
Testing and Replenishing Your Soils

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Soil infertility is a key constraint to crop production for small farmers. Soils throughout Sub-Saharan Africa are degraded and deficient in nutrients and organic matter. As a result, there is a growing demand for soil testing services from farmers and NGO staff who want guidance on which inputs are best, and how much they should apply to restore soil health and fertility.

Given the wide range of soil testing options which are available, it is important to identify which tests are most useful. Some tests are helpful in developing recommendations for how farmers manage crops. Other tests may not help make crop management decisions, but they are useful in training farmers to think about soil health. Still others are appropriate in monitoring and evaluation of the effects of a project on soil nutrients and soil health.⁴

For the full article, follow this link (<http://edn.link/mt6t4x>) to read the "Conservation Agriculture Newsletter" written by Neil Miller.

Types of Soil Testing:

- Soil pH affects the availability of many of the nutrients which are needed for good plant health. In addition, farmers can improve the pH of acidic soils by using lime and/ or wood ash. Soil pH testing using pH strips costs less than \$0.15 per sample, and thus individual small-scale farmers can afford to have their fields tested.
- Complete soil nutrient tests should include pH, phosphorus (P), and potassium (K). Additional soil tests for calcium, magnesium, and cation exchange capacity are sometimes included at no additional cost, but are less helpful since they aren't generally as limiting.
- Soil organic matter (SOM) testing - Since SOM provides many benefits for soil health and fertility, our goal for tropical soils is generally to maximize SOM. Thus, testing for SOM doesn't help in making management decisions—farmers should always apply more if they can!
- Nitrogen testing is often expensive and the nitrogen content of the soil changes rapidly, especially with wet conditions. For this reason, nitrogen testing is not generally helpful in developing fertility recommendations.
- Micronutrient testing is also expensive and the availability of most micronutrients is strongly influenced by soil pH. Furthermore, micronutrient fertilizers are rarely available for small scale farmers. For these reasons, it is generally better to focus on good soil pH management rather than to spend time and money on micronutrient testing.³

Replenishing Your Soils

Taken from ECHO Best Practice Note 1: Improving Degraded Land

Lands that are most at-risk for degradation or desertification are those with fragile ecosystems or in places with higher populations. Poor farming practices that don't concentrate on replenishing the soils after taking from them are also a major issue leading to decreased land quality. Unprotected soils are vulnerable to compaction and erosion as well as sun exposure which can kill off valuable microbial populations.

It is important to remember you must give to receive, and that rule is no different when considering our soils. Read ECHO's Best Practices for improving soil quality to learn a few steps you can take to improve the quality of your land.⁷

- Build up soil organic matter through the use of leguminous cover crops and/or trees
- Cover the soil with crop residues, living mulches, and/or dispersed trees
Disturb the soil as little as possible, leaving organic mulches on the soil surface
- Concentrate fertility close to plants
- Utilize micro-catchments and, where possible, water-holding structures such as sand dams to capture and hold rainwater for agricultural use
- On sloping land, establish barriers along contours to minimize erosion
- Build resiliency through diversification, integrating crops, trees, and animals into small farms in ways that cycle nutrients as efficiently as possible.
- Select and implement farming systems that incorporate multiple conservation agriculture principles.

References

³Soil Quality Indicators. Apr. 2011. USDA Natural Resources Conservation Service.

⁷"Improving Degraded Land." *ECHO Best Practices Note*, no. 1, 2012, pp. 1-4.