NEW HERBICIDES FOR RYEGRASS & WILD RADISH CONTROL

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1. My research (weeds evolve)
2. Mix and Rotate PRE herbicides
3. 2019 efficacy data: WA populations
   ARG (PRE stand-alone vs mixtures)
4. Physiology of herbicide resistance
5. Pot studies with cinmethylin
6. HPPD herbicides in wild radish

Early detection of resistance

Field population

1st

2nd

3rd

Trifluralin-resistant

Experimental selection with pyroxasulfone

Understanding cross-resistance

Trifluralin-resistant

Selection with Sakura: Cross-resistance to Boxer Gold

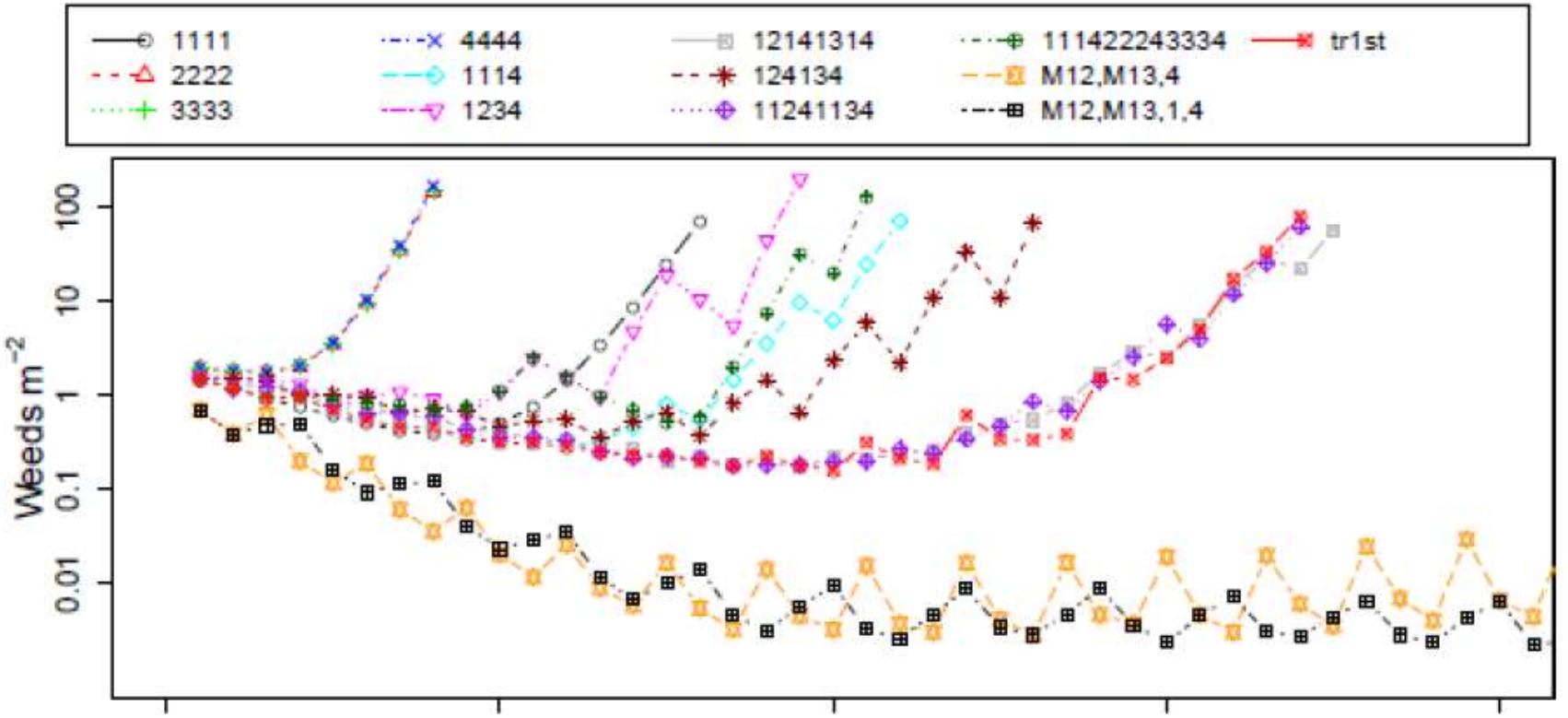
Mix and Rotate herbicides

Rotate BETWEEN the boxes ✓✓✓

@ FULL DOSE ✓✓✓

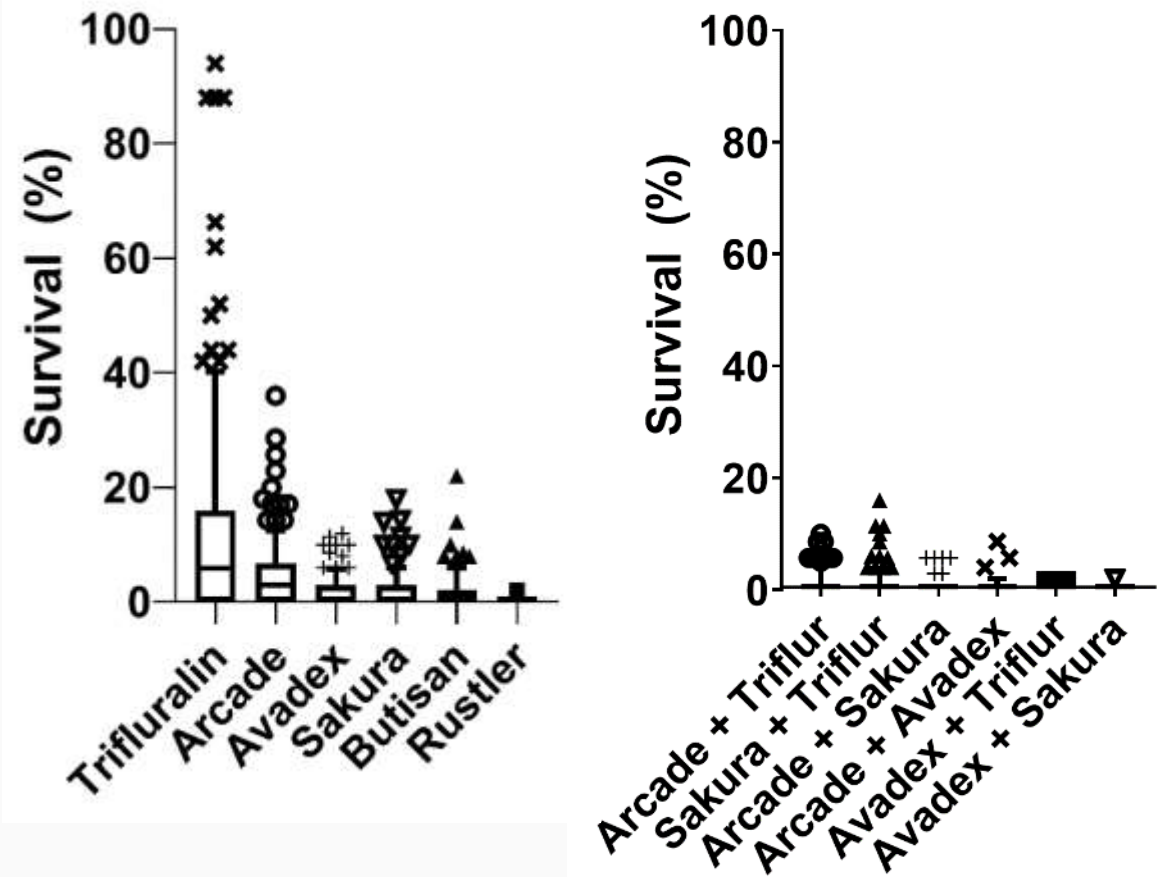
Trifluralin	SAKURA BOXER G AVADEX	RUSTLER

