Visualization, Tools, and Resources for Wheat at GrainGenes

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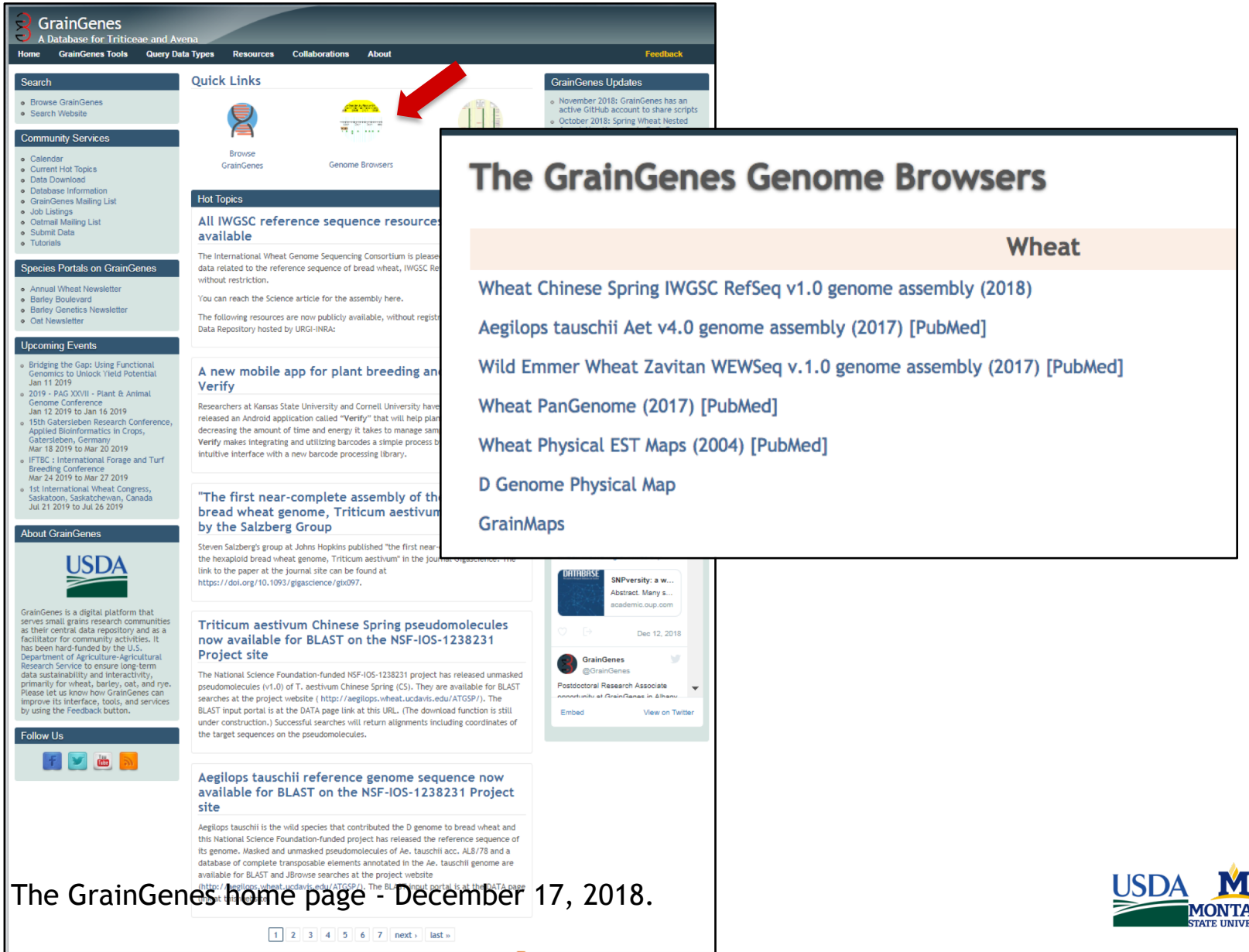
IWGSC data in GrainGenes



The GrainGenes home page - December 17, 2018.

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Wheat Chinese Spring IWGSC RefSeq v1.0 genome assembly (2018)

SNP leaf rust response

Primary Data

Name	leaf rust response
Type	SNP
Score	0.00435157240824644
Description	Excalibur_c20133_87
Position	chr1A:298037397..298037397
Length	1 bp

Attributes

Description	Excalibur_c20133_87
Gwas	Excalibur_c20133_87
Id	Excalibur_c20133_87
Marker	Excalibur_c20133_87
Phenotype_trial	AMPanel_LR_2012_StPaul
Pvalue	0.00435157240824644
Qvalue	0.382616433860993
Seq_id	chr1A
Source	rrBLUP
Trait	leaf rust response

