Doubling potential of sweet cherry cultivars

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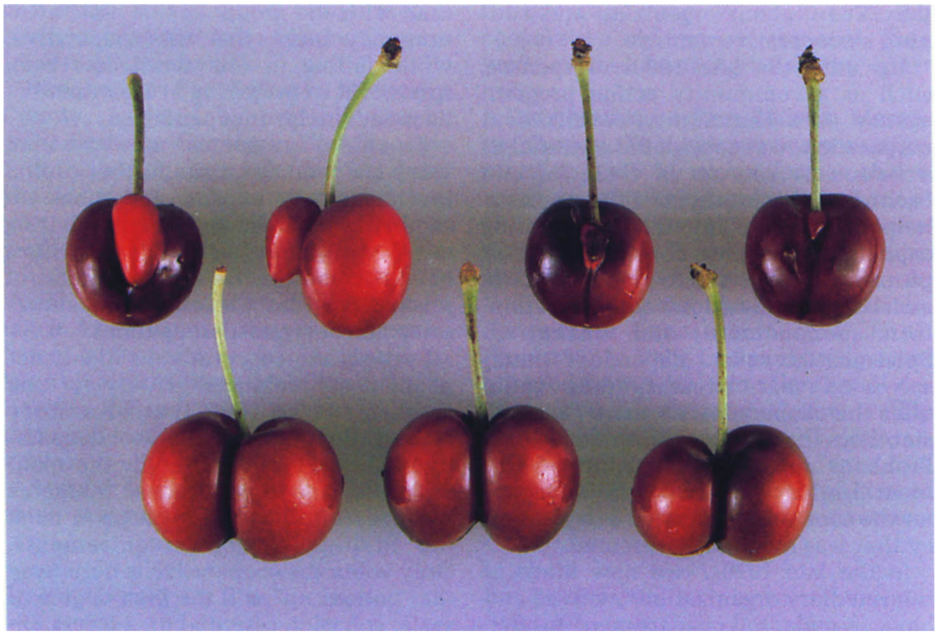

High summer temperatures during flower bud differentiation are usually considered the cause of double (lower row) and spur (upper row) sweet cherries.

Doubling percentages for 22 sweet cherry cultivars, 1973 through 1980, Kearney Horticultural Field Station, Parlier

Cultivar	1980	1979	1978	1977	1976	1975	1974	1973	Average
	%								
High doubling potential									
Chinook	35	60	31	16	33	40	37	23	34.4
Stella*	29	24	2	...	...	...	...	...	18.3
Bing	8	29	12	3	11	29	3	47	17.8
Royal Ann†	13	37	34	3	13	13	4	15	16.5
Early Burlat	27	34	3	5	16	6	8	17	14.5
Corum†	21	55	2	2	1	7	6	17	13.9
Compact Van*	11	16	11	...	...	...	...	...	12.7
Van	10	22	39	1	8	12	0	3	11.9
Moderate doubling potential									
Berryessa†	7	17	9	2	15	14	1	13	9.8
Larian	10	11	7	1	12	23	9	5	9.8
Mona	4	4	23	1	1	3	3	24	7.9
Moreau	9	11	3	0	3	6	2	9	5.4
Lambert	10	15	1	2	1	3	2	2	4.5
Bada*†	0	8	...	...	...	...	...	...	4.0
Low doubling potential									
Vernon	5	1	7	0	1	0	1	0	1.9
Sam	0	8	1	0	0	1	2	2	1.8
Sue†	9	2	1	1	0	0	0	0	1.6
Black Republican	3	2	4	1	1	1	0	0	1.5
Black Tartarian	2	3	1	1	2	1	1	0	1.4
Rainier†	2	4	0	1	2	1	0	0	1.3
24A-9A	2	3	2	0	1	0	0	0	1.0
Jubilee	2	0	1	0	1	0	0	0	0.5

*Cultivars grafted into orchard in 1975; other cultivars planted in 1970.
†Yellow fleshed cultivars. The others are black (red) fleshed.

Sweet cherry production in the Sacramento and southern San Joaquin valleys of California has historically been limited by excessive fruit doubling on the commonly grown cultivars. High summer temperatures at the time of flower bud differentiation are generally believed to cause double pistils to form, resulting in many double or spur (one side of the double aborted) fruit at harvest time the following year. Double and spur fruit are considered culls in commercial market channels, and they tend to be more prone to decay than normal cherries.

In 1970, we began a project at the Kearney Horticultural Field Station near Parlier (Fresno County), California, to evaluate the doubling potential of 19 sweet cherry cultivars. This test included cultivars commonly grown in the western United States, and some newer introductions, several of which were reported to have resistance to doubling. The cultivars were mainly black (red) fleshed sweet cherries used for fresh market, but also some yellow fleshed types used for canning and brining (maraschino cherries) were included. Two trees of each cultivar grafted on *Prunus mahaleb* rootstock were established in a half-acre block with a planting distance of 20 by 20 feet.

Beginning with fruit production in 1973, we evaluated the number of double and spur fruit on each tree by randomly collecting 25 fruits from each of four quadrants (100 fruits per tree). The percentages of double and spur fruit from both trees of each cultivar were averaged. In 1975, three five-year-old trees in the original block were grafted over to one tree each of the cultivars Bada, Compact Van, and Stella. Fruits from these cultivars were subsequently evaluated similarly to those from the older trees.

