

‘Mountain Magic’: An Early Blight and Late Blight-resistant Specialty Type F₁ Hybrid Tomato

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‘Mountain Magic’ is a small-fruited, indeterminate, fresh-market tomato (*Solanum lycopersicum* L.) hybrid, which combines early blight [*Alternaria solani* (Ellis & G. Martin) L.R. Jones & Grout] and late blight [*Phytophthora infestans* (Montagne, Bary)] resistances with other important disease resistance genes. It has superior horticultural traits including a high sugar level and ex-

tended shelf life and is well adapted for home garden and commercial production in organic and conventional culture.

Origin

‘Mountain Magic’ is the F₁ hybrid of NC 2 CELBR × NC 2 Grape (Fig. 1). NC 2 CELBR is a large-fruited, determinate to-

mato breeding line, which combines moderate resistance to early blight with a high level of late blight resistance based on the combination of the *Ph-2* and *Ph-3* genes (Gardner and Panthee, 2010a). NC 2 Grape is an indeterminate, compact growth habit (brachytic, *br* gene) grape tomato line, which has a high sugar level and carries the ripening inhibitor (*rin*) gene (Gardner and Panthee, 2010b). ‘Mountain Magic’ was tested as NC 05114 in organic and conventional culture from 2005–2007 before being named and released for commercial seed production in 2008.

Description

‘Mountain Magic’ has a fairly compact indeterminate plant with good foliage cover. Fruit are round to slightly ovate in shape. Fruit ripen to an attractive red color and are firm and highly crack-resistant (Table 1). Immature fruit have uniform light green color (*u* gene) and have jointed pedicels. Vine-ripened fruit are high in sugar (Table 2) and have been rated consistently as having very good flavor. The *rin* gene in heterozygous condition in the hybrid slows ripening and

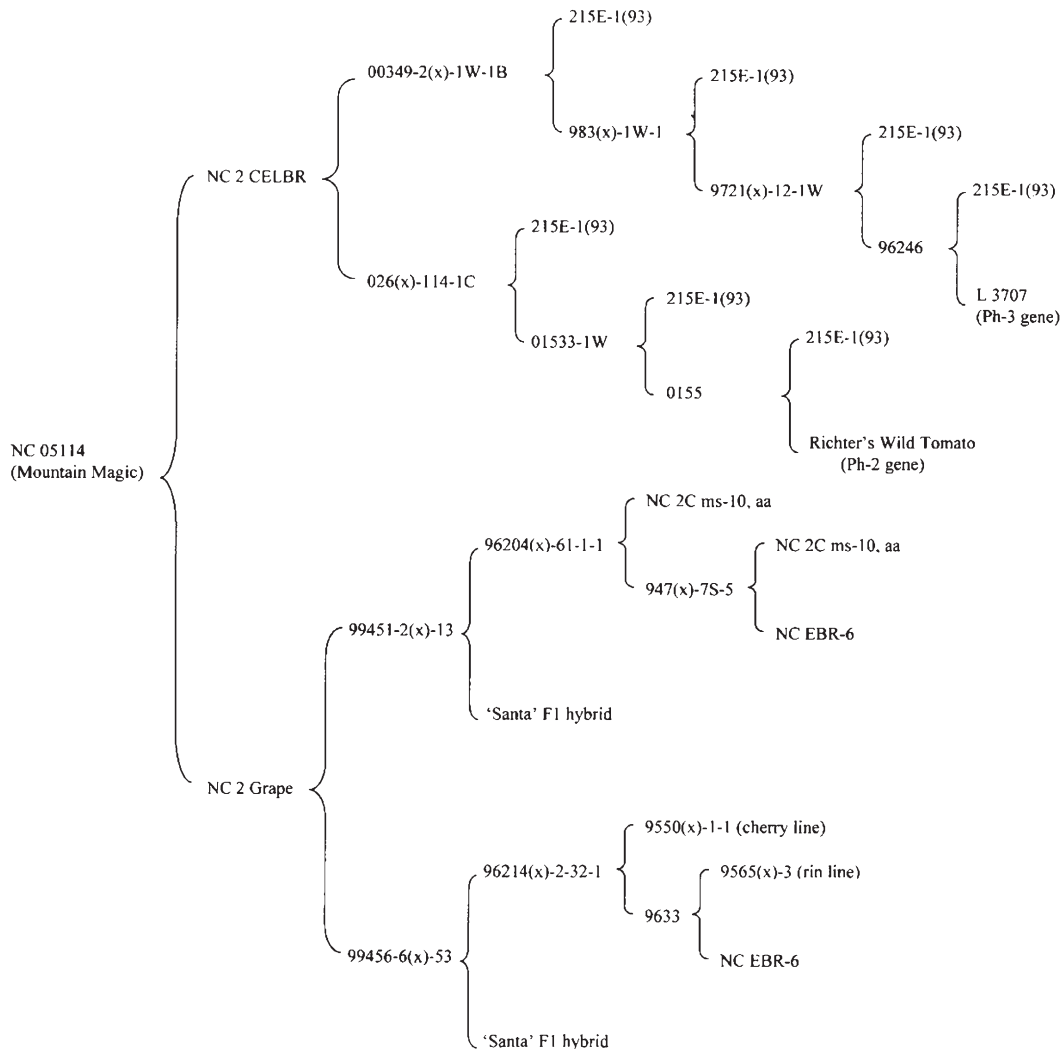


Fig. 1. Pedigree of ‘Mountain Magic’ F₁ hybrid tomato.

