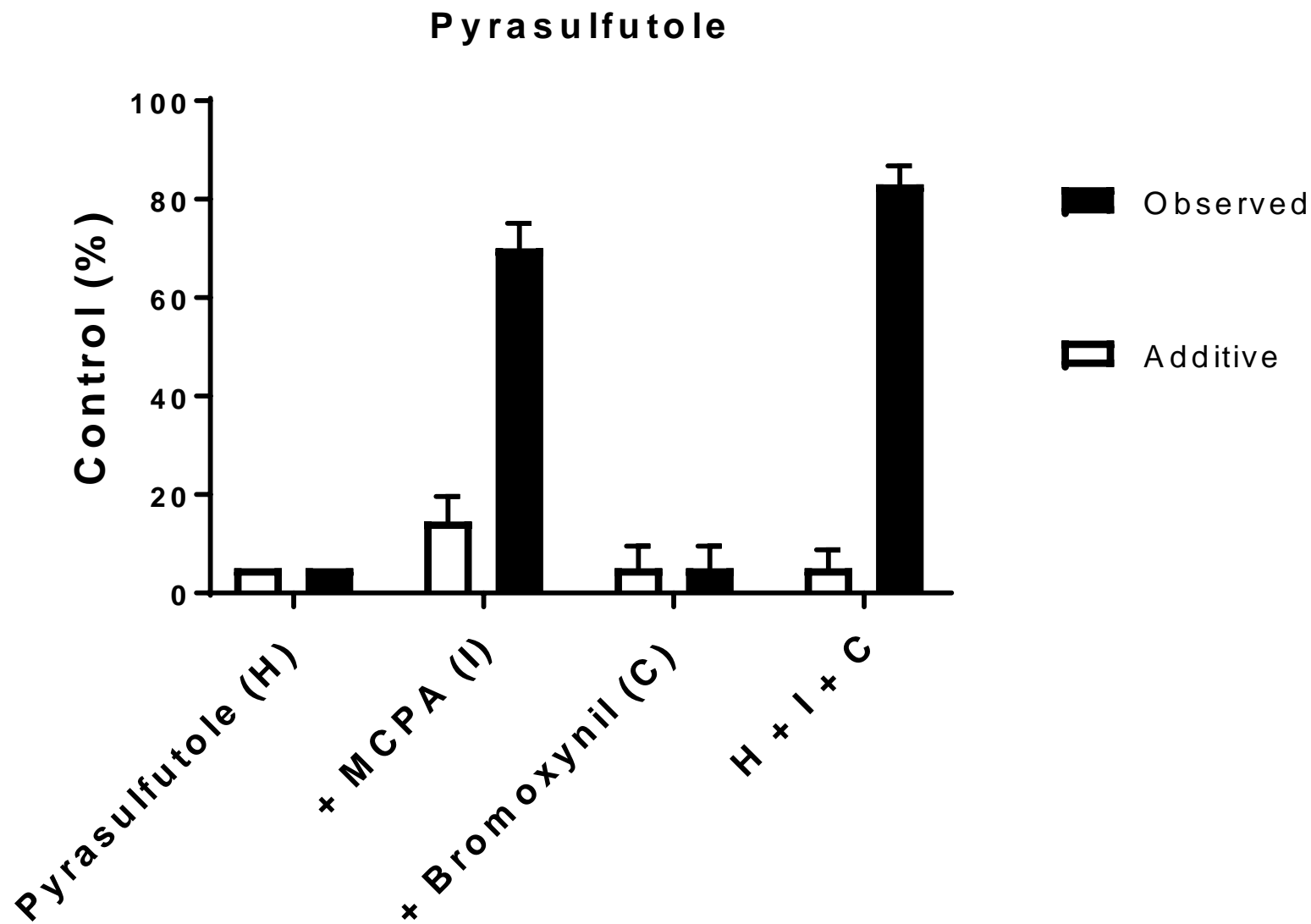
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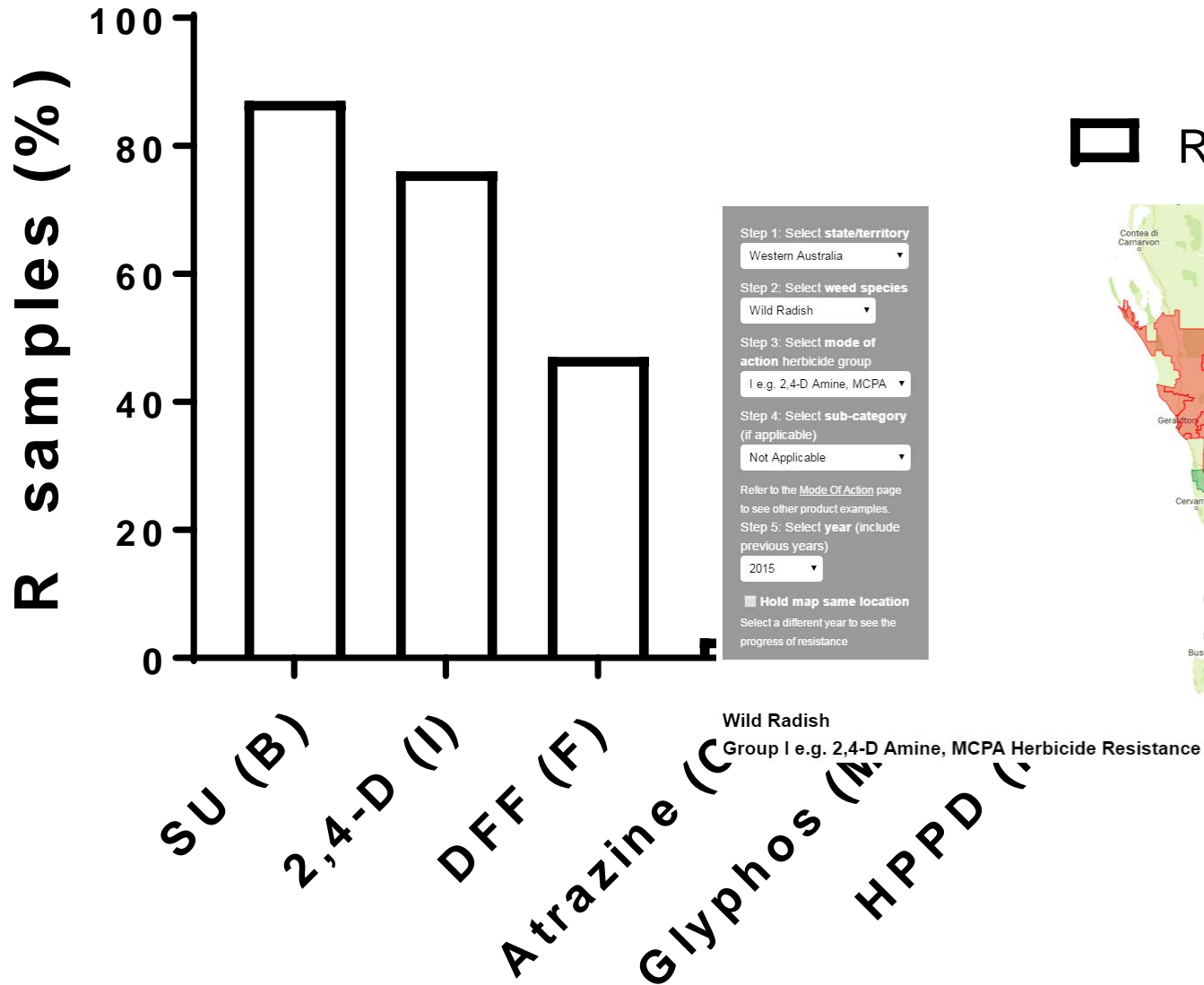
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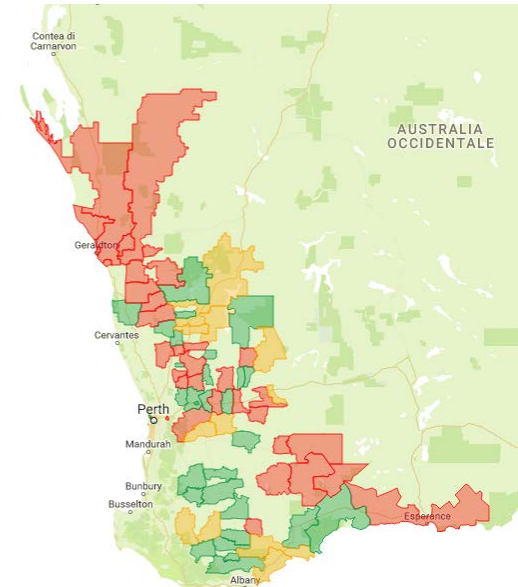
Synergy confirmed H, C, I