Resistance delayed with mixtures

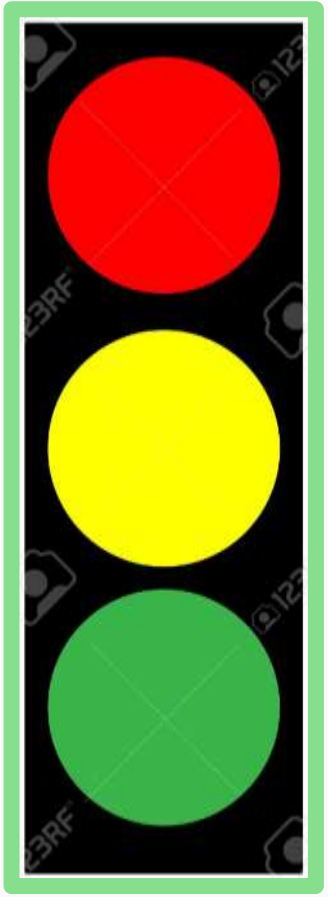


Resistance test in “focus” paddocks

~140 populations from WA



Recommended label rate



Resistance > 20%

‘Developing’ 6-19%

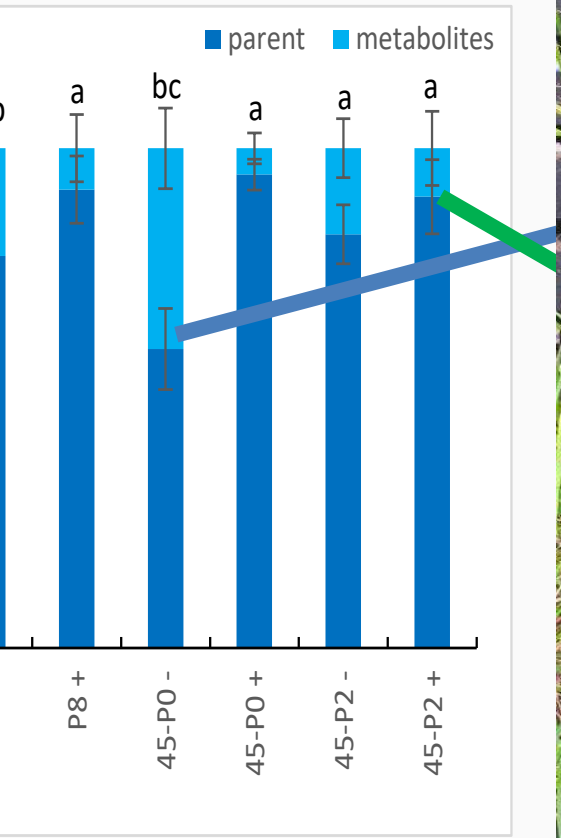
Susceptible < 5%

Trifluralin resistance in 50% samples

Arcade resistance in 30% samples

Trifluralin + Arcade resistance in 8% samples

Physiology of trifluralin resistance

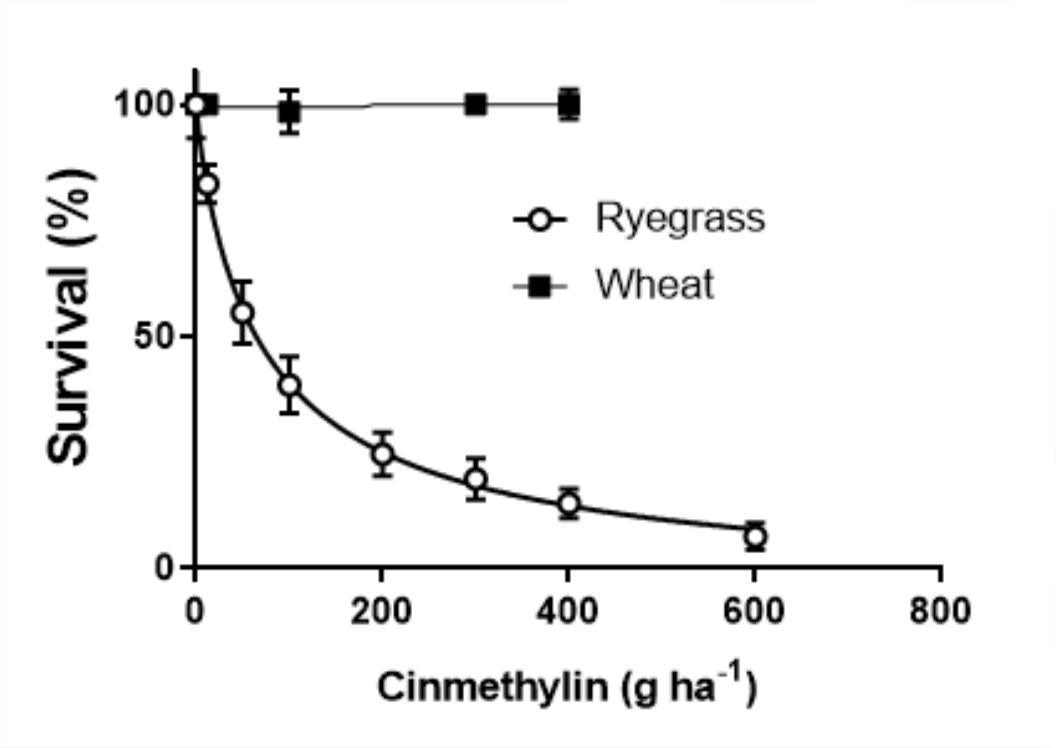


