

IRRI

INTERNATIONAL RICE RESEARCH INSTITUTE

Update from inbred irrigated breeding program

Bert Collard

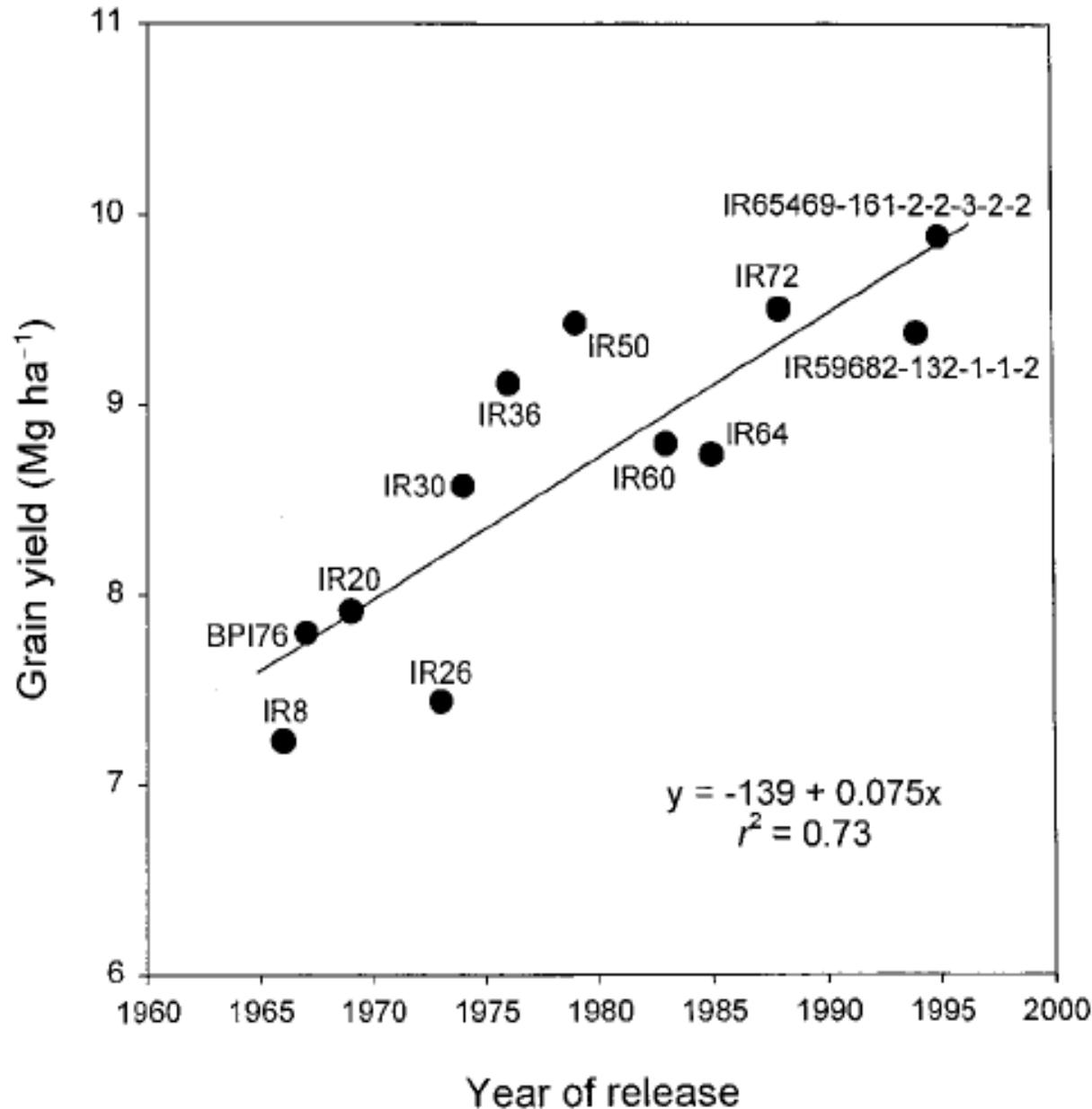
Irrigated breeder for SE Asia

Rice
Science
for a Better
World





Increasing the rate of genetic gain in rice



Annual gain in
rice yield =
~1% yield
increase/year

Peng et al (1999).
Crop Science 39: 1552-1559.

