‘Mountain Merit’: A Late Blight-resistant Large-fruited Tomato Hybrid

Dilip R. Panthee¹ and Randy G. Gardner
Department of Horticultural Science, North Carolina State University, Mountain Horticultural Crops Research and Extension Center (MHCREC), 455 Research Drive, Mills River, NC 28759-3423

Additional index words. fresh-market tomato, fusarium wilt, late blight, root-knot nematodes, tomato spotted wilt virus, verticillium wilt

‘Mountain Merit’ is a large-fruited, determinate, fresh-market F₁ hybrid tomato (Solanum lycopersicum L.) resistant to late blight [Phytophthora infestans (Montagne, Barry)]; verticillium wilt (Verticillium dahliae); fusarium wilt [Fusarium oxysporum f.sp. lycopersici (Sacc.) W.C. Snyder and H.N. Hans] races 1, 2, and 3; tomato spotted wilt virus (TSWV); and root-knot nematodes (Meloidogyne spp.). ‘Mountain Merit’ provides a highly adapted cultivar for North Carolina tomato growers and carries multiple resistances to important tomato diseases not currently combined in any other tomato cultivar.

Origin

‘Mountain Merit’, the F₁ hybrid of NC 1CELBR × NC 123S (Fig. 1), resulted from a tomato breeding effort to develop a large-fruited, fresh-market tomato hybrid with combined late blight, fusarium wilt, verticillium wilt, root-knot nematodes, and tomato spotted wilt virus resistances adapted to vine-ripe production in North Carolina (NC). NC 1 CELBR was developed for resistance to late blight (Ph-2 and Ph-3 genes combined) and early blight (C. 1943 and PI 126445 sources) along with verticillium wilt resistance (Ve gene) and fusarium wilt races 1 and 2 resistance (I and I-2 genes) (Gardner and Panthee, 2010). NC 123S resulted from selfing the F₁ hybrid ‘Amelia’ and was selected for resistance to TSWV (Ssw-3 gene), verticillium wilt (Ve gene), root-knot nematodes (Mg gene) and races 1, 2, and 3 of fusarium wilt (I, I-2, and I-3 genes). NC 1 CELBR and NC 123S were released after late blight appeared (Table 2). Observational trials in late blight resistance breeding plots in 2006, 2007, and 2009 at Wayneville and Mills River also indicated a high level of resistance to late blight in ‘Mountain Merit’.

Description

When averaged over five conventionally grown trials, ‘Mountain Merit’ did not differ in non-graded or U.S. combination grade (U.S. No. 1 + U.S. No. 2 fruit) from widely grown standard cultivars (Table 1). ‘Mountain Merit’ was later than ‘Mountain Glory’, ‘Mountain Fresh’ (Gardner, 1999), and ‘Fletcher’ as indicated by its lower early-season yield (first three harvests). Average fruit weight of ‘Mountain Merit’ was less than that for ‘Mountain Fresh’ but did not differ from ‘Mountain Glory’ and ‘Fletcher’ (Table 1).

Fruit of ‘Mountain Merit’ develop deep red color and are firm in the fully ripened stage. Immature fruits have a glossy, uniform green color (u gene). Fruit pedicels are jointed. The fruit are deep olate to flattened globe in shape with generally smooth blossom end scars and have good resistance to fruit cracking and weather check. ‘Mountain Merit’ has performed well in observational trials in research station and grower fields throughout the mountains and piedmont of North Carolina. Plant growth habit is vigorous determinate (sp) similar in height to that of ‘Mountain Fresh’ when staked. Foliation provides adequate, but not dense, cover for fruit protection. Single dominant disease resistance genes include Verticillium dahliae Kleb. (Ve gene); races 1, 2, and 3 of Fusarium oxysporum Tsp. lycopersici (Sacc.) Snyder. and Hans (I, I-2, and I-3 genes); root-knot nematodes (Mg gene); and TSWV (Ssw-3 gene). It has the Ph-2 and Ph-3 genes in heterozygous condition conferring incomplete resistance to late blight.

In an organic culture trial at Waynesville, NC, in the summer of 2009, ‘Mountain Merit’ did not differ in total or marketable fruit yield from the two early blight-susceptible cultivars Pink Brandywine and Cherokee Purple (Table 2). However, late blight did not occur until mid-August after much fruit of the susceptible cultivars, both earlier in maturity than ‘Mountain Merit’, had been harvested from the trial. ‘Mountain Merit’ had no late blight symptoms on foliage when there was an extremely high level of inoculum pressure of Phytophthora infestans which developed complete disease within 1 week in the susceptible control (‘Pink Brandywine’). Late blight was present on some fruit of ‘Mountain Merit’ but was much less than for the susceptible cultivars Pink Brandywine and Cherokee Purple harvested after late blight appeared (Table 2).

Use

‘Mountain Merit’ provides growers in North Carolina and other states with similar growing conditions a high-yielding, disease-resistant, fresh-market tomato cultivar with acceptable fruit quality. The combined resistances to late blight, TSWV, and root-knot nematodes, allow conventional growers to more economically control important soil-borne and foliar diseases and allow organic growers who have limited approved chemical pesticides to manage these important diseases, especially late blight. ‘Mountain Merit’ lacks resistance to tomato mosaic virus. Although NC 1 CELBR has early blight resistance, it is lacking in the NC 123S parent. Because early blight resistance is recessive (Nash and Gardner, 1988), expression of resistance in the F₁ hybrid is not of a sufficient level to be useful.

Availability

‘Mountain Merit’ was released on an exclusive basis for seed production and sales to Bejo Seeds, and commercial seed should be available in 2011. Distribution of seed of NC 1CELBR and NC 123S to other breeders requires a signed seed transfer agreement, which can be downloaded at the following
Small trial samples of ‘Mountain Merit’ are available from D.R. Panthee (dilip_panthee@ncsu.edu), MHCREC, 455 Research Drive, Mills River, NC 28759.

### Literature Cited


