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 F₁ 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 F₃ 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 F₃ 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/foliage 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 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 3 Grape.

[Signature]
Director, North Carolina Agricultural Research Service

10-16-09
Date
Figure 1. Pedigrees of NC 1 grape and NC 3 grape tomatoes.