

Unit A: Basic Principles of Plant Science with a focus on Field Crops



Lesson 5: Understanding Flower Anatomy

Vocabulary

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- Anther
 - Calyx
 - Corolla
 - Complete flower
 - Fertilization
 - Filament
 - Incomplete flower
 - Imperfect flower
 - Ovary
 - Perfect flower
 - Petals
 - Pistil
 - Pistillate
 - Pollen
 - Pollination
 - Sepals
 - Stamen
 - Staminate
 - Stigma
 - Style

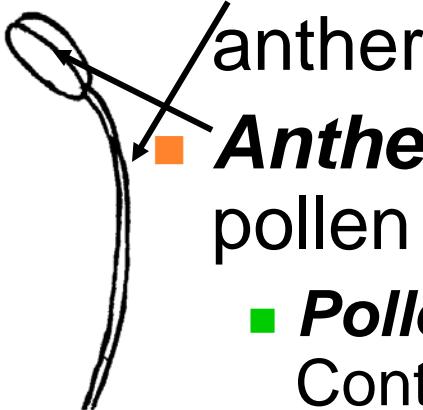
What Are the Parts of A Flower?

- Flowers are the most obvious part of most plants
- They are made of many intricate and important parts
- Most flowers contain male and female parts



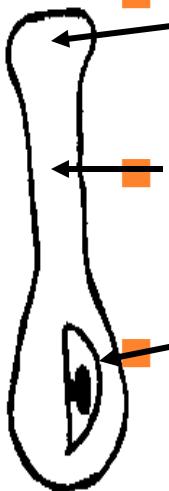
Parts of a Flower

- 1. **Stamen** – the male part of a flower;
Made up of two parts:
 - **Filament** – stalk of a stamen; Holds up the anther
 - **Anther** – sack-like portion containing the pollen
 - **Pollen** – grain released by the flowers;
Contains the sperm
 - Flowers containing only stamens are called **staminate**



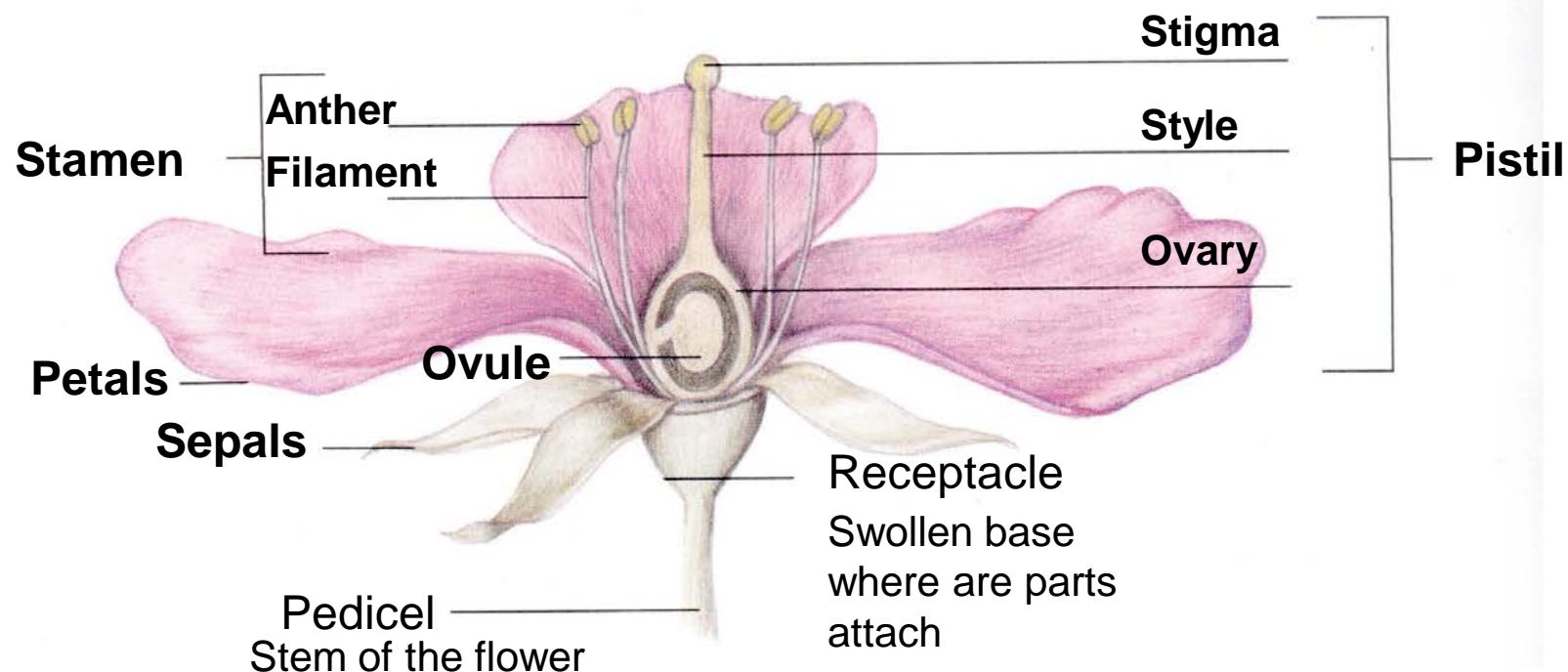
- 2. **Pistil** – female part of the flower;
Made up of three parts:

