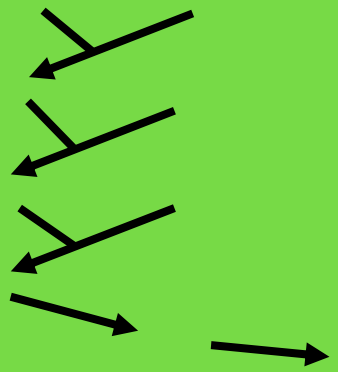
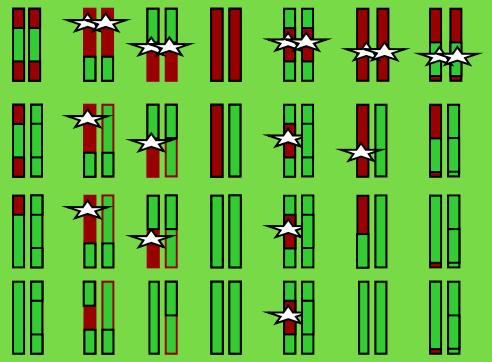
WGIN2 JIC Update

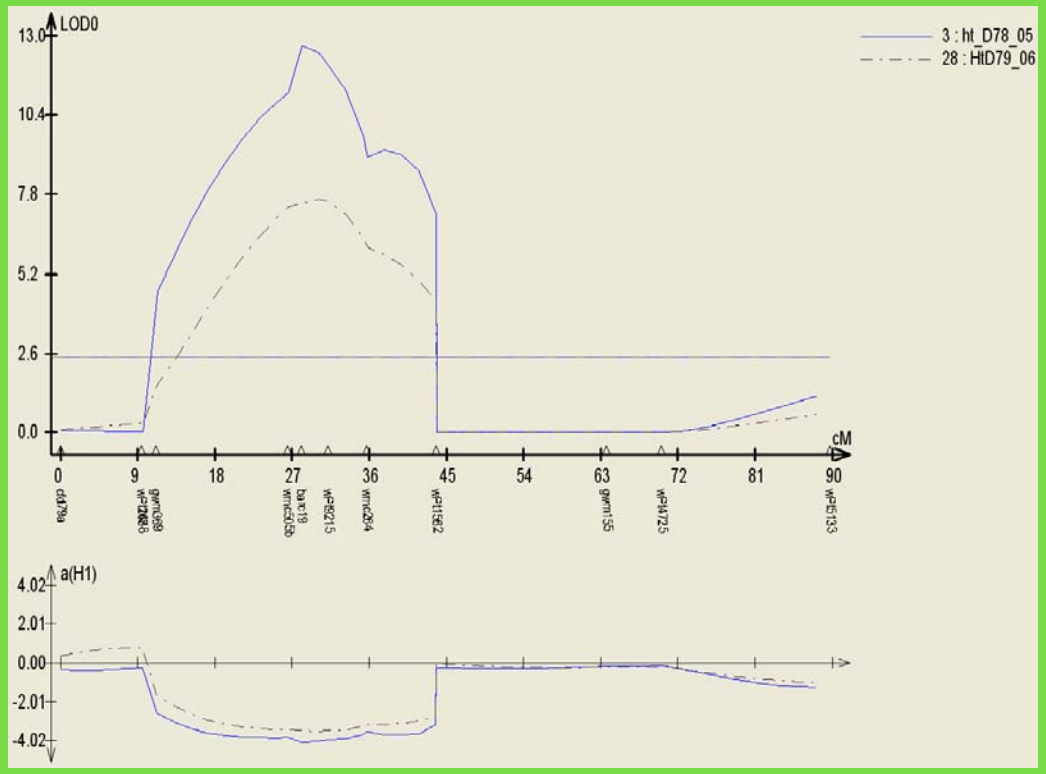
Development of Near Isogenic Lines

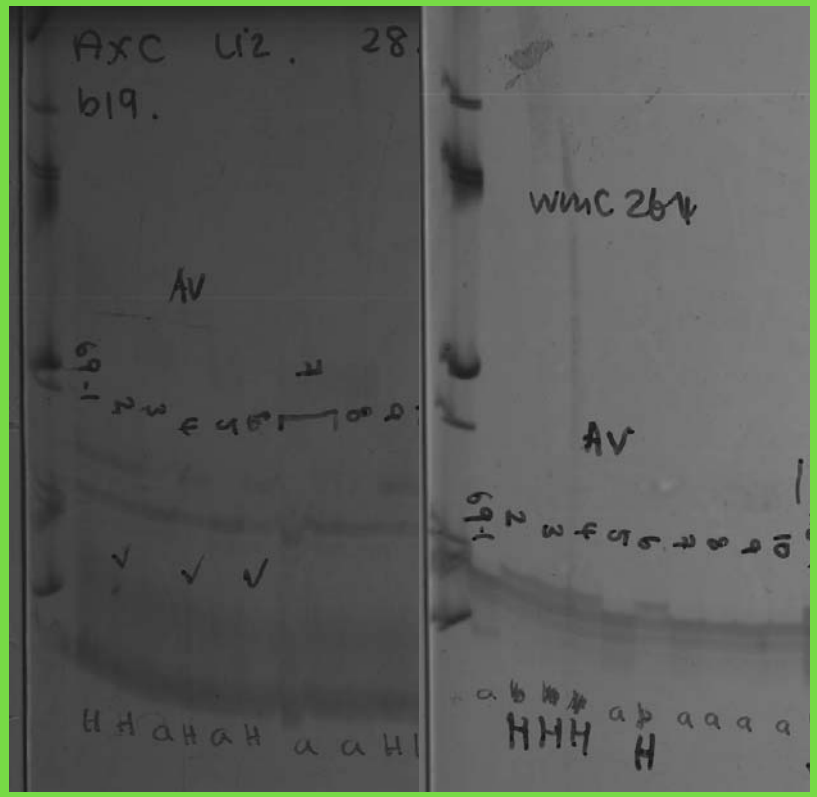
Near Isogenic Line development
-Example of strategy for 3A height





WGIN1 → WGIN2





Near isogenic line development- Yield

QTL	F_1	BC_1	BC_2	Homozygotes
2D				
3B				
5A				
7B				
7D				

DNA for heterozygotes (BC_2) and homozygotes BC_2F_2 now extracted ready for MAS

Near isogenic line development- Crop height

QTL	F_1	BC_1	BC_2	Homozygotes
2A				
2D				
3A				
3B				
6A				
6B				

DNA for heterozygotes (BC_2) and homozygotes BC_2F_2 now extracted ready for MAS

Near isogenic line development- Ear emergence

QTL	F_1	BC_1	BC_2	Homozygotes
1B				
1D				
6B				

DNA for heterozygotes (BC_2) and homozygotes BC_2F_2 now extracted ready for MAS

Gamma mutagenesis

Gamma M_1 mutants:
CS bagged left (2500) sown). Paragon (2000 sown) currently bagging right
50% fertility rate expected

Now harvested M_2 seed- for sowing in spring 2010
Scope for a further 4000

Taking Paragon EMS alleles forward

Leaf senescence segregating

Tagging plants by visiting students for DNA collection and trait scoring

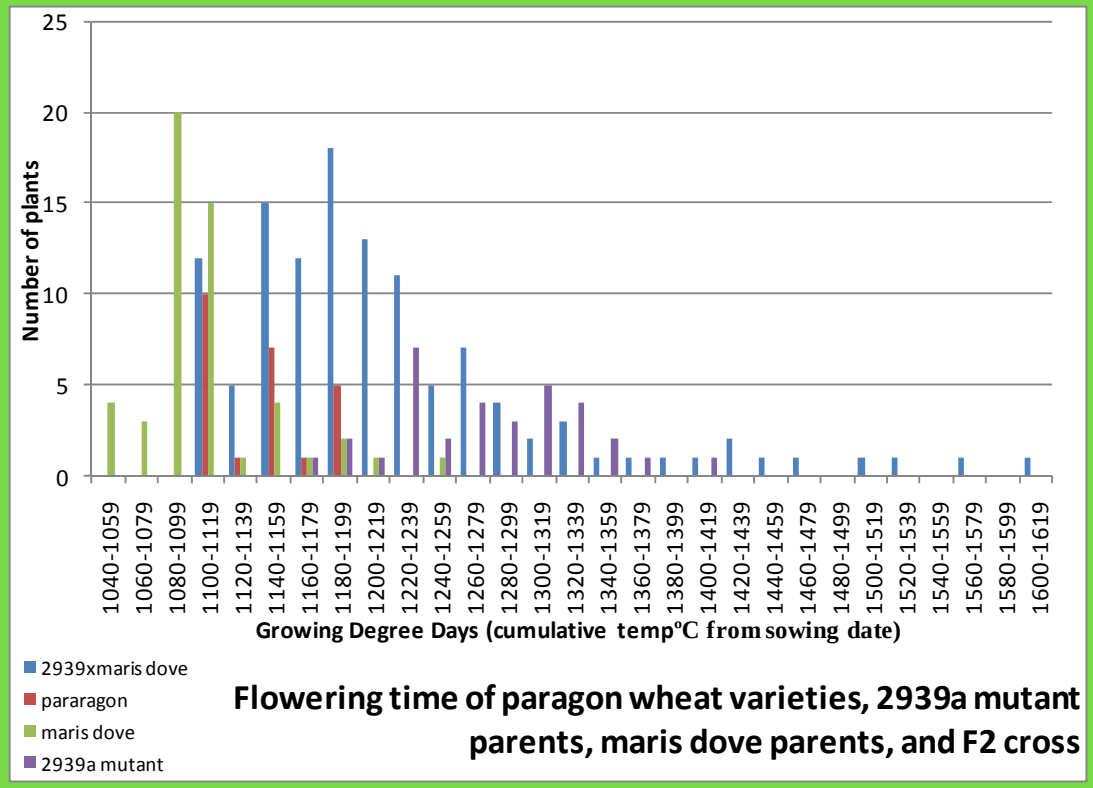
Mutant x Spring cultivars: F_2 families
12 families – segregations of mutant types height, flowering, leaf senescence and biomass

Paragon mutants in Hege 80s
Left – flowering time differences (first two plots) Right – leaf senescence

Heading date DArT data returned for heading date

- 2939a mutant was crossed with Maris Dove
- 2939a mutant was crossed with Wembley
- 423a mutant was crossed with White Fife
- 423a mutant was crossed with Koga

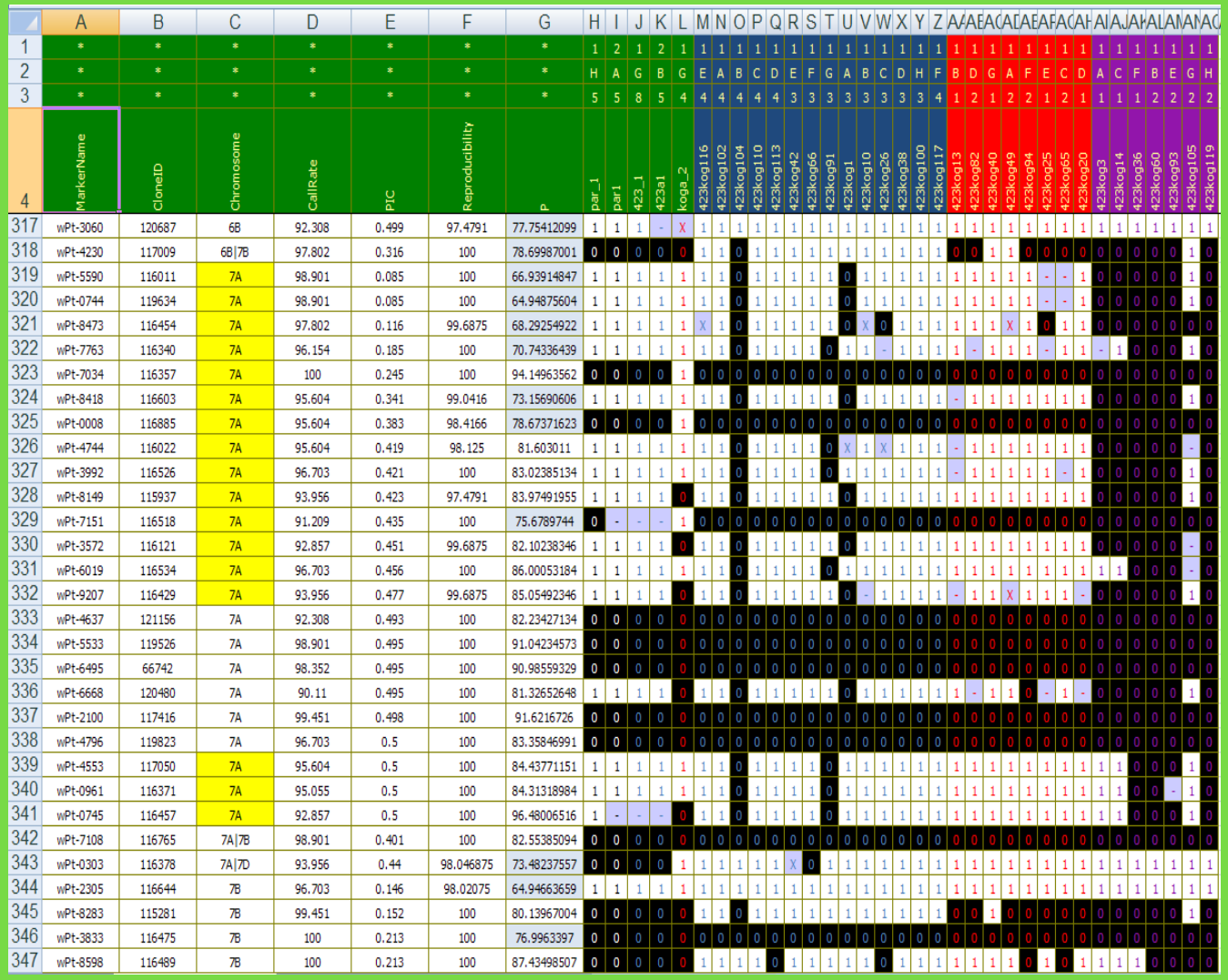
Segregation of ear emergence for 2939a



Flowering time of paragon wheat varieties, 2939a mutant parents, maris dove parents, and F2 cross

‘Late late’ 423a

Grp 7 associations for 423a



	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	AA	AB	AC	AD	AE	AF	AG	AH	AI	AJ	AK	AL	AM	AN	AO
1	*	*	*	*	*	*	*	1	2	1	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
2	*	*	*	*	*	*	*	H	A	G	B	G	E	A	B	C	D	E	F	G	A	B	C	D	H	F	B	D	G	A	F	E	C	D	A	C	F	B	E	G	H
3	*	*	*	*	*	*	*	5	5	8	5	4	4	4	4	4	4	3	3	3	3	3	3	3	3	3	4	1	2	1	2	2	1	2	1	1	1	2	2	2	2
4	MarkerName	CloneID	Chromosome	CallRate	PIC	Reproducibility	P	par_1	par1	423_1	423a1	koga_2	423kog116	423kog102	423kog104	423kog110	423kog113	423kog42	423kog66	423kog91	423kog1	423kog10	423kog26	423kog38	423kog100	423kog117	423kog13	423kog82	423kog40	423kog49	423kog94	423kog25	423kog65	423kog20	423kog3	423kog14	423kog36	423kog60	423kog93	423kog105	423kog119	
317	wPt-3060	120687	6B	92.308	0.499	97.4791	77.75412099	1	1	1	-	X	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
318	wPt-4230	117009	6B|7B	97.802	0.316	100	78.69987001	0	0	0	0	0	1	1	0	1	1	1	1	1	1	1	1	1	1	1	0	0	1	1	0	0	0	0	0	0	0	0	0	1	0
319	wPt-5590	116011	7A	98.901	0.085	100	66.93914847	1	1	1	1	1	1	1	0	1	1	1	1	1	0	1	1	1	1	1	1	1	1	1	1	1	-	-	1	0	0	0	0	0	1	0
320	wPt-0744	119634	7A	98.901	0.085	100	64.94875604	1	1	1	1	1	1	1	0	1	1	1	1	1	0	1	1	1	1	1	1	1	1	1	1	1	-	-	1	0	0	0	0	0	1	0
321	wPt-8473	116454	7A	97.802	0.116	99.6875	68.29254922	1	1	1	1	1	X	1	0	1	1	1	1	1	0	X	0	1	1	1	1	1	1	1	X	1	0	1	1	0	0	0	0	0	0	0
322	wPt-7763	116340	7A	96.154	0.185	100	70.74336439	1	1	1	1	1	1	1	0	1	1	1	1	0	1	1	-	1	1	1	1	-	1	1	1	-	1	1	-	1	0	0	0	1	0
323	wPt-7034	116357	7A	100	0.245	100	94.14963562	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
324	wPt-8418	116603	7A	95.604	0.341	99.0416	73.15690606	1	1	1	1	1	1	1	0	1	1	1	1	1	0	1	1	1	1	1	-	1	1	1	1	1	1	1	0	0	0	0	0	1	0
325	wPt-0008	116885	7A	95.604	0.383	98.4166	78.67371623	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
326	wPt-4744	116022	7A	95.604	0.419	98.125	81.603011	1	1	1	1	1	1	1	0	1	1	1	1	0	X	1	X	1	1	1	-	1	1	1	1	1	1	1	0	0	0	0	0	-	0
327	wPt-3992	116526	7A	96.703	0.421	100	83.02385134	1	1	1	1	1	1	1	0	1	1	1	1	0	1	1	1	1	1	1	-	1	1	1	1	1	-	1	0	0	0	0	0	1	0
328	wPt-8149	115937	7A	93.956	0.423	97.4791	83.97491955	1	1	1	1	0	1	1	0	1	1	1	1	1	0	1	1	1	1	1	1	1	1	1	1	1	1	1	0	0	0	0	0	1	0
329	wPt-7151	116518	7A	91.209	0.435	100	75.6789744	0	-	-	-	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
330	wPt-3572	116121	7A	92.857	0.451	99.6875	82.10238346	1	1	1	1	0	1	1	0	1	1	1	1	1	0	1	1	1	1	1	1	1	1	1	1	1	1	1	0	0	0	0	0	-	0
331	wPt-6019	116534	7A	96.703	0.456	100	86.00053184	1	1	1	1	1	1	1	0	1	1	1	1	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	0	0	-	0
332	wPt-9207	116429	7A	93.956	0.477	99.6875	85.05492346	1	1	1	1	0	1	1	0	1	1	1	1	1	0	-	1	1	1	1	-	1	1	X	1	1	1	-	0	0	0	0	0	1	0
333	wPt-4637	121156	7A	92.308	0.493	100	82.23427134	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
334	wPt-5533	119526	7A	98.901	0.495	100	91.04234573	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
335	wPt-6495	66742	7A	98.352	0.495	100	90.98559329	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
336	wPt-6668	120480	7A	90.11	0.495	100	81.32652648	1	1	1	1	0	1	1	0	1	1	1	1	1	0	1	1	1	1	1	1	-	1	1	0	-	1	-	0	0	0	0	0	1	0
337	wPt-2100	117416	7A	99.451	0.498	100	91.6216726	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
338	wPt-4796	119823	7A	96.703	0.5	100	83.35846991	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
339	wPt-4553	117050	7A	95.604	0.5	100	84.43771151	1	1	1	1	1	1	1	0	1	1	1	1	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	0	0	1	0
340	wPt-0961	116371	7A	95.055	0.5	100	84.31318984	1	1	1	1	1	1	1	0	1	1	1	1	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	0	-	1	0
341	wPt-0745	116457	7A	92.857	0.5	100	96.48006516	1	-	-	-	0	1	1	0	1	1	1	1	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	0	0	1	0
342	wPt-7108	116765	7A|7B	98.901	0.401	100	82.55385094	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
343	wPt-0303	116378	7A|7D	93.956	0.44	98.046875	73.48237557	0	0	0	0	1	1	1	1	1	1	X	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
344	wPt-2305	116644	7B	96.703	0.146	98.02075	64.94663659	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
345	wPt-8283	115281	7B	99.451	0.152	100	80.13967004	0	0	0	0	0	1	1	0	1	1	1	1	1	1	1	1	1	1	1	0	0	1	0	0	0	0	0	0	0	0	0	0	1	0
346	wPt-3833	116475	7B	100	0.213	100	76.9963397	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
347	wPt-8598	116489	7B	100	0.213	100	87.43498507	0	0	0	0	0	1	1	1	1	0	1	1	1	1	1	0	1	1	1	1	1	1	1	0	1	0	1	1	1	1	0	0	0	0

Koga 7A nullisomics

AE Watkins and population development

Ten AE Watkins x Paragon SSD populations- now at F_3

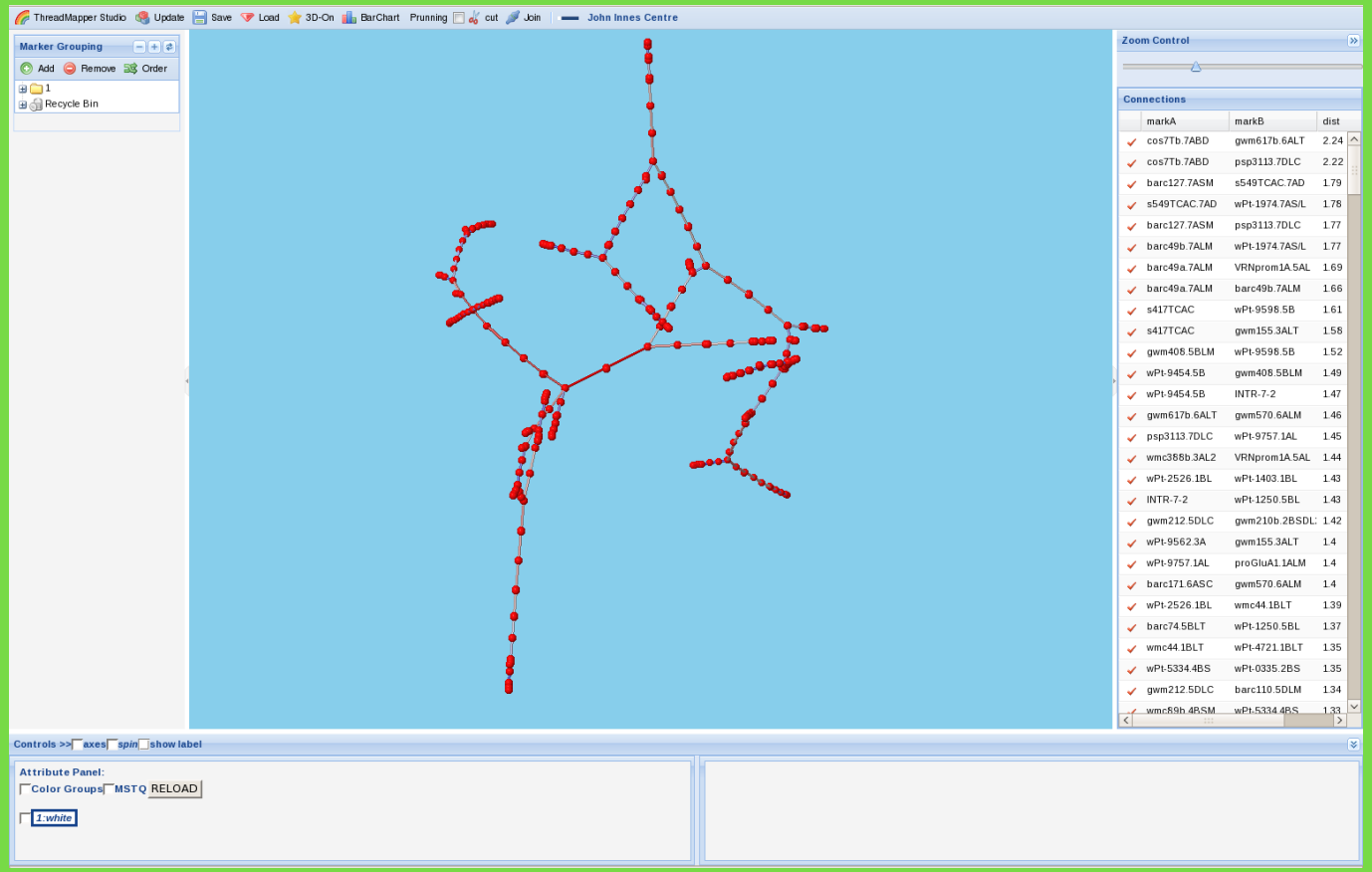
- Extremes- height and ear emergence. Ten SSD populations up to F_3 plants, therefore F_5 seed in June ’10.
- More to come eg- Thousand grain weight, grain length and grain width measured on 1100 Watkins lines. Done, data ready for website now and lines sown for crossing to Paragon.
- Also 2 SSDs Paragon X CS and JIC synthetic up to F_4. F_5 seed now sown and DNA extracted.
- 1071 Watkins accessions in soil house and field (Hege 90, 1m2) Autumn ’09.
- DNA extraction of soil house material (bagged) and minimum 800g of Watkins seed for further work.

Avalon x Cadenza

- Workshop When? 3rd Nov
- Where? JIC- Genome Centre Seminar Room
- JIC continues to maintain stocks

Improving A x C map

- http://cbr.jic.ac.uk/threadmapper



Handling data

- Development of relational database as core resource at JIC

- Propose to link version containing WGIN data to WGIN website

Navigation

- Home
- Browse Accession Data
- Map Data
- Group Data
- Trial Data
- Phenotype Data

General Options

- About This Database
- Credits

Search JIC WGI Database

View Map Definitions

The following maps were found in this version of Germinate.

To view markers contained on a map choose a map from the table below and click on its description.

Description	Created On	Updated On
JIC 200? Savannah X Rialto map (SaXRi or RxS)	2009-05-28 16:47:21	
JIC 200? Malacca X Charger map (MaXCh or MxC)	2009-05-28 17:10:00	
JIC 2006 Charger X Badger map (ChXBa or CxB)	2009-05-28 17:13:48	
JIC 2006 Beaver X Soisson map (BeXSo or BxS)	2009-05-28 17:31:43	
JIC 2009 Avalon X Cadenza map (AvXCa or AxC)	2009-05-28 17:43:59	

Back

vigation

me
owse Accession Data
p Data
oup Data
al Data
enotype Data

neral Options

out This Database
edits

arch JIC WGI
tabase

View Map Definitions

The following maps were found in this version of Germinate.

To view markers contained on a map choose a map from the table below and click on its description.

Description	Created On	Updated On
JIC 200? Savannah X Rialto map (SaXRi or RxS)	2009-05-28 16:47:21	
JIC 200? Malacca X Charger map (MaXCh or MxC)	2009-05-28 17:10:00	
JIC 2006 Charger X Badger map (ChXBa or CxB)	2009-05-28 17:13:48	
JIC 2006 Beaver X Soisson map (BeXSo or BxS)	2009-05-28 17:31:43	
JIC 2009 Avalon X Cadenza map (AvXCa or AxC)	2009-05-28 17:43:59	

Retrieving map data for map : JIC 2009 Avalon X Cadenza map (AvXCa or AxC)

The table below contains further information about markers contained on your selected map. Clicking the marker name will take you to furthern information about that particular marker while clicking the 'MapChart Format' button will allow you to export the map in MapChart format. For further information about MapChart please visit http://www.biometris.wur.nl/uk/Software/MapChart/

Export to MapChart Format

Show Marker Data

Marker Name	Close Index	Map Feature Description	Chromosome	Feature Start	Feature End
Tagluten	1A	Gene	1A	0.00	0.00
wmc336a	1AS	SSR	1A	3.00	3.00
I102W1		Gene	1A	4.00	4.00
psp3027	1A	SSR	1A	6.00	6.00
gwm164	1A	SSR	1A	7.00	7.00
gwm498	1A	SSR	1A	8.00	8.00
GluA1		Gene	1A	9.00	9.00
wPt9757		DArT	1A	10.00	10.00
wmc93		SSR	1A	11.00	11.00
gwm99	1A	SSR	1A	12.00	12.00
gwm33a	1B	SSR	1B	0.00	0.00
wPt2230	1BS	DArT	1B	1.00	1.00
TaglgapG	1BS	Gene	1B	2.00	2.00
gwm264	5A	SSR	1B	3.00	3.00

Navigation

- Home
- Browse Accession Data
- Map Data
- Group Data
- Trial Data
- Phenotype Data

General Options

- About This Database
- Credits

Search JIC WGI Database

Categorical Data Export

From these pages you are able to view phenotypic data that is held by Germinate.

Go to the Chart Utility

Experiment Name	Description	Date
JIC NUE 2008 Savannah X Rialto DH phenotypes	JIC SaXRi DH phenotypes from field trial in Bawburgh, 2008, at two nitrogen levels (low n and nor n). (Population also wrongly called RiXSa)	2007-10-16
JIC 2007 Avalon X Cadenza DH phenotypes	JIC AvXCa DH phenotypes from field trials in Bawburgh for WGIN project, 2007	2006-10-01

Back

Navigation

- Home
- Browse Accession Data
- Map Data
- Group Data
- Trial Data
- Phenotype Data

General Options

- About This Database
- Credits

Search JIC WGI Database

Categorical Data Export

From these pages you are able to view phenotypic data that is held by Germinate.

Go to the Chart Utility

Dataset Description	Dataset Date	Version	Experiment Name
spikelet number per ear;2007			JIC 2007 Avalon X Cadenza DH phenotypes
ear length;2007			JIC 2007 Avalon X Cadenza DH phenotypes
straw biomass;2007			JIC 2007 Avalon X Cadenza DH phenotypes
ear biomass;2007			JIC 2007 Avalon X Cadenza DH phenotypes
peduncle length;2007			JIC 2007 Avalon X Cadenza DH phenotypes
internode1 length;2007			JIC 2007 Avalon X Cadenza DH phenotypes
internode2 length;2007			JIC 2007 Avalon X Cadenza DH phenotypes
internode3 length;2007			JIC 2007 Avalon X Cadenza DH phenotypes
1000-dehulled grain weight;2007	2009-03-18		JIC 2007 Avalon X Cadenza DH phenotypes
grain surface area;2007	2009-03-18		JIC 2007 Avalon X Cadenza DH phenotypes
grain width;2007	2009-03-18		JIC 2007 Avalon X Cadenza DH phenotypes
grain length;2007	2009-03-18		JIC 2007 Avalon X Cadenza DH phenotypes

Ok we are looking at dataset 1000-dehulled grain weight;2007

This dataset has the following phenotypes defined against it.

Name	Short Name	Description	Export
1000-dehulled grain weight	TGRWT	The weight, measured in grams, of 1000 well-developed whole grains (without hull).	☐

Submit

Back

WGIN at JIC

Catherine Baker

Liz Sayers

Richard Goram

Luzie Wingen

Simon Orford

Michelle Leverington

John Snape

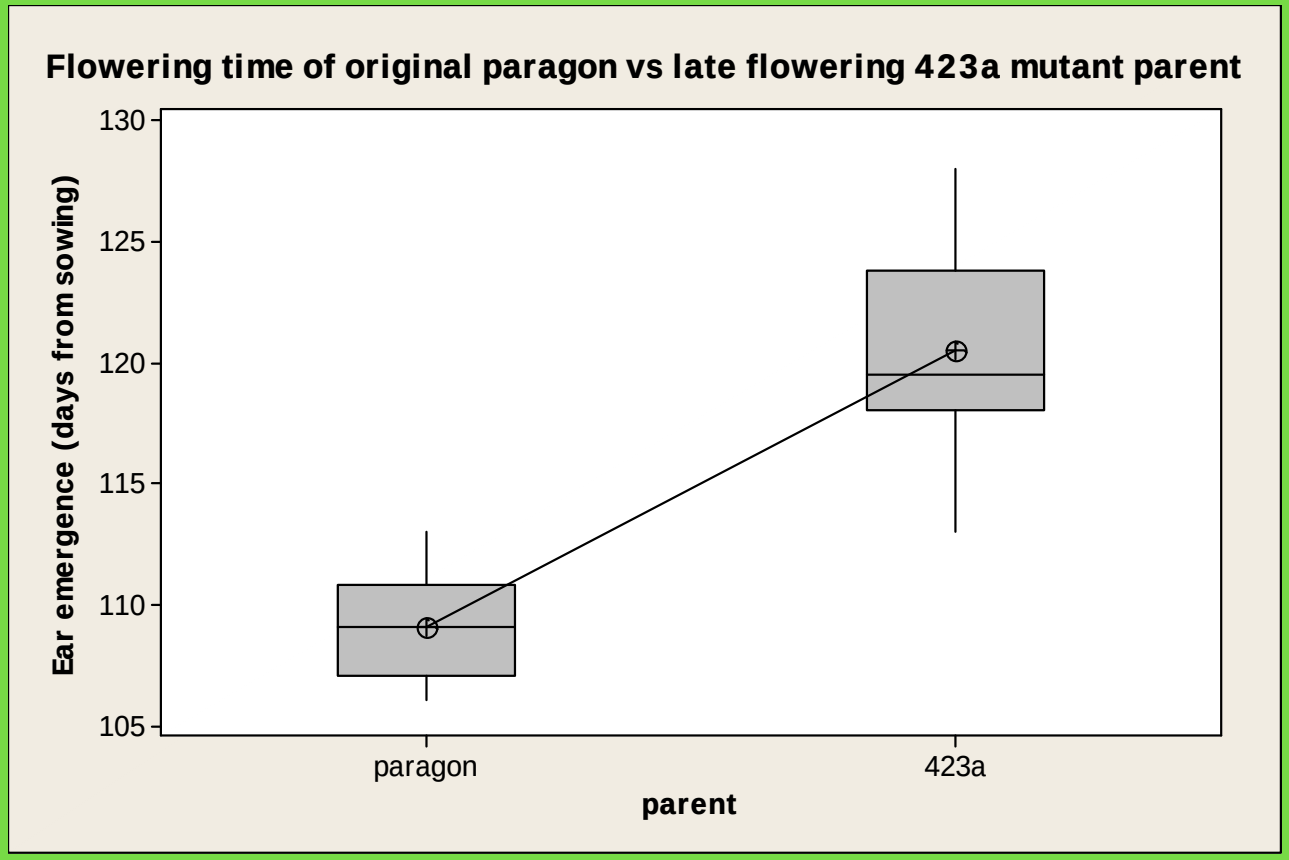
Lesley Fish

Debora Gasperini

"And he gave it for his opinion, that whosoever could make **two ears of corn** or two blades of grass to grow upon a spot of ground where only one grew before, would deserve better of mankind, and do more essential service to his country, than the whole race of politicians put together."
— Jonathan Swift (Gulliver's Travels)

Gamma M2 mutants: CS left
Paragon right
Frequent flag leaf rolling

Phenotypes confirmed



Insect resistance in wheat: Cereal aphids (RRes)

Ruth Gordon-Weeks and Lesley Smart

Objective 1. To explore whether the differential response of hexaploid wheats to two different cereal aphid species has a genetic basis.

Milestone 1. Determine the differential susceptibility to two cereal aphid species of targeted lines from the Spark x Rialto mapping population.