***This must
improve to meet
projected
increased rice
demands!***



New Gates Foundation project:

BILL & MELINDA
GATES foundation

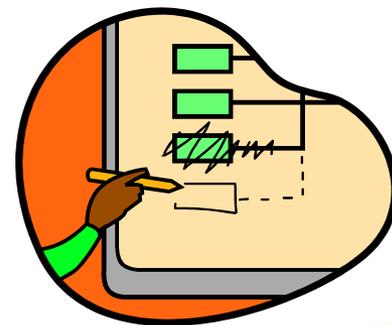
Transforming Rice Breeding (TRB)

- US \$12.5 million – 5 years
- Focus on IRRI's **irrigated** pipelines + cross-cutting activities
- Emphasis on **irrigated rice** South Asia (India & Bangladesh) – US \$2.5 million
- Starting in 2014



IRRI irrigated breeding program has been completely re-designed

- ✓ New PBGB structure and systems
- ✓ Improved cost efficiency
- ✓ Quicker breeding cycle
- ✓ Exploit new technologies and methods





IRRI VARIETY DEVELOPMENT PIPELINES

IRRIGATED LOWLANDS

IRRIGATED RICE SE-ASIA



IRRIGATED RICE SOUTH ASIA



HYBRID RICE



RAINFED LOWLANDS

RAINFED RICE SE-ASIA



RAINFED RICE SOUTH ASIA



AFRICA

RAINFED / IRRIGATED RICE ES-A

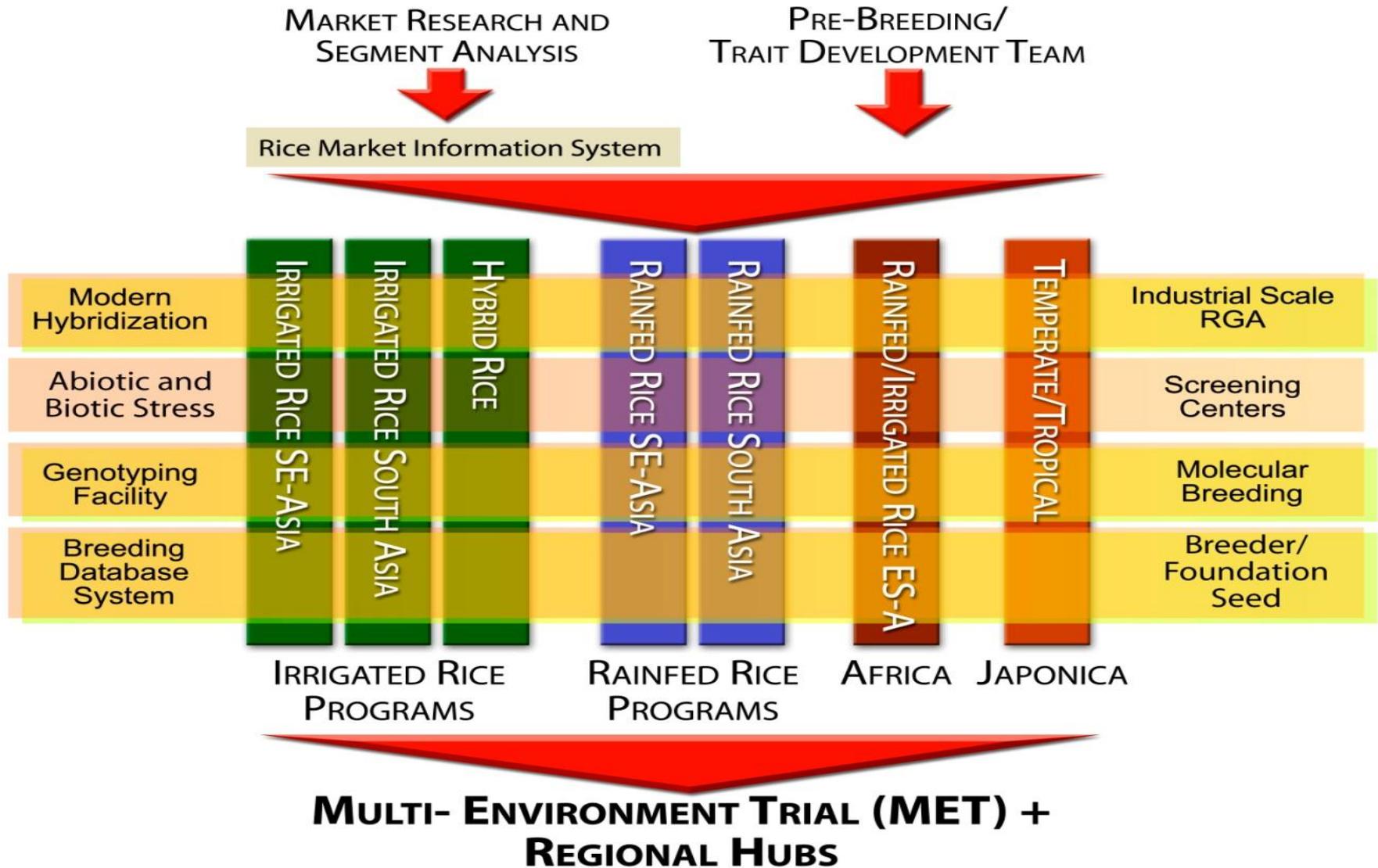


JAPONICA

TEMPERATE / TROPICAL



New PBGB structure



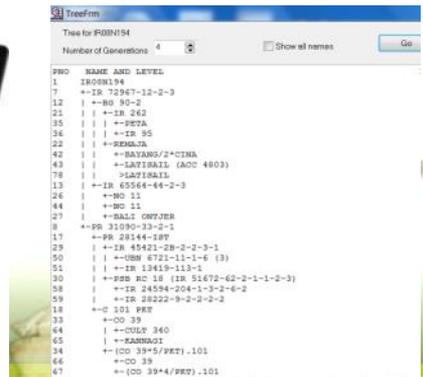
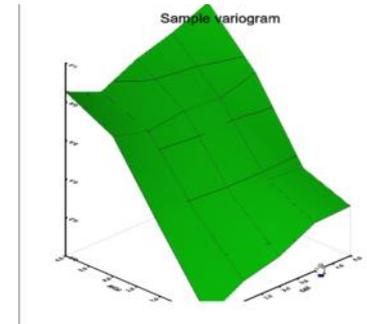
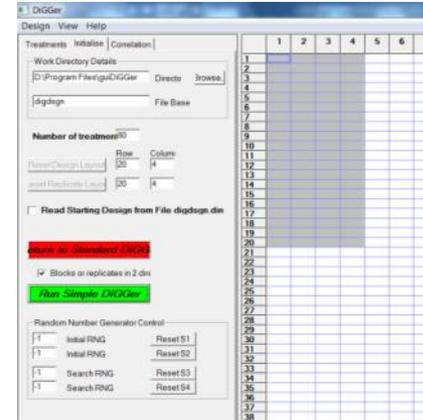
Using rapid generation advance (RGA)



