Fungicide resistance update and plans for 2022

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Developed and utilised in planta screen for detecting fungicide resistance in Australian blackleg populations

Prosaro	Aviator XPro
Veritas	Miravis
Maxim	Flutriafol
Untreated	ILeVo
Saltro	Jockey

Treatments randomised
3 replicate trays

30 hrs

Australian Government
Australian Research Council

THE UNIVERSITY OF MELBOURNE

syngenta

marcroft
GRAINS PATHOLOGY

Percentage of infected cotyledons is recorded 17 days post infection and used to determine frequency of populations with fungicide resistance
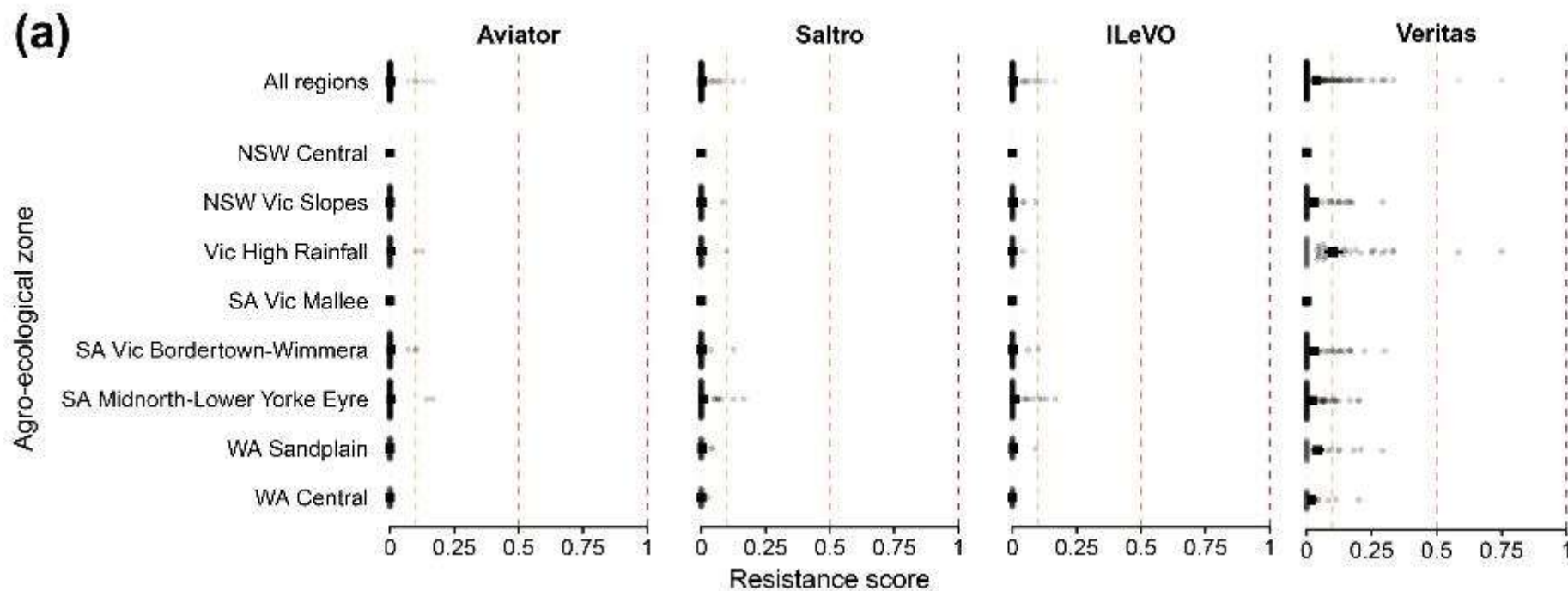

Untreated   Miravis (SDHI)   Flutriafol (DMI)   Jockey (DMI)

(a)

