Unit C: Classification of Agricultural Crops
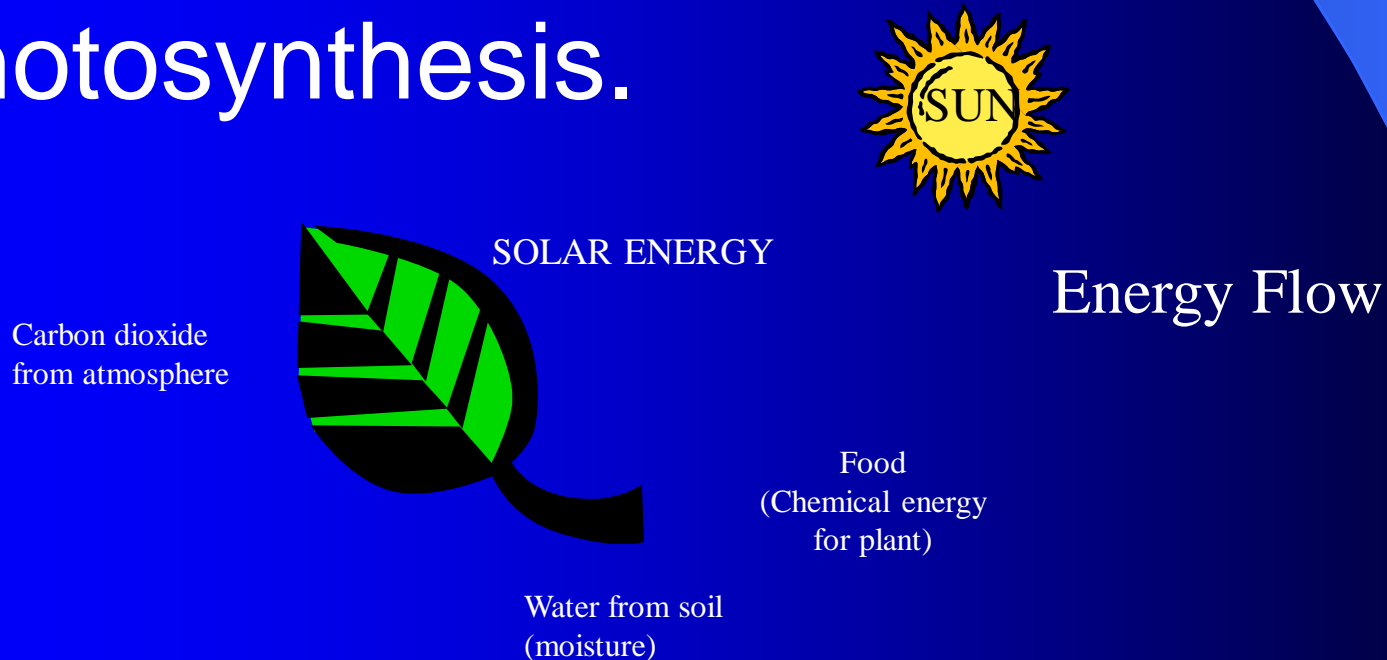
Lesson 1: Classifying and Naming Plants

Terms

- Common names
- Dichotomous key
- Kingdom
- Morphology
- Plant
- Scientific names
- Species
- Taxonomy

What is a plant and why are they important?

- A plant is a living organism that has the capacity to make its own food through a process known as photosynthesis.

SUN

SOLAR ENERGY

Energy Flow

Carbon dioxide from atmosphere

Food
(Chemical energy for plant)

Water from soil
(moisture)

Plants are found in varying climates.

- Some 350,000 different species of plants have been identified.

- Knowing the requirements of a particular plant helps in successfully growing it.

Plants are made of many cells.

- Some plants, such as trees, grow quite large and live for many years.

- Some plants are small and may live for only one year with rice and wheat being examples.

Plants are used in many ways.

- Food—Plants are used to produce human food and animal feed materials.

- Clothing—Plant fibers are used to produce clothing.

- Shelter—Plant materials, especially lumber and plywood, are used in building houses and other structures.

