

Cherry Rootstocks for Sacramento County

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Choosing the Right Rootstock

The choice of cherry rootstock depends on several key factors: the variety to be used, the soil texture, the depth to water table, and the training system. We don't yet know the best rootstocks to use for new, high-density training systems, but a dwarfing rootstock is likely crucial.

The soils in several areas along the river and sloughs in western Sacramento County are highly variable, from very sandy to clayey. Even more important is a fluctuating water table, which can be as high as 3-4 feet below the soil surface. Mazzard and Mahaleb are both deep rooted and they either perform poorly or die on our heavy soils or where the water table is high. Colt grows well on both very sandy and clay soils, and it can best tolerate periodic high water tables. Gisela rootstocks are shallow rooted (thus explaining why they tend to lean over), so their roots never reach the water table. They prefer sandy soils, but will work on clay soil if planted on a mound so the crown area is above ground.

Maxma 14 (a.k.a. Maxima 14) and Krymsk 5 and 6 also survive well on our soils, although Maxma 14 is slightly better on sandy soils. Young trees on Maxma 14 tend to have insufficient shoot breaks for selection of branches, unlike trees on Gisela 6 or 12. But trees on Krymsk 5 and 6 give the greatest number of shoot breaks. Trees on Krymsk rootstocks are more susceptible to virus problems, but so far prune dwarf and Prunus necrotic ringspot viruses are not a problem here.

Although Colt survives well here, its biggest problems are that it makes an excessively large tree and it tends to have low production. Therefore, it should only be used with varieties like Coral Champagne and Sweetheart, which can over-produce on standard rootstocks. The use of Bing on Colt rootstock will result in large trees with low production.

Most orchards in Sacramento County are being planted to Maxma 14 and Krymsk rootstocks, with some Gisela 12. Gisela 6 is no longer being planted due to its extreme susceptibility to bacterial canker. Maxma 14 and Krymsk rootstocks appear to be less susceptible to bacterial canker, but they are certainly not immune. G12 produces fairly big trees with large fruit, but yields tend to be light.

Spacing of trees can vary by rootstock. The ideal spacing for Maxma 14 and Krymsk rootstocks in this area is probably around 16 x 10 ft. or 16 x 12 ft., and Gisela can be closer at 14 x 10 ft. or 14 x 8 ft. Growers would generally rather have to fight to keep a tree from crowding than to have it produce too much, with small fruit and stunted growth.

Rootstock Characteristics (Adapted from Long and Kaiser, 2010)

Colt was released in the 1970s as a semi-dwarfing rootstock, but it produces a vigorous tree that is similar in size to 'Mazzard' with similarly low precocity. It has been widely planted in California due to its resistance to cherry stem pitting disease. It has also shown resistance to *Phytophthora* root rot, bacterial canker and gopher damage, but it is susceptible to crown gall and is sensitive to drought stress.

Gisela series. Gisela 6 has been widely planted in Sacramento County but not in San Joaquin County. It is somewhat dwarfing and can be easily kept to 8-10 ft. tall, it is very precocious with high yields, and it is easy to manage. Trees on Gisela 6 need to be properly pruned from an early age in order to maintain fruit size. It is much easier to form new shoots on Gisela 6 than on

Gisela 5 and is one of the reasons for the popularity of this rootstock. Because of a smaller root system, anchorage can be a problem, especially on windy sites, and trees may tend to lean when older. Gisela 6 would be a nearly ideal rootstock except for the fact that trees are highly susceptible to bacterial canker. Gisela 5 produces a small tree on which it is difficult to size fruit and maintain vigor, and Gisela 12 tends to produce larger trees, with somewhat deeper root systems so they lean less than Gisela 6.

Krymsk 5 is more precocious than Mazzard or Colt, but less so than Gisela rootstocks. It is similar in size to Gisela 6 and has good anchorage and tolerance of both heavy soils and water stress. It can have a fair amount of root suckering from the crown, especially on heavy soils, but usually not in the tree row. The tree form is excellent, with wide branch angles.

Krymsk 6 produces a tree that is about three-fourths the size of Krymsk 5 and Gisela 12. Like Krymsk 5, Krymsk 6 rootstock is well anchored and seems to be adapted to heavier soils, but it has less root suckering. Tree form is good, with wide crotch angles.

Mahaleb is slightly more precocious and slightly less vigorous than Mazzard. Mahaleb is drought tolerant, but it is very sensitive to periodic waterlogging, making it a poor choice for many Delta soils. It is best suited to deep, well-drained sandy and loam soils. It has some delayed incompatibility problems with some varieties, such as Chelan and Tieton. Also, gophers are attracted to Mahaleb.

Mazzard also does not perform well in poorly drained or wet soils. It has high vigor and moderate productivity, and good fruit quality can be obtained with only moderate pruning and management inputs. Its biggest drawback is that it lacks precocity, often not coming into production until the 5th or 6th leaf or into full production until the 12th leaf. Vigorous growth makes it difficult to control in high-density plantings.

Maxma 14 is the result of a cross between Mazzard and Mahaleb. It is about three-fourths the size of Mahaleb, which lends itself to higher density plantings. It is compatible with most varieties and is precocious and productive. It is one of the leading rootstocks in use in Europe. Maxma 14 rootstock is tolerant to wet soils and is resistant to iron chlorosis.

Table 1. Planting parameters for various cherry rootstocks.

Variety	Super High Density	Mod. High Density	Low Density	Shallow/Poor Soils	Low Yielding Varieties	Heavy Yielding Varieties
Colt	No	No	Yes	Yes	No	Yes
Gisela 5	Yes	No	No	No	Yes	No
Gisela 6	No	Yes	No	(1)	Yes	(3)
Gisela 12	No	Yes	No	(1)	Yes	(3)
Krymsk 5	No	Yes	No	(1)	Yes	(3)
Krymsk 6	(3)	Yes	No	(1)	Yes	(3)
Mahaleb	No	No	Yes	(2)	No	Yes
Maxma 14	No	Yes	No	(1)	Yes	(3)
Mazzard	No	No	Yes	Yes	No	Yes

(1) At higher densities (2) Avoid heavy soils (3) With proper management

Table 2. Attributes of various cherry rootstocks.

Variety	Percent of Full Size	Precocity	Advance bloom/harvest	Compati-bility	Root suckers	Anchorage
‘Colt’	100	No	No	Good	No	Good
‘Gisela 5’	50-60	Yes	2–4 days	Good	No	Fair to good
‘Gisela 6’	85-90	Yes	0–1 day	Good	No	Fair
‘Gisela 12’	80-100	Yes	No	Good	No	Good
‘Krymsk 5’	85-90	Yes	No	N/A	Moderate	Good
‘Krymsk 6’	65-70	Yes	No	N/A	Moderate	Good
‘Mahaleb’	90	Slight	No	Fair to good	No	Good
‘Maxma 14’	100	Yes	No	Good	No	Good
‘Mazzard’	100	No	No	Good	Low	Good

(Source for Tables 1 & 2: Long and Kaiser, 2010.)

Reference

Lynn E. Long and Clive Kaiser. 2010. Sweet cherry rootstocks for the Pacific Northwest. A Pacific Northwest Publication, PNW 619, September 2010.

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