

Soils Report

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Healthy Soils: The Promise For the Future

NRCS has joined groups across the world to celebrate the [International Year of Soils in 2015](#). The 68th session of the United Nations General Assembly designated 2015 for the yearlong soils celebration as a way to increase understanding of the importance of soil for food security and essential ecosystem functions. Soil is one of the largest pools of organic carbon, which is essential for mitigating and adapting to climate change. In an era of water scarcity, soils are fundamental for its appropriate storage and distribution. It can take up to 1,000 years to form one centimeter of soil, and with 33 per

cent of all global soil resources degraded and human pressures increasing, critical limits are being reached that make stewardship an urgent matter.

There are 4 core soil health principles (together they can improve the function & productivity of soil):

- Minimize soil disturbance
- Energize soil with diversity
- Keep the soil covered
- Maximize living roots



Healthy soil is:

- 45% minerals
- 25% water
- 25% air
- 5% organic matter



Healthy soils are:

- Energized by active live roots throughout the year;
- Growing plants capture energy and feed soil microbes thus improving soil health;
- Cover-crops, or plants with high diversity, help build soils with abundant plant roots, protect topsoil from erosion (wind and water), trap moisture in plant residue, lowers soil temperature and evaporation, all which increases available soil moisture;
- Every 1% increase in organic matter results in as much as 25,000 gallons of available soil water per acre. Each pound of soil organic matter (SOM) can hold up to 18 to 20 pounds of water and 1% of SOM can hold up to 1 inch of water in the soil. Each 1% increase in SOM can provide up to 30 pounds of available nitrogen per acre;
- Natural biological processes in the soil are responsible for about 60% of the available nitrogen and 50% of the available phosphorus in the soil;
- Many nutrients taken up by plant roots are first cycled through a soil organism before becoming available to the plant. This fact alone shows the importance of soil microbes. Millions of species and billions of organisms (bacteria, fungi, algae, mites, springtails, thrips, beetles, termites, ants, nematodes, earthworms and many more) all reside in the soil...making it the greatest concentration of biomass on the planet;
- Mycorrhizal fungi attach themselves to plant root tips to tap into the carbohydrates being transported from the plant leaves. In turn, the fungi hyphae (filaments) grow out from the roots and bring water and soil nutrients back to the plant from broken-down plant residues and recycled nutrients from other larger macro- and micro-shredder insects;
- Soil microbiology - with over 1 million species of microorganisms, less is known about these organisms and their interactions than we know about the moon. Soil biology is one of the least understood, appreciated, and mistreated ecosystems in the world, and yet...all life depends on soil. Ironic isn't it, the beauty we see all around us are expressions of the unique combination of soil, soil microbes, and climate.

Healthy soils are the promise for our generation and our future. With 2015 as the “International Year of Soils” we need to spread the word... “Soil is no longer a dirty word”.

Adapted from “Unlock the Secrets in the Soil”, NRCS 2014 Soils Planner.