Plants are used in many ways

- Paper - Many kinds of plants are used in manufacturing paper, with pine trees being widely used.

- Human appeal - Some plants are used for their beauty in landscaping and preparing floral displays.

- Others - Plants have many uses in the lives of humans, ranging from fuel sources, to medical applications, and in hobbies like gardening.

The classification of plants and other living things is known as taxonomy.

- The first efforts in taxonomy began over 2,000 years ago in Greece.

- Modern taxonomy uses seven divisions or stages in classification, with each stage being more specific than the previous stage.

- These stages form a taxonomic hierarchy.

7 Stages in Plant Classification

Kingdom

Division

Class

Order

Family

Genus

Species

The seven stages in the hierarchy

- Kingdom - Kingdom is the first stage, with all living organisms fitting into one of five categories under the Kingdom stage:
  - monera
  - protista
  - fungi
  - plantae
  - animalia

Kingdom	Types of Organisms
Monera	Bacteria, blue-green algae, and spirochetes
Protista	Protozoans and algae of various types
Fungi	Funguses, molds, mushrooms, yeasts, mildews, and smuts
Plantae (plants)	Mosses, ferns, woody and non-woody flowering plants
Animalia (animals)	Sponges, worms, insects, fish, amphibians, reptiles, birds, and mammals

The seven stages in the hierarchy

- Division - Ten divisions are used in the plant kingdom. (This stage is known as phylum.)

10 Divisions

- Bryophyta (mosses, liverworts, hornworts).

- Psilophyta (whisk ferns),

- Lycopodiophyta (club-mosses, spike-mosses, quillworts)

- Equisetophyta (horsetails),

- Polypodiophyta (true ferns)

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10 Divisions

- Cycadophyta (cycads),
- Ginkgophyta (ginkgo),
- Gnetophyta (vessel-bearing gymnosperms)
- Coniferophyta (conifers)
- Magnoliophyta, (contains all of the vascular, flowering plants)

- Class - Members of a class have more common characteristics than those of a division.

  – As an example, the Division Magnoliophyta is split into 2 well-known Classes: Magnoliopsida (Dicotyledons) and Liliopsida (Monocotyledons) based on a variety of features from leaf venation and flower structure to growth form, root structure, and seed structure, each class with its subsequent Orders and Families.

- Order - Members of an order are more alike than those of a class.

The seven stages in the hierarchy

- Family - Members of a family are more alike than those of an order.

  More plant species will be contained in a family than any order within it, because a family is a much more inclusive group.

● Genus - Members of a genus are very similar.

– Representing organisms with similar morphology, structure, reproductive organs, and, perhaps most importantly, evolutionary history. These genera are designed to illustrate that the individual organisms grouped within the same genus are very closely related to each other.

The seven stages in the hierarchy

- Species - The species is the most specific stage in the taxonomic hierarchy for an organism.

- Members of a species can be bred and produce offspring similar to their parents.

- No two species have the same scientific name.

Species

- Groups within a species that have unique traits may be formed into subspecies or varieties.

- Species names are comprised of the genus and species.

Classification of the Common Wheat

Kingdom	Plantae	Land-adapted plants having an embryo
Division	Magnoliophyta	Flowering plants
Class	Liliopsida	Monocotyledons- Flowering plants whose embryos have one seed leaf
Order	Commelinales	A fibrous-leaved group
Family	Poaceae	The grass family
Genus	*Triticum*	Wheat
Species	*Triticum aestivum*	Common wheat

Plant classification uses of a dichotomous key.

- A dichotomous key is a written set of choices that leads to the name of a plant or other organism.

- The choices are sequential and involve determining if a plant fits a group with specific characteristics.

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Morphology

- Is the study of the internal and external appearance of an organism.
- Most plants are identified by external appearance.
- Internal appearance of plant growth structures will help verify classification and may be needed with some species.
- The characteristics observed are often referred to as evidence in classification.

Scientists look for similarities and differences in organisms.

- Common characteristics with plants include leaf shape and arrangement; stem structure, including exterior bark or epidermis; root system, such as fibrous or tap;and flower color, structure, and other features.

