FINAL PROJECT REPORT (2013)

Project Title: Consulting to the WTFRC and OSCC for cherry improvement

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Total Project Funding: $7,500

Budget History:

Item	2013	Year 2:	Year 3:
Salaries			
Benefits			
Wages			
Benefits			
Equipment			
Supplies			
Travel	$4,000		
Plot Fees			
Miscellaneous	3,500		
Total	$7,500		

ORIGINAL OBJECTIVES:

- Provide analysis and critique of technical aspects of proposals and reports for competitive funding of research and development related to cherry improvement.

- Provide ideas and analysis of approaches and methods to facilitate adoption of new sweet cherry cultivars by clientele groups in the sweet cherry production and delivery pipeline.

- Facilitate adoption and use of technology and materials from the RosBREED project to support sweet cherry improvement.

- Interact with WSU, OSCC and ARS scientists and PNW growers on scientific matters related to cherry improvement for the region.

ACTIVITIES and ACCOMPLISHMENTS

- Provided expertise and analyses to WTFRC and OSCC
    - Reviewed and critiqued research proposals and reports to the Boards
    - Critiqued proposals from cherry team members to WTFRC and competitive grants programs.
    - Visited California nurseries with Jim McFerson

- Attended the NW Cherry Research Review Nov. 13, 2012 in Yakima WA
    - Presented assessment of and discussed proposals
    - Participated in Cherry GGB workshop prior to the Cherry Research Review

- Participated in RosBREED annual review as a member of the Scientific Advisory Panel January 10, 2013, San Diego, CA
    - Served on Scientific Advisory Panel
    - Evaluated results and outcomes of activities in the RosBreed project as a member of the Scientific Advisory Panel.
    - Evaluated results from the participating projects

- Facilitated interaction among breeders and scientists.
    - Reviewed and discussed cherry research data and information with PNW and other researchers.
    - Provided information about graduate education for future plant breeders and plant breeding capacity needed in fruit and nut crop breeding.

- Alerted cherry team members to key references for breeding and genetics of sweet cherry.

- Submitted invoices for expenditures on a quarterly basis.

RESULTS and DISCUSSION

I provided scientific reviews to the commissions of proposals and reports for which I have expertise. In addition to those coming to this program, researchers continue to submit good proposals that are competitive and are being funded at a level commensurate with other public institutions. The grant proposals I reviewed show innovative ideas and approaches that I believe contribute to continued competitiveness and opportunities for funding.

The cherry GGB workshop organized by Dr. Oraguzie and held prior to the Research review provides a good forum for presentation of research findings and information by PNW scientists. The morning session is primarily for discussion of scientific issues among the scientists, while the afternoon session is for a breeding program update for commission advisory committee members. Overall the cherry breeding program benefits from collaborative interaction with other supporting scientists in the PNW (WSU, OSU, ARS, WTFRC and others) who devote significant resources and effort to issues and opportunities impacting sweet cherry improvement and the tree fruit industries. Collaboration and exchange of ideas among members of the cherry improvement team promotes synergy and minimizes redundancy and duplicated effort.

The federally-funded RosBREED project is in its final months, with many of the activities focused on achieving the multi-faceted milestones and goals. Several scientists associated with the PNW Cherry Improvement have played key roles in the success of RosBREED and the ongoing Genome Database for Rosaceae (GDR). Both of these projects have been very important for implementing the cherry breeding program and will have a continuing impact on the ultimate success, measured by the development and release of outstanding new cultivars for the cherry industry. The WTFRC and OSCC have been key supporters of these initiatives, providing a win-win situation wherein provision of matching funds leverages several times more federal funding for programs important to continuing profitability for the PNW cherry industry.

The PNW cherry breeding program stands to be a major beneficiary of tools and materials for DNA-informed breeding when it is well integrated into a targeted breeding program for cultivar development. This is the only public sweet cherry breeding program in the U.S. taking advantages of these key resources.

