

Fruit Culture in Alabama

Fruitfulness and Pollination

► For homeowners and fruit producers alike, gaining insight into the essential pollination requirements is crucial for successful fruit crop cultivation.

To better select fruit crops for planting, growers should become familiar with the terms used to describe pollination characteristics and fruitfulness of different crops. Some basic terms are pollination, self-pollination, cross-pollination, self-fruitful, cross-fruitful, parthenocarpic, and perfect-flowered.

Pollination refers only to the transfer of pollen from one flower's anthers (male structure) to the stigma (female structure) of the same or another flower. The processes of pollination and subsequent seed formation are generally necessary for fruit set and development of most fruit crops.

Self-pollination occurs when flowers are pollinated by pollen within the same horticultural variety from the same or different trees. Most peach varieties, such as 'Redhaven', are fruitful when self-pollinated and, therefore, can be planted in large blocks without using a second variety.

Cross-pollination occurs when flowers of one variety are pollinated by pollen from a second variety. For example, the apple variety 'Golden Delicious' is often used in orchards to cross-pollinate 'Red Delicious' varieties.

Self-fruitful implies that a single variety of a given fruit crop will produce satisfactory fruit crops when grown by itself. This may occur because the variety is self-pollinating (such as peach) or parthenocarpic (such as some persimmons, figs, and satsumas).

Cross-fruitful implies that cross-pollination is required among two or more varieties to produce satisfactory crops. The 'Red Delicious' apple varieties, for example, are cross-fruitful when cross-pollinated with varieties of 'Golden Delicious'.

Parthenocarpic means fruits are produced without complete seed development, resulting in seedless fruits. Fruit are produced without pollination and results in incomplete or no seed development and production of seedless fruit. Examples of parthenocarpy are figs and satsuma. Satsuma has sterile pollen, mostly nonviable ovules, which results in the production of seedless fruit.



Figure 1. Insects, especially bees, are essential pollinators of most fruit plants, such as rabbiteye blueberries.

Perfect-flowered means that flowers of that variety have functional male and female parts. The muscadine grape variety 'Carlos' has perfect-flowers that are self-fruitful. Other muscadine grape varieties may produce only flowers that have female structures. Varieties like 'Carlos' can serve as pollinators for varieties that produce only female flowers such as 'Fry'.

Pollination and fruiting characteristics of fruit plants are described in table 1.

Whether a fruit crop is self-fruitful or requires cross-pollination influences how varieties are arranged in a planting. For self-fruitful plants, single varieties will perform better when planted alone. Two or more varieties of each crop should be planted for fruit crops requiring cross pollination. Planting entire rows with the same variety makes management of cultural practices and harvesting much easier and more cost effective. When only the minimum number of pollinators is desired, a pollinator variety should be planted every third plant in every third row.

Table 1. Pollination and Fruiting Characteristics of Fruit Crops

Fruit Crop	Characteristic	Description
Tree Fruits		
Apple	Cross-pollinating	Plant two or more varieties of each crop for cross-pollination. Golden Delicious apple varieties tend to be a least partially self-fruitful when planted alone.
Pear	Cross-pollinating	Use a second variety every two to four rows. Plant only two to three rows of the same variety.
Asian Pear	Cross-pollinating	Some varieties appear partially self-fruitful, but a minimum of two varieties should be used.
Peach	Self-fruiting	
Nectarine	Self-fruiting	
Quince	Self-fruiting	
Plum	Cross-pollinating	Plant two or more varieties of each crop for cross-pollination. Exceptions to this general rule are Methley, Homeside, and AU Producer plums, which are generally self-fruitful.
Cherry, Sweet	Cross-pollinating	Sweet cherries are not recommended in Alabama because of freeze problems. Pollinating requirements are also exacting.
Cherry, Sour	Self-fruiting	Montmorency sour cherry is self-fruitful.
Oriental Persimmon, Astringent	Self-fruiting	
Oriental Persimmon, Non-astringent	Self-fruiting or cross-pollinating	Non-astringent persimmon varieties, such as Fuyu, are self-fruiting but can shed excessively and may require the use of pollinators, such as Gailey, to ensure full cropping.
Pomegranate	Self-fruiting	
Fig, Common	Self-fruiting	
Small Fruits		
Bunch Grape	Self-fruiting	
Muscadine Grape, Perfect Flowered	Self-fruiting	
Muscadine Grape, Female		Female muscadine grape varieties must be planted with perfect flowered varieties for cropping.
Blackberry	Self-fruiting	
Raspberry	Self-fruiting	
Blueberry, Rabbit-eye, Highbush, Southern Highbush		Two or more rabbit-eye varieties must be planted for cross-pollination. Rabbit-eye blueberries generally fruit best when a varietal sequence of two to one is used across the planting, such as two rows of Tifblue varieties and one row of Premier. Highbush blueberry varieties are more self-fruitful but usually benefit from interplanting two or more varieties.
Strawberry	Self-fruiting	

Table 1. Pollination and Fruiting Characteristics of Fruit Crops (cont.)

Fruit Crop	Characteristic	Description
Subtropical and Exotic Fruit		
Satsuma	Self-fruiting	
Kumquat	Self-fruiting	
Meyer Lemon	Self-fruiting	
Kiwifruit	Primocane fruiting	Kiwifruit have male and female varieties that must be interplanted to ensure cropping. One male is used for every five to ten female plants.
Feijoa	Cross-pollinating	



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