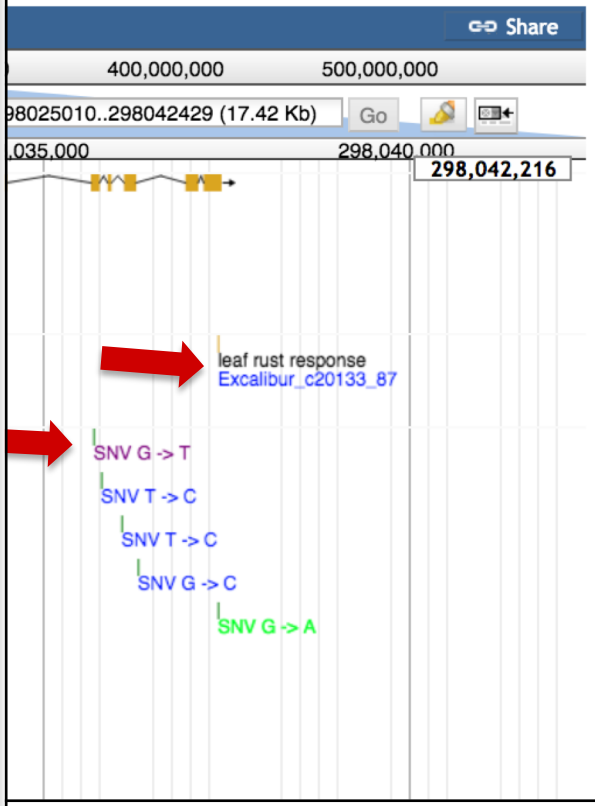
Region sequence

FASTA

```
>chr1A chr1A:298037397..298037397 class=SNP length=1
G
```

OK

der THE TORONTO AGREEMENT and their analysis cannot be



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SNP leaf rust response

Primary Data

Name	leaf rust response
Type	SNP
Score	
Descriptio	
Position	
Length	

Attributes

Description	
Gwas	
Id	
Ma	
Phe	
Pva	
Qva	
Sec	
Sou	
Tra	
Reg	

T3/Wheat

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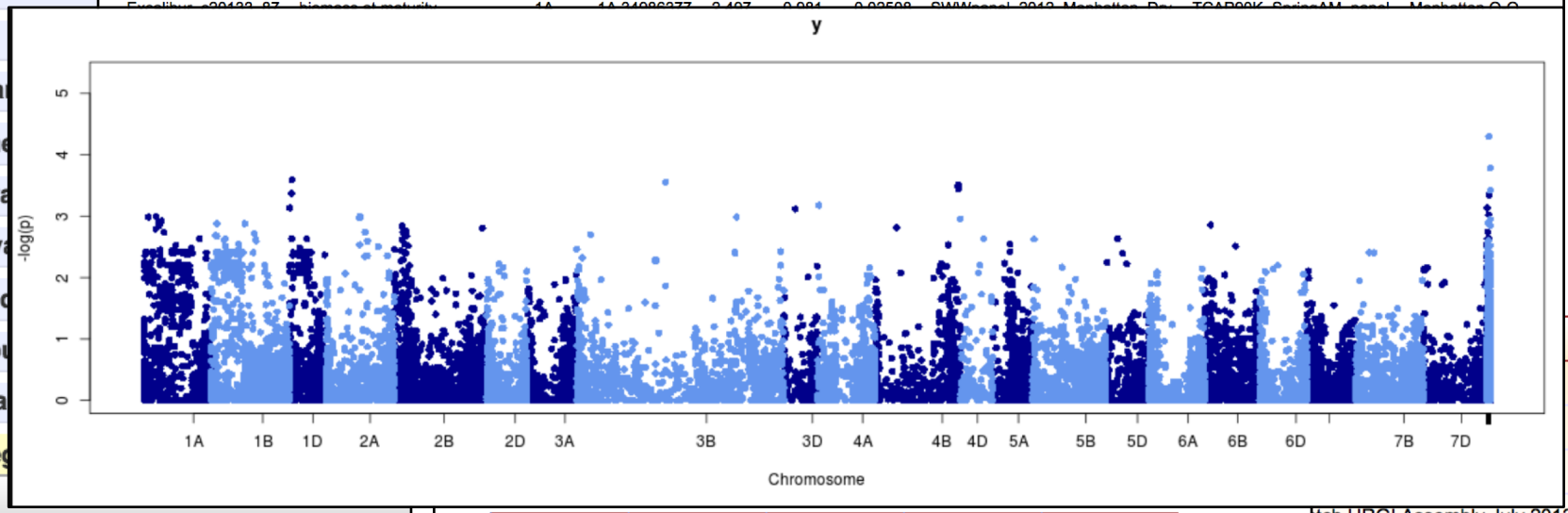
Links to T3 from SNPs found via GWAS (triticeaetoolbox.org/wheat)

GWAS Results

marker name = Excalibur_c20133_87

marker	phenotype	chrom	pos	z-score	q-value	p-value	phenotype trial	genotype trial	plot
Excalibur_c20133_87	leaf rust severity	1A	1A 34986377	2.741	0.720	0.01225	AMPanel_LR_2012_StPaul	TCAP90K_LeafRustPanel	Manhattan Q-Q
Excalibur_c20133_87	leaf rust response	1A	1A 34986377	3.065	0.383	0.00435	AMPanel_LR_2012_StPaul	TCAP90K_LeafR	Manhattan Q-Q
Excalibur_c20133_87	flag leaf chlorophyll content	1A	1A 34986377	2.496	0.984	0.02513	SW-AMPanel_2014_Davis_Dry	TCAP90K_SpringAM_panel	Manhattan Q-Q
Excalibur_c20133_87	days to flag leaf senescence	1A	1A 34986377	2.404	0.846	0.03243	SW-AMPanel_2012_Bozeman	TCAP90K_SpringAM_panel	Manhattan Q-Q
Excalibur_c20133_87	seeds per head	1A	1A 34986377	2.618	0.954	0.01769	SW-AMPanel_2013_Huntley	TCAP90K_SpringAM_panel	Manhattan Q-Q
Excalibur_c20133_87	seeds per head	1A	1A 34986377	2.379	0.943	0.03469	SW-AMPanel_2014_Imperial_Irr	TCAP90K_SpringAM_panel	Manhattan Q-Q



