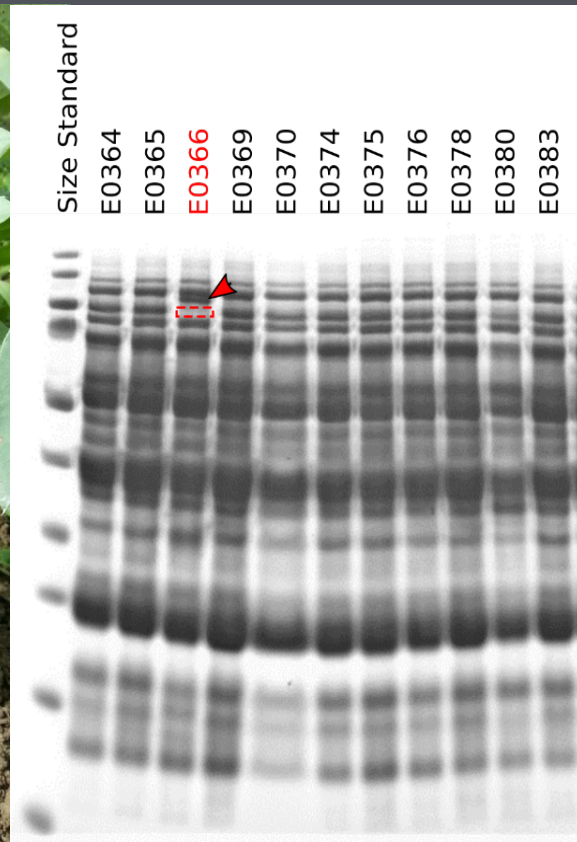


‘Faba bean breeding for neglected regions’