	Aviator	Saltro	ILeVO	Veritas

Agro-ecological zone (y-axis): All regions, NSW Central, NSW Vic Slopes, Vic High Rainfall, SA Vic Mallee, SA Vic Bordertown-Wimmera, SA Midnorth-Lower Yorke Eyre, WA Sandplain, WA Central

Resistance score (x-axis): 0, 0.25, 0.5, 0.75, 1

(b)

	Aviator	Saltro	ILeVO	Veritas
All regions	3 4 362	3 12 354	4 12 353	2 51 55 261
NSW Central	3	3	3	3
NSW Vic Slopes	73	1 72	3 70	10 5 58
Vic High Rainfall	1 1 55	1 56	1 56	2 17 15 23
SA Vic Mallee	4	4	4	4
SA Vic Bordertown-Wimmera	3 78	1 1 79	2 79	10 8 63
SA Midnorth-Lower Yorke Eyre	2 91	2 6 85	4 5 84	7 16 70
WA Sandplain	32	2 30	1 31	5 8 19
WA Central	26	1 25	26	2 3 21

Stubble samples (%) (x-axis): 0, 25, 50, 75, 100

Resistance category

- none (RS = 0)
- low (0 < RS ≤ 0.1)
- moderate (0.1 < RS ≤ 0.5)
- high (RS > 0.5)