Spark x Rialto Mapping population extreme responses

Diuraphis noxia

Genotype	no. of aphids per plant
SR 120	23.33
SR 111	22.6
SR 98	16.29
SR 7	2.00
SR 67	2.00
SR 122	2.00
SR 10	1.86
SR 39	1.22
Spark	4.44
Rialto	2.71

Schizaphis graminum

Genotype	no. of aphids per plant	
SR 21	24.33	most
SR 8	23.50	preferred
SR 92	20.86	
SR 6	18.00	
SR96	18.00	
SR 110	2.83	
SR 95	2.50	
SR 4	2.25	
SR 39	2.00	least
SR 144	1.88	preferred
Spark	16.88	
Rialto	5.43	

Data from John Snape

Family

Aphididae

Sub-family

Aphidinae

Tribe

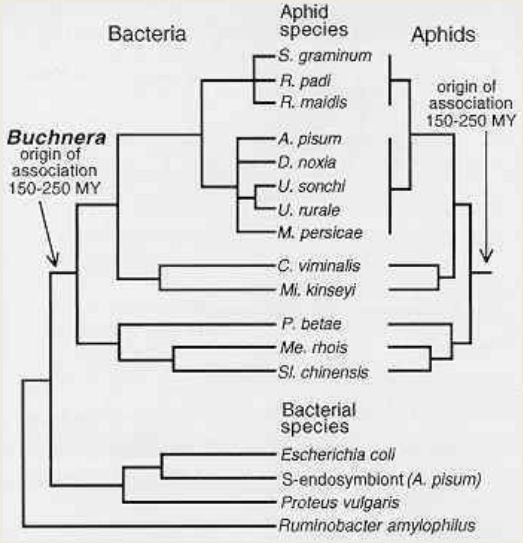
Macrosiphini Aphidini

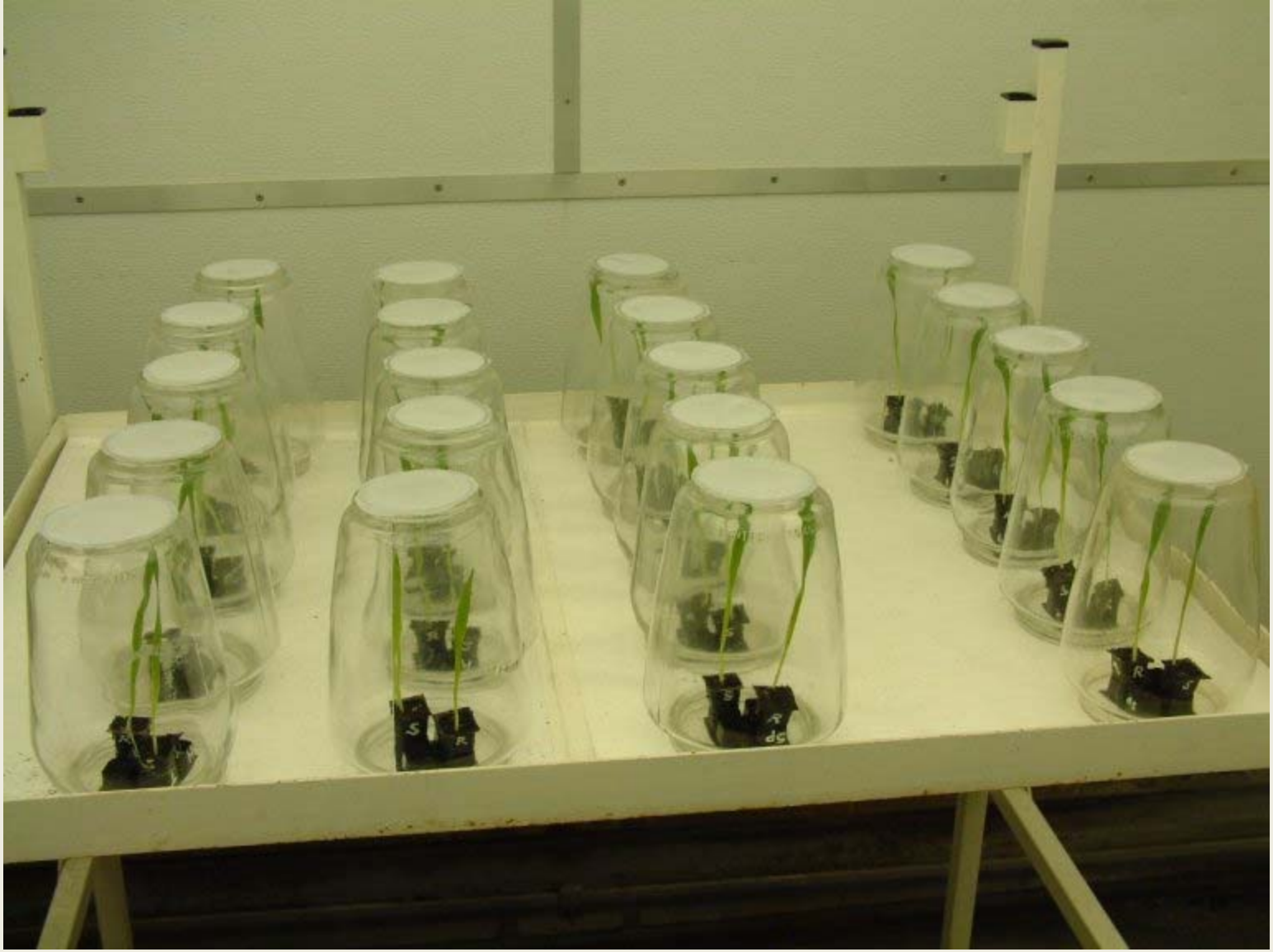
Diuraphis noxia
Russian Wheat aphid

Schizaphis graminum
Greenbug

Sitobion avenae
Grain aphid

Rhopalosiphum padi
Bird-cherry oat aphid



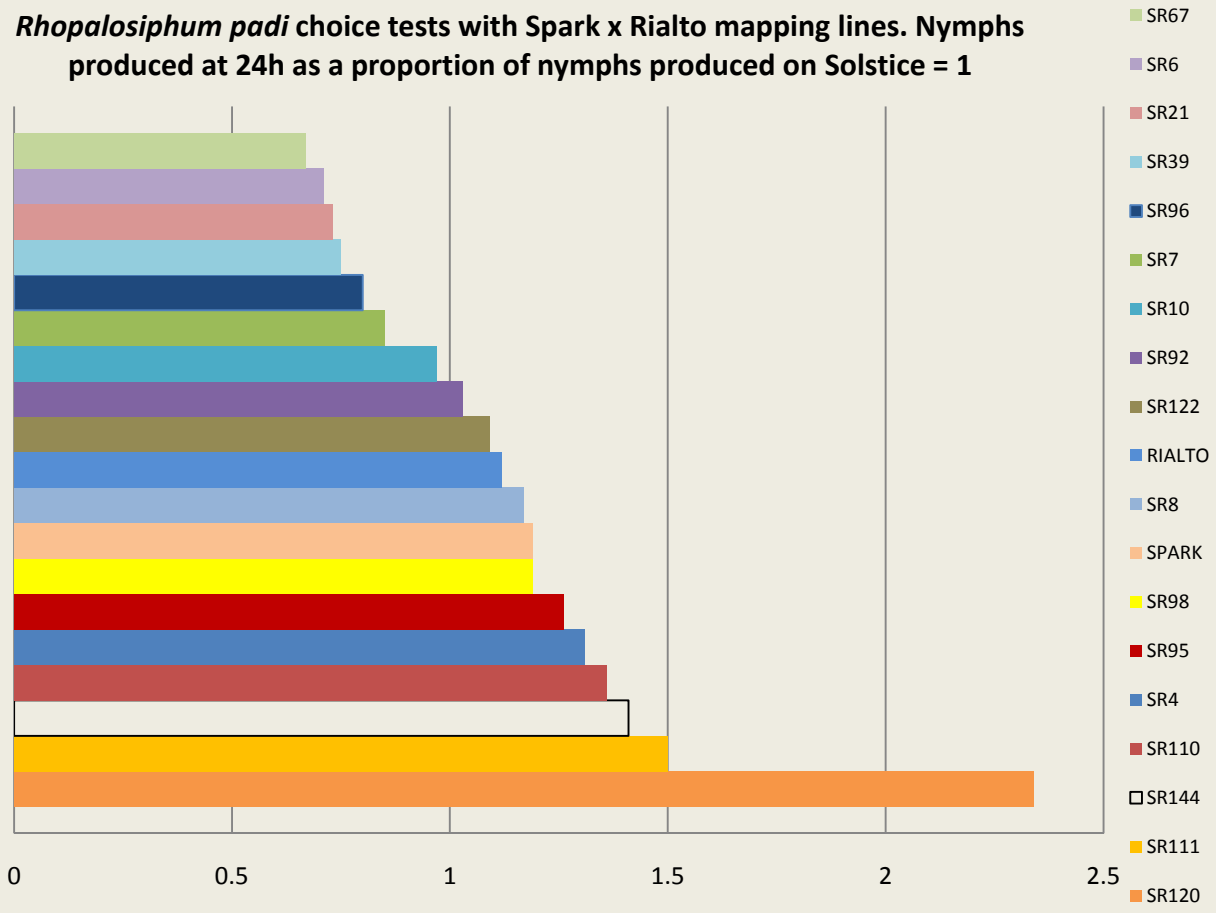


17 Genotypes plus the parental lines tested in choice tests, with cv. Solstice as the standard variety, against *Sitobion avenae* and *Rhopalosiphum padi.*

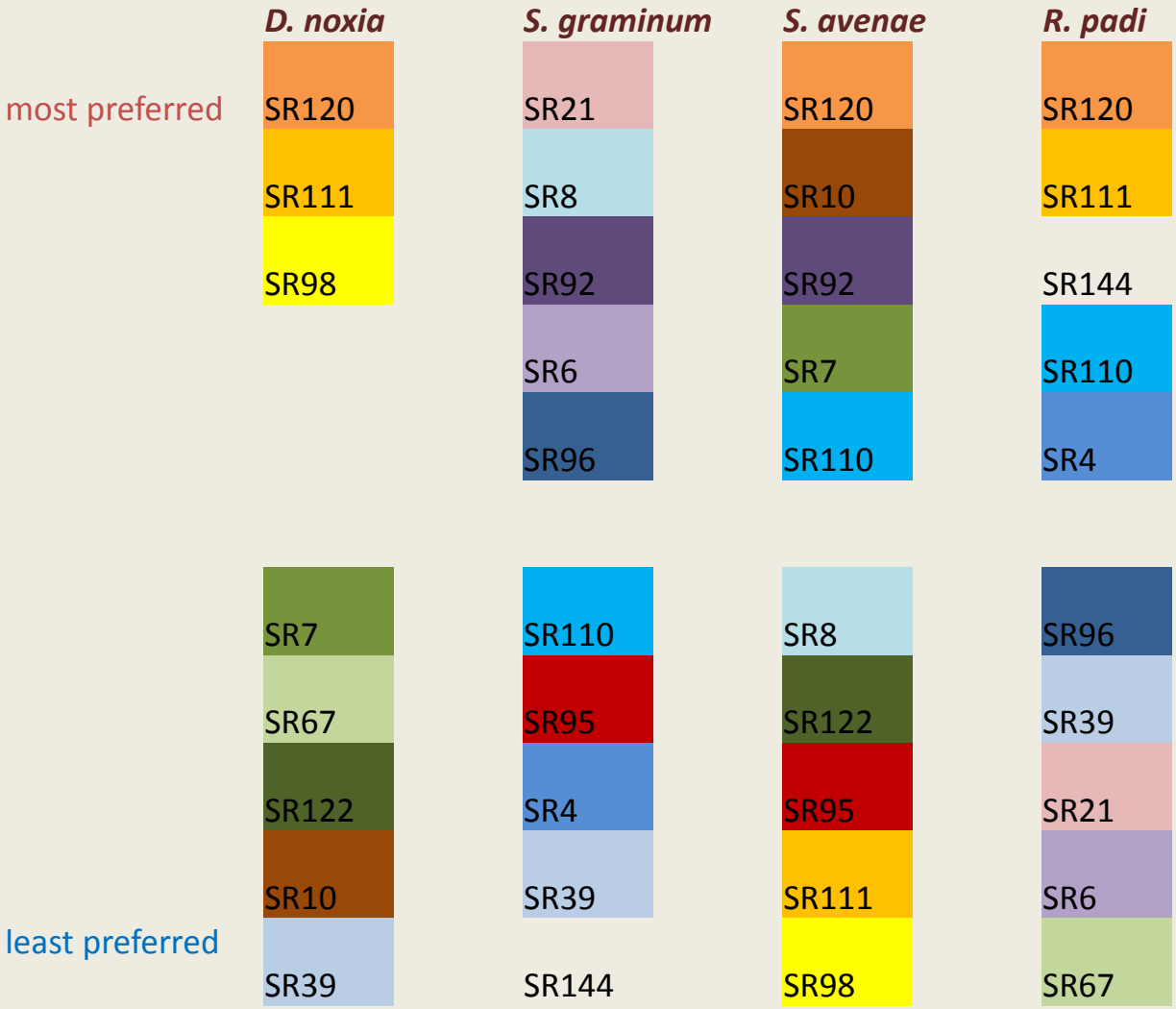
Preference Index *Sitobion avenae*

***Sitobion avenae* choice tests with Spark x Rialto mapping lines. Nymphs produced at 24h as a proportion of nymphs produced on Solstice = 1**

Preference Index *Rhopalosiphum padi*

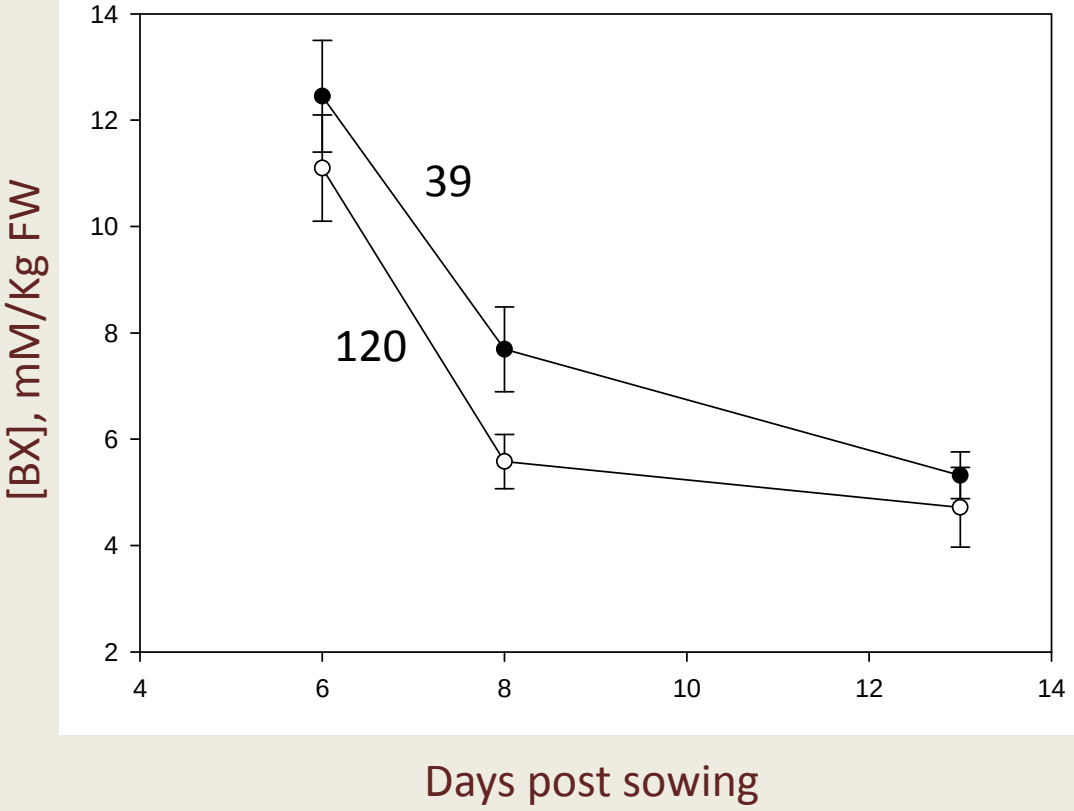


Spark x Rialto antixenosis responses



Of the two parental lines, Spark is preferred to Rialto by all aphid species tested

Benzoxazinone concentration in leaf tissue

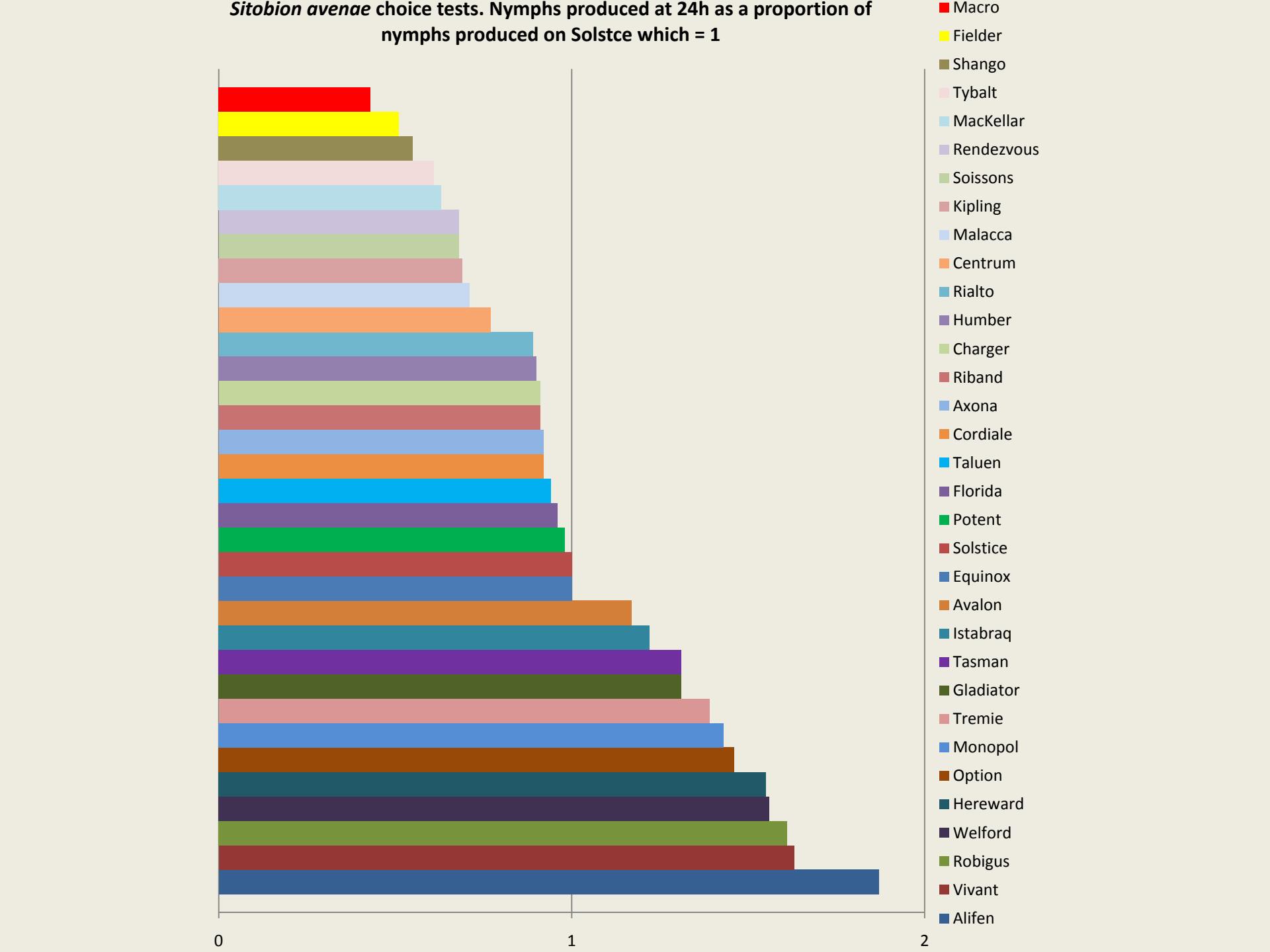


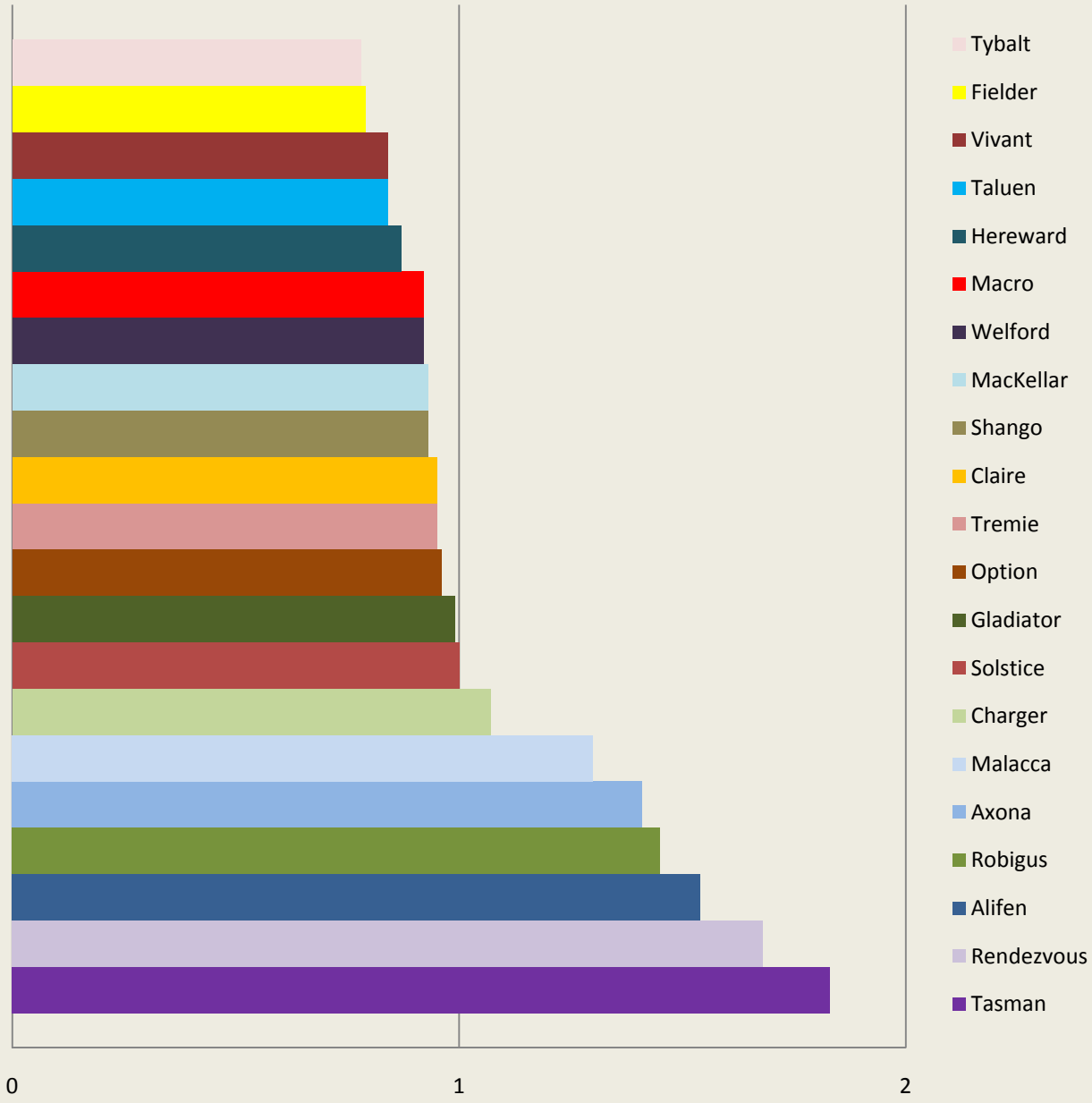
Further Work

- Conduct comparative development tests for both UK cereal aphid species on some of the least and most preferred genotypes

- Investigate levels of *BX* gene upregulation in some of the least and most preferred genotypes after infestation with the UK cereal aphid species

- Determine whether there is any genetic difference between the least and most preferred genotypes


Sitobion avenae choice tests. Nymphs produced at 24h as a proportion of nymphs produced on Solstce which = 1
Macro
Fielder
Shango
Tybalt
MacKellar
Rendezvous
Soissons
Kipling
Malacca
Centrum
Rialto
Humber
Charger
Riband
Axona
Cordiale
Taluen
Florida
Potent
Solstice
Equinox
Avalon
Istabraq
Tasman
Gladiator
Tremie
Monopol
Option
Hereward
Welford
Robigus
Vivant
Alifen
0
1
2


Rhopalosiphum padi choice tests. Nymphs at 24h as a proportion of nymphs on Solstice which = 1
Tybalt
Fielder
Vivant
Taluen
Hereward
Macro
Welford
MacKellar
Shango
Claire
Tremie
Option
Gladiator
Solstice
Charger
Malacca
Axona
Robigus
Alifen
Rendezvous
Tasman
0
1
2

Objective 8 - NUE and NUE linked QTLs

M J Hawkesford

WGIN management Meeting, 20th October 2009

Objectives

1. Dissect components of yield and NUE parameters in varieties of interest as identified in the preliminary screening in WGIN 1.
2. Examine physiology/biochemical processes contributing to NUE and quantify expression of key genes in selected varieties.
3. Examine variation in NUE in more ‘exotic’ germplasm arising from WGIN.
4. Use mapping populations to identify robust key QTLs for NUE.
5. Examine variation in early seedling nitrogen uptake ability.
6. Determine whether functionality can be maintained at reduced grain protein. This will utilise bread making quality QTLs which are independent of protein content (and known storage proteins) as identified in a previous LINK project and derived from the Hereward x Malacca population.

Workplan

- Diversity/N trials 2009-2013 (5years)
  - Core 15
  - Exotics e.g. Watkins
  - Specific A x C lines
  - Other germplasm as deemed appropriate
- Avalon x Cadenza field trials 2009/10/11 (3 years)
  - high/low N (one low, 2 high N)
  - to supplement WGIN1 trials (one high, 2 low)
- Avalon x Cadenza – G/H trial 2012
- Hereward x Malacca NILS
  - fields trials 2012/13
  - 20 lines

Diversity trial

- Germplasm
  - Core set
  - New varieties: Marksman, Gallant, Oakley (Chablis)
  - Inclusion (6 varieties) as part of BBSRC-IPA on quality-yield relationships
  - Inclusion of exotic materials, e.g. A x C, Watkins, suggestions???
- Traits
  - Yield, NUE etc
  - Partitioning information
  - Analysis of post anthesis canopy longevity
  - Analysis of genotypic variation in early N-uptake efficiency

08/09 Diversity Varieties

Wheat varieties for WGIN-NUE
2008/9

Variety	Code	Dressing	Code	Data (04/05/06/07)	Rationale
1. Avalon	Av	recleaned	AV	No/05/06/07	WGIN DH parent; Low NupE & NutE (D)
2. Cadenza	Ca	recleaned	CA	04/05/06/07	WGIN DH parent; Best NupE (W)
3. Claire NEW 2005	Cl	kinto	CL	No/05/06/07	Biggest area on RL; WGIN DH parent; Good second wheat
4. Cordiale NEW 2006	Co	redigo deter	CO	No/no/06/07	Good second wheat
5. Hereward	He	anchor	HE	04/05/06/07	Best protein on RL; benchmark bread variety
6. Hurley NEW 2005	Hu	recleaned	HU	No/05/06/07	Low NupE & NutE (W)
7. Istabraq NEW 2005	Is	kinto lattitude	+IS	No/05/06/07	Best yield on RL; Distilling cultivar; In LINK 'GREENgrain'; Good second wheat
8. Malacca	Ma	redigo deter	MA	04/05/06/07	Biggest Group 1 area; DH choice; Low NupE, high NutE (W)
9. Marksman	Mk	redigo	MK		new for 2009, PRS request
10. Maris Widgeon	Mw	sibutol	MW	04/05/06/07	Tall (rht), old cultivar
11. Mercia	Me	recleaned	ME	04/no/06/07	Low NupE & NutE (desk); Low Canopy N requirement; In IGF micro-array
12. Monopol	Mo	recleaned	MO	04/05/06/07	Breeder choice; High NupE, worst NutE (W)
13. Paragon	Pa	redigo twin	PA	04/05/06/07	Spring variety; WGIN mutagenesis population; High NupE (W)
14. Riband	Ri	recleaned	RI	04/05/06/07	WGIN DH parent; Distilling cultivar; In LINK 'GREENgrain'; High NutE (W)
15. Robigus NEW 2005	Ro	redigo deter lattitude	+RO	No/05/06/07	Best Group 3 yield; Best NUE, high NupE & NutE (D); Good second wheat
16. Soissons	Ss	redigo	SS	04/05/06/07	WGIN DH parent; Early maturing; High NupE, low NutE (W)
17. Solstice	Sl	beret gold lasttitude	+SL	04/05/06/07	Biggest Group 2 area; DH choice; Worst NupE (W)
18. Xi19	Xi	redigo deter	XI	04/05/06/07	Best Group 1 yield; High NUE, NupE, NutE (D); Low NupE (W)
19. AxC line 100	D1	recleaned			new for 2009 - good early export from leaves
20. AxC line 116	D2	recleaned			new for 2009 - poor early export from leaves
21. AxC line 99	D3	recleaned			new for 2009 - high leaf %N at anthesis
22. AxC line 155	D4	recleaned			new for 2009 - low leaf %N at anthesis
23. AxC line 127	D5	recleaned			new for 2009 - high NUtE
24. AxC line 82	D6	recleaned			new for 2009 - low NUtE

Wheat varieties for WGIN-NUE 2009/10 W=WGIN data, D=desk study

Variety	Code	Dressing	Code	Nabim	Rationale	inclusion in trial requested by	previous years of trials
1. Avalon	Av	recleaned	AV	1	WGIN DH parent; Low NupE & NutE (D)	PB, RG, MJH	No/05/06/07/08/09
2. Cadenza	Ca	recleaned	CA	2	WGIN DH parent; Best NupE (W)	PB, RG, MJH	04/05/06/07/08/09
3. Chablis NEW 09/10	Ch			2	SPRING variety (previous grown in 2004 trial) as very N-responsive variety	MH	only in 04
4. Claire NEW 2005	Cl	kinto	CL	3	Biggest area on RL; WGIN DH parent; Good second wheat	PB,PS	No/05/06/07/08/09
5. Cordiale NEW 2006	Co	redigo deter	CO	2	Good second wheat. BBSRC Quality project	RG	No/no/06/07/08/09
6. Gallant NEW 09/10				1	new claimed high yield and high protein type	MH	
7. Hereward	He	anchor	HE	1	Best protein on RL; benchmark bread variety. BBSRC Quality project	PB,PS	04/05/06/07//08/09
8. Istabraq NEW 2005	Is	kinto + lattitude	IS	4	Best yield on RL; Distilling cultivar; In LINK 'GREENgrain'; Good second wheat. BBSRC Quality project. WUE trial	PB,PS	No/05/06/07/08/09
9. Malacca	Ma	redigo deter	MA	1	Biggest Group 1 area; DH choice; Low NupE, high NutE (W). BBSRC Quality project	PS	04/05/06/07/08/09
10. Marksman	Mk	redigo	MK	2	new for 2009, PRS request for BBSRC Quality project	PS	only 09
11. Maris Widgeon	Mw	sibutol	MW	1	Tall (rht), old cultivar	PB, AM	04/05/06/07/08/09
12. Mercia	Me	recleaned	ME	1	Low NupE & NutE (desk); Low Canopy N requirement; In IGF micro-array. WUE trial. RHT series	RG	04/no/06/07/08/09
13. Oakley NEW 09/10	Oa			4 (hard)	Hard milling type. Highest yielding wheat on RL.	MH	
14. Paragon	Pa	redigo twin	PA	1	Spring variety; WGIN mutagenesis population; High NupE (W)	PB	04/05/06/07/08/09
15. Riband	Ri	recleaned	RI	3	WGIN DH parent; Distilling cultivar; In LINK 'GREENgrain'; High NutE (W)	RG	04/05/06/07/08/09
16. Robigus NEW 2005	Ro	redigo deter + lattitude	RO	3	Best Group 3 yield; Best NUE, high NupE & NutE (D); Good second wheat. WUE trial	PB, AM	No/05/06/07/08/09
17. Soissons	Ss	redigo	SS	2	WGIN DH parent; Early maturing; High NupE, low NutE (W)	PB,RG, AM	04/05/06/07/08/09
18. Solstice	Sl	beret gold + lasttitude	SL	2	Biggest Group 2 area; DH choice; Worst NupE (W)	RG	04/05/06/07/08/09
19. Xi19	Xi	redigo deter	XI	1	Best Group 1 yield; High NUE, NupE, NutE (D); Low NupE (W). BBSRC Quality project. WUE trial	PB,PS	04/05/06/07/08/09
20. AxC line 100	D1	recleaned			new in 2009 - high NUtE		09/
21. AxC line 116	D2	recleaned			new in 2009 - low NUtE	MJH	09/
22. AxC line 181	D3	recleaned			new in 2010 - rapid canopy senescence	MJH	10/
23. AxC line 112	D4	recleaned			new in 2010 - slow canopy senescence	MJH	10/
24. AxC line 127	D5	recleaned			new in 2009 - good early export from leaves	MJH	09/10/
25. AxC line 82	D6	recleaned			new in 2009 - slow early export from leaves	MJH	09/10/

2008/09 Diversity Trial

BBC filming, 3rd August, 2009

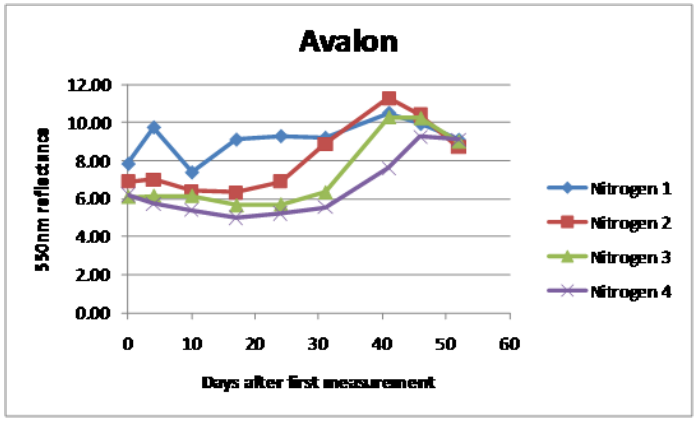
A x C traits - Rothamsted

- Flowering time and height
- Yield (grain and straw) and tgw
- Nitrogen (grain and straw)
- Computed NUtE, N uptake (final)
- Early N uptake

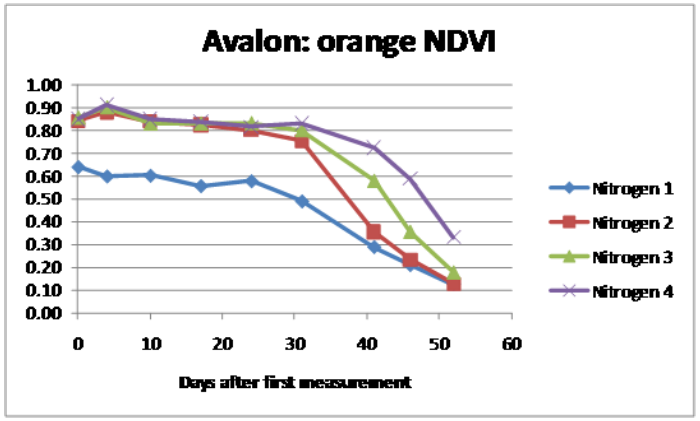
- Leaf N and SPAD (anthesis and 21 dpa)
- Leaf size (leaf 2)
- Canopy longevity, reflectance, rate of senescence
- Gene expression

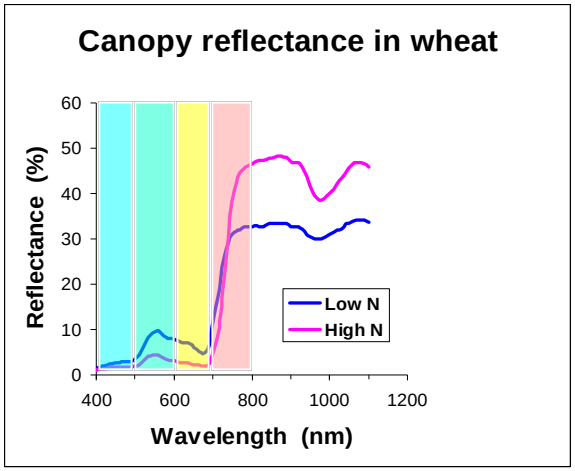
Canopy screening

Reflectance (550nm)

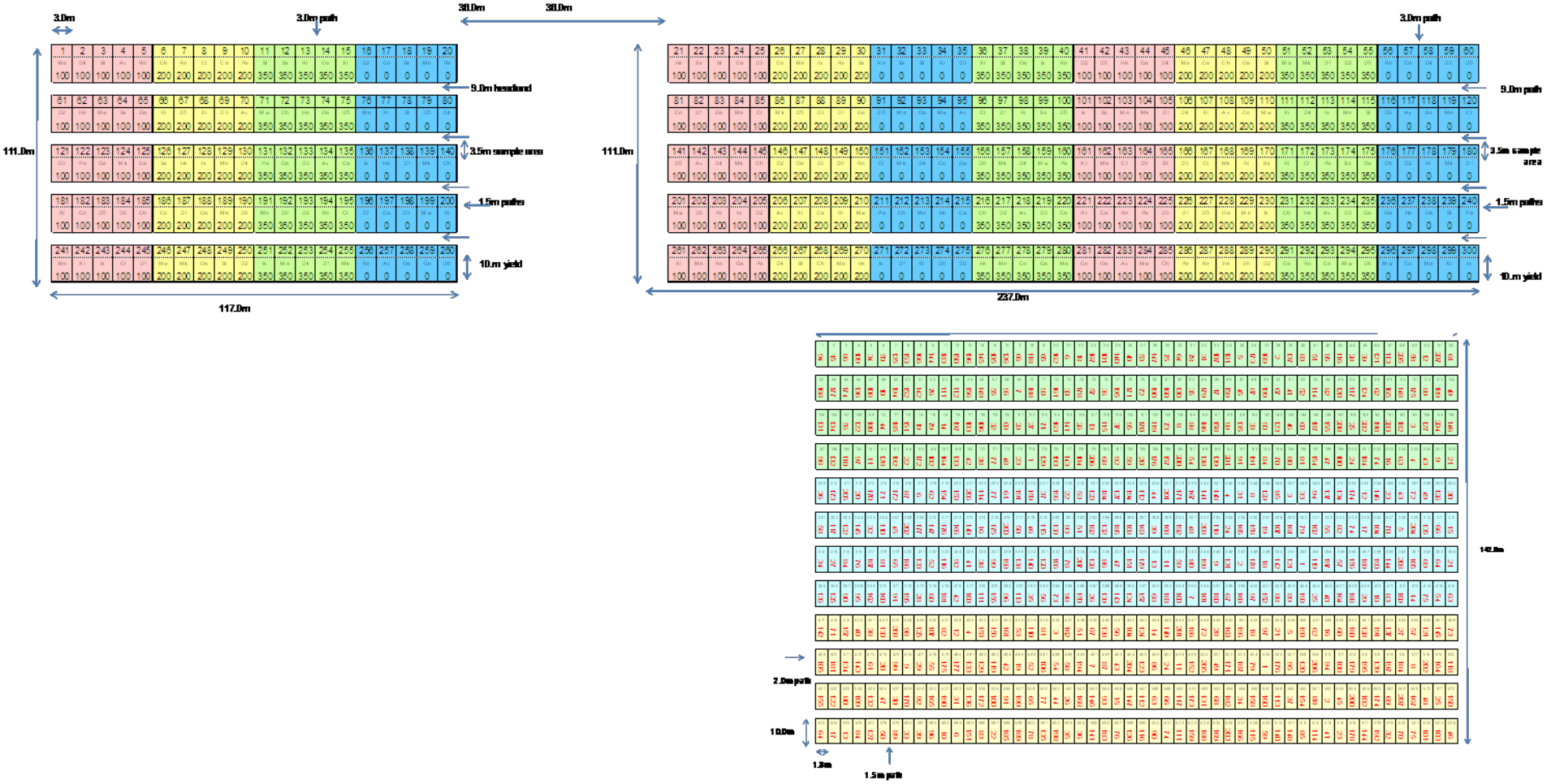


oNVDI=(750-680)/(750+680)





Status 2009-10 field expts



Drought tolerance

WGIN-2 SG meeting

Sutton Bonington 20 October 2009

The University of Nottingham

WGIN 2 (Activity 9, Drought tolerance)

1. **To identify the physiological traits explaining improved water-use efficiency and drought tolerance in elite winter wheat varieties.**
2. **To identify robust QTLs for water-use efficiency and drought-tolerance traits using one existing DH population in an elite background.**
3. **To develop one new DH population in an elite modern background segregating for drought-tolerance traits.**
4. **To identify novel genes and alleles controlling water-use efficiency and drough tolerance using the AE Watkins and Gediflux collections.**
5. **To collate a diverse germplasm collection (cultivars, advanced lines) from worldwide drought-tolerance wheat breeding programmes as a resource for future association genetics studies.**

WGIN 2 (Activity 9, Drought tolerance)

	Project Month	Milestone
30/11//2011	36	Act 9 Obj1: Complete phenotyping and data analysis for drought tolerance traits in elite winter wheat varieties in 2009/10 &10/11.
30/11/2012	48	Act 9 Obj2: QTL analysis to identify genome locations associated with WUE and drought tolerance traits completed.
31/03/2012	40	Act 9 Obj3. Complete development of one new DH population in an elite modern background segregating for drought-tolerance traits.
28/02/2013	51	Act 9 Obj4: Association genetics analysis of drought tolerance traits using AE Watkins & Gediflux collections completed.
28/02/2013	51	Act 9 Obj5: Collation of diverse germplasm collection (cultivars, advanced lines) from worldwide drought-tolerance wheat breeding programmes completed.

