‘Crimson Seedless’: A New Late-maturing, Red Seedless Grape

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The ‘Crimson Seedless’ grape (*Vitis vinifera* L.) (Fig. 1) is a late-season, attractive, red seedless grape cultivar with firm berries. The cultivar, introduced in 1989, fills the need for a red seedless cultivar for the fresh market and provides a seedless alternative to ‘Emperor’, a late-ripening, red-seeded grape.

Origin

‘Crimson Seedless’ is the result of five generations of hybridization at the U.S. Dept. of Agriculture Horticultural Field Station in Fresno, Calif., starting in 1926 (Fig. 2). The source of seedlessness is ‘Sultanina’ (syn. ‘Thompson Seedless’), which was used as a parent in the first generation of crossing. C33-199, a late-ripening, white seedless grape with all white grapes in its parentage, was used in the final hybridization with ‘Emperor’ to produce ‘Crimson Seedless’. The cross was made in 1979 and consisted of 1222 emasculated and pollinated flowers that produced 151 seeds. The 85 resultant seedlings were planted in 1980 in research plots in cooperation with California State Univ., Fresno. Four seedlings were selected, of which two had seeded red fruit, one had seedless white fruit, and one had seedless red fruit. ‘Crimson Seedless’ was selected in 1983 and tested as C102-26.

Description

‘Crimson Seedless’ vines are very vigorous on their own roots. Cane pruning is advisable because production on spurs was low in initial trials. In our tests, the trellis consisted of a 2.1-m stake with two cross arms 61 and 107 cm wide. Two wires supported the canes on the lower cross arm and four wires supported the shoots on the top cross arm. The vines pruned to 10 canes produced significantly higher yield than those pruned to six canes (Table 1). Yields of 1000 to 1500 boxes (box = 10 kg) per hectare in commercial

production have been achieved compared to 1750 to 2250 boxes per hectare for ‘Emperor’. Some fruit quality characteristics [i.e., berry weight and diameter, soluble solids concentration (SSC), titratable acid] were not significantly affected by the pruning level, but pH was lower for vines pruned to 10 canes than to six canes.

‘Crimson Seedless’, on average, ripens in early October in Fresno, when SSC has reached 19% and the sugar : acid ratio is >20:1. ‘Crimson Seedless’ matures slightly before ‘Emperor’. For example, in a grower trial on fourth-leaf grafted vines, ‘Crimson Seedless’ had

18.8% SSC and 0.75 g titratable acidity/100 ml, while ‘Emperor’ had 15.4% SSC and 0.89 g titratable acidity/100 ml on 9 Sept. 1988. The clusters of ‘Crimson Seedless’ were medium in size (weight = 0.5 kg; length = 20 cm) and conical with a shoulder. The clusters were well-filled to slightly compact. The berries of ‘Crimson Seedless’ in this trial were medium in size, averaging 4.0 g, 16.6 mm in diameter, 20.8 mm long, and cylindrical to oval. This compares to ‘Emperor’, which averaged 6.3 g, 20.8 mm in diameter, and 22.2 mm long. The berries of ‘Crimson Seedless’ respond to girdling and gibberellic acid, although rates used for ‘Thompson Seedless’ cause excessive thinning and a thickened rigid rachis and pedicel, which results in increased shatter. Application of gibberellic acid or girdling has increased berry size by an average of 1 g; application of 6.25 g·ha⁻¹ at bloom to reduce berry set and 75 g·ha⁻¹ at 12 days after berry set to increase berry size gave optimum response (Dokoozlian, 1994).

The peduncle of ‘Crimson Seedless’ is medium in diameter and becomes lignified and brown at the shoot. The pedicel is medium in length and thickness. The brush is medium in length and is yellow-green. The berries are bright red with a thick white bloom ($L^* = 28.89$, $a^* = +0.45$, $b^* = -0.28$, chroma $C^* = 56$, hue = 326.41) compared to ‘Emperor’ ($L^* =$

Fig. 1. ‘Crimson Seedless’ fruit.

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Fig. 2. Parentage of 'Crimson Seedless'.

Table 1. Effect of level of pruning on growth, yield, and fruit quality of 'Crimson Seedless' vines at California State Univ., Fresno, picked 13 Nov. 1991 (fourth crop).

Variable	Pruning level (canes/vine)		
	6	8	10
Vine growth and yield			
Number of shoots	59 c ^z	76 b	105 a
Number of clusters	40 b	46 b	76 a
Pruning weight (kg/vine)	5.3 b	7.3 a	8.0 a
Total yield (kg/vine) ^y	15.2 b	18.9 ab	29.1 a
Net yield (kg/vine) ^y	11.1 b	13.0 ab	20.3 a
Packed fruit (boxes/ha) ^x	1368 b	1600 ab	2493 a
Fruit quality			
Cluster weight (kg/cluster)	0.32	0.30	0.31 ^{ns}
Berry weight (g/100 berries)	361	346	339 ^{ns}
Berry diameter (mm)	16.8	16.3	16.0 ^{ns}
Soluble solids (%)	22.1	22.1	22.3 ^{ns}
Titrate acidity (g/100 ml)	0.44	0.44	0.44 ^{ns}
pH	3.71 a	3.65 ab	3.59 b

^zMean separation within rows by Duncan's multiple range test, $P \leq 0.05$.

^yThe crop was harvested at proper maturity and sorted by a trained commercial crew. Total yield = all fruit harvested; net yield = marketable fruit. Row and vine spacing were 3.66 and 2.14 m, respectively; two vines per treatment and five replications.

^xCalculated from net yield on the basis of 1295 vines/ha and 10 kg/box.

^{ns}Nonsignificant.

29.19, $a^* = +0.49$, $b^* = -0.21$, chroma $C^* = 54$, hue = 317.56), which is reddish-purple as determined by a chromameter (model CR-200; Minolta, Higashi-Ku, Osaka, Japan). Exposure to light by removal of basal leaves has been beneficial for fruit color development. (2-Chloroethyl)phosphonic acid (ethephon) has also increased fruit color development. The flesh is light yellow, translucent, meaty, and firm. The skin is thick, medium tough, and does not separate from the flesh. The flavor is sweet, neutral, and very good as rated by us. The berries contain two aborted, soft seeds that are very small and undetectable when eaten. The largest aborted seeds average 6.5 mg fresh weight compared to 4 mg for 'Thompson Seedless'. 'Crimson Seedless' has held on the vine longer than 'Ruby Seedless' and does not crack. Fruit stored at 1°C until 25 Dec. remained in very good condition and showed similar storage characteristics as 'Emperor'. 'Crimson Seedless' can be grown where other late-ripening *V. vinifera* grapes are grown.

Availability

'Crimson Seedless' was released as a public variety. There are no restrictions on its propagation. Certified virus-tested plants or cuttings can be obtained from the Foundation Plant Material Service, Univ. of California, Davis, CA 95616.

Literature Cited

Dokoozlian, N. 1994. Crimson Seedless research update: Reducing berry set and increasing berry size with gibberellic acid. Vine Lines (Nwsltr. Univ. Calif. Coop. Ext. Fresno County) April. p. 1-3.