

'Mountain Spring' Tomato; NC 8276 and NC 84173 Tomato Breeding Lines

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'Mountain Spring' is an early midseason, determinate, fresh-market tomato (*Lycopersicon esculentum* Mill.) hybrid. 'Mountain Spring' and its parent lines, NC 8276 and NC 84173, were developed at the Mountain Horticultural Crops Research Station, Fletcher, N.C.

Origin

NC 8276 and NC 84173 are inbred lines in the F₆ generation. The pedigree of NC 8276 includes two previous releases from the North Carolina fresh-market tomato breeding program, 'Piedmont' (Gardner, 1985) and NC 50-7 (Gardner, 1982), and the Univ. of Florida's 'Florida MH1' (Fig. 1). NC 84173 resulted from a cross between a selection of the breeding line Fla. 7060 (Scott et al., 1989) and an early generation selection from the same pedigree as NC 8276. 'Mountain Spring' is the F₁ hybrid of NC 8276 x NC 84173. 'Mountain Spring' was tested extensively in North Carolina and in several other states as NC 87127 and in the Southern Tomato Exchange Program as STEP 710.

Description

NC 8276. Plant habit is determinate (*sp.*). Foliage exhibits slight adaxial leaf curl, similar to 'Florida MH1'. NC 8276 has the nipped blossom trait (*n* gene) and generally produces fruit with a pinpoint blossom scar. Nonripe fruit are uniformly light green (*u* gene) and have a glossy finish. Fruit pedicels are jointed. Fruit shape is deep oblate and generally symmetrical. Fruit ripen to a uniform, bright-red external and internal color that is usually free of white tissue. Ripe fruit are very firm (subjective ratings) and soften slowly. Gel of ripe fruit is red. Season of maturity is early midseason.

Total nongraded yield of NC 8276 was not significantly different from other lines in trial in 1988 and 1989 (Table 1). Because of its smooth fruit shape, small blossom scar, and excellent resistance to fruit cracking (Table 1), NC 8276 greatly exceeded 'Pikred' in U.S. Combination grade (U.S. No. 1 + U.S. No. 2) yield. NC 8276 fruit are very large (Table 1), with >50% of the fruit exceeding 8.9 cm in diameter in staked trials in North Carolina.

NC 8276 is resistant to races 1 and 2 (*I* and *I-2* genes) of *Fusarium oxysporum* f. sp. *lycopersici* (Sacc.) Snyder & Hans. (fusarium wilt) and to race 1 (*Ve* gene) of *Verticillium dahliae* Kleb. (verticillium wilt). NC 8276 has shown excellent resistance to radial and concentric fruit cracking and weather check (fine cuticle cracking on the shoulder area of the fruit) over several seasons of trials. Some susceptibility to graywall has been noted under conditions of high N fertility and high soil moisture. Like 'Florida MH1' and other cultivars having curled foliage, NC 8276 is

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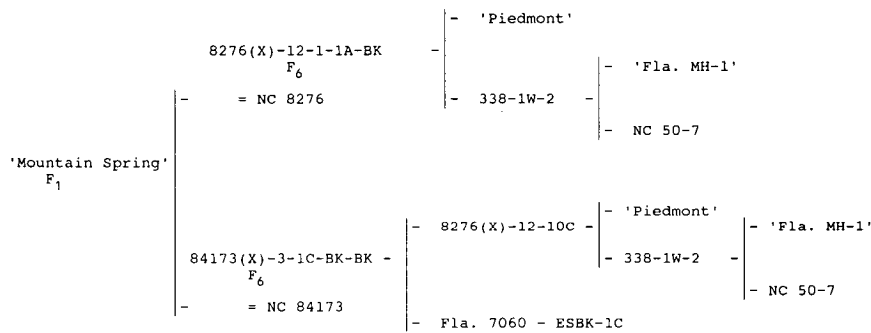


Fig. 1. Pedigree of 'Mountain Spring' tomato and its parent lines, NC 8276 and NC 84173.

Table 1. Performance of 'Mountain Spring' F₁ hybrid tomato compared with its parent lines and with 'Pikred' in staked trials at Fletcher, N.C.