More efficient data collection and exploitation

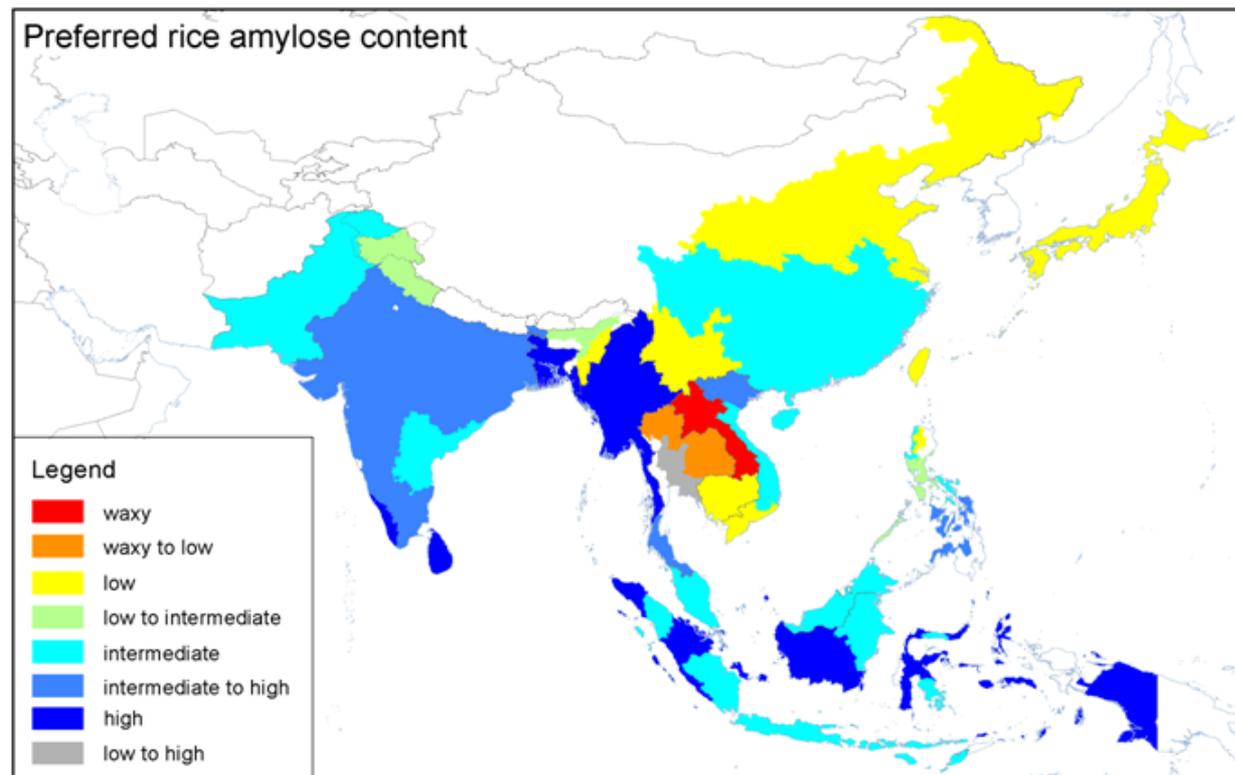


- Data collection
 - ✓ Portable data collectors
 - ✓ Bar coding of plots
 - ✓ Computerized systems
- New statistical methods
 - improved experimental designs
 - spatial analysis



GRiSP Product 4.3.4. Market analysis and information for developing specialty rices and rice-products

- Quality maps allow targeted breeding to provincial level.
- Also provide platform for collaborative research to further define each quality type, and provide a host of new consumer-relevant traits of quality.



