



## Fruit Drop – A Serious Problem to Fruit Growers

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Fruit growers have long faced substantial losses as a result of pre-harvest and post-harvest fruit drop. Some species and types' fruits loosen from the stalk as they approach picking maturity, and large quantities may fall prior to and during the picking operation. Such fruits are severely damaged and, even if rescued, have a low value as compared to those harvested from the tree. Fruit drop is a significant issue in certain fruit crops. While in others, fruit drop begins at the moment of fruit set and becomes severe at various phases of fruit growth. Before harvest, certain fruit crops experience a significant decline.

### Kinds of drop

Fruitlet abscission is a typical occurrence in many plants that occurs as a result of developmental and environmental stimuli, resulting in considerable crop losses. Fruit abscission occurs in three stages. The first is the period of fruit set, which lasts about a month after full bloom and is also known as cleaning drop. The first drop happens soon after the blossom opens. At this point, flowers with aborted pistils usually fall off. The second period of strong fruit drop, known as "Second drop," can occur at the start of a hot summer. At this point, unfertilized blooms, as well as some fertilized ones, fall off. The third drop is also known as the "Post set drop." Because of the production of abscission layers in the immature fruit stalks, this happens when the fruits are marble size. Most deciduous fruits experience this drop, and this natural thinning of the fruit allows the tree to produce larger fruits. June drop, also known as pre-harvest drop, is a time of strong fruit drop that occurs when the summer heat rises. Many factors cause half-developed and three-quarter-developed fruits to be shed at this stage. This is the loss suffered by the fruit grower, and it is a severe challenge that they face.

### Causes of Drop

The chief causes of shedding of blossom and young fruits are:

#### (i) Structural defects

Defects in flower parts, winter injury, spray, damage due to insect, defective pistils are responsible for early shedding of blossom in apple. Defective ovules are also responsible.

#### (ii) Non pollination

Self pollination may fail, while cross pollination may be prevented by lack of suitable pollen or by the absence of carriers. Even if pollen reaches the stigma, it may be washed off by rain before it can exert a stimulus.

#### (iii) Non fertilization

(a) Gametic sterility



This condition seems to be common in polyploids containing an uneven multiple of the basic number of chromosomes especially in triploid varieties of apple. Such pollen grain either fails to germinate or if pollen tubes are formed these usually burst easily or they reach the ovary and give rise to unbalanced embryo.

*(b) Incompatibility*

Incompatibility in apple and pears is due to physiological reactions occurring between the pollen tube and the style and ovarian tissues.

*(c) Failure of double fertilization*

This may prevent the formation of the endosperm and thus that of the embryo.

**(iv) Abortion of embryo**

It may arise from genetical and unfavourable nutritional conditions and usually results in shedding of fruits.

## **Management of Fruit Drop**

### **1. Planting windbreaks and shelterbelts:**

High wind speeds cause mechanical damage to the fruits and branches, as well as desiccation due to excessive water loss through transpiration. Windbreaks of fast-growing, deep-rooted trees are planted around the orchard to guard against hot and cold winds and reduce fruit drop.

### **2. Water and Moisture Management:**

Most fruit crops suffer from substantial fruit drop due to moisture stress during fruit set and development. Water application in an irrigated system should be based on appropriately sequenced evapotranspiration deficiencies. The notion of irrigation scheduling based on plant water content should be suitable for deep-rooted perennial fruit plants. Mulching conserves soil moisture and improves water efficiency by minimizing evaporation from the soil surface by cutting the supply of heat energy to the evaporating site and lowering its thermal conductivity. Fruit drop is reduced as a result of this procedure. Mulching materials include wheat and rice straw, sawdust, and black or white polyethylene.

### **3. Nutrition Management:**

Fertility management for fruit drop reduction should be done in such a way that the intercrop residues provide the majority of the nutritional supplements to the fruit plants. However, applying manures and fertilizers on an annual basis near the zones of maximal root activity, which coincides with rainfall incidence, is beneficial. Foliar feeding of micronutrients in recommended dosages aids in the treatment of nutrient deficits.

### **4. Pest and Disease Management:**

Fruit trees perennial nature creates a relatively steady agro-ecosystem in which pests and disease can thrive and propagate. A close eye should be kept on the spread of various pests and illnesses, and appropriate control techniques should be implemented to prevent their detrimental impacts.

### **5. Use of growth regulators:**

Various growth regulators are advised for controlling fruit drop in various fruit crops. However, caution should be exercised when preparing the solution. The recommended concentration for reducing fruit drop should be rigorously observed; for example, 2, 4-D functions as a hormone at lower concentrations but as a weedicide at greater concentrations.



**Prevention of fruit drop in different crops at a glance**

<b>Fruit crop</b>	<b>PGR</b>	<b>Concentration</b>	<b>Time of Application</b>
Mango	NAA or 2, 4-D	20-30 ppm	Last week of April or when the fruits attain marble size.
Citrus species	2, 4-D or Gibberelic acid GA <sub>3</sub>	8-10 ppm 50 ppm	Before the young fruits attain growth, twosprays of the recommended dose maybe given.
Litchi	NAA or 2, 4-D	10-15ppm +1% ZnSo <sub>4</sub> .	At the time of fruit development
Grape	Gibberelic acid GA <sub>3</sub> or PCPA	100 ppm	Before harvesting
Apple	NAA or 2, 4-D or 2,4,5-T	10 ppm 20-50 ppm	Immediately after the petals drop.

**Conclusion**

Fruit drop is a serious problem associated with fruit crops which lead to huge loss to the farmers. Many external and internal factors are responsible for fruit drop. So it is needed to minimize fruit drop by using various techniques and by adopting various control measures.

