Benefitting from Networking: Alignment of national research and international research priorities

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Outline

- Background
  - Location specificity of agriculture research
  - Global issues needs global solutions
  - Linking national research with international research

- Alignment with Global Rice Science Partnership (GRiSP)
  - How to make alignment?
  - Examples of research activities
  - Value of networking
Alignment of national research agenda with global priority: An example from Global Rice Science Partnership (GRiSP) alliance.

GRiSP-Japan

Merged under NARO in April 2016
Alignment exercise at JIRCAS with GRiSP

JIRCAS’ Four Research Programs

Program A: Environment and Natural Resource Management
- Conservation of Arid Grasslands
- Savanna Agriculture in Africa
- Island Environment Conservation
- Biological Nitrification Inhibition

Program B: Stable Food Production
- Environment Stress Tolerance
- Stable Supply of Upland Crops
- Tropical Field Crops
- Integrated Pest Management

Program C: Rural Livelihood
- Recycling-based Production in China
- Local Food Resources
- Biomass in Asia
- Sustainable Forestry
- Aquaculture in Tropical Coastal Areas

Program D: Information Analysis
- Analyses on Food Supply/Demand and Production Structures
- Provision of Research Trends and Local Information

Rice research
Rice included

GRiSP Theme

JIRCAS Outputs = GRiSP Outputs
SPIKE increases rice grain yield: enhancement of yield-related traits

Panicle

Leaf

Root

Increased photosynthesis, root growth, translocation and sink capability

Fujita et al. PNAS (2013)
Multi-environment testing with SPIKE

Field trial in India

Field trial in Laos

Field trial in Indonesia

Field trial at IRRI

Field trial using Japanese lines with SPIKE

Further collaboration in Africa and Latin America (with AfricaRice and CIAT)
Deeper rooting for drought tolerance (discovery of DRO1 gene)

Upland rice cultivar from the Philippines

Provided by Dr. Uga, NARO
**DRO1** conduces to high yield performance under several conditions of drought stress

Responses of IR64 and IR64+Dro1 to 27 days of severe drought condition

**Collaborative project with GRiSP-CGIAR**

Use of gene to enhance phosphate starvation tolerance

• Phosphate depletion is one of the major problems in food production in Africa, and Asia.
• Fertilizer price has been increasing.
• Technologies to increase the uptake of phosphorus in soil are required.

Phosphorus (P) efficiency breeding network

Screening germplasm collections to identify P efficient donors; identification of causal loci and genes

P efficient donor

inefficient variety

breeding line with donor gene

Global partners in P efficiency breeding efforts

Markers are developed and shared with global partners to enhance their breeding research efficiency

Target: Varieties with improved yield at reduced or low P fertilizer application
Value of networking

- Complimentary strengths among partners
- G x E x M: efficient evaluation
- Efficient deployment of new knowledge and materials
- Upgrading of Japanese national research to international standard
- Triggering of global innovations benefitting both national and international research
Thank you!