WUE trial 2009-10

Split plot design (3 reps): plot size 1.6 x 12 m
Main plot: Fully irrigated (trickle irrigation)
Unirrigated

Split plot (variety):

1. Var 1 (LINK, Tol)
2. Var 2 (LINK, Tol)
3. Var 3 (LINK, Tol)
4. Var 4 (LINK, Intol)
5. Var 5 LINK, Intol)
6. Var 6 (LINK, Intol)
7. Cadenza ~ parent EMS pop *
8. Beaver ~ low WUE
9. Gallant - crossover variety high GPC and yield *
10. Hereward - standard variety in several NUE projects *
11. Istabraq - included as a main variety in the 'Green Grain' project *
12. Oakley - high YP (good for examining trade off between YP and WUE) *
13. Xi19 - some reports that has high WUE *
14. Rialto ~ parent DH pop
15. Savannah ~ parent DH pop
16. Soissons ~ high WUE

* Common with NUE trial

ANALYTICAL REPORT

Report Number	78459-09	L935	JOHN ALCOCK	Client SB53704729
Date Received	12-MAY-2009		DIV. OF AGRIC & ENVIRON	
Date Reported	01-JUN-2009		UNIV OF NOTTINGHAM	
Project	SOIL MINERAL NITROGEN		SUTTON BONINGTON CAMPUS	
Reference	SB53704729		LOUGHBOROUGH	
Order Number			LEICS LE12 5RD	

Laboratory Reference		MINN50606	MINN50607	MINN50608	MINN50609						
Sample Reference		FIELD 2 0-30	FIELD 2 30-60	FIELD 4 0-30	FIELD 4 60-90						
Determinand	Unit	SOIL	SOIL	SOIL	SOIL						
Dry Matter	% w/w	87.7	88.8	87.7	87.7						
Nitrate Nitrogen	mg/kg	55.92	7.21	62.09	7.04						
Ammonium Nitrogen	mg/kg	66.61	1.66	53.34	2.29						
Available Nitrogen 30cm profile	kgN/ha	490.1	35.5	461.7	37.3						
Sand 2.00-0.063mm	% w/w	65	80	62	68						
Silt 0.063-0.002mm	% w/w	23	11	27	15						
Clay <0.002mm	% w/w	12	9	11	19						
WHC at 0.33 Bar	% w/w	13.7	9.4	15.6	14.8						
WHC at 15 Bar	% w/w	6.4	3.5	6.9	7.3						
Textural Class		Sandy Loam	Loamy Sand	Sandy Loam	Sandy Clay Loam						

Notes

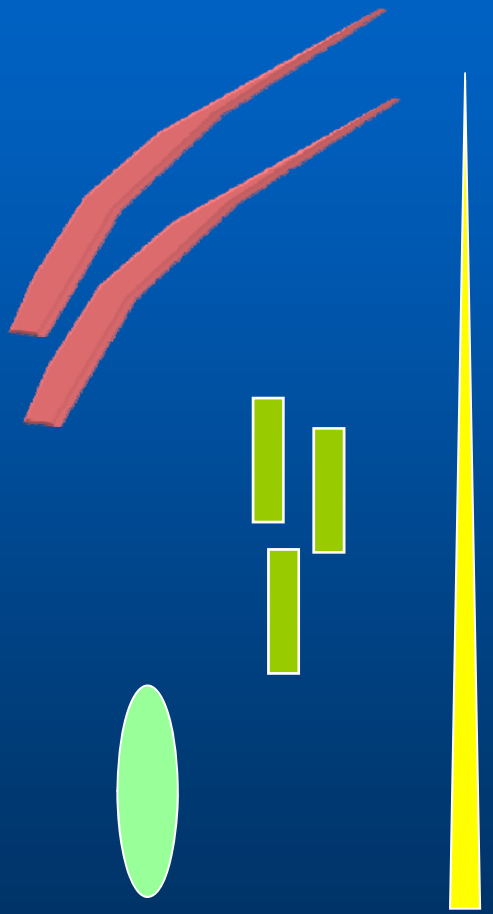
Analysis Notes	The sample submitted was of adequate size to complete all analysis requested. The results as reported relate only to the item(s) submitted for testing. The results are presented on a dry matter basis unless otherwise stipulated, with correction for stone content. If stones content not stipulated on sample submission form then 0% Stones assumed. If the depth was not 30cm, this must be taken into account when calculating nitrogen recommendations.
Sample Storage	The sample will be kept as the dry ground sample for at least 1 month.
Document Control	**This test report shall not be reproduced, except in full, without the written approval of the laboratory.**

Reported by *Andrew Chase*

Natural Resource Management Ltd.
Coopers Bridge, Braziers Lane, Bracknell, Berkshire, RG42 6NS
Tel: 01344 886338
Fax: 01344 890972
email: enquiries@nrm.uk.com

Measurements

- **Combine grain yield, yield components**
- **DM and partitioning at GS31, GS61, harvest**
- **% stem WSC at GS61+10d**
- **Leaf senescence kinetics for flag-leaf, L2 and L3.**
- **TE by ^{13}C Δ grain samples**
- **Stomatal conductance/photosynthetic rate using Licor (subset only)**
- **Water use ~ gravimetric analysis of soil cores (subset only)**



Evaluation of novel genetic resources

- NIAB backcrossing CIMMYT synthetic wheats (shown in Mexico to have improved drought tolerance) in Xi19 background.

- 29 BC1F3 families grown in small plots (4 x 1 m) and the recurrent parent (Xi19) on the drought-prone light sand at Bunny Park Farm.

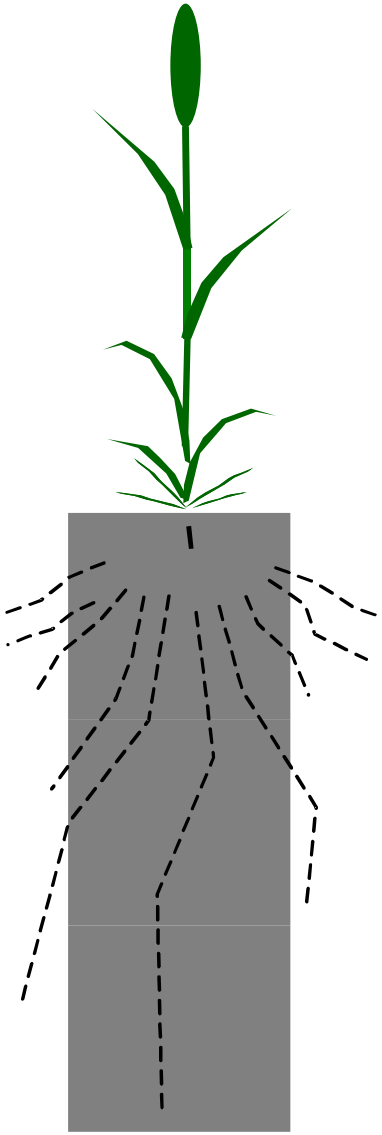
Ideotype for high sustainable yield under drought

OPTIMIZE WUE

- High ^{13}C Δ
- Pn capacity
- Specific leaf N

MAXIMIZE HARVEST INDEX

- Stem CHO reserves
- Stay green



MAXIMIZE WATER CAPTURE

- RLD at depth
- β (distribute roots deeper)
- Specific root length

EARLINESS

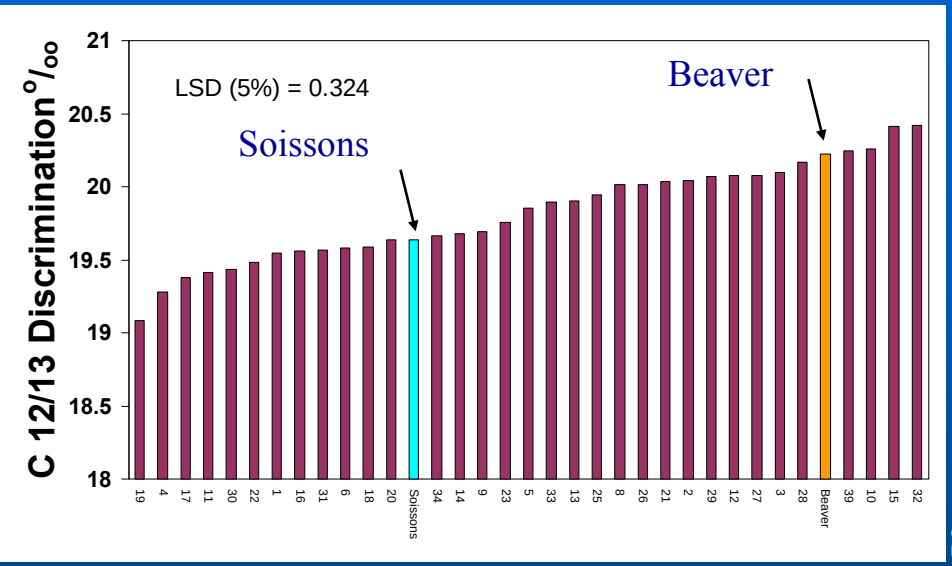
- Extend stem elongation phase
- Early onset GS31

Drought Resistance: Target traits

Grain yield	=	Crop water use	X	Water-use efficiency (biomass)	X	Harvest index

Target traits →	• Stay-green • Root density	• Transpiration efficiency ($^{13}C\ \Delta$) • Awns	• Flowering • Stem CHO reserves

Transpiration efficiency: ^{13}C Isotope Discrimination (grain): Beaver x Soissons DH population

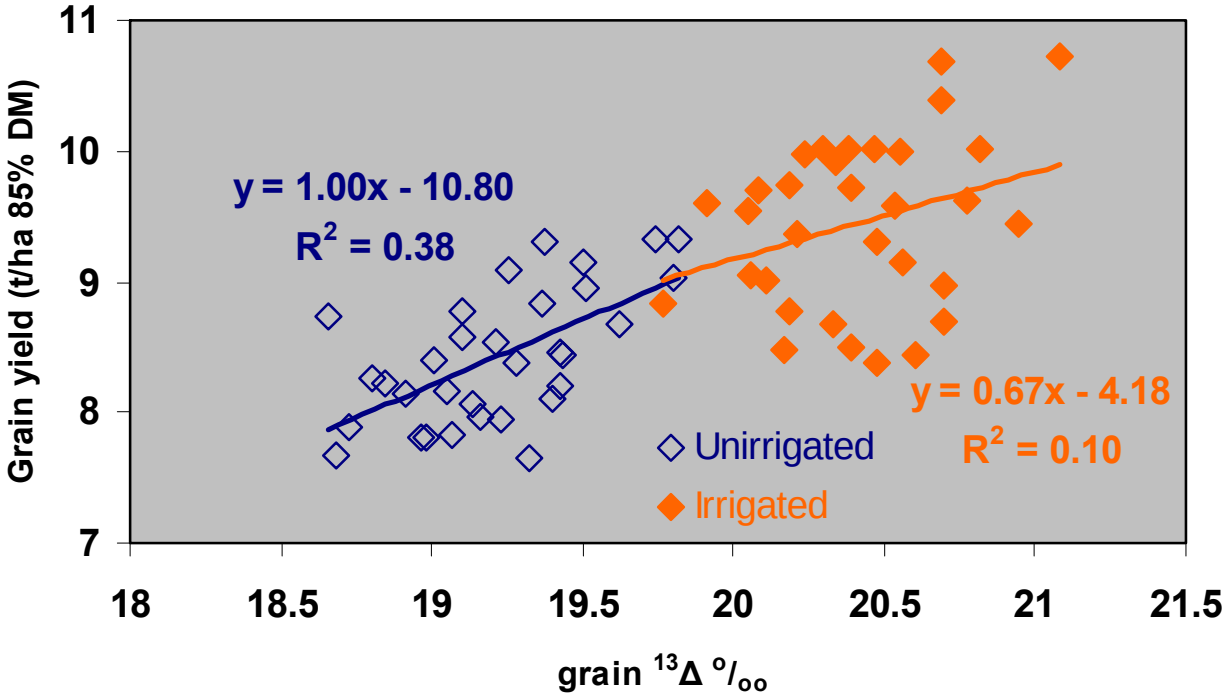


- Beaver x Soissons DHs phenotyped in 2003 and 2005
- Identify lines with contrasting ^{13}C Δ ~ QTLs
- Investigate role of leaf activity sub-traits

Sutton Bonington 2005

^{13}C Δ grain negatively correlated with TE

Relationship between ^{13}C Δ (grain) and grain yield



Mean GL 2002-3 and SB 2004-5

Resistance to Take-all and Septoria

Richard Gutteridge
Hai-Chun Jing
Kim Hammond-Kosack

Wheat Genetic Improvement Network

defra
Department for Environment Food and Rural Affairs

BBSRC
bioscience for the future

ROTHAMSTED RESEARCH

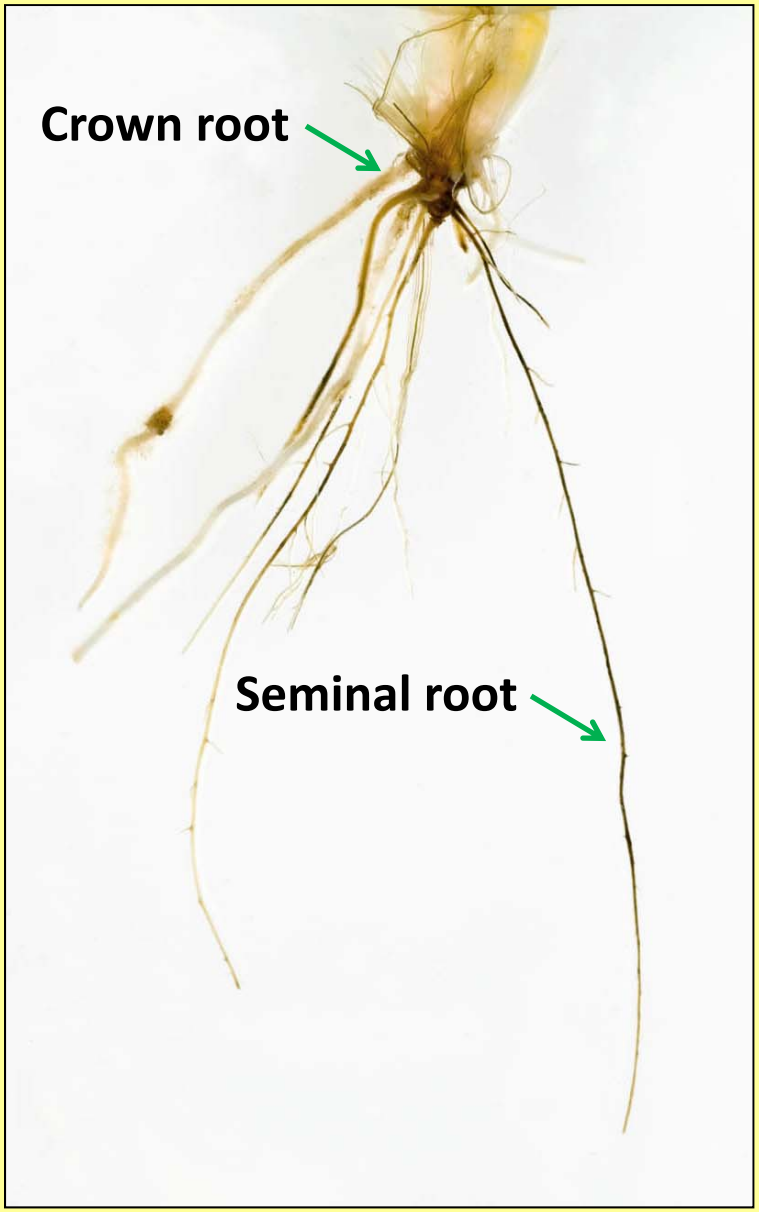
WGIN MM@UoN
20th Oct 2009

Take-all disease of wheat

• *Gaeumannomyces graminis* var. *tritici* (*Ggt*)

- ascomycete soil borne fungus

- related to rice blast fungus *Magnaporthe oryzae* (previously *M. grisea*)



Ggt infected wheat seedling


A *Ggt* infected seminal root
Take-all lesion
Runner hypha

Typical take-all patch showing stunting and premature ripening of the crop

Talk Outline

- **Hexaploid wheat – Watkins / Gediflux collections**
  - **field evaluation to identify potentially resistance genotypes**
  - **results so far / current activities**
- **Diploid wheat**
  - **phenotyping via pot bioassay and field trials**
  - **mapping populations**
- **Hexaploid wheat – inoculum build-up in 1st wheats**

Watkins Hexaploid wheat collection
Take-all / eyespot assessments

- **2007 – 2008 field season – one plot / genotype** – established from 45 seeds

- **740 lines from the collection**

Watkins collection sown into a 3rd wheat situation

The harvested roots – August 2008

root drying

Stored at room temp prior to assessment in a white tray filled with water

severe infection

light infection

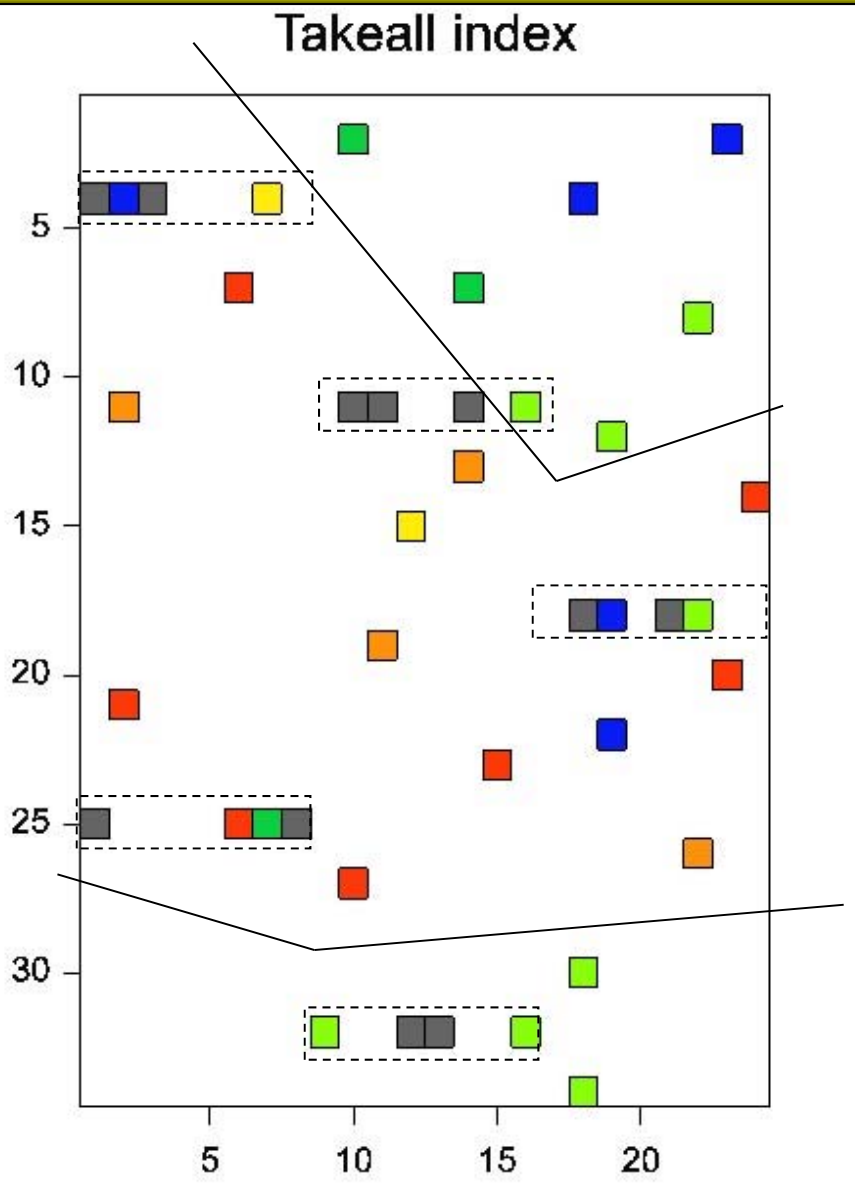
Watkins Experiment 2008 RRes Take-all severity - control plots

5 control blocks

Variety	TAI
Hereward	35.6
Triticale	18.4
Rye	1.7
Oats	0.0

TAI

- 0-5
- 6-15
- 16-25
- 26-35
- 36-45
- 46- 55
- > 55



Hereward - Extra 20 plots - mean TAI = 45.3

Alpha design

N = 800 plots

Mean of all plots
Hereward = 43.4

Watkins Hexaploid wheat collection 2008 Take-all / eyespot assessments

- **All assessments completed – 740 lines**

  12,000 plants

- **Initial findings suggest that 253 lines (34%) can be omitted due to susceptibility to Take-all.**

- **Further lines may also be discarded once the stats is completed**

Watkins Hexaploid wheat collection 2008 Take-all / eyespot assessments

All 740 lines also assessed for stem base diseases

- **eyespot**
- **sharp eyespot**
- **brown foot rot (fusarium spp.)**
- **74,000 straws assessed**
- **now in stats**

Note : the 2008-2009 trial was fungicide treated in the spring 2009 to minimise stem base diseases

Only this one year of data

Watkins / Gediflux collections assessment 2009 - 2010

Watkins

500 lines carried forward from the 2008 trial but some may be discarded once statistical analysis complete

78 new lines added not previously tested

Gediflux collection – 60 lines in total

All lines: For 2 years

2008 – 2009 - done, roots to be assessed

2009 – 2010 exp planned

A.E.Watkins and Gediflux collection 2008 – 2009 field trial

- **The same single plot – Alpha design**

- **Foliar diseases**

  winter/ spring infection by septoria and mildew but then did not develop further

  late infection by yellow rust and brown rust

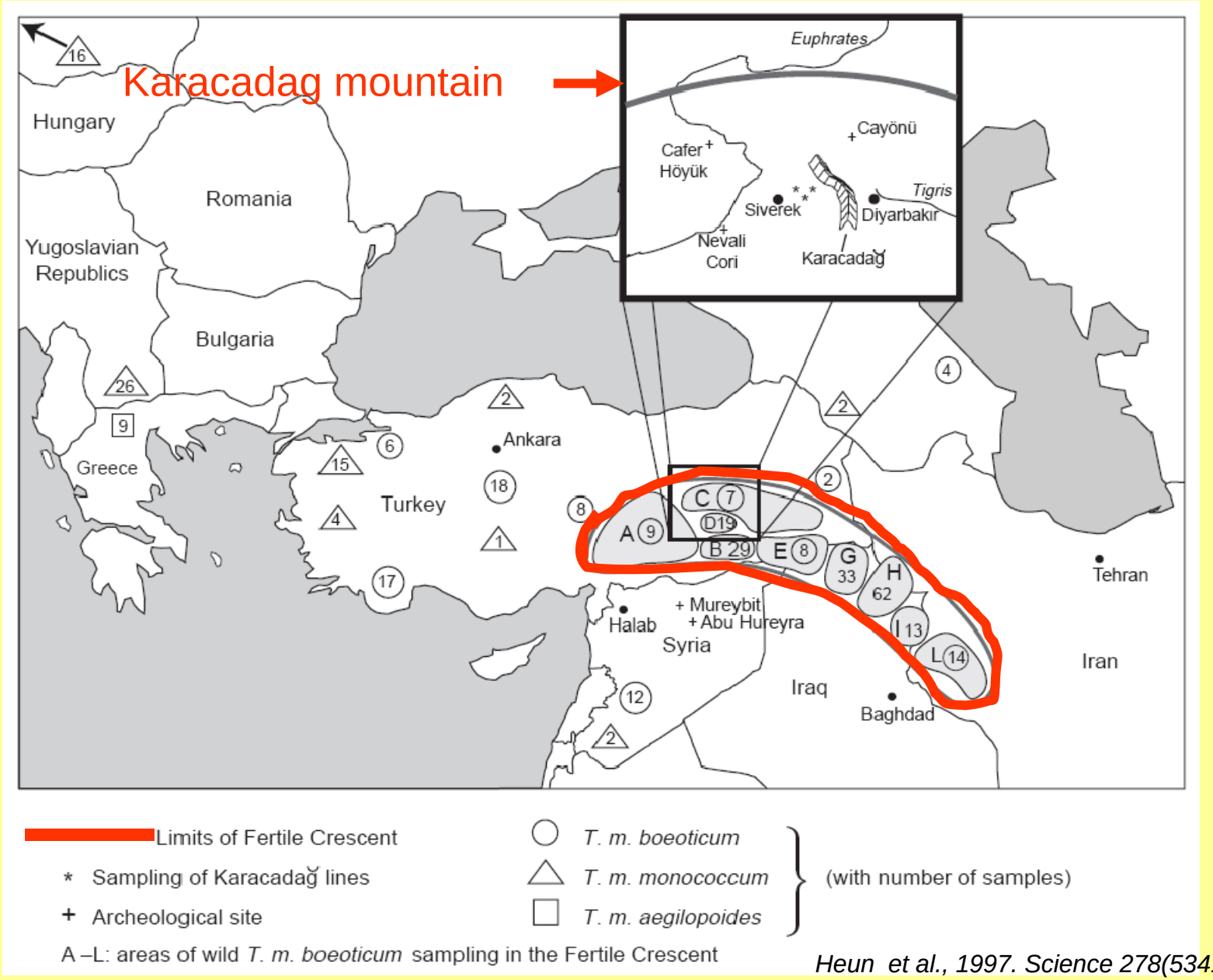
  ALL lines affected recorded but not assessed

- overall less FOLIAR disease than in 2007-2008

Talk Outline

- Hexaploid wheat – Watkins / Gediflux collections
  - field evaluation to identify potentially resistance genotypes
  - results so far / current activities
- **Diploid wheat**
  - **phenotyping via pot bioassay and field trials**
  - **mapping populations**
- **Hexaploid wheat – inoculum build-up in 1st wheats**

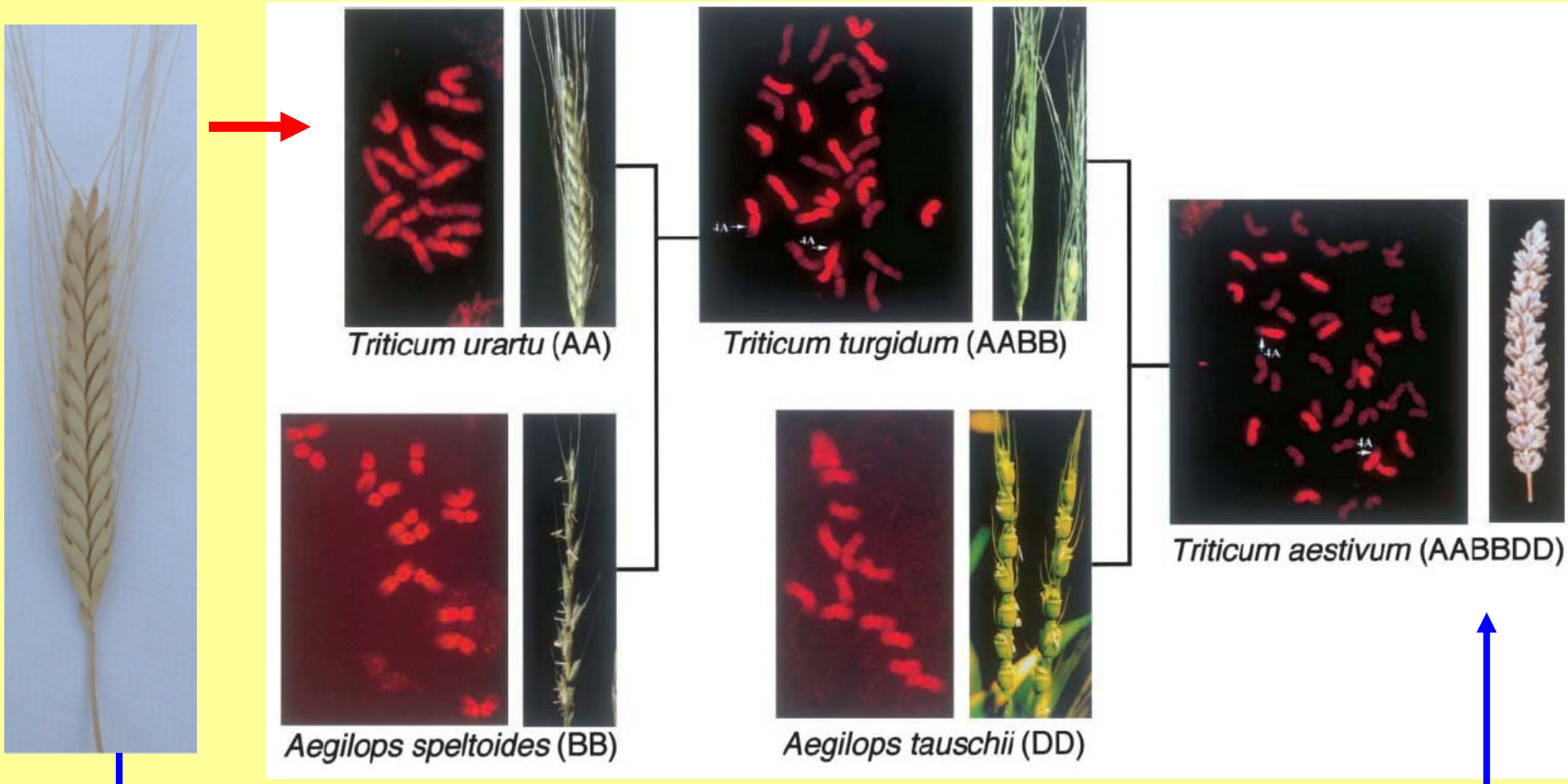
T. monococcum domesticated from *T. boeoticum*



Heun et al., 1997. Science 278(5341): 1312-1314.

Origin of bread wheat

T. monococcum A^mA^m



Gill *et al.* (2004) *Genetics* 168: 1087–1096

T. monococcum - pot bioassays and field trials

Pot bioassays started in 2005

- **Naturally infected soil**
- **Naïve soil + 12 Ggt isolates**

Min. 5 reps – total of 50 seeds per genotype

Field trials started in 2006

Some promising results

The Pot Bioassay - Standard two methods

- Collected field soil-crumble to an even texture, with large stones removed, stored in a cold room until required.
- Two experimental set-ups

1. Fill pot fill with 50cc of moist sand, 300g of naturally infected soil, sown with 10 seeds evenly over the soil surface and covered with horticultural grit.

