CRIS Report for CAP Planning Grant

Proposal Number: 2004-04244

Award: $12,000

Starting date: 10/01/04

Termination Date: 9/30/05

ITEM 21.

OBJECTIVES: The objective of this conference is to plan a 2005 Coordinated Agricultural Project (CAP) on wheat translational genomics. Participants will discuss priorities for research, training, education, and extension and will elaborate a sound management plan to integrate genomics research into practical public wheat breeding efforts. Participants of this conference will discuss strategies to address the priorities established by growers, public wheat breeders and industry representatives in a preliminary stakeholders meeting (http://maswheat.ucdavis.edu/PDF/MeetingFeb22.pdf, Kansas City, MO 2/22/2004). The expected outcome of this planning conference is a scientific proposal to address the wheat industry priorities and a clear timetable for a preparation of a grant proposal.

An additional objective of this meeting is to elaborate strategies to incorporate two new resources available to the public wheat breeding programs. The first one is the creation of four regional USAD-ARS high-throughput genotyping laboratories that have the capacity to generate tens of thousands of marker data-points per year. The second one is the recent incorporation of valuable genes into almost 100 wheat lines adapted to the different US wheat growing regions using marker assisted selection (MAS). A creative combination of these new resources with the traditional breeding programs can have a significant impact on wheat improvement in the US.

Integration of genomics into practical wheat improvement programs is a high priority for the National Wheat Improvement Committee and the National Association of Wheat Growers. Most of the public wheat breeders in the US are currently aware of the potential benefits of these technologies to their programs. The interest in marker assisted selection was confirmed by the participation of the breeders from 23 states (representing 86% of the US wheat) in the Kansas stakeholder workshop.

A final objective of this meeting is to prioritize the traits for the different wheat market classes that need additional research, and then select appropriate mapping populations to generate the necessary information.

The planned scientific discussion for this conference is relevant to the general issues of Genomics and Future Food and Fiber Production and to the CSREES goals for a safe, secure and more nutritious food supply and world food security through genomics. This

conference is aligned with the 5-year plan of the Interagency Working Group on Plant Genomes and extends the groundwork established by the research community to implement knowledge and tools generated by genomics research into practical wheat improvement programs. The results of this discussion will facilitate the implementation and integration of the numerous USDA-ARS and University projects that are currently developing improved lines by MAS, testing new marker technologies, and developing molecular markers for new traits.

ITEM 22.

APPROACH

A two-day conference is planned for August 16-17, 2004 in Denver Colorado at the Embassy Suites hotel. Dr. Jorge Dubcovsky from the University of California - Davis is the PI for this planning grant (jdubcovsky@ucdavis.edu) and Dr. Forrest Chumley from Kansas State University is the Co-PI (fchumley@oznet.ksu.edu). Drs. Nora Lapitan and Scott Haley from Colorado State University have agreed to serve as members of the local organizing committee.

Invitations have been sent to public wheat breeders, coordinators of the USDA-ARS genotyping laboratories, and wheat genome scientists. This conference will facilitate the exchange of information between scientists and breeders.

A questionnaire will be sent to the participants prior to the meeting to compile their opinions about the different topics that will be discussed during the meeting. The results of this survey will be presented in the meeting. Representatives from the *MAS*wheat project and from the genotyping laboratories will make presentations on the current status of their programs. International researchers from the Canadian and Australian wheat marker programs will make presentations on the applications of these technologies in their countries.

The discussion topics will include:

- Breeding strategies to integrate the high-throughput MAS techniques into the breeding programs.
- Required mapping populations, types of populations, and assignment of trait responsibilities to programs.
- Criteria for participation in the project: competitive grant structure vs. stable participation of a broad group of programs with clear benchmarks.
- Budget.
- Alternative strategies if the CAP is not funded
- Management plan.
- Quotas for data-points to be assigned by each genotyping laboratory to each of the public breeding programs.
- Data management strategies.

- Intellectual property.
- Priorities and plan for training, education, and extension.
- Selection of an advisory board.
- Publication policy.

A report will be produced describing the participants, objectives, strategies and products for a Coordinated Agricultural Project on wheat translational genomics. Jorge Dubcovsky, Forrest Chumley, and a writing committee selected in the conference will be responsible for preparation of this final document that will be circulated among all participants, presented to USDA and posted on pertinent websites including Grain Genes and *MAS*Wheat.

ITEM 23.

NON-TECHNICAL SUMMARY: A two-day conference to plan a Coordinated Agricultural Project (CAP) on wheat translational genomics is planned for August 16-17, 2004 in Denver Colorado. Participants will include public wheat breeders, coordinators of the USDA-ARS genotyping laboratories, and wheat genomics researchers. The objective of the workshop is to plan future research efforts integrating genomics research into practical public wheat breeding efforts. This conference will facilitate the exchange of information and the planning of the best strategies to address the priorities for wheat improvement established in a previous stakeholders meeting (Kansas City MO, February 22, 2004) (http://maswheat.ucdavis.edu/PDF/MeetingFeb22.pdf).

A questionnaire will be sent to the participants prior to the meeting to compile their opinions about the different topics included in the agenda for this meeting. The results of this survey will be presented in the planning conference. Researchers from US, Canada, and Australia will present the current status of marker assisted selection technologies in their countries.

The discussion topics will include: breeding strategies to integrate high-throughput marker assisted selection techniques into the breeding programs, mapping populations for new traits, budget and management plan, data generation, curation and distribution, intellectual property and publication policy, advisory board composition, education, and outreach.

A report will be produced establishing a research plan for implementation of genomics research into practical public wheat breeding. This document will be circulated among all participants, posted on pertinent websites including Grain Genes and *MAS*Wheat, and presented to USDA.

ITEM 24.

KEYWORDS wheat, marker assisted selection, public breeding, translational genomics