FINAL PROJECT REPORT

Project Title: Consulting for the Northwest cherry improvement project

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Cooperators: Jim McFerson, Nnadozie Oraguzie, Cameron Peace, Amit Dhingra, Amy Iezzon

Total Project Funding:

Budget History:

Item	**2010**		
Salaries			
Benefits			
Wages			
Benefits			
Equipment			
Supplies			
Travel	4,000		
Miscellaneous	5,500		
Total	$9,500		

ORIGINAL OBJECTIVES:

- Coordinate and lead monthly conference calls among members of the cherry team to facilitate discussion and resolution of key issues related to sweet cherry improvement.

- Facilitate collaboration among team members and identify 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 that combines classical breeding with new technology for developing commercial sweet cherry cultivars suited for the PNW.

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

FINDINGS AND ACCOMPLISHMENTS:

- 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 and Nnadozie Oraguzie

- Reviewed and critiqued research proposals from cherry team members.
  - Individual submissions to the NRI competitive grants program
  - Projects and work being done in the RosBreed project
  - Various proposals to the WTFRC

- Facilitated interaction among breeders and scientists.
  - Discussed Prunus breeding activities at Davis with C. Peace, N. Oraguzie and others during their trip to California
  - Attended RosBreed annual meeting and served on Scientific Advisory Panel
  - Attended International Horticultural Congress in Lisbon and discussed RosBREED and opportunities for DNA-facilitated selection in fruit crops.

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

- Submitted invoices for expenditures on a quarterly basis.

RESULTS AND DISCUSSION:

The monthly (fall and spring) conference calls provide a good forum for members of the cherry team to discuss important issues about cherry improvement. We strive to include as many people and topics as possible that impact the breeding program and others that may benefit from genetic, genomic and breeding information. Topics discussed included; key marker-locus-trait associations for marker-assisted breeding, key traits of economic importance, evaluation of promising selections during advanced stage testing, evaluation sites in the PNW and implementation of RosBREED activities and procedures.

Members of the cherry team continue to work well and have a constructive, interactive and inter-dependent approach to cherry improvement. They exchange ideas and provide constructive input to each others' ideas. This promotes synergy without redundancy and duplicated effort. I have read

several proposals in 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 grants program. Many members of the cherry team contributed substantial time and effort to the RosBreed project and numerous other national, regional and local projects.

The cherry breeding program and other important cherry research programs are fortunate to have access to outstanding scientists in the PNW (WSU, OSU, ARS, WTFRC and perhaps others) devoting significant effort to improving the vitality and competitiveness of the tree fruit industries. These scientists have been successful in garnering funds from competitive grants which multiple the effects of the funding from the Washington and Oregon. Through continued collaboration these efforts can result in innovative new cultivars, better production and handling methods, improved consumer acceptance, and ultimately sustainability of growers. Continued interaction among these components is critical to continued support and success.

The Northwest Sweet Cherry Breeding Program led by Dr. Oraguzie continues to make good progress toward meeting goals established for the program. Key support personnel have been hired and are acquiring knowledge for running operations and support of the work. Pollination, seed handling, germination, seedling growing in the greenhouse and tree management in the field continue to improve and the seedlings in the field are producing fruit for evaluation prior to selecting individuals for further testing and propagation. The number of seeds produced annually from crosses is quite sufficient to meet program targets. Upgrading of support facilities for the breeding program is continuing.

Field plantings and plant growth are on target and fast tract evaluation of outstanding seedlings is being done for the second year. Some that were selected last year will be dropped following analysis of information in 2010 that indicates they are not likely to be worth keeping. Others show promise and will be planted in the next stage field trials. Phenotypic and molecular marker information is being combined to make better decisions about future performance and value.

Use of DNA-based information for marker assisted breeding is a key element of the cherry breeding program. Marker-assisted seedling selection (MASS) for self fertility/incompatibility and fruit quality traits shows considerable promise for improving program efficiency and accuracy of selecting potentially outstanding plants. Collaboration with the Peace lab for timely genotyping and with Iezzoni for genetic analysis as well as guidance about program practices provided important resources for the breeding program. Work with Dr. Main on building a data base will be critical to manage the extensive information that is accumulating and tracking the plants in the populations that are being evaluated and selected as well as the testing of advanced materials for commercial utility.

EXECUTIVE SUMMARY
Title: Consulting for the Northwest Cherry Improvement Project
PI: Fredrick A. Bliss
WTRFC Funding: $9,500.

I served as a consultant to the Northwest Cherry Improvement Project which is focused on development of new cultivars through classical breeding and applied genomics such as marker-assisted selection to improve efficiency. I continued working with other 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. 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 objectives and opportunities for improvement in program management.

Objectives this year (2010) were to: 1) Coordinate and lead monthly conference calls among members of the cherry team to facilitate discussion and resolution of key issues; 2) facilitate collaboration among team members and identify key resources in the PNW and externally; 3) work with N. Oraguzie the breeding program leader to continue development and implementation of an efficient breeding program that combines classical breeding with new technology for developing commercial sweet cherry cultivars suited for the PNW ; and 4) provide constructive analysis and critique of reports and proposals for competitive funding of research and development.

The objectives were met through activities conducted through telephone conference calls, electronic communication, and participation meetings of the Advisory Committee whenever possible. Activities included: 1) Coordinated conference calls with members of the cherry team; 2) reviewing and critiquing research proposals from cherry team members; 3) participating in the Prunus GGB Team Workshop prior to the research review; 4) involvement with the RosBREED project as a member of the Scientific Advisory Panel; 5) facilitating interaction among breeders and scientists; and 6) alerting cherry team to key references and ideas for breeding and genetics of sweet cherry.

Overall the NWCIP which is only 5+ years old is making very significant progress towards developing new cultivars.

-Several thousand seedlings have been produced each year and are now being evaluated using standard phenotypic evaluations and molecular markers in the lab, greenhouses and field.
-This breeding program is actively involved in the RosBREED project which adds greatly to overall breeding capacity.
-Resources are being added to meet sufficient plant breeding capacity. Many key support personnel are on board and students are beginning to become involved as well.
-There is excellent collaboration among the breeder and other scientists from the PNW, nationally and internationally to provide DNA-based markers for use in the breeding program. Marker-assisted breeding is being used actively for cherry improvement.
-Outstanding seedlings have been selected the past two years for fast-track evaluation as potential new cultivars. Fruit trait evaluations are key to making decisions about whether selections should be cloned, multiplied and evaluated in the next stage trials.
-There will be many elite selections coming from the breeding program annually that will need to be evaluated in field trials for potential cultivars. This will cost resources so consideration should be given as soon as possible to how this will be funded and managed.

The consulting project budget of $7,500 included $2,000 for travel to Wash. State for project review and related activities and $5,500 for miscellaneous expenses related to consulting. I will spend less than the amount budgeted.