2. Artificial inoculum addition - shake 300g of 'naïve' soil with 50g of dilute inoculum in a plastic bag, transfer to bioassay pot. (inoculum = sand/maize meal cultures, 10 different isolates, including both A and B types, mixed together)

Min. 5 reps – total of 50 seeds

Assess - % roots with Take-all

Take-all Assessment of field experiments

Whole plant root systems are assessed in a white dish under water and the proportion of roots affected by the disease are graded as follows:

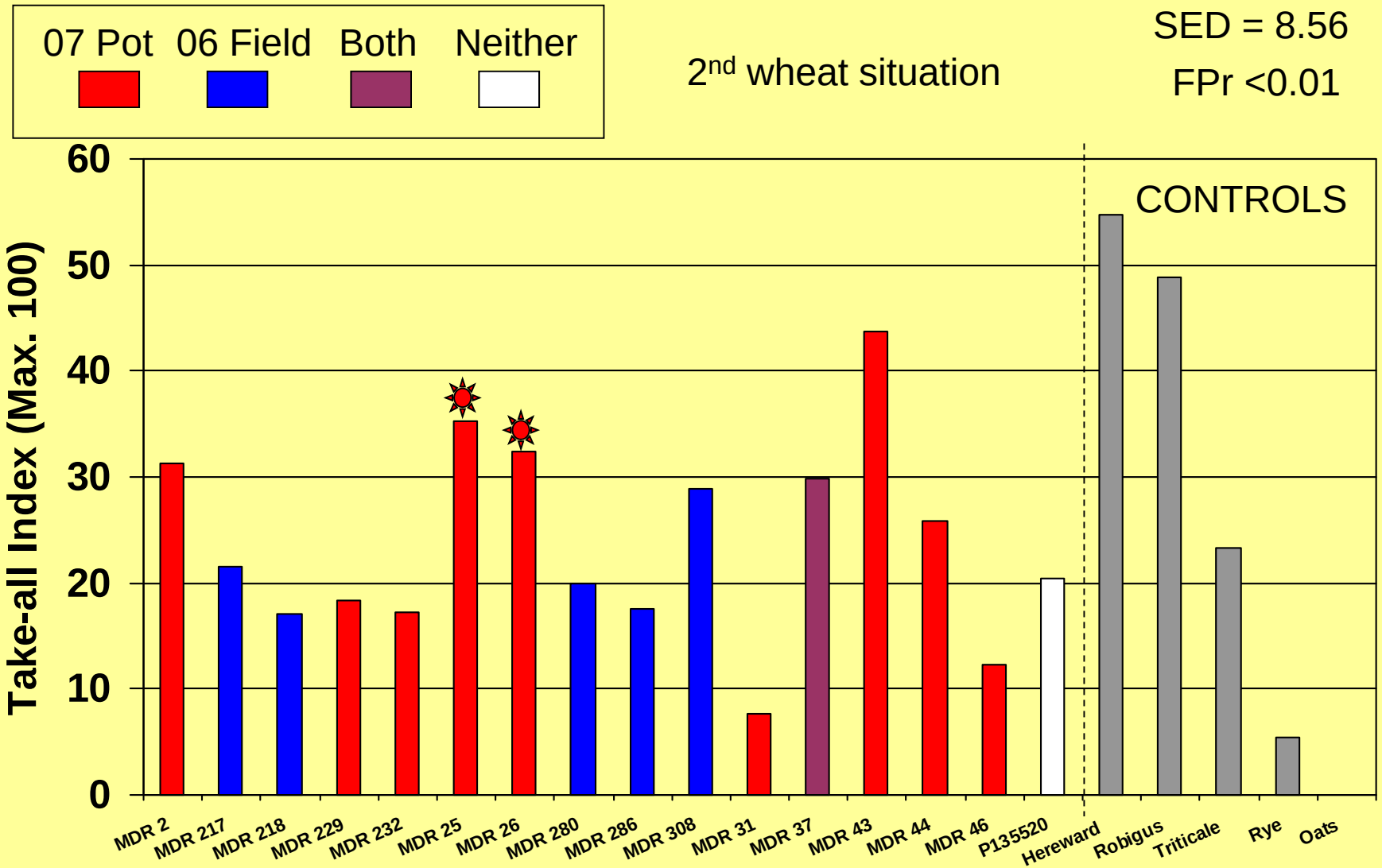
Slight 1: 1 – 12%; Slight 2: 13 – 25%; Moderate 1: 26 – 50%
Moderate 2: 51 – 75%; Severe >75%

Take-all Index (TAI) calculated by:

1 x %plants with slight 1; + 2 x %plants slight 2; + 3 x %plants moderate 1; + 4 x %plants moderate 2; + 5 x % plants severe

Divide by the number of categories (5) ; **Maximum index = 100**

Field experiment 2008



5 rep exp but 10 reps MDR 37, MDR 46 and MDR 229

T. monococcum lines in the field 2008 - 2009

Note : Results from the previous field experiment (i.e. those on the previous slide) were not available when deciding which lines to test

Tested 5 *Tm* lines with contrasting Take-all susceptibility

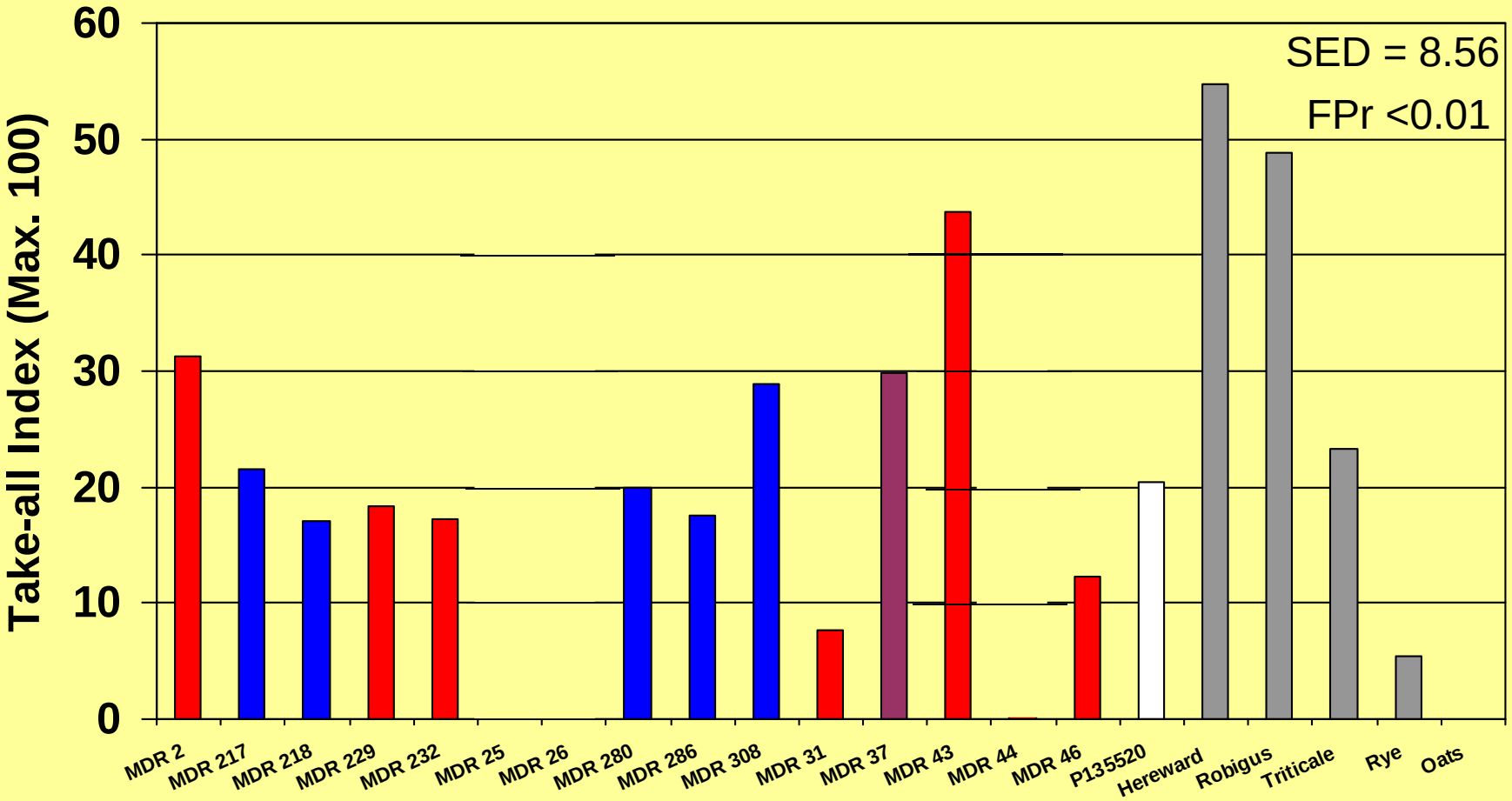
Genotype	TAI (2008 field)
MDR046	12
MDR0229	18
MDR037	30
MDR002	32
MDR308	30

Plus 5 tetraploids, 10 hexaploids, rye and triticale, 5 replicates of each

All plots sampled in July. Stored and awaiting assessment

T. monococcum lines in the field 2009 - 2010

Note : This selection is based on the 2008 field data



Triticarte - custom wheat array

1536 clones derived from the two *T. monococcum* accessions

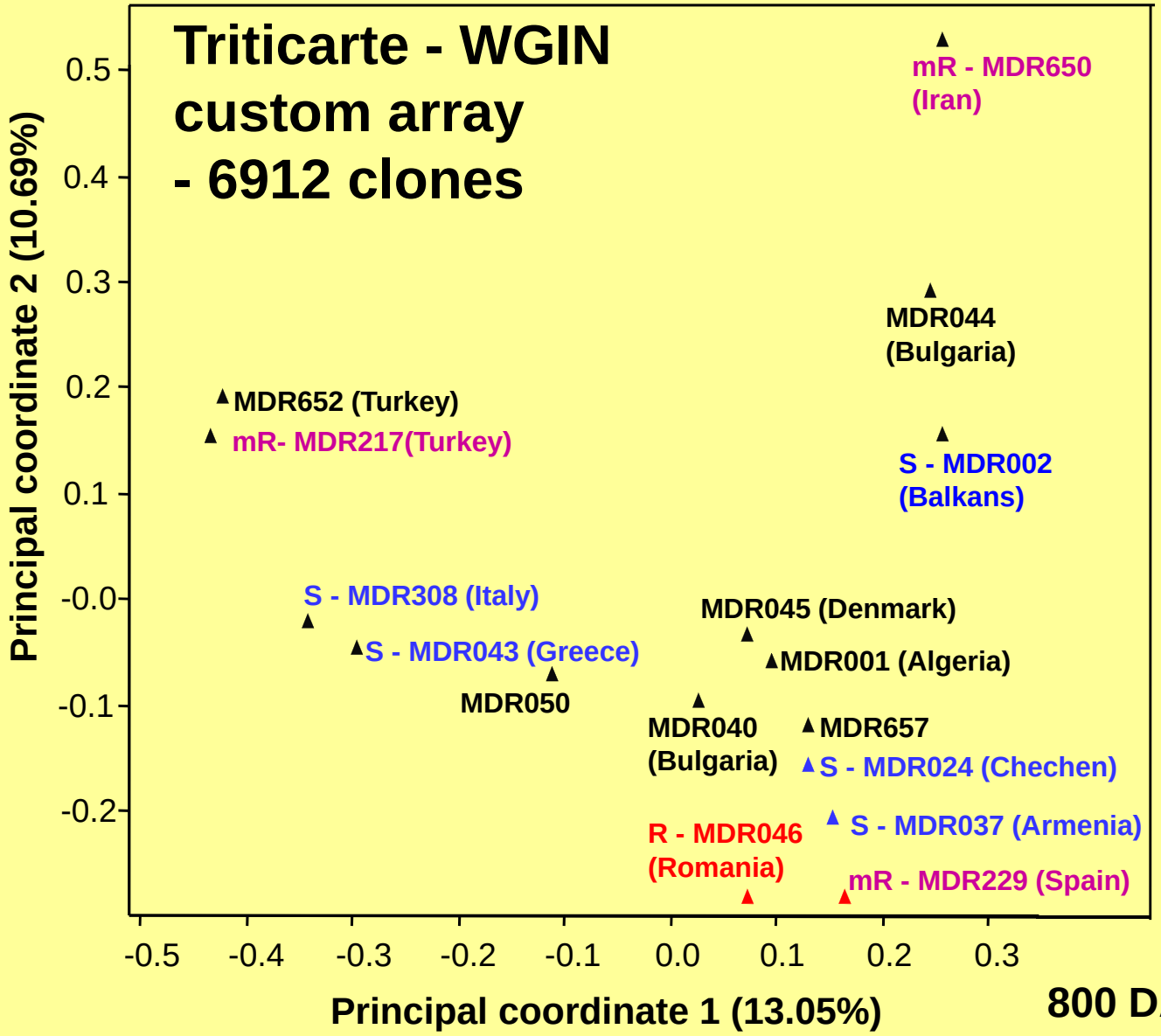
2304 clones derived from hexaploid wheats (including the Triticarte Wheat 2.3 array)

1536 clones derived from tetraploid durum wheat (including the Triticarte Durum 2.0 array)

1536 clones derived from 15 Iranian accessions of other Triticum species with genomes homologous to the A-genome of bread wheat (Ali Mehrabi, unpublished)

Jing, Bayon, Kanyuka, Berry, Wenzl, Hunter, Kilian and Hammond-Kosack (2009) BMC Genomics Oct

DArT marker and PCA analysis of *T. monococcum* accessions



Not yet in DArT analysis
MDR218
MDR232
MDR280
MDR286
MDR031

800 DArT markers
297 mapped in *Tm*

Hai-Chun Jing, unpublished

Glasshouse crosses completed

2008

MDR037 x MDR046
MDR037 x MDR229

→ **2009** → **F_2 seed harvested** → **~ 85 lines SSD for each pop^n**

2009

	Male	MDR043	MDR024	MDR037	MDR308	MDR002	MDR031	MDR046	MDR229	MDR217	MDR650
Female		S	S	S	S	S	R	R	mR	mR	mR
MDR043	S		28	0	15	11	28	6	11	59	18
MDR024	S	10		X	X	X	40	15	2	13	X
MDR037	S	X	X		X	X	28	26	5	31	X
MDR308	S	X	X	X		X	43	23	60	62	48
MDR002	S	X	X	X	X		48	36	31	32	13
MDR031	R	9	28	4	6	13		20	2	38	X
MDR046	R	4	11	2	2	X	10		X	30	X
MDR229	mR	16	50	0	X	X	9	X		X	X
MDR217	mR	14	X	X	X	X	4	X	X		X
MDR650	mR	40	X	X	X	X	X	X	X	X	

< 10 grain

X = not done

Talk Outline

- Hexaploid wheat – Watkins / Gediflux collections
  - field evaluation to identify potentially resistance genotypes
  - results so far / current activities
- Diploid wheat
  - phenotyping via pot bioassay and field trials
  - mapping populations
- **Hexaploid wheat – inoculum build-up in 1st wheats**

Take-all and inoculum build up WGIN 1

Background

- The risk of take-all is largely dependent on the amount of inoculum in the soil at the time of sowing

- A soil core bioassay, taken after harvest, is used to measure the take-all infectivity of the soil

- Results from WGIN 1 have suggested that varieties can build up the take-all fungus differentially when grown as a first wheat.

ROTHAMSTED RESEARCH

THE SOIL CORE POT BIOASSAY

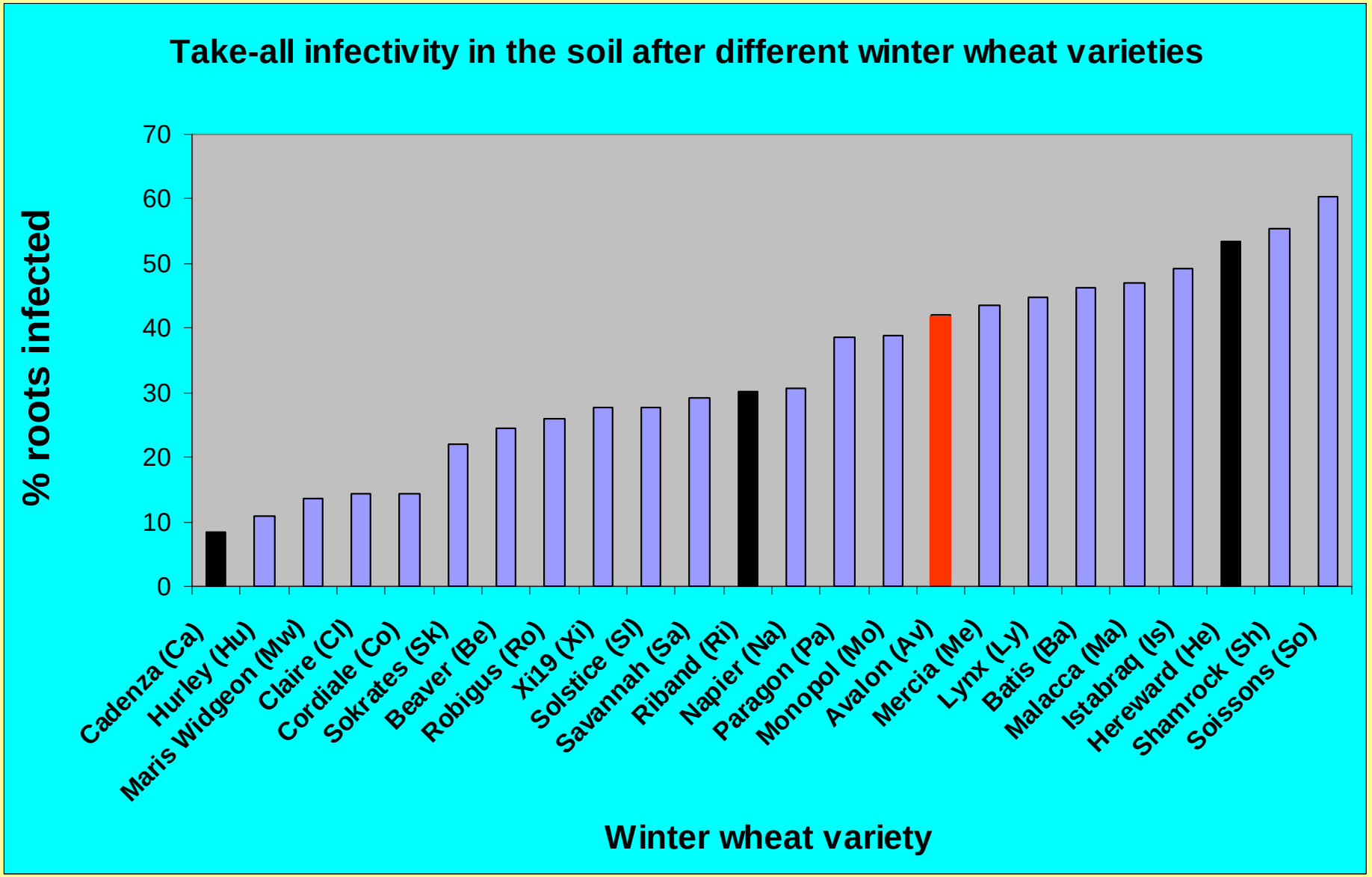
Soil core bioassay plants

Severe take-all infection

Slight take-all infection


200 kgN plots
defra
Wheat
Genetic
Improvement
Network
BBSRC
bioscience for the future
www.WGIN.org.uk

WGIN winter wheat bioassay 2008



Consistent ranking over 4 years

Take-all inoculum build up ranking by varieties: 1 = Low – 9 = High

Variety	2004	2006	2007	2008	Overall ranking
Cadenza	1	2	1	1	1.25
Xi19	7	1	2	2	3
Riband	5	4	4	3	4
Mercia	3	5	3	6	4.25
Monopol	6	7	5	4	5.5
Avalon	nd	6	8	5	6.33
Soissons	8	3	6	9	6.5
Malacca	4	9	7	7	6.75
Hereward	9	8	9	8	8.5

Objective 10.8 – take-all inoculum build up in 1st wheat situation

Diversity trial 2009 – The experiment included 6 DH lines from A x C (**82, 99, 100, 116, 127, 155**)

Soil cores taken from all varieties after harvest, one nitrogen rate (N2 ~200kgN/ha, total 360 cores (5 cores per plot), being processed using the pot bioassay.

Diversity trial 2010

Standard varieties –

Hurley and Monopol - omited

Chablis, Gallant and Oakley - new

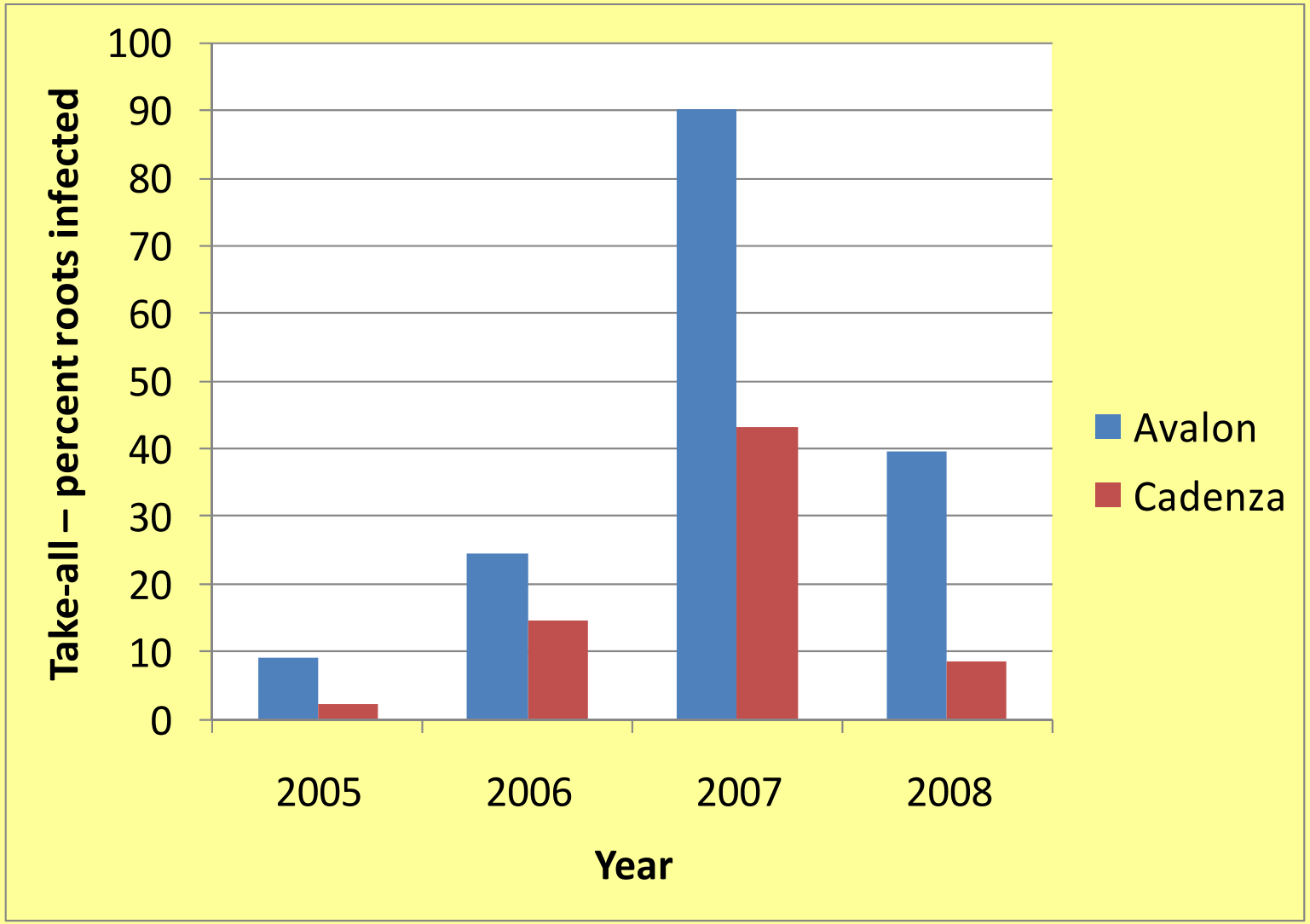
6 DH lines from A x C (**82, 100, 116, 112, 127, 181**)

Objective 10.9 Avalon x Cadenza

Attempting to define the genetic basis of take-all inoculum build up (TAB)

- A very tough goal

% roots infected with take-all in a soil core bioassay
Avalon and Cadenza 2005 - 2008 WGIN Diversity trials

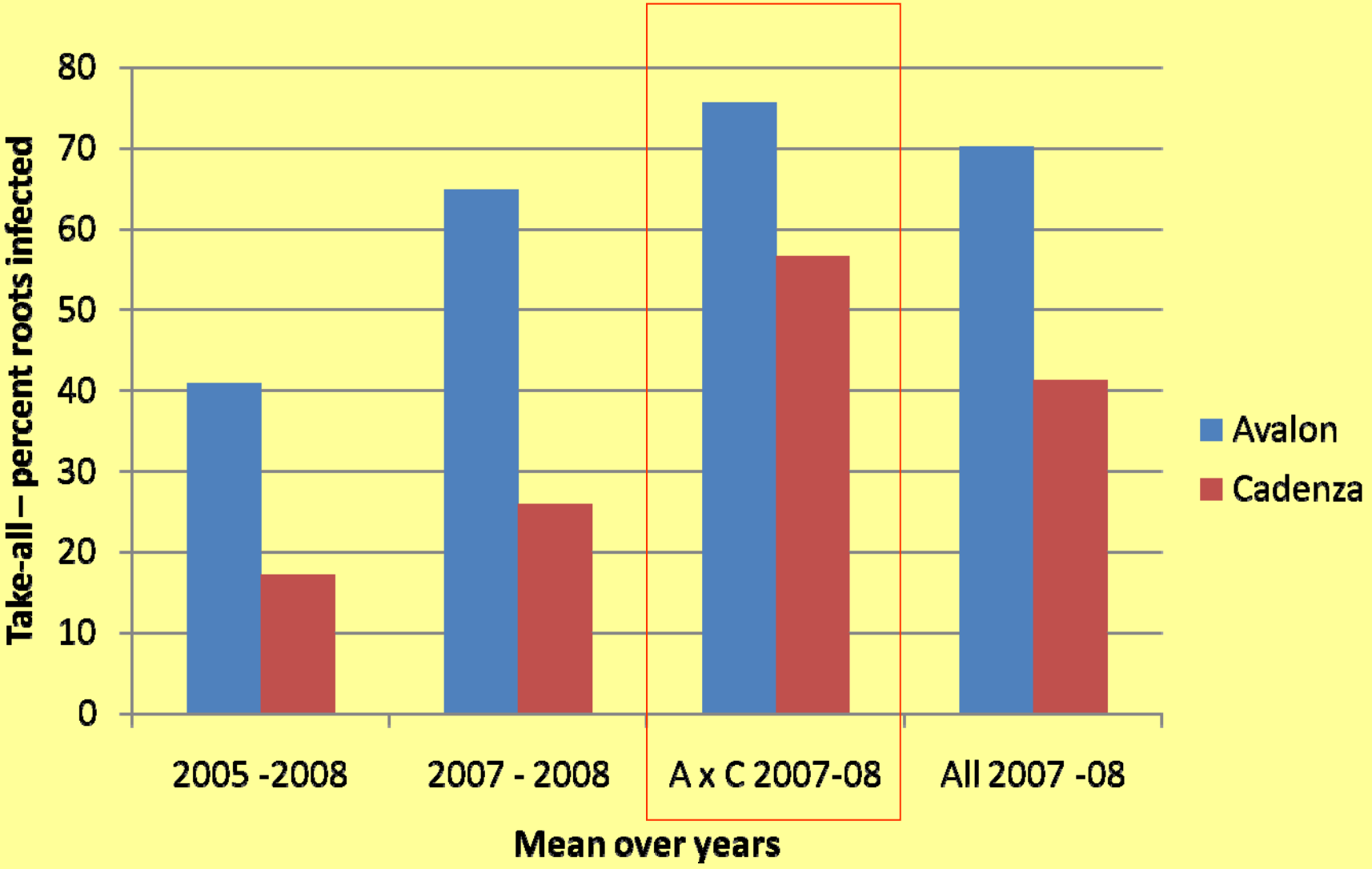


Avalon x Cadenza DH trial

Just the parental plots soil-core sampled in 2007 and 2008

and the pot bioassays done

% roots infected with take-all in a soil core bioassay
Avalon v Cadenza



Disappointment then a lucky break

Disappointment: Due to the late harvest in 2008 and the present of cereal volunteers the A x C line DH population, this trial was not sampled for the take-all soil infectivity.

The lucky break – 2007-2008 Seed multiplication trial

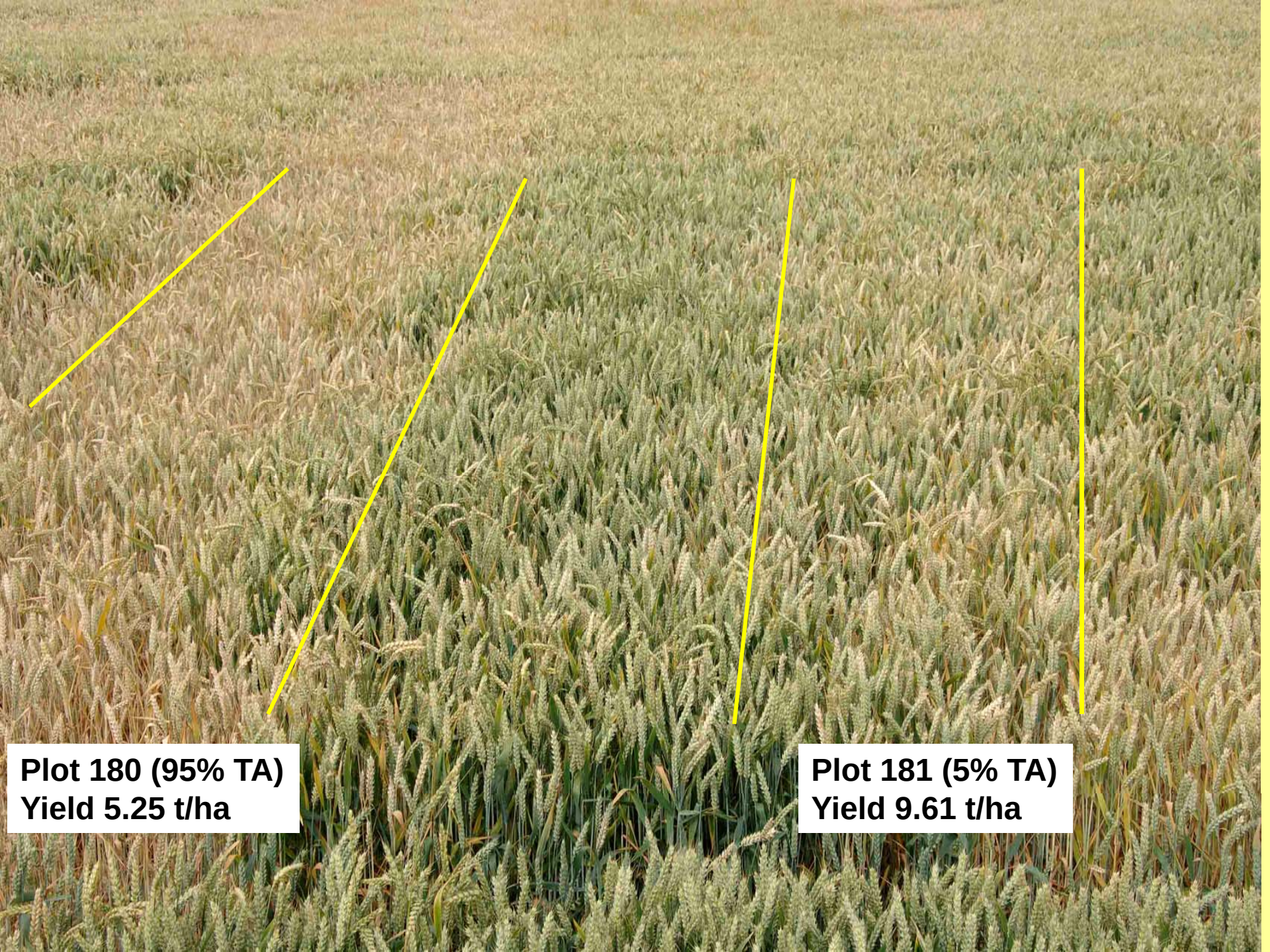
62 A x C lines in a separate field + parental lines (plot size 20m x 2m) for multiplication in 2008 were ploughed and then over sown with Oakley

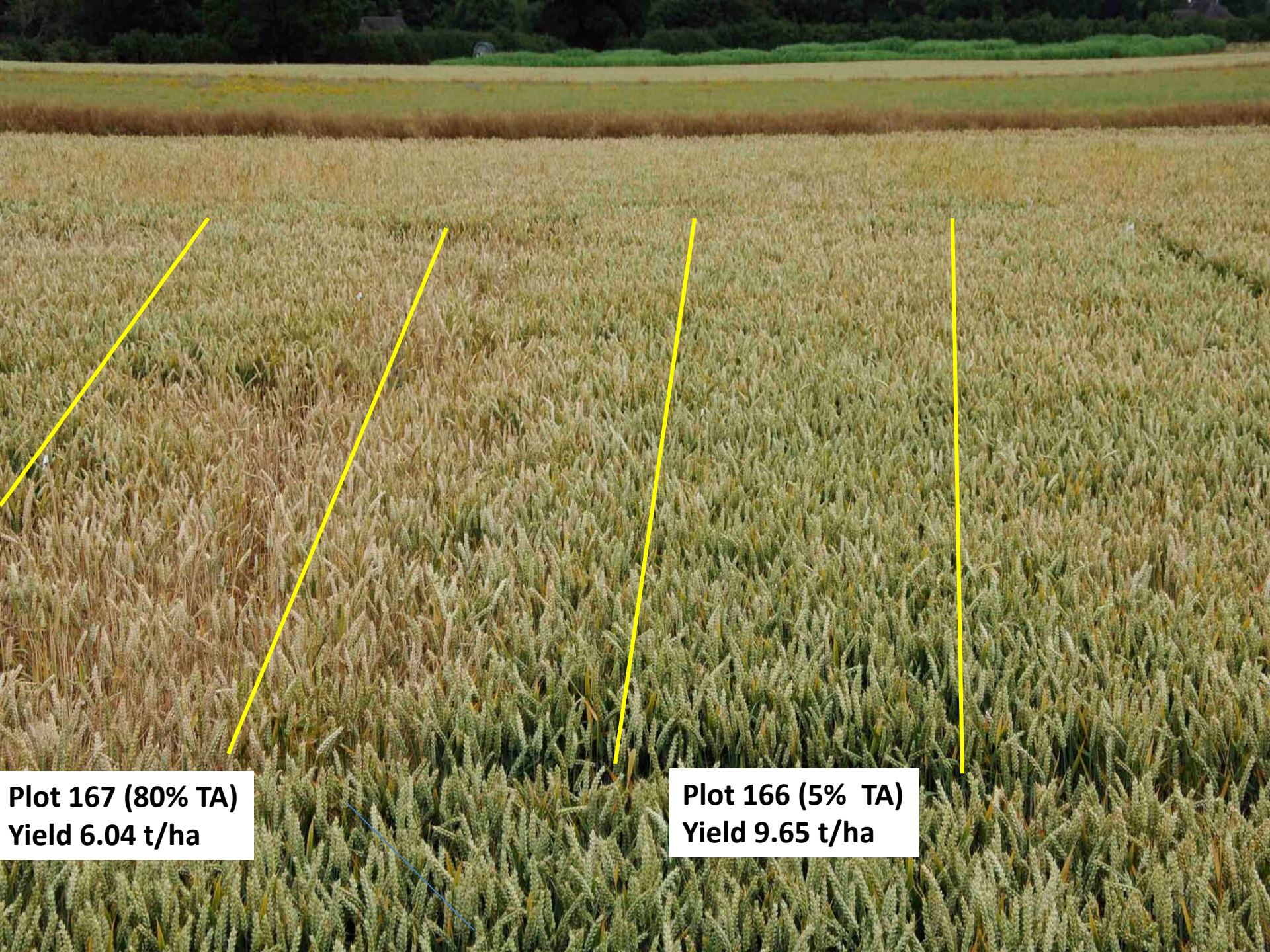
By July 2009 take-all patches were showing in the areas where the 2008 plots had been sown

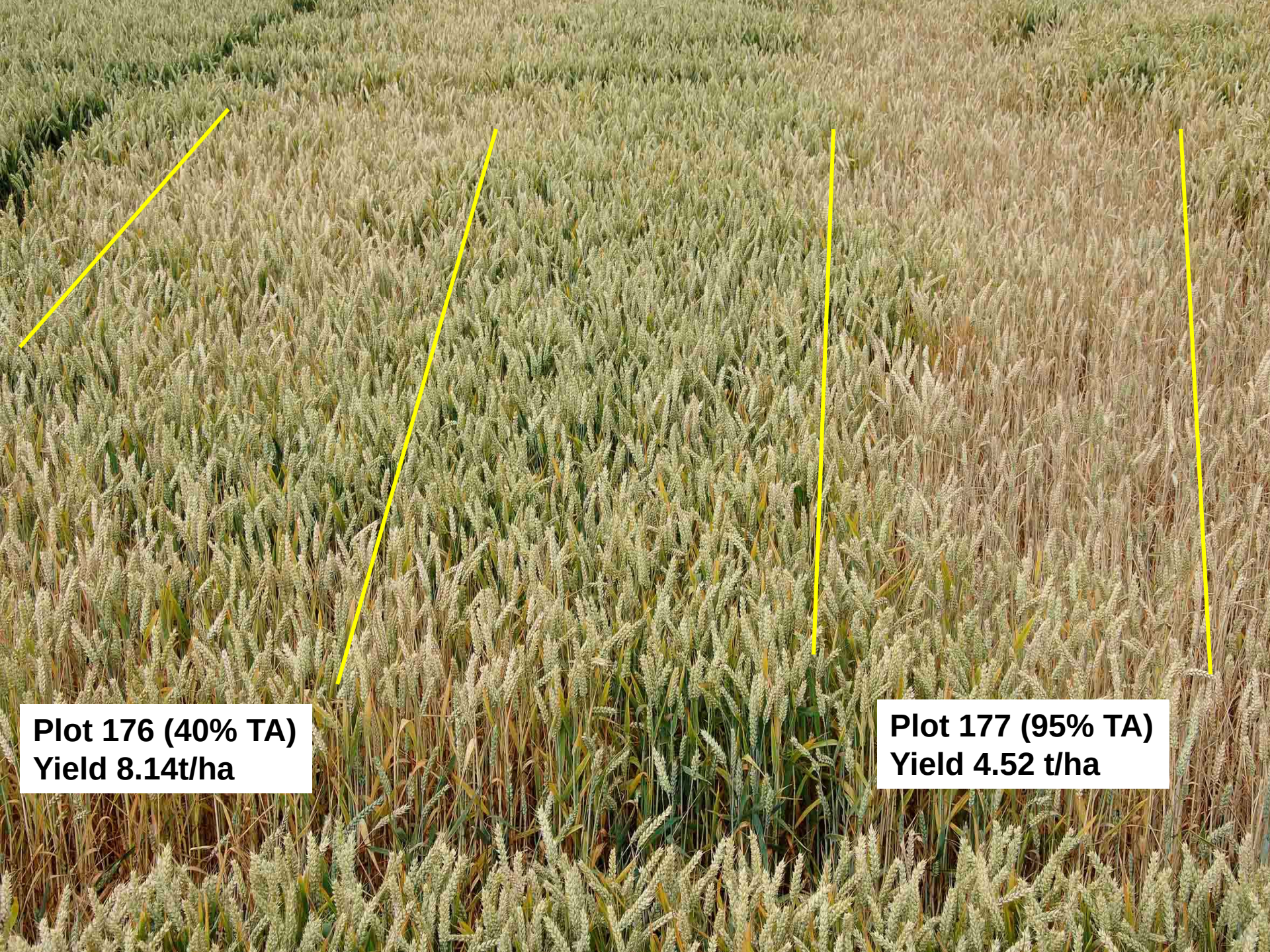
These areas were scored for take-all patches as a percentage of area affected

Middle 2 m of each plot was harvested and yield measured


Square Take-all patches
June 2009


Plot 180 (95% TA)
Yield 5.25 t/ha
Plot 181 (5% TA)
Yield 9.61 t/ha


Plot 167 (80% TA)
Yield 6.04 t/ha
Plot 166 (5% TA)
Yield 9.65 t/ha

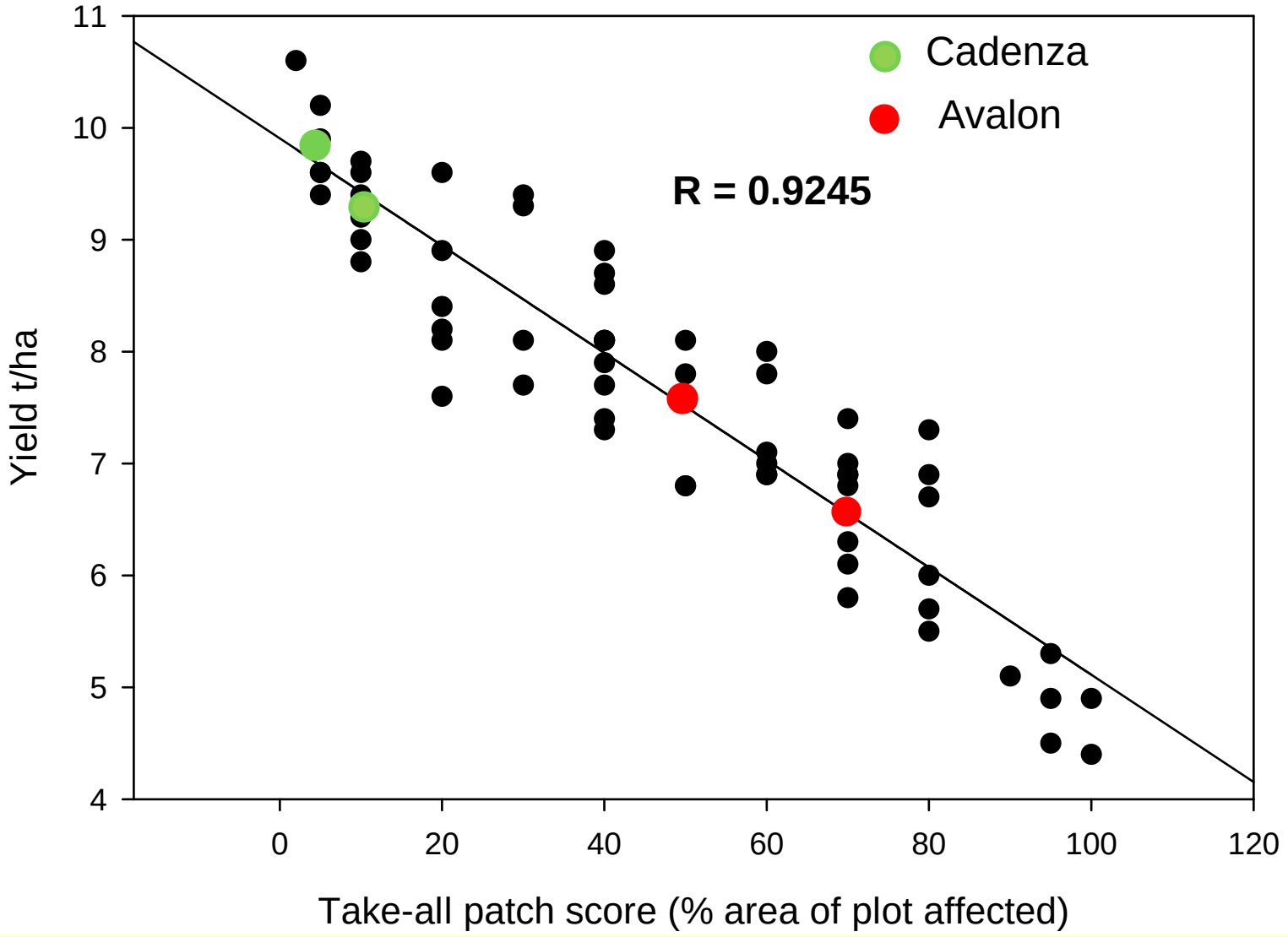

Plot 176 (40% TA)
Yield 8.14t/ha
Plot 177 (95% TA)
Yield 4.52 t/ha

Avalon x Cadenza seed multiplication field plots over-sown with Oakley wheat in 2009

Ahh!!! what is this then?

