



## The Future for California Raisins Is Drying On the Vine

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Most California raisins are produced from the Thompson Seedless variety and by sun drying on paper trays placed on a terrace between vine rows. The raisins won't dry unless fully exposed to sunlight, and this puts serious constraints on trellis design (photo 1). To increase yields, raisin trellises have gotten larger over the years, but not much. Research has demonstrated that raisin yields will improve 15 to 20% with a seven-foot vertical trellis compared to a six-foot vertical trellis, and a small cross arm (24") can also improve yields and fruit maturity. But, increase the trellis size much more than that and row middles become shaded, and the raisins won't dry.

The past ten years raisin growers have watched with frustration as table and wine grape growers took advantage of new trellis and canopy management technology that increases yield and fruit quality. In the San Joaquin Valley, wine grape growers have gone to ten-foot row spacing rather than the traditional twelve foot, or they have spread and thinned the canopy by using cross arms and quadrilateral cordons. Table grape growers have used open gable and overhead systems and sophisticated canopy management techniques. These new innovations optimize the use of sunlight available to the vineyard. But the raisin grower, because of the trellis limitations imposed by tray drying, has not been able to capitalize on new trellis and canopy management systems, until now.

Now, raisin growers can modernize their trellis and canopy management systems thanks to the development of technology that allows raisins to be dried on the vine (DOV) rather than on trays. Also, DOV raisins can be easily harvested by machine providing relief to an industry hard hit by labor shortages in recent years. New, early maturing, Thompson-like varieties have added to the excitement. They can be successfully dried on the vine using overhead and open gable trellis systems, and these systems increase yields.

DOVine and Fiesta ripen a few weeks earlier than Thompson Seedless and produce a very similar raisin. Canes can also be cut a few weeks earlier to initiate drying, and this lengthens and improves the drying period making it possible to produce DOV raisins with overhead and open gable trellis systems. Thompson Seedless does not dry adequately with overhead or open gable trellis systems. The canes must be cut late in August and too much fruit remains green and above moisture when the drying season ends. DOV is possible with Thompson Seedless, however, by using a southside drying system developed by Sun Maid.

Pete Christensen, University of California raisin specialist, has been evaluating a number of different DOV trellis systems including an overhead, open gable, and southside systems at the UC Kearney Ag Center. The overhead trellis (designed by Gary Pitts

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of Fowler) utilizes vines trained to a quadrilateral; alternate middles are used for fruiting and cane renewal (photo 2). The open gable trellis balances and dries the crop on both sides of the trellis with renewal shoots in the center. Bilateral, quadrilateral and head training systems can be used with the open gable, but the quadrilateral looks the most promising (photo 3). The southside trellis (first tried by Dave Walker and then developed into a commercial system by Sun Maid) exposes fruit bearing shoots and the drying clusters to the south side of the row and renewal shoots are separated to the north (photo 4). The southside system was specifically developed so that Thompson Seedless could be successfully dried on the vine. At the Kearney Ag Center several southside trellis designs with bilateral cordons training and cane pruning are being evaluated.

With the overhead and gable systems, the DOVine and Fiesta varieties have produced high quality raisins and consistently yielded between 3.5 to 4.0 tons per acre. The average yield for traditional tray dried raisins is 2 to 2.5 tons. Yields with the southside trellis have been similar to tray drying. All of the DOV systems can be mechanically harvested. When you dry raisins on the vine they tend to have finer wrinkles and are more plump than tray-dried raisins. When using an air stream sorter, DOV raisins grade better than tray-dried at similar maturity.

DOV will play an important role in the future for the California raisin industry. It offers the potential to increase yields and produce high quality, natural, sun-dried raisins that are machine harvested. The conversion of traditional Thompson Seedless raisin vineyards to DOV using southside trellising is gaining momentum. However, growers who are considering planting and establishing a new DOV vineyard should strongly consider one of the early ripening varieties along with an overhead or open gable trellis.



**Photo 1. Raisins drying on paper trays with a traditional trellis.**



**Photo 2. Overhead trellis with alternate middles for fruiting and cane renewal.**



**Photo 3. Open gable trellis with quadrilateral training and cane/spur pruning.**



**Photo 4. Mechanical harvesting DOV raisins with a southside trellis system.**