Cultivar or line	Yield (t·ha ⁻¹)								
	Early season			Total season					
	Nongraded			Nongraded			U.S. Combination Grade		
	1987	1988	1989	1987	1988	1989	1987	1988	1989
Mountain Spring	47	39	18	111	112	103	44	60	57
NC 84173	27	32	19	98	112	100	32	41	30
NC 8276	---	33	15	---	106	88	---	61	36
Pikred	46	46	25	104	97	94	10	21	11
LSD (0.05)	9	4	5	NS	13	NS	10	9	14
	Fruit wt (g)			Fruit cracking (%) ^y		Rough blossom scar (%)			
	1987	1988	1989	1987	1988	1987	1988		
Mountain Spring	350	329	355	19	9	29	6		
NC 84173	395	360	377	29	34	23	4		
NC 8276	---	295	309	---	6	---	12		
Pikred	286	270	281	70	50	41	22		
LSD (0.05)	32	23	17	8	6	10	5		

^zDash indicates no data obtained.

^yIncludes radial and concentric cracking and weather check (fine cuticle cracking on shoulder area of fruit).

more susceptible to early blight than cultivars lacking the curled foliage trait.

NC 84173. Plant habit is determinate (*sp*). When staked and pruned, plants average 80 cm high. Foliage has moderate adaxial leaf curl in association with the nipped blossom trait (*n* gene), a characteristic derived from 'Florida MH1'. NC 84173 resembles Fla. 7060 in fruit type. Fruit are extremely large (Table 1) and vary from round to elongate round. Fruit pedicels are jointed and very long, like those of Fla. 7060. The blossom scar of NC 84173 is generally pinpoint, because of the *n* gene, with little prominent nipping of fruit. Immature fruit are uniformly green (*u* gene). Fruit exterior and interior develop to a uniformly bright red with no incidence of internal white tissue noted. Fruit are very firm in the ripe stage and soften slowly.

NC 84173 is resistant to races 1 and 2 (*I* and *I-2* genes) of *F. oxysporum* sp. *lycopersici* (fusarium wilt) and to race 1 (*Ve* gene) of *V. dahliae* (verticillium wilt). NC 84173 has shown some susceptibility to zippering (adnate anther scar) and weather check, resulting in reduced U.S. Combination Grade yields in some trials (Table 1). NC 84173 has good resistance to radial and concentric fruit cracking.

'Mountain Spring'. Plant type is determinate (*sp*). Foliage exhibits slight to moderate adaxial leaf curl but provides good coverage for fruit protection. Fruit of 'Mountain Spring' are deep oblate in shape. Blossom scars are typically pinpoint as a result of the *n* gene, present in both parent lines. Immature fruit are a glossy, uniform light green (*u* gene). Fruit pedicels are jointed. Fruit ripen to a uniform bright red externally

and internally. Ripe fruit are very firm and soften slowly. Flavor is similar (subjective ratings) to 'Pikred' and other early season determinate cultivars.

'Mountain Spring' has produced high yields in trials in North Carolina (Table 1) and several other states. Fruit are very large, with a high percent >8.9 cm in diameter. 'Mountain Spring' is classified as early midseason in maturity. In comparison with 'Pikred', it has generally produced lower early season nongraded yields. However, because of its much better fruit quality, 'Mountain Spring' has greatly exceeded 'Pikred' in yield of U.S. Combination Grade fruit (Table 1).

'Mountain Spring' is resistant to races 1 and 2 (*I* and *I-2* genes) of *F. oxysporum* f. sp. *lycopersici* (fusarium wilt) and to race 1 (*Ve* gene) of *V. dahliae* (verticillium wilt). Fruit are highly resistant to all types of fruit cracking (Table 1), and to blossom-end rot, puffiness, and angularity. Some susceptibility to graywall has been observed under conditions highly conducive to development of the disorder.

Use

'Mountain Spring' is intended primarily for vine-ripe, fresh-market production. It has shown adaptability to staked and nonstaked production systems and performed well in trials in several eastern states and in Ontario. NC 8276 and NC 84173 are not intended for direct use as cultivars. Both should be useful to other breeders because of their combinations of disease resistance and fruit quality characteristics. Applications have been filed for Plant Variety Protection Certificates for NC 8276 and NC 84173.

Availability

'Mountain Spring' was released on an exclusive basis to Rogers NK Seed Co. Small samples of 'Mountain Spring', NC 8276, and NC 84173 for trial and breeding purposes are available from R.G.G., Mountain Horticultural Crops Research and Extension Center, Fletcher, NC 28732.

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