>chr1A chr1A:298037397..2980
G

tch URGI Assembly July 2013

Line Name	GRIN Accession	Leaf Rust Severity (%)	Leaf Rust Response (0-1)	Check
THATCHER	PI 168659	70.0	1.0	1
RL6003	GSTR 401	70.0	1.0	0
RL6016	GSTR 403	50.0	1.0	0

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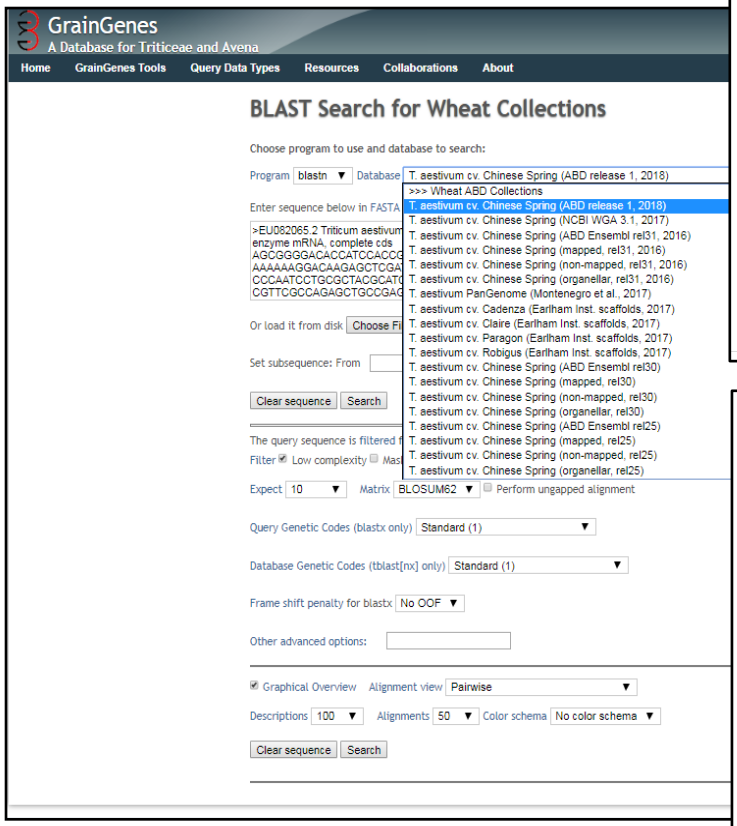
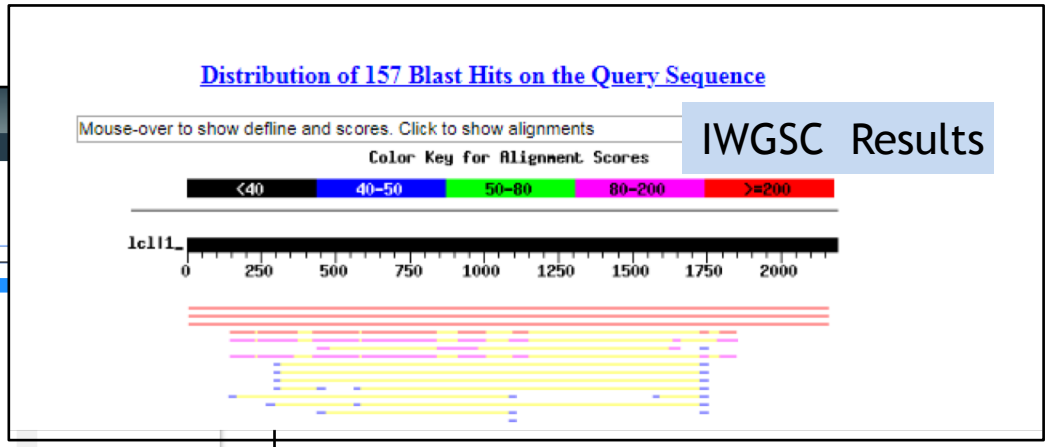
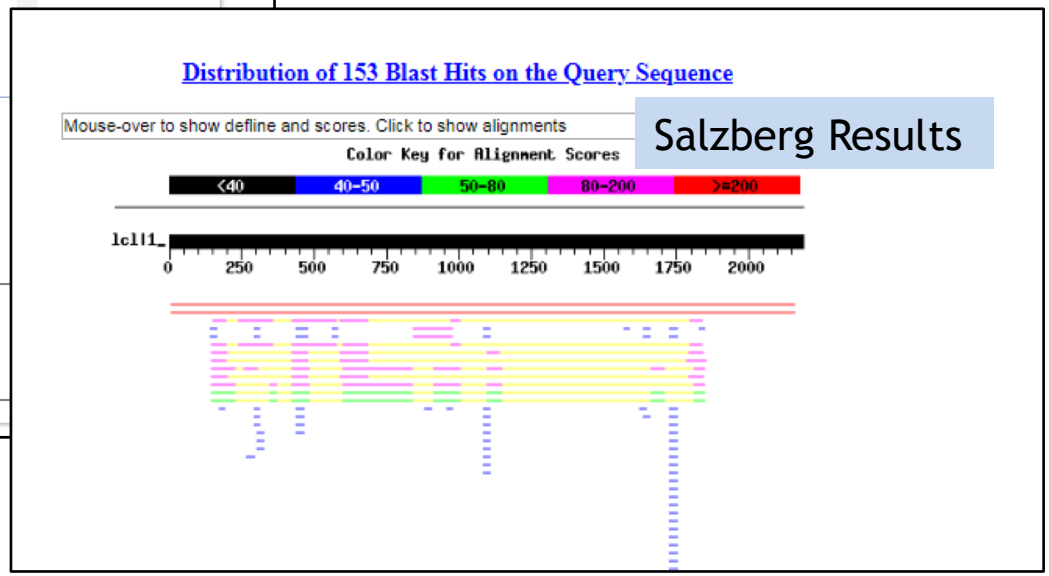
In the works … ‘BLAST-able’ JBrowse





