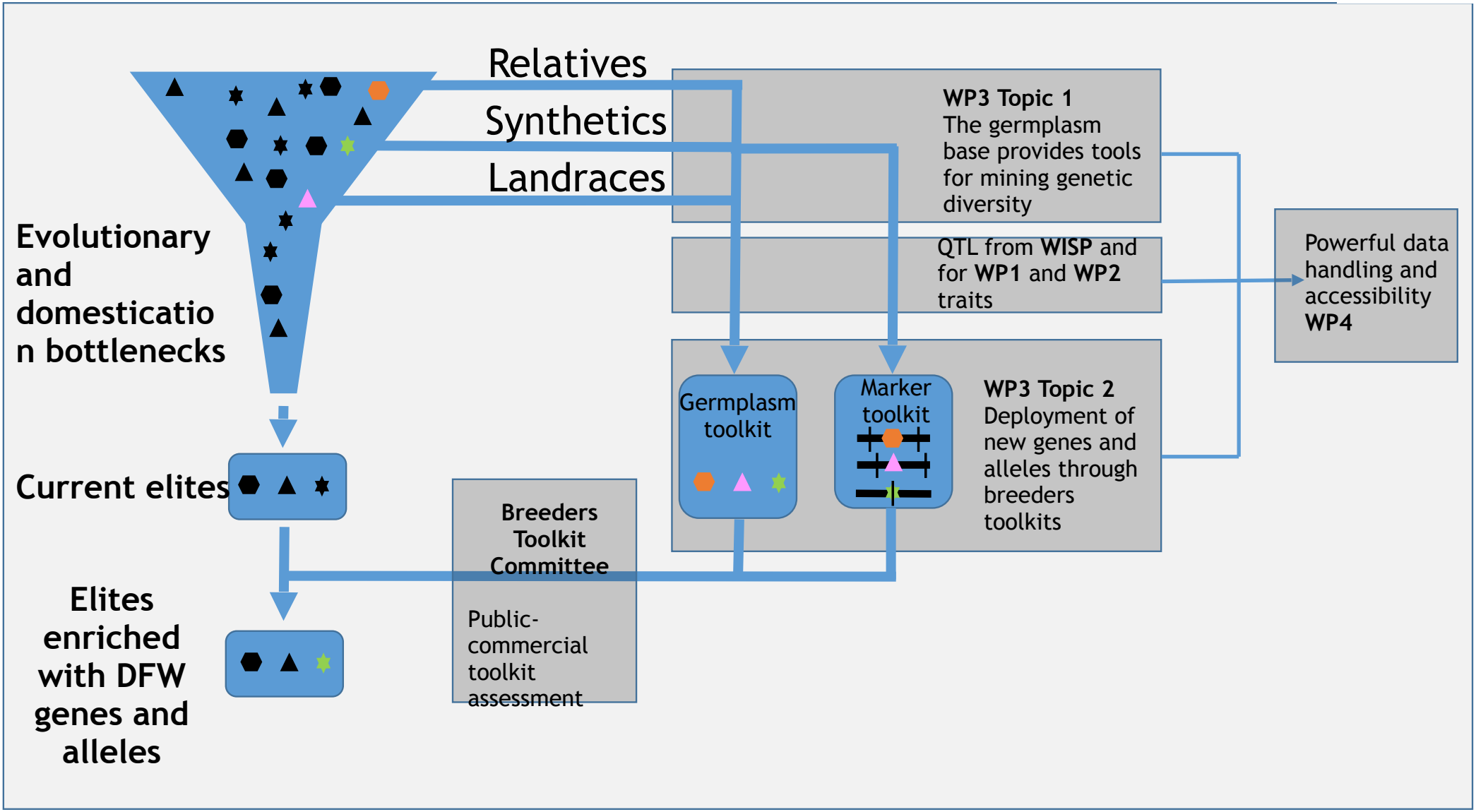
DFW WP3 – TOOLKITS FOR BREEDING

The more elite varieties become the harder it gets to introduce diversity into them

Sources of new and useful variation also carry a lot of undesirable variation

Eg 100% lodging of the AE Watkins wheat landrace collection!

