

# 2. Review E3 Plant Biology



# Flowering plants angiosperms

*Monocots* monocotyledons, one seed leaf

*Dicots* dicotyledons, two seed leaves

**Gymnosperms** Non-flowering plants including **conifers**.

Woody plants have basic stem structures that are perennial with annual growth rings

**Trees** are defined as single stem plants greater than 20 feet tall

**Shrubs** are defined as multi-stem plants less than 20 feet tall

Specific plants can have several common names but only **one** scientific name in scientific classification.

**The scientific name is a binomial, two parts, consisting of Genus and species**

**Cultivar is a contraction of 'cultivated variety'**

**Variety—naturally occurring variation of a plant. Preceded by var. and *italicized***

**Hybrid—a cross of two or more species or cultivars.**

The point of attachment for the leaf is called the **node**.

**Buds** embryonic stems enclosed in scale-like leaves called bud scales.

Buds along the stem are **called lateral or axillary buds**

**Apical meristems** at the growing tip of the shoot and root are primary meristems

- **Secondary meristems** also called **lateral meristems**, increase diameter.

**Xylem** conducts water and dissolved minerals from the roots upward only.

**Phloem** conducts sugars and other metabolic products from the leaves.

**Epidermis** an outer protective layer or layers of cells in the leaves covered with waxy layers called the **cuticle**

The **cuticle** can affect the ability of pesticides to penetrate the plant.

**Compound leaves** have two or more leaflets arising from the attachment point to the stem

The three types of leaf arrangements are alternate, opposite, and whorled.

The two types of plant root system are **taproot**, with a single main root, and **fibrous**, with many branching roots.

A **rhizome** is an underground stem that spreads to produce new aboveground shoots.

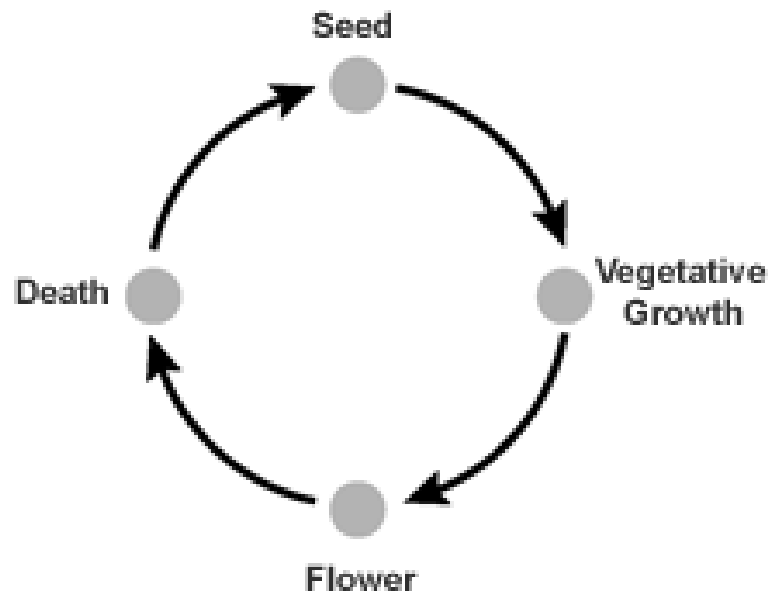


The **mesophyll** is a layer between the upper and lower epidermis containing chlorophyll.

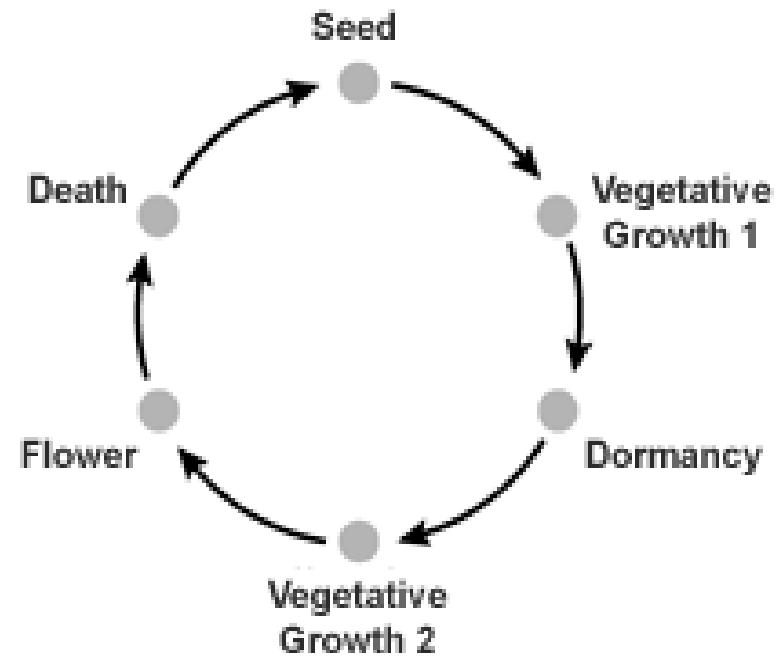
The **pistil** is the female part of the flower and the **stamen** is the male part.

**Adventitious roots** arise from certain stem tissue if separated from the plant or if injury occurs.

### Annual Growth Cycle



### Biennial Growth Cycle



In seed **germination**, the embryo utilizes food stored in the cotyledons and endosperm, takes up water, oxygen, a required temperature range, and sometimes light to germinate. If the conditions are met the seedling is now self-sustaining.

**Photosynthesis** is the process by which green plants use sunlight to synthesize food from carbon dioxide and water.

- **Apical meristems** found in growing tips, produce elongation
- **Secondary or lateral meristems** found in stems, produce increase in diameter
- The first step of cell growth is cell division e.g., leaves, buds, and adventitious roots.

The **three stages of plant growth** are cell division, cell elongation, and cell differentiation.

**Differentiation** in plants refers to the processes by which distinct cell types arise from precursor cells and become different from each other. The structure or function of differentiated cells are specialized for a particular function.

There are three primary nutrients, also called **macronutrients**, nitrogen, phosphorus, and potassium.

**Nitrogen** has the main role in plant growth

Too much or too little **water** stresses plants and increases pressure from pests and diseases.

**Relative humidity** a measure of the amount of moisture in the air.

**Relative humidity** is a **ratio**, expressed in percent, of the amount of atmospheric moisture present relative to the amount that would be present if the air were saturated.

**Temperature** influences a number of plant processes such as blooming and dormancy.

**Systemic pesticides** are absorbed by the roots or through the foliage and then are translocated to other parts of the plant.

**Contact pesticides** only stay active on the plant for a few days to three weeks.