No or extremely low resistance to SDHI and QoI fungicides

(a)
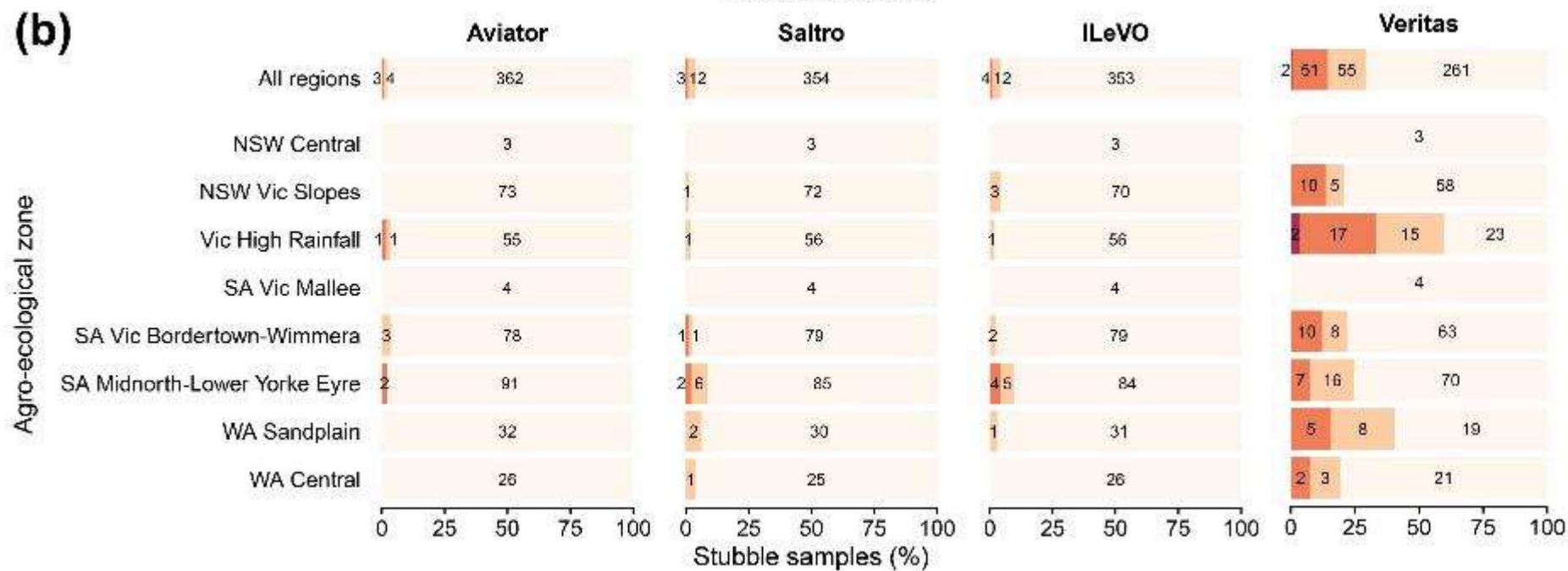