

# Practical Grower

by Lynn Long

ALTERNATIVES TO MAZZARD



MANY CHERRY PRODUCERS TODAY ARE LOOKING for an alternative to Mazzard. Pacific Northwest cherry growers have relied on the mazzard rootstock for years. Mazzard provides good fruit size and reliable production. However, it produces a very large tree and is low in precocity, taking five to six years to produce the first marketable crop. Growers now comprehend the advantages that dwarfing rootstocks provide in growing a high-density pedestrian orchard, where two-thirds of the crop can be harvested from the ground without the use of ladders. They also recognize the advantages these dwarfing, precocious rootstocks afford through earlier production, often producing a crop in just three years.

## Labor savings

Pedestrian orchards provide a savings in labor and an increase in harvest efficiencies. Data collected in The Dalles, Oregon, indicated that pickers were able to harvest 171 pounds of cherries per hour from a high-density pedestrian orchard compared to 100 pounds per hour from full-size trees. This means fewer pickers will be needed to harvest the crop when combining dwarfing rootstocks with pedestrian systems. It is expected that there will also be similar labor savings in other operations such as pruning.

## Economic advantages

Besides labor savings, pedestrian orchards grown on dwarfing rootstocks can be an economic benefit to the grower as well. When comparing a standard density orchard planted on a 15 x 18 foot spacing on Mazzard rootstock with a high-density orchard planted on a 10 x 16 foot spacing on dwarfing rootstock, a definite economic advantage is provided by the high-density orchard on dwarfing rootstock. It is possible to recover all the costs of establishment in eight years with the high-density block on dwarfing rootstock compared to 15 years with a standard-density orchard on Mazzard rootstock.<sup>1</sup>

## Rootstock Selections

**Gisela 5.** Gisela 5 is best known in Europe and is widely planted in Germany, but for the most part is considered too dwarfing by growers in the Pacific Northwest. The rootstock produces a tree that is 50 to 70 percent the size of Mazzard. Branch angles are wide, but branching is sparse. Gisela 5 is intolerant of poorly drained soils. Bloom and harvest timing are generally advanced by as much as two to three days. Like Gisela 6 and 12, it will begin cropping in the third leaf, but it is important to maintain proper fertilization and pruning (i.e., many invigorating dormant heading cuts), or it will overset, stop growing, and produce small cherries. It is not recommended with self-fertile varieties such as Lapins or Sweetheart as oversetting and subsequent devigoration of the tree may be a

problem. However, this rootstock is an excellent match with less productive varieties such as Tieton and Regina. There are no recorded cases of incompatibility with Gisela 5.

**Gisela 6.** Gisela 6 is a very vigorous rootstock producing a tree that is about 90 percent the size of Mazzard in the Pacific Northwest. Although it is large, it produces a tree that is more easily managed. Branch angles are wider, and when pruned heavily, it does not sucker profusely, an attribute that allows the production of a much smaller tree than Mazzard affords.

Gisela 6 has become the most popular of the new generation of rootstocks because it provides good precocity while maintaining the vigor necessary to produce large fruit. However, close attention must be paid to crop load because fruit size can become a problem, especially with self-fertile varieties. With proper pruning, fruit size can be maintained even with a productive variety such as Sweetheart. In a small demonstration plot in The Dalles, 8th leaf Sweetheart produced 76 percent 9-row and larger fruit when grown on Gisela 6 rootstock.<sup>2</sup> As with Gisela 5, both bloom and harvest dates are slightly earlier, and no compatibility issues have been seen. Trees grown on Gisela 6 occasionally show signs of poor anchorage and may need staking on windy sites.

**Gisela 12.** Gisela 12 was originally chosen for production because of its intermediate tree size and its potential for large fruit. With the cultivar Bing, Gisela 12 consistently produced a tree midway in size to Gisela 5 and 6 in university studies in both Oregon and Washington. However, in a commercial planting in The Dalles, third-leaf Regina trees grown on Gisela 12 were larger in size than similar age Regina grown on Gisela 6.

