



Crimson Seedless Production Practices

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Crimson Seedless is a late-season red seedless table grape developed by David Ramming and Ron Tarailo of the USDA Fruit Genetics and Breeding Research Unit, Fresno, CA. Crimson Seedless (previously known as selection #102-26) resulted from a cross of Emperor x C33-199. The variety was released to the industry in 1989. Approximately 1,000 acres of Crimson Seedless are estimated to have been planted in the San Joaquin Valley since 1989.

Crimson Seedless is the latest ripening seedless table grape currently produced in California. It ripens in mid-October and, weather permitting, can be held on the vine through mid-November. The variety has been received favorably by the retail trade due to its excellent eating characteristics; Crimson Seedless berries are crisp and firm.

The primary problem associated with the production of Crimson Seedless is that it lacks sufficient berry color. Small berry size can also be a problem. Unfortunately, cultural practices which increase the berry size of Crimson Seedless further reduce the color of its berries.

Site Selection and Planting

Crimson Seedless is highly vigorous when planted on its own roots. While the cultivar is adapted to a wide range of soil types and conditions, our observations suggest that sites of moderate vigor are preferred for planting

compared to high vigor sites. Vines may become excessively vegetative when planted in deep, fertile soils. Extravagant nitrogen fertilization and irrigation should be avoided in order to reduce potential problems with excessive vigor. Vines should be spaced 8" (between vines) x 12" (between rows).

Insufficient information is currently available for the recommendation of rootstocks. Because of the high vigor of this variety, the use of low vigor rootstocks is preferred over the use of high vigor stocks.

Training and Trellising Systems

Trials are currently underway to evaluate the effect of training/trellis systems on vine productivity and fruit quality of Crimson Seedless. Our current recommendations are based on field observations and grower experiences.

Initial observations suggested that the variety lacked sufficient fruitfulness for spur pruning. As a result, most Crimson Seedless vineyards are head trained and cane pruned. The standard system is a single cross-arm trellis consisting of 7-foot stakes and 36" to 48" wide cross-arms. The wider cross-arm should be utilized when high vigor is expected. Four to five wires are attached to each cross-arm; the middle wires are used to tie canes and the outside wires provide support for foliage. The cross arm is usually

oriented horizontally (flat), but may be offset 10 to 20° above horizontal on the north (east-west oriented rows) and east (north-south oriented rows) side of the vine row.

More recent observations indicate that satisfactory yields may be obtained with quadrilateral cordon training and spur pruning. Quadrilateral cordon vines should be trained with 24" to 36" between their fruiting regions. The wider spacing should be used when high vigor is expected. The width of cross-arms for foliage support wires should be 42" to 48". One foliage support wire should be attached to each end of the cross-arm.

The quadrilateral cordon trained/spur pruned system offers several advantages over the head trained/cane pruned system. First, spur pruning is less complicated and less expensive than cane pruning. Second, because clusters are borne within defined regions of the canopy, fruit management practices (cluster thinning and tipping) and harvest are easier to perform. Basal leaf removal and other canopy management practices used to improve cluster exposure to sunlight are also easier to perform on quadrilateral cordon trained vines compared to head trained vines. The latter is particularly important since the fruit of Crimson Seedless requires sunlight for coloration.

The productivity of highly vigorous vines should likely be improved with the use of large, extensive trellis systems such as the "Y" trellis or the gable trellis. When properly managed these systems maximize the exposure of developing fruit wood to sunlight.

Pruning

Three or four canes may be retained on third leaf vines. Care must be taken not to over-crop the vines in their first year of production. Cluster number per vine should usually not exceed 18 in the first year of production.

Due to the low fruitfulness often observed on highly vigorous Crimson Seedless, it may be necessary to retain up to eight canes to insure adequate productivity of mature vines. Vines of moderate vigor are usually more fruitful than vigorous vines, and sufficient production can be obtained by retaining only five or six canes.

On mature quadrilateral cordon trained vines 6 (2 to 3 buds) spurs should be retained on each cordon arm. This yields a total of 24 spurs per vine.

Cluster Thinning and Tipping

We have insufficient experience to recommend an optimum range for the number of clusters which should be retained per vine. The inherent vigor of this cultivar suggests that mature vines should be able to sufficiently ripen large crops. However, our observations indicate that fruit coloration becomes increasingly difficult as crop load approaches 800 boxes per acre. Crop load management is therefore important for the production of well-colored, high quality grapes. Our preliminary work suggests that the number of clusters on mature vines should generally not exceed 35, particularly if a size girdle is applied.

Large, heavily shouldered clusters should be tipped to 5 or 6 rachis laterals or cluster branches following fruit set. Large, prominent wings should also be removed from the clusters at this time. Many clusters may set too many

flowers, resulting in tight bunches with small berries at harvest. Berries and/or shoulders should be removed from the compact regions of well-set clusters to reduce cluster tightness.

Berry thinning is critical if an increase in berry size is desired. Experiments with bloom applications of gibberellic acid indicates that the application of 1 gram per acre is effective. Further experimentation is needed to develop guidelines for gibberellic acid berry thinning sprays on Crimson Seedless.

Girdling

Girdles applied at berry set (4-5 mm berry diameter) increase the berry weight and yield of Crimson Seedless approximately 40%. However, berry set girdles severely reduce fruit color.

Girdles applied at berry softening improve the color and accelerate the maturation of Crimson Seedless fruits. Girdles applied at fruit softening have no effect on berry size.

Gibberellic Acid for Improving Berry Size

Initial reports indicated that gibberellic acid was phytotoxic to Crimson seedless grapevines. Rates of gibberellic acid similar to those used for Thompson Seedless cause foliar toxicity on Crimson seedless, and may reduce the number of flower clusters the year following the application.

Research on the Effects of Ethephon on Color Development

Our work with ethephon on Crimson Seedless is limited, but it appears that the application of 3/4 to 1 pint per acre at berry softening (1 to 5% of the berries exhibiting color) is adequate to improve fruit color without causing excessive loss of berry firmness.

Canopy Management

Proper canopy management practices are essential for the successful production of Crimson Seedless. It is critical that clusters be exposed to sunlight during ripening for maximum coloration. Basal leaf removal is recommended on spur pruned vines. The removal of basal leaves surrounding the clusters on cane pruned varieties is also recommended. Leaf removal should be performed near berry set, or immediately following fruit softening.

Shoot trimming or hedging may also be performed to improve cluster exposure to sunlight and to reduce humidity within the fruiting region. Hedging should be performed immediately following berry softening to avoid potential problems with fruit sunburn. Both sides of the canopy should be trimmed to allow the uniform penetration of sunlight into the canopy interior. Portions of clusters receiving inadequate sunlight will remain green or obtain only partial color.

Care must be taken when hedging that sufficient foliage is retained to adequately mature the crop. Excessive foliage removal may slow fruit maturation and significantly retard fruit color development. Extensive hedging prior to berry softening may also stimulate lateral shoot

growth and necessitate additional shoot trimming.

Fruit Maladies

The fruit of Crimson Seedless appear to hold up well into November in the absence of significant fall rainfall. However, bunch rot and berry "slip skin" can occur if heavy precipitation is followed by periods of cool temperatures.

Growers must continue mildew control through the fall to avoid the establishment of powdery mildew on the cluster stem and rachis.

Crimson Seedless berries do not appear to be highly susceptible to early or late season cracking. Sunburn can be a problem, but the variety appears to be much less susceptible to sunburn than Thompson Seedless. Excessive berry shatter at harvest has not been reported as a problem.