Overview of the history, evolution, and management of the RiceCAP project

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Applied Plant Genomics
Coordinated Agricultural Project

USDA/CSREES

A coordinated research, education, and extension project for the application of genomic discoveries to improve rice in the United States.
**BROADER GOAL**

- Improved U.S. rice
- Molecular toolbox

**Multi-institutional, Multi-state**

- University of California - Davis
- Colorado State University
- Kansas State University
- University of Arkansas
- USDA-ARS
- Ohio State University
- Louisiana State University

1 PD
14 Co-PI's
Coordinated Agricultural Project
RiceCAP

• Program Itinerary
• History and Evolution of the RiceCAP
• General Outline of the RiceCAP project
• Overview of Project Management
• Meeting Expectations

Program Outline (cont.)

• Morning (cont.) – RiceCAP Project Outline
  – Introduction of RiceCAP
  – U.S. rice breeding programs & RiceCAP project efforts
    (milling yield & sheath blight resistance)
  – U.S. molecular programs & RiceCAP project efforts
  – Connecting whole genome variation with phenotype
  – Science of milling yield & quality
  – Sheath blight importance & resistance breeding
  – Coordinated sheath blight screening effort
**Program Outline (cont.)**

- **Afternoon – RiceCAP Project Objectives/Details/Coordination**
  - Introduction-RiceCAP objectives and team leaders
  - Objective 1
    - Breeding efforts
    - Molecular efforts
  - Objective 2
    - Gene function
  - Objective 3
    - Workshop 1 – Marker Assisted Selection
    - Workshop 2 – Virus Induced Gene Silencing
  - Objective 4 – Extension/Outreach
  - RiceCAP data management
  - Q & A

- **Evening – PI introduction & program outline (objectives 1 & 2)**
  - Objective 1 – Breeding
  - Objective 1 – Molecular markers
  - Objective 2 – Gene function

- Q & A
Program Outline

• Wednesday, November 17\textsuperscript{th}
  – Executive committee breakfast
  – Meeting & discussions
    • Boards (Ventana)
    • Outreach team (8:00-9:00)
    • Sheath blight screening (9:00-10:00)
    • Molecular breeding/markers & data management (10:00-11:00)

History and Development

• 2001 USDA/ARS workshop at the DBNRRRC, Stuttgart, AR
  – Meeting the research needs of the rice industry
  – Brought together diverse clientele (scientists and industry personnel)
  – Develop better understanding of grain quality and exploit genomic data
  – Improving U.S. rice cultivars and production

• 2002
  – Rice breeders and rice industry discussions - Rice Outlook Conference
  – Rice Technical Workers Group

• 2003
  – Rice Breeders Meeting
  – LISTSERV among the rice community
  – CAP proposal announcement
  – Roundtable discussion by researchers (Several locations)
  – Online discussion among researchers
History and Development

• 2004
  – Researcher meeting at PAG (San Diego)
  – RiceCAP Proposal Executive Committee
  – Project Director
  – Proposal Development (USDA/RFA)
  – RTWG
  – Proposal Submission (March)
  – USDA Reverse Site Visit (June)
  – Revise proposal and address concerns

RiceCAP Project

• 2004
  – September
    • Project Management (organization)
    • Data management
  – November – first RiceCAP meeting
    • Rice Functional Genomics meeting

• 2005
  – January - Initiate science
Request For Applications (RFA)

- Develop or improve fine genetic and physical maps...establish mapping populations...identify genomic intervals that carry traits of agronomic interest...
- Develop or improve informatics-based tools...translate basic discovery for U.S. agriculture crop improvement...provide training opportunities that foster a collaborative interface between breeders, biologists, computational biologists, and end users.
- Develop or improve molecular markers and apply MAS to characterize germplasm critical to U.S. plant breeding objectives.
- Dissemination of information to all users
- Societal impact of plant genome research
- Include an advisory group with principal stakeholders and partners
- Complement and link already existing programs (multi-disciplinary, multi-institution, multi-state)
- Effectively communicate understanding of applied plant genomics to all segments of society.

Trait Prioritization

- **Yield Comp.**
  - High: Cooking Quality, Milling Yield Comp.
  - Moderate: Health/Nut., Insect Res., Sheath Blt

- **Relevance**
  - High
  - Moderate
  - Low

- **Difficulty**
  - Difficult
  - Moderate
  - Easy
Principle Scientists

- Cartwright, Rick, University of Arkansas Cooperative Extension
- Fjellstrom, Bob – USDA/ARS Texas A&M
- Hulbert, Scot – Kansas State University
- Jia, Yulin – USDA, Stuttgart, AR
- Jodari, Farmen - CRRF
- Leach, Jan – Colorado State University
- Leong, Sally – USDA/ARS, University of Wisconsin
- McClung, Anna – USDA/ARS, Texas A&M
- Moldenhauer, Karen – University of Arkansas, Stuttgart, AR
- Nelson, Clare, Kansas State University
- Nelson, Rick, Samual Noble Foundation
- Nguyen, Henry – University of Missouri
- Oard, Jim – Louisiana State University
- Ronald, Pam – University of California, Davis
- Rutger, Neil – DBNRRRC
- Wang, Guo-liang – Ohio State University
- Yang, Yinong – University of Arkansas

PROJECT MANAGEMENT
RiceCAP Management Organization

Stakeholder Advisory Board
- Dan Kennedy
- George Dunklin
- Ernest Girouard
- Eric Larabee
- Dwight Roberts
- Chuck Wilson
- Dr. G. Khush (Liaison)

Scientific Advisory Board
- Dr. William Crosby
- Dr. Stephen Goff
- Dr. David Mackill
- Dr. Ron Phillips
- Dr. Mark Walton
- Dr. G. Khush (Liaison)

Executive Committee
- Dr. Neil Rutger, Chair
- Dr. Rick Cartwright
- Dr. Scot Hulbert
- Dr. Jan Leach
- Dr. Anna McClung
- Dr. Clare Nelson

Project Director
- Dr. Jim Correll

Project Manager

Grants Officer

Financial Officer

Data Management
- Dr. Clare Nelson
- Data Assistant

Object 1 Team
- Hulbert, McClung, Fjellstrom, Jia, Linscombe, Leong, Moldenhauer, Nguyen, Oard, C. Nelson

Object 2 Team
- Yang, Ronald, Wang, Leach

Object 3 Team
- McClung, Correll, R. Nelson

Object 4 Team
- Cartwright, Korth, Lemaux, Leong, Moldenhauer, Raid

Co-PI’s

Collaborators

BOARD RESPONSIBILITIES

- Science and Industry guidance
- All aspects of the project
  - Management
  - Data management
  - Science
  - Workshops
  - Extension and Outreach Efforts
- Sub-project evaluations
- Progress / bottlenecks
- Budgets
- Written Report
BROADER GOAL

Improved U.S. rice

Molecular toolbox

RiceCAP