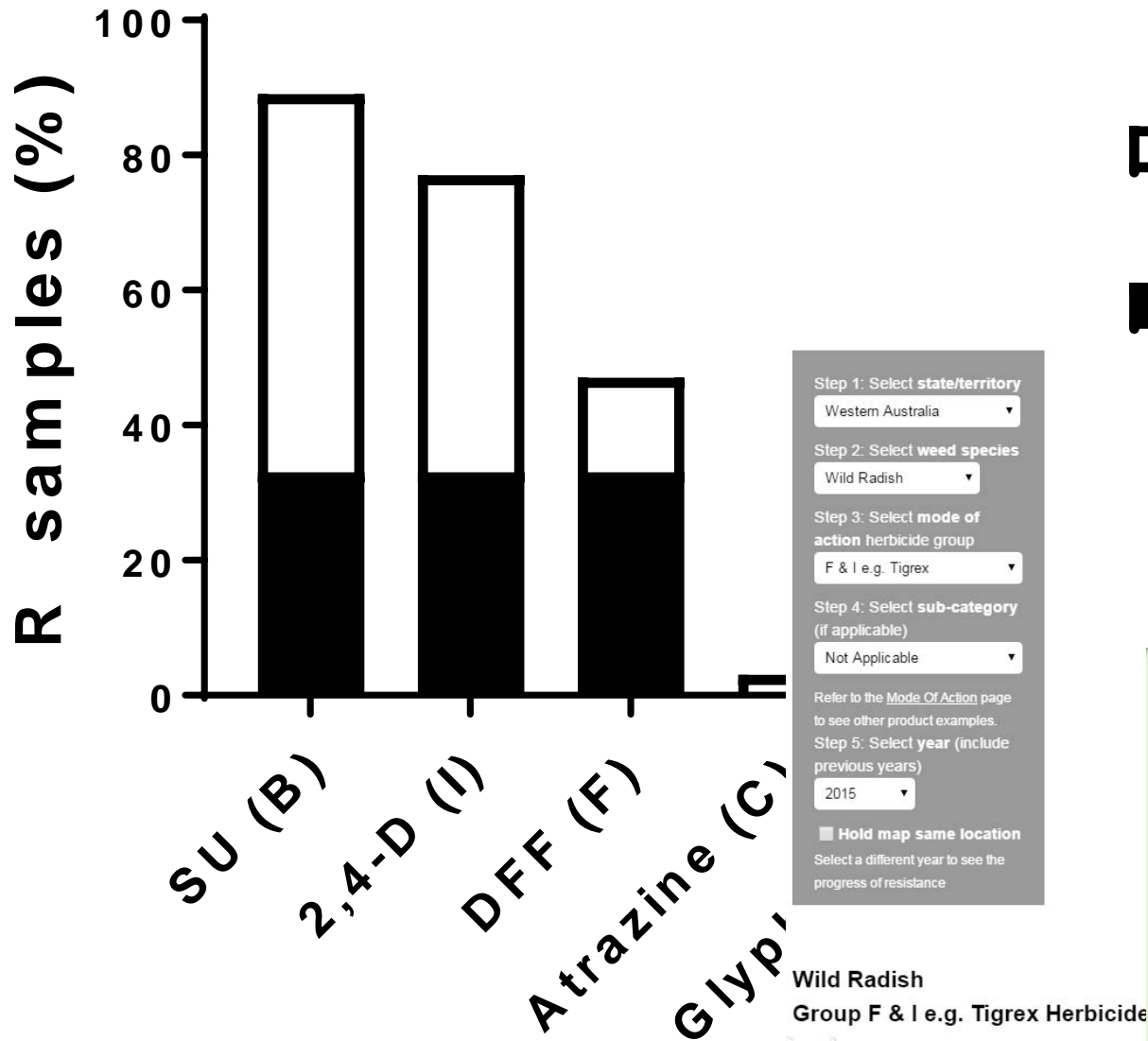
2010 WA Survey



 Resistance

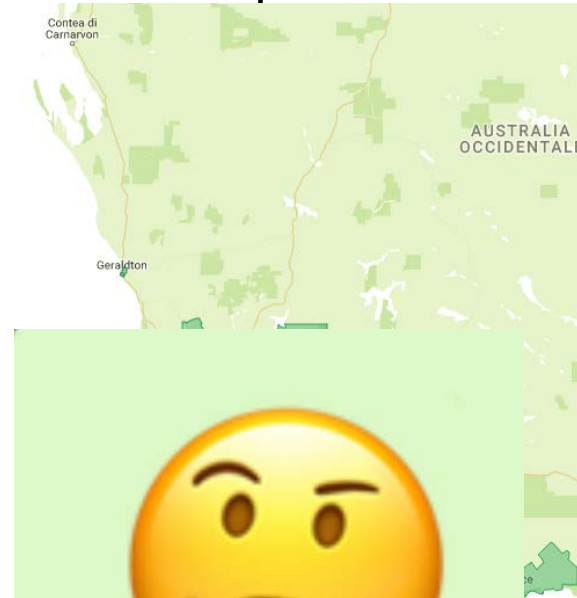