IWGSC Results



Salzberg Results

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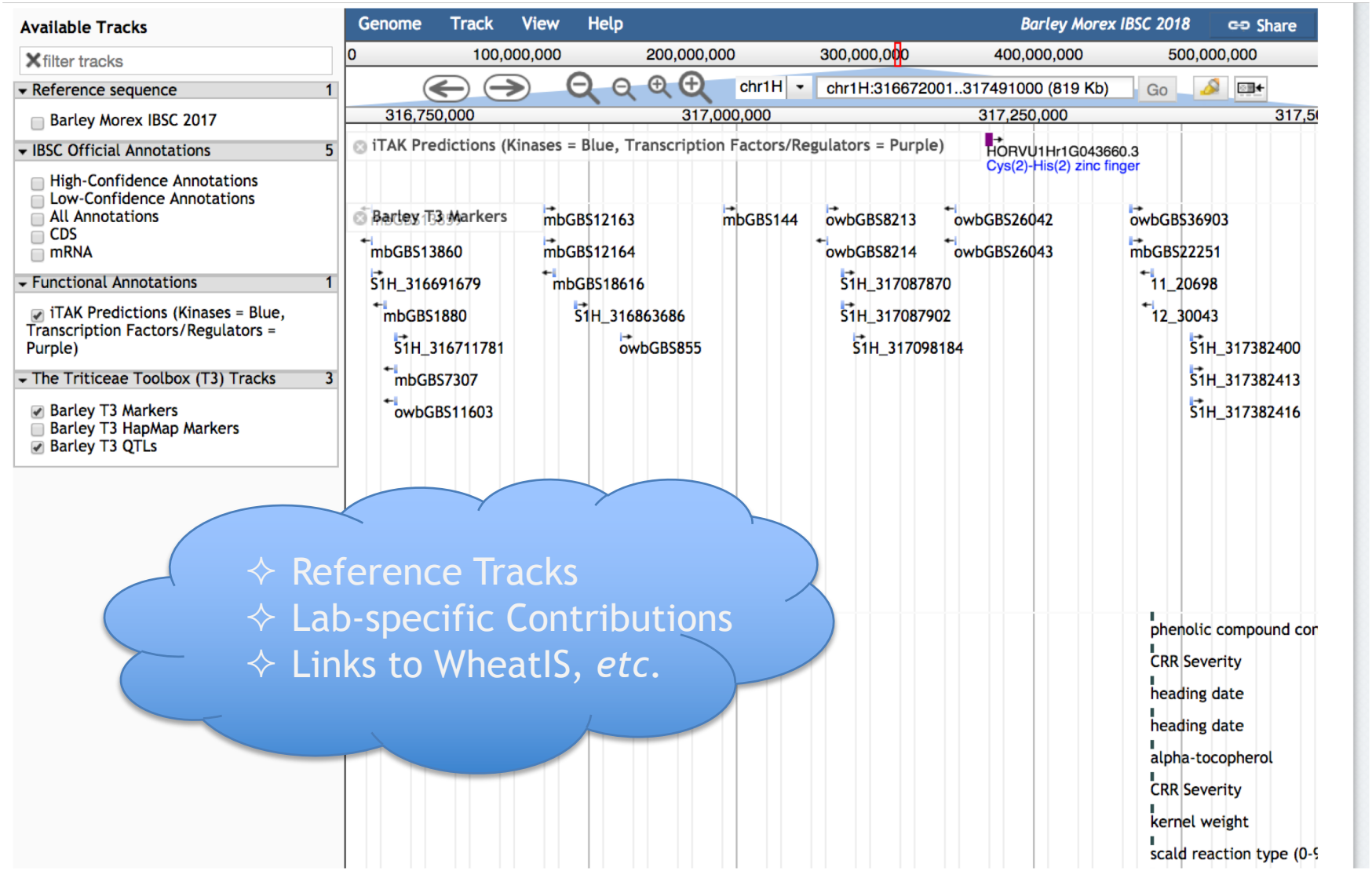
In the works … curated tracks



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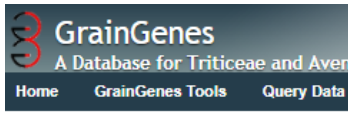
In the works … annotations in the SQL database



GrainGenes Class Browser

Query (optional)

Results: 3522189 Records in 29 Classes

Class	Records
Allele	9063
Assembly	5
Author	24501
Colleague	2638
Collection	291
Gene	5837
Gene Class	554
Gene Product	6270
Germplasm	39754
Image	2387
Journal	1224
Keyword	22378
Library	93
Locus	318131
Map	3063
Map Data	257
Marker	142729
Pathology	454
Polymorphism	3099
Probe	234542
Protein	32636
QTL	2234
Rearrangement	838
Reference	15029
Sequence	2645748
Species	1987
Trait	285
Trait Study	5563
Two Point Data	599

PAG 2018

Results: 4220460 Records in 29 Classes

Class	Records
Allele	9063
Assembly	5
Author	25039
Colleague	2662
Collection	299
Gene	5954
Gene Class	561
Gene Product	6278
Germplasm	45521
Image	2387
Journal	1200
Keyword	22385
Library	93
Locus	885672
Map	3734
Map Data	293
Marker	142669
Pathology	454
Polymorphism	3099
Probe	318663
Protein	32636
QTL	2277
Rearrangement	838
Reference	15293
Sequence	2684910
Species	1994
Trait	287
Trait Study	5595
Two Point Data	599

PAG 2019

We've been busy!
in 2018, GrainGenes added **698,271** new records.