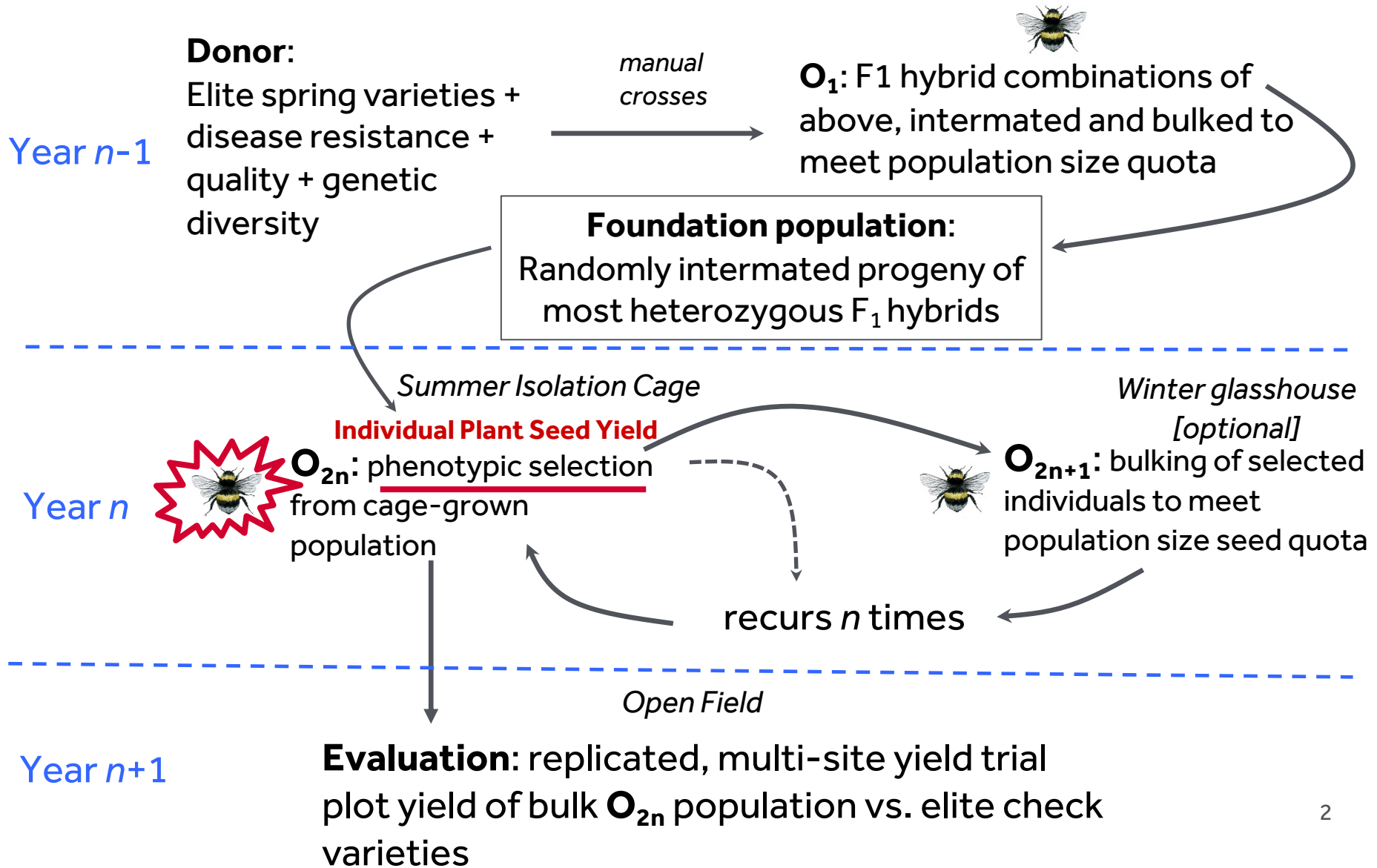


Prof Donal O’Sullivan
University of Reading (UK)