DNA-based information and technology are critical plant breeding capacity elements for success and efficiency. Diagnostic marker-locus-trait (M-L-T) associations are available for incompatibility/fertility alleles, fruit maturity date, fruit size, firmness, color, flavor components. Others nearing utility include flowering time, cracking, stem retention force. Using features from the breeder tool box, informed decisions can be made for parental choice and production of the most efficient crosses for segregating traits. Molecular genotyping provides the opportunity for marker assisted selection of preferred genotypes, genetic verification of selected phenotypes, and genetic fingerprinting of elite selections for intellectual property protection.

Key collaborations include; new sources of genetic variability for important fruit traits (Iezzoni), data base management and breeder toolbox (Main), development of marker-locus-trait associations and genotyping of breeding materials (Peace), genome sequencing and Fast-trac breeding (Dhingra), testing and commercial evaluation of elite selections (Einhorn, Long, Whiting, Commission scientists). Interaction among these (and other) programs is critical to continued support and success. Especially with reduced budgets for research and development in the public sector, it is important to prioritize activities for cherry improvement activities in order to maximize return on investment for all programs.

Advancement of promising new selections into pre-commercial testing and evaluation is encouraging. Collaborative efforts among the breeding team, growers in Washington and Oregon, and WTFRC personnel are required to ensure effective evaluation and that the selections meet industry needs and opportunities to expand profitability. New elite selections will be identified each year in the breeding cycle. Thus, it is important to have a strategy to utilize phenotypic and molecular marker information along with grower evaluations and feedback from

various stage trials to decide whether to either discard/discontinue selections or introduce and release them as new commercial cultivars.

Along with the research and breeding studies, these projects provide opportunities to train and prepare the next generation of breeders and genetic support scientists at W.S.U. Grad students and post doctoral researchers often have key roles in the programs. I continue to work with faculty to review curriculum and program components of plant breeder education and training.

EXECUTIVE SUMMARY
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The objectives were to: 1) Provide analysis and critique of technical aspects of proposals and reports for competitive funding of research and development related to cherry improvement; 2) provide ideas and analysis of approaches and methods to facilitate adoption of new sweet cherry cultivars by clientele groups in the sweet cherry production and delivery pipeline;3) facilitate adoption and use of technology and materials from the RosBREED project to support sweet cherry improvement; and 4) interact with WSU, OSCC and ARS scientists and PNW growers on scientific matters related to cherry improvement for the region.

These objectives were met through telephone calls, electronic communication, and participation in various meetings. Activities included: 1) reviewing and critiquing research proposals from cherry team members and other scientists as requested; 2) participating in the Cherry Research Review and Cherry GGB Workshop prior to the annual research meeting; 3) serving the RosBREED project as a member of the Scientific Advisory Panel; 4) facilitating interaction among breeders and scientists; 5) alerting cherry team to key references and ideas for breeding and genetics of sweet cherry, and 6) working on education and curriculum.

I provided consultant services to the WTFRC and OSCC about cherry improvement. My role is to provide information and feedback to Jim McFerson and Board members from Washington and Oregon about progress toward objectives and to support the breeder and researchers working on this project. I worked with researchers, cooperators and members of the industry to provide expertise and knowledge about fruit breeding. I provide insight, guidance and ideas for identifying and applying appropriate technology to facilitate efficient cultivar development. I evaluate research proposals when requested.

The PNW cherry breeding program stands to be a major beneficiary of tools and materials for DNA-informed breeding when it is well integrated into a targeted breeding program for cultivar development. This is the only public sweet cherry breeding program in the U.S. taking advantage of these valuable resources. DNA-based information and technology are critical plant breeding capacity elements for success and efficiency. Key collaborations include; new sources of genetic variability for important fruit traits (Iezzoni), data base management and breeder toolbox (Main), development of marker-locus-trait associations and genotyping of breeding materials (Peace), genome sequencing and Fast-trac breeding (Dhingra), testing and commercial evaluation of elite selections (Einhorn, Long, Whiting, Commission scientists). Interaction among these (and other) programs provides for continued support and success. The advancement of promising new selections into pre-commercial testing and evaluation is encouraging. Collaborative efforts among the breeding team, growers in Washington and Oregon, and WTFRC personnel are required to ensure effective evaluation and that the selections meet industry needs and opportunities to expand profitability.

The consulting project budget included $4,000 for travel to Wash. State for project review and related activities and $3,500 for miscellaneous expenses related to consulting. I will spend less than the amount budgeted.