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# Grass Makes Its Own Food

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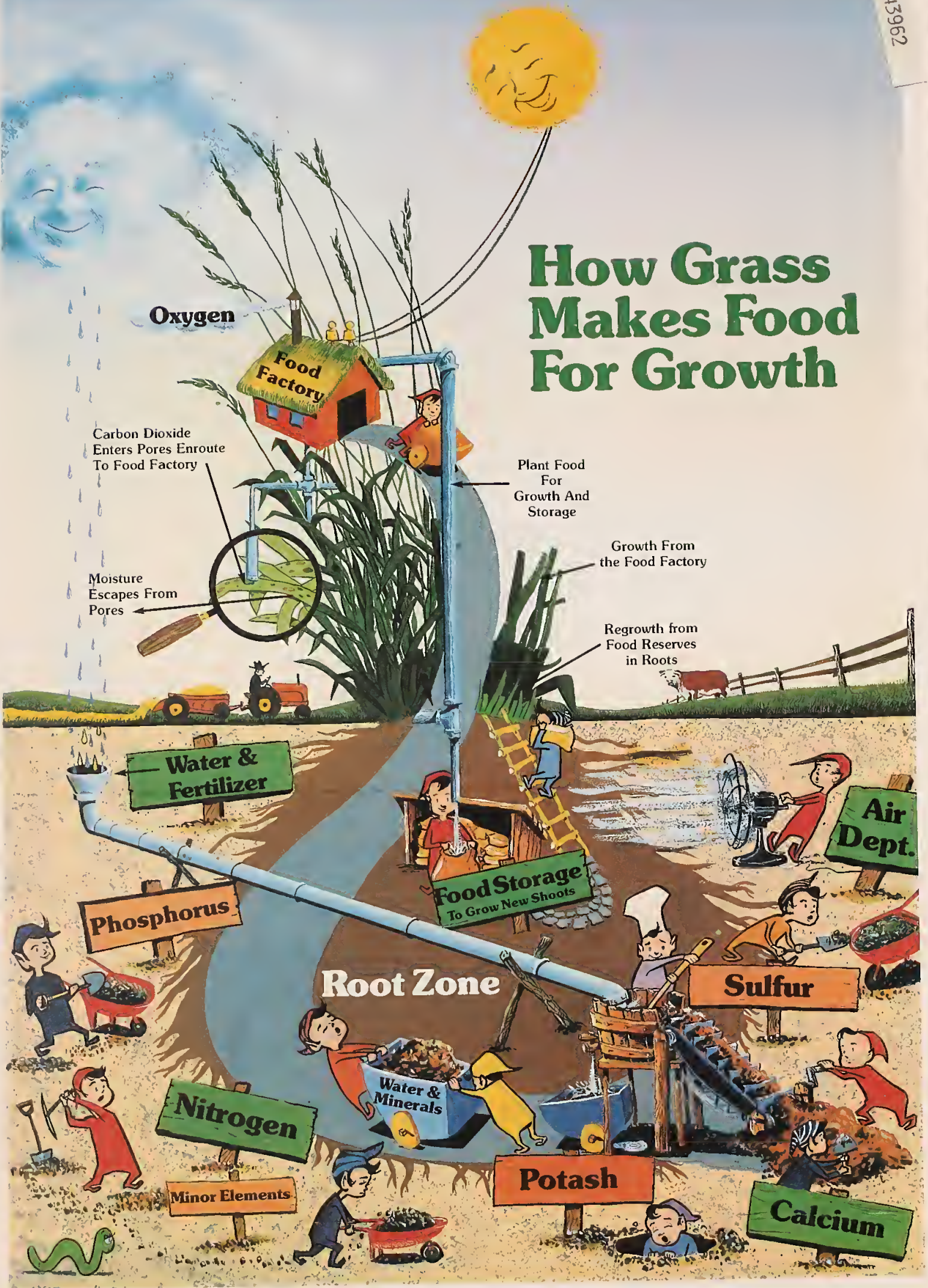
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# How Grass Makes Food For Growth



**Grass Makes Food** for growth in the "food factory" in its leaves. It uses food stored in the roots to live on while it is dormant and to make new growth in the spring or after its leaves are closely grazed or cut. If leaves are grazed or cut too closely, the plant cannot manufacture enough food to maintain a thriving root system, a thick stand, and good top growth. Roots are the highways that bring water and nutrients from the soil to the food factory in the leaves. From the air the leaves get carbon and oxygen.