117 new gene records in 7 gene classes

5,767 germplasm records in 8 new collections

567,541 locus records on 671 new maps

84,121 new probe records

39,162 new sequence records

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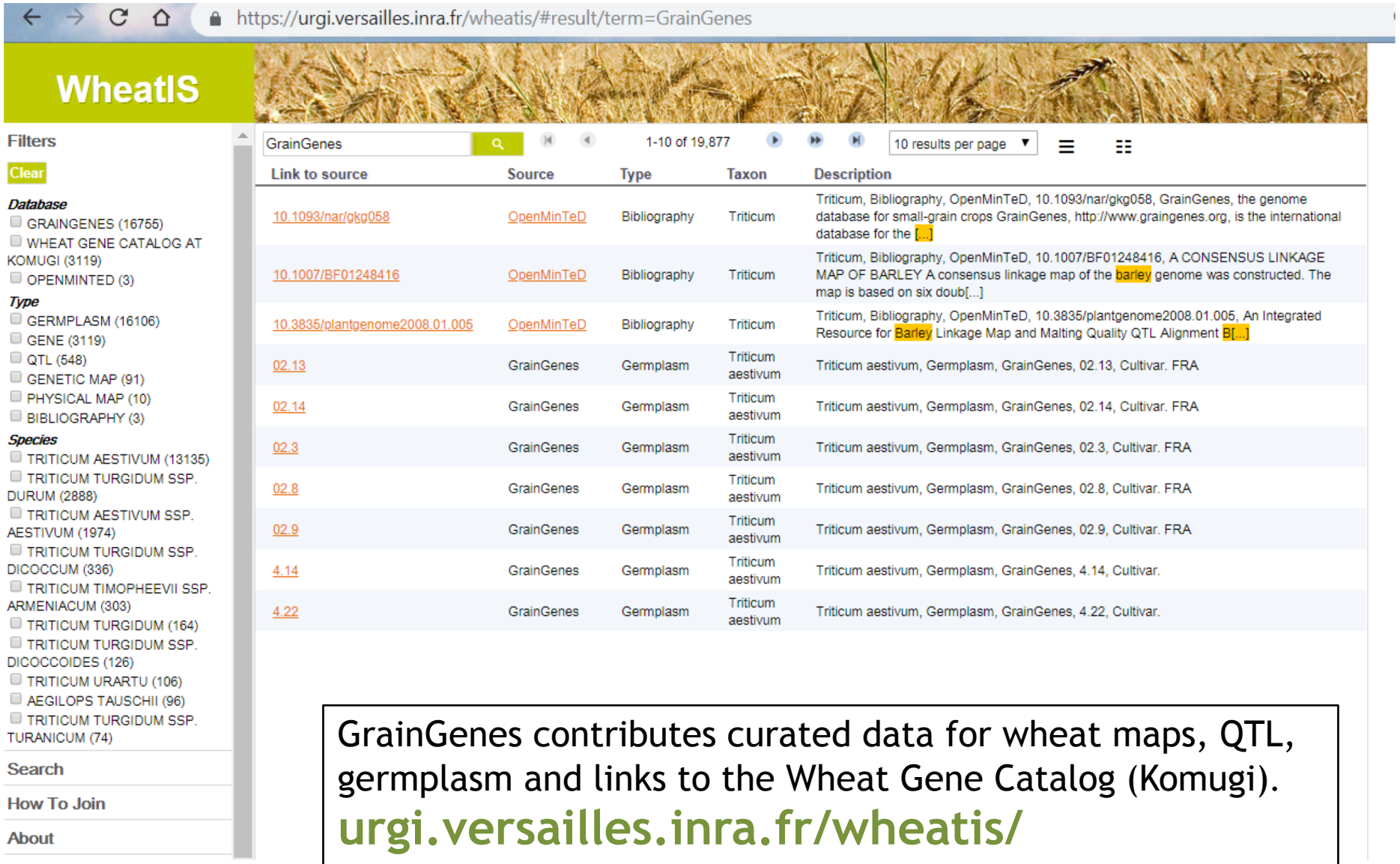
WheatIS Partnership



GrainGenes contributes curated data for wheat maps, QTL, germplasm and links to the Wheat Gene Catalog (Komugi).

urgi.versailles.inra.fr/wheatis/

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WheatIS Partnership

Vrn1

1-3 of 3 | 10 results per page

Link to source	Source	Type	Taxon	Description
vrn1	Wheat Gene Catalog at Komugi	Gene	Triticum aestivum	Triticum aestivum, Gene, Wheat Gene Catalog at Komugi, vrn1, [GrainGenes Summary] Response to Vernalization; Symbol Comment: Winter type
Vrn1	Wheat Gene Catalog at Komugi	Gene	Triticum aestivum	Triticum aestivum, Gene, Wheat Gene Catalog at Komugi, Vrn1, [GrainGenes Summary] Response to Vernalization; Symbol Comment: Spring type
Vrn-A1a	Wheat Gene Catalog at Komugi	Gene	Triticum aestivum	Triticum aestivum, Gene, Wheat Gene Catalog at Komugi, Vrn-A1a, [GrainGenes Summary] Response to Vernalization ; Comment: Cultivars possessing Vrn-A1a are insensitive to vernalization. Vrn-A1a is epistatic to other gen[...]

https://shigen.nig.ac.jp/wheat/komugi/genes/symbolDetailAction.do?symbolName=Vrn1