- **Stigma** – sticky organ which receives the pollen grains
- **Style** – a rod shaped middle part; Similar to the stalk of the stamen
- **Ovary** – swollen base containing the eggs or ovules
- Flowers having only female parts are called **pistillate**



- 3. ***Petals*** – the showy, colorful leaf-like structures which often attract animals or insects for pollination
 - When all the petals are fused together, it is called the ***corolla***
- 4. ***Sepals*** – beneath the petals; More leaf-like structures usually green in color
 - Protect the flower before it opens
 - When all the sepals are fused together, it is called the ***calyx***

Parts of a Flower

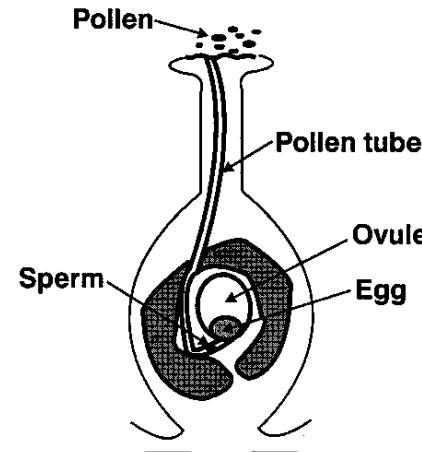


What is the Purpose of a Flower?

- We use flowers for many practical purposes like food, clothing and medicine; We also use them for aesthetic purposes – to beautify our homes
- The main purpose of a flower is to reproduce sexually with other flowers or with itself
- The first step of reproduction begins with ***pollination*** (the process of transferring pollen to stigma), and there are two types:

- A) Cross-pollination is when the pollen of one plant lands on the stigma of a different plant; Keep in mind that the plants must be of the same species (for example, two dandelions)
- B) Self-pollination occurs when the pollen of the anther lands on the stigma of the same plant
- Pollen is carried to plants by animals, wind, gravity, water and many other methods

- Once the pollen reaches the stigma, it starts to grow down the style depositing the sperm in the ovary
- When the sperm and egg combine, it is called **fertilization**