Using energy from the sun, the food factory combines all these elements into the sugars, starches, proteins, oils, and fats that the grass plant uses to grow and to reproduce itself. Thick, healthy, deep-rooted grasses give better protection from wind and water erosion and provide better livestock feed than do weak stands. Anyone who values grass keeps plenty of leaf growth so the food factory can work properly.

## **Grass Makes Its Own Food**

- **For Growth**
- **For Forage**
- **For Good Land Use**
- **For Soil Conservation**

**Grasses**, like all green plants, live and grow on food manufactured primarily in their own green leaves.

Ranges, pastures, lawns, or other grass crops can flourish and conserve soil only as the individual plants have an opportunity to make food for their own growth.

Plant food is manufactured in the leaves, and not, as many people suppose, drawn from the roots or the soil. The plant gets the “raw materials” to make food from the soil and the air. Because the plant’s “food factory” is above the ground, grazing, mowing, or clipping promptly stops production to the extent that green foliage is removed.

**The Chart** inside this folder shows the main steps in manufacturing food within a grass plant. Anyone who cares for grass—rancher, farmer, lawn-keeper—needs to know something about this process.

Water, entering the soil, forms a film around each soil particle and dissolves some of the minerals present. Tiny root hairs come in contact with these films of water and absorb the mineral solution. A network of small roots carries this mineral solution to the main roots. The roots transport it to the stems; stems carry it to the leaves.

Plants use phosphorous, nitrogen, potash, calcium, magnesium, and sulfur in large quantities to manufacture their food. They use other minerals such as iron, manganese, molybdenum, copper, boron, and zinc in only small quantities but must have them for good plant growth. All these minerals are in the solution the roots carry to the “plant food factory” inside their leaves.

Minerals from the soil make up about 5 percent of the solid material in plant roots, stems, seeds, and leaves. Carbon, hydrogen, and oxygen from the air and water make up most of the other 95 percent.



The leaves take in carbon dioxide from the air through tiny pores. Using energy from the sun, the leaves recombine the carbon with oxygen and hydrogen to make sugars, starches, and fiber. The sugars then combine with the mineral elements from the soil to make proteins, plant oils, and fats. Unused oxygen and water vapor escape through the leaf pores.

The plant uses sugars, starches, proteins, oils, and fats to grow and reproduce itself. Animals get these foods when they eat the foliage or seeds.

**A Perennial Grass** stores food in its roots after it has made the season's main growth. It uses these reserves to live on while the plant is dormant, to make the first growth next season, and to start new growth after its green leaves and stems are closely grazed or cut.

The ability of perennial grasses to recover quickly after grazing or mowing makes these plants especially valuable for forage production and soil conservation. This same ability often deceives the user of grass into thinking he can repeatedly remove any amount of leaves without injury.

What happens to grass plants that repeatedly lose their green leaves during the growing season? Since no "food factories" are left to receive and combine the raw materials from the soil and air, the plant keeps drawing on food stored in the roots to grow new leaves. It robs the storehouse until the supply is exhausted and then dies of starvation.

Research shows that many grasses will not reach their maximum vigor and growth when more than half their leaf surface is removed by frequent grazing or mowing.

Repeated removal of green foliage causes a corresponding reduction in the plant root system. Top growth

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that is kept small cannot feed a large root system; neither can a stunted root system supply enough raw materials to support a large growth of stems and leaves.

A grass cover that is weak does not make efficient use of soil moisture and nutrients. As a result it does not provide the maximum amount of livestock feed. And it is not able to protect the soil from erosion by wind or water.

A dense cover of grass protects the soil from the battering, splashing action of rain. The leaves break up the raindrops and allow more water to soak into the soil, thus preventing erosion, conserving moisture for plant growth, and restoring underground water supplies. The higher and denser the grass, the better it shades the soil and keeps it cool. This reduces loss of water by evaporation and enables grass to grow better in hot weather.

For every pound of growth above ground, most grasses produce a pound or more of roots. Some of the better forage grasses send their roots down 10 to 15 feet. Some lawn grasses may penetrate as deep as 3 to 4 feet.

**Decaying Grass** roots, leaves, and stems and the manure produced by grazing animals supply organic matter to the soil. This maintains its tilth and fertility, makes it more absorptive, and reduces erosion. To the extent that grass reduces the amount of water running off the land, it helps reduce floods.

During the drought of the 1930's and again in the 1950's wind erosion occurred largely on land that had little or no plant cover because of cultivation or too-close grazing. Wind-tunnel studies have shown that a good growth of grass breaks the force of the wind before it can reach the ground and move the grains of soil.

Thus, the man who values grass sees to it that his "food factory" is large enough. Everywhere, grass plants must have adequate green leaves to survive and grow.