

Sub Programme 2

ARM: Wrap up



Key observations

- **Excellent progress**
- **Brilliant science**
- **Application oriented**
- **Highly integrated with other SPs**
- **Linkages within non-GCP projects**
- **Maximized synergy**
- **Moving ahead!**



Genetic and genomic resources...

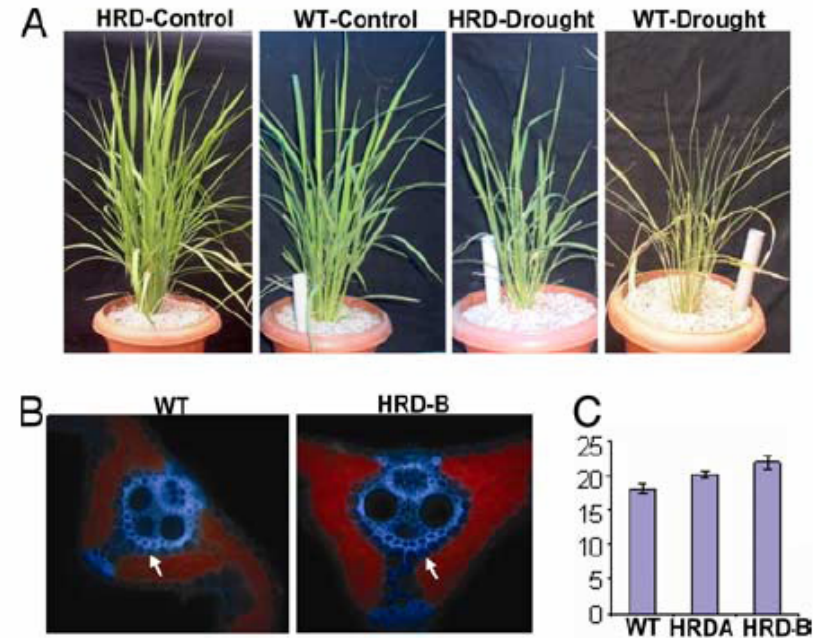
Genetic resources



- **Mutant populations:** rice, bean, potato
- **Application**
 - over expression of *HRD* provides non-stunted but high WUE
 - comparative biology

PNAS 2007

Improvement of water use efficiency in rice by expression of *HARDY*, an *Arabidopsis* drought and salt tolerance gene



HRD overexpression (control) and water ion of WT and *HRD* scope, revealing rec unded by the bundle

Andy Pereira

Genomic resources



- **Musa genomics**- 41 BACs sequenced (Sasaki)
- **Basic genomic resource development**
 - some progress in less studied species
(Hearne, Hash)
- **Legume genomics**
 - NSF project on legume genomic resource development and comparative genomics (Cook)
 - EU-GLIP project on comparative and functional genomics (Ellis)
 - Tropical Legumes I (GCP)
 - Linkages with Tropical Legume II (BMGF)



Comparative maps and gene cloning

Cloning of genes



- **Cloning project of Al gene in sorghum**
(Kochian/ Magalhaes)
 - markers for breeding
 - comparative biology
 - *new project* (uptake by SP3)

nature
genetics

A gene in the multidrug and toxic compound extrusion (MATE) family confers aluminum tolerance in sorghum

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Cloning of genes/tools



- **Cloning of *Pup1* and *Saltol*** (Ismail)
 - SSR, gene specific, SFP markers
 - *new* project

- **Comparative genomics tools**
 - GOST (Conte/Rouard)
 - *Fuzzy Blast* (Baumann)



Gene discovery/assignment of gene pathways....

Gene discovery



- **Profiling of stress transcriptome** (Agilent 22K and Hi Affymetrix)- GBrowse; integration with QTL data (Kikuchi/Mau/Leung)
- **Non-host specific genes** and comparative transcriptome in maize and wheat (Boyd)
- **Allelic imbalance** showed *cis-acting* variation a common phenomenon in barley (Baum)
- **Expression analysis tools** and databases (Leung/Mau)

Gene pathways



- **Grain formation project:**
 - anther transcriptome and metabolome
 - cellulose synth., ABA 8'-hydroxylase genes, CW invertase (Bennett)
- **Disease QTL project:**
 - NILs for northern/ southern leaf blight in maize (Nelson)
- **Growth maintenance under water deficit in maize wheat:**
 - modelling combined with transcript and genetics data (Tardieu)

Looking forward....

genomic
resources

comparative
genomics

Developing

Use of tools/
approaches;
ref maps, AB-QTL
Introgression

-Gene discovery,
-Validation and
assignment of
gene pathways,
-omics approaches
reverse genetics

***More emphasis on
drought tolerance....***

e.g. lentil,
yam, pigeonpea,
sweet potato

e.g. chickpea,
common bean,
sorghum

e.g. rice,
maize, wheat,
barley

GCR
crops

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- **Peter Langridge and RAP panel**
- **GCP/SP2 community**
- **GCP Secretariat**



***Together we can make
a BIG difference and
deliver to the resource-
poor farmers for whom
GCP (we all) is working!***