South East				
Number on Tags	Original number on Bag	Trifluralin	BG	Arcade
105	88	69	9	6
106	89	22	18	9
109	93	33	7	20
111	95	47	0	0
125	114	4	40	20
127	116	0	10	13
129	118	100	0	0
140	86A	73	7	0
144	90A	33	3	0
147	93A	20	15	0
150	95A	43	0	0
152	97A	12	0	4
154	99A	0	0	5
155	100A	5	10	35
158	102A	4	20	6
162	105A	0	28	4
171	114A	33	53	0
172	118A	32	4	4
173	119A	91	17	3

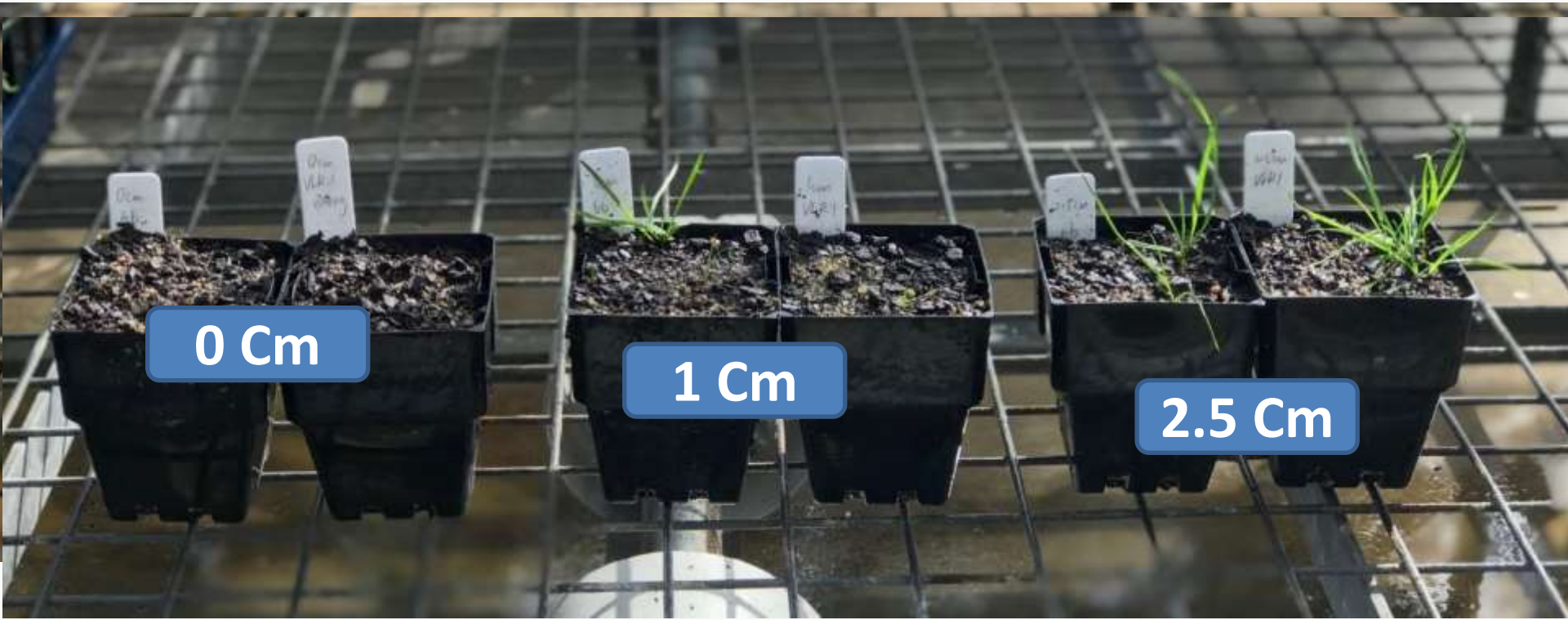
No resistance for some mixtures!

