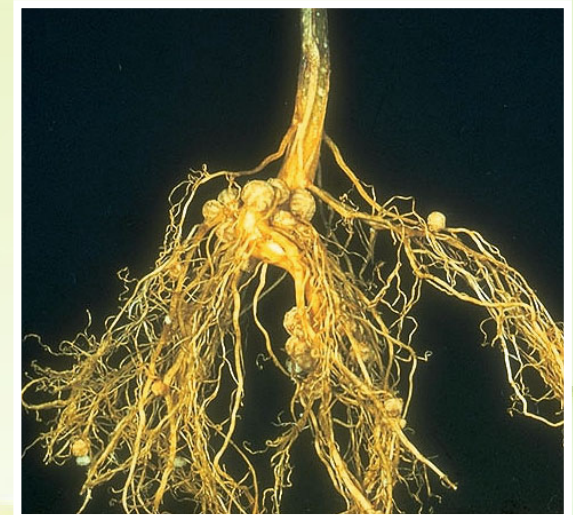


Therefore growing legumes will

- enhance the N-supplying power of soils
- increase the soil reserves of organic matter
- stimulate soil biological activity
- improve soil structure
- reduce soil erosion by wind and water
- increase soil aeration
- improve soil water-holding capacity
- make the soil easier to till



BENEFITS OF GROWING LEGUMES



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Legumes have been used in agricultural production since the earliest of civilizations. They have served as the primary source of nitrogen for many cropping systems, as well as providing food for humans and domestic animals. In many developing agricultural regions of the world, legumes are still used extensively for these purposes.

A legume is a plant in the family Fabaceae (or Leguminosae). A legume fruit is a simple dry fruit that is called "pod". Well-known legumes include alfalfa, clover, peas, beans, lentils, lupins and peanuts. The ability of legumes to fix atmospheric nitrogen is perhaps the most notable aspect that sets them apart from other plants. In addition, legumes can provide a wide range of important soil quality benefits.

Soil Quality Benefits of Legumes:

Soil quality benefits of legumes include: increasing soil organic matter, improving soil porosity, recycling nutrients, improving soil structure, decreasing soil pH, diversifying the microscopic life in the soil, and breaking disease build-up and weed problems of grass-type crops.

Soil Organic Matter:

As mentioned previously, legumes are high in protein, and therefore, nitrogen rich. Because most crop residues contain much more carbon than nitrogen, and bacteria in the soil need both, the nitrogen supplied by legumes facilitates the decomposition of crop residues in the soil and their conversion to soilbuilding organic matter.

Soil Porosity:

Several legumes have aggressive taproots reaching 6 to 8 feet deep and a half inch in diameter that open pathways deep into the soil. Nitrogen-rich legume residues encourage earthworms and the burrows they create. The root channels and earthworm burrows increase soil porosity, promoting air movement and water percolation deep into the soil

Recycle Nutrients:

Because perennial and biennial legumes root deeply in the soil, they have the ability to recycle crop nutrients that are deep in the soil profile. This results in a more efficient use of applied fertilizer and prevents nutrients (particularly nitrate nitrogen) from being lost due to leaching below the root zone of shallower-rooted crops in the rotation.

Improve Soil Structure:

The improvements are attributed to increase in more stable soil aggregates. The protein, glomalin, symbiotically along the roots of legumes and other plants, serves as "glue" that binds soil together into stable aggregates. This aggregate stability increases pore space and tilth, reducing both soil erodibility and crusting.

Lower Soil pH:

Because inoculated, nodulated legumes acquire their N from the air as diatomic N rather than from the soil as nitrate, their net effect is to lower the pH of the soil. In greenhouse studies, alfalfa and soybeans lowered the pH in a Nicollet clay loam soil by one whole pH unit.

Legumes could lower the pH and promote increased plant-soil-microbial activity on soils with a pH above the range for optimum crop growth and development.

Biological Diversity:

Legumes contribute to an increased diversity of soil flora and fauna lending a greater stability to the total life of the soil. Legumes also foster production of a greater total biomass in the soil by providing additional N. Soil microbes use the increased N to break down carbon-rich residues of crops like wheat or corn.

Break Pest Cycles:

Legumes provide an excellent break in a crop rotation that reduces the build-up of grassy weed problems, insects, and diseases. A three year interval between the same type (grassy, broadleaf, cool season, warm season) crop is usually sufficient to greatly reduce weed, insect, and disease pressure.

Legumes can provide a multitude of benefits to both the soil and other crops grown in combination with them or following them in a rotation. Locally adapted legumes can be used in almost any conservation situation to improve soil quality. It is ecologically sound, viable and sustainable. It has long been recognized and valued as "soil building" crops.