Strategy for allele mining and deployment



Breeders Toolkit Academic-Commercial Interface

Breeder Tool Kit Selection Committee

Chair
Simon Griffiths

DFW

Breeding Companies

KWS
Jacob Lage

RAGT
David Schafer

LSPB
Peter Jackson

Limagrain
Constance Lavergne

Syngenta
David Feuerhelm

DSV
Matt Kerton

Elsoms
Milika Buurman

Work Package Leaders

Malcom
Hawkesford

Cristobal
Uauy

Rob
Davey

Work Package 3 Institute Representatives

Bristol
Keith Edwards

NIAB
Keith Gardner

Nottingham
Julie King

GRU Representative and BTK Coordinator
Simon Orford

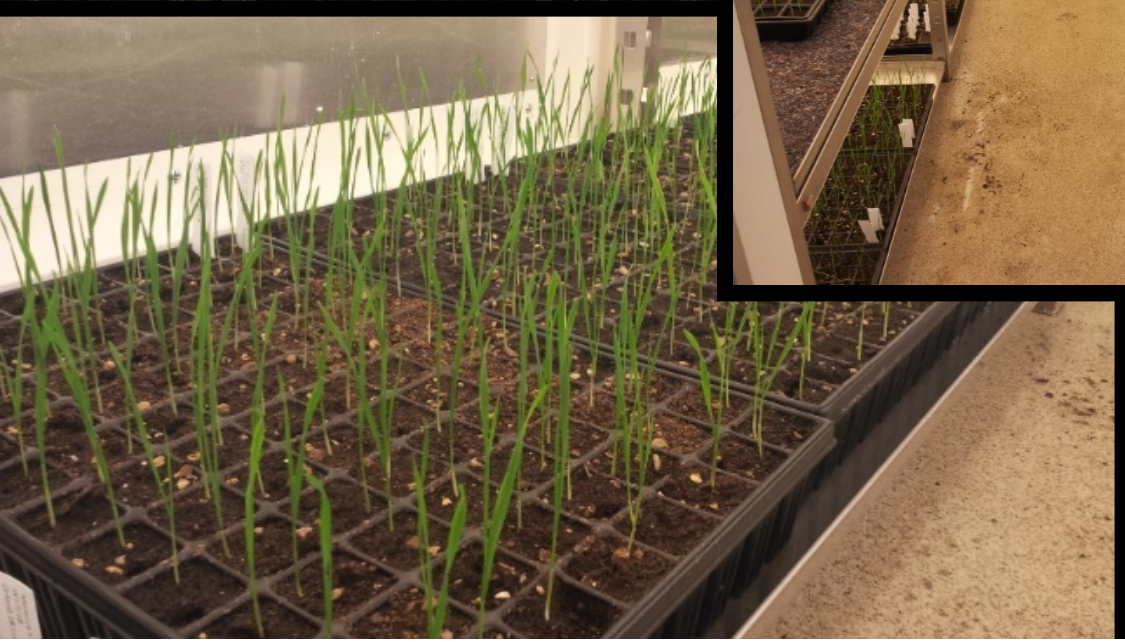
DFW Programme Manager
Julie Ellwood