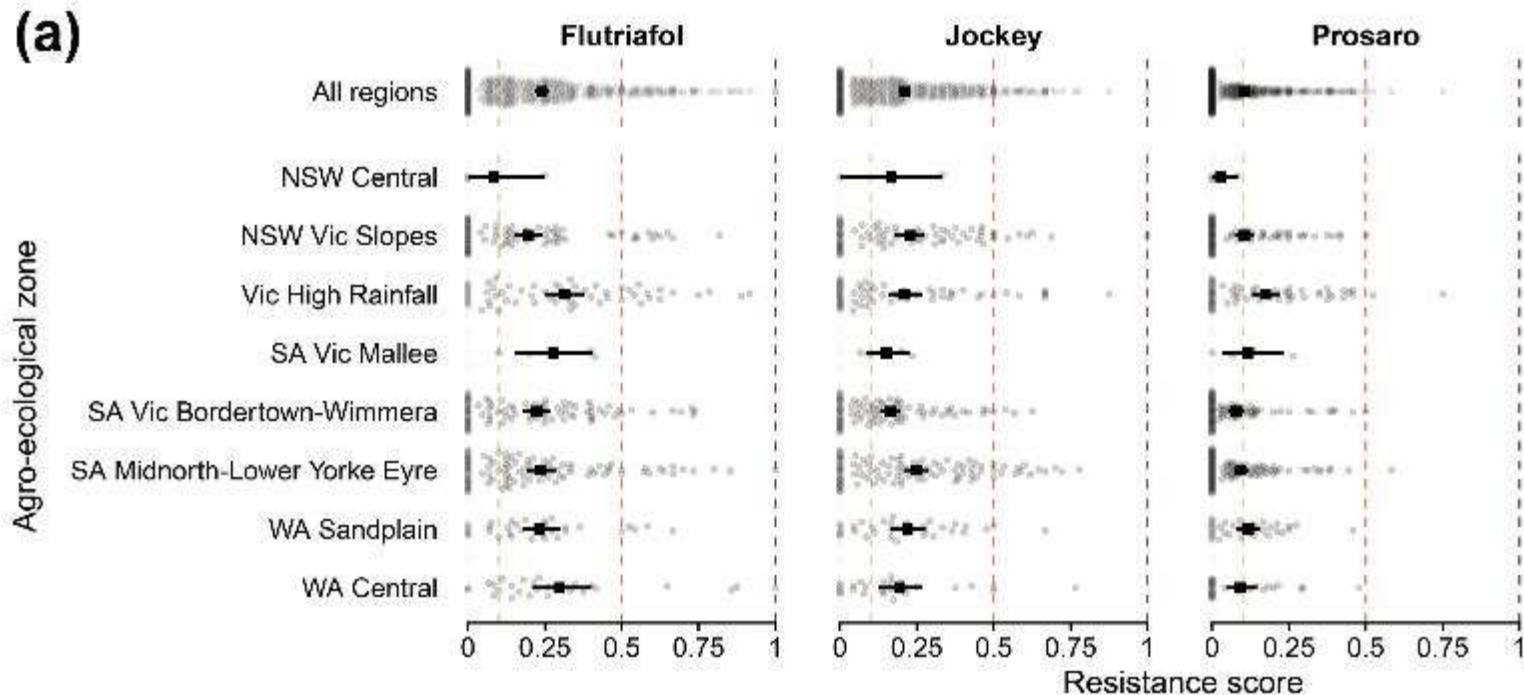
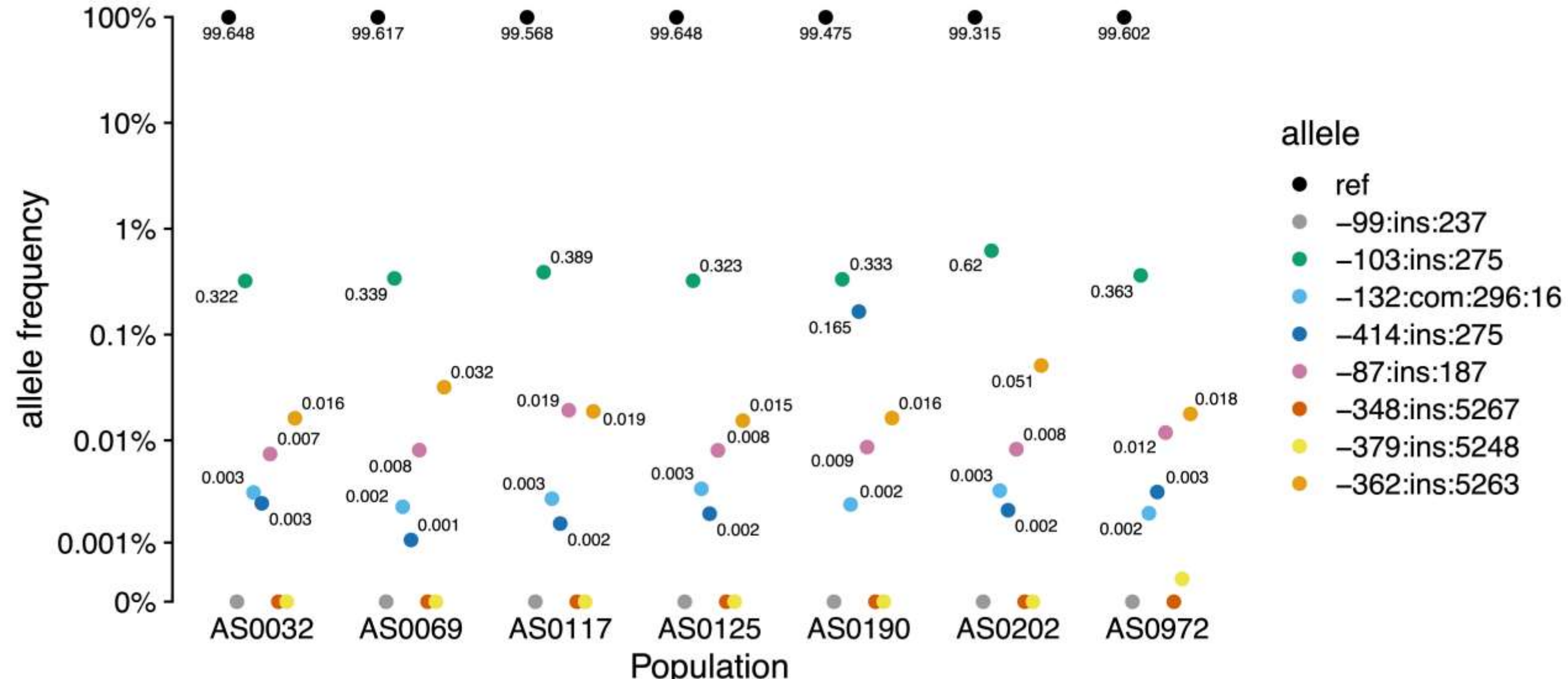High levels detected for the DMI fungicides