Hm !!! That is better

Avalon x Cadenza lines in 2008, oversown with wheat cv. Oakley in 2009. Relationship between take-all patch score and yield



Can we genetically analyse and map the trait ?

319 markers on the A x C map
62 DH lines + parentals scored

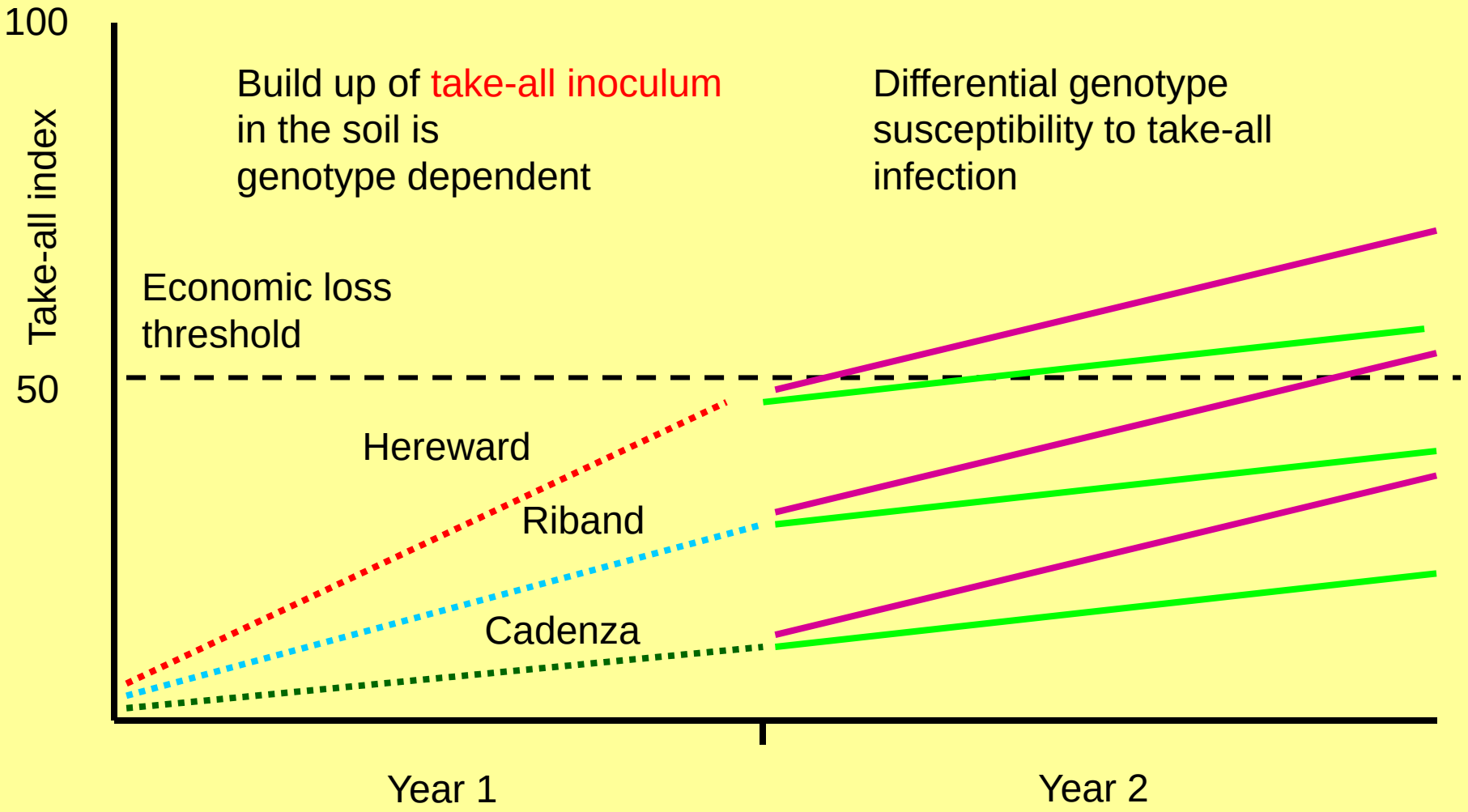
2009 A x C DH trial harvested in August

Soil cores have been taken from A x C field experiment in 2009 from all 203 + parentals lines, total 1272 cores (6 cores / plot from one rep)

Bioassays are in progress

Cultivar rotation trial – R/CS 688

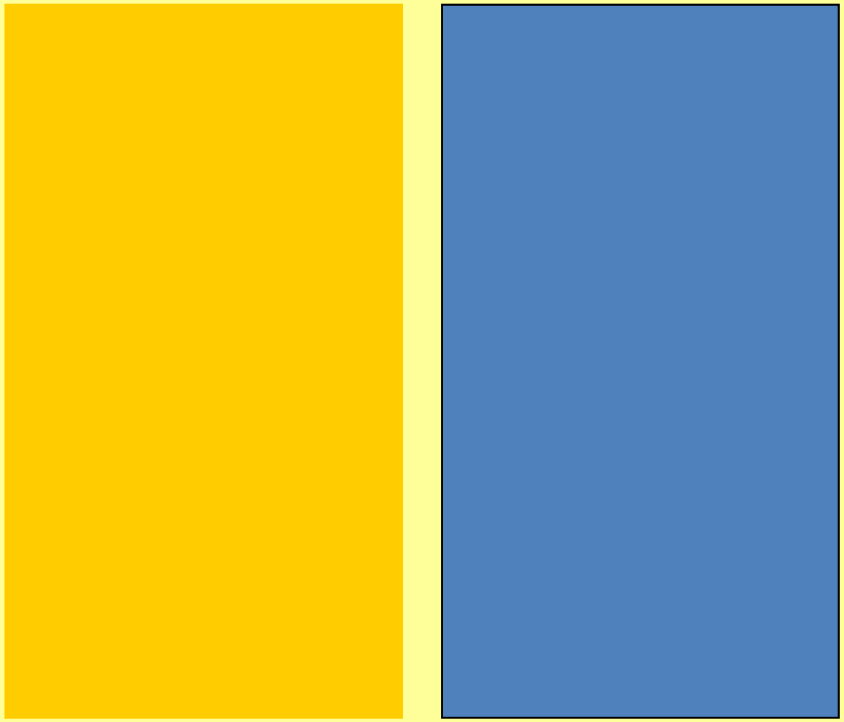
Overall objective: Explore the effect of sowing different sequences of cultivars on take-all disease pressure



Cultivar rotation trial – R/CS 688

Overall objective: Explore the effect of different cultivar sequences on take-all disease pressure

Step 1: Year 1 To create different take-all disease pressures in the field using the varieties Hereward (high inoculum build up) and Cadenza (low inoculum build up)

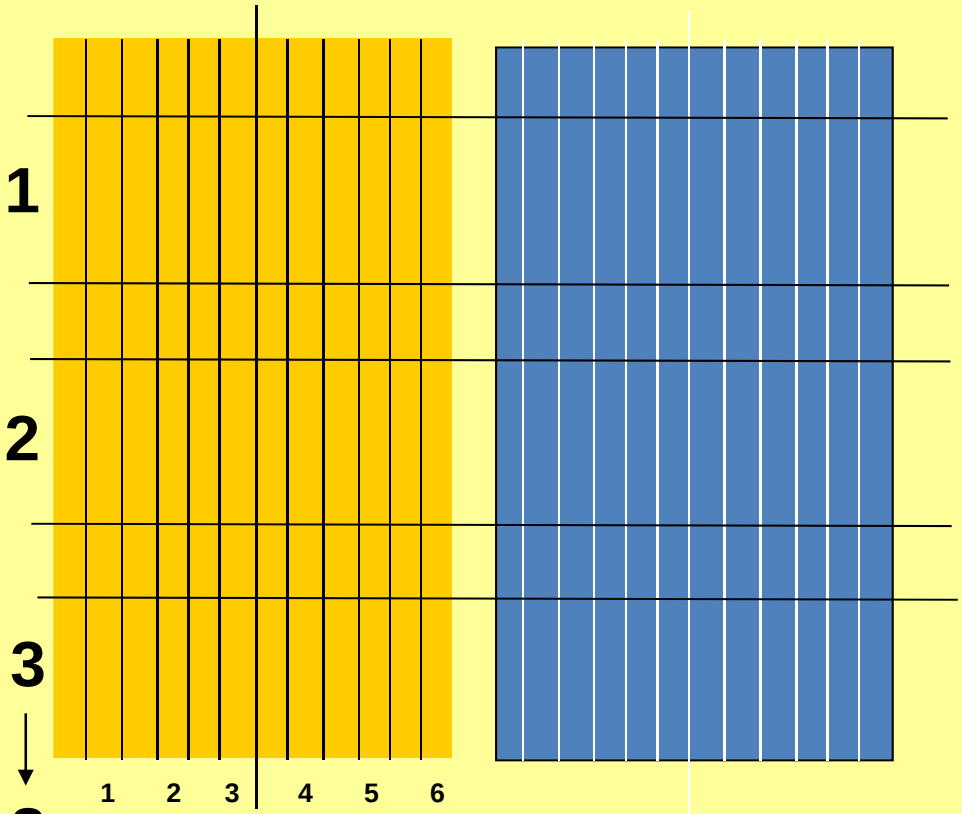


12m x 82m, of each variety
4 replicates of each
done in 2008 – 2009
Sown - 10th October 2008
Harvested – 16th August 2009

Cultivar rotation trial – R/CS 688

Overall objective: Explore the effect of different cultivar sequences on take-all disease pressure

Step 2: Year 2 Each of the 2009 large plots divided into eight 10m x 3m for the 2009 – 2010 field season



14 m discard (for tractor movement)

10 m plot

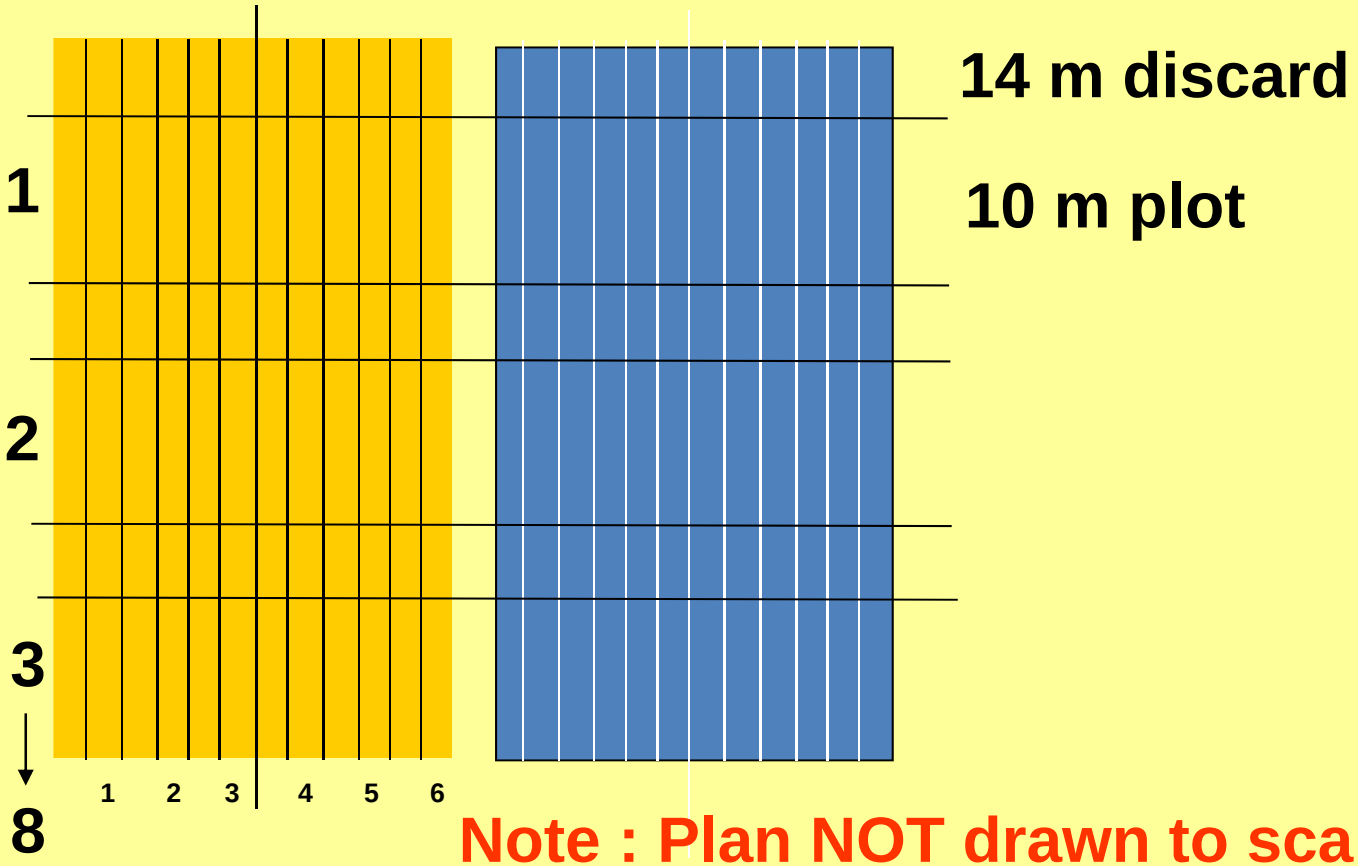
After 2009 harvest, five soil cores were taken from each of the designated 2010 plots
i.e. 64 plots x 5 = 320 cores, being processed.

Plan NOT drawn to scale

Cultivar rotation trial – R/CS 688

Step 2: Year 2 **Each of the 2009 large plots divided into eight 10m x 3m for the 2009 – 2010 field season**

8 different wheat cultivars representing the NABIM groups 1 – 4 sown



Note : Plan NOT drawn to scale

The eight selected cultivars for the rotation trial

Variety	Group
Hereward	1
Gallant	1
Xi 19	1
Solstice	1
Cordiale	2
Einstein	2
Robigus	3
Duxford	4

HGCA – BBSRC studentship

1st wheat crop-

very little disease

Yield average 12.69t/ha

1st and 3rd wheat variety trials; 45 NL winter wheat varieties.

Both variety trials sown on 09th October 2008 on Rothamsted Farm.
Photographs taken 08th July 2009.

3rd wheat crop-

severe disease

Yield average 7.64t/ha

Take-all inoculum build-up under *T. monococcum*

2008-9 Bulking up seed

9 *Tm* lines (MDR 2, 25, 26, 30, 37, 43, 45, 46, 229) were bulked up in the field

Harvest in August. Awns were removed from individual ears and seed + glumes separated.

Approximately 1.5Kg of seed obtained/line.

2010 Field experiment

The experiment consists of 5 *Tm* lines (MDR 46, 37, 25, 45, 2) + Hereward control + Cadenza control x 3 replicates

Overall Take-all summary – root resistant

- **Not known if root resistance to take-all is controlled by the same mechanism which confers the reduction in take-all inoculum build-up (TAB) in soil**

- **Already 250 lines from the Watkins collected discarded - fully Take-all susceptible**

- ***T. monococcum* resistance - as good as Triticale**

  Current focus
  - generating mapping populations
  - rapidly advancing them to F_4 by SSD
  - only then screen for resistance in pots

Overall summary – Take-all inoculum build up (TAB) in the soil of a 1st wheat crop

- Ongoing NUE Diversity trial with new genotypes

- Avalon x Cadenza DH population
  - consistent parental differences - years / trials
  - a promising 1st data set on 62 DH lines
  - 212 plot bioassays for 2009 trial in progress (>1200 pots)

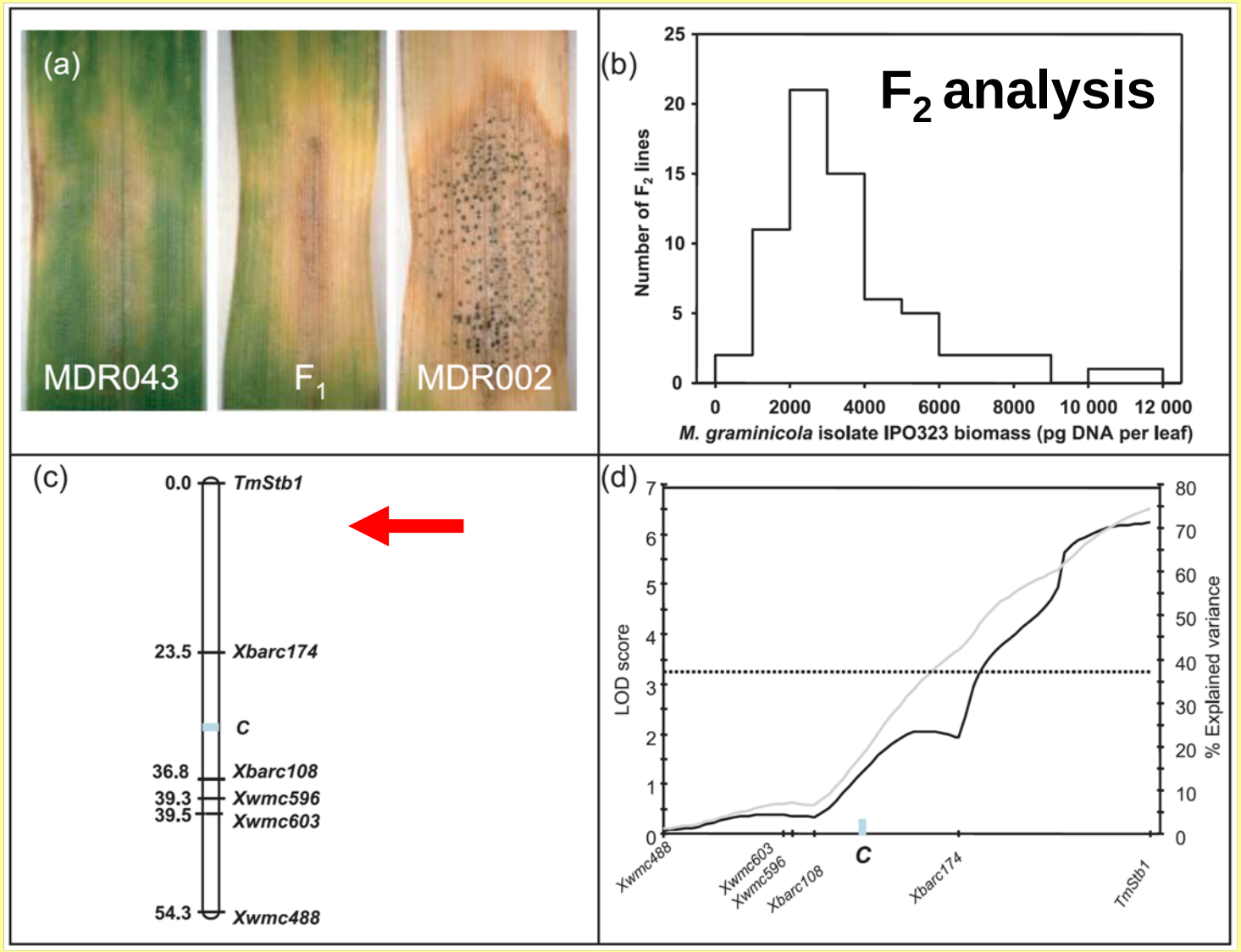
- *T. monococcum* – now enough seed to start first TAB trial with 5 MDR lines
  - includes MDR037, MDR046 mR + 3 S lines Hereward (high TAB) and Cadenza (low TAB)

Objective 11

***T. monococcum* – Introgression of the *TmStb1* locus conferring resistance to Septoria tritici blotch into hexaploid wheat**

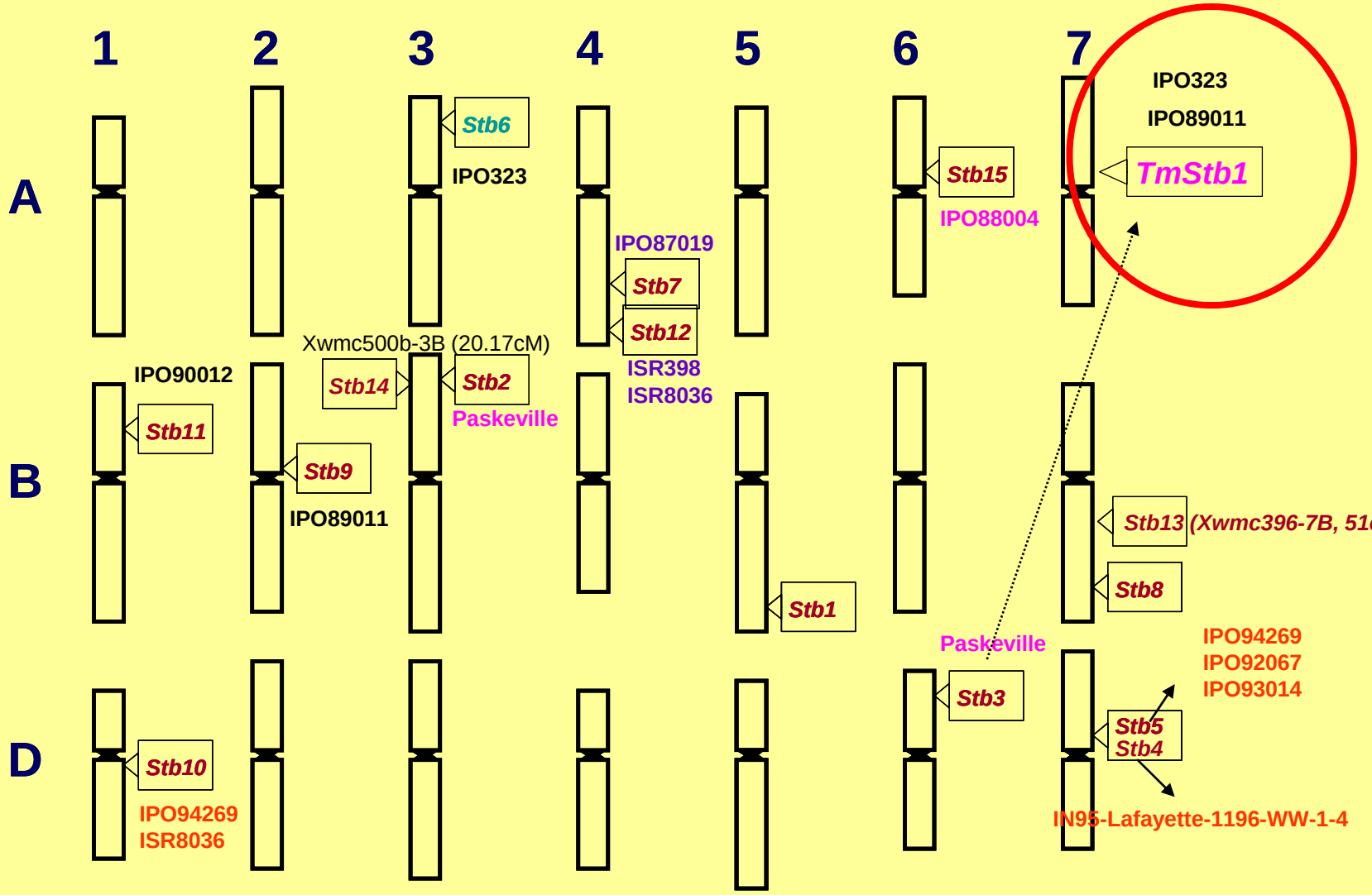
5 years of field assessment of resistance

Resistance conferred the *TmStb1* locus on 7A^{m}



Jing et al. (2008) New Phytologist

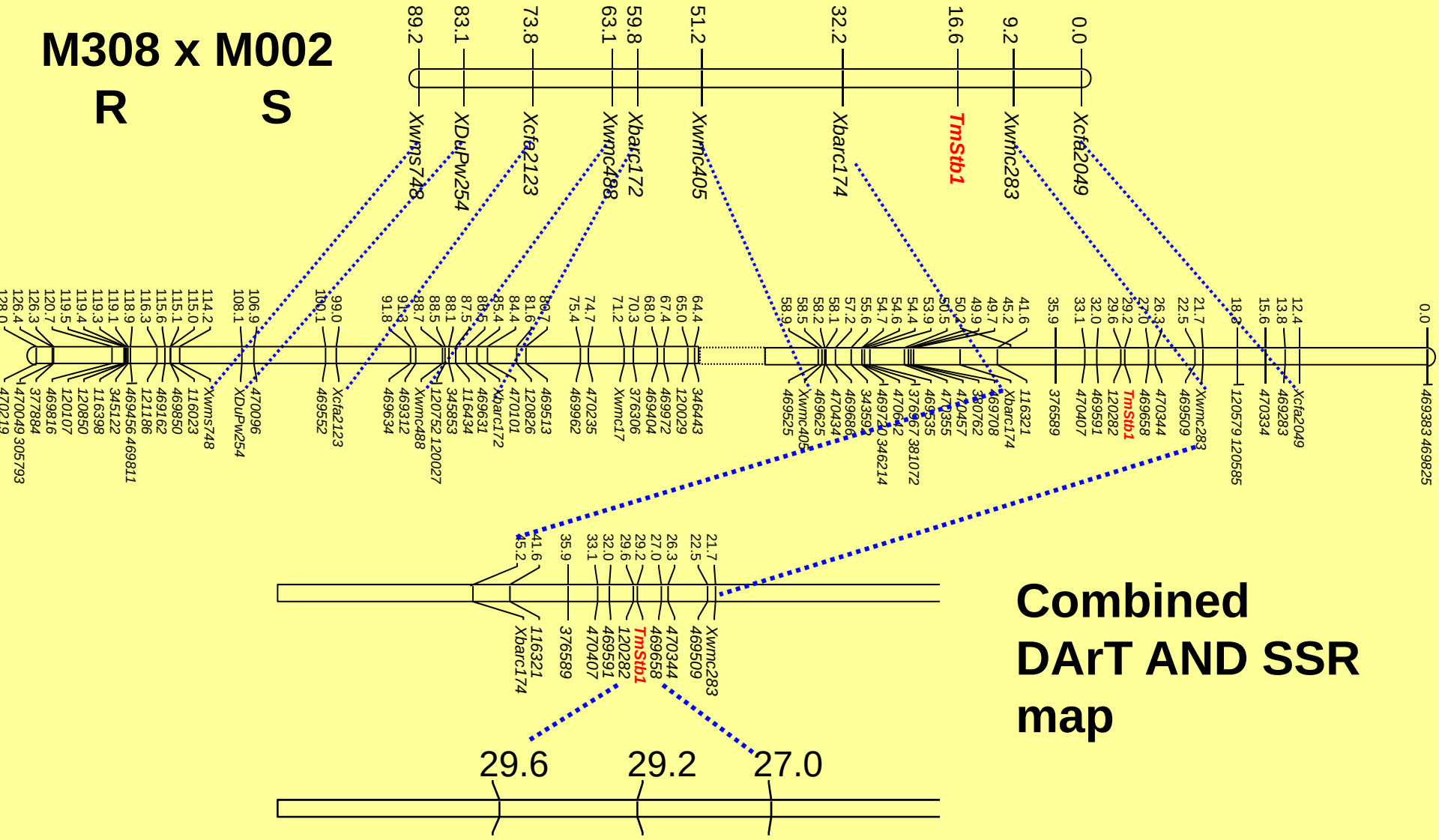
Wheat *Stb* genes for resistance to Septoria tritici blotch



Fine-mapping of *TmStb1* locus on 7A^{m}

M308 x M002

R S



Introgression of *TmStb1* locus into hexaploid wheat

What has been completed in 2009

***Ta* x *Tm* crosses**
Genotypes tested - Chinese Spring, Cadenza, Riband

14 days post pollination – immature grain recovered and into embryo rescue

Best F_1 plant recovery rate with Chinese Spring

F_1 plants exhibit Septoria resistance to a normally virulent fungal isolate on Chinese Spring

Angela Doherty and Mike

Staff change

Hai-Chun Jing – left RRes August 2009

New post **Sorghum – salinity stress**

Head, Centre for Bioenergy Plants Research and Development,
Institute of Botany,
Chinese Academy of Sciences
20 Nanxincun, Xiangshan,
Beijing 100093, China
Email: hcjing@ibcas.ac.cn
Webpage: www.ibcas.ac.cn

Replacement

Wing-Sham Lee - 'Sam'

Cambridge – undergraduate and PhD graduate

She starts at RRes 2nd Nov 2009

Introgression of *TmStb1* locus into hexaploid wheat

Plans for 2009 and 2010

Backcross the F_1 plants and F_1 selfed plants exhibit Septoria resistance to Chinese Spring

A. Chromosome counting of all the parental material by root squashes / cytology

B. Use the closest SSR markers to the *TmStb1* locus to check for the presence of *Tm*7A interval

By the A / B strategy we plan to eliminate the plants lacking Tm7A interval prior to crossing

Convert the flanking DArT into PCR based markers

Allison van der Meene, Sam, Angela and Mike

Many thanks to…..

Wheat Pathogenomics Team (RRes)

Richard Gutteridge
Sanja Treskic
Vanessa McMillan
James Bruce
Adrian Czaban

Hai-Chun Jing

Watkins Exp.

