China National Rice Research Institute

RICE RESEARCH & DEVELOPMENT IN CHINA (2016-2020)

Dr. Shihua Cheng

Director General, CNRRI

Central Park Hotel Songdo Seoul, 25 October 2016

Outline

- Rice research and development priorities
- Rice research and development challenges
- Priorities for Collaboration with IRRI and/or Other Partners

1. Rice Germplasm Resources (RGR) Research and New Important Gene Discovery

- **Identification and evaluation of RGR**
- **Development of identification and evaluation techniques for RGR**
- **Research on genomics, proteomics and metabolomics for RGR linked to important agricultural traits including yield, quality, biotic and abiotic factors**

2. Innovation of Key Breeding Techniques and Breakthrough Breeding materials

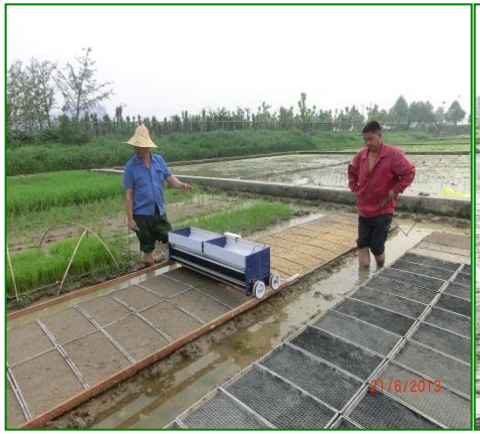
- Improve phenotype – genotype identification to establish high efficiency MAS technology
- Establish a large-scale functional gene discovery, screening & polymerization platform to breakthrough new materials

ALK, Science in
qGC6, TAG. 2011
China, 2003
DU1, Plant Mol Biol. 2
SDG714, Plant Cell. 20
GIF1, Nat Genet. 2008
Fon4, Plant Physiol. 20
REP1, Plant Physiol. 2
LH2, Cell Res. 2006
EG1, Plant J. 2009
IBF1, Theor Appl Gene
NAL1, Plant Physiol. 2
NL1, Cell Res. 2009
SLL1, Plant Cell. 2009
LC2, Cell Res. 2010
NRL1, Plant Mol Biol.
ZEBRA2, Plant Mol Bi
NLS1, Plant J. 2011
LAZY1, Cell Res.
2007
GDD1, Plant
D88, Plant Mol Biol. 2
Cell.2011
D27, Plant Cell. 2009
DLT, Plant J. 2009;Plant Cell.2012
OsPTF1, *Plant P.*2005

LAX2, *Plant Cell*. 2011
GH2, *Plant Physiol*. 2006
PHR1, *Plant Cell*. 2008
OsCH1, *Planta*. 2012
GN1, Science, 2005
GW8, *Nat.Genet*, 2012
PHS, Plant J. 2008
DEP1, Nat. Genet. 2009
SP1, Plant J. 2009
EUI1, *Plant Cell Physiol*. 2006;
Plant Cell. 2006
SUI1, *Plant Mol Biol*. 2011
OsWRKY03, Cell Res. 2005
BC1, *Plant Cell*, 2003
BC10, *Plant J*. 2009
BC12, *Plant J*. 2010
BC14, *PNAS*, 2011
MOC1, *Nature*. 2003
IPA1, *Nat Genet*. 2010
TAD1, *Nat Commun*. 2012

3. Breeding of high-yield, superior quality, multi-resistance, wide adaptability, suitable for mechanization transplanting or direct seeding cultivation varieties

4. Development of sustainable, low-cost, high economic cultivation technology including two-decrease one-increase, full- mechanization, Intelligence & information production, high resource use efficiency etc.

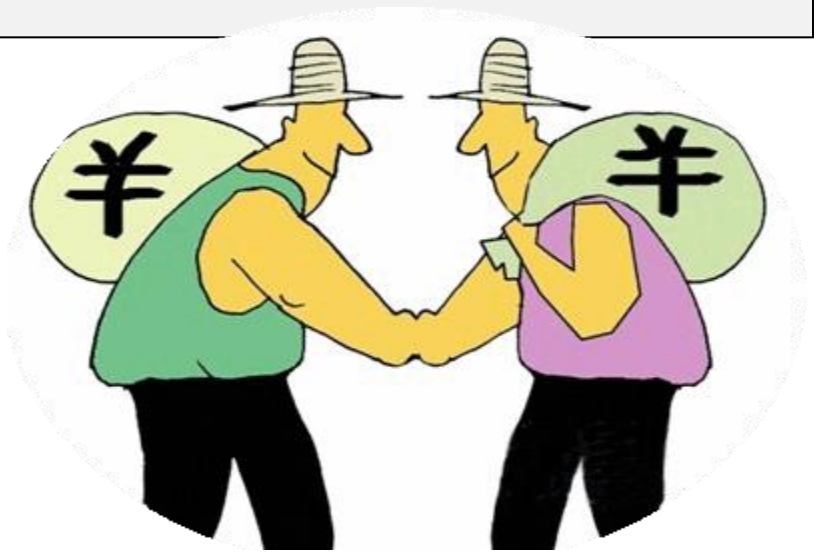



5. Research of integrated plant protection prevention and control technology including establishment of monitoring, early-warning system and diagnosis platform, new biological pesticide etc.

6. High value-chain adding and safety control monitoring as improving the added value of rice processing & comprehensive utilization level

Priorities at Farm Level

- ✓ Intensive land use to realize large-scale rice production
- ✓ Mechanization transplanting and direct seeding cultivation technologies application, ICT service platform and facility
- ✓ Transfer of new varieties, technologies and equipment including demonstration, training and service



1. Germplasm Resources

- Lack of breakthrough germplasm resources for breeding use since 1990S
- Low RGR use rate for breeding

2. Breeding Technology

- Functional genomics research and breeding practice separated, few cloned genes used in rice breeding
- Lack of breakthrough varieties

3. Cultivation Technology

- Existing varieties are not well adapted to simple easy operation cultivation system;
- Disconnection of seed, cultivation, plant protection, soil, fertilizer technology
- Application difficulty of full-mechanization matching technology

4. Knowledge Transfer

- Farmer aging and low education level
- Extensive production management

1. Functional genomics of important agronomic traits

- **Genetic and molecular mechanisms of important agronomic traits of rice**
- **Establish high-efficient rice molecular breeding program**

2. Application of hybrid rice technology out of China

3. Human resources exchange and training MS and Ph.D. students in rice research and development

Thank you !