https://designingfuturewheat.org.uk/breeders-toolkit/

BREEDERS TOOLKIT NOMINATION CRITERIA

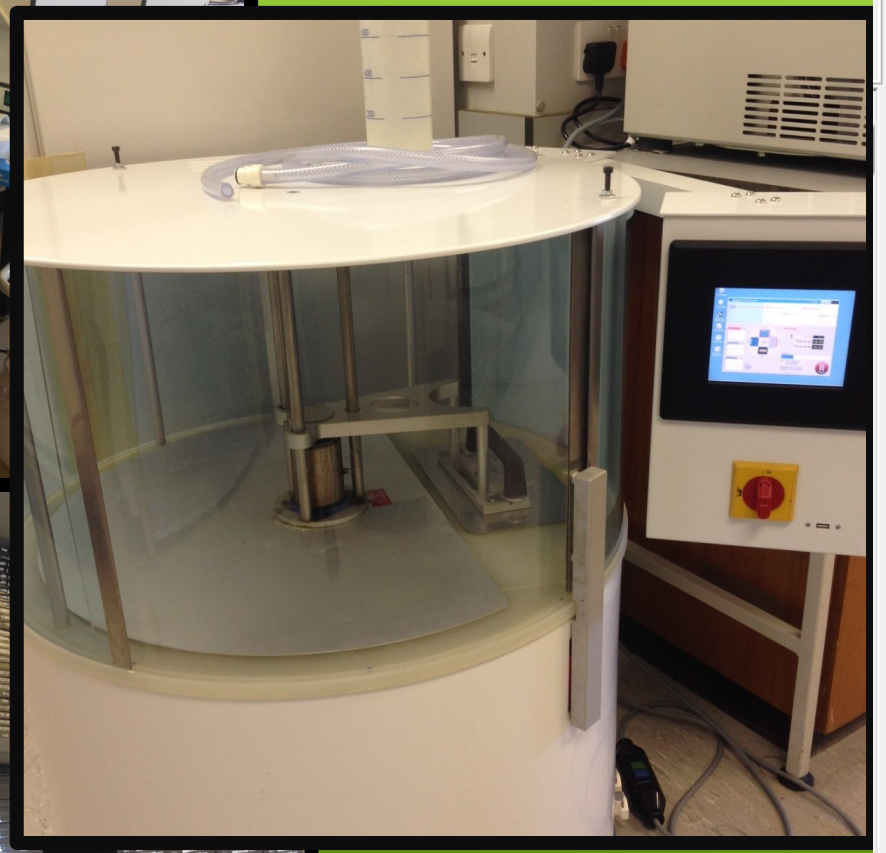
- What is it? (e.g.QTL, alien introgression,mutation,)
- What trait does this relate to? (eg height, seed zinc content, lodging resistance)
- Work Package (please tick)
  - 1
  - 2.1
  - 2.2
  - 3.0
  - Material from outside DFW
- Describe the likely merit of the locus in breeding
- What evidence do you have to support this?
- What selection method can be used (marker, phenotypic)?
- How do you think this material should be assessed to validate its value in breeding? Quantity of seed available now
- Any other comments?