Simon Orford
Elke Anzinger
Sarah Usher
Steve Freeman

BAB Dept Statistics

Sue Welham
Rodger White

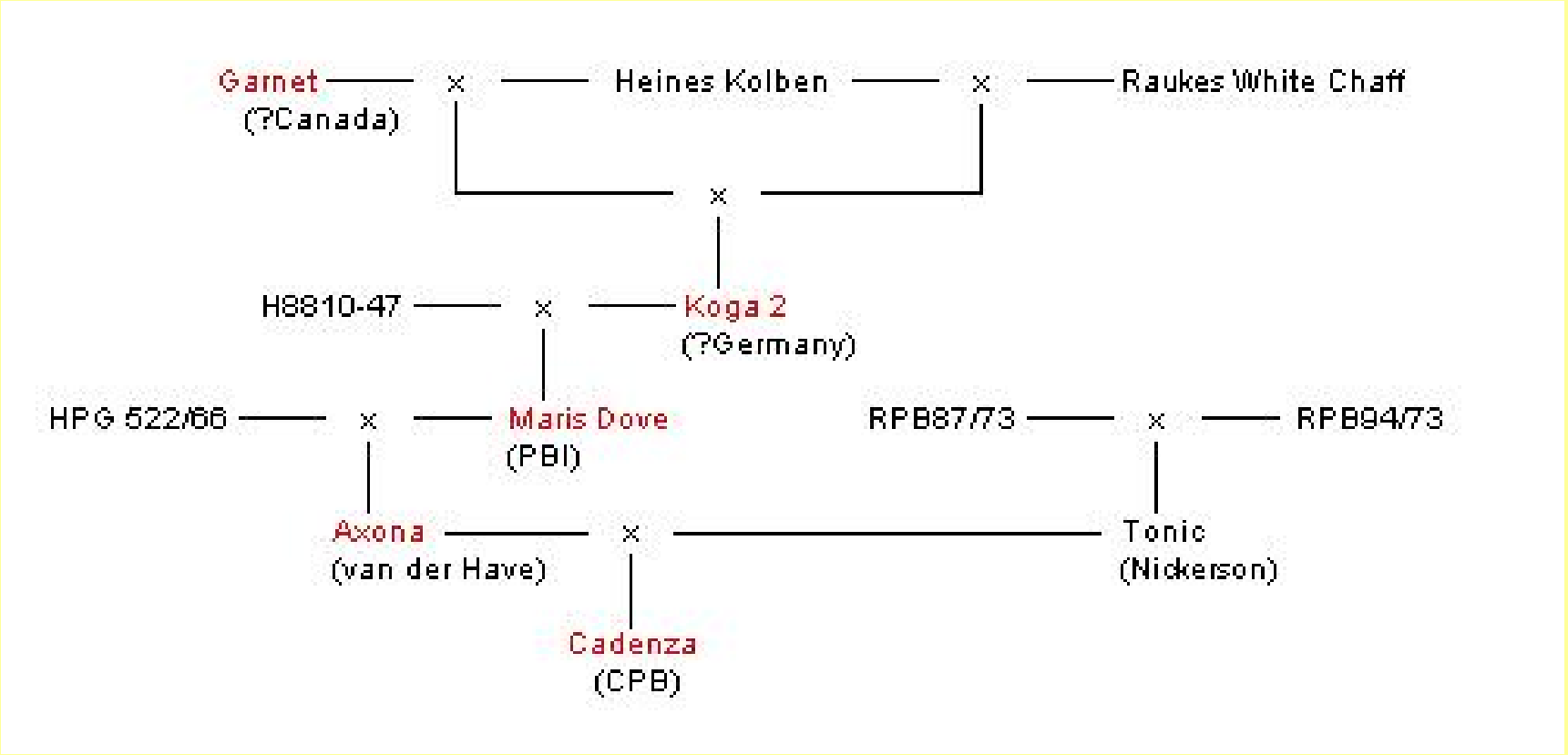
The Triticarte team

BBSRC bioscience for the future

Wheat Genetic Improvement Network

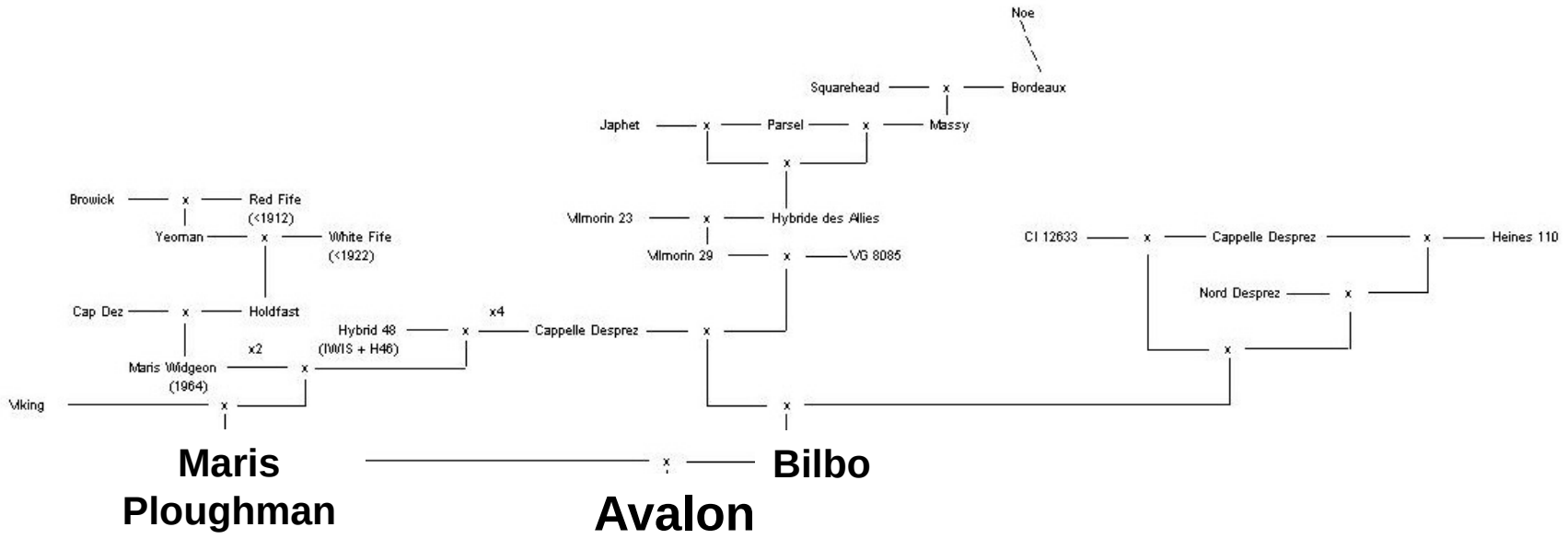
defra Department for Environment Food and Rural Affairs

Cadenza Pedigree



Avalon Pedigree

GRIN: Avalon = Maris Ploughman / Bilbo
GRIN: Maris Ploughman =Cappelle *4/ Hybrid 48 //2* Maris Widgeon /3/ Viking
GRIN: Bilbo = Vilmorin 29 / VG 8058 // Cappelle Desprez /4/ CI 12633 / Cappelle Desprez /3/ Heines 110 / Cappelle Desprez // Nord Desprez
GRIN data source: Mike Ambrose



The Resource Search

A Monogram Facility
with the BBR project
A community resource for wheat functional genomics

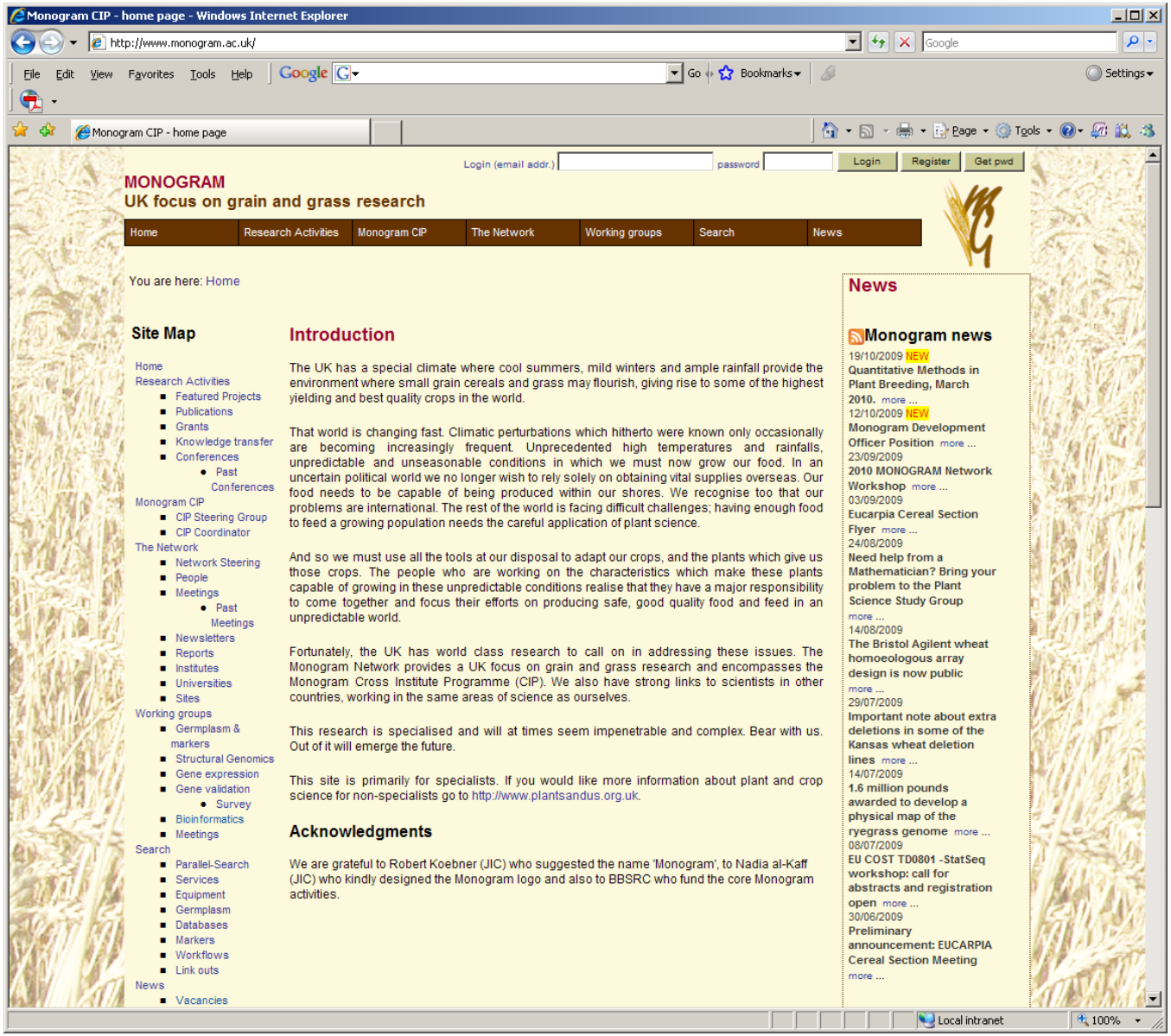
PJ Verrier
Biomathematics & Bioinformatics Department
Rothamsted Research

Some history

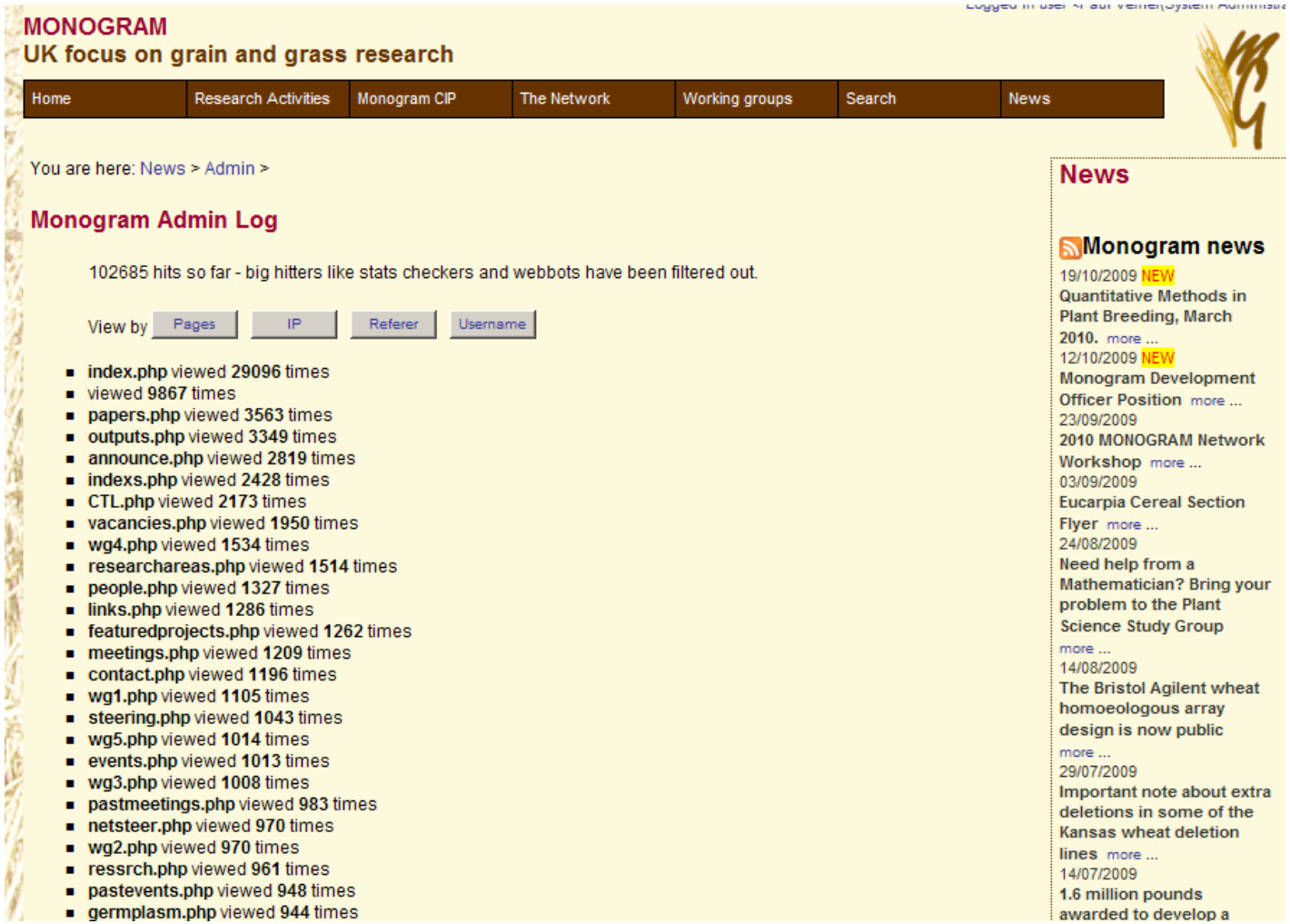
- Monogram Cross Institute Programme
  - The Monogram web site
- Small Grain Cereals Network
  - The Monogram Network
- BBR funded project
  - A community resource for wheat functional genomics (a 5 year project)

Result of merger

- Monogram network
  - Its own web resources
  - Long term support for web
  - Delivery portal for resources
    - Web pages
    - Working parties
    - Web sites
    - Data resources
    - Merged searches



http://monogram.ac.uk


MONOGRAM
UK focus on grain and grass research
Home
Research Activities
Monogram CIP
The Network
Working groups
Search
News
You are here: News > Admin >
Monogram Admin Log
102685 hits so far - big hitters like stats checkers and webbots have been filtered out.
View by Pages IP Referer Username
index.php viewed 29096 times
viewed 9867 times
papers.php viewed 3563 times
outputs.php viewed 3349 times
announce.php viewed 2819 times
indexs.php viewed 2428 times
CTL.php viewed 2173 times
vacancies.php viewed 1950 times
wg4.php viewed 1534 times
researchareas.php viewed 1514 times
people.php viewed 1327 times
links.php viewed 1286 times
featuredprojects.php viewed 1262 times
meetings.php viewed 1209 times
contact.php viewed 1196 times
wg1.php viewed 1105 times
steering.php viewed 1043 times
wg5.php viewed 1014 times
events.php viewed 1013 times
wg3.php viewed 1008 times
pastmeetings.php viewed 983 times
netsteer.php viewed 970 times
wg2.php viewed 970 times
ressrch.php viewed 961 times
pastevents.php viewed 948 times
germplasm.php viewed 944 times
News
Monogram news
19/10/2009 NEW
Quantitative Methods in Plant Breeding, March 2010. more ...
12/10/2009 NEW
Monogram Development Officer Position more ...
23/09/2009
2010 MONOGRAM Network Workshop more ...
03/09/2009
Eucarpia Cereal Section Flyer more ...
24/08/2009
Need help from a Mathematician? Bring your problem to the Plant Science Study Group more ...
14/08/2009
The Bristol Agilent wheat homoeologous array design is now public more ...
29/07/2009
Important note about extra deletions in some of the Kansas wheat deletion lines more ...
14/07/2009
1.6 million pounds awarded to develop a

The Smart Carbohydrate Centre

Producing and exploiting novel variation for starch properties in wheat and barley

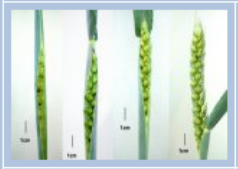
The Smart Carbohydrate Centre provides completely new resources for end-users and breeders of wheat and barley, paving the way for the development of new cultivars with improved or novel food and industrial value, and of new, renewable raw materials for industry.

WheatBP
Wheat, The Big Picture - a member of the Monogram Network

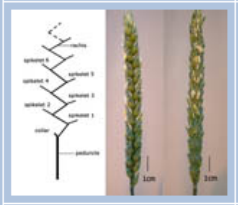
Home | Growth | Grain | Methods | Glossary

You are here: Flowering and fertilisation > Wheat ear pictures

Flowering and fertilisation: Wheat ear pictures

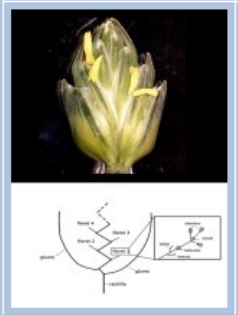


All the events around anthesismust be well co-ordinated for the successful release of pollen and fertilization of the ovule. The ear is quickly raised above the crop canopy by the growth of the last stem internode or peduncle . It remains protected inside the sheath of the flag leaf until the anthers are almost mature.



Spikelets are arranged on alternate sides of the rachis . The collar is a rudimentary spikelet which only rarely sets grain. The last-forme
degrees to the lateral spikelets, making the wheat e
spikelets are found on the mainstem than on the pri
genetically limited; in cv Mercia it is, on average, 22
conditions will determine how many florets within each spikelet remain viable at anthesis.

The primary axis of the wheat ear, it bears the spikelets.



Each spikelet initiates between eight and twelve florets of which only four or five will be potentially fertile at flowering. The outer glumes are barren, their function is to protect. Similarly the lemma and palea of each floret protect the delicate structures inside.

Site Map

- Home
  - How to use this site
  - Search
  - Glossary
  - Copyright statement
  - Links to related web sites
  - cDNA libraries and IGF
  - Credits and thanks
- Growth
  - Germination
    - Diagrams and pictures
  - Early growth and tillering
    - Diagrams and pictures
  - Stem elongation
    - Diagrams and pictures
  - Wheat apex development
    - Images from the microscope
  - Flowering and fertilisation
    - Wheat ear pictures
    - Anthesis: floret pictures
    - Micrographs of fertilisation
  - Pollen release
    - Ten pictures of anthesis
  - Credits and thanks
- Grain
  - Grain growth 1 to 4 days
    - Whole grain photographs
    - Embryo sac: events inside
    - Embryo sac: wall changes
    - Embryo micrographs
  - Grain growth 4 to 10 days
    - Whole grain photographs

Monogram Publications

Add new

Search Publications

You can search the Monogram publications by any of these fields.

Search Author:

AND Search Title:

and Years from to

Submit Reset

Click on reset to see all the publications.

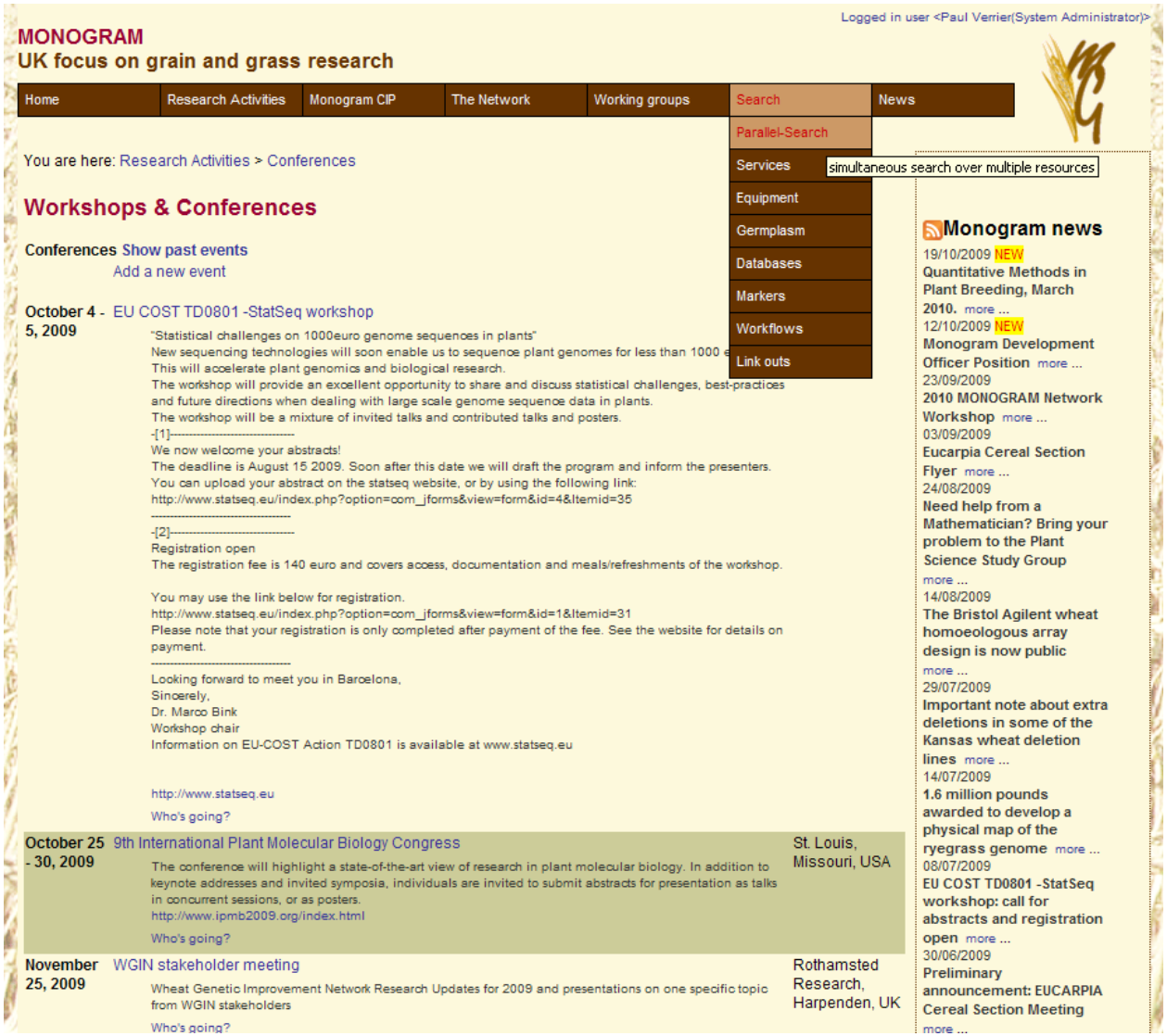
Results of your search
Your search settings are:
With in the title
With in the Author's list

Result: 623 papers

Reference Type: Book or Book Chapter

2009

- HD Jones and PR Shewry - Editors(2009) **"Transgenic Wheat, Barley and Oats: Production and Characterisation"**, *Methods in Biotechnology*, Series Ed. J Walker. Humana Press Totowa NJ (in press)


Logged in user <Paul Verrier(System Administrator)>
MONOGRAM
UK focus on grain and grass research
Home
Research Activities
Monogram CIP
The Network
Working groups
Search
News
Parallel-Search
Services
simultaneous search over multiple resources
Equipment
Germplasm
Databases
Markers
Workflows
Link outs
You are here: Research Activities > Conferences
Workshops & Conferences
Conferences Show past events
Add a new event
October 4 - 5, 2009
EU COST TD0801 -StatSeq workshop
"Statistical challenges on 1000euro genome sequences in plants"
New sequencing technologies will soon enable us to sequence plant genomes for less than 1000 e
This will accelerate plant genomics and biological research.
The workshop will provide an excellent opportunity to share and discuss statistical challenges, best-practices and future directions when dealing with large scale genome sequence data in plants.
The workshop will be a mixture of invited talks and contributed talks and posters.
-[1]----------
We now welcome your abstracts!
The deadline is August 15 2009. Soon after this date we will draft the program and inform the presenters.
You can upload your abstract on the statseq website, or by using the following link:
http://www.statseq.eu/index.php?option=com_jforms&view=form&id=4&Itemid=35

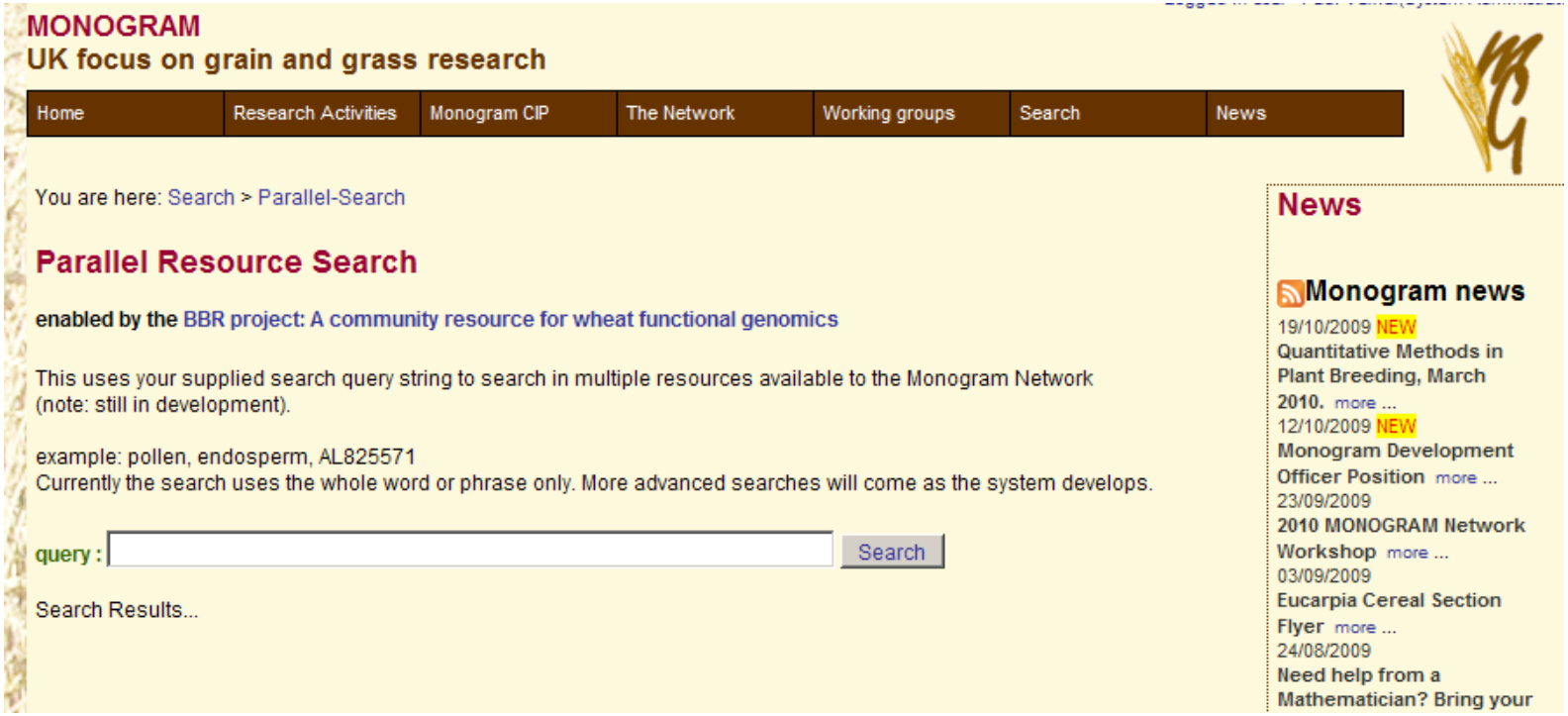
-[2]----------
Registration open
The registration fee is 140 euro and covers access, documentation and meals/refreshments of the workshop.
You may use the link below for registration.
http://www.statseq.eu/index.php?option=com_jforms&view=form&id=1&Itemid=31
Please note that your registration is only completed after payment of the fee. See the website for details on payment.

Looking forward to meet you in Barcelona,
Sincerely,
Dr. Marco Bink
Workshop chair
Information on EU-COST Action TD0801 is available at www.statseq.eu
http://www.statseq.eu
Who's going?
October 25 - 30, 2009
9th International Plant Molecular Biology Congress
St. Louis, Missouri, USA
The conference will highlight a state-of-the-art view of research in plant molecular biology. In addition to keynote addresses and invited symposia, individuals are invited to submit abstracts for presentation as talks in concurrent sessions, or as posters.
http://www.ipmb2009.org/index.html
Who's going?
November 25, 2009
WGIN stakeholder meeting
Rothamsted Research, Harpenden, UK
Wheat Genetic Improvement Network Research Updates for 2009 and presentations on one specific topic from WGIN stakeholders
Who's going?
Monogram news
19/10/2009 NEW
Quantitative Methods in Plant Breeding, March 2010. more ...
12/10/2009 NEW
Monogram Development Officer Position more ...
23/09/2009
2010 MONOGRAM Network Workshop more ...
03/09/2009
Eucarpia Cereal Section Flyer more ...
24/08/2009
Need help from a Mathematician? Bring your problem to the Plant Science Study Group more ...
14/08/2009
The Bristol Agilent wheat homoeologous array design is now public more ...
29/07/2009
Important note about extra deletions in some of the Kansas wheat deletion lines more ...
14/07/2009
1.6 million pounds awarded to develop a physical map of the ryegrass genome more ...
08/07/2009
EU COST TD0801 -StatSeq workshop: call for abstracts and registration open more ...
30/06/2009
Preliminary announcement: EUCARPIA Cereal Section Meeting
more ...

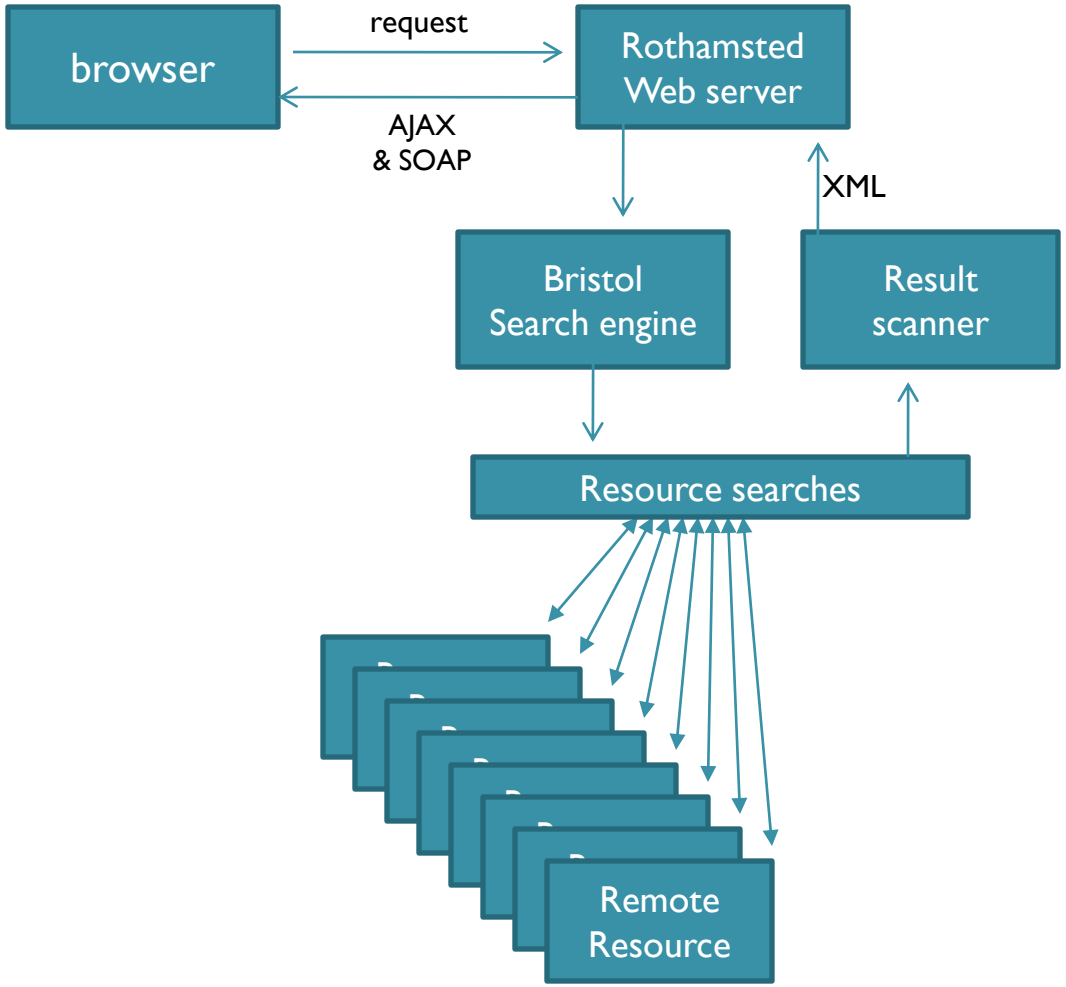
BBR Objectives 2008/9

- *Continue to develop the Monogram web site as the one stop shop for UK wheat activity*

- Bristol – updated resource search to include all genetic resources so far identified
- Rothamsted – updated facilities & tools


MONOGRAM
UK focus on grain and grass research
Home
Research Activities
Monogram CIP
The Network
Working groups
Search
News
You are here: Search > Parallel-Search
Parallel Resource Search
enabled by the BBR project: A community resource for wheat functional genomics
This uses your supplied search query string to search in multiple resources available to the Monogram Network (note: still in development).
example: pollen, endosperm, AL825571
Currently the search uses the whole word or phrase only. More advanced searches will come as the system develops.
query :
Search
Search Results...
News
Monogram news
19/10/2009 NEW
Quantitative Methods in Plant Breeding, March 2010. more ...
12/10/2009 NEW
Monogram Development Officer Position more ...
23/09/2009
2010 MONOGRAM Network Workshop more ...
03/09/2009
Eucarpia Cereal Section Flyer more ...
24/08/2009
Need help from a Mathematician? Bring your

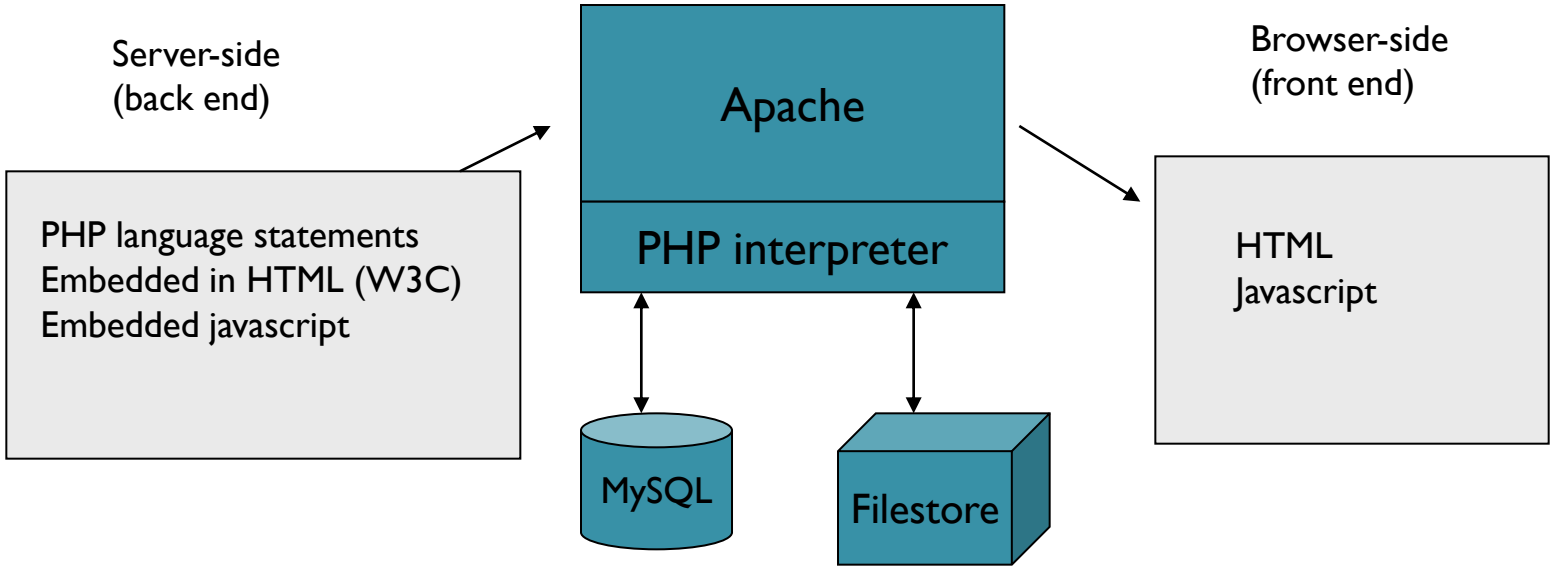
Parallel Search



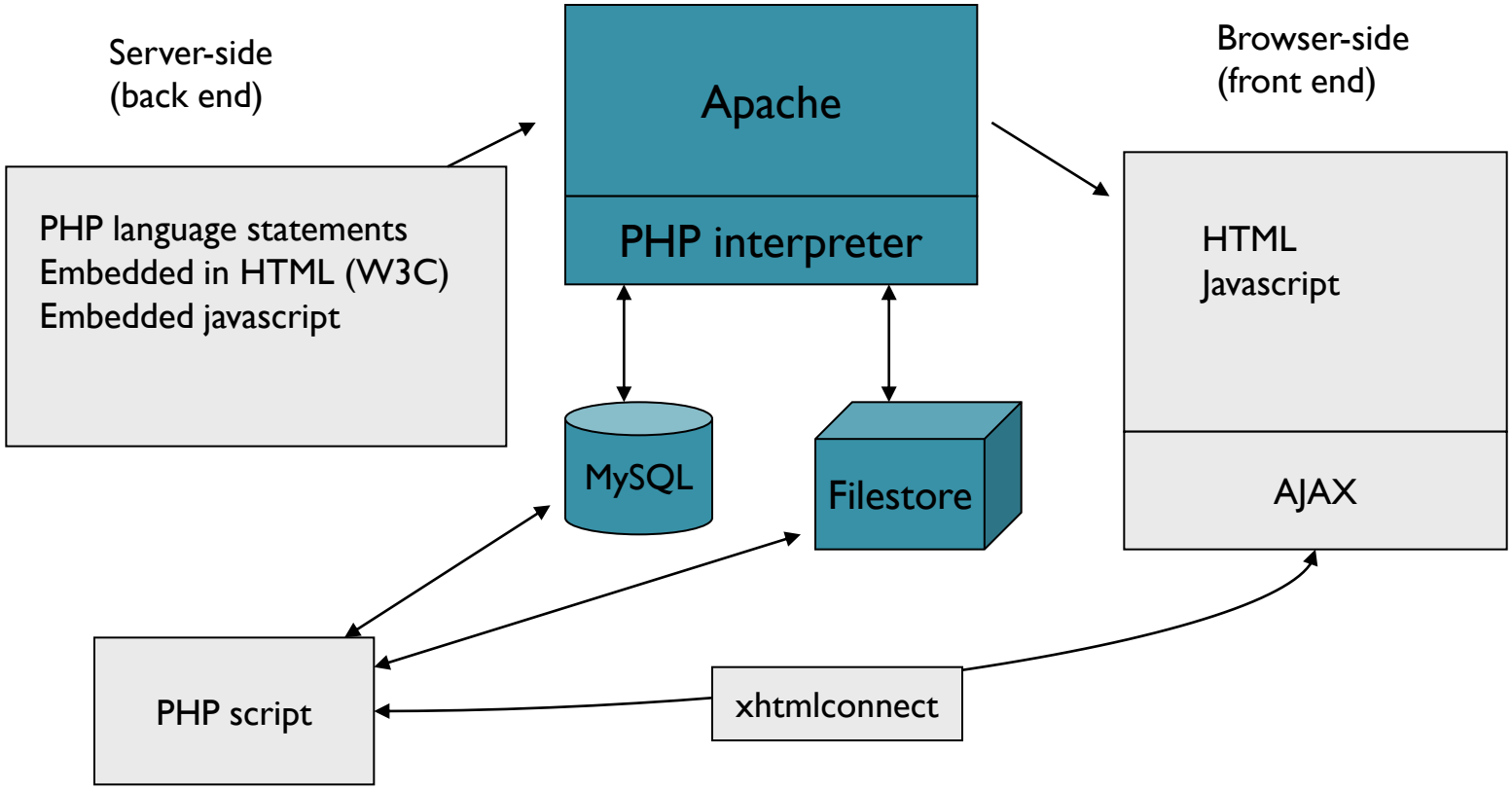
Framework

- Linux based server at Rothamsted
- Apache web server
- MySQL database
- PHP development
- Re-usable scripts
- AJAX techniques for Javascript xhtml transfers
- SOAP based web services for data transfer
- Enable capture of remote site data/pages
- Enable searching of remote site data

