

**FINAL PROJECT REPORT**

**Project Title:** Consulting for the Northwest Cherry Improvement Project

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**Cooperators:** Jim McFerson, Nnadozie Oraguzie, Amy Iezzoni, Cameron Peace, Amit Dhingra, Matt Whiting, Jim Olmstead, Yanmin Zhu

**Other funding sources:** None

**Budget History:**

<b>Item</b>	<b>2009</b>		
<b>Salaries</b>			
<b>Benefits</b>			
<b>Wages</b>			
<b>Benefits</b>			
<b>Equipment</b>			
<b>Supplies</b>			
<b>Travel</b>	\$4,000		
<b>Miscellaneous</b>	5,500		
<b>Total</b>	<b>\$9,500</b>		

### **ORIGINAL OBJECTIVES:**

- Coordinate and lead monthly conference calls among members of the cherry team to facilitate discussion of key issues related to sweet cherry improvement.
- Facilitate collaboration among team members and key resources in the public and private sectors in the PNW and externally.
- Work with N. Oraguzie the breeding program leader to continue development and implementation of an efficient breeding program for developing commercial sweet cherry cultivars suited for the PNW.
- Provide analysis and critique of reports and proposals for competitive funding of research and development related to cherry improvement.

### **SIGNIFICANT ACTIVITIES and FINDINGS:**

- Coordinated conference calls with members of the cherry team
  - Eight conference calls during the year to discuss issues relevant to sweet cherry improvement. Participants included Jim McFerson, Amy Iezzoni, Cameron Peace, Amit Dhingra, Matt Whiting, Jim Olmstead, Yanmin Zhu, David Rudell, Dorrie Main and Nnadozie Oraguzie
- Reviewed and critiqued research proposals from cherry team members.
  - Individual submissions to the NRI competitive grants program
  - Presentations at the 2009 Molecular Markers in Horticulture Symposium
  - Group proposals for the RosBreed and RosTrait submissions
  - Various proposals to the WTFRC
- Interacted with key members of the sweet cherry improvement team about important issues relating to cherry improvement research
  - Nnadozie Oraguzie and Amy Iezzoni about breeding program activities and a Best Practices document
  - Cameron Peace and other team members about optimal use of molecular markers for cherry breeding
- Participated in the 2009 Molecular Markers in Horticulture Symposium at Prosser, OR July 2009.
  - Made a keynote presentation
  - Interacted with international scientists and breeders about use of molecular markers for breeding tree fruits.
- Facilitated interaction among breeders and scientists.
  - Discussed Prunus germplasm activities at Clonal Repository in Davis with Nnadozie Oraguzie relative to his trip to California
  - Continued interactions with molecular scientists at Kearney Agric. Center, Parlier, CA and with UC Davis scientists relative to peach rootstocks.
  - Participated in GRIN-Global process review as member of the oversight committee.
- Alerted cherry team to key references for breeding and genetics of sweet cherry.
- Submitted invoices for expenditures on a quarterly basis.

## **RESULTS & DISCUSSION:**

The monthly (except during the summer busy season) conference calls provide a good forum for members of the cherry team to discuss important issues relative to cherry improvement. Although all members are not able to participate in all calls, most have been consistent and provide good ideas and constructive discussion. These are regularly scheduled meetings where issues such as trait importance, testing sites, marker-locus-trait associations and similar topics were discussed.

Members of the cherry team continue to do constructive, interactive and inter-dependent work on cherry improvement. They exchange ideas and provide critical analysis each others' ideas. There is a lot of sharing of ideas to promote synergy without redundancy and duplicated effort. I am available and have read a good number of proposals during preparation which I believe contributes to a higher likelihood of acceptance and funding success. Several members of the team submitted research proposals that were accepted and funded by various competitive grants program. Many members of the cherry team contributed substantial time and effort to preparing the RosBreed proposal, which was funded. Amy is to be congratulated for her excellent guidance and leadership of the RosBreed Team. Other members are leaders of the various sub-programs in that proposal.

There are an exceptional number of outstanding scientists in the PNW (WSU, OSU, ARS, WTFRC and perhaps others) devoting significant effort to improving the quality and competitiveness of the tree fruit industries. They continue to secure significant funding from outside sources that adds measurably to the support provided by the Commission. Through continued collaboration these efforts can result in significant new cultivars, better production and handling methods, improved consumer acceptance, and ultimately sustainability of growers. Continued interaction among the researchers is critical to continued support and success.

