

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

Notice of Release of NC 2 Grape Tomato Breeding Line

NC 2 Grape (NC 2) tomato breeding line is an open-pollinated, high sugar grape tomato line with compact indeterminate growth habit based on the short internode brachytic (*br*) gene. It has fruit size and shape similar to that of 'Santa,' which is the current standard cultivar for grape tomato production. NC 2 Grape was developed for use as a parent in F₁ hybrids and has the *rin* gene, which prevents fruit ripening when in the homozygous condition by blocking ethylene production. The *rin* gene is incompletely recessive and when used in the heterozygous condition in F₁ hybrids, increases shelf life of the fruit by slowing fruit ripening and softening.

NC 2 Grape was developed from crosses involving the high sugar grape tomato hybrid 'Santa' with NC State lines with compact growth habit (*br* gene) and ovate cherry tomatoes (see pedigree in Figure 1). NC 2 Grape shares the same pedigree as NC 1 Grape and NC 3 Grape on one side (NC 99451) of the final cross which led to its development. The other parent (NC 99456) of the final cross leading to NC 2 Grape traces back to NC EBR-6 plum tomato, to an NC cherry tomato line (NC 9550), and to a large fruited line with the ripening inhibitor (*rin*) gene (NC 9565).

Selection in the development of NC 2 Grape was aimed at incorporating the *rin* gene for extended shelf life into a high sugar background derived from 'Santa' grape tomato hybrid. Fruit of NC 2 Grape are similar in shape and size (10 g/ fruit) to 'Santa' and develop a deep yellowish orange exterior color. The fruit develop high sugar as they reach the deep yellowish orange color stage. Since the fruit do not produce ethylene as a result of the action of the *rin* gene, they do not go through the climacteric ripening phase of normal tomatoes and remain very firm and crisp. Mature fruit left on the plant do not decay and exhibit very little bursting in spite of their high sugar content.

The *rin* gene is useful in developing tomato hybrids with extended shelf life. *Rin* is classified as recessive in action, but it is not completely recessive and exerts influence in the heterozygous condition in delaying fruit ripening and softening when used in hybrids. *Rin* is used extensively in large fruited hybrids for vine ripe production worldwide. Hybrids of NC 2 Grape crossed with other lines in the NC State tomato breeding program have exhibited good shelf life and increased sweetness coming from the NC 2 Grape parent.

NC 2 Grape was transferred to Harris Moran seed Company through a seed transfer agreement and is being used as the male parent in the grape tomato hybrid 'Smarty.' NC 2 Grape will be useful directly as a parent in other grape tomato hybrid development and for further breeding to improve grape tomato cultivars.

Breeder seed of NC 2 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 or 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 2 Grape.


Director, North Carolina Agricultural Research Service

10-16-09
Date

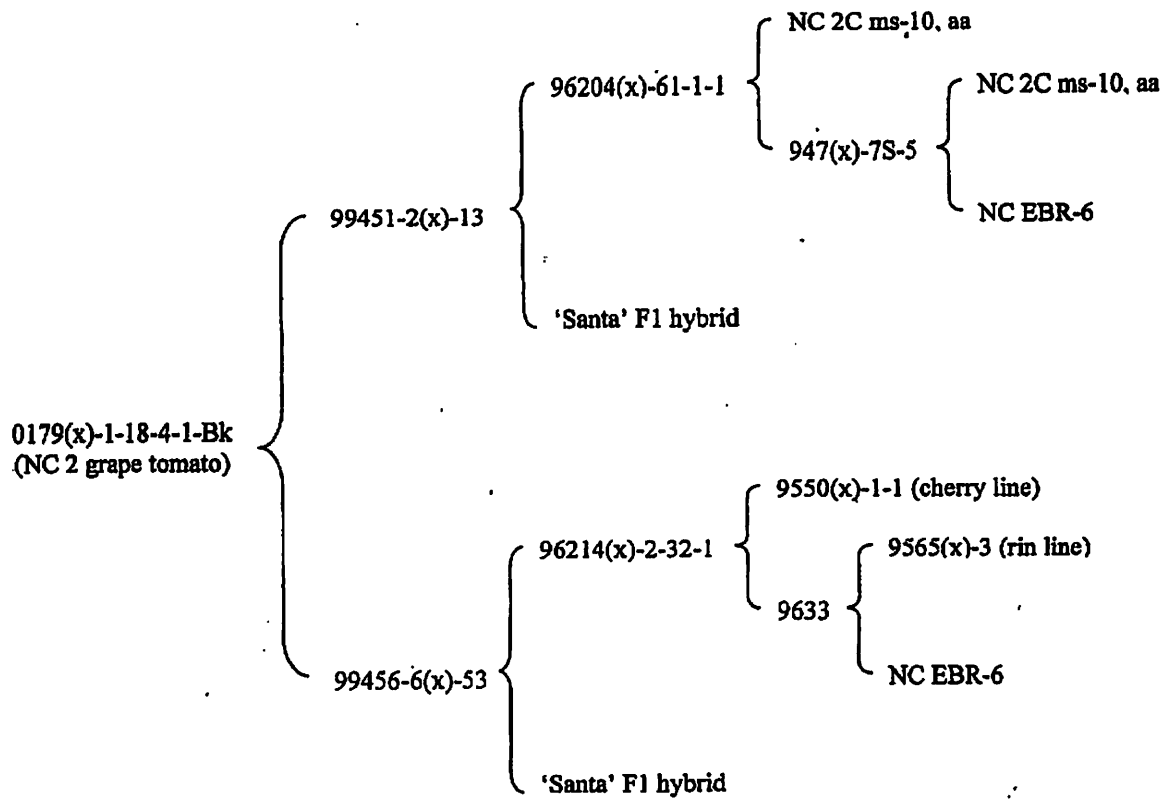


Figure 1. Pedigree of NC 2 grape tomato.