

## **Title: GET SOIL SMART**

PRWIN is excited to bring “Get Soil Smart” a new section to our newsletter, where we will bring you along on a ride to learn more about Soil, what it is, what it does, and why soil is different than dirt!

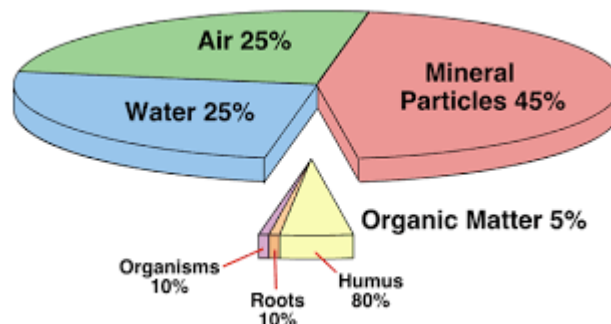
For the first article we will start with the basics. Soil is one of our most important natural resources. It is a fully functioning ecosystem unto itself and has 6 main functions that work to benefit the ecosystem above the soil surface and below.

Soil is a:

- 1) Medium for growth, providing a place for plants to establish and grow with a ready supply of water and nutrients,
- 2) Recycling System for nutrients and organic wastes, where waste products and dead plants and animals decompose and their elements are then utilized by other life forms,
- 3) System for Water Supply and Purification, regulating water loss, use, and performing purification,
- 4) Habitat for Soil Organisms, from single-celled organisms to small mammals,
- 5) Modifier of atmosphere, soil takes up large quantities of CO<sub>2</sub>, O<sub>2</sub>, Methane (CH<sub>4</sub>), and
- 6) Engineering Medium, provides the foundation for all aspects of the human-built ecosystem.

### **What is Soil?**

Soil is composed of 4 components: mineral, organic matter, water and air. The mineral fraction is where soil is formed. Below is a general breakdown of the quantity of components that make up soil, with a few extra details for Organic Matter.



### **How does Soil Form?**

Soils form with the help of 5 major influences:

Parent Material – it is the original material, generally bedrock, from which soil begins to develop.

Climate – Precipitation and Temperature are the top aspects of climate that spur the development of soil. They induce weathering of the parent material and developing soils, transport soluble elements through the soil, affect the rate of reactions and processes occurring, and determine the amount of plant growth and decomposition that will occur and contribute to the composition of soil.

Organisms – Living vegetation, microbes, animals and increasingly human beings all contribute to the quantity of organic matter in the soil and the mixing of components into and throughout the soil.

Topography – The slope and position of landscape determines the amount of weathering and erosion that can occur and will influence the amount of topsoil and productivity of an area.


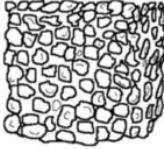
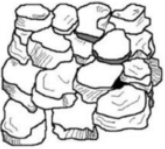

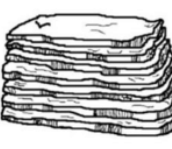
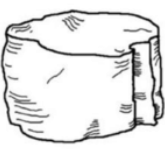
Time – the length of time the parent material has been undergoing soil formation.

**What are the Soil Types?**

You have likely heard of the 3 soil **textures**: Sand, Silt and Clay. Sand is the largest particle and Clay is the smallest. Most soils have a combination of these 3 textures, which make up the mineral portion of the soil.

Soil also has **structure**, which is how soil particles clump together in what are called peds. There are 6 types of Peds which are described in the image below. Between each of these structures is where air, water, and organisms travel.

A soil’s texture and structure determine how it will behave to external forces. It will also determine how the soil is utilized; if an area will be used for growing plants, whether they be trees, flowers or crops, it can help determine the most appropriate plant varieties to grow.

<p><b>SINGLE GRAIN</b></p> 	<p><b>GRANULAR</b></p> 	<p><b>BLOCKY</b></p> 
<p>Composed of largely non-reactive sand size particles of roughly uniform size distribution.</p>	<p>Predominantly the result of biological forces including: earthworms, insects, fungal hyphae, and fine roots.</p>	<p>Developed through cycles of shrink-swell. Size defined by boundaries in homogeneous matrix (i.e. root patterning). Most common to soils with rapid drying.</p>
<p><b>PRISMATIC</b></p> 	<p><b>PLATY</b></p> 	<p><b>MASSIVE</b></p> 
<p>Uniform shrinkage after extended periods of saturation. Most common in uniformly textured soils, enriched with sodium, that slowly dry.</p>	<p>Generally occur through unidirectional compressional forces. Most commonly produced in surface soils compressed by heavy equipment.</p>	<p>Common in fine textured sediments that are slowly sorted and cemented (argillinc), manufactured (clay barriers), or compressed (fragipan).</p>

Images courtesy of the U.S. Department of Agriculture

In future newsletters we will focus on 1 aspect of soil, that will keep it short, sweet, and informative!