

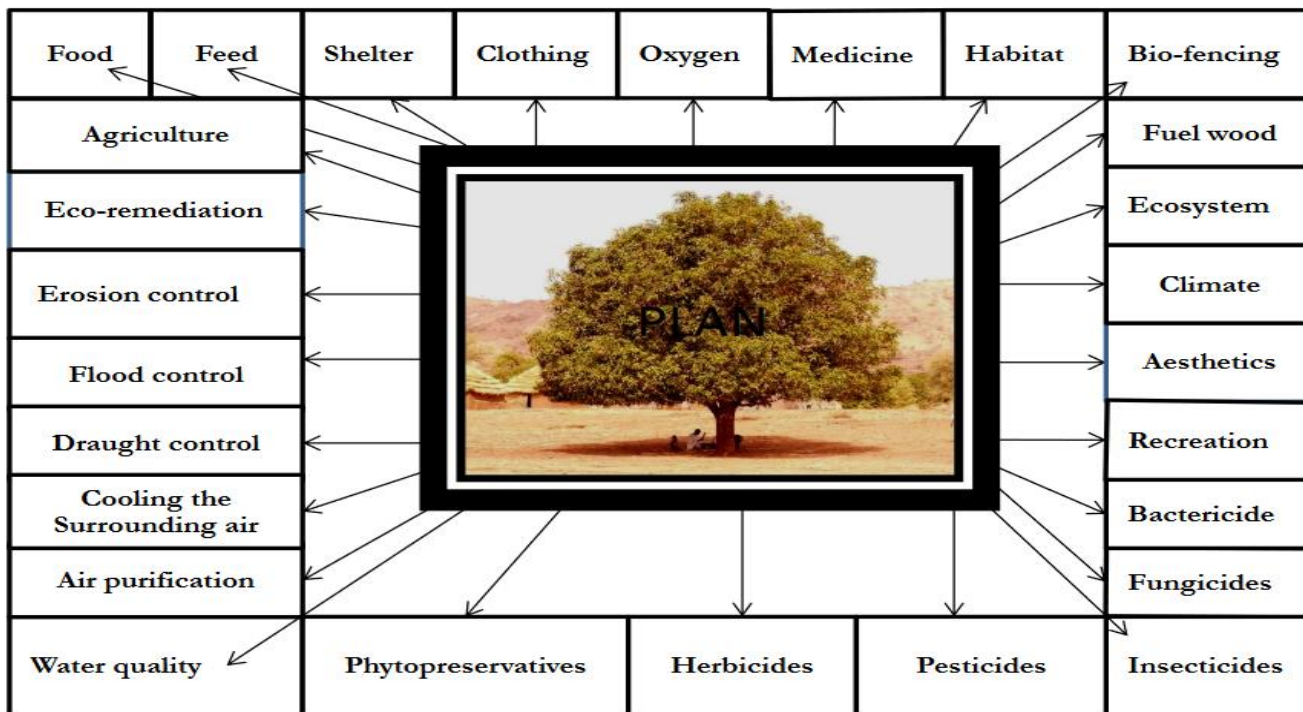
# Principles of plant and animal breeding (Biol 3122)

## 1. Introduction

### 1.1. Importance of plants and animals to man

#### ✓ What is plant?

- Plant is a living thing that grows in the earth and usually has stem, leaves and roots.
- The term plant refers to a living thing that usually can produce its own food, reproduce, but cannot move around.
- These include trees, shrubs, herbs and vines.
- Plant is one of the major kingdoms of life forms,
- A life form we cannot live without plant. Because plants are the only life forms that can produce their own food (upon which we depend).
- Earth is called a green planet due to the presence of plants on it.
- Plants are considered to be the first living organisms born on the earth.
- **Without plants**, the **environment** and **human life** on this earth cannot exist.
- We grow plants in our **homes, gardens, farms, roadsides**, etc.
- **Their presence** is inevitable for **clean air, food, and water** in this world.



## Importance of Plants to humans

- ✓ Plants and plant communities are very important to humans and their environment as well as nature.

### 1. Food

- ✓ Plants are the primary source of foodstuff for human populations.
- ✓ Many cereals, legumes, roots and tubers, fruits, nuts, leaves, and young shoots of plants.
- ✓ Provide valuable and fundamental diets for human consumption and wellbeing.
- ✓ This is the prime importance of plants to humans.
- ✓ Furthermore, many **plant species** are widely utilized as **spices** and condiments.
- ✓ Which have **strong flavor, taste** and **smell** as well as **nutritional** and **medicinal** importance.

### 2. Clothing

- ✓ **Plants** are the **largest providers** of **textile** and **fabric material**.
- ✓ Much **human clothing** is made from **materials** that come **directly** or **indirectly** from **plants**.
- ✓ **Cotton** is the principal plant used for **clothing manufacture**.