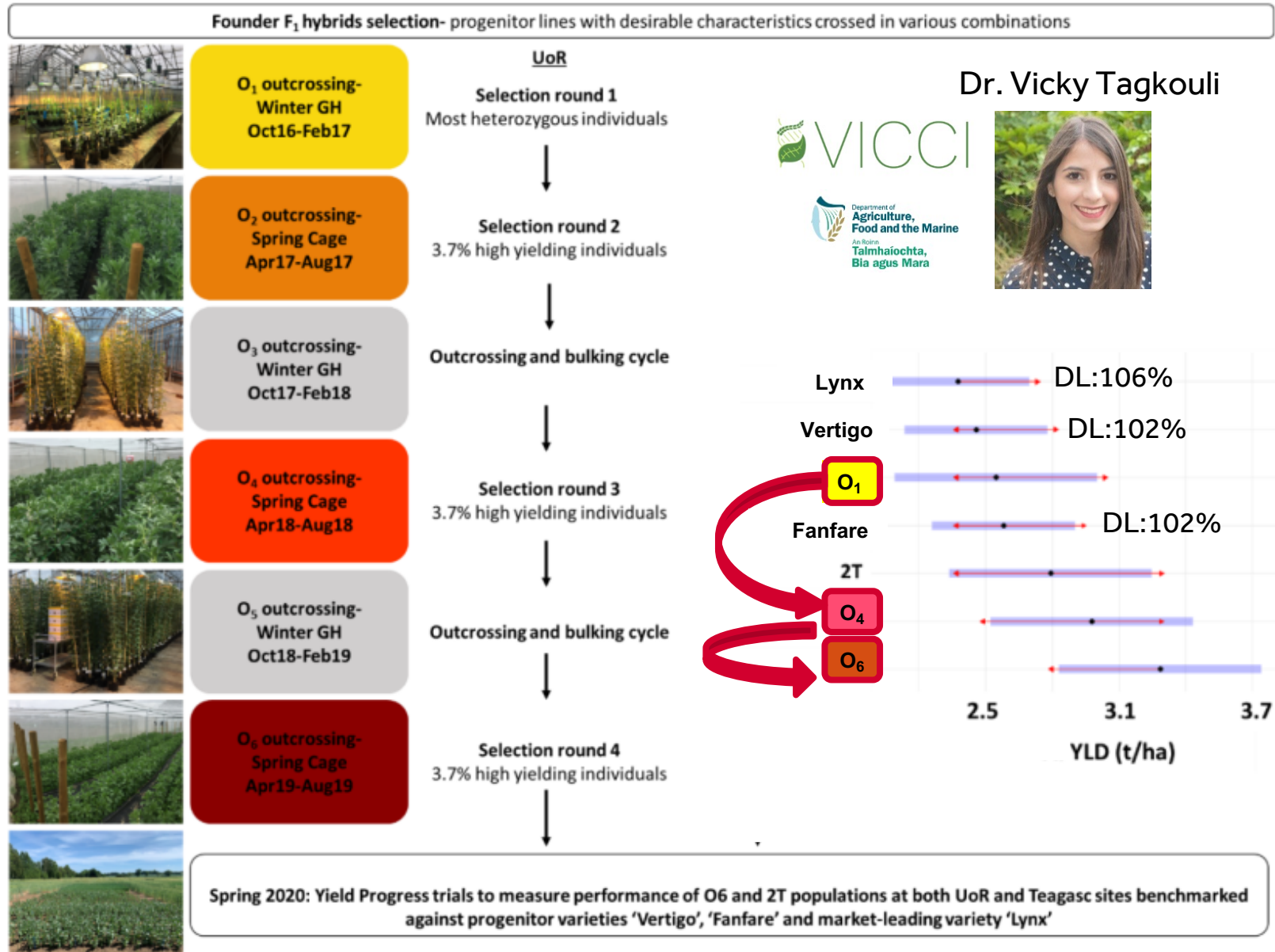
29th April 2021

THE 'MRSS' SOLUTION

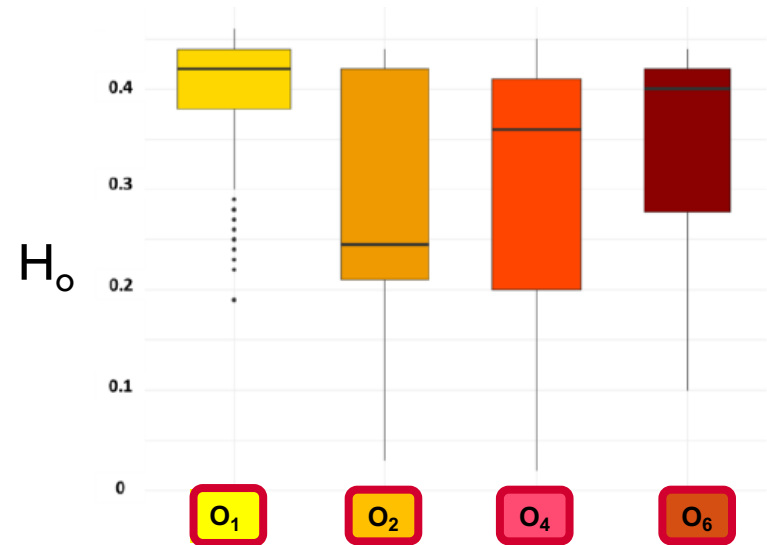
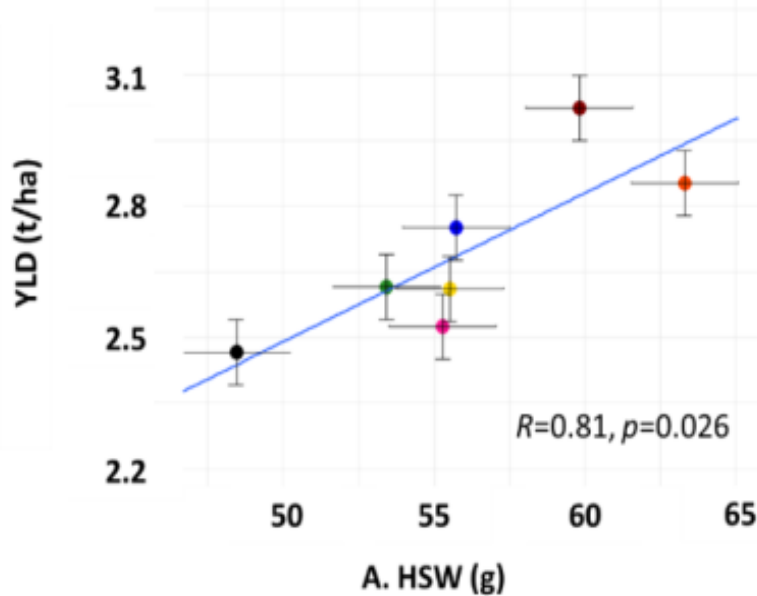
Modified Recurrent Selection Scheme (MRSS)



'Fanfare' & 'Vertigo' x *zt1*, *zt2*, *vc*, *asco* and diverse inbred lines



HOW DID IT WORK?

