



# Guide for the Commercial Grower of Sweet Cherries in Oregon

## Varieties, Pollinizers, and Rootstocks

Here are some terms and definitions used to describe pollination and fruit set of sweet cherry varieties in Oregon:

**Pollination.** The transfer of pollen to the stigma.

**Cross-pollination.** The transfer of pollen from the anthers of a flower of one variety to the stigma of a flower of a different variety.

**Fertilization.** The union of the male germ cell, contained in the pollen tube, with the female germ cell, or egg.

**Self-incompatible.** A variety that is unable to set and mature a commercial crop of fruit with its own pollen.

**Cross-compatible.** The pollen produced by either variety of a combination is capable of functioning in the styles and fertilizing the ovules of the other variety.

**Cross-incompatible.** Varieties A and B are unfruitful when pollinated by each other because the pollen, although it is viable, is unable to develop sufficiently on this particular variety of stigma to effect fertilization. Either variety may be an effective pollinizer for some other varieties.

**Pollinizer.** The variety (plant, tree) used to furnish pollen.

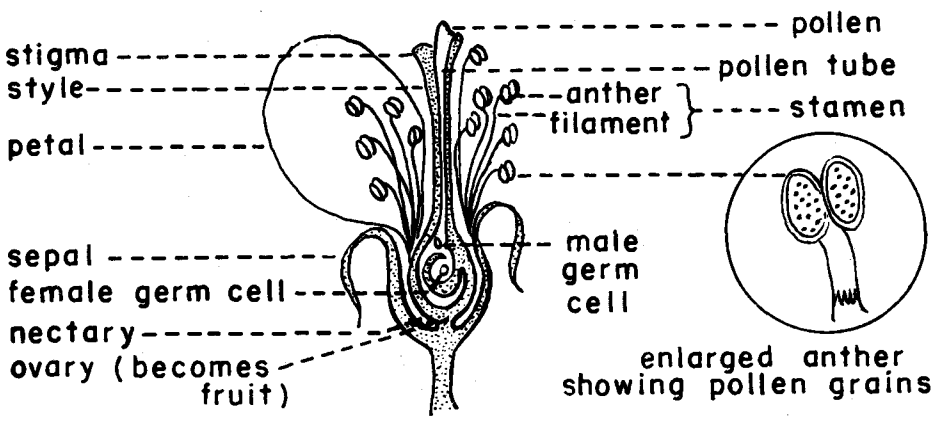
**Pollinator.** The agent (insect, human) that transfers the pollen from the pollinizer to the stigma.

### Varieties

All sweet cherry varieties, except Stella and some Stella crosses, are self-incompatible and must be cross-pollinated for satisfactory yields. Royal Ann (Napoleon), Bing, and Lambert are cross-incompatible, as are some other combinations of varieties. However, all varieties produce viable pollen.

**Royal Ann.** Known in some states as Napoleon, Royal Ann is the principal variety grown for brining and subsequent processing into maraschino cherries. The skin is thin and light yellow with a pink blush. Its medium-long stem and moderately pointed fruit shape are associated with the highest quality cocktail-style cherry.

Being firm fleshed, it has superior quality in the brine. It is more susceptible to rain



Longitudinal section of a sweet cherry flower

cracking than some other varieties. More limited quantities are commercially canned. Brown coloration from bruising shows quite clearly on Royal Ann, especially in hot weather.

The tree blooms and matures its fruit approximately in midseason. The tree tends to grow upright with little branching. Ann is highly susceptible to bacterial canker and dead-bud, diseases caused during cold, rainy weather by the bacterium, *Pseudomonas syringae*. It is somewhat less winter-hardy than Lambert.

Corum or Bada in the Willamette Valley, and Black Republican or Van in Eastern Oregon, are the pollinizers most commonly used for Royal Ann at present. These varieties are cross-compatible with Royal Ann. Most seedlings bloom too early to effect pollination. Black Republican blooms before Royal Ann and in some years is in full bloom before the first 10% of the Royal Ann bloom has opened.

The fruits of Black Republican are purplish-black and medium in size, ranging from 3/8 to 3/4 inch in diameter. It is rated as an inferior variety for canning and brining, but it has been successfully marketed as a frozen product. In dry, unirrigated orchards, the fruit is often small and has a bitter flavor.