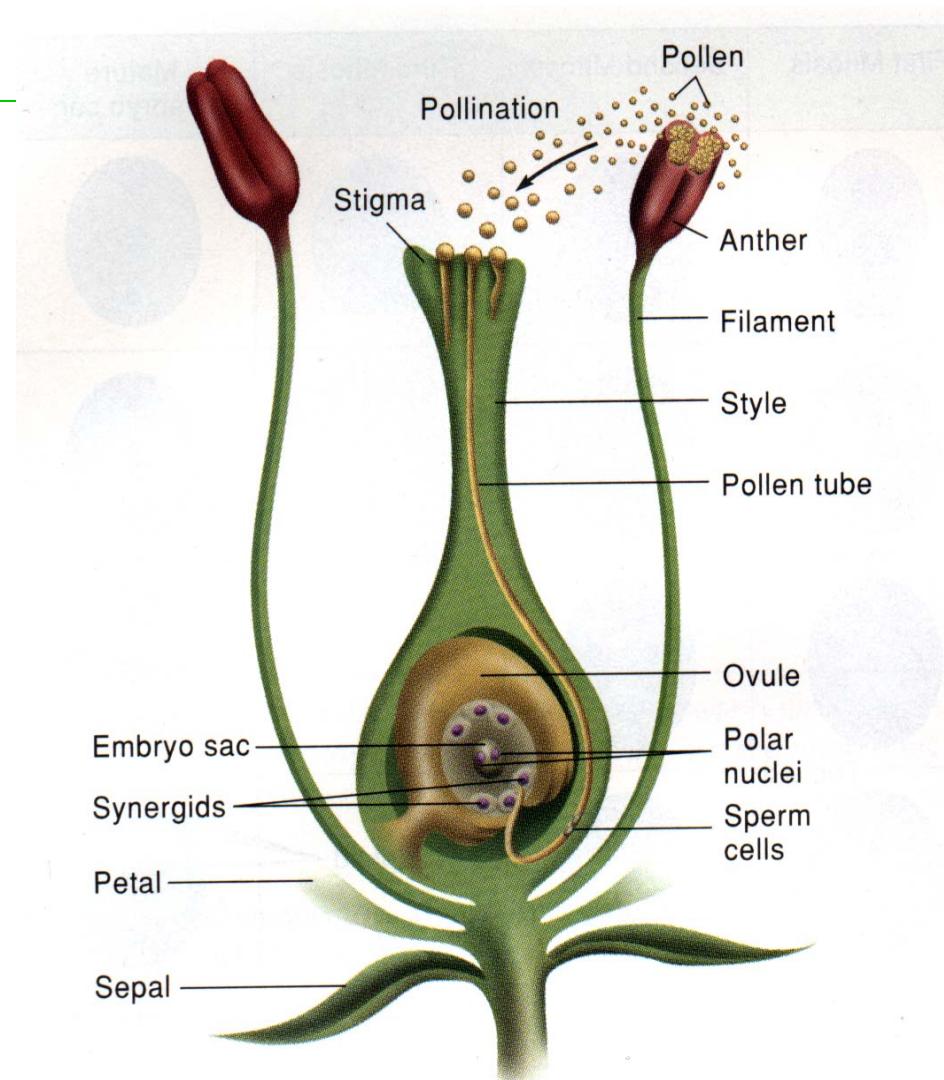
FERTILIZATION

Pollination and Fertilization

This picture shows self-pollination (pollen is being transferred from the anther to stigma of the same plant)

Notice that one or more pollen grains will start to grow a tube down towards the ovary

The sperm nucleus will then fuse with the nucleus of the egg(s) (ovule).



What Are Some of the Different Types of Flowers?

- Flowers come in many shapes, sizes and colors
- Not all of them have all the structures mentioned before
 - A. ***Complete flowers*** have all the major parts: stamens, pistils, sepals & petals
 - B. ***Incomplete flowers*** are missing one or more of these major parts; for example a flower could be missing sepals or pistils

- C. ***Perfect flowers*** have both stamens and pistils on the same flower
- D. ***Imperfect flowers*** are missing either the stamens or pistils

How is a Monocot Flower Different From a Dicot Flower?

- A good way to tell the difference between a monocot and a dicot is to look closely at the flowers
- Monocots have flower parts in multiples of 3 (3,6,9,12)
- Dicots have flower parts in multiples of 4 or 5 (4,12,16 or 5,10,15)

Summary

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- What is the male part of a flower called?
 - What are the two parts of the stamen and what do they do?
 - What is a pistil? And what are its three parts?
 - What is a staminate flower? Is it perfect or imperfect?
 - How is the corolla different from the calyx?
 - What part of the flower usually attracts pollinators?
 - How is pollination different from fertilization?

Summary continued

- What are some ways in which a plant can be pollinated?
- What are the two types of pollination and how are they different?
- Describe how the sperm gets to the egg of the flower?
- Can you have a perfect, incomplete flower and why?
- Can you have an imperfect, complete flower and why?
- How can you tell the difference between a monocot and a dicot flower?