

Linking LR Diversity to Conventional and Participatory Breeding

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Outline of talk

1. Outline of key issues
2. Examination of the points of difference
3. Role of Genebanks as facilitators
4. Case studies

Genepool Concept

- Perceived as 'Exotic' ie. far removed from elite material
- Time penalties due to introgression of deleterious segments
- May be poorly adapted to local conditions
- Often lacking required disease and pest resistance

Within the primary genepool but not first choice of breeders

Secondary

Close species

Tertiary

Distant species

So where's the problem?

Breeding programme considerations

- Limited number of parental lines places within crossing programme so competition between candidates is high
- Larger capacity for screening/ evaluation
- Ownership and IP

2. Points of Difference

Conventional Breeding

- Specific features (USP)
- Ecogeographic or diversity assessment
- Local adaptation

Participatory Breeding

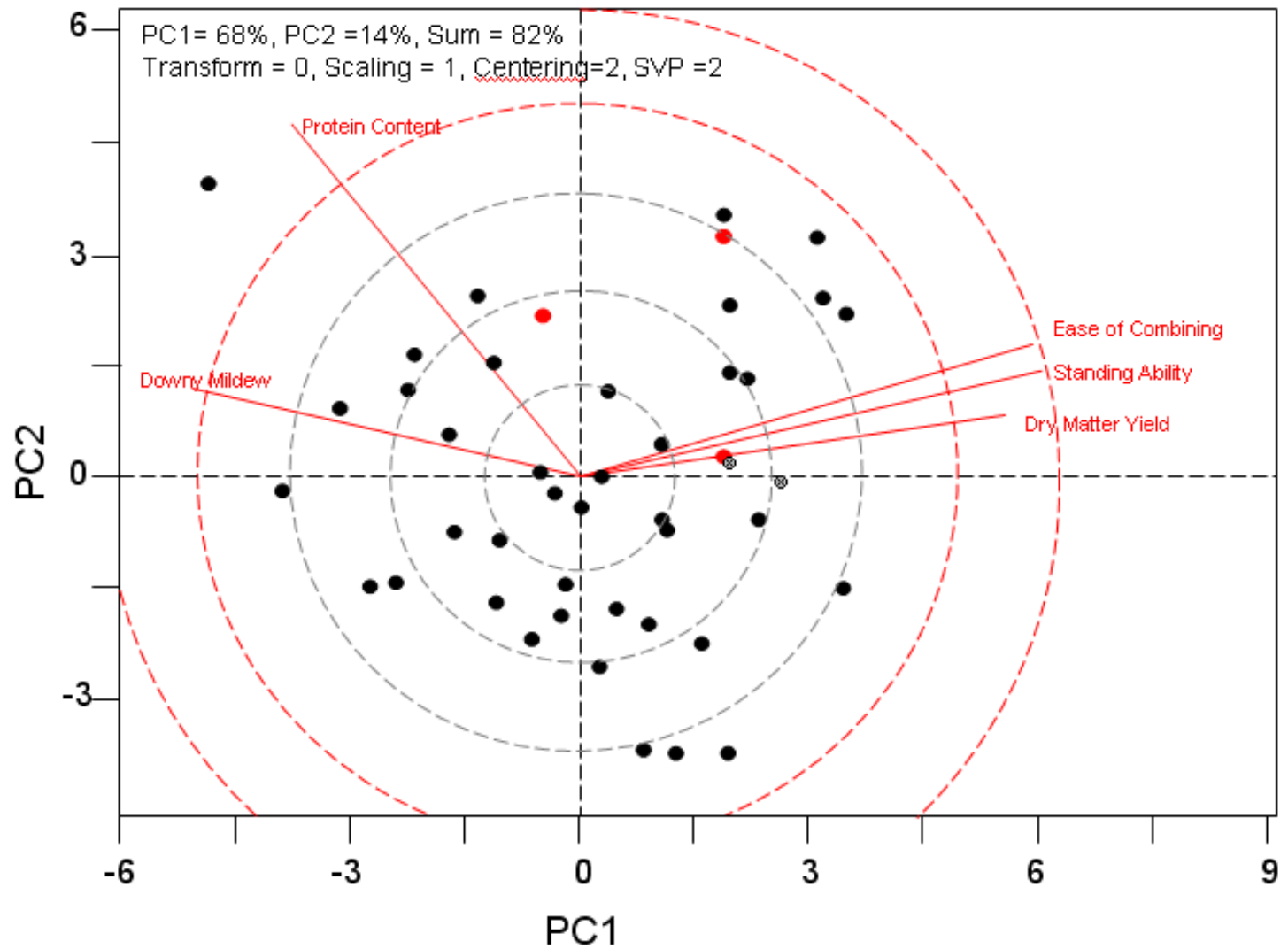
- Local or regional provenance
- Local adaptation
- Specific features
- Demonstrable benefit

3. Genebanks as facilitators

- Range of mechanisms short/medium/long
- Ancillary information and characterisation data are critical for uptake
- Prebreeding or germplasm enhancement may be required