(b)
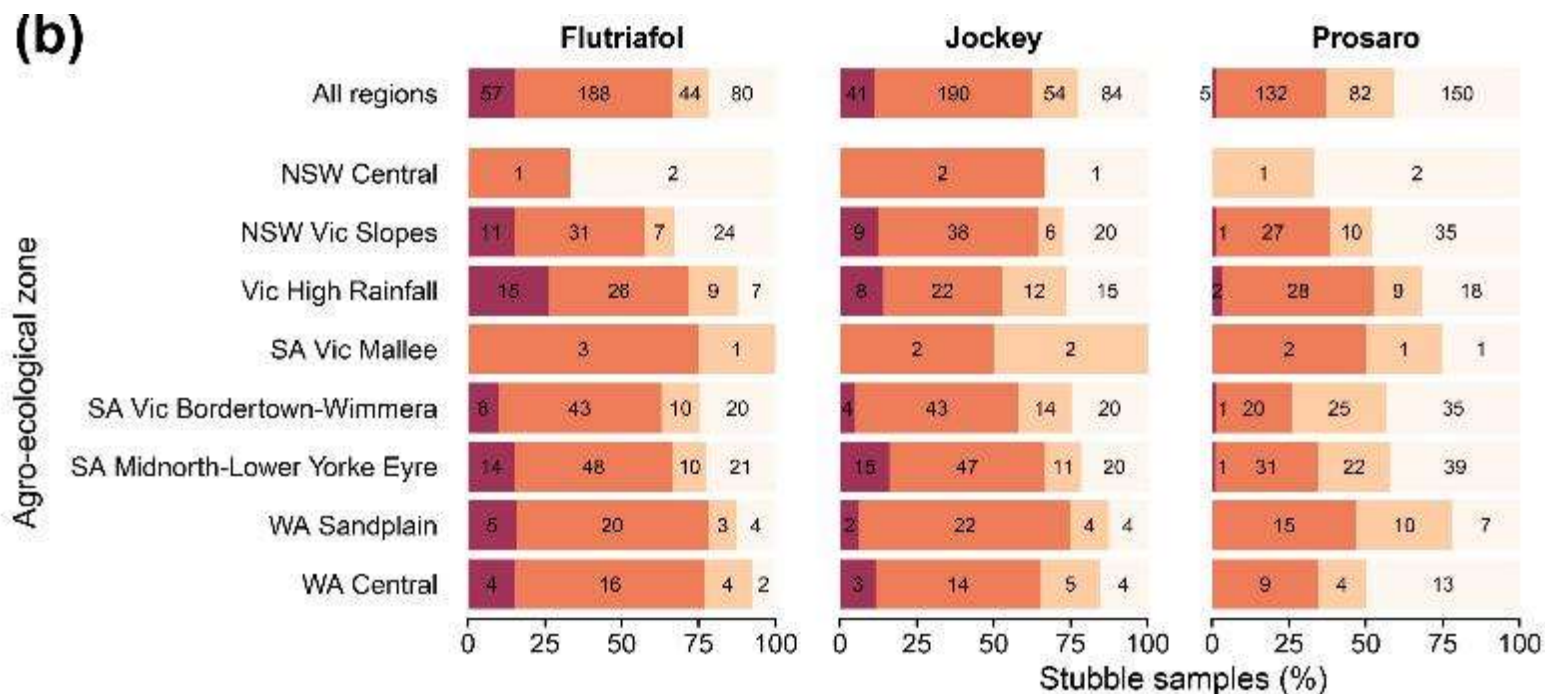
Changes to fungicide sensitivity is detected for the DMIs, but what does that mean?