Table 1. Fruit yield and size of 'Mountain Magic' tomato in organic and conventional trials using an overhead wire trellis system with plants pruned to a single stem at Waynesville, NC, in 2007.

Genotype	Total yield (t/ha) ^z		Fruit wt (g/fruit) ^z		Cracked fruits (%) ^z		Reaction to LB ^y	Fruit infected with LB (%)
	Organic	Conventional	Organic	Conventional	Organic	Conventional		
Red Brandywine	52	49	264	267	29	26	S	65
Stupice	54	56	94	85	3	4	S	39
NC 0652	45	50	300	298	26	27	R	0
Mountain Magic	50	43	59	59	0	0	R	0
LSD(0.05)	NS	7	17	11	8	6		28

^zAverage of two replications in organic and conventional trials. NS = nonsignificant at $P = 0.05$.

^yNatural field inoculum of late blight, which occurred at the end of the harvest season, was used to score the disease development under organic conditions. R = resistant; S = susceptible.

LB = late blight; LSD = least significant difference.

Table 2. Fruit yield, size and total soluble solids (TSS) of 'Mountain Magic' tomato in an organic culture trial using a string-weave trellis system with tall stakes at Waynesville, NC, in 2011.

Genotype	Total yield (t/ha) ^z	Marketable yield (t/ha) ^z	Marketable fruit (%) ^z	Fruit wt (g/fruit) ^z	TSS ^y	Taste rating ^x
Blush	84	75	89	23	6.8	3.7
Cherokee Purple	156	36	23	286	5.3	3.2
Mountain Magic	121	110	91	40	7.0	3.4
NC08144	137	83	60	238	5.3	3.0
NC08224	158	31	20	283	5.3	3.0
LSD(0.05)	21	15	5	20	0.6	0.3

^zAverage of two replications.

^yTotal soluble solids were measured in six vine-ripened fruit per replicate at three harvest dates.

^xTaste test was conducted by untrained panel of ≈ 200 consumers and tomato breeders at the score of 0 to 5, in which 0 means poor taste and 5 means excellent taste.

LSD = least significant difference.

extends shelf life so that the fruit can be left on the plant for an extended period after ripening. 'Mountain Magic' has performed well in replicated yield trials and in grower field plantings where almost all of the fruit have been marketable because of their uniformly smooth shape and freedom from defects (Tables 1 and 2). Fruit are early in maturity, and the hybrid yields over a long production period as a result of its indeterminate growth habit. It has been successfully grown in an overhead wire trellis system pruned to a single stem (Table 1) and in a string-weave cultural system using tall stakes (Table 2). In the string-weave system, it has performed very well when pruned to remove all side shoots from the base of the plant except the shoot immediately below the first inflorescence with no additional pruning thereafter. Fruit size averaged 59 g when pruned to a single stem and 40 g with less pruning in the string-weave trellis system (Tables 1 and 2).

'Mountain Magic' is resistant to verticillium wilt (*Verticillium dahlia* Kleb) conferred by the *Ve* gene and to fusarium wilt [*Fusarium oxysporium* f.sp. *lycopersici* (Sacc.) W.C. Snyder and H.N. Hans] races 1 and 2 (*I* and *I-2* genes). It has the *Ph-2* and *Ph-3* genes in heterozygous condition, which confer a high level of resistance to late blight [*Phytophthora infestans* (Montagne, Bary)] (Table 1). In non-sprayed or organic trials using fungicides approved for organic production, 'Mountain Magic' has maintained good late blight resistance under conditions highly conducive to late blight development. Early blight [*Alternaria solani* (Ellis & G. Martin) L.R. Jones & Grout] resistance of 'Mountain Magic' has also been good under both non-sprayed and organic culture. 'Mountain Magic' is susceptible to septoria leaf spot (*Septoria lycopersici*) but has not defoliated as quickly as some other varieties grown in the same trials.

Uses

'Mountain Magic' provides home garden and commercial growers with a productive, high-quality tomato with a wide range of useful disease resistances. Because of its early blight and late blight resistances, it is highly adaptable to organic culture in addition to conventional culture. 'Mountain Magic' is comparable to the popular greenhouse hybrid 'Campari' in fruit size and quality, which gives growers in field production systems a hybrid competitive to this popular greenhouse hybrid. 'Mountain Magic' is well adapted to marketing in clamshell packages. Because of its resistance to fruit cracking and long shelf life resulting from the *rin* gene, fruit can be left on the plant until fully ripe, allowing the development of optimum flavor before harvest.

Availability

'Mountain Magic' was released to Bejo Seeds as an exclusive for seed production and sales. Seed are available through distributors for Bejo, and it is listed in numerous commercial grower and home garden catalogs.

Literature Cited

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