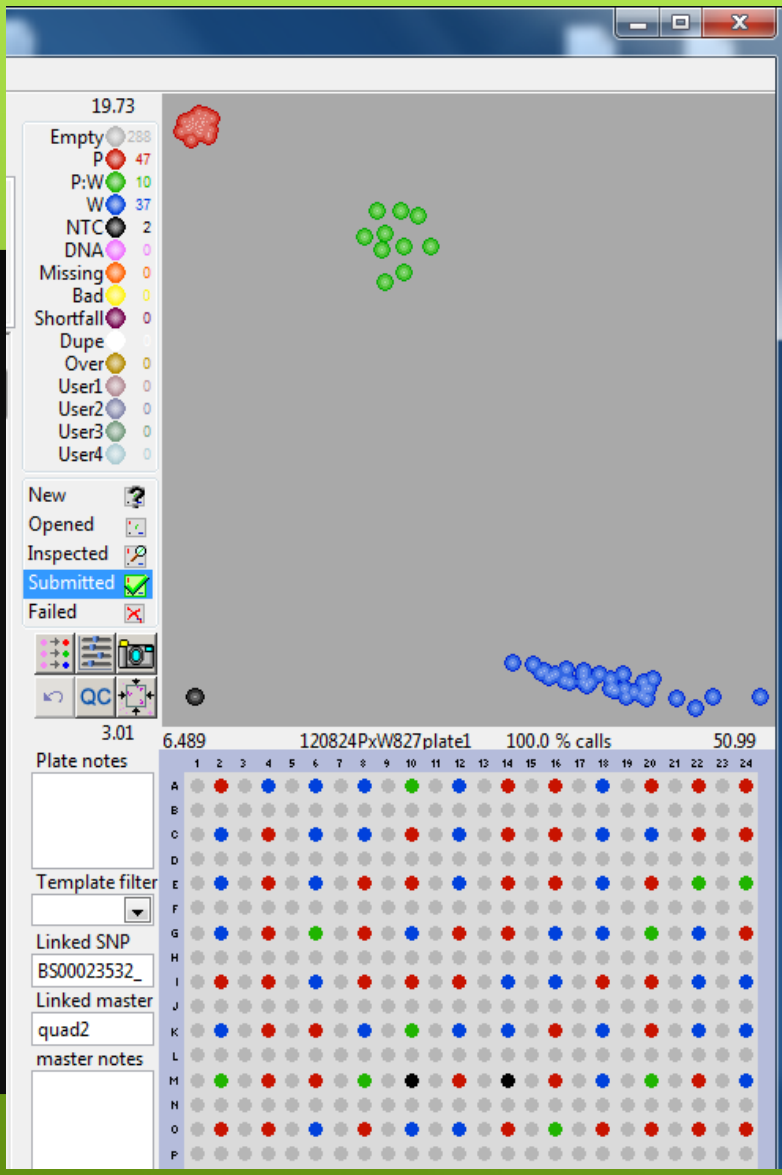

Sarah Collier

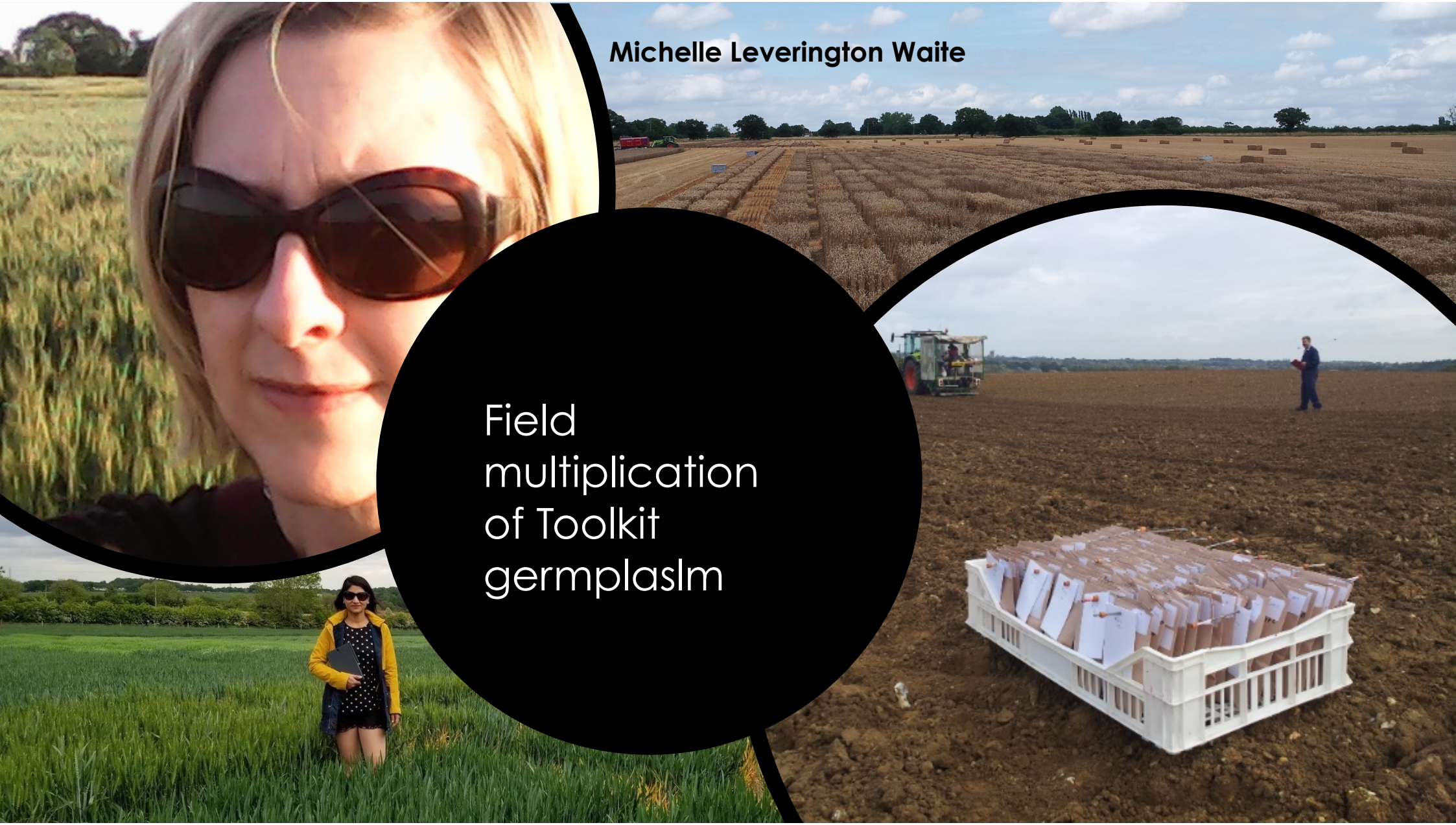



Rajani Awal


Meridian
CUBE
FUSION



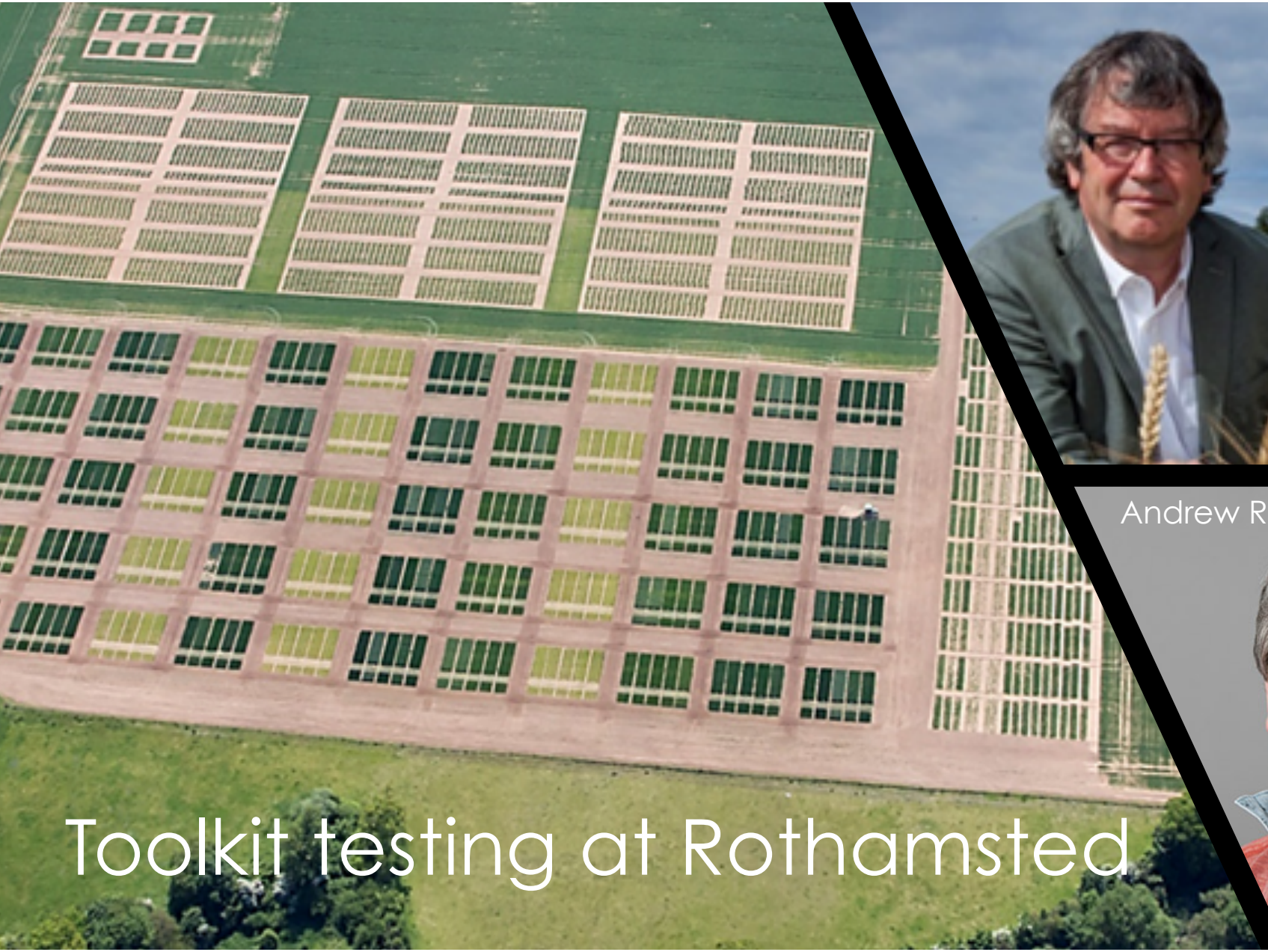

19.73
Empty 288
P 47
P:W 10
W 37
NTC 2
DNA 0
Missing 0
Bad 0
Shortfall 0
Dupe
Over 0
User1 0
User2 0
User3 0
User4 0
New
Opened
Inspected
Submitted
Failed
QC
3.01
Plate notes
Template filter
Linked SNP
BS00023532_
Linked master
quad2
master notes
6.489
120824PxW827plate1
100.0 % calls
50.99


Michelle Leverington Waite
Field multiplication of Toolkit germplaslm

Academic Toolkit as of now

- 1742 lines ready
- Deposited in GRU
- Axiom 35 K genotyped
- Grown at developer sites- mostly JIC, NIAB, Nottingham Uni
- When sufficient seed is available they undergo central DFW testing

