

Contract Title: Develop seedling populations for future sweet cherry cultivar selection

Consultant: Amy Iezzoni

Cooperator: Matt Whiting, Washington State University

Objective: Conduct sweet cherry hybridizations and seed germinations to result in one-year-old hybrid seedlings from which future cultivars could be selected.

Commercial goal: Develop a full-season series of sweet cherry varieties that exceed current varieties for a range of characteristics desired for current and future domestic and foreign market opportunities.

Rationale: The development of a successful sweet cherry breeding program requires extensive planning and horticultural skill to achieve a potential goal of 5,000 to 10,000 hybrid seedlings. This plan represents a “low-budget” approach towards developing seedling populations that could be evaluated to identify superior selections with cultivar potential.

Plan of work: The proposed plan of work consists of the following seven steps. Steps 1-5 would be conducted in 2004.

1. Develop a crossing plan.
2. Implement the crossing plan
3. Harvest and clean seed.
4. Seed storage.
5. Planting.
6. Seedling growth
7. Dig and store one-year-old seedlings.

1. Develop a crossing plan: A crossing scheme will be designed by the P.I. to achieve the commercial goal stated above.

2. Implementation of the crossing plan: The majority of crosses will be made by Amy Iezzoni in Prosser, WSU, and surrounding locations as necessary. Trees for crossing and pollen will be identified by Matt Whiting and by Amy Iezzoni through direct contacts with growers. Additional labor requirements include: (1) hand labor to collect pollen, (2) a full time assistant during the bloom period who would work with A.I. to become familiar with the crossing process and mother tree locations, continue with pollinations once A.I. is gone if bloom is prolonged due to cool weather, and later in the season conduct fruit collection and seed cleaning, and (3) a crew that can work from 5 to dark if we encounter any really warm days. A.I. shall bring all the necessary equipment and supplies.

Pollen of three parental selections will be purchased through contacts in Europe. This pollen will be sent to A.I. checked for pollen germination percentage and, if viable, used in the Prosser crosses.

3. Harvest and clean seed. Throughout June and July the fruit from the hand crossing will be harvested from all the mother trees by the assistant identified and trained during bloom.

The flesh will be removed from the seeds, the seed will be air dried for 24 hours, given a fungicide treatment and then placed in bags for stratification.

4. Seed storage. Seed in stratification bags will be kept in a ~5C cooler at Prosser, WSU, and periodically checked for moisture content and lack of contamination.
5. Planting: The seed will be planted in a seed bed at Willow Drive Nursery in in October. The seed will be hand planted by A.I., M.W., and assistance from the Prosser crew. A.I. shall be responsible for labeling the nursery and making a nursery map.
6. Seedling growth: The seed bed at Willow Drive Nursery will be cared for using standard procedures used at Willow Driver Nursery for obtaining mazzard rootstocks from seeds. A.I. shall visit the nursery to assess seed germination through stand counts and re-label the families to assure that the tags remain intact.
7. Dig and store the seedlings: The seedlings will all be individually labeled with family origin prior to digging. Trees will be dug after one season of growth using standard procedures. The trees will be placed in the storage cooler at Willow Driver Nursery to await delivery to a planting site.

Proposed schedule of accomplishments:

1. Develop a crossing plan: April 5, 2004. .
2. Implement the crossing plan: April – May 2004.
3. Harvest and clean seed: June – July 2004.
4. Seed storage: Summer 2004.
5. Planting: Early October 2004
6. Seedling growth: 2005
7. Dig and store one-year-old seedlings: Fall 2005/Spring 2006. Trees available for planting in Spring 2006.

Budget

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P.I.: Amy Iezzoni

Project Duration: one year

Current year: 2004

Project total: \$ 15,582 (\$13,982 for AI and \$1,600 for MW)

Current year request: \$15,582

Budget breakdown: This budget reflects the actual costs incurred. Receipts are available upon request. The outcome of this project is presented in Appendix 3 of the Breeding Proposal.

Item	Year 1 (2004)
Fee for A.I.	\$10,000 ^a
Hourly labor	\$1,600 ^b
Imported pollen	\$450 ^c
Materials & Supplies	\$1,000 ^d
Air travel, rental car, & lodging	\$2,532 ^e
Seedling tree cost	0 ^f
TOTAL	\$15,582

^a For P.I. (Amy Iezzoni) to design, organize and conduct the crossing/growing plan outlined in the Plan of Work.

^b Funds for Matt Whiting to cover the cost of a labor assistant for two weeks during bloom and two weeks during seed collection and harvest, and one day for seed planting.

^c Three pollen samples were purchased from two locations in Europe. Cost was \$100/sample plus the cost of express mail shipping.

^d Supplies (pollination bags, vials, dessicant, labels etc.) and expenses for A.I. bought from this budget and not MSU supplies (mostly lodging and rental car in Prosser) to conduct the outlined work plan.

^e This project required 3 trips in 2004: (1) travel to Prosser to carry out the pollinations, (2) travel to Prosser for seed harvest, cleaning and stratification, (3) travel to Ephrata, WA in October to plant seed. This budget request takes into account the funds already granted to A.I. for other projects. These funds cover trips 1 and 2.

^f Ken Adams at Willow Drive Nursery has generously agreed to grow the seedlings for ~ \$1/tree. This charge will appear in 2005.

FINAL REPORT

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Significant Accomplishments:

- 64 crosses were made in April 2004 resulting in 4,466 hybrid seeds.
- The crosses involved 18 parents.
- One European cultivar was successfully used as a parent by importing pollen.
- The seed were planted Oct. 4, 2004 in a nursery row and will be dug Fall 2005 for planting in the Fruit Test Sites.

Discussion:

The success of the crossing done in April 2004 at WSU-Prosser by Amy Iezzoni in collaboration with Matt Whiting validates the feasibility of conducting an accelerated crossing strategy using a collaborative approach.

Details of the actual crosses with seed numbers is provided in Appendix 3 of the Breeding Proposal.