

FINAL PROJECT REPORT  
WTFRC Project Number: CH-05-511

**Project Title:** Northwest Cherry Improvement Project

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**Cooperators:** Matt Whiting, Jim Olmstead, Amy Iezzoni, Jim McFerson

Budget History:

Item	2006
Salaries	
Benefits	
Wages	
Benefits	
Equipment	
Supplies	
Travel	\$1,500
Miscellaneous	\$7,520
Total	\$9,020.

**Significant activities and findings:**

Presented ideas, evaluations of breeding strategies and plans, development of realistic objectives, and analyses of progress against approved project goals.

- Provided materials for incorporation into new project; “Breeding and Genetics Program for the Pacific Northwest Fresh Market Sweet Cherry Industry”.
- Developed document to define suggested primary and secondary tree and fruit characteristics.
- Developed document to define Cultivar Targets for the WA and OR Sweet Cherry Breeding Program

Conducted literature reviews and preparation of reports.

- Reviewed literature associated with cherry breeding and improvement. Provided information to Jim McFerson and references to Amy, Jim O. and Matt for use in the breeding program.

Traveled to research sites in Washington and Oregon to evaluate project and assess progress.

- November 2 - 4, 2005. Traveled to The Dalles, OR to participate in the OSCC/WTFRC cherry research review. Met with Amy Iezzoni, Matt Whiting, Jim Olmstead, Jim McFerson and industry members from Washington and Oregon to discuss activities and progress in the sweet cherry breeding program. Reviewed research proposals and reports to become more familiar with activities related to cherry improvement.
- The Advisory Committee and invited guests met for a working dinner during the 2005 Cherry Research Review in The Dalles, OR. Present were: Denny Hayden, Fred Bliss, Jim McFerson, Bryce Molesworth, Kyle Mathison, Tom Mathison, Norm Gutzwiler, John Carter, Tom Auvil, Brent Milne, Amy Iezzoni, Tim Smith, Tom Butler, Randy McAlister, Jim Doornink, Matt Whiting and Jim Olmstead. The topics discussed included current and future needs such as greenhouse space in Prosser, testing site selection and costs, contracting DNA marker genotyping to outside labs, and commercialization and intellectual property issues for both the scion breeding program and Amy’s rootstock evaluation project.

Continued work on developing a panel of sweet and sour cherry cultivars for DNA screening by Cameron Peace at the Kearney Agric. Center, Parlier, CA for polymorphic expression of candidate genes he isolates in his NRI-funded grant.

- October 27 – 28, 2005. Traveled to Kearney Agric. Center, Parlier, CA to meet with Cameron Peace, Carlos Crisosto, and Zaiger Genetics to review molecular marker research in their labs and to assess potential for use in marker assisted selection (MAS) in stone fruits.

Submitted invoices for expenditures on a quarterly basis.

- Quarter one (July 1, 2005 – Sept. 30, 2005) : \$ 560.00
- Quarter two ((Oct. 1, 2005 – Dec. 31, 2005): \$3,046.50
- Quarter three (Jan. 1, 2006 –Mar. 31, 2006): \$ 320.00
- Quarter four (Apr. 1, 2006 – June 30, 2006): \$ 360.00
- Total \$4,286.50

## **Results and discussion:**

Jim Olmstead started in the Post-doc position and provides on-site breeder guidance and direction for the project. This is especially important for continuity and progress in the breeding program.

Significant progress was made by the breeding team to produce the number of seedlings specified in the program plan. Germination of the 7,166 seed from 2005 began as expected in January of 2006. Due to lack of available greenhouse space in Prosser, space was contracted out in two commercial greenhouses. In the Spring, 2006, 17,848 seed from 111 crosses were realized.

The Mid-Columbia Ag Research and Extension Center (MAREC) in Hood River was selected as the Oregon testing site for Cherry Breeding Program selections. Amy Iezzoni and Jim Olmstead visited the Mid-Columbia Agricultural Research and Extension Center on Nov 2 and met with Clark Seavert, Anita Azarenko, and Bryce Molesworth about plot establishment. Plans were finalized for scion seedling plantings beginning in Spring 2007.

An initial contact was made with STA Laboratories ([www.stalabs.com](http://www.stalabs.com)) to test the feasibility of DNA marker genotyping for the Breeding Program. This will provide opportunities for developing capacity for marker assisted selection in the future. Initial work can be done using markers for the self-fertility allele which are public and the test is relatively easy to interpret. This will be an important step to determine the extent with which the genotyping for selection can be contracted out.

Powdery mildew resistance screening was done for seedling populations segregating for resistance genes. Greenhouse incidence of disease was used as an initial evaluation method. Concurrently, more detailed evaluations of fruit and foliar disease reactions for parental resistance sources and previously identified seedlings are being conducted.

It was planned to develop and validate a DNA screening test for determining seedlings resistant and susceptible to powdery mildew, but no candidate markers were identified despite extensive surveys. This lack of polymorphism adds to the growing evidence that there is a lack of genetic diversity in sweet cherry germplasm. This is a major issue that should be carefully evaluated and properly addressed.

There is excellent progress being made on developing and using genomic tools for research and breeding of rosaceous crops, including sweet cherry. The recent hiring of additional scientists using molecular genetics provides excellent complementary support for the Northwest breeding programs.