National BioResource Project
KOMUGI - Wheat Genetic Resources Database -

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Genome / Development

Catalogue of Gene Symbols

Database
Gene Symbols
Class list
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Search
References
Search

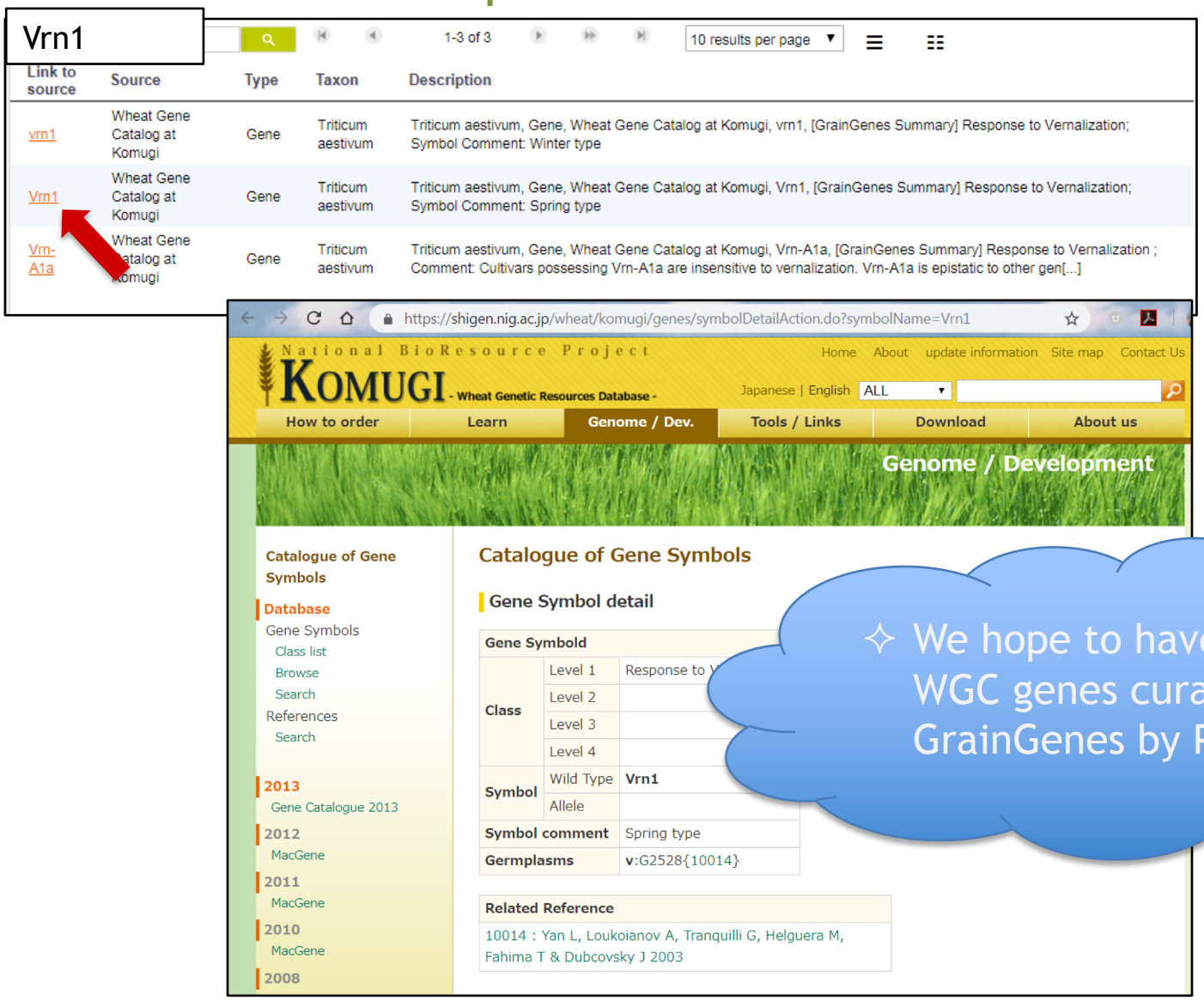
2013
Gene Catalogue 2013
2012
MacGene
2011
MacGene
2010
MacGene
2008

Catalogue of Gene Symbols

Gene Symbol detail

Gene Symbold		
Class	Level 1	Response to V
	Level 2	
	Level 3	
	Level 4	
Symbol	Wild Type	Vrn1
	Allele	
Symbol comment		Spring type
Germplasms		v:G2528{10014}

Related Reference
10014 : Yan L, Loukoianov A, Tranquilli G, Helguera M, Fahima T & Dubcovsky J 2003



✧ We hope to have all WGC genes curated in GrainGenes by PAG2020

WheatIS nodes:

transPlant-MIPS (UP):
- CrowsNest: 13324

transPlant-IPK (UP):
- CR-EST: 199220
- GEBIS: 51814
- MetaCrop: 355

UWA (UP):
- Wheat Pangenome: 167167

GrainGenes (UP):
- GrainGenes: 16755
- Wheat Gene Catalog at Komugi: 3119

Gramene-WheatIS (UP):
- Gramene: 229851

transplant-IPGPAS (UP):
- PlantPhenoDB: 3

T3 (UP):
- Triticeae Toolbox:
- ...3
- ...241077
- ...en AgroLD:
- KNetMiner: 110775
- OpenMinTeD: 3398
- WheatIS File Repository: 6