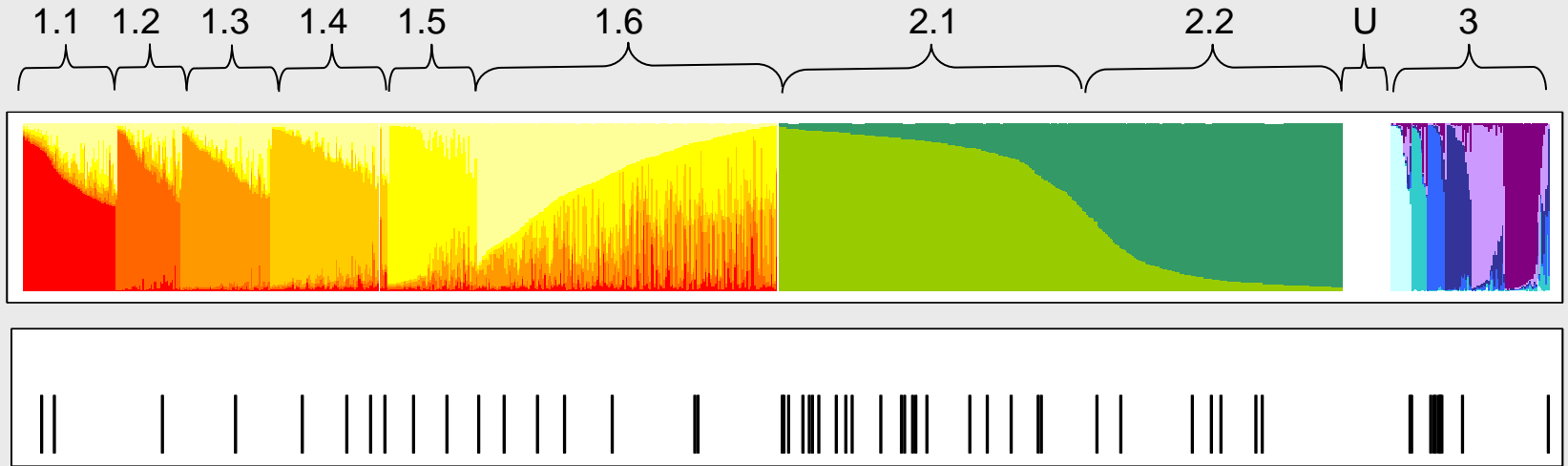
Case study 1. Characterisation and Evaluation data

Linking traits and markers: Performance scores



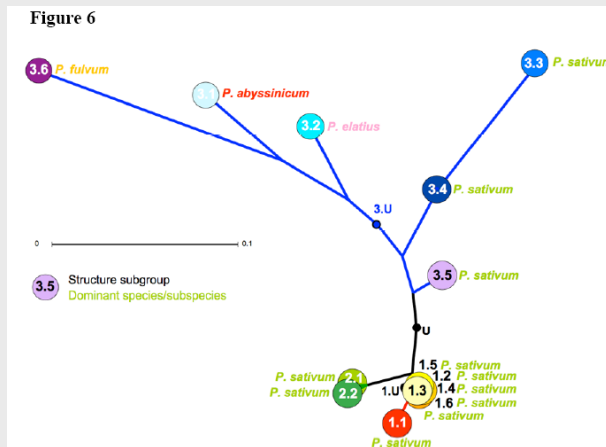
Case study 2:

Structure analysis of 45 RBIP markers on 3029 accessions of the JIC Pisum Collection based on (K=3)

