

Are Productive Soils Always Fertile?

“Fertile” is a term with great meaning and significance. Historically, great civilizations developed along *fertile* valleys, new industries emerged from *fertile* minds and billions of people are fed by the produce from *fertile* fields. Stewards of the land, modern farmers, know that while *fertile* soils are not always highly productive their highly productive soils are always *fertile*.

Science documents that a fertile soil is essential for optimum productivity, profitability and, yes, even protection of water quality and soil from erosion. To perform to its potential, however, a fertile soil must be teamed with other best management practices (BMP's). These would include quality seed, integrated pest management, timeliness of operations, liming to correct soil acidity, crop rotations, etc.

For some, a fertile soil is evaluated mostly by its level of nutrient availability. However, there is more to it than that. A fertile soil must also have . . . good internal structure for optimum water infiltration and internal drainage . . . enough decomposing crop residues to maintain soil organic matter . . . a healthy microbial population . . . an optimum soil acidity adjusted to crop need . . . and freedom from physical restrictions to root growth.

No single component of a fertile soil does more in support of optimum plant growth than the fertility level of that soil. Good soil fertility:

- Stimulates early season plant growth . . . for deeper, more effective root systems; rapid plant cover to better shield the soil from erosion.
- Improves crop use efficiency of nutrients and resources such as water and light.
- Provides nutrients throughout the growing season and especially during critical peak periods of plant development.

- Provides natural crop resistance and/or tolerance to disease, injury, moisture and temperature stress.
- Enhances crop maturity and quality for early harvest, improved marketability and profit potential.
- Generates optimum amounts of crop residues essential as food for microorganisms . . . as a source of binding agents for good soil structure . . . as protection against water and wind erosion . . . as cover for wildlife . . . as feed for livestock.

Fertile soils are under attack. After decades of using science-based facts to build soil productivity, farmers are being encouraged to change to a soil mining operation. Soil test summary data, however, indicate that soil fertility levels in many states are declining . . . not increasing. The need for higher crop yields requires the continued use of research-based facts to establish crop nutritional requirements. For sustained optimum performance, crops often need more, not less, inputs.

Fertile soils require regular maintenance. Like a precision machine, the soil's biological, physical and chemical systems require replacement parts. Fertilization and liming, for example, are needed to replace nutrients removed in the harvest, lost by natural processes such as leaching, and to help improve crop use and effectiveness of other production inputs and practices.

The “fertile” character of productive soils has contributed significantly to our standard of living . . . especially the abundance of quality, safe and low-cost food and fiber products. Fertile soils are essential for continued improvement in crop yields, profitability and stewardship of land and water resources.

Adapted from PPI's Agri-Briefs; Fall '94, No. 5.