Thriving in High Production Years by Producing Quality Cherries

Lynn E. Long
OSU Extension Horticulturist

As more and more acres of cherries are planted, the Pacific Northwest cherry industry continues to grow. Although, we have not harvested a huge crop to date the potential is certainly there. Whether or not growers will be able to make money in the years of record yields depends on the quality of their product.

Although many growers have survived for years by producing 11 and 12 row 'Bing' cherries, those days may soon be over. In the large crop years that are predicted for the future, the first cherries sold will be the largest.

Even though large fruited new varieties have made their way onto the scene in the last few years I do not see 'Bing' being replaced from its position of prominence. This means that we have to grow the best quality 'Bing' cherries possible if we are going to be successful.

Pruning

One of the most important factors affecting fruit quality is pruning. A study conducted a number of years ago illustrates how crop load, as manipulated by pruning, affects fruit size, soluble solids and predisposition to mechanical injury (Murphey, 1988). Three pruning regimes were compared, heavy, average and minimal. Heavy pruning consisted of saw cuts, removal of some spur-bearing wood and removing very vigorous one-year-old shoots. Average pruning consisted of removing weak, shaded spur-bearing wood over 3 years old, removing 2 and 3 year old fruiting wood, and allowing for good light penetration. Minimal pruning consisted primarily of removing a few branches, but did not alter the status of fruiting spurs or wood to any great extent.

Early in the fruit growth curve the difference in fruit size was very small, but by the time the fruit turned dark red, fruit from the heavy, average and minimally pruned trees averaged 26.6 mm, 24.2 mm and 21.4 mm, respectively. Larger fruit sell for a premium even in these years of average to short cherry supplies, it is likely that this trend will be even greater in large crop years.

According to this same study large fruit are better tasting and hold up better in transit. At the mahogany stage, fruit from heavily pruned trees averaged 5.4 brix higher than those from minimally pruned trees. In addition, the study also showed that larger fruit were more resistant to bruising.

Pruning to optimize fruit size means keeping in mind some simple rules such as the concept of big, smaller, smallest referring to the size of the wood as one moves from the bottom to the top of the tree. Since vigor and growth will be greatest in the tree top two-thirds of the pruning needs take place in the top third of the tree. In addition, wood with old spurs need to be replaced with young wood. The largest fruit is grown on young spurs

and at the base of the previous seasons growth. It is these cherries that are the largest, firmest and sweetest. Young wood, therefore, needs to be maximized. Heading new shoots in the lower portion of the tree where vigor is hardest to maintain can encourage vigor and young shoots. Removing older branches while leaving a three-inch stub will encourage new growth to replace the old.

Self-Fertile Varieties and Precocious Rootstocks

New challenges in growing quality fruit have arisen with the introduction of self-fertile varieties and precocious rootstocks such as Gisela 5, 6 and 12. Self-fertile varieties and the Gisela rootstocks tend to set heavy crops with a tendency to grow fruit in clusters as is seen with 'Lapins' and 'Sweetheart'. Bud spacing increases from tip to base on the new shoots of these trees. In addition, tip buds typically have more flowers per bud than basal buds. To reduce fruit clumping and crop load, newly formed shoots should be headed every winter. Heading these shoots, and removing a third of the branch can reduce overcropping and fruit clumping tendencies.

Gibberellic Acid

Another crop management factor that greatly affects cherry quality is the application of gibberellic acid (GA). Most packing houses in the Pacific Northwest require a GA treatment for export cherries. When applied under the right conditions GA treated fruit is consistently firmer, higher in soluble solids and larger compared to untreated fruit at similar color maturities (Table 1) (Facteau, 1988).

Table 1. Mean fruit firmness, soluble solids, and weight for paired GA_3 limb study at 10 ppm, over 3 years in 4 orchards with 2 cultivars. Means were compared by student's t test and were significant at 1% (*).

