



# 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](http://www.wheat-research.com.au/CAGE_index.html)**

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# AusWheat CRC (Cooperative Research Centre)

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- 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

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- 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*)

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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

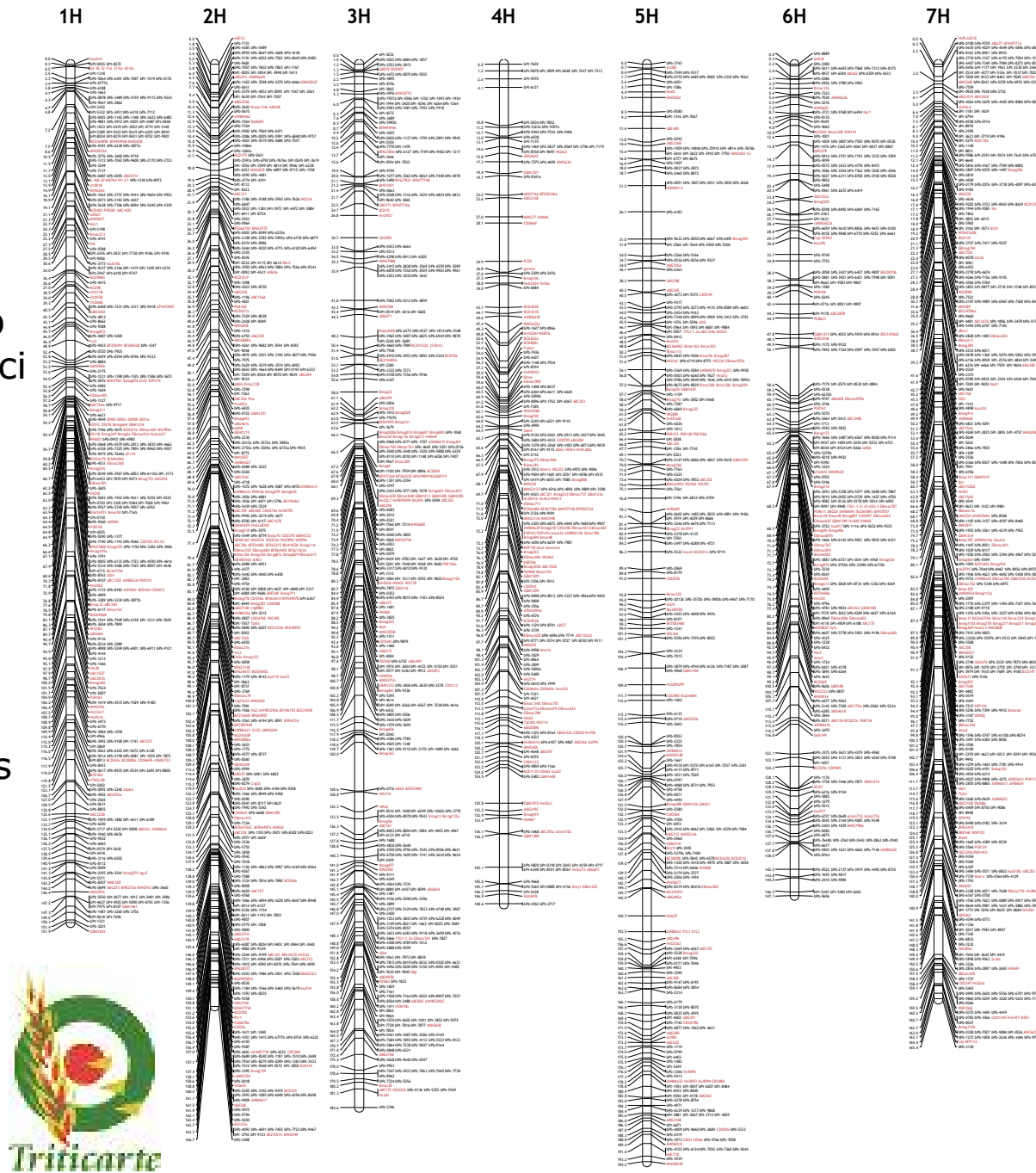
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- ❑ CIMMYT historic & incoming lines to be genotyped using DArT®
  - ❑ Consolidated map of DArTs, SSRs, STMs, RFLPs gives extensive coverage and correlation to known traits
  - ❑ Existing phenotyping data from CIMMYT plus that generated in these trials 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

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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](mailto:cjohnson@wheatcrc.com.au)
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