



Tree and Vine Newsletter

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Cherry Rootstocks for Sacramento County

by Chuck Ingels and Robert Arceo

Choosing the Right Rootstock

The choice of cherry rootstock depends on several key factors: the variety to be used, soil texture, depth to water table, and 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. Gisela 12 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 delayed incompatibility problems with some varieties, such as Chelan and Tieton. Also, gophers are attracted to it.

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. (Source: Long and Kaiser, 2010)

| 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. (Source: Long and Kaiser, 2010)

| Variety | Percent of Full Size | Precocity | Advance bloom/harvest | Compatibility | 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 |

Reference

Lynn E. Long and Clive Kaiser. 2010. Sweet cherry rootstocks for the Pacific Northwest. A Pacific Northwest Publication, PNW 619, September 2010. (<http://extension.oregonstate.edu/wasco/>)

Cherry Rootstock and Training Trial

A rootstock and training systems trial was planted in March 2010 as part of a National Cooperator (NC 140) cherry rootstock project, led by Dr. Greg Lang of Michigan State University. The local trial is being conducted by Joe Grant (UCCE San Joaquin County) and me, with grower cooperator Robert Arceo.

We are comparing three training systems using the variety Benton: 1. Upright fruiting offshoot (UFO), 2. Tall spindle axe (TSA), and 3. Kym Green bush (KGB), with three rootstocks each:

Gisela 3, Gisela 5, and Gisela 6. In addition, Gisela 12 was planted in the UFO system only. Six replications of four trees were planted for each rootstock/training system.

To see the progress of the trial, including photos of each step along the way, visit our web site (<http://cesacramento.ucdavis.edu>), click on Pomology, Viticulture, and Environmental Horticulture, and follow the links on the left.

We will be holding a pre-harvest meeting at the site. Details in the next newsletter and online.

Clarksburg District Grape Day

Wednesday, March 7, 2012

9:00 AM to Noon

Jean Harvie Senior and Community Center, 14273 River Road, Walnut Grove CA 95690
(Stay on River Rd. to south end of Walnut Grove; The Community Center is on the left.)
(a wheelchair accessible facility)



Continuing Education Units:

*Calif. Dept. of Pesticide Regulation (DPR: 1.0 hr. approved)
Certified Crop Adviser (2.3 hours applied for)*

Sponsors:

UC Cooperative Extension, Sacramento County
Clarksburg Wine Growers & Vintners Association

- 8:30 Sign in
Pastries provided courtesy of Sacramento Valley Farm Credit
- 9:00 **Welcome and Announcements**
Tim Waits – President, Clarksburg Wine Growers & Vintners Association
- 9:05 **Update on the wine grape market**
Jeff Bitter – Allied Grape Growers, Fresno
- 9:35 **Recent consumer wine trends**
John Gillespie – Wine Colleagues, St. Helena
- 10:10 Break
- 10:35 **Grapevine canker diseases and their control**
Doug Gubler – UC Davis Plant Pathology Department
- 11:10 **Grapevine virus diseases and their control**
Deborah Golino – Foundation Plant Services, UC Davis Plant Pathology Dept.
- 11:45 **Updates on CWGVA events**
Tim Waits – President, Clarksburg Wine Growers & Vintners Association
- 12:00 **Luncheon** – Courtesy of AGRO Crop Insurance