Corum has been an effective pollinizer over a period of years. Although it is in full bloom before Royal Ann, there is sufficient

overlap of the bloom periods for effective pollination.

Although it is somewhat inferior, it is also suitable for commercial brining, so it is a good pollinizer for Royal Ann.

Bada is cross-compatible with Bing, Royal Ann, and Lambert. The blooming period of Bada coincides more closely with that of Ann than does Corum. It is a better pollinizer for Royal Ann than Corum.

The full-bloom period of Van coincides well with that of Royal Ann, and it is an excellent pollinizer for that variety. Although it is a black cherry suitable for fresh shipping, its quality is inferior to that of Bing. The fruitset on mature Van trees is usually so heavy that the fruits are smaller than Bing and Royal Ann. Since the tree is very susceptible to bacterial canker, it is not suitable for the Willamette Valley, but it is the principal pollinizer in eastern Oregon.

**Corum** is a light-colored cherry with a pronounced red blush. It ripens 4 to 5 days before Royal Ann. The stem is approximately the same length as Ann, but the fruit itself is not pointed. The flesh is not quite as firm as that of Ann. The tree is considerably less susceptible to bacterial canker than Ann. It branches more freely, tends to be more spreading, and tends to bear at an earlier age. In recent years, it has proven to be much more susceptible to damage by virus than Royal Ann, and has therefore fallen in favor. It is not



recommended for eastern Oregon because Van is more marketable there.

**Bada.** This variety (pronounced *ba-dah*) was introduced by the University of California in 1964. The skin is cream-colored with a red blush. It has excellent quality as a brined cherry. It is similar to Royal Ann in texture but is more resistant to bruising and to rain cracking. The stem is slightly longer and thicker than that of Ann, and the fruit is indistinguishable in appearance from Ann. The flesh of Bada is approximately as firm as that of Royal Ann. Bada ripens a few days earlier than Ann. The tree is not very vigorous; at maturity it is only 50-60% as large as Royal Ann. It bears early, heavily, and consistently. The tree is more resistant to bacterial canker than Ann and has equal cold-hardiness.

**Rainier.** The fruit of Rainier is white with a red blush. It has a relatively short stem and a flat apical end unlike Royal Ann. When canned, the fruit is solid yellow with no red color. In some years, the pits crumble or crack with the slightest pressure. This defect appears only rarely, but it is so serious that it should be considered to be a major drawback to this variety as a brining cherry. Rainier has a pronounced tendency to crack in rainy weather. Because it is large and firm, it has been sold to a limited extent on the fresh market. Some growers pack it in the field because it shows bruises so easily.

**Bing.** This large, black, firm-fleshed variety is the highest quality fresh-shipping cherry grown anywhere in the U.S. It is grown extensively in The Dalles and Milton-Freewater districts for shipping. It is nearly round, broader than long, and uniform. Its dark red flesh is firm, not very fibrous, juicy, sweet, and very good in quality. The stone is relatively small in comparison to the size of the fruit.

Bing produces an excellent canned product but is inferior for brining unless picked before fully ripe. Since it is very susceptible to rain cracking, it is not grown commercially west of the Cascades. It ripens 5 to 7 days after Royal Ann and about a week before Lambert.

The tree is less winter-hardy than Lambert. It is susceptible to bacterial canker and dead-bud caused by *Pseudomonas syringae*.

Bing is cross-incompatible with Royal Ann and Lambert. It is cross-compatible with Van, Chinook, Black Republican, Corum, and Bada. In some years, Black Republican blooms too early to be a completely effective pollinizer for Bing. The full-bloom period of Van coincides well with that of Bing, and it is an excellent pollinizer for that variety. Its fruit can be sold fresh or for canning. Although both Bada and Corum are good pollinizers for Bing, Bada is a superior variety to Corum. Chinook was introduced as a black-fruited pollinizer for Bing that could be shipped

fresh. It has been removed from orchards because of its relatively soft flesh and serious rain cracking.