- Changes to sensitivity is caused by mutations in the promoter region of the *Cyp51* gene leading to increased gene expression
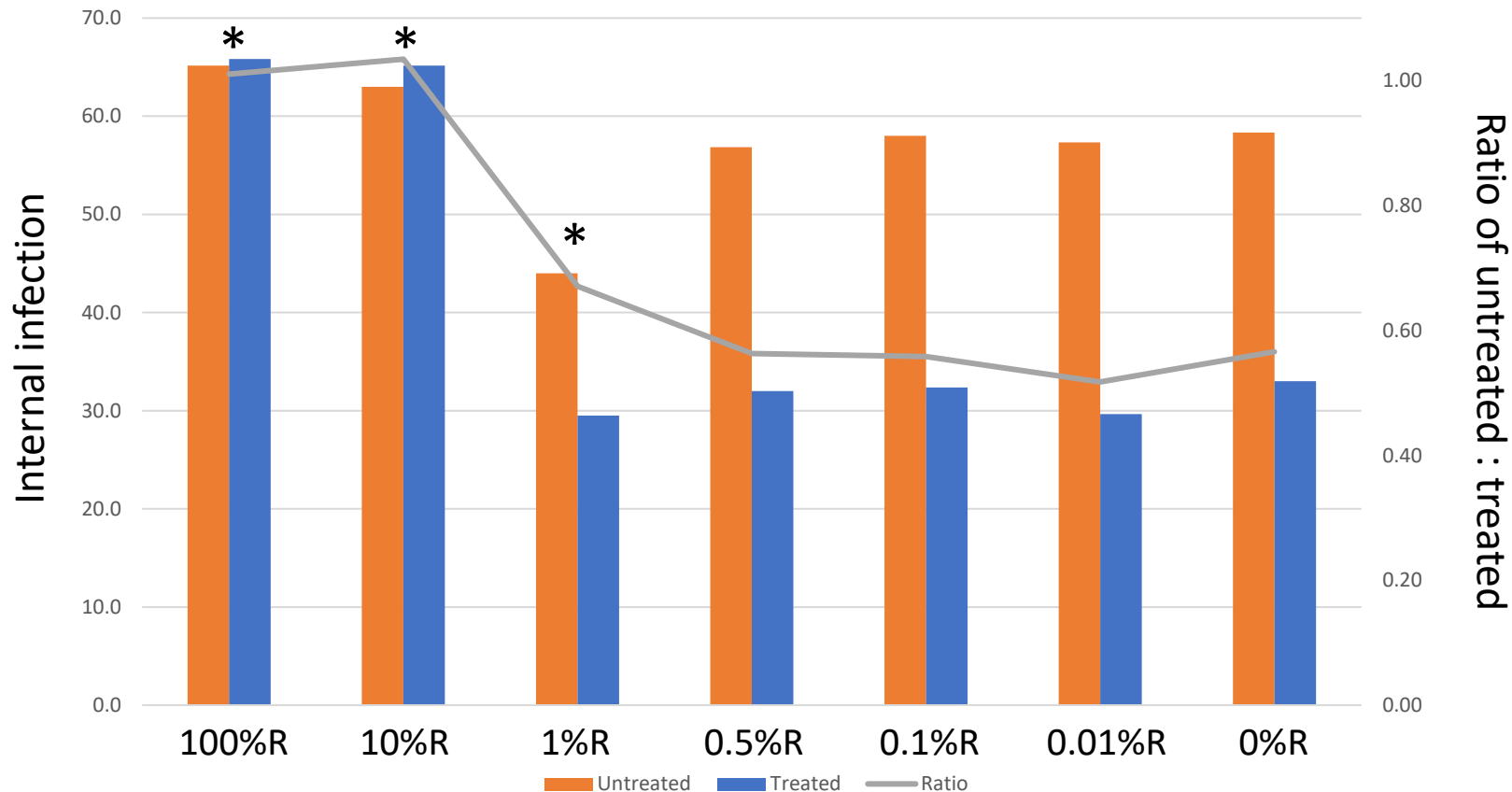
What is the frequency of resistance within a population?

What proportion of the population is required to reduce fungicide efficacy?

- Work funded directly by Syngenta

Plans for 2022

- We will work with Syngenta to continue to screen their products
  - What about other companies?
  - Need funding

- Target areas where fungicide use is high with the aim of detecting resistance early
  - Extremely sensitive test

- If any resistance/decreased sensitivity detected we will culture isolates and confirm with in planta, in vitro and molecular assays.