This rootstock has just recently become commercially available so little is known about its interaction with other cultivars. With Bing it produces a tree about 70 percent the size of Mazzard, allowing easy adaptation to any of the pedestrian training systems. As with the other Gisela selections, this rootstock produces wide branch angles and is much more precocious than Mazzard.

**Maxma 14.** Although Maxma 14 has only recently become available to American cherry producers, it is widely planted in France and is the most popular of the precocious rootstocks in that country. French producers claim that it produces a tree that is about 70 percent the size of Mazzard and of intermediate precocity. However, in trials in The Dalles, fifth leaf trees were of similar size to Mazzard.<sup>2</sup> Due to its intermediate precocity, this rootstock may combine well with more productive cultivars and have a reduced tendency to overset compared to any of the Gisela rootstocks. Maxma 14 is tolerant of alkaline soils but does not do well in poorly drained soils.

**Fruit Size.** Since dwarfing rootstocks

were first tested back in the 1980s, the predominant concern has been fruit size. Unpublished data by Dr. Tim Facticeau of Oregon State University showed that several selections within the Gisela series of rootstocks could provide fruit size comparable to mazzard (see *Fruit Size and Tree Yield table*).

Maintaining fruit size with productive rootstocks such as the Gisela series is often a challenge. Typically, it is easy to produce large fruit in the third and fourth leaf on dwarfing rootstock, but fruit-to-leaf ratio begins to decline by the fifth leaf, detrimentally affecting fruit size. Proper pruning can help maintain the fruit-to-leaf ratio. When dealing with dwarfing rootstocks, it is best to plant at higher rather than lower densities (see *Plant Spacing table*). Higher densities force growers to make more severe pruning cuts, thereby reducing crop load and improving fruit-to-leaf ratio and subsequent fruit size.

With dwarfing rootstocks, it is also important to prune during the dormant season. Summer cuts reduce vigor and can encourage oversetting and correspondingly small fruit. Pruning cuts should be made into both last year's wood and older wood. It is important to head new shoots by about one-third each year. Heading removes the closely spaced tip buds that tend to have more flowers than basal buds. Making a few cuts into two- and three-year-old wood will help to rotate out old wood while stimulating tree vigor.

Dwarfing rootstocks, when properly managed, can offer important advantages over the full-size Mazzard rootstock. The main attributes of precocity and size control can translate into reduced labor needs and increased economic returns.

## References

Seavert, C.G., M.K. White and L.E. Long. (2002). "Orchard Economics: Establishing and Producing Standard- and

High-Density Sweet Cherries in Wasco County." *EM 8802*. Oregon State University.

Núñez-Elisea, R. and L.E. Long (2001). *Pruning, training, rootstocks, and irrigation management in sweet cherry in Northwest Cherry Research Review*. Washington Tree Fruit Research Commission and the Oregon Sweet Cherry Commission. p. 7-12.

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## FRUIT SIZE AND TREE YIELD

A compilation of fruit size and tree yield on 4th through 6th leaf Bing trees grown on several rootstocks in The Dalles, Oregon. Figures show average percent fruit size.

Rootstock	6th leaf trunk area cm <sup>2</sup>	Cumulative yield lbs/tree	13 row	12 row	11 row	10 row+
Mazzard	152.3	77.8	1.4	22.2	32.0	44.4
Gisela 5	93.2	110.0	1.4	19.1	30.3	49.2
Gisela 6	156.9	125.2	0.4	15.2	36.3	48.2
Gisela 12	114.5	126.1	0.9	17.3	33.7	48.1

SOURCE: T. Facticeau

## PLANT SPACING

Suggested plant spacing for various rootstocks and training systems (in row spacing x between row spacing expressed in feet).

Rootstock	Steep Leader	Central Leader	Spanish Bush
Mazzard	14-16 x 18-20	Not recommended	Not recommended
Gisela 5	8-10 x 14-16	8 x 14-16	6-8 x 14-16
Gisela 6	12-14 x 16-18	8-10 x 16	8-10 x 16
Gisela 12	12 x 16	8-10 x 14-16	8 x 14-16
Maxma 14	12-14 x 16-18	10 x 16	8-10 x 16