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### SOIL QUALITY AND FERTILIZATION

**Soil quality is basically an indication of how well a soil does what we want it to do...the higher the soil quality, the better it performs the desired function.** Depending on the desired function, people can have very different ideas about soil quality. For example, a farmer will likely define soil quality differently than a construction engineer. For the agriculturalist, the soil is the medium in which plants grow and the source of most plant nutrients.

**Soil water and air bathe plant roots and help keep them and above-ground plant parts healthy and vigorous.** The quality of soil in which plants grow is thus important in determining crop yield potential, profitability, sustainability, and the maintenance of the soil resource for future generations.

**Soil quality is not directly measurable; however, there are several indicators that are used in its evaluation.** Examples of soil quality indicators are soil organic matter content, and various physical, chemical, and biological properties. Although management practices to enhance soil quality will vary with soil type and other factors, the Natural Resources Conservation Service (NRCS) has listed several principles that apply in most crop production situations.

- **Add (increase) soil organic matter**
- **Avoid excessive tillage**
- **Carefully manage fertilizer and pesticide use**
- **Increase ground cover**
- **Increase plant diversity (e.g., through rotation)**

**Soil organic matter improves soil quality by positively influencing soil structure, tilth, bulk density, water infiltration rates, water holding capacity, and water and air movement within the soil.** Organic matter helps to bind soil particles together, reduces soil crusting, increases the stability of soil aggregates, acts as a reservoir for plant nutrients, and reduces soil runoff and erosion losses.

**One of the greatest benefits of complete and balanced crop fertilization, aside from increasing crop yields and improving farmer profit potential, is its effect on soil organic matter.** Both organic and inorganic (mineral) fertilizer sources contribute to the buildup of organic matter in soils. There is widespread public misperception that organic agriculture is more environmentally friendly and better maintains soil organic matter levels. However, there is no generally accepted scientific evidence to support the superiority of either organic or inorganic plant nutrient sources. In fact, long-term experiments from around the world indicate that sustained yields and soil productivity can be accomplished with balanced nutrient applications using either animal manures and/or commercially produced mineral fertilizers.

**The key, then, is the wise use of fertilizer to boost crop yields, improve farmer profits, and protect the environment.** An important part of environmental protection is improved soil quality through the buildup of organic matter, which can be accomplished by balanced nutrient input, regardless of whether organic, mineral, or a combination of the two sources.

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