**Lambert.** In Oregon, Lambert is grown primarily as a late-maturing black variety for freezing and shipping. Its firm black flesh has a superb flavor when fully mature. The stem is longer than Bing, and the fruit is distinctly heart-shaped and pointed. It is usually of medium size but tends to be quite small with a heavy crop. It is susceptible to rain cracking but less so than Bing. It is grown primarily in Union County, but because it often matures after rains have ceased, it is also grown in limited quantities in western Oregon. The tree is more winter-hardy than Royal Ann or Bing. It is susceptible to bacterial canker.

The most commonly grown pollinizers for Lambert are Van and Sam. Black Republican and Van often bloom too early to be effective. Sam is one of the better pollinizers for Lambert. The fruit is black and nearly as large as Bing and Lambert. It is rated low in brining quality because of its coarse texture. Although inferior to Lambert, it is satisfactory for canning. Its peak bloom comes slightly before that of Lambert. It matures earlier than Lambert and tends to be soft.

### Number and placement of pollinizers

The number and placement of pollinizers required for the most effective pollination is largely determined by the foraging habits of the honey bees that carry the pollen. Wind plays little or no part in sweet cherry pollination.

An arrangement in which every other tree in every other row is a pollinizer would provide maximum cross-pollination, but this scheme includes too many pollinizer trees to be practical unless the fruit from them is nearly as valuable as the main variety.

A system where every third tree in every third row is a pollinizer places a pollinizer next to every tree of the main variety at least on the diagonal and allows for a minimum number of pollinizers.

Do not graft pollinizers into the limbs of the main variety. (The varieties frequently are mixed during harvest, especially under mechanical harvesting.)

More information on pollination is available in OSU Extension Service Fact Sheet 172, *Stone Fruit Pollination*.

### Rootstocks

Most sweet cherry trees are budded low by the nursery on mazzard seedlings. These trees are satisfactory in The Dalles district. However, in most other districts (especially west of the Cascades), it is very difficult to establish low-budded trees of most varieties because of gummosis cankers of the trunk and lower limbs caused by the bacterium *Pseudomonas syringae*.

To avoid this problem, plant either unbudded mazzard seedlings or mazzard selection F-12-1. After the tree is established a year or more, graft or bud the desired variety 12-18 inches from the trunk on the scaffold limbs. Although some mazzard seedlings are susceptible to bacterial canker, most are tolerant.

Mazzard F-12-1 is uniformly tolerant of the bacterium. Because F-12-1 trees have shown more damage following winter freezes than have mazzard seedlings, they would be less desirable in a cold climate. Trees of Corum and Bada budded low in the nursery have shown an acceptable degree of resistance to canker when planted in western Oregon orchards.

Seedlings of *Prunus mahaleb* are sometimes used as rootstocks for sweet cherries. Trees on some *mahaleb* seedlings are slightly smaller than trees on most mazzard seedlings. *Mahaleb* is seldom used as a rootstock in Oregon because it is not tolerant of wet soils, especially when they are poorly drained.

To obtain a semidwarf tree, sweet cherries are sometimes grafted onto a sour cherry trunk that, in turn, is on a *mahaleb* root. Limited observations of such compound trees suggest that while some do perform satisfactorily, they do not always do so.

Trees with sour cherry trunks have shown a higher rate of mortality under some orchard conditions. Small fruit and weak trees have resulted.

Colt is a new rootstock from the United Kingdom that produces trees 65-75% as large as on mazzard seedling, according to tests in that country. Young trees in Oregon tests are growing more slowly than trees on mazzard. It is expected to be resistant to bacterial canker, on the basis of tests in the United Kingdom. Colt induces more fruit buds on the scion variety in the early years than mazzard seedling or F-12-1. It produces very few suckers and provides good anchorage.

Although the question of its cold-hardiness is not yet answered, early observations indicate that it is not as cold-hardy as mazzard seedling. It was more sensitive to drought in the United Kingdom than other cherry stocks.

M × M 60 is a new rootstock that has been tested fairly extensively in Oregon. Its advantages include earlier bearing, resistance to bacterial canker, and a slight reduction in tree size (probably equal to Colt). Although its cold-hardiness has not been tested extensively enough, others of the same group of rootstock clones have been as cold-hardy as mazzard. This rootstock is worthy of commercial trial.

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