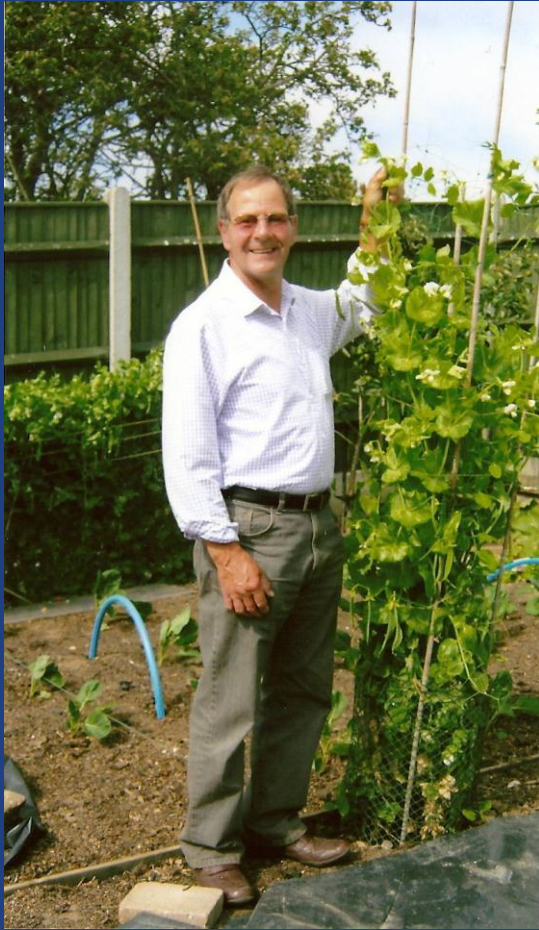


Powdery Mildew Resistant accessions

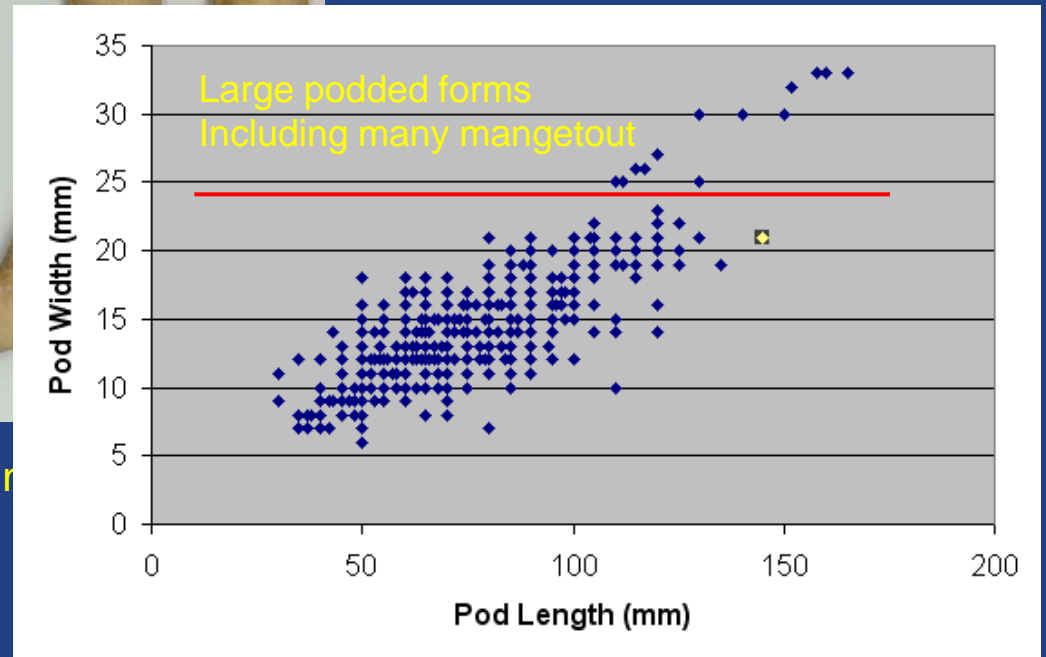
Erylis
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Case study 3. JI 3564: Uncle Albert Heritage pea



2011 Karl Andrew who still grows his Ur



Case study 4. Demonstration Plots of Heritage wheats



Table 2. Lodging scores for a range of heritage bread wheats at nominal 'harvesting time'. Lines ranked in ascending order of scores in 2009, 2010 and 2008. Scores 1 – 9 where 1= upright and 9= severely lodged. Green= 1 - 2, orange=3 - 5, Red=6 - 9. Grey boxes indicate the line was not grown in that year.

ACC	CULT	Ht at maturity	L 06	L 07	L 08	L 09	L 10
5623	Red Standard	120		1	1	1	1
511	Squareheads Master 13/4	130	1	1	1	1	1
517	Yeoman	112		1	1	1	1
1200	Brown's Winter Wheat	120			2	1	1
385	Cappelle Desprez	83				1	1
499	Holdfast	104				1	1
4114	Maris Widgeon	94				1	1
419	Marsters A1	110		2	1	2	1
505	Milns N 59	118		1	1	2	1
1123	Hunter's 2	115				2	1
1151	Balwin Early Red	105				2	1
501	Little Joss	122		3	1	3	1
1128	Egyptian Mummy	112				3	1
492	Browick	128				4	1
497	Golden Drop	135				4	1
976	Benefactor	120		1		4	1
1001	Browick Old True	138	2	1	1	5	1
1080	New Harvester	118		1	1	6	1
1012	Bearded Red	130		1	1	6	1
498	Hen Gymro	130		2	2	6	1
253	Red Fife	120	1	1	3	6	1
1126	Yeoman B 9425	123				6	1
1157	Square Heads	125	1	1	1	7	1
1091	Red Stettin 13	127		1	1	7	1
987	Red Lammas	130		3	6	7	1
989	Sherriffs Epi Carre	118				7	2
986	Hickling de Mars	137				7	3
997	Teverson	130			4	8	1
1002	Chidham 1	120		3		8	2
1003	Old Welsh April Bearded	125	3		3	8	3
988	Rouge d'Ecosse	148				9	1
1035	Oxford Prize	128		3		9	1
999	Prince Albert	134				9	1
260	White Fife	137		3	3	9	5
990	Talavera de Belle Vue	123			6	9	6

Summary

- LR National Inventories in themselves are not sufficient. They are only a first part in the pathway.
- Genebanks have an important role as facilitators;
 - Focused/ packaged promotions
 - Remember '*Small is Beautiful*'
 - Growing demonstrations
- Understand the markets – The players and structure
- Target use and value- 'Where's the story?'

Thank you for your attention.