

**Title: Raspberry Breeding for the Southern Region  
Progress Report  
SRSFC Project #1  
Research Proposal**

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**Regional Cooperators:**

Drs. David Lockwood and Dennis Deyton, University of Tennessee  
Mr. Stanley Scarborough, Georgia Grower  
Dr. Jeremy A. Pattison, Virginia Polytech Institute and State University

**Objective(s):**

Our overall objective was to reinvigorate the NCSU bramble breeding program. Our emphasis was the development of raspberries adapted to the region.

Specific objectives of this proposal are to: 1) reintroduce ‘Mandarin’ to the Southern Region, 2) propagate selections from the NCSU raspberry breeding program for regional distribution and evaluation 3) continue crossing and selecting using germplasm with desirable characteristics and 4) develop raspberry certification program and nursery industry. 5. Begin a molecular mapping project with the Genomics Research Laboratory.

**Justification:**

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 Regions is at the moment restricted to blackberries. However, the demand for locally produced raspberries exceeds the essentially non-existent supply.

**Methodologies and Results:**

Objective 1. Reintroduce Mandarin. Raspberries are particularly prone to viruses that cause inferior fruit quality (Martin 2002). ‘Mandarin’ has been indexed and propagated through the NCSU Micropropagation Unit (MPU). Virus indexed planting stock has been sent to collaborators (David Lockwood, UT, Jeremy Pattison and Doug Pfeiffer VT) in the Southern Region. Collaborators will be asked to supply feedback on adaptation and fruit quality. Sakuma

Brothers Nursery (Washington) and TreesUSA (Texas) nurseries have clean planting stock and are propagating this cultivar at this time and we are looking for additional nurseries to propagate Mandarin.

Objective 2. Meristem, virus-index, propagate and distribute advanced NCSU selections. The NCSU MPU meristemmed and virus indexed NC 535, NC 534, NC 535 in 2006. In addition they are processing a new selection we want to put on the "fast track" NC 548. They are meristemming and producing additional plants of NC 451 and NC 344, two NCSU selections we plan to release in 2007. Three growers in NC have NC 451, and NC 344 will be sent to growers/university personnel in the spring of 2007. David Lockwood, UT has 12 plants each of NC 535, NC 534 and NC 533 and will be putting them in a replicated trial.

Objective 3. Continue breeding process. In 2006, over 30 crosses were made at NCSU greenhouses. These crosses resulted in approximately 10,000 seeds. These seeds and others from the stockpile generated in past years are in the stratification process and will be planted in 2007 at 3 research stations in NC. We estimate over 25,000 seedlings will go out in 2007.

Objective 4. Certification Program. Our experience with the blackberry industry in the last few years has taught us the importance of using Certified planting stocks. An integral component of our raspberry breeding program is the development of a certification program for the dissemination of clean stock to nurseries. This certification program will enable us to establish a nursery industry in the Southern Region. Thus providing growers the opportunity to produce plants as well as fruit. We will be working with the NCSU MPU, North Carolina Crop Improvement Association, Inc. and NC Seed Producers Inc. to develop this program. We used a combination of standards for NC Blackberry Nurseries and those developed for raspberry nurseries from Oregon and Washington. We will submit our standards to the North Carolina Crop Improvement Association for their approval in January 2007.

Objective 5. Objective 5. Begin a molecular mapping project with the Genomics Research Laboratory. A core mapping population of 200 seedlings have been randomly selected from a population of NC 497 X Qualicum. Currently we have half of the population in vitro and very soon we will have purified DNA from the entire population. about 25 of these plants are already established in rooting media. Genetic linkage map will be established using AFLP and SSR markers, and will be integrated onto existing Rubus map (Graham et al. 2004). Additionally, this map will be used for comparative mapping with other members within Rosacea. Mother plants (400+) have been set in the field at the Sandhills Research Station and these plants will be used for determination of chilling requirement in 2006-7 and 2007-8.

Additional progress beyond stated objectives. Release of 2 NC selections. In 2007, we plan to release 2 raspberry selections from the NC Bramble Breeding program. They are NC 344 and NC 451.

NC 344 (Mandarin X Glen Prossen): This is a floricanic fruiting cultivar. It is adapted to the mountains of NC and anticipate it will do well in TN and parts of VA with more moderate climates. Harvest season is mid June (same as Mandarin) and fruit size is larger than Mandarin.

NC 451 (Rosanna X NC 245): 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.

More information on their characteristics will be made available to the SRSFC in 2007, via the newsletter.

**Conclusions and Impact Statement:**

Significant progress has been made in the bramble breeding program, especially in the raspberry portion of the program. Crosses continue to be made, plants are selected, meristemmed, propagated and distributed to cooperators. Progress beyond the original scope of the proposal includes the release of two raspberry cultivars in 2007.

**Citations:**

None