- Scientists may also use chromosomes, embryo growth, and biochemistry of a plant in its classification.

How are plants named?

- Common names are the "everyday" names that people use.

- Scientific names are the names of plants based on taxonomy.
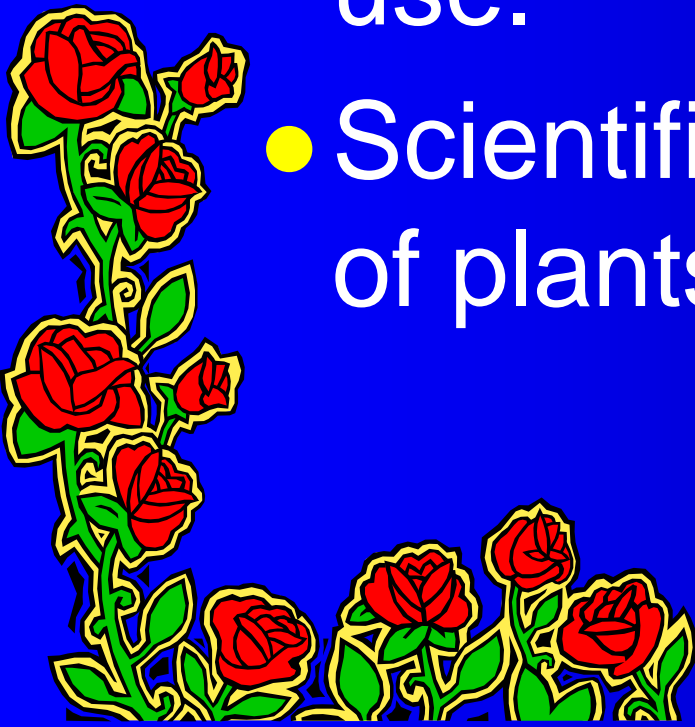
Common names

- Common names may vary from one region or location to another.

- One plant species may be known by several different common names.

Scientific names

- A scientific name is often comprised of two words—the genus and species of the plant.
- Scientific names are written in italics or are underlined.
- The first letter of the genus is capitalized; no other letters are in capital letters.
- An example is *Triticum aestivum*—which is the common wheat

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Examples of Common and Scientific Names

- Rice— *Oryza sativa*
- Barley— *Hordeum vulgare*
- Maize— *Zea mays*
- Cotton -- *Gossypium spp.*
- Tomato— *Lycopersicon esculentum*
- Grass pea – *Lathyrus sativus*
- Almonds- *Amygdalus communis*

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Why are scientific names used

- enhance communication about plants.

- are based on relationships among different species of plants.
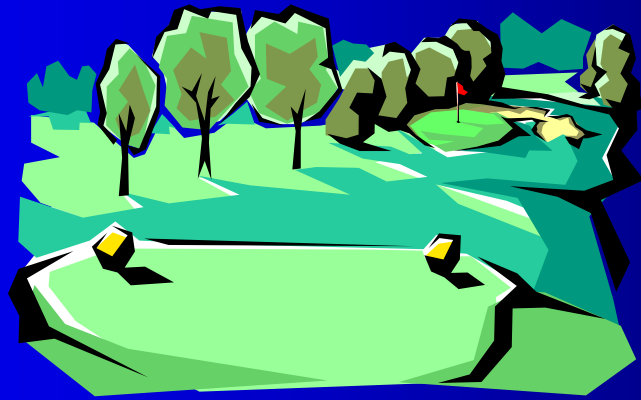
Why are scientific names used

- Plants with common characteristics are in the same family, order, class, and division.

- These help scientists understand characteristics shared by different species of plants.

Scientific names illustrate differences between plants.

- Differences should be obvious from the names of plants.

- Maize, wheat, and barley are in the grass family and are obviously different from strawberries and apples in the rose family, Rosaceae.

Scientific names are universally accepted

- By scientists and agriculturalist use
- Using the scientific name assures that there is no confusion about which crop is being discussed.
- Using scientific names enhances the exchange of research information.