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

Lesson 5: Understanding Flower Anatomy
Vocabulary

- 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

Courtesy of McGraw Hill Publishers
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

- Stamen
  - Anther
  - Filament
- Petals
- Sepals
- Ovule
- Pedicel
- Stigma
- Style
- Ovary
- Receptacle
- Swollen base
  where are parts attach

Courtesy of McGraw Hill Publishers
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 grown down the style depositing the sperm in the ovary. When the sperm and egg combine, it is called *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).

Courtesy of McGraw Hill Publishers
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

- 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?