I feel the Northwest Sweet Cherry Breeding Program led by Dr. Oraguzie has made significant progress during the past year toward meeting goals that were established. He has hired professional assistants to aid with key program activities and others that can provide day to day breeding work and horticultural maintenance that is needed. Pollination, seed handling, germination, seedling growing and tree management are all essential but difficult processes for sweet cherry. The cherry team is continuing to learn how to manage the plant materials, and development and use of a 'Best Practices' document is proving helpful in that regard. He has successfully guided the upgrading of research facilities at Prosser which was badly needed. The number of crosses and seeds produced in 2009 were on target with germination results yet to be seen.

Field plantings and plant maintenance have been improved and the first seedling selections for possible 2<sup>nd</sup> stage testing in 2011 were made and are to be propagated this fall. The facilities for evaluating fruit-related traits are in place and were used for data collection in 2009. The extensive data being collected in the breeding program points to the need for establishing a good electronic data base, which will be an important activity in the coming year.

Good progress has been made by the team toward identifying additional marker-locus-trait associations that can be used for selection in the breeding program. The development of a program by Dr. Peace and associates to assess how markers can best be used for practical selection provides an objective means for decision making. Seedling screening using markers for compatibility/incompatibility has provided not only an indication of self fertile plants but also which seedlings result from hybridization as opposed to selfing or unintended outcrossing. This information can be used to increase information about populations to be used for not only breeding but also genetic and genomic studies. Collaborative work with Dr. Iezoni for analyzing populations for markers linked to genes that control fruit size and quality factors is an important resource that will be

available shortly for use in targeted selection for these important traits. Dr. Dhingra is providing significant collaboration on tissue culture and is leading the studies on sequencing the cherry genome to provide basic information for future studies. Exploration of pathways involved in important quality traits is being actively pursued by Dr. Rudell. The leadership of Dr. Main for database management and support for the Rosaceae is an important resource for the breeding program. This is a brief mention, and there is likely other, of some key support available and flowing to the breeding program. The challenge is how best to use this effectively to meet breeding objectives.

## **EXECUTIVE SUMMARY**

**Title:** Consulting for the Northwest Cherry Improvement Project

**PI:** Fredrick A. Bliss

**WTFRC Funding:** \$9,500.

I have continued as a consultant to the Northwest Cherry Improvement Project which is an integrated project focused on development of new cultivars through classical breeding and application of applied genomics technology to improve breeding efficiency. The long-term nature of tree fruit breeding requires efficient use of resources and plant materials and well-integrated activities that will minimize the time required to develop and release new cultivars that fit the needs of the N.W. cherry industry.

I continued working with other researchers, cooperators and members of the industry to provide expertise and knowledge about fruit breeding. I provide insight and ideas for identifying and applying appropriate technology to facilitate cultivar development in a minimum timeframe. My role is to support the efforts of the breeders and researchers working on this project and provide information and feedback to Jim McFerson and Board members about progress toward breeding and other research objectives.

Objectives this year were to: 1) Coordinate and lead monthly conference calls among members of the cherry team to facilitate discussion of key issues related to sweet cherry improvement., 2) facilitate collaboration among team members and key resources in the public and private sectors in the PNW and externally, 3) work with N. Oraguzie the breeding program leader to continue development and implementation of an efficient breeding program for developing commercial sweet cherry cultivars suited for the PNW, and 4) provide analysis and critique of reports and proposals for competitive funding of research and development related to cherry improvement.

The objectives were met through activities conducted from my home office in Davis, CA such as telephone conference calls, electronic communication, and participation in the Cherry research review. Activities included: 1) Coordinated conference calls with members of the cherry team that included Jim McFerson, Amy Iezoni, Cameron Peace, Amit Dhingra, Matt Whiting, Jim Olmstead, Yanmin Zhu, David Rudell, Dorrie Main and Nnadozie Oraguzie; 2) review and critique of research proposals from cherry team members, 3) interaction with key members of the sweet cherry improvement team about important issues relating to cherry improvement research; 4) participation in the 2009 Molecular Markers in Horticulture Symposium at Prosser, OR July 2009; 5) facilitating interaction among breeders and scientists; and 6) alerting cherry team members to key references for breeding and genetics of sweet cherry.

The scientists in the PNW (WSU, OSU, ARS, WTFRC and perhaps others are devoting significant effort to improving the vitality and competitiveness of the tree fruit industries. Through collaboration these efforts can result in significant new cultivars, better production and handling methods, improved consumer acceptance, and ultimately sustainability of growers. Good progress continues in the breeding program and other research programs that provide supporting information and technology for efficient breeding efforts.