EBI (UP):
- Ensembl Plants: 2391552

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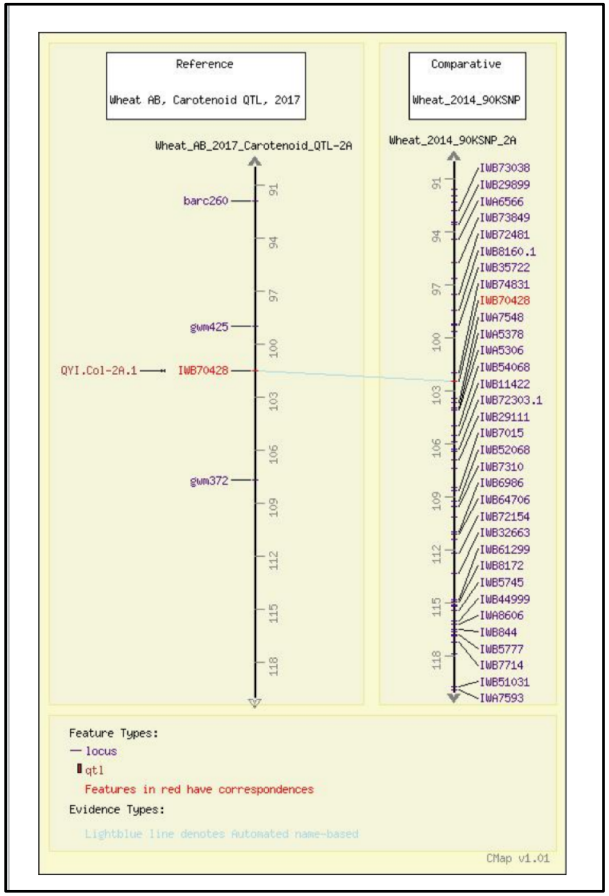
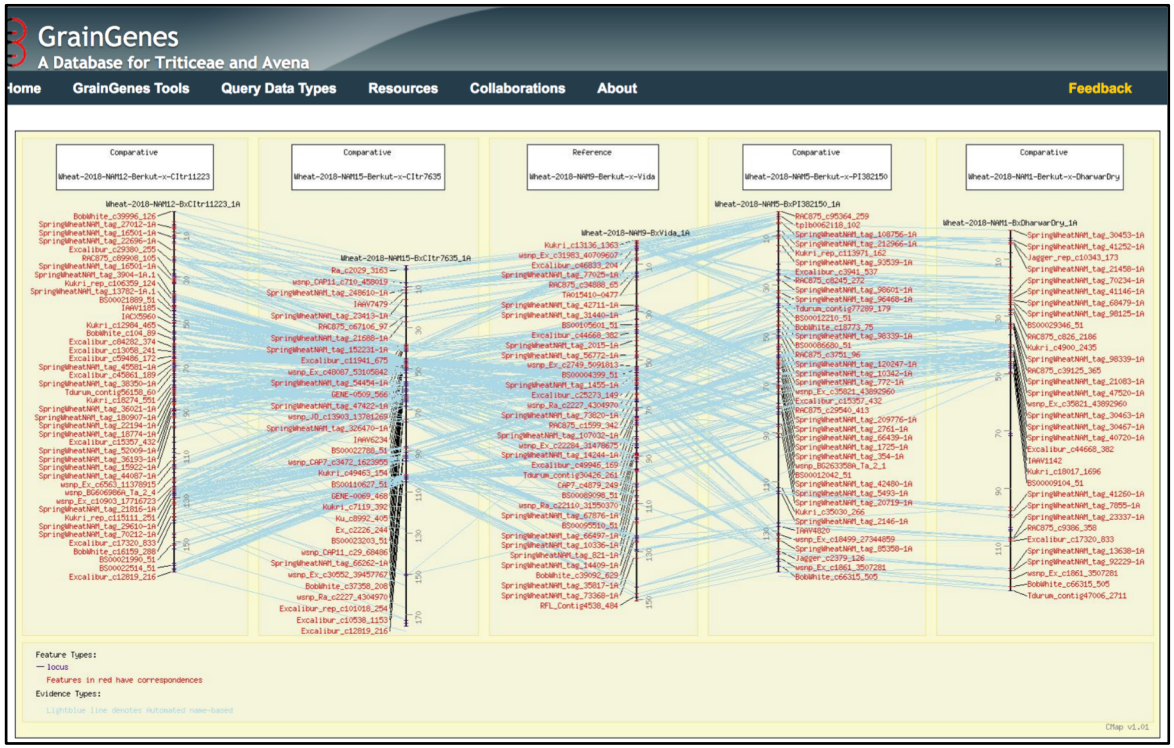
Visualizing genetic relationships with CMap



Using a densely mapped set to enrich markers around QYI.col-2A.1, a 'Grain Yellow Index' QTL mapped in durum Colasuanno *et al*. (2017)



Aligned maps from a spring wheat nested-association mapping (NAM) population with drought-tolerant Berkut as the common parent (Jordan et al. 2018)

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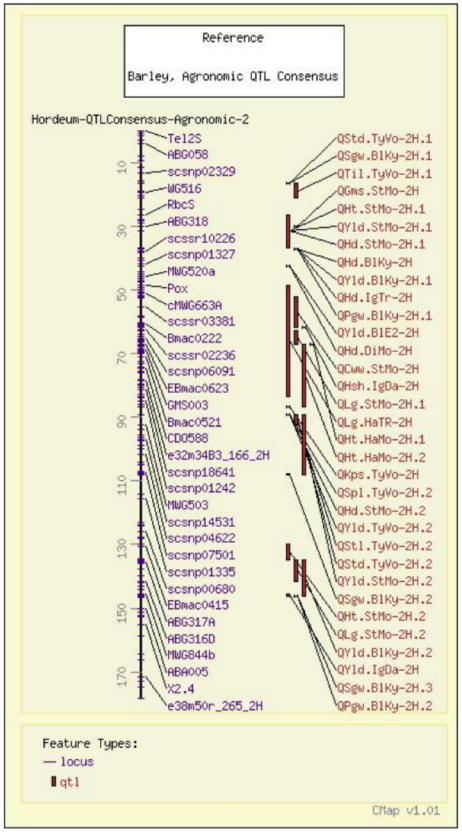
In the works ... wheat QTL data

- 2,099 durum QTL aligned to the upcoming genome release.
  - curated as both new and original published QTL name.