	Resistance (%)	Weed control (%)
Herbicide		
Arcade + Trifluralin	8	99
Sakura + Trifluralin	5	99
Sakura + Arcade	3	99
Sakura + Avadex	0	99
Trifluralin + Avadex	0	99

New wheat-selective Luximax



Herbicide separation from crop seed

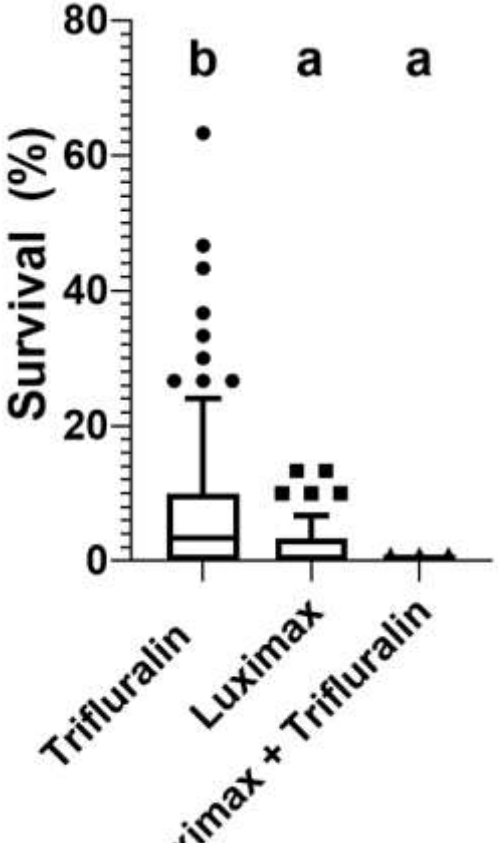


Resistance by selection in pots?

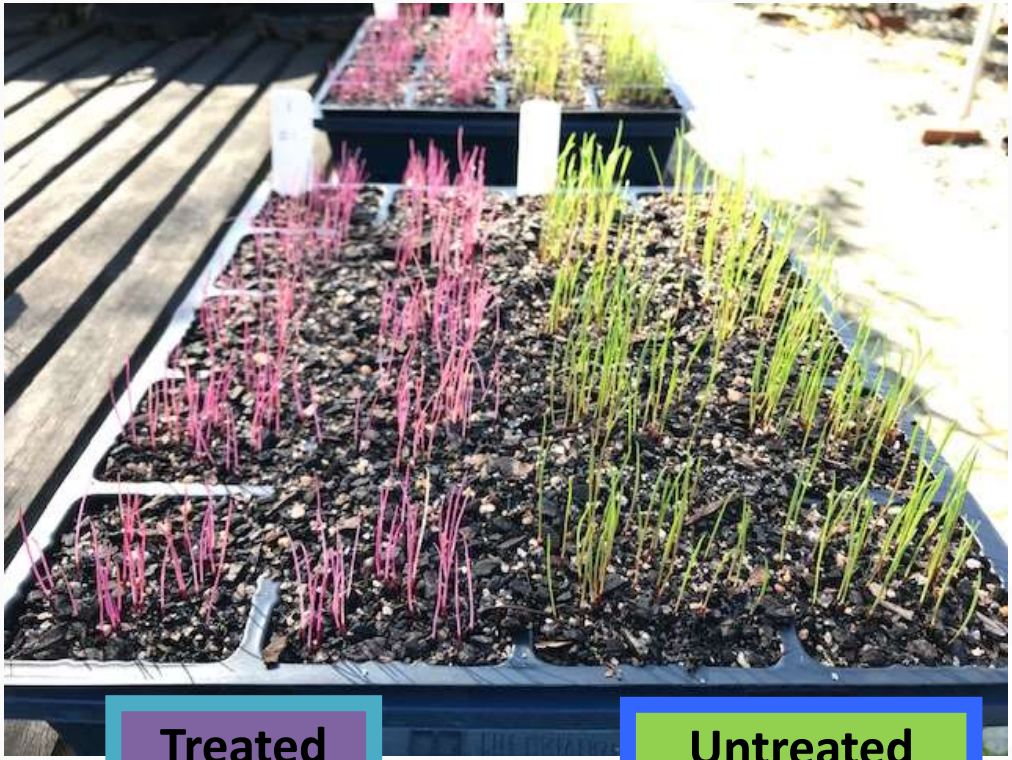
	Cinmethylin (g / ha)				
Survival %	**0**	**50**	**100**	**250**	**375**
Progeny 3A	108	94	44	2	0
Progeny 3B	76	68	20	0	0
VLR1	110	2	0	0	0

