

Rangeland Management

(Theory)

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How Plants Grow and Develop

- 1- Plants have basically same needs as humans and animals. They require food, water, and a suitable place to live.
- 2- Plants make their own food but do need to have the proper ingredients for its production. Those ingredients include air, water, minerals, and energy needed to combine the ingredients into useable food.
- 3- Grasses and trees use their green leaves to make food.
- 4- Grasses normally store extra food in their roots, so they can stay alive during the period when their leaves are not green and start healthy growth again when conditions for growth are right.
- 5- Trees store most of their food in their stems and branches for the time when their leaves fall.

The most important ingredients for plant production.

First: Air

- 1- Plants need oxygen from the air for their normal life functions, but they require carbon dioxide (CO₂) to produce food.
- 2- There are small holes in the leaves that allow the air to enter the plant where the carbon dioxide is used in the manufacture of food and allow the extra oxygen to go out into the air.
- 3- The plant regulates the size of these holes to keep the flow of air controlled, opening them when carbon dioxide is needed for food manufacture, and closing them at times when the air is not needed or when too much water is being lost through evaporation.
- 4- Since we have little control over air, we cannot easily affect the way plants use it, except to make sure they have enough leaves to manufacture the food they need.



Fig1. Grass plants manufacture food in the leaves and store food in the roots

Second: Water

- 1- The water is using normally by plants through their roots from the soil. When there is not enough rain, the plants suffer due to lack of water.
- 2- Likewise, when the tops of the grass are kept short by overgrazing, the roots will not get enough food to grow long and they may not reach water and minerals which are deeper in the soil.

Third: Minerals

- 1- Minerals occur naturally in the soil but there may not be enough of certain types to allow good growth of plants.
- 2- One of the minerals that is most limited is nitrogen. Legumes, take nitrogen from air and add it to the soil. A good combination of trees and grasses can provide the nitrogen needed for both trees and grasses to grow well.

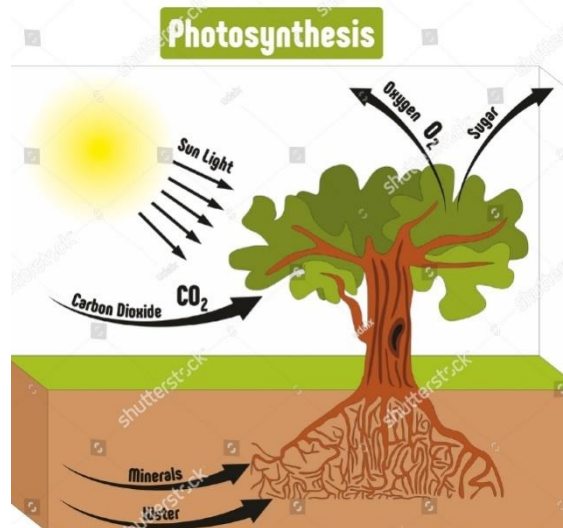


Fig.2 Plants take minerals and water from the soil, CO₂ from the air and energy from the sun.

Fourth: Energy

- 1- The sun provides energy to the plants.
- 2- If the plants are shaded too much or if the leaves of the plants are grazed or cut too short when the plant is in its growing period, the plant may not obtain enough of the sun's energy to allow it to remain healthy.
- 3- Management of the tree cutting and of livestock grazing will allow desirable plants to remain healthy and strong.

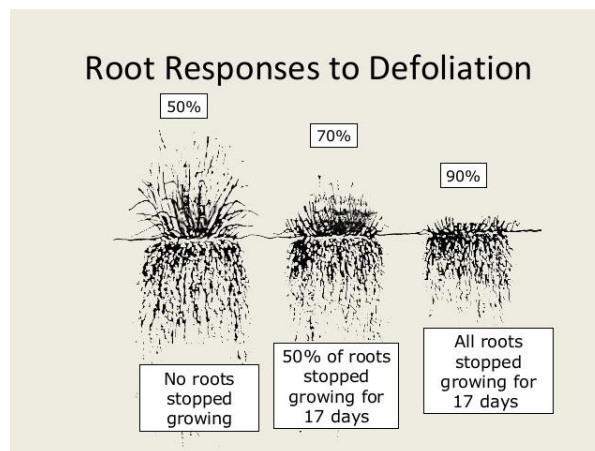


Fig. 3 Overuse of the plant tops limit the growth of roots so the plant is not able to maintain its health and strong.

- **Summarise of pasture plant benefits**
- **a. Products.**
- **b. Environmental benefits.**
- **c. Economic benefits.**

a. As Products

Products such as leather, milk, meat and wool are commonly used by millions of people.

What is the ultimate source of these valuable products?

It would be correct to say that they are all **derived** from animals.

But what enables animals to produce any of these products? Their source of energy for living and producing is found in the food they eat. Much of the food of animals are plants.

b. Environmental benefits.

- Natural plants are extremely important in the production of food and fiber. However, pasture plants also play a vitally important role in maintaining a good natural environment.
- **Specifically, :**
 1. **produce oxygen for clean air,**
 2. **help to reduce soil erosion,**
 3. **aid in keeping residue out of waterways,**
 4. **provide food and shelter for wildlife,**
 5. **and beautify our surroundings with a variety of foliage and flowers.**

List of main grassland organizations and their role in promoting forages and grassland agriculture?.

- 1) [International Grassland Congress](#): (1920) This organization started by European scientists and dealt primarily with northern and central European countries for many years but now has expanded to include other land areas. This group encourages the interaction of scientists and technicians to address the improvement, management, use and better production of grasslands.
- 2) [International Rangeland Congress](#): Begun in the United States in the 1970's, this organization promotes better understanding and appreciation of rangeland ecosystems.
- 3) [Society of Range Management](#): This United States based group promotes teaching and research in the area of range management.
- 4) [American Forage and Grassland Council](#): This organization seeks to be the voice of forage-based agriculture. It promotes research and education in the area of forage and grassland.
- 5) [American Society of Agronomy](#): This organization promotes research, teaching and extension activities in the area of forages.
- 6) [American Society of Animal Science](#): This group promotes the teaching, research and extension activities in the area of animal science.