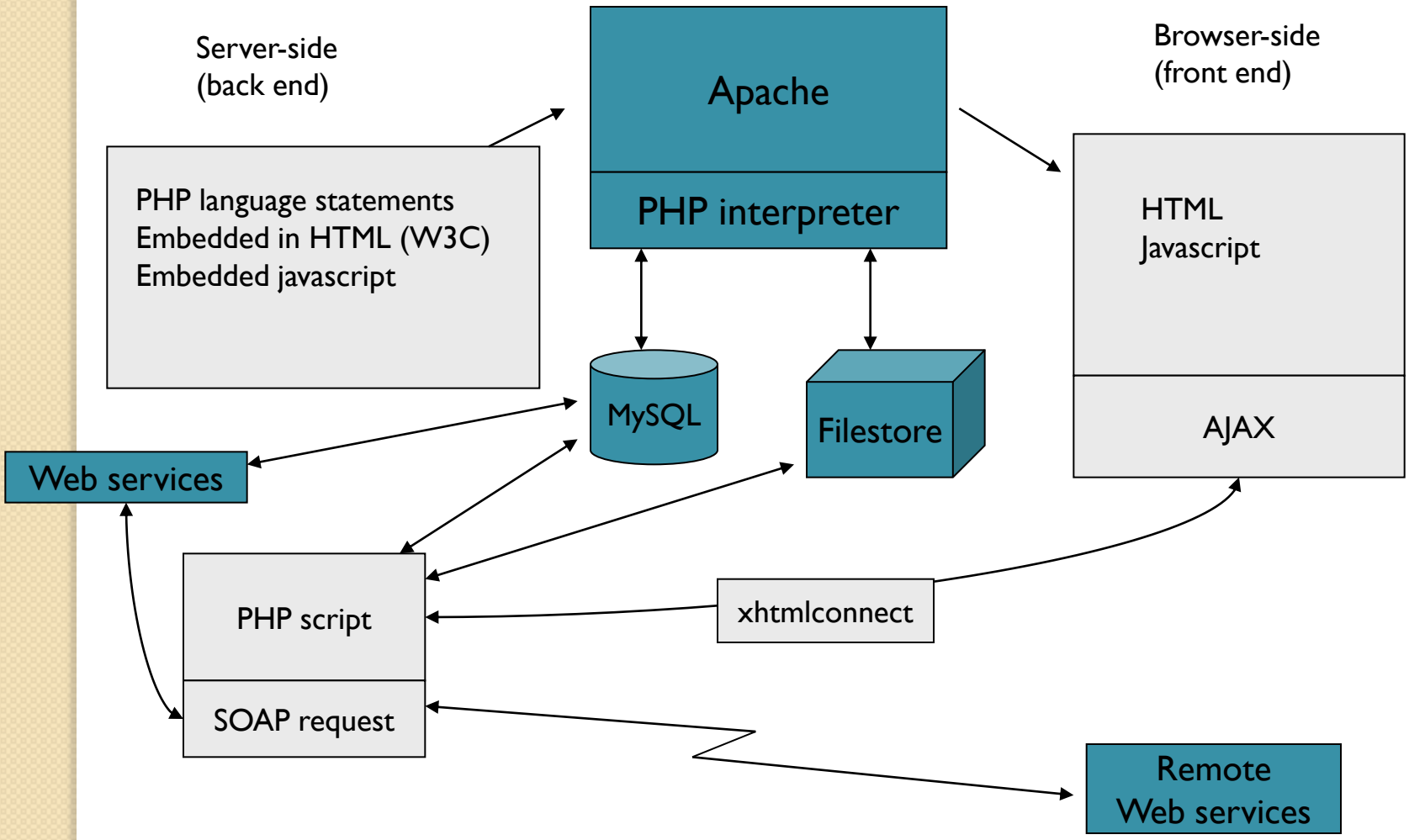
Creating a page



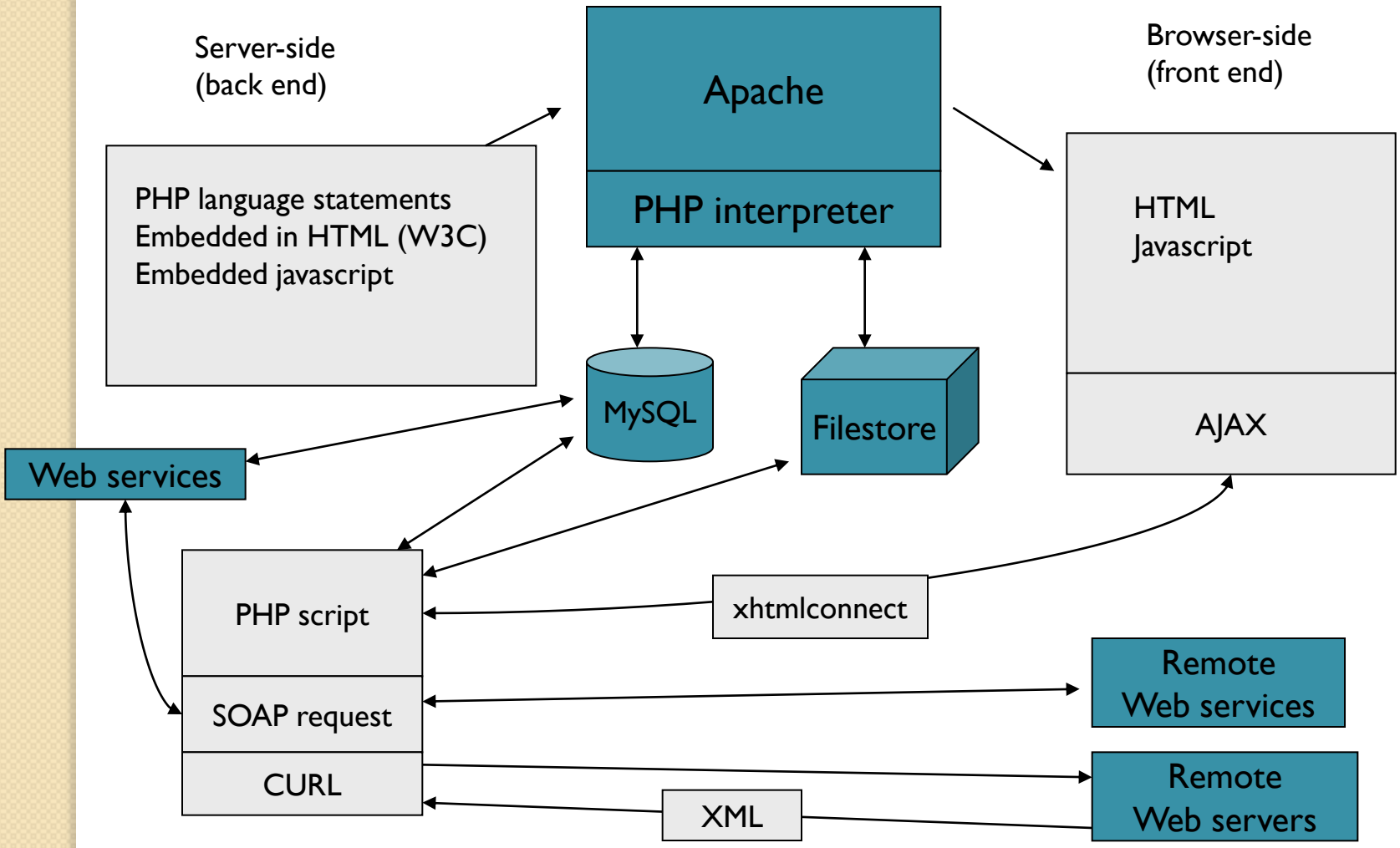
Creating a page



Creating a page



Creating a page



GAIT genotypes (Excel)

	A	B	C	D	E	F	G	H
1	File name	gwm357 1A	psp3003 1A	psp3027 1A	psp3001 1A	gwm99 1A	gwm558 2A	psp3088 2A
2	adroit	failed rxn	203	164	161	108		170
3	aintree	120	203	152	161	failed rxn	117	168
4	alta	124	203	162	161	108	117	168
5	altria	122	203	164	161	108	117	170
6	andante	122	203	164	161	108		168
7	anduril	124	203	162	161	108		170
8	anfield	120	203	152	161	108	117	168
9	angas	128	201	152	161	108	117	164
10	anglia	122	203	154	161	108		168
11	apollo	122	203	154	161	108	117	168
12	apostle	122	203	162	161	108		170
13	aquila	122	203	164	161	108	119	170
14	argent		203	164	161			170
15	aristocrat	122	203	164	161	108	117	168
16	arminda	122	203	162	161	108		170
17	arpege	122	203	164	161	108	119	170
18	aslan	122	203	164	161		117	170
19	atou	122	203	164	161	110		170
20	avalon	124	203	164	161		117	170
21	avans	122	203	164	161	108	119	164
22	avocet	122	203	164	161	108		168
23	axona	122	203	164	161	110	131	168
24	aztec	124	203	164	161	108	117	170
25	baldus	122	203	164		108	119	164
26	batavia	124	203	162	161	112	119	168
27	beaufort	124	203	164	161		119	168

WGIN Website

Research Results

Below are links to WGIN research results. This website is continuously updated to add new research results as soo they become available.
A detailed account of research findings is also available in the stakeholder newsletters and the WGIN management meeting documents as well as in the Research Activities section.

Research data:
Watkins collection phenotype data from the 2006 JIC field trial
Phenotype data of the EMS mutated Paragon M5 population collected at JIC between March and August 2006
Mapping data for the Avalon x Cadenza DH population
Development and analysis of 146 Conserved Orthologous Sequence (COS) markers in Wheat, Rice and Brachypodium distachyon
Avalon and Cadenza Field Trial 2006

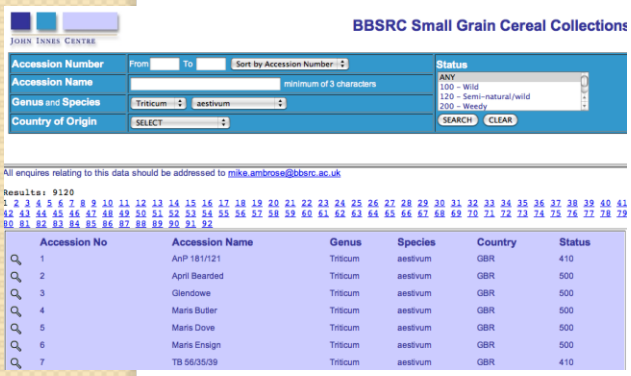
Watkins data

B	C	D	E	F	G	H	J	K	L
COUNTRY of origin	ACCESSION name	06 Rep 2 Heading	06 Rep 2 Heading	06 Rep 3 Heading	06 Rep 4 Heading	Mean Heading	Mean days to Heading	st dev	Heading Uniformity
Morocco		*	*	*	*	*	*	*	*
Crete	Blé mavratheri	*	*	*	*	*	*	*	*
Iran		*	*	*	*	*	*	*	*
Iraq	Rustam Exp Farm 99	08-Jun	08-Jun	08-Jun	08-Jun	08-Jun	84	0	yes
Australia		09-Jun	09-Jun	09-Jun	09-Jun	09-Jun	85	0	yes
Australia		16-Jun		*	09-Jun	11-Jun	87.33	4.04	no
Australia		07-Jun	08-Jun	08-Jun	08-Jun	07-Jun	83.75	0.5	yes
Portugal	Trigo Temporao de Coruche	09-Jun	09-Jun	*	*	10-Jun	85.33	0.58	yes
Portugal	Trigo Precoce	18-Jun	18-Jun	18-Jun	18-Jun	18-Jun	94	0	yes
India	Pusa 80-5	09-Jun	09-Jun	15-Jun	12-Jun	11-Jun	87.25	2.87	no
India	Pusa 111	06-Jun	06-Jun	06-Jun	06-Jun	06-Jun	82	0	yes
India	Pusa 90	13-Jun	16-Jun	16-Jun	13-Jun	14-Jun	90.5	1.73	yes
Bulgaria	Bebrovo	08-Jun	21-Jun	22-Jun	22-Jun	18-Jun	94.25	6.85	no
Yugoslavia		03-Jul	05-Jul	08-Jun	06-Jul	28-Jun	104	13.4	no
Yugoslavia		06-Jul	24-Jun	24-Jun	23-Jun	26-Jun	102.75	6.18	no
Spain	Mocho	22-Jun	22-Jun	23-Jun	22-Jun	22-Jun	98.25	0.5	yes
Spain	Mocho	27-Jun	17-Jun	28-Jun	27-Jun	24-Jun	100.75	5.19	no
India		13-Jun	18-Jun	15-Jun	15-Jun	15-Jun	91.25	2.06	yes
India	Gangajali	15-Jun	15-Jun	15-Jun	15-Jun	15-Jun	91	0	yes
India	Thori	14-Jun	15-Jun	15-Jun	15-Jun	14-Jun	90.75	0.5	yes

Avalon-Cadenza mapping

A	B	C	D	E	F	G	H
Avalon x Cadenza			1	2	3	4	5
marker name	location	distance cM					
wPt-4029	.1AS	0	-	A	A	B	A
wPt-9752	.1AS	5.562	-	A	A	A	A
wmc336a	.1AS	23.114	B	A	A	A	A
wPt-3904	.1AS	39.672	-	A	A	A	A
barc119	.1AS	44.082	B	A	A	B	A
gwm498	.1ASC	49.606	B	B	A	B	A
gwm164	.1ALC	50.418	B	B	A	-	A
wPt-6046	.1AL	50.676	-	B	A	B	A
psp3027	.1ALM	50.856	B	B	A	A	A
Glu-A1	.1ALM	54.511	B	B	-	B	A
wPt-9757	.1AL	55.766	B	B	B	B	A
gwm99	.1ALT	72.934	A	B	B	B	A
gwm33	.1BS	0	B	A	A	B	A
wPt-2230	.1BS	10.32	B	A	A	A	A
wPt-3465	.1BS	10.597	-	A	A	A	A
wPt-1560	.1BS	11.011	-	A	A	B	A
wPt-2988	.1BS	11.094	-	A	A	B	A
gap(database accession), (c-gliadin: gene fa	.1BS	11.115	B	A	A	B	A
gwm264	.1BST	11.659	B	c	A	B	A
wPt-5562	.1BS	18.49	B	A	A	A	A
wPt-8168	.1BS	34.519	A	B	A	A	A
wPt-3451	.1BS	35.246	-	B	A	A	A

BBSRC Small Grain Cereals Collection



Wheat Pedigree data

```
BBSRC Wheat Collection Pedigree Report

        ACC NAME                        PEDIGREE
          2 April Bearded               English Land Variety
          3 Glendowe                    Not recorded
          4 Maris Butler                Koga 2*Hybrid 46
          5 Maris Dove                  H 8810-47*Koga 2
          6 Maris Ensign                Breustedts Teutonen*Cappelle Desprez
         53 Meteor                      April Bearded*Yeoman
         55 Clarion                     Halle 10*(Carpo*Generoso)
         56 Orca                        Ministre*Peko
         57 Rothwell Sprite             (HD 12*Cappelle Desprez)*Fasan
         58 Toro                        (Ministre*Peko)*Carpo
         59 Arin                        Halle 5756*Breustedts 778/40*Weihenstephaner GKJ
         60 Aronde                      (Thatcher*Teutonen)*Koga
         61 Carpo                       (Lin Calel*Rimpau Bastard 2)*Jabo
         62 Densi                       (Marquis*(Peragis*H Kolben))*((Peragis*Marquis)*(Garnet*(Keuzung
56*Ja
         69 ELS                         (CA*(Garnet*Zimbera))*Erli
         71 Fasan                       (Peragis*Garnet)*(Teutonen*H
Kolben*Peragis)*(Ardito*Peragis*H'heim 25
```

Parallel Resource Search

enabled by the BBR project: A community resource for wheat functional genomics

This uses your supplied search query string to search in multiple resources available to the Monogram Network (note: still in development).

example: pollen, endosperm, AL825571
Currently the search uses the whole word or phrase only. More advanced searches will come as the system develops.

query : Search

Search Results...

News

Monogram news

03/09/2009 NEW
Eucarpia Cereal Section Flyer more ...
24/08/2009
Need help from a Mathematician? Bring your problem to the Plant Science Study Group more ...
14/08/2009
The Bristol Agilent wheat homoeologous array design is now public more ...
29/07/2009
Important note about extra deletions in some of the Kansas wheat deletion lines more ...
14/07/2009
£1.6 million awarded to develop a physical map of the ryegrass genome more ...
08/07/2009
EU COST TD0801 -StatSeq workshop: call for abstracts & registration open more ...
30/06/2009
Preliminary announcement: EUCARPIA Cereal Section Meeting more ...
03/06/2009
Brachypodium Sequence Released more ...
27/05/2009
Molecular study of the wheat-ergot interaction funded more ...
20/05/2009
OECD-GenomeAssociation-

Parallel Resource Search

enabled by the BBR project: A community resource for wheat functional genomics

This uses your supplied search query string to search in multiple resources available to the Monogram Network
(note: still in development).

example: pollen, endosperm, AL825571
Currently the search uses the whole word or phrase only. More advanced searches will come as the system develops.

query : grain Search

Matches found with the keyword grain:

No hits to WhETS
18 hits to BLASTX gene annotations at cerealsdb
24 hits to WGIN web site
1 hits to wheat SNPs
84 hits to images at wheatbp
1 hit to grain in the wheatbp glossary
6 hits to wheat Germplasm at JIC
5 hits to wheat Pedigree data at JIC
20 hits to the MONOGRAM site
3 hits to WGIN results files
1 hits to the SmartCarb site

Search completed

News

Monogram news

03/09/2009 NEW
Eucarpia Cereal Section Flyer more ...
24/08/2009
Need help from a Mathematician? Bring your problem to the Plant Science Study Group more ...
14/08/2009
The Bristol Agilent wheat homoeologous array design is now public more ...
29/07/2009
Important note about extra deletions in some of the Kansas wheat deletion lines more ...
14/07/2009
£1.6 million awarded to develop a physical map of the ryegrass genome more ...
08/07/2009
EU COST TD0801 -StatSeq workshop: call for abstracts & registration open more ...
30/06/2009
Preliminary announcement: EUCARPIA Cereal Section Meeting more ...
03/06/2009
Brachypodium Sequence Released more ...
27/05/2009
Molecular study of the wheat-ergot interaction funded more ...
20/05/2009
OECD-GenomeAssociation-

Parallel Resource Search

enabled by the BBR project: A community resource for wheat functional genomics

This uses your supplied search query string to search in multiple resources available to the Monogram Network
(note: still in development).

example: pollen, endosperm, AL825571
Currently the search uses the whole word or phrase only. More advanced searches will come as the system develops.

query : grain Search

Matches found with the keyword grain:

No hits to WhETS
18 hits to BLASTX gene annotations at cerealsdb
24 hits to WGIN web site
1 hits to wheat SNPs
84 hits to images at wheatbp
1 hit to grain in the wheatbp glossary
6 hits to wheat Germplasm at JIC
5 hits to wheat Pedigree data at JIC
20 hits to the MONOGRAM site
3 hits to WGIN results files
1 hits to the SmartCarb site

Search completed

News

Monogram news

03/09/2009 NEW
Eucarpia Cereal Section Flyer more ...
24/08/2009
Need help from a Mathematician? Bring your problem to the Plant Science Study Group more ...
14/08/2009
The Bristol Agilent wheat homoeologous array design is now public more ...
29/07/2009
Important note about extra deletions in some of the Kansas wheat deletion lines more ...
14/07/2009
£1.6 million awarded to develop a physical map of the ryegrass genome more ...
08/07/2009
EU COST TD0801 -StatSeq workshop: call for abstracts & registration open more ...
30/06/2009
Preliminary announcement: EUCARPIA Cereal Section Meeting more ...
03/06/2009
Brachypodium Sequence Released more ...
27/05/2009
Molecular study of the wheat-ergot interaction funded more ...
20/05/2009
OECD-GenomeAssociation-

Text Search results

Home

Wheat database

SNPs

images at wheatbp

Monogram network

2009-09-10 10:51:46 database contains **26377** ESTs
Summary and download

WestDB ID	Top blastx Hit	E-value	NCBI Link	View full blastx output
C04_e310_plate_11	grain softness protein 1 [Triticum aestivum]	3e-75	gb|AAG09276.1|AF177218_1	more
E03_e310_plate_11	grain softness protein 1b, 15K - wheat	1e-08	pir||S48187	more
E06_e310_plate_3	grain softness protein 1a, 15K (clone TSF69) - wheat	2e-88	pir||S48186	more
E07_e310_plate_3	grain softness protein 1a, 15K (clone TSF69) - wheat	1e-88	pir||S48186	more
G03_e310_plate_5	grain softness protein 1 [Triticum aestivum]	3e-83	gb|AAG09276.1|AF177218_1	more
H01_e310_plate_5	grain softness protein 1 [Triticum aestivum]	2e-88	gb|AAG09276.1|AF177218_1	more
H02_e310_plate_5	grain softness protein 1 [Triticum aestivum]	2e-88	gb|AAG09276.1|AF177218_1	more
A07_h116_plate_11	grain softness protein 1b, 15K - wheat	3e-72	pir||S48187	more
C03_h116_plate_11	grain softness protein 1b, 15K - wheat	3e-46	pir||S48187	more
G05_h116_plate_12	grain softness protein 1a, 15K (clone SR3.1) - wheat (fragment)	4e-81	pir||S51770	more

Parallel Resource Search

enabled by the BBR project: A community resource for wheat functional genomics

This uses your supplied search query string to search in multiple resources available to the Monogram Network
(note: still in development).

example: pollen, endosperm, AL825571
Currently the search uses the whole word or phrase only. More advanced searches will come as the system develops.

query : grain Search

Matches found with the keyword grain:

No hits to WhETS
18 hits to BLASTX gene annotations at cerealsdb
24 hits to WGIN web site
1 hits to wheat SNPs
84 hits to images at wheatbp
1 hit to grain in the wheatbp glossary
6 hits to wheat Germplasm at JIC
5 hits to wheat Pedigree data at JIC
20 hits to the MONOGRAM site
3 hits to WGIN results files
1 hits to the SmartCarb site

Search completed

News

Monogram news

03/09/2009 NEW
Eucarpia Cereal Section Flyer more ...
24/08/2009
Need help from a Mathematician? Bring your problem to the Plant Science Study Group more ...
14/08/2009
The Bristol Agilent wheat homoeologous array design is now public more ...
29/07/2009
Important note about extra deletions in some of the Kansas wheat deletion lines more ...
14/07/2009
£1.6 million awarded to develop a physical map of the ryegrass genome more ...
08/07/2009
EU COST TD0801 -StatSeq workshop: call for abstracts & registration open more ...
30/06/2009
Preliminary announcement: EUCARPIA Cereal Section Meeting more ...
03/06/2009
Brachypodium Sequence Released more ...
27/05/2009
Molecular study of the wheat-ergot interaction funded more ...
20/05/2009
OECD-GenomeAssociation-

ROTHAMSTED RESEARCH

Search website Go!

Science Links

BBSRC bioscience for the future

Rothamsted Research is sponsored by the Biotechnology & Biological Sciences Research Council

Patron: Her Majesty the Queen

Rothamsted Research,
Harpenden,Hertfordshire,AL5 2JQ
Tel: + 44 (0) 1582 763 133
Fax: + 44 (0) 1582 760 981

Search results for:
'(grain or grained or graining or grainer or grains)'

Match: All Format: Short Sort by: Score

Refine search: grain Search

Documents 1 - 10 of 24 matches. More ☆'s indicate a better match.

☆☆☆☆ WGIN: Objective 6
☆☆☆☆ WGIN: Objective 11
☆☆ WGIN 2 - home
☆ WGIN: Project Outline
☆ WGIN: International Cooperation
☆ WGIN: Objective 9
☆ WGIN 2 - home
☆ WGIN 2 - home
☆ WGIN 2 - home
☆ WGIN: Links

Pages: 1 2 3 →

Parallel Resource Search

enabled by the BBR project: A community resource for wheat functional genomics

This uses your supplied search query string to search in multiple resources available to the Monogram Network
(note: still in development).

example: pollen, endosperm, AL825571
Currently the search uses the whole word or phrase only. More advanced searches will come as the system develops.

query : grain Search

Matches found with the keyword grain:

No hits to WhETS
18 hits to BLASTX gene annotations at cerealsdb
24 hits to WGIN web site
1 hits to wheat SNPs
84 hits to images at wheatbp
1 hit to grain in the wheatbp glossary
6 hits to wheat Germplasm at JIC
5 hits to wheat Pedigree data at JIC
20 hits to the MONOGRAM site
3 hits to WGIN results files
1 hits to the SmartCarb site

Search completed

News

Monogram news

03/09/2009 NEW
Eucarpia Cereal Section Flyer more ...
24/08/2009
Need help from a Mathematician? Bring your problem to the Plant Science Study Group more ...
14/08/2009
The Bristol Agilent wheat homoeologous array design is now public more ...
29/07/2009
Important note about extra deletions in some of the Kansas wheat deletion lines more ...
14/07/2009
£1.6 million awarded to develop a physical map of the ryegrass genome more ...
08/07/2009
EU COST TD0801 -StatSeq workshop: call for abstracts & registration open more ...
30/06/2009
Preliminary announcement: EUCARPIA Cereal Section Meeting more ...
03/06/2009
Brachypodium Sequence Released more ...
27/05/2009
Molecular study of the wheat-ergot interaction funded more ...
20/05/2009
OECD-GenomeAssociation-

Switch to protein view view contig cluster_137_contig_3 in fasta format

emb|CAH10045.1| GSP-1 Grain Softness Protein [Triticum aestivum]

Frame: -2 Start: 635 End: 144
Rice bin: 0.0 Wheat nulli bin(s): 5AS 5BS 5DS

Cultivar and tissue source:	SNP summary	Full sequence
		1.....51..
	A	.....
	varietal?	.....
	confident?	.....
Consensus		..M..I..L..H..K..Y..S..F..C..M..C..V..Y..T..L..F.*.V.. ACATGCATAATTAGATGTTTGTAAGAGAAACACATACATACATAAGTAA*GGAA
Y1 BQ805765, cv: Butte 86, tissue: whole grains, dev stage: 3-44 days post anthesis seed,	T	.....
U2 BE399689, cv: Cheyenne, tissue: endosperm, dev stage: 5-30 days post anthesis,		.....
V2 BE399947, cv: Cheyenne, tissue: endosperm, dev stage: 5-30 days post anthesis,	T	.....
U3 BG604292, cv: Cheyenne, tissue: Endosperm, dev stage: 5 -30 days post anthesis seed,	T	.....TGTAAGAGAAACACATACATACATAAGTAA-GGAA
D1 BJ241590, cv: Chinese Spring, tissue: seed DPA10, dev stage: Feekes' scale 11.2,	C	.....
E1 BJ232125, cv: Chinese Spring, tissue: seed DPA10, dev stage: Feekes' scale 11.2,	C	.....
F1 BJ237766, cv: Chinese Spring, tissue: seed DPA10, dev stage: Feekes' scale 11.2,		.....AGAGAAACACATACATACATAAGTAA-GGAA
G1 BJ234106, cv: Chinese Spring, tissue: seed DPA10, dev stage: Feekes' scale 11.2,	C	.....CATACATACATAAGTAA-GGAA
H1 BJ241561, cv: Chinese Spring, tissue: seed DPA10, dev stage: Feekes' scale 11.2,	C	.....
I1 BJ235554, cv: Chinese Spring, tissue: seed DPA10, dev stage: Feekes' scale 11.2,	C	.....
BJ232169, cv: Chinese Spring, tissue:		

Parallel Resource Search

enabled by the BBR project: A community resource for wheat functional genomics

This uses your supplied search query string to search in multiple resources available to the Monogram Network
(note: still in development).

example: pollen, endosperm, AL825571
Currently the search uses the whole word or phrase only. More advanced searches will come as the system develops.

query : grain Search

Matches found with the keyword grain:

No hits to WhETS
18 hits to BLASTX gene annotations at cerealsdb
24 hits to WGIN web site
1 hits to wheat SNPs
84 hits to images at wheatbp
1 hit to grain in the wheatbp glossary
6 hits to wheat Germplasm at JIC
5 hits to wheat Pedigree data at JIC
20 hits to the MONOGRAM site
3 hits to WGIN results files
1 hits to the SmartCarb site

Search completed

News

Monogram news

03/09/2009 NEW
Eucarpia Cereal Section Flyer more ...
24/08/2009
Need help from a Mathematician? Bring your problem to the Plant Science Study Group more ...
14/08/2009
The Bristol Agilent wheat homoeologous array design is now public more ...
29/07/2009
Important note about extra deletions in some of the Kansas wheat deletion lines more ...
14/07/2009
£1.6 million awarded to develop a physical map of the ryegrass genome more ...
08/07/2009
EU COST TD0801 -StatSeq workshop: call for abstracts & registration open more ...
30/06/2009
Preliminary announcement: EUCARPIA Cereal Section Meeting more ...
03/06/2009
Brachypodium Sequence Released more ...
27/05/2009
Molecular study of the wheat-ergot interaction funded more ...
20/05/2009
OECD-GenomeAssociation-

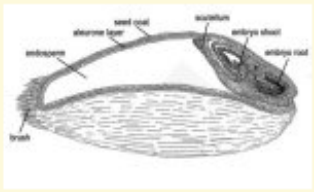
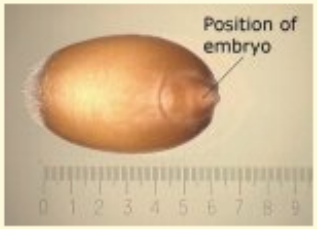
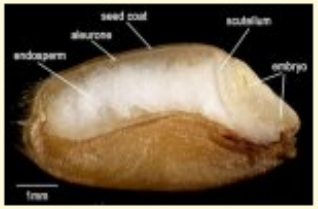
Navigation

(**days** = days after flowering)

Funded by: HGCA

Search

Search Results for grain:

	Simple diagram of the dry grain showing its principle parts; the endosperm, aleurone and seed coat, the scutellum and the embryo with its primordial shoot and root. During grain milling these tissues are crudely separated: the endosperm becomes the white flour, the embryo is the germ and the aleurone layer and the seed coat are the bran. The seed coat is a complex structure. The Cell Layers inside the Grain are described in detail in a separate section.
	Fully imbibed grain just before the embryo emerges. After planting the grain quickly takes up water and the chemical processes of germination start.
	The imbibed grain, split open along its long axis, shows the embryo in close contact, via the scutellum, with the stored reserves of the endosperm. The internal processes of germination are well under way. Several hydrolytic enzymes are activated to perform specific tasks. The cell walls of the endosperm are broken down, the starch and storage proteins they contain are degraded and released, and the aleurone and embryo are activated ready for growth.
	The grain with the embryo dissected away from the endosperm. The structure between

Parallel Resource Search

enabled by the BBR project: A community resource for wheat functional genomics

This uses your supplied search query string to search in multiple resources available to the Monogram Network
(note: still in development).

example: pollen, endosperm, AL825571
Currently the search uses the whole word or phrase only. More advanced searches will come as the system develops.

query : grain Search

Matches found with the keyword grain:

No hits to WhETS
18 hits to BLASTX gene annotations at cerealsdb
24 hits to WGIN web site
1 hits to wheat SNPs
84 hits to images at wheatbp
1 hit to grain in the wheatbp glossary
6 hits to wheat Germplasm at JIC
5 hits to wheat Pedigree data at JIC
20 hits to the MONOGRAM site
3 hits to WGIN results files
1 hits to the SmartCarb site

Search completed

News

Monogram news

03/09/2009 NEW
Eucarpia Cereal Section Flyer more ...
24/08/2009
Need help from a Mathematician? Bring your problem to the Plant Science Study Group more ...
14/08/2009
The Bristol Agilent wheat homoeologous array design is now public more ...
29/07/2009
Important note about extra deletions in some of the Kansas wheat deletion lines more ...
14/07/2009
£1.6 million awarded to develop a physical map of the ryegrass genome more ...
08/07/2009
EU COST TD0801 -StatSeq workshop: call for abstracts & registration open more ...
30/06/2009
Preliminary announcement: EUCARPIA Cereal Section Meeting more ...
03/06/2009
Brachypodium Sequence Released more ...
27/05/2009
Molecular study of the wheat-ergot interaction funded more ...
20/05/2009
OECD-GenomeAssociation-

All enquires relating to this data should be addressed to mike.ambrose@bbsrc.ac.uk

Results: 6

	Accession No	Accession Name	Genus	Species	Country
	829	Touzelle Barbuza Gros Grains	Triticum	aestivum	FRA
	2865	Newgrain 265	Triticum	aestivum	GBR
	2866	Newgrain 65-112	Triticum	aestivum	GBR
	2867	Newgrain K 7/A5-1	Triticum	aestivum	GBR
	7164	Purple Grain	Triticum	aestivum	*
	7272	Mivhor Multigrain	Triticum	aestivum	ISR

Parallel Resource Search

enabled by the BBR project: A community resource for wheat functional genomics

This uses your supplied search query string to search in multiple resources available to the Monogram Network
(note: still in development).

example: pollen, endosperm, AL825571
Currently the search uses the whole word or phrase only. More advanced searches will come as the system develops.

query : grain Search

Matches found with the keyword grain:

No hits to WhETS
18 hits to BLASTX gene annotations at cerealsdb
24 hits to WGIN web site
1 hits to wheat SNPs
84 hits to images at wheatbp
1 hit to grain in the wheatbp glossary
6 hits to wheat Germplasm at JIC
5 hits to wheat Pedigree data at JIC
20 hits to the MONOGRAM site
3 hits to WGIN results files
1 hits to the SmartCarb site

Search completed

News

Monogram news

03/09/2009 NEW
Eucarpia Cereal Section Flyer more ...
24/08/2009
Need help from a Mathematician? Bring your problem to the Plant Science Study Group more ...
14/08/2009
The Bristol Agilent wheat homoeologous array design is now public more ...
29/07/2009
Important note about extra deletions in some of the Kansas wheat deletion lines more ...
14/07/2009
£1.6 million awarded to develop a physical map of the ryegrass genome more ...
08/07/2009
EU COST TD0801 -StatSeq workshop: call for abstracts & registration open more ...
30/06/2009
Preliminary announcement: EUCARPIA Cereal Section Meeting more ...
03/06/2009
Brachypodium Sequence Released more ...
27/05/2009
Molecular study of the wheat-ergot interaction funded more ...
20/05/2009
OECD-GenomeAssociation-

