



Informatics Development at AusWheat CRC

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Coordinator of Communications, GRDC-CIMMYT suite of projects

www.wheat-research.com.au/CAGE_index.html

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AusWheat CRC (Cooperative Research Centre)

- Centre to coordinate and resource collaborative wheat R&D
- Funded by Australian government and industry
- Start 1 July 2007 for 7 years
- Core Participants:

Commercial

- GRDC
- AWB(I)
- Arnott's
- Allied Mills

Supporting participants may include:

- *Bayer Crop Science*
- *CSIRO PI*
- *Diversity Arrays Technology P/L*

Non-commercial

- Dept Primary Industries NSW
 - Dept Agriculture WA
 - *Qld Dept Primary Industry*
 - Aust. Bureau of Agricultural and Resource Economics
 - *University of Sydney*
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Research and Education Focus

- Wheat quality
 - agronomic, yield, food processing
 - Whole genome profile application
 - Finished germplasm targets
 - Rapid, small-scale quality diagnosis
 - Doubled haploid service
 - Breeder informatics
 - Development
 - Training
 - Graduate degree
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Coordination Project, CIMMYT-Australian Germplasm Evaluation (*CAGE*)

C. Johnson, R. Trethowan

- Coordinated effort; strong interaction with other projects in GRDC's suite:
 - Quarantine
 - Germplasm Evaluation
 - Database
 - Synthetics Evaluation
 - IAT
 - RDRN

 - *Clare Johnson*: information coordinator
 - *Richard Trethowan*: CIMMYT/breeder liaison coordinator (PBIC from July 2006)
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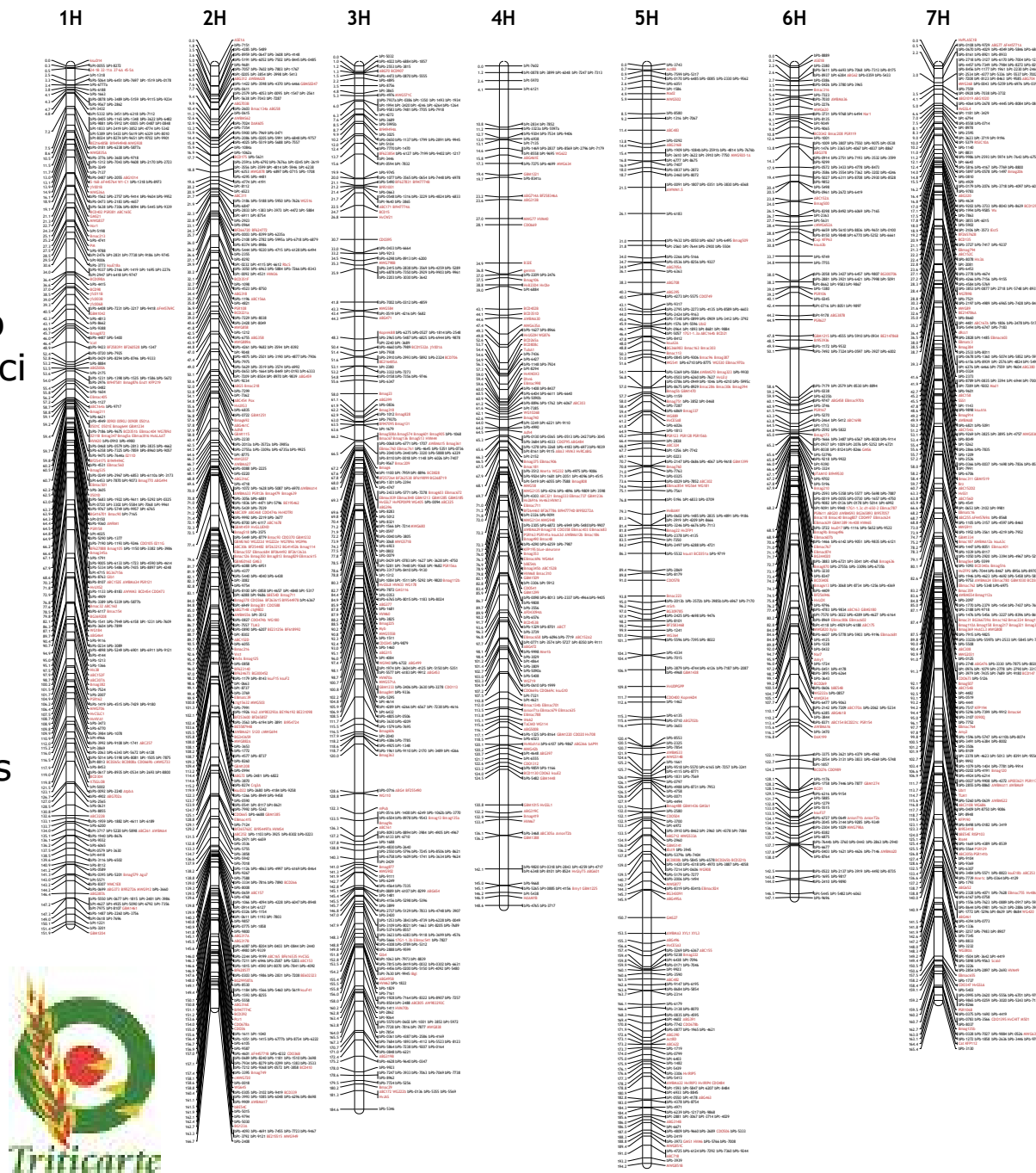
Activities: genotyping and testing

- ❑ CIMMYT historic & incoming lines to be genotyped using DArT®
 - ❑ Consolidated map of DArTs, SSRs, STMs, RFLPs gives extensive coverage and correlation to known traits
 - ❑ Existing phenotyping data from CIMMYT plus that generated in these trials to enable further marker-trait association.
 - ❑ Web database to link marker information to trial data and pedigree
 - ❑ Rich information provided to breeders by this means
 - ❑ (Limited) supplementary testing of most promising lines:
 - LMA
 - Starch quality type
 - 1B/1R
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DArT®

- High density diversity map of barley: 2,085 DArT® loci (black) + 850 SSR, RFLP and STS loci (red)
- Combined segregation data of eight populations.
- 2-3 days, not years
- Wheat map mid-2006
- Full wheat service provides 2,500 data points /sample
- 400 data point version mid-2006
- Need IT capacity to integrate with field data!





Support for ICIS / informatics development

Interested in:

- Breeding practices to maximise diversity, therefore:
 - Acknowledge multi-gene traits; adaptivity
 - Recurrent Introgressive Population Enrichment
 - Profile diversity rather than select with "perfect" markers
 - Correlate with phenotype
 - Directed/undirected data mining; cluster analysis
 - Multidimensional database/hybrid OLAP vs SQL
 - XML:
 - **distributed** web access and authoring (collaborators)
 - 'Virtual' database

 - Please discuss collaboration with me:
 - Email cjohnson@wheatcrc.com.au
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