2010 WA Survey

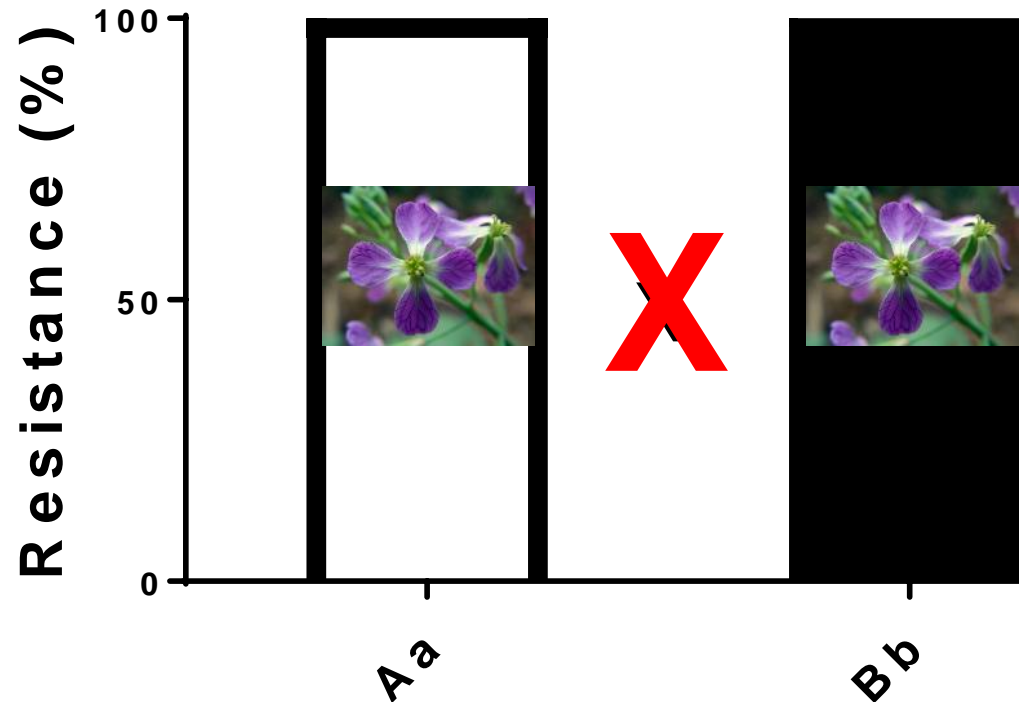


Resistance

Multiple R



Two resistant plants (heterozygous)