		Firmness (g)		Soluble Solids (%)		Weight (g)	
Year	Cultivar	Control	GA_3	Control	GA_3	Control	GA_3
3 yr mean	Bing	286	347*	16.9	17.8*	8.2	9.0*
3 yr mean	Lambert	245	277*	15.7	16.8*	8.0	8.8*

Besides the previously mentioned attributes, GA treated fruit also resists impact damage better than non-treated fruit. Data in Table 2 shows a significant reduction in pitting, over a 2-year span, looking at dark mahogany fruit and red fruit (Looney and Lidster, 1980).

Table 2. Effect of GA_3 on bruising and surface pitting of 'Van' sweet cherries at red and dark mahogany harvest times.

		Bruised		Pitted	
Year	Harvest	Control	GA_3	Control	GA_3
1 (20 ppm)	Red	13.1	11.4	55.1	38.1
	Dark mahog.	43.1	28.1	11.9	9.6
2 (30 ppm)	Red	6.8	8.5	70.8	28.3
	Dark mahog.	14.0	8.5	27.5	7.5

GA should be applied at straw color, as the cherry is turning from green to yellow. Straw color generally occurs about 3 weeks before harvest on ‘Bing’. Typically, 20 ppm of GA is applied in a dilute spray. Coverage is important, as GA is not systemic in the tree. Increasing dose of GA results in a greater response, but at high rates, over 35 to 40 ppm, return bloom is affected. This can have detrimental affects on crop quality as flowers borne at the base of one-year wood are reduced to a greater extent than flowers borne on spurs. This means that the buds that produce the largest cherries are the flower buds that are primarily eliminated by high levels of GA.

GA will also affect the time of harvest due to the fact that it delays fruit coloring. Typically, harvest is delayed 3-5 days in treated as opposed to untreated blocks. It is common for growers to use this trait as both a harvest and marketing tool. The three to five day delay in harvest often gives growers the opportunity to finish picking a non-treated block before moving to a treated block. In addition, delaying the harvest by a few days can be a monetary advantage to growers growing a late maturing variety as prices often increase at the end of the season.

Unfortunately, response to GA can be variable. The most important factor affecting the success of GA applications is fruit load. Vigorous, lightly cropped trees treated with GA respond to a greater extent than more heavily cropped trees. In fact, in years when there is a heavy crop, dosage can be raised to 30 ppm to increase the potential effect.

Although there are many positive responses to GA applications, probably the response that concerns growers the most is the response of treated cherries to rain. Although it appears that GA treated cherries are not more sensitive to rain cracking (Facteau, personal communication), GA treatments do seem to cause larger cracks. This can be a problem in that small cracks will often heal or will be accepted by inspectors and consumers.

Calcium

In recent years, many Pacific Northwest growers have begun to apply calcium, in addition to GA, to increase cherry firmness. Typically, growers will apply multiple applications (3 or 4) of calcium beginning as early as shuck fall. There are many calcium products on the market that can be effective for this purpose.

Growing good quality cherries has always been important to the cherry industry. However, as crop sizes increase only the highest quality cherries will demand strong returns. Among other production practices, proper pruning and gibberellic acid and calcium treatments can be the difference between mediocre quality and poor returns and top quality fruit with high returns.

Literature cited

Facteau, T. (1988). Improving Cherry Quality in the Proceedings of the 1988 Pacific Northwest Cherry Production Shortcourse. Washington State University. Pullman, WA. Pp 216-230.

Looney, N.E. and P.D. Lidster (1980). Some growth regulator effects on fruit quality, mesocarp composition and susceptibility to postharvest surface marking of sweet cherries. J. Amer. Soc. Hort. Sci. 105:130-134.

Murphey, A. S. (1988). Changes in Cherry Maturation and Quality on the Tree in the Proceedings of the 1988 Pacific Northwest Cherry Production Shortcourse. Washington State University. Pullman, WA. pp 234-239.