Achim Dobermann, GRiSP
report 2012

Team: Themes 2, 4 & 5



Direct seeding



Mechanized field trials



Multi-location trials

IRRI
MET
system



2014 – sites in
Bohol and
Bukidnon

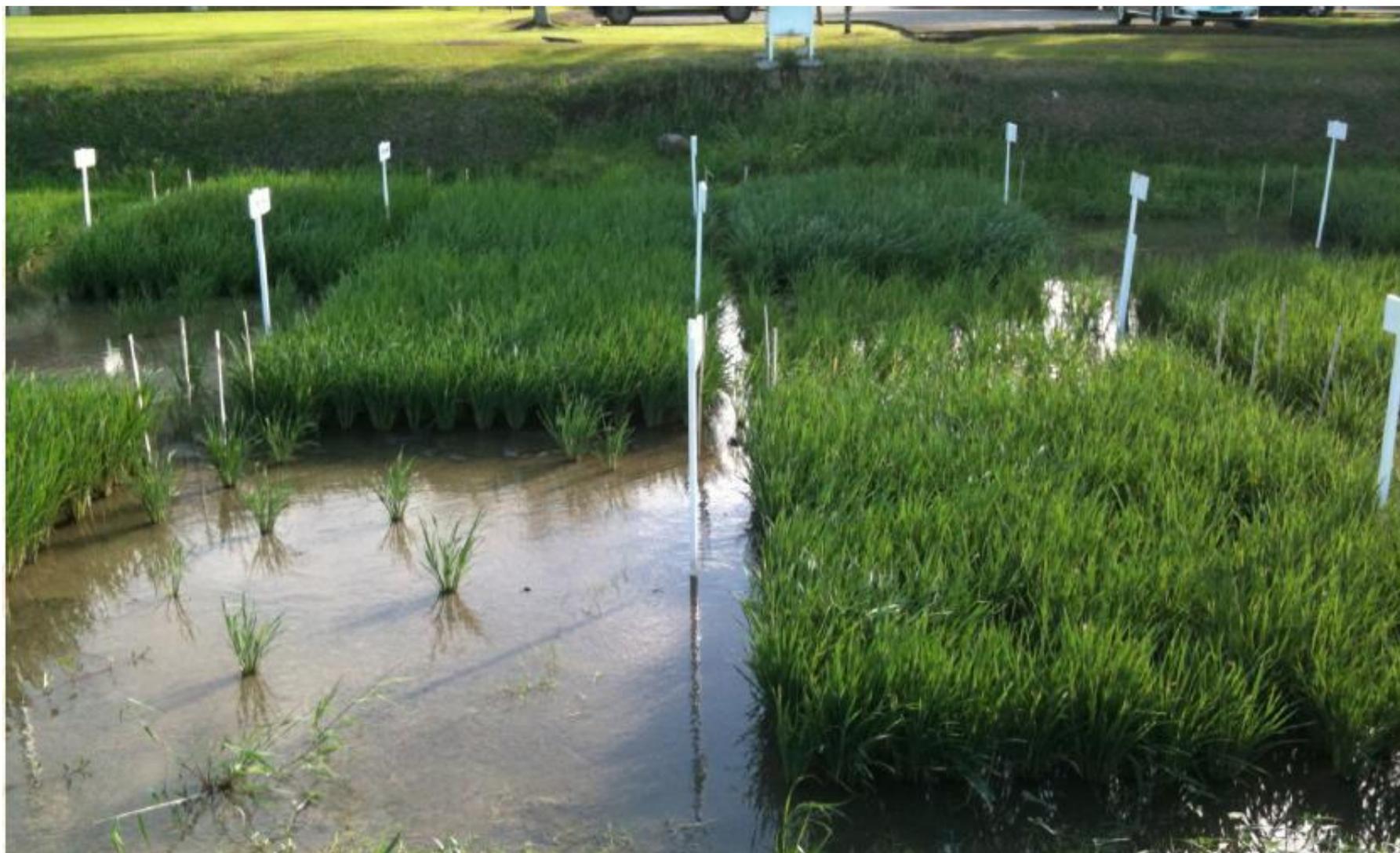


Metrics

- Financial
 - Budget/year & expenditure
- Program
 - Size of breeding operation
- Progress
 - Genetic gain, yield performance of new test entries compared to checks