b

B

A

Ab

AB

a

ab

aB

b

B

A

Ab

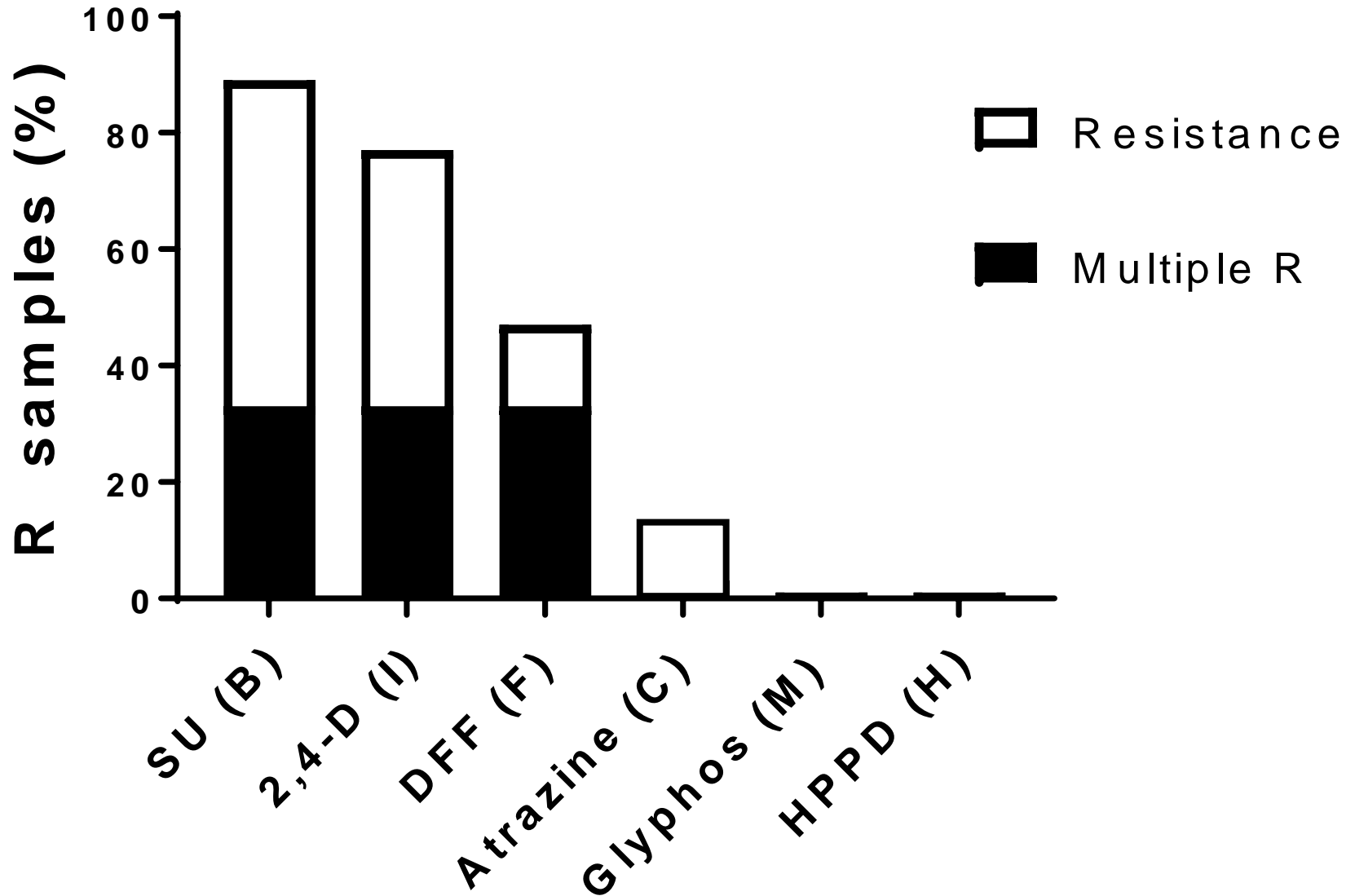
AB

a

ab

aB

2010 WA Survey



Creeping resistance to HPPDs (H+C)?

- 3 generations of low dose



Take-home message for agronomists

- 1 → Herbicides are the current best tools to control weeds. In Australia: high adoption, effective and good fit in no-till
- 2 → Exclusive use of herbicides is not sustainable (multiple resistance particularly worrying)
- 3 → Recommended herbicide use: mixtures at high dosage (three-way synergy mixtures: C+F+I or C+H+I)
- 4 → HPPD creeping resistance in wild radish: more work needed!