BASF
We create chemistry

Screening of WA field populations



There will be more to come…

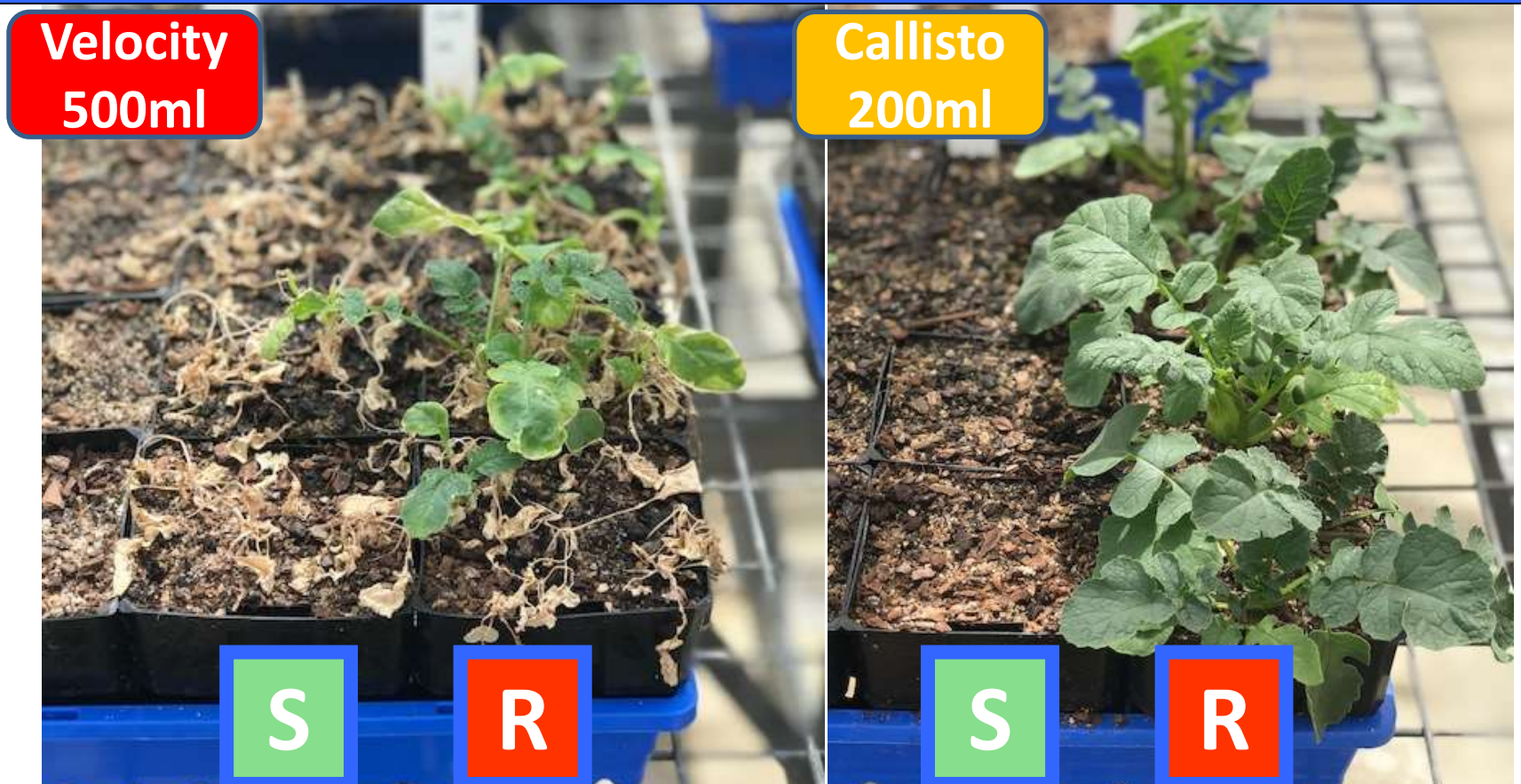


Velocity recurrent selection (in pots)

