

**North Carolina Agricultural Research Service  
North Carolina State University  
Raleigh, North Carolina**

**Notice of Release of NC 3 Grape Tomato Breeding Line**

NC 3 Grape (NC 3) tomato breeding line is an open-pollinated, high sugar grape tomato breeding line with compact, determinate growth habit. NC 3 Grape has fruit size and shape similar to that of 'Santa,' the current industry standard for grape tomatoes. NC 3 Grape was developed as a parent to be used in combination with compact indeterminate lines having the *rin* gene to produce long shelf life hybrids. To facilitate F<sub>1</sub> hybrid seed production, the *ms-10,aa* male sterile, green stem seedling marker combination was crossed into NC 3 Grape.

NC 3 Grape has the same parentage as NC 1 Grape up to the F<sub>3</sub> generation of the final cross (see pedigree in Figure 1). Its compact growth habit was derived from the early blight resistant plum tomato NC EBR-6, which is determinate and has the brachytic gene (*br*) for short internode length. It was selected in the F<sub>3</sub> generation from the self of hybrid NC 99451 for determinate growth habit and for segregation for the *ms-10,aa* gene combination. The *ms-10* gene conditions male sterility, and *aa* (lack of anthocyanin) provides a green stem marker gene closely linked to the *ms-10* gene. The linkage of *aa* to *ms-10* allows for selection of male sterile plants in the seedling stage as soon as the plants emerge and is useful in producing a male sterile female parent line which does not require emasculation of flowers for hybrid seed production. The *ms-10,aa* combination was derived from the NC 2C *ms-10,aa* line, which is a parent line in the cherry tomato hybrid 'Mountain Belle.'


NC 3 Grape has fruit size (10 g/fruit) and shape similar to that of 'Santa.' Fruit of NC 3 Grape develop high sugar but are not as sweet as fruit of 'Santa' or NC 1 Grape. This is likely the result of NC 3 Grape having a determinate growth habit with a higher fruit/foilage ratio than 'Santa' and NC 1 Grape, which are indeterminate in growth habit and have more leaves between fruit clusters. Fruit of NC 3 Grape have jointless pedicels, and the immature fruit have the *u* gene for uniform light green color of immature fruit.

Foliage of NC 3 Grape is moderately resistant to early blight, derived from the NC EBR-6 line, and the fruit hold well on the plant into late season without bursting or rotting.

NC 3 Grape has potential for use as a parent in other grape tomato hybrids and for further breeding to improve grape tomatoes and to facilitate hybrid seed production.

Seed of NC 3 Grape were transferred to Harris Moran Seed Company through a seed transfer agreement with NC State University and is being used as the female parent in the grape tomato hybrid 'Smarty.'

Breeder seed of NC 3 Grape are available by contacting Dr. Randy Gardner or Dr. Dilip Panthee, Mountain Horticultural Crops Research and Extension Center, 455 Research Drive, Mills River, NC 28759 or by telephone: 828.684.3562; fax: 828.684.8715; email addresses: [randy\\_gardner@ncsu.edu](mailto:randy_gardner@ncsu.edu) or [dilip\\_panthee@ncsu.edu](mailto:dilip_panthee@ncsu.edu). A fully executed tomato seed transfer agreement with NC State University's Office of Technology Transfer will be required to acquire seed of NC 3 Grape.

  
Director, North Carolina Agricultural Research Service

10-16-09  
Date

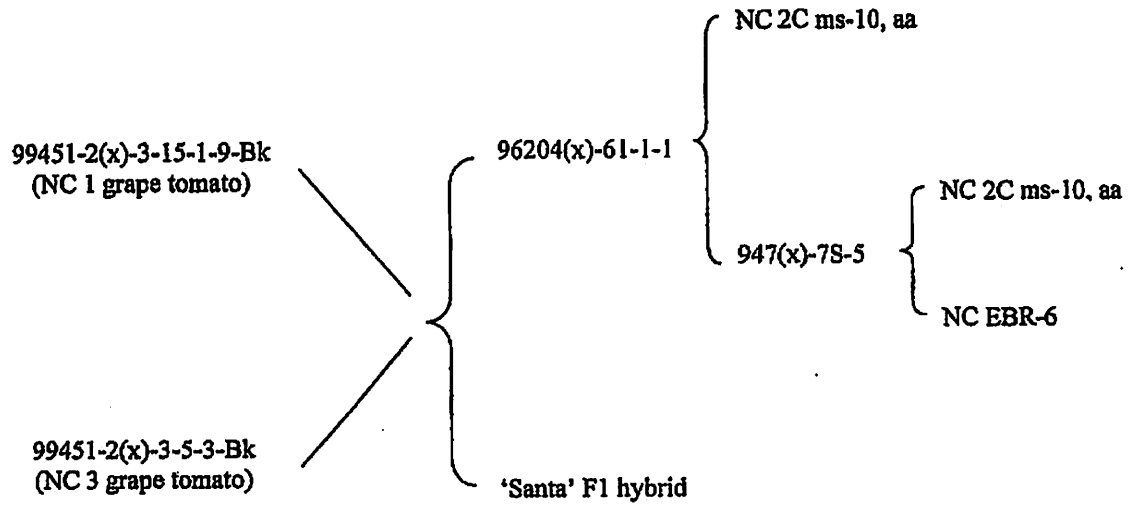


Figure 1. Pedigrees of NC 1 grape and NC 3 grape tomatoes.