### 3. Furniture & Shelter

- ✓ **Plants** are the important source of furniture.
- ✓ The **plant wood** is used to build houses and also to make other **furniture** items.
- ✓ Some of these materials are **wood, timber, straw**, and bamboo used in making roofs and walls both in **local** and **sophisticated** houses.

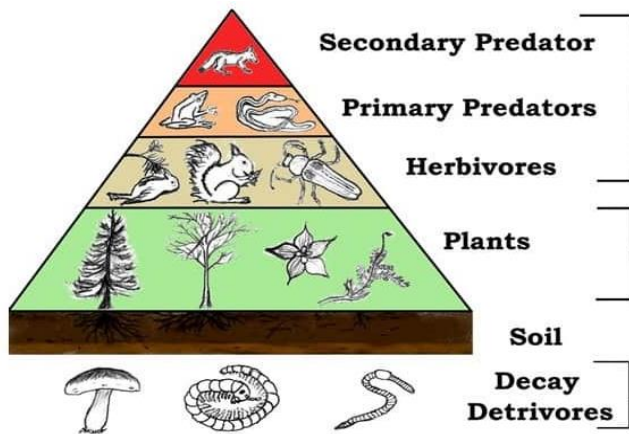
### 4. Medicines

- ✓ **Plants** are an excellent **source of medicine** even for life- threatening diseases.
- ✓ **Plant medicine** is safer due to their **lower chances of side** effects and also better compatibility with humans.
- ✓ **For example** drugs like Vincristine for cancer treatment (from vinca rosea), Heophylline for asthma (from coffee and Tea).

### Importance of Plants in nature

- **Environment** and the **climate** are interlinked mainly with plants.
- The presence of plants influences **Rainfall, humidity**, and **temperature**.
- **Cutting down plants** also imbalance the environment which will **indirectly** affect human life.

- They form the starting point of **food chains**:



❖ **Gaseous balance:**

- ✓ Plants help maintain **gaseous balance** in the **air**.
- ✓ Animals **emit carbon dioxide** by taking in **oxygen**.
- ✓ This rise in carbon dioxide levels in air is reduced by plants.
- ✓ They consume **carbon dioxide** and release **oxygen** during **photosynthesis**.
- ✓ Thus oxygen the essential life force is kept intact on the earth due to plants alone.

❖ **Prevent soil erosion:**

- ✓ Plants, **when grown in dense**, prevent **soil erosion**, i.e., in times of winds, the **fertile top layer of soil** is carried away by **air**.
- ✓ This is prevented by **plants** if grown around. etc.

**What is Animals?**

- A living organism that feeds on organic matter, typically having specialized sense organs and nervous system and able to respond rapidly to stimuli.
- Animals are multicellular eukaryotic organisms that form the biological kingdom Animalia.
- With few exceptions, animals consume organic material, breathe oxygen, are able to move, can reproduce sexually, and grow from a hollow sphere of cells, the blastula, during embryonic development.

**Individual Activity 1. Discuss the importance of Animals for human**

## 1.2.Center of domestication of plants (Vavilovian centers) and animals

- ✓ **Domestication** is the first step of making the wild weed species of cultivated plants. It is the process of bringing wild species under human management according to their needs.
- ✓ In the context of **plant, domestication** is the change of the ideotype to adopt them better to **manmade environment**.
- ✓ **Under domestication** the wild species get changed to **cultivated species** mainly due to natural selection **or human selection**.
- ✓ In **nature there** is continuous selection by natural force like **temperature, soil, weather, pests, diseases etc.** the genotype which is more suited to a given environment leaves behind others which are less adaptive in nature.
- ✓ **Domestication** is the process whereby a population of animals or plants is changed at the genetic level through a process of selection, in order to accentuate traits that benefit humans.
- ✓ In the **Convention on Biological Diversity**, a domesticated species is defined as a species is defined in which the evolutionary process has been influenced by humans to meet their needs. **Therefore**, a defining characteristic of domestication is artificial selection by humans.

### Effects of domestication

- Most of the characteristics of wild species have been affected under domestication which involves **three** processes **like mutation, hybridization and genetic recombination** under the influence of human selection or natural selection.
- Some characters have got changed, some have lost and many have developed during domestication.
- Some of the important characters which have been affected are listed below
  1. Elimination of dormancy period.
  2. Decrease in toxins or other undesirable substances.
  3. Increase in size of the grains or fruits.
  4. Increase in economic yields.
  5. Change mode of reproduction.
  6. Losses of defensive adaptation like hairs, thorns, etc.
  7. Decrease in variability.
  8. Selection of bisexual variety rather than dioecious.