Toolkit testing at Rothamsted



Harvest 2020 Breeders Toolkit

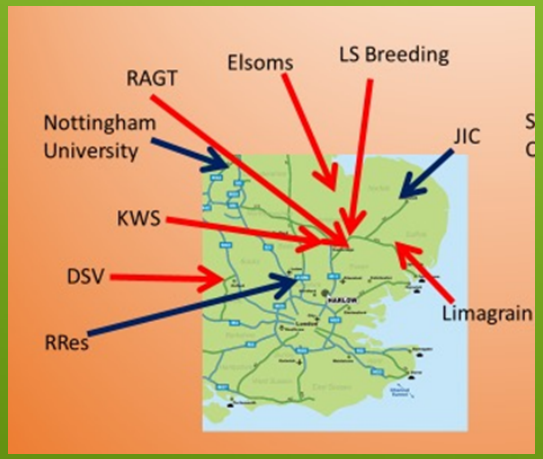
WBTK Code	TK Code	Genotpye	BTK trial (Harvest year)	Description of Introgression	Recipient Cultivar	Comment
WBTK0020	WL0120	PW141-21-3-4-Q2A-GFP-W	BTK2020	Wat 1190141 QTL 2A-GFP	Paragon	JIC WP3
WBTK0021	WL0170	PW292-25-6-3-Q2A-MATU-W	BTK2020	Wat 1190292 QTL 2A-MAT	Paragon	JIC WP3
WBTK0022	WL0247	PW352-26-5-19-Q2A-DTMA-W	BTK2020	Wat 1190352 QTL 2A-MAT	Paragon	JIC WP3
WBTK0023	WL0296	PW468-84-4-2-Q5A-NDRE-W	BTK2020	Wat 1190468 QTL 5A-NDRE	Paragon	JIC WP3
WBTK0024	WS0095	SHW008 SYN Sel 51	BTK2020	NIAB SHW-008 BC1F6	Robigus	JIC WP3
WBTK0025	WS0105	SHW008 SYN Sel 61	BTK2020	NIAB SHW-008 BC1F6	Robigus	NIAB
WBTK0026	WS0117	SHW090 SYN Sel 70	BTK2020	NIAB SHW-090 BC1F6	Robigus	NIAB
WBTK0027	WR0032	D029 DHF1-29	BTK2020	Ae. mutica DH BC	Paragon	NIAB
WBTK0028	WR0154	D329 DHF1-329	BTK2020	Ae. mutica DH BC	Paragon	Nottingham
WBTK0029	WM0012	gw2-A / Par (+/-)	BTK2020	gw2-A	Paragon	Nottingham
WBTK0030	WM0013	Par / POL (-/+)	BTK2020	POL	Paragon	JIC WP1
WBTK0031	WM0014	gw2-A / POL (+/+)	BTK2020	gw2-A and POL	Paragon	JIC WP1

Multi site breeder trials coordinated by GRU

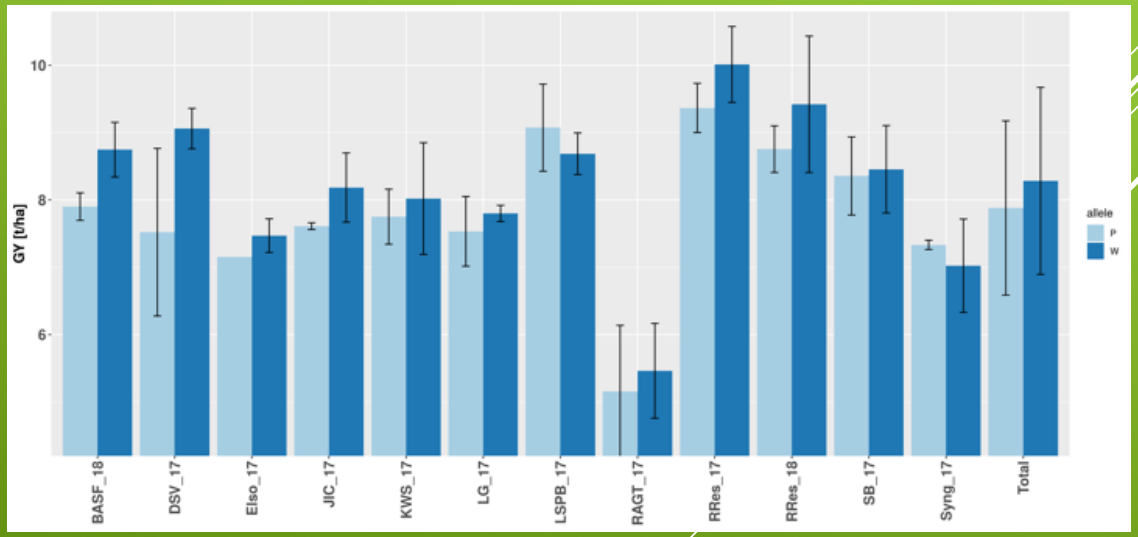
Simon Orford GRU

What does a successful BTK nomination look like?

Multi site trials



Consistent advantage conferred by new locus



Near isogenic lines carrying 7BL segment from Watkins landrace increase yield

Toolkit NILs

Breeders Toolkit

RIL populations

RESOURCES IN GRU

SeedStor