There was considerable seasonal variation in the percentages of doubling between 1973 and 1980 (see table). These results are comparable to the year-to-year variations in commercial cherry orchards, depending on temperatures in the previous season. For example, 1977 was a year of very low doubling for all cultivars, whereas in 1979 cultivars with high doubling potential produced many doubles. In general, as the trees matured and began to spread, more limbs became exposed to direct sunlight, resulting in higher doubling percentages.

Cultivars in this test fell into three categories for doubling tendency (see table). The high-potential group averaged over 10 percent doubles for the test period, but during high doubling years, these cultivars frequently produced 30 percent or more double fruit. The moderate potential group averaged 4 to 10 percent doubles, but occasionally some cultivars produced 20 to 25 percent in high doubling years. The low potential group averaged less than 2 percent for the test period, and only a few of these cultivars exceeded 5 percent even in the worst years.

We conducted a limited test comparing the standard planting (20 by 20 feet) with a hedgerow planting of 7 by 15 feet. With most cultivars the closer spacing reduced the amount of fruit doubling (but did not eliminate it), presumably because limbs were shaded during bud differentiation. However, in the hedgerow, fruit maturity was delayed and yield reduced, probably also as a result of shading.

Some producers are interested in growing sweet cherries outside the traditional areas of adaptation in California. It should be noted that the cultivars Bing, Royal Ann, Early Burlat, and Van, which now make up over 90 percent of the sweet cherry acreage in California, all have high doubling potential. Therefore, if commercial cherry production is to be attempted in the warmer locations of the Central Valley, a change in cultivar selection should be considered.

Although the low potential group in this test included some cultivars generally considered unsuitable for commercial production (Black Republican and Black Tartarian), others within the group have commercial possibilities. The number of sweet cherry cultivars tested was limited, but this study points out the necessity for evaluating commercially promising cultivars for doubling potential under warm growing conditions before extensive plantings are made in such areas as the southern San Joaquin and Sacramento valleys of California.

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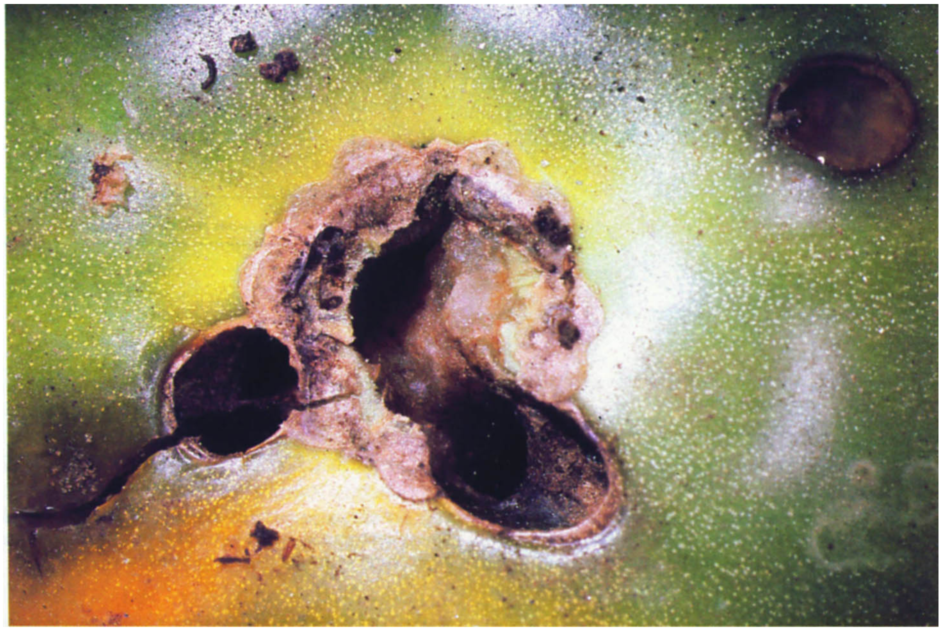
Jack Kelly Clark

Damage to processing tomato caused by tomato fruitworm, *Heliothis zea*.

Monitoring lepidopterous pest damage to processing tomatoes

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Few quantitative procedures exist for monitoring lepidopterous pests in processing tomatoes, yet reliable, cost-efficient sampling techniques are essential for the implementation of an integrated pest management program. These sampling techniques must be of such intensity as to predict the amount of damage with a given degree of reliability, yet sufficiently time-efficient to be useful to growers or crop consultants. Without such procedures, assessing a pest's status is subjective and may result in unnecessary control actions. Reliable control decision criteria are especially important in processing tomatoes, where thresholds for damage are set by government or industry standards, and exceeding damage thresholds can result in rejection of the crop.

Two lepidopterous pests are perennial problems in the San Joaquin and Sacramento valleys of California: the beet armyworm, *Spodoptera exigua* (Hübner), and the tomato fruitworm, *Heliothis zea* (Boddie). The larvae of both species can enter the fruit, but tomato fruitworm is especially important, because it contaminates fruit with excrement. Such fruit often remains unhealed and becomes unmarketable.

During the summer of 1981, three commercial fields in Sutter and Yolo counties were monitored weekly for fruit damage by two techniques at 36 predetermined sites in each field. We took a "whole-plant" sample at each site by uprooting two plants and recording the numbers and proportion of damaged fruit. The whole-plant method provided an absolute estimate of lepidopterous pest activity, and was a standard upon which to base comparisons. The second method consisted of selecting 30 fruit at random from plants at each site. Some pest control advisors use a random procedure to assess damage, often without regard to adequate sample size. In both