Molecular breeding: example of Swarna-Sub1



Original

+ Sub1

Impact of Swarna-Sub1



SWARNA-SUB1

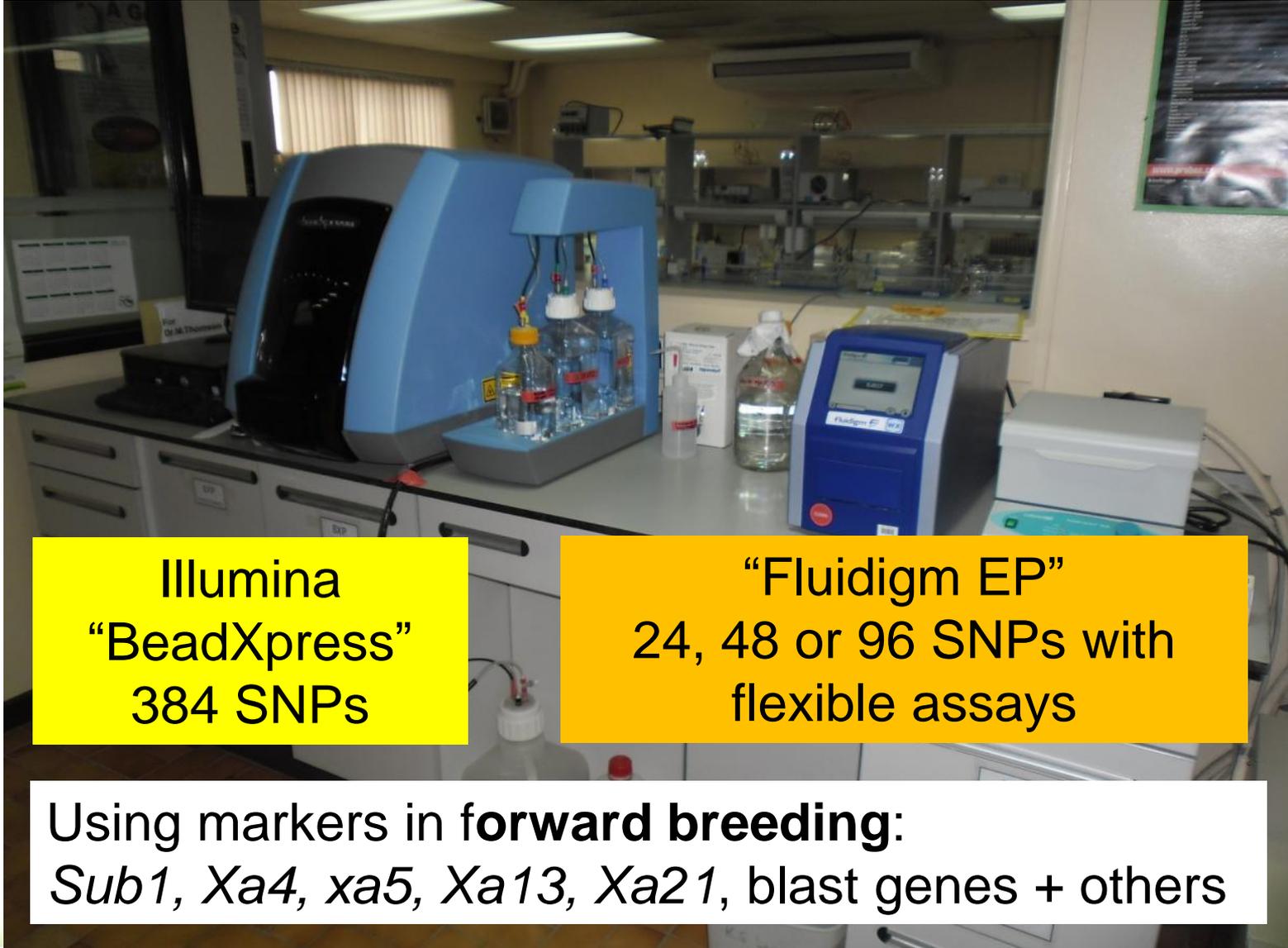
POOJA

New Sub1 varieties under development

Country	Variety	Target date
Nepal	Sabitri	2014
Pakistan	IR6, Super Basmati	2015
Philippines	NSIC Rc222, Rc238, Rc302	2016-2017
Myanmar	Manaw thukha	2017



New SNP genotyping platforms



Illumina
“BeadXpress”
384 SNPs

“Fluidigm EP”
24, 48 or 96 SNPs with
flexible assays

Using markers in **forward breeding**:
Sub1, Xa4, xa5, Xa13, Xa21, blast genes + others

Establishing partnerships with NARS in S and SE Asia

BRRRI



বাংলাদেশ ধান গবেষণা ইনস্টিটিউট
গাজীপুর
BANGLADESH RICE RESEARCH INSTITUTE
GAZIPUR

DRR



IRRI

Thank you