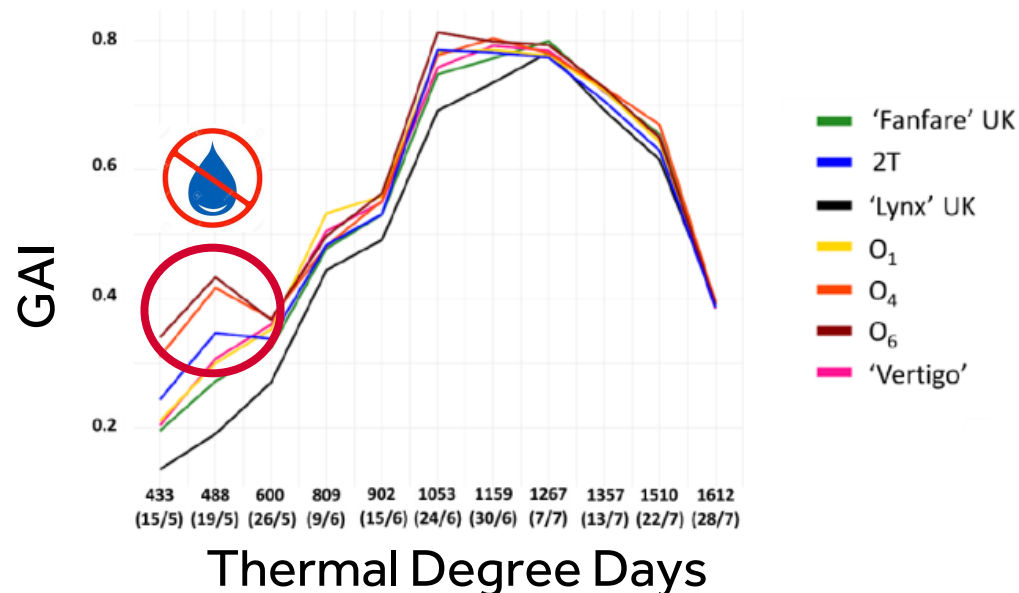


Rapid increases in:

- Heterozygosity = hybrid vigour
- Seed size = initial N reserve

Hypothesis:

Relatively large seed size and hybrid vigour gave O₄ and O₆ a head start and an advantage



Founder F₁ hybrids selection- progenitor lines with desirable characteristics crossed in various combinations



O₁ outcrossing-
Winter GH
Oct16-Feb17

O₂ outcrossing-
Spring Cage
Apr17-Aug17

O₃ outcrossing-
Winter GH
Oct17-Feb18

O₄ outcrossing-
Spring Cage
Apr18-Aug18

O₅ outcrossing-
Winter GH
Oct18-Feb19

O₆ outcrossing-
Spring Cage
Apr19-Aug19

UoR

Selection round 1
Most heterozygous individuals

Selection round 2
3.7% high yielding individuals

Outcrossing and bulking cycle

Selection round 3
3.7% high yielding individuals

Outcrossing and bulking cycle

Selection round 4
3.7% high yielding individuals



Carlow, IE

Dr Sheila Alves
(Teagasc)



1T

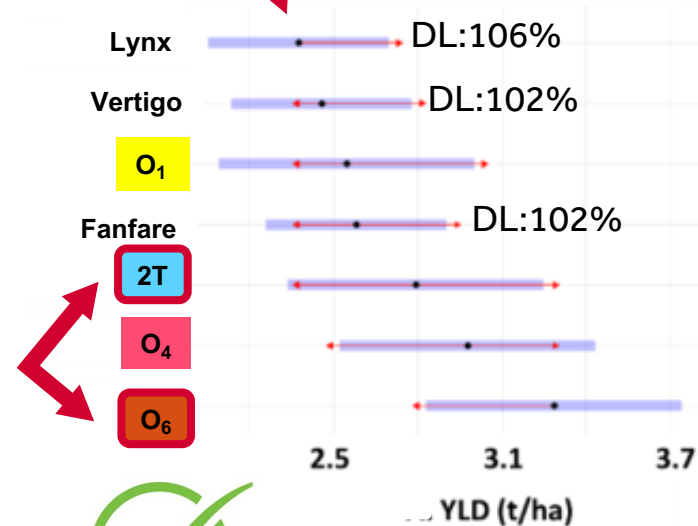
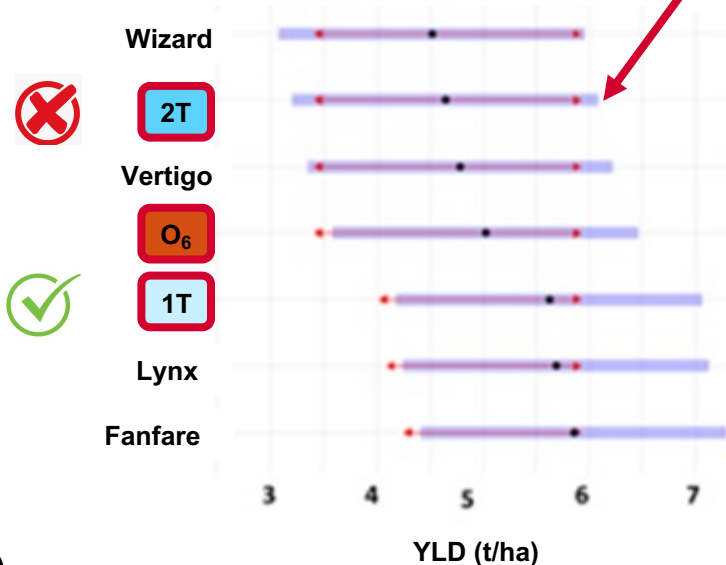
2T

