# Seed dormancy

Seed dormancy is an evolutionary adaptation that prevents seeds from germinating during unsuitable ecological conditions that would typically lead to a low probability of seedling survival.

It can be classified into two types –

## 1. Innate dormancy / Primary dormancy

The state of the seed itself or dormancy induced in the seeds at the time of dispersal from the mother plants.

**It is of two types exogenous and endogenous**

- **Exogenous dormancy** : It is due to the seed coat factor either due to presence of inhibitors or hard seed nature
- It is further classified into -
  1. Physical
  2. Chemical
  3. Mechanical

- **Endogenous dormancy**: This type of dormancy is imposed by rudimentary or undeveloped embryo at the time of ripening or maturity.
- It is further classified into -
  1. **Morphological** - Due to immature embryo, which is not able to putforth germination even under favourable conditions? (E.g.) Apple
  2. **Physiological** - Due to arrest of the metabolic activity in the seeds due to presence of some inhibitors like ABA, coumarines, phenols etc.
  3. **Morphophysiological** - Combination of immature embryo with inhibitors

## 2. Secondary dormancy

It occurs in nature when seeds cannot germinate due to the environmental conditions, e.g., when a seed becomes buried in the soil.

- **Types of secondary dormancy**
- Thermo – Dormancy due to temperature
- Skoto – Light Photo – Quality of light and Osmotic – stress or high osmotic stress prevents germination

**Dormancy breaking treatments**

**Physical dormancy**

1. **Scarification**

**i. Acid-** By using concentrated H2S04@100 ml/kg of seed for 2-3 minutes treatments dormancy can be overcome in the above group of seeds. E.g. Rose seeds

**ii. Mechanical-** Seeds are rubbed on a sand paper or with a help of mechanical scarifier or by puncturing on seed coat with the help of needle to enhance / increase the moisture absorption by seeds. E.g. Bitter gourd for sand scarification

**iii. Physical treatment** – hot water treatment- The seeds should be soaked in boiled water for 1-5 minutes for 60-80 minutes.

2. **Stratification treatment**

**a) Cold stratification**

- Incubate the seed at low temperature of 0-5 degree C

**b) Warm stratification**

- seeds require temperature of 40-50 degree C for few days
- In case of oil palm it requires temperature of 40-50 degree C for 2 months for breaking dormancy
- Moisture content of seed should not be more than 15%

3. **Temperature treatments**

**a) Low temperature treatment**

- Apple seed dormancy can be released by low temperature treatment by storing the seeds at 5 degree C.

**b) High temperature treatment**

- high temperature treatments are exhibited by early flowering "winter " annuals.
- E.g. Blue bell (Hyacinthoidesnonscripta)

**c) Alternate temperature treatments**

- Most of the plant species which grow in temperate and cool temperate regions require alternate temperature for breakage of dormancy.
- (e.g.) Bull rush (Typha)

**Zenia**: The direct/visible effects of pollen on endosperm and related tissues in the formation of a seed color.

**Metazenia**: Is the effect of pollen on the material tissues of fruit.