Pollination Requirements for Fruits and Nuts

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Apples, apricots, blackberries, cherries, figs, grapes, muscadines, peaches, pears, persimmons, plums, strawberries, pecans and walnuts are found growing in many areas of Oklahoma.

Fruit set must be secured before a crop can be produced. Many factors influence pollination: general health and nutrition, insects and diseases, late frost or winter injury, and too much rain at blossoming time. The chief cause, however, in most instances is that of poor pollination. The flavor or color of fruit is not affected by cross-pollination.

Fruits do not cross-pollinate outside of their own species. For example, stone fruits (peaches, plums, apples, and apricots) do not pollinate one another.

Most fruits are insect pollinated. Two or more varieties of each kind of fruit should be used in all fruit plantings unless it is positively known that the variety is self-fruitful. Following is a brief discussion of selecting varieties to improve fruit set.

Selecting Apple Varieties

The flowers of the apple are true hermaphrodites. The blossom has five stigmas. If each one is fertilized, better apples will be produced. The June drop of apples in many orchards is a direct result of poor pollination. Unless three or more seeds are developing, the young apples will not reach true size and will no doubt drop immature sometime before harvest time. Most apple varieties require cross-pollination. Those not requiring it usually produce more and better fruit when crossing occurs. In normal blossoming years, from 5 percent to 10 percent of the blossoms, if properly pollinized, will usually result in a satisfactory fruit set for the tree. It should be remembered that about 90 percent of the fruit set of apples is the result of insect activity during the period the tree is in full bloom.

The pollinizer trees should make up from one-fourth to one-tenth of the total number of trees in the planting. It is possible to have the pollinizer trees of a variety equally as productive and valuable as the principal variety. They should bloom at the same time and have plenty of mature pollen. They should be self-fertile or receive pollen from the principal variety.

It is difficult to classify the varieties because they do not behave in the same manner in different producing areas. The following general classification should be helpful:

Self-fruitful: Yellow Transparent and Grimes Golden.

Partly self-fruitful: Ben Davis, Black Ben, Gano, Summer Champion, Lodi, and Rome Beauty. (These varieties need cross-pollination. Yellow Transparent blooms at the right time and is considered a good pollinizer for this group.)

Partly self-fruitful: Jonathan, Blackjon, and Jonared. (They need to be cross-pollinated. Golden Delicious, Starking, or York Imperial are good pollinizers for this group.)

Self-unfruitful: Delicious, Starking, Arkansas Black, and Red June. (Jonathan and Golden Delicious are good pollinizers for this group.)

Self-unfruitful and pollen sterile: Winesap, Turley, Stayman Winesap, and its sports. (Jonathan and Golden Delicious are good pollinizers for this group.)

Where pollination problems occur in existing plantings, an application of nitrogen fertilizer applied three weeks before blooming could help solve the problem.

Add some bee colonies to the orchard. Bouquets of flowers of suitable varieties can be attached to the trees. Graft or add new pollinizer trees.

Apricots, Bramble Fruits and Cherries

Most of the bramble fruits produced in Oklahoma are considered self-fruitful. The recoommended varieties are self-fruitful. The Dallas variety of blackberries requires cross-pollination.

Apricots are generally considered self-fruitful.

Sour cherries are self-fruitful. It is better to have two varieties (Early Richmond and Montmorency). Sweet cherries are self-unfruitful.

Figs and Grapes

Figs generally need cross-pollination.

Grapes are mostly wind-pollinized. Most of the varieties are self-fruitful and cross-compatible. The exceptions are America, Enda, Last Rose and Brighton. They require cross-pollination by other varieties. Grapes bloom late in the season and seldom are the blossoms injured by late spring frost; however, winter injury will sometimes kill buds that would otherwise produce fruiting wood during the summer.

Muscadines, Peaches and Pears

Most varieties of muscadines are self-sterile. Pollen is carried by the wind from the male plant to the female plant. About one-fourth of the planting should be made up of male vines. Where only a few vines are planted, the male vines may be located nearby on the fence row or edge of the field.

The Wallace and Willard (white) varieties have perfect flowers, are self-fruitful, and can produce the pollen for the female vines in the planting, thus eliminating the need for the male vines.

Most varieties of peaches are considered self-fruitful. The exception is J.H. Hale. It produces abortive pollen but can be pollinated by almost any variety.

Most varieties of pears are partly self-fruitful. Usually, two or more varieties will result in a better pear crop. Bartlett and Seckel are cross-incompatible. Bartlett and Kieffer are considered cross-incompatible. Garber is a good pollinizer for Kieffer. Maxine, Magness, and Moonglow are three new varieties believed to be blight resistant. Magness is pollen-sterile, thus requiring a pollinator.

Pecans and Walnuts

Pecan trees are monoecious (having both male and female flowers on the same tree). The male flowers are three-branched catkins produced on last year's wood. The pollen is carried by the wind to the female flowers, borne in clusters on the current season's growth.

Most varieties are considered self-fruitful; however, better production is obtained when more than one variety is planted.

Wet weather during the pollination period may reduce dissemination of pollen. A good plan is to leave a few native pecan trees in the vicinity of the pecan grove to furnish additional pollen. Some native trees bear their pollen early and some late. Pollination is usually completed most years during the last days of May. The tip ends of the nutlets turn brown and harden immediately after they are pollinized or their receptive period has passed. If the female flower fails to receive pollen, it usually turns yellow and falls to the ground within a week or so. Approximately 75 percent of the small nut drop that usually occurs in June or about six weeks after the pollination period is a result of the female flowers not becoming fertilized.

There is no evidence of cross-incompatibility in varieties tested. The problem develops because the male and female flowers do not mature at the same time. Moore, Texas Prolific, and San Saba have pollen available in time to pollinate the earliest flowers of any variety. Moneymaker and Success usually depend upon other varieties for pollination. Stuart, Burkett, Schley, and Delmas sometimes require pollen from other varieties.

No pollination difficulties have been experienced in Oklahoma among the native or improved varieties of walnuts. The male and female flowers of the walnut occur in a similar manner as found in pecans. Two or more varieties of walnuts are recommended for a planting. (Some difficulty may be experienced with the Carpathian varieties.) Some of the young trees produce female flowers for two or three years before they develop catkins to furnish the pollen.

Persimmons, Plums and Strawberries

Japanese or Kaki persimmon (also referred to as Oriental) is dioecious. Some plants produce male (staminate) flowers and some produce female (pistillate) flowers. Some produce both and are self-fruitful. Some persimmons bear male flowers only when the tree is young, later change to the production of female flowers only, and in some cases, produce both male and female flowers.

The persimmon tree is usually a male or female. American and Japanese trees are not inter-fruitful.

Most of the Japanese plum varieties are self-unfruitful. Varieties like Bruce, Hanska, Gold, America, and a dwarf variety, Sapa, are considered self-fruitful and cross-compatible. It is a good plan, however, to plant two or more varieties.

The recommended varieties of strawberries are self-fruitful. Pollination problems, however, do occur in some of the everbearing varieties, but in most cases it is the result of high temperatures.

Original material by Glenn G. Taylor.

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