Name=QTL0429_ARL__TRL-Maccaferri_et_al__2016	chr1A	QArl.uboGWAS-1A
Name=QTL1511_1B-Maccaferri_et_al._2016	chr1B	QTrl.ubo-1B.1

- Basemaps for Wheat QTL mapped on recent consensus maps



2015 *T.aestivum* Consensus.
'Wheat, Yr genes and QTL'
Maccaferri *et al*.

2015 *T.durum* Consensus.
'Wheat_AB_2015_Consensus'
Maccaferri *et al*.

2014 *T.aestivum* Consensus.
'Wheat_2014_90KSNP'
Wang *et al*.

2013 *T.aestivum* Consensus.
'Wheat, 2013, 9K Consensus'
Cavanagh *et al*.

X

Abiotic Stress

Disease Resistance

Agronomic

Quality

=

16 New MapSets

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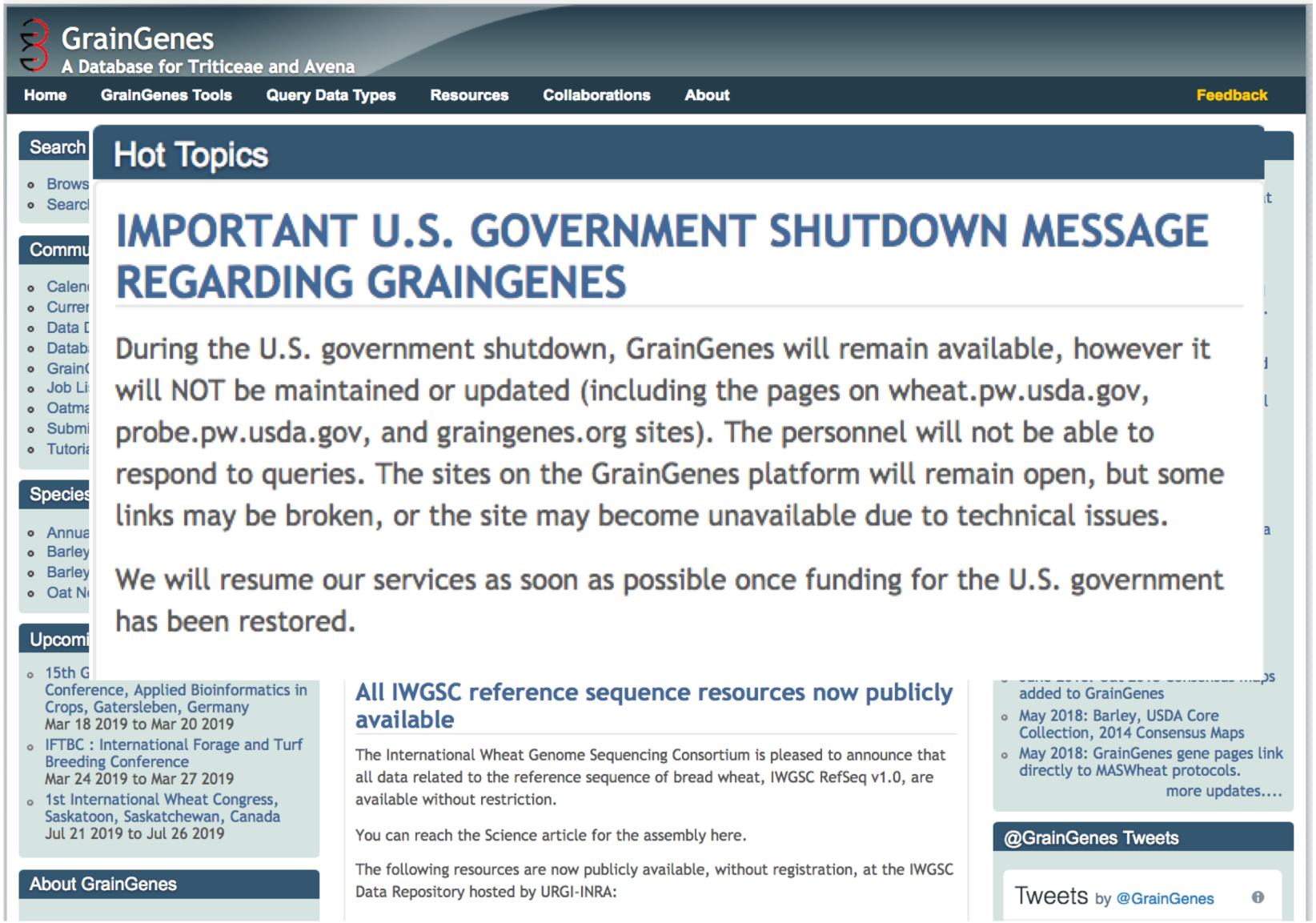
GrainGenes is still providing data and tools



The GrainGenes home page – January 14, 2019.

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