

Current Status of Plum and Grape Tomato Breeding at NC State University

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Efforts are being made to improve plum tomatoes for disease resistance and fruit quality. As a result, Plum Regal is the latest hybrid developed from NC 25P and NC 30P with intermediate fruit size. It has determinate growth habit and is resistant to Verticillium wilt (Ve gene), Fusarium wilt races 1 and 2 (I and I-2 genes), tomato spotted wilt virus (Sw-5 gene), and late blight (Ph-3 gene). Furthermore, it has moderate early blight resistance derived from both parents and has exhibited less defoliation due to bacterial spot than in Plum Crimson (a previous release) in research station and tomato growers' fields. NC 25P is a fresh-market plum breeding line with the Ph-3 gene for late blight resistance derived from L 3707, a wild tomato selection *Lycopersicon pimpinellifolium*.

Grape tomato improvement for fresh market is also focused on developing hybrids with superior fruit quality, multiple disease resistance, and improved plant growth habit. In an effort to pyramid the disease resistance, Fusarium wilt race 3 and tomato spotted wilt virus (TSWV) resistance was combined in grape hybrid NC 07310 whereas Mountain magic combines resistance to early blight and late blight, and has excellent flavor. Segregating population was generated by selfing NC 07310 and homozygous lines for Sw-5 and I-3 were identified by using molecular markers. On the other hand, late blight and early blight resistance was combined in yet another grape hybrid NC 08135 and its segregating population was developed. Two male sterile lines with early and late blight resistance identified by detached leaf test, and with high sugar content (>8.0%) were identified and crosses are being made to develop new hybrids. These hybrids will be evaluated in the greenhouse in Fall 2009 and Spring 2010 before testing in the Summer of 2010. These hybrids are expected to be promising to improve for multiple disease resistance and superior fruit quality.