BBSRC Wheat Collection Pedigree Report

ACC	NAME	PEDIGREE
2	April Bearded	English Land Variety
3	Glendowe	Not recorded
4	Maris Butler	Koga 2*Hybrid 46
5	Maris Dove	H 8810-47*Koga 2
6	Maris Ensign	Breustedts Teutonen*Cappelle Desprez
53	Meteor	April Bearded*Yeoman
55	Clarion	Halle 10*(Carpo*Generoso)
56	Orca	Ministre*Peko
57	Rothwell Sprite	(HD 12*Cappelle Desprez)*Fasan
58	Toro	(Ministre*Peko)*Carpo
59	Arin	Halle 5756*Breustedts 778/40*Weihenstephaner GKJ
60	Aronde	(Thatcher*Teutonen)*Koga
61	Carpo	(Lin Calel*Rimpau Bastard 2)*Jabo
62	Densi	(Marquis*(Peragis*H Kolben))*((Peragis*Marquis)*(Garnet*(Keuz
69	ELS	(CA*(Garnet*Zimbera))*Erli
71	Fasan	(Peragis*Garnet)*(Teutonen*H Kolben*Peragis)*(Ardito*Peragis*
72	Grano	Koga*(Koga*Breustedts Teutonen)
78	Heines Kolben	Saumar de Mars Selection
79	Janus	((Von Rumkers Dickkopf*Erli)*(Erli*Hope))*Dickkopf
80	Kloka	Weihenstephaner 43/48 Selection
81	Koga 1	Heines Kolben*Garnet
82	Koga 2	(Heines Kolben*Garnet)*(Heines Kolben*Raeckes White Chaff)
83	Kolibri	(Heine 2174*Peko)*Koga 2
84	Lera	(Marquis*(Peragis*Heines Kolben))*((Peragis*Marquis)*Weihenst
85	Opal	Triesdorfer Ruf*Garnet*Heine Kolben*Koga*Rumkers Erli
86	Peko	Peragis*Heines Kolben
87	Peragis	Blue Dame*Green Dame
89	Teutonen	Heines Kolben*R 1004(=Noe*Squarehead)
90	Trident	(Heine 2174*Peko)*Koga 2
91	Erli	Lichtis Fruh*(Erbachshofer Janetzki*Japhet)
92	Fram 2	Jo 3*Mo 07

Parallel Resource Search

enabled by the BBR project: A community resource for wheat functional genomics

This uses your supplied search query string to search in multiple resources available to the Monogram Network
(note: still in development).

example: pollen, endosperm, AL825571
Currently the search uses the whole word or phrase only. More advanced searches will come as the system develops.

query : grain Search

Matches found with the keyword grain:

No hits to WhETS
18 hits to BLASTX gene annotations at cerealsdb
24 hits to WGIN web site
1 hits to wheat SNPs
84 hits to images at wheatbp
1 hit to grain in the wheatbp glossary
6 hits to wheat Germplasm at JIC
5 hits to wheat Pedigree data at JIC
20 hits to the MONOGRAM site
3 hits to WGIN results files
1 hits to the SmartCarb site

Search completed

News

Monogram news

03/09/2009 NEW
Eucarpia Cereal Section Flyer more ...
24/08/2009
Need help from a Mathematician? Bring your problem to the Plant Science Study Group more ...
14/08/2009
The Bristol Agilent wheat homoeologous array design is now public more ...
29/07/2009
Important note about extra deletions in some of the Kansas wheat deletion lines more ...
14/07/2009
£1.6 million awarded to develop a physical map of the ryegrass genome more ...
08/07/2009
EU COST TD0801 -StatSeq workshop: call for abstracts & registration open more ...
30/06/2009
Preliminary announcement: EUCARPIA Cereal Section Meeting more ...
03/06/2009
Brachypodium Sequence Released more ...
27/05/2009
Molecular study of the wheat-ergot interaction funded more ...
20/05/2009
OECD-GenomeAssociation-

Documents from the website matching the keyword "grain"

www.monogram.ac.uk/announce.php matched grain

www.monogram.ac.uk/links.php matched grain

www.monogram.ac.uk/gbmarkers.php matched grain

www.monogram.ac.uk/germplasm.php matched grain

www.monogram.ac.uk/wg3.php matched grain

www.monogram.ac.uk/universities.php matched grain

www.monogram.ac.uk/institutes.php matched grain

www.monogram.ac.uk/report.php matched grain

www.monogram.ac.uk/newsletter.php matched grain

www.monogram.ac.uk/pastmeetings.php matched grain

www.monogram.ac.uk/meetings.php matched grain

www.monogram.ac.uk/people.php matched grain

www.monogram.ac.uk/indexs.php matched grain

www.monogram.ac.uk/monocip.php matched grain

www.monogram.ac.uk/pastevents.php matched grain

www.monogram.ac.uk/grants.php matched grain

Parallel Resource Search

enabled by the BBR project: A community resource for wheat functional genomics

This uses your supplied search query string to search in multiple resources available to the Monogram Network
(note: still in development).

example: pollen, endosperm, AL825571
Currently the search uses the whole word or phrase only. More advanced searches will come as the system develops.

query : grain Search

Matches found with the keyword grain:

No hits to WhETS
18 hits to BLASTX gene annotations at cerealsdb
24 hits to WGIN web site
1 hits to wheat SNPs
84 hits to images at wheatbp
1 hit to grain in the wheatbp glossary
6 hits to wheat Germplasm at JIC
5 hits to wheat Pedigree data at JIC
20 hits to the MONOGRAM site
3 hits to WGIN results files
1 hits to the SmartCarb site

Search completed

News

Monogram news

03/09/2009 NEW
Eucarpia Cereal Section Flyer more ...
24/08/2009
Need help from a Mathematician? Bring your problem to the Plant Science Study Group more ...
14/08/2009
The Bristol Agilent wheat homoeologous array design is now public more ...
29/07/2009
Important note about extra deletions in some of the Kansas wheat deletion lines more ...
14/07/2009
£1.6 million awarded to develop a physical map of the ryegrass genome more ...
08/07/2009
EU COST TD0801 -StatSeq workshop: call for abstracts & registration open more ...
30/06/2009
Preliminary announcement: EUCARPIA Cereal Section Meeting more ...
03/06/2009
Brachypodium Sequence Released more ...
27/05/2009
Molecular study of the wheat-ergot interaction funded more ...
20/05/2009
OECD-GenomeAssociation-

Documents from the Wheat genetic Improvement (WGIN) website matching the keyword "grain"

DiversityTrialGrainYields.xls

WGINTakeAllReport.pdf

Traits field trial 2003-5.pdf

Back to Monogram search page

Parallel Resource Search

enabled by the BBR project: A community resource for wheat functional genomics

This uses your supplied search query string to search in multiple resources available to the Monogram Network
(note: still in development).

example: pollen, endosperm, AL825571
Currently the search uses the whole word or phrase only. More advanced searches will come as the system develops.

query : grain Search

Matches found with the keyword grain:

No hits to WhETS
18 hits to BLASTX gene annotations at cerealsdb
24 hits to WGIN web site
1 hits to wheat SNPs
84 hits to images at wheatbp
1 hit to grain in the wheatbp glossary
6 hits to wheat Germplasm at JIC
5 hits to wheat Pedigree data at JIC
20 hits to the MONOGRAM site
3 hits to WGIN results files
1 hits to the SmartCarb site

Search completed

News

Monogram news

03/09/2009 NEW
Eucarpia Cereal Section Flyer more ...
24/08/2009
Need help from a Mathematician? Bring your problem to the Plant Science Study Group more ...
14/08/2009
The Bristol Agilent wheat homoeologous array design is now public more ...
29/07/2009
Important note about extra deletions in some of the Kansas wheat deletion lines more ...
14/07/2009
£1.6 million awarded to develop a physical map of the ryegrass genome more ...
08/07/2009
EU COST TD0801 -StatSeq workshop: call for abstracts & registration open more ...
30/06/2009
Preliminary announcement: EUCARPIA Cereal Section Meeting more ...
03/06/2009
Brachypodium Sequence Released more ...
27/05/2009
Molecular study of the wheat-ergot interaction funded more ...
20/05/2009
OECD-GenomeAssociation-

The Smart Carbohydrate Centre

Producing and exploiting novel variation for starch properties in wheat and barley

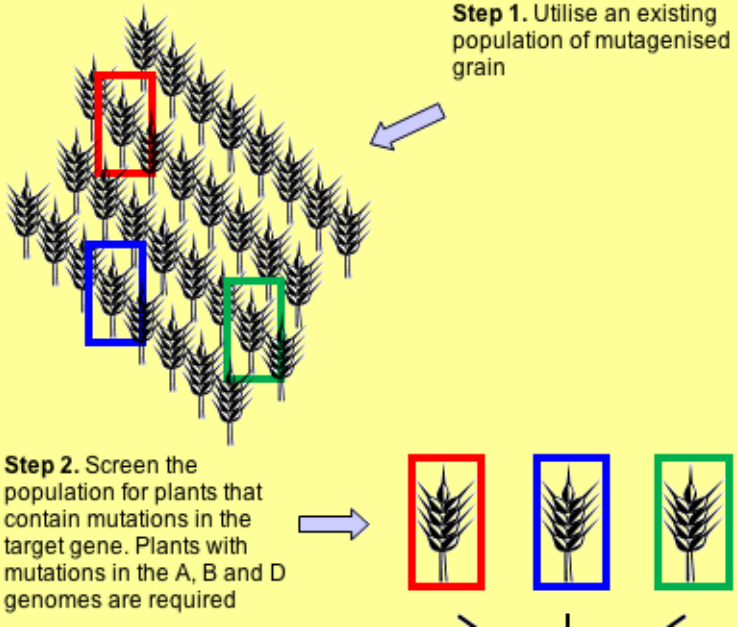
Our approach in wheat

Wheat is a much more important source of starch and flour than barley. It is of very considerable commercial interest to produce wheat varieties with new starches. Unfortunately this is extremely difficult to do because wheat has three sets of each of its chromosomes (called the A, B and D genomes). In other words, wheat is a hexaploid. We cannot apply to wheat the simple genetic approaches we are using in barley (a diploid).

To generate variation in wheat we need to alter expression of target genes in all three genomes. To do this we are, we are using TILLING (Targeting Induced Local Lesions in Genomes) in collaboration with Rothamsted Research. TILLING is a non GM, reverse genetics technique. It enables us to find mutations in wheat in genes we think (based on our work with barley and our knowledge of other cereals) will influence the properties of starch. Once we have found plants with mutations in the target gene in the A or B or D genome, we can cross them together to produce a line in which the starch should have new properties. This line can then be tested by users of wheat such as millers and bakers. Importantly, we also need to backcross the mutant plants to eliminate the thousands of other mutations they carry.

In collaboration with Andy Phillips,

ROTHAMSTED RESEARCH

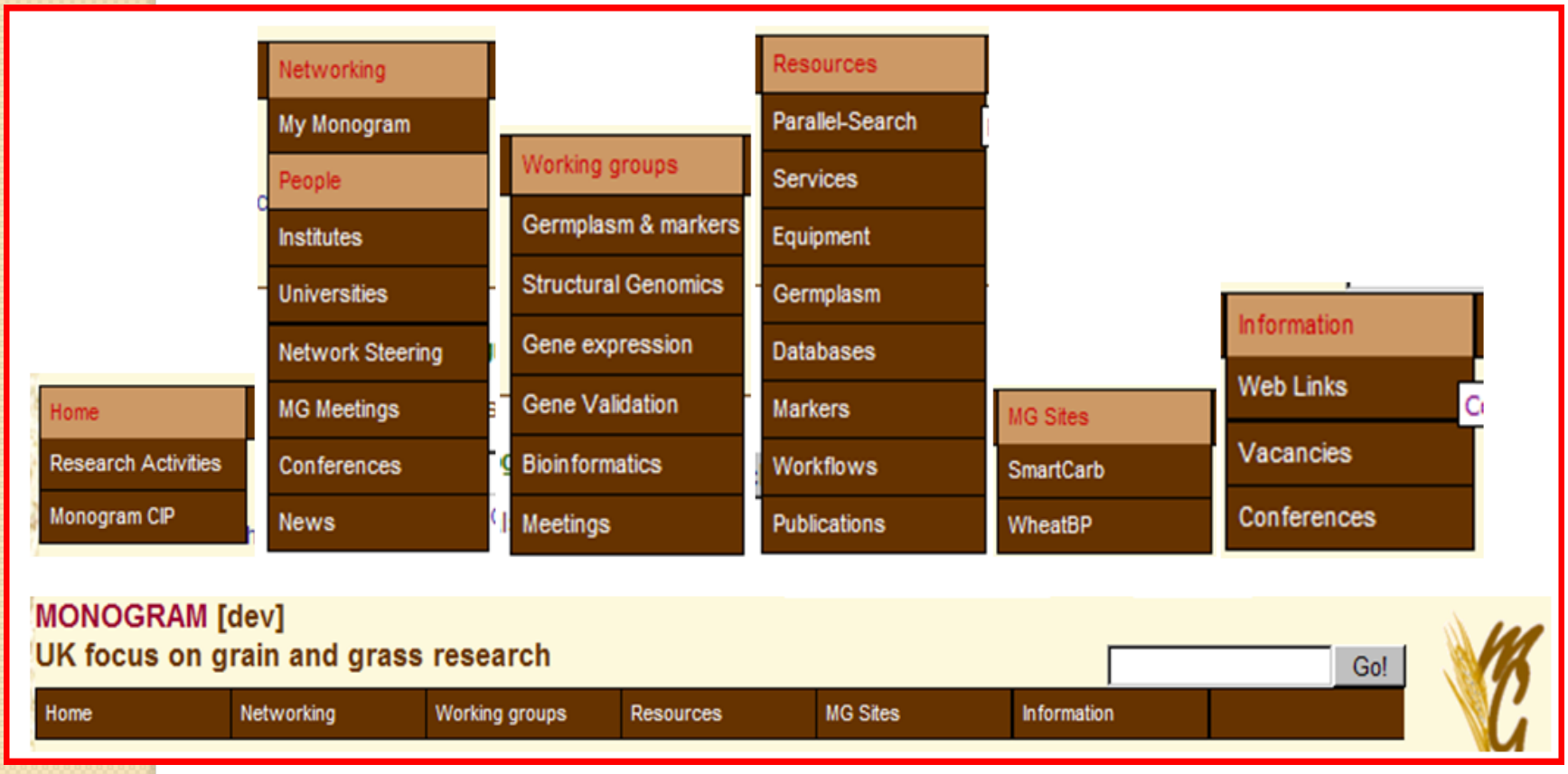


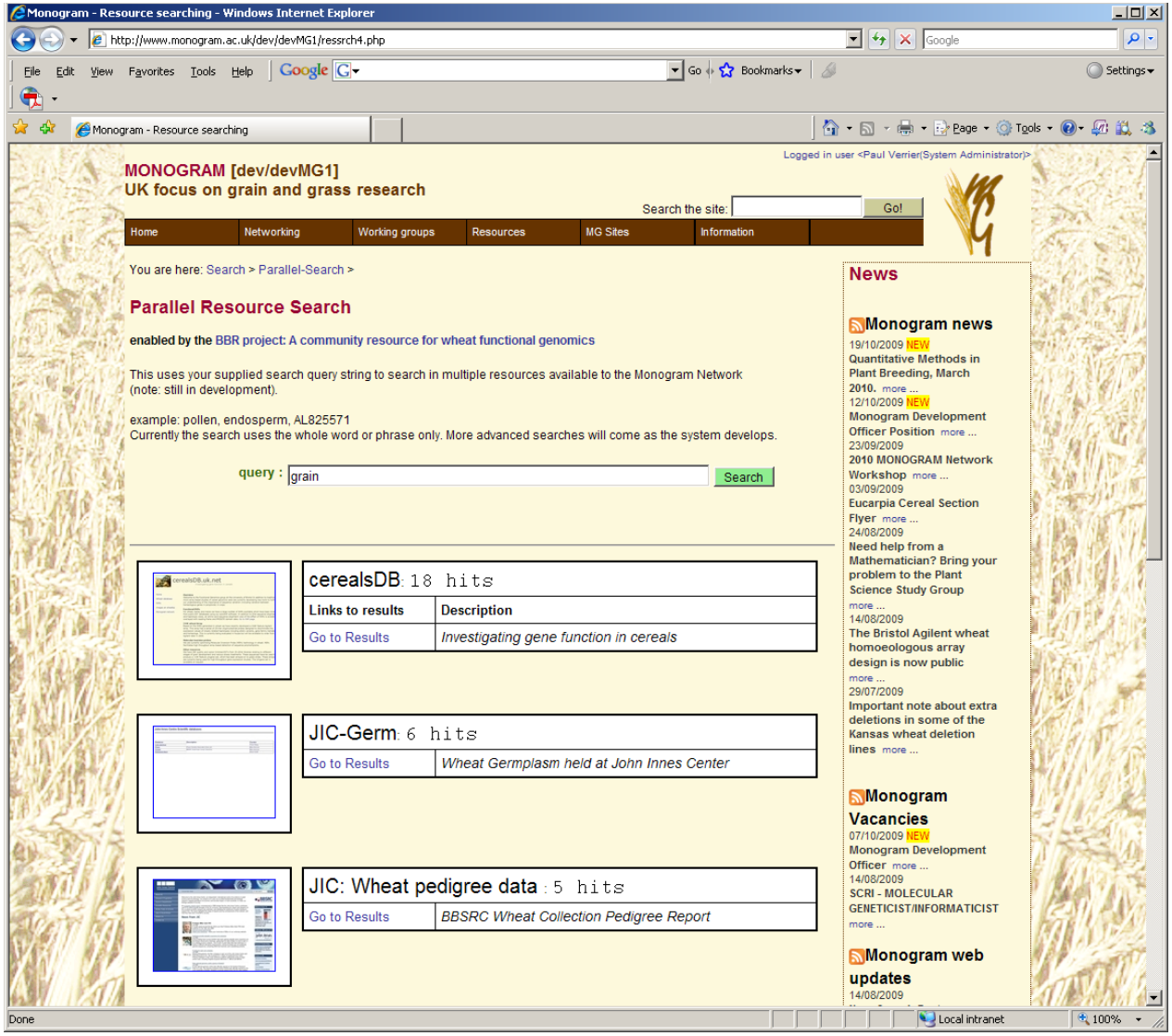
Next Steps

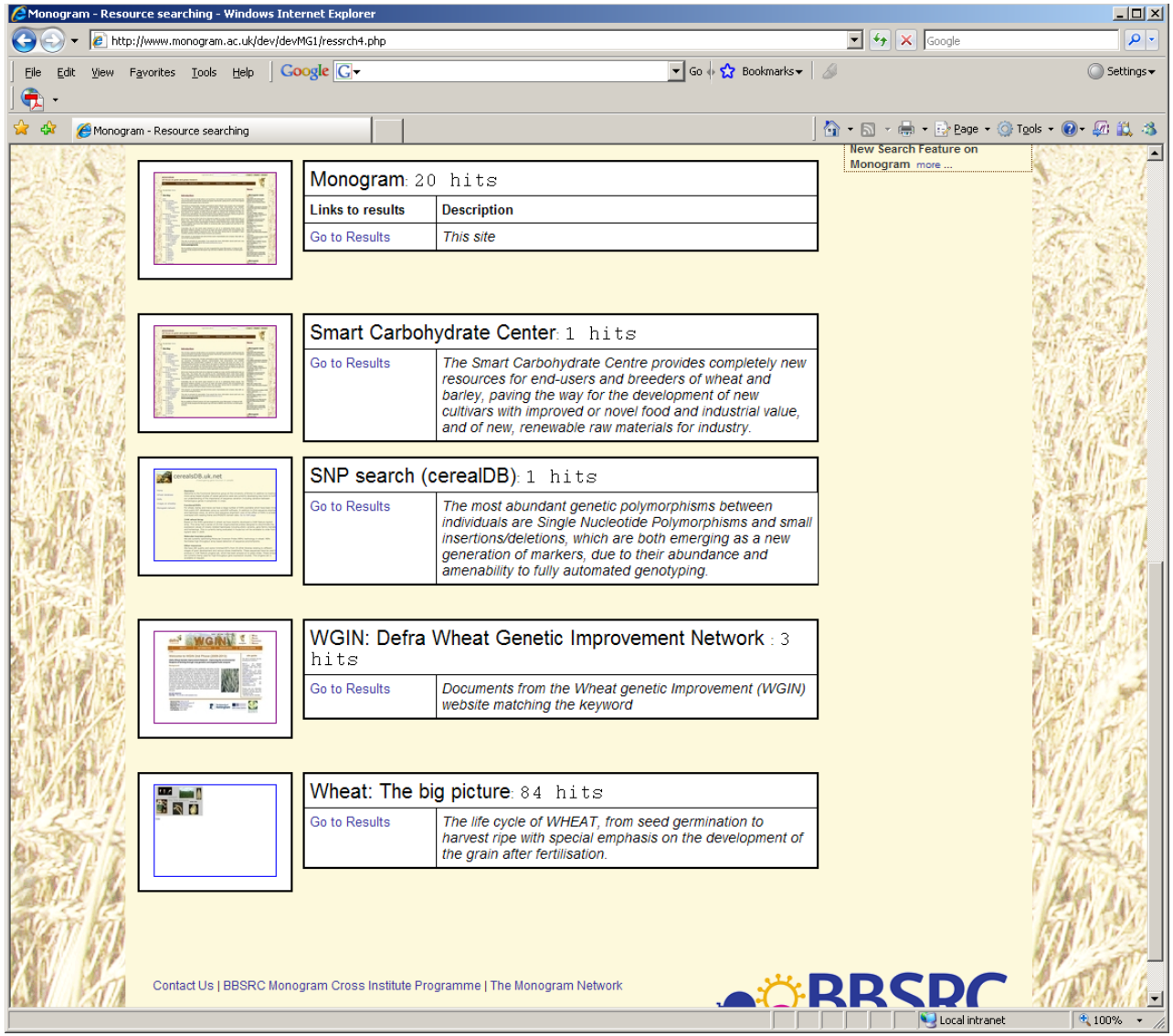
- SNPs from Bristol
- 454 wheat data
- Gbrowse
- Revised Resource centric web

FUTURE: Resource centered

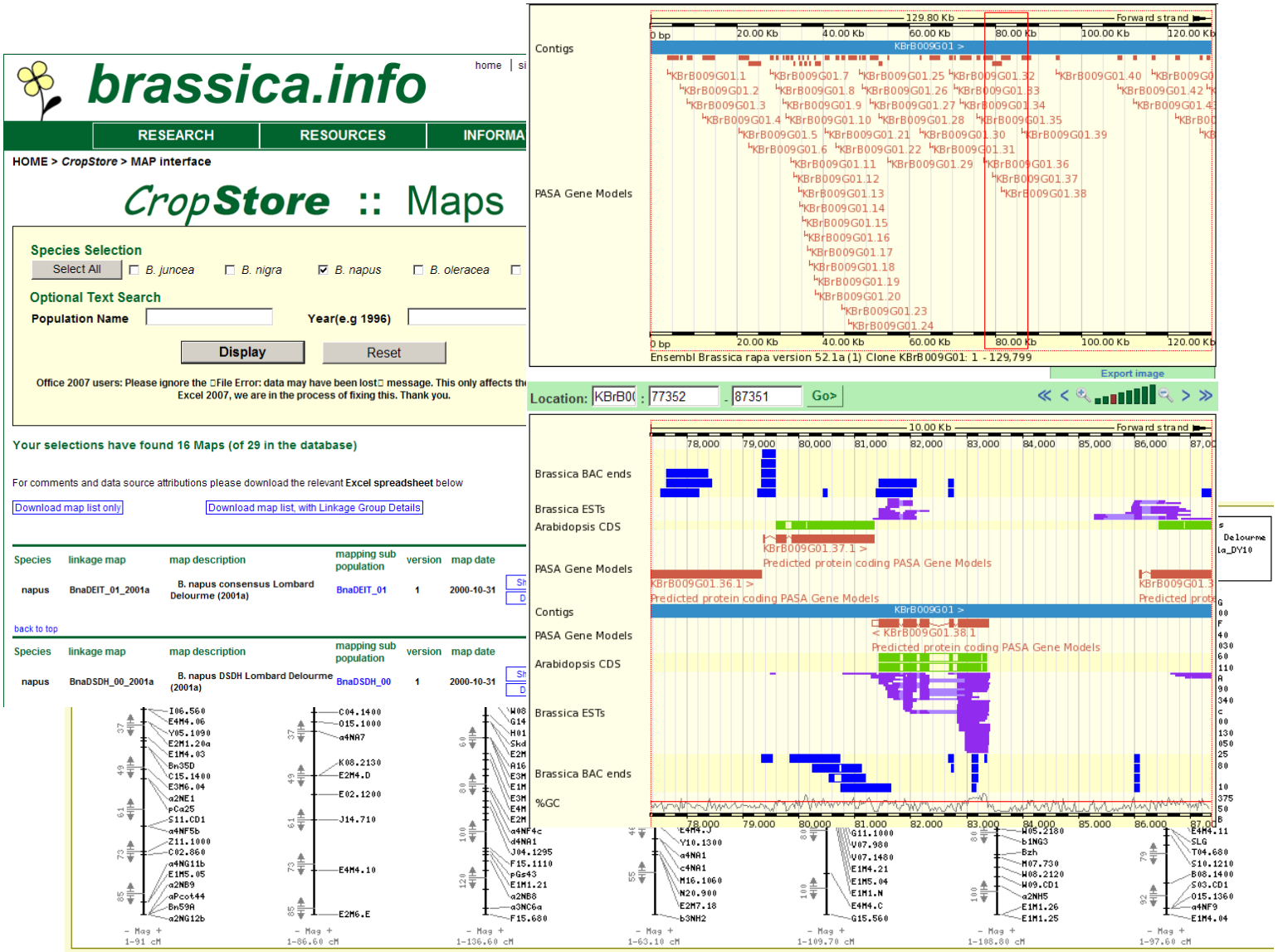
- Consortium → resources
- New Menu:



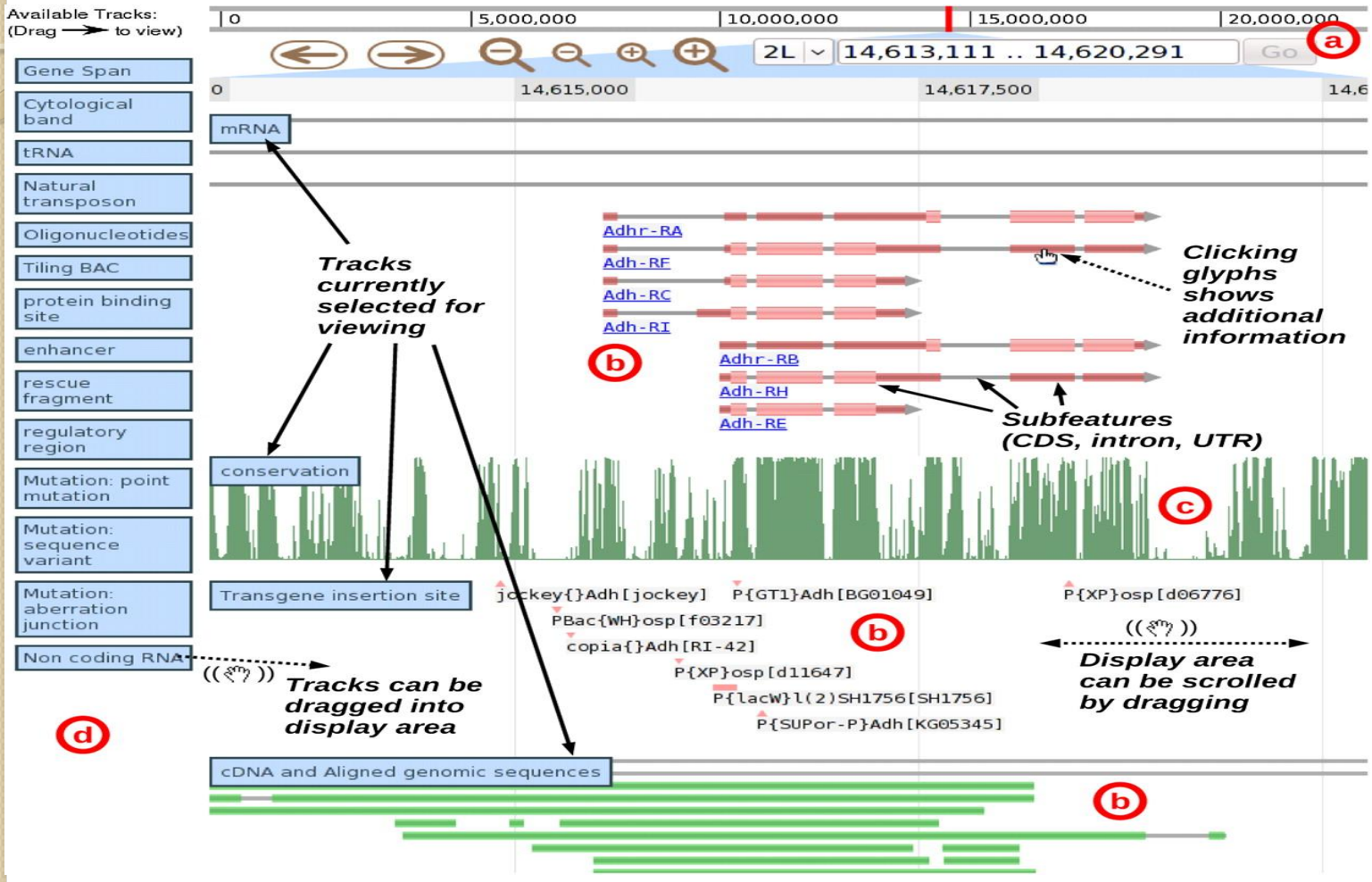

Monogram - Resource searching - Windows Internet Explorer
http://www.monogram.ac.uk/dev/devMG1/ressrch4.php
Monogram - Resource searching
Logged in user <Paul Verrier(System Administrator)>
MONOGRAM [dev/devMG1]
UK focus on grain and grass research
Search the site:
Go!
Home
Networking
Working groups
Resources
MG Sites
Information
You are here: Search > Parallel-Search >
Parallel Resource Search
enabled by the BBR project: A community resource for wheat functional genomics
This uses your supplied search query string to search in multiple resources available to the Monogram Network
(note: still in development).
example: pollen, endosperm, AL825571
Currently the search uses the whole word or phrase only. More advanced searches will come as the system develops.
query : grain
Search
cerealsDB: 18 hits
Links to results
Description
Go to Results
Investigating gene function in cereals
JIC-Germ: 6 hits
Go to Results
Wheat Germplasm held at John Innes Center
JIC: Wheat pedigree data : 5 hits
Go to Results
BBSRC Wheat Collection Pedigree Report
News
Monogram news
19/10/2009 NEW
Quantitative Methods in Plant Breeding, March 2010. more ...
12/10/2009 NEW
Monogram Development Officer Position more ...
23/09/2009
2010 MONOGRAM Network Workshop more ...
03/09/2009
Eucarpia Cereal Section Flyer more ...
24/08/2009
Need help from a Mathematician? Bring your problem to the Plant Science Study Group more ...
14/08/2009
The Bristol Agilent wheat homoeologous array design is now public more ...
29/07/2009
Important note about extra deletions in some of the Kansas wheat deletion lines more ...
Monogram Vacancies
07/10/2009 NEW
Monogram Development Officer more ...
14/08/2009
SCRI - MOLECULAR GENETICIST/INFORMATICIST more ...
Monogram web updates
14/08/2009
Done
Local intranet
100%


Monogram - Resource searching - Windows Internet Explorer
http://www.monogram.ac.uk/dev/devMG1/ressrch4.php
Monogram - Resource searching
New Search Feature on Monogram more ...
Monogram: 20 hits
Links to results
Description
Go to Results
This site
Smart Carbohydrate Center: 1 hits
Go to Results
The Smart Carbohydrate Centre provides completely new resources for end-users and breeders of wheat and barley, paving the way for the development of new cultivars with improved or novel food and industrial value, and of new, renewable raw materials for industry.
SNP search (cerealDB): 1 hits
Go to Results
The most abundant genetic polymorphisms between individuals are Single Nucleotide Polymorphisms and small insertions/deletions, which are both emerging as a new generation of markers, due to their abundance and amenability to fully automated genotyping.
WGIN: Defra Wheat Genetic Improvement Network : 3 hits
Go to Results
Documents from the Wheat genetic Improvement (WGIN) website matching the keyword
Wheat: The big picture: 84 hits
Go to Results
The life cycle of WHEAT, from seed germination to harvest ripe with special emphasis on the development of the grain after fertilisation.
Contact Us | BBSRC Monogram Cross Institute Programme | The Monogram Network
BBSRC
Local intranet
100%

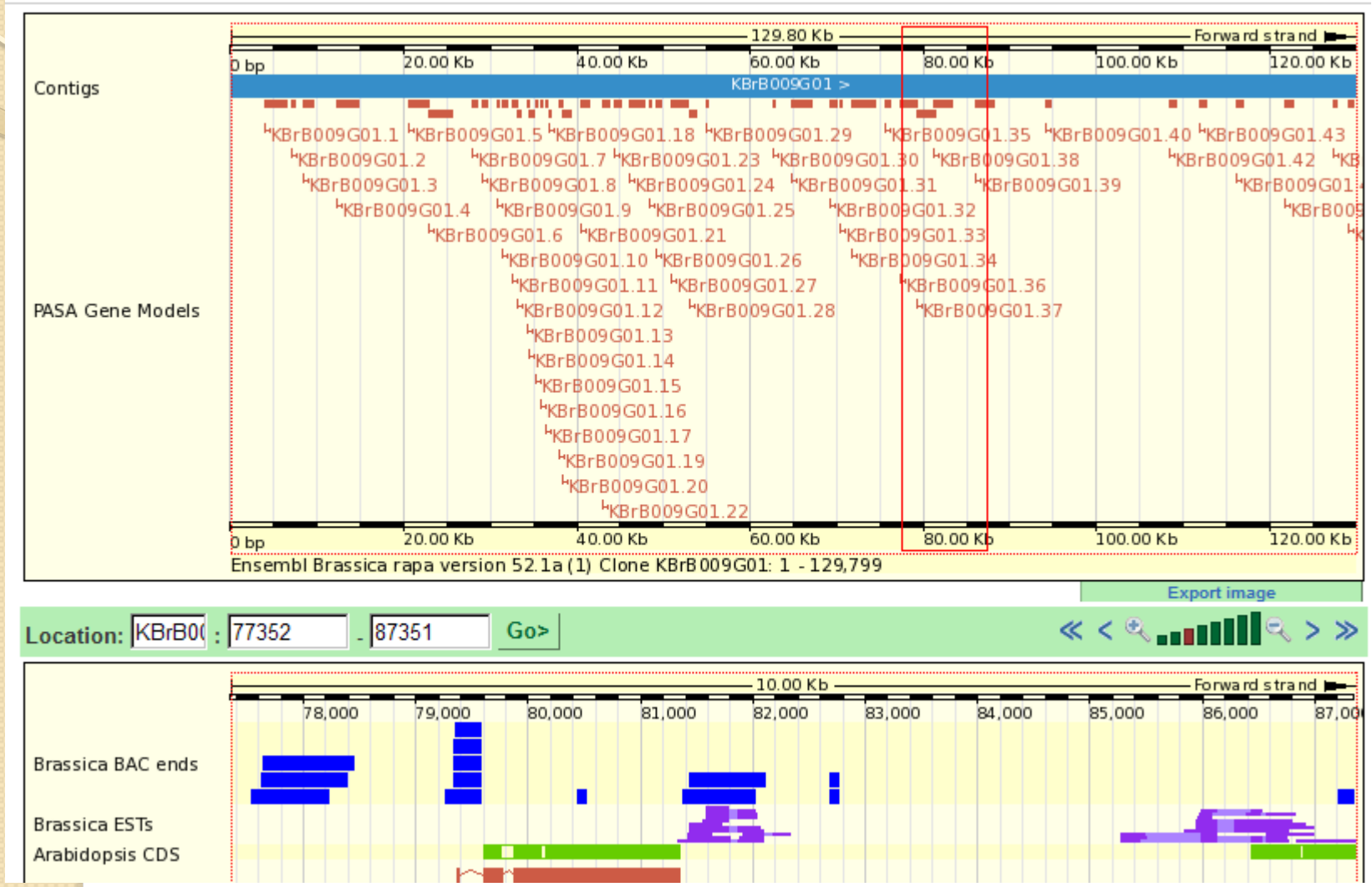
Brassica tools into Wheat tools



Jbrowse vs GBrowse



Future: wheat Ensembl?



Aknowledgments

- Bristol
  - Gary Barker (who supplied many of the slides)
  - Keith Edwards
- Rothamsted
  - Nathalie Castells
  - Chris Love
- The Community
  - Adding items to Monogram Web
  - Enabling searches to resources