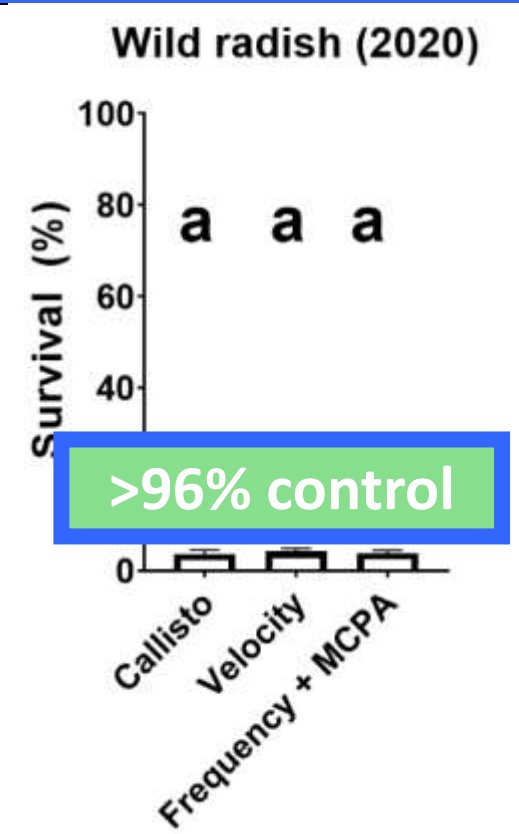
Label rate of Callisto

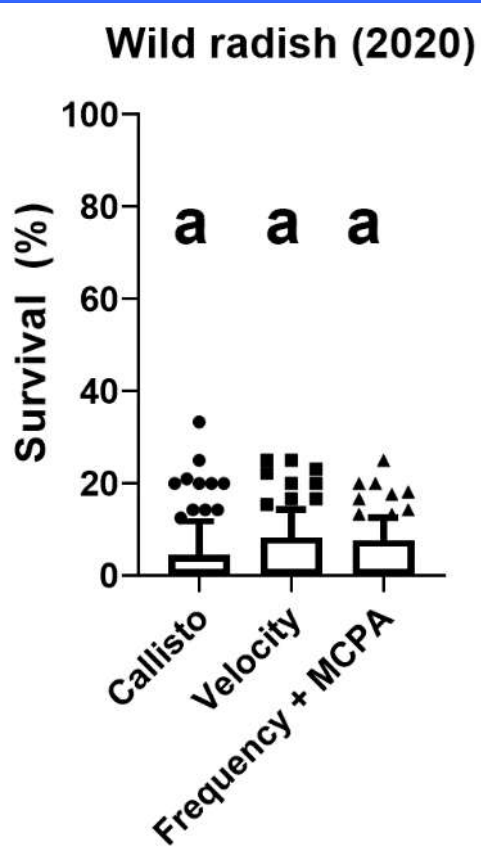
Velocity use resulted in Callisto resistance

Velocity recurrent selection (in pots)



