

Factors of Healthy and Productive Soils

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As the population of the earth grows, producing enough food to feed the world will become more and more difficult. Our nation's cropland is decreasing rapidly, due to urbanization, and as this happens the concept of healthy and productive soils becomes more eminent. Knowing the importance of our soils is the first step in sustaining a healthy farming community, because healthy soils produce more food and goods than unhealthy soils.

Soils with an ideal composition of surface horizons are deemed healthy. The more important soil horizons for row crop farming are the O, A, and B horizons. The O horizon is the top layer of soil and is on top of the A horizon. The O horizon is the organic layer, and is packed with lots of organic matter, which is important for nutrient and moisture control for crops. Next the A horizon is a diverse layer of soil that holds and traps water and nutrients for plant uptake. Finally, the B horizon is made up of a collection of all different kinds of soil, and is support for the O and A horizon. The B horizon is the least weathered of the three horizons. (Cox, 2013)



Another important factor in healthy soil is pore space. Pore space is directly related to ecosystem productivity. Pore space determines the soil to water ration and the soil to air ratio. When pores have proper size and space, water can carry an optimal nutrient supply to the roots of the crop as well as play a role in pH balance. The soil to air ratio determines the amount of oxygen and carbon dioxide in the soil which affects soil quality and degradation. This leads to higher organic matter in the soil and lessens compaction and produces better root growth. (Cox, 2013)

Soil structure is a key factor in our nation's cropland. Soil structure can be altered by many factors including minimizing tillage and intergrading more soil surface mulching with organic matter. Without adequate soil structure, soil can be eroded. Farmland without good drainage can have problems such as a reduction of nutrient assimilation, increase leaching of chemicals, and faster organic matter losses. Drier soil can support farm equipment better than wet soil. The benefits of soil drainage are removal of excess water, by increasing the aeration of the soil, and promotion of a deep root zone.

Identifying and understanding soil structure allows us to utilize different farming methods and production techniques to prolong soil health. Knowing simple factors like soil type and soil formation will better assist you in producing healthy and abundant crops. For example, how would one know what type of irrigation to use in the field? Just a few methods of row crop irrigation are center pivot sprinklers, drip irrigation, subsurface irrigation, traveling gun sprinkler, and flood or furrow irrigation. Different produce and crops need different types of maintenance and work. Understanding your soil and its unique properties will allow you to achieve maximum output during growing season. Ultimately, knowing and understanding the soil type on your farm will better aid you in making a better and more sustainable crop. Soil integrity is a huge factor in producing the crops we need. Maintaining healthy soil is key to a productive harvest and sustainable production. Our soils are the beginning and end to a healthy and productive harvest and economy.

References: Michael Cox. 2013. Soils.

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