

**Title: Raspberry Breeding for the Southern Region
Progress Report
SRSFC Project 2007-02
Research Proposal**

PIs:

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Objective(s):

Our overall objective was to continue to build the NCSU bramble breeding program. Our primary emphasis was raspberry variety development for the region, and a smaller emphasis on development of primocane fruiting blackberries.

Specific objectives of this proposal for 2007 were to: 1) release 2 raspberry selections as named cultivars, (one primocane fruiting (PF) and the one floricanne fruiting (FF)) 2) continue crossing and selecting of using germplasm with desirable characteristics, 3) establish advanced selection (unreplicated) and replicated trials of selections and 4) continue mapping project to identify heat tolerant and high chilling genotypes.

Justification and Description:

In the U.S., large-scale commercial bramble production is located almost exclusively in states along the Pacific Coast. According to a Census of Agriculture, California, Oregon, and Washington reported 76 percent of the harvested U.S. raspberry acreage. The majority of the acreage in Washington is destined for processing and the California industry is aimed toward the

fresh market. However, imports from other countries in the off-season are increasing and enable consumers to get fresh raspberries nearly year round. Production of brambles in the Southern Region is at the moment restricted to blackberries. However, the demand for locally produced raspberries exceeds the essentially non-existent supply. Both SunnyRidge Farm and Dole Foods are interested in sourcing raspberries and additional blackberries from the southeast in order to fit specific market windows.

Objectives and Results:

Objective 1. Introduce new raspberry cultivars.

We announced the release of NC 451 as 'Nantahala' in February at the North American Bramble Growers annual meeting in Columbus, Ohio. Through the North Carolina Crop Improvement Association, we are applying for a plant patent (will be completed in early December). 'Nantahala' was tested as NC 451 (Rosanna X NC 245). "Nantahala" has superior flavor and is larger than Caroline and Heritage. It is later than most primocane fruiting cultivars and responds well to season extension with row covers. It does well in the NC mountain locations of Laurel Springs and Fletcher and we anticipate it will do well in TN and parts of VA. The plan is to have 5000 plants available through Sakuma Brothers nursery in 2008.

We decided to hold off on the release of NC 344 in order to observe this selection at additional sites in western NC.

Objective 2. Continue crossing and selection process.

We made 42 crosses in 2007 that have generated over 35,333 seeds. Breeding objectives in 2007 included: heat tolerance, high chilling, early season florican fruit production, and primocane fruiting. All of these seeds were treated and those that germinate will be planted in the field at one of four research stations in NC (Upper Mountain Research Station in Laurel Springs, Mountain Horticultural Crops Research Station in Fletcher, Sandhills Research Station in Jackson Springs or the Piedmont Research Station in Salisbury).

Twenty-five selections were made in 2007 at the Cunningham Research Station, in Kinston. Selections appear to have one or more of the traits of heat tolerance, high chilling and early florican fruiting. These selections will be propagated and put into second test trials and undergo additional observation. An elite group of selections from this group as well as those in the program prior to this year will be used as parents in 2007.

Objective 3. Selections that have done well in second test plots (3-4 plant plots) will be placed in replicated trials.

Replicated trials of florican and primocane fruiting raspberries and blackberries were established in 3 locations in 2007. A replicated trial of primocane fruiting (PF) blackberry selections was established at the Upper Mountain Research Station in Laurel Springs. This trial included 6 PF NC selections, 2 PF selections from the University of Arkansas Breeding program and one PF cultivar (Prime-Jim). Replicated raspberry trials were established in Salisbury and Oxford. These trials included both primocane and florican fruiting selections and cultivated varieties. One florican fruiting raspberry selection that produced fruit for an extended period of time in 2007 will be propagated and put directly into replicated trials in 2008.

Objective 4. Molecular mapping of Rubus.

A PhD continues to work on this project. The objective of his project is to link heat tolerance in a segregating raspberry population (NC 497 X Qualicum) to molecular markers using SSR and AFLP technology. This map will also be aligned with the general Prunus and Rosaceae maps through the use of common markers. The student, Ramon Molina Bravo went to

HortResearch in Palmerston, New Zealand in July 2007. There he prescreened 40 SSR markers. The prescreening involved markers found on the *Rubus* map developed by Graham et al. (2004), and will be used to as anchor points to develop our map based on the our population.

Conclusions and Impact Statement:

Significant progress has been made in the bramble breeding program, especially in the raspberry portion of the program. One cultivar, 'Nantahala' will be patented in early 2008. Crosses continue to be made, plants are selected, meristemmed, propagated and distributed to cooperators.

Industry support is growing in the region. SunnyRidge Farms has signed contracts with several NC blackberry growers, and they will produce 50-100 new acres in 2008, with plans to double that acreage in 2009. In addition, a new grower organization, called the "North Carolina Commercial Blackberry and Raspberry Growers Association" was formed. Although they are primarily blackberry growers they wanted to be inclusive of potential raspberry growers in the future. SunnyRidge Farms is also interested in sourcing raspberries from western North Carolina and other nearby states in the future.

Citations:

None