Screening of 120 WA populations

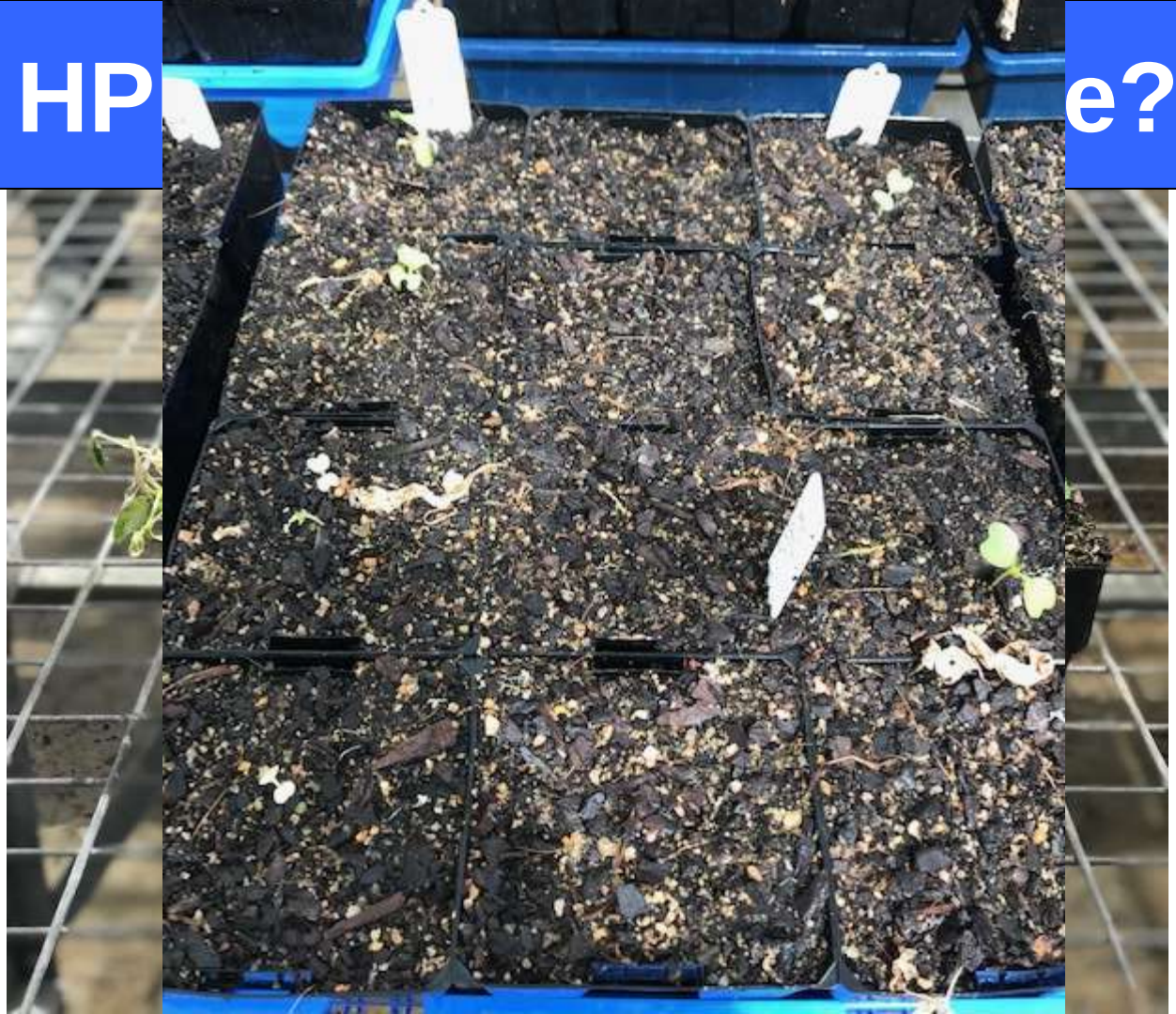




200 ml Callisto

500 ml Velocity

HP e?



Velocity (in pots)

Progeny

- Surveillance allows early detection of resistance (ryegrass, radish);
- Test and adopt herbicide mixtures to mitigate resistance;
- Physiology of herbicide resistance can inform its management;
- Do not assume anything when it comes to resistance!

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