Spring 2020: Yield Progress trials to measure performance of O6 and 2T populations at both UoR and Teagasc sites benchmarked against progenitor varieties 'Vertigo', 'Fanfare' and market-leading variety 'Lynx'

RECIPROCAL TRANSPLANT

ANOVA P-value:

Site – 0.0001***



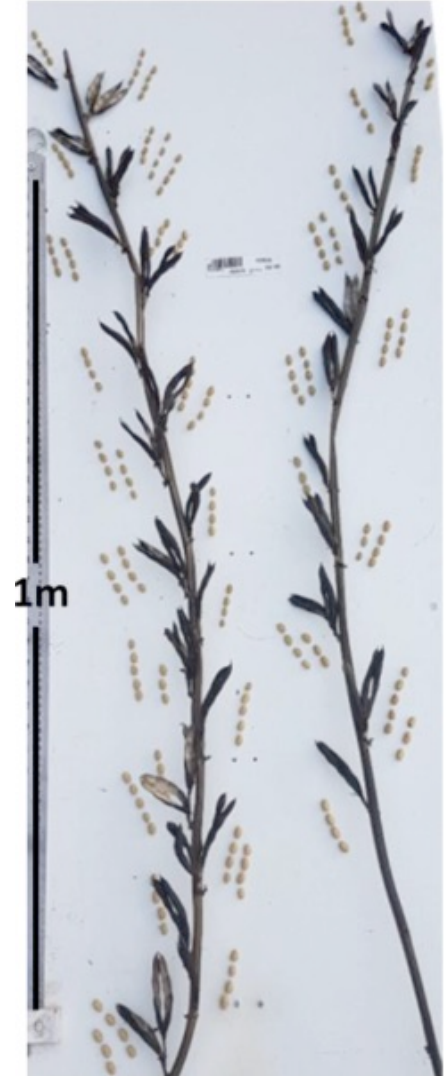
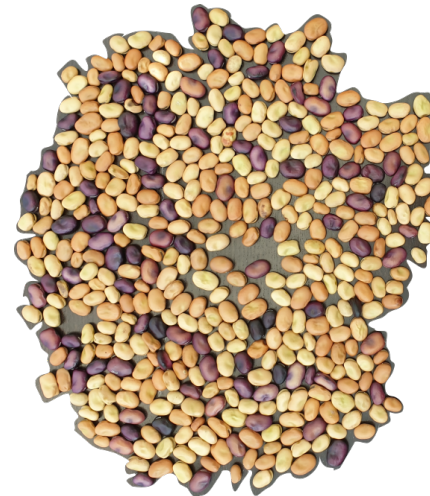
? 1T > O6 > 2T

CONCLUSIONS

- Small, simple, single-person breeding programmes work!
 - Leave outcrossing to the bees
- Individual plant seed yield seems to be effective as a proxy for population yield
- Yields competitive with commercial checks
- Site-specific adaptation is readily achieved
- Simulations help dimension programmes and design longer-term strategies
- Markers easily integrated e.g. MAS/GS over winter
- These populations are not real varieties (yet!)

HORIZON-CL6-2022-BIODIV-02-02

“Projects will foster demonstration and testing of legume breeding in different regions, with emphasis in regions where the legume breeding sector is less developed.”



201 seeds, 107g