

Restoring Soil Fertility in Western Kenya



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The highlands of East and Central Africa have among the highest agricultural potential on the continent. The rainfall is adequate and the temperatures are moderate. Despite this, crop yields in western Kenya are declining. Due to intensive agriculture over the last three decades, the soil of this densely populated region (500-1,000 people per square kilometre) is being drained of its nutrients, particularly phosphorus.

Nearly 10 million people, most of whom are subsistence farmers, live in the western Kenyan area. Few of them have enough money to purchase adequate amounts of chemical fertilizer. As a result, they have seen the quality of their lands erode over successive harvests, says [Amadou Niang](#), a researcher with the [International Center for Research in Agroforestry](#) (ICRAF). "In the maize fields of Kakamega, the plants are very small, sickly, and diseased," he adds. "For farmers, the yields are clearly inadequate — only 1 tonne of maize per hectare — even though the same area could generate 10 times more."

Pilot project

In 1994, scientists from the Kenyan Agricultural Research Institute and the Kenya Forestry Research Institute, in collaboration with ICRAF and the Tropical Soil Biology and Fertility Program (TSBF), launched a 7-year pilot project to help farmers in western Kenya manage their lands better. The team is receiving logistical and financial assistance from a variety of sources including farming cooperatives, non-governmental organizations, the International Development Research Centre (IDRC), and other agencies.

The conventional alternative to chemical fertilizers — organic fertilizers such as compost — is not entirely appropriate to the Kenyan situation. Although composts preserve soil humidity and provide some essential nutrients, they do not provide an adequate payback in terms of increasing phosphorus levels. In fact, huge quantities of organic residues are required to obtain relatively insignificant amounts of soil phosphorus. "The addition of phosphorus-rich fertilizer is absolutely indispensable," says [Cheryl Palm](#), a researcher with TSBF. "What we still need to know is how to maximize its use."

Tithonia shrub

So far, the team has discovered that the leaves of the tithonia shrub can be used to double or triple maize yields when used either alone or in combination with phosphorus fertilizer. Fresh tithonia leaves contain high amounts of several nutrients required by crops, including phosphorus. A common 'weed', tithonia was introduced into Kenya during the 1920's. It originated in Mexico and is used by Kenyan farmers to mark the boundaries of their fields. The plant is also found lining some roadways.

With the help of around 200 local farmers, the researchers are testing a combination of phosphate rock and tithonia mulches to improve soil fertility. "Conventional, phosphorus-rich fertilizer costs about 130 shillings (CA\$3) a kilo," notes Niang. "Phosphate rock is a raw material that is found in abundance in Tanzania and is sold at a better price" (55 shillings per kilo) — although it is still too expensive for the majority of subsistence farmers.

Global responsibility

According to Palm, restoring soil fertility is a community and, indeed, a global responsibility. "In order for the environment to be restored and for food security to be achieved some day in western Kenya, it is absolutely necessary for phosphorus to be used and the entire society to be involved," she stresses. "We need to invest in the land to replenish the soil capital. Local, national, and international institutions should become involved in this investment."

Miguel Legault is a freelance journalist who works for television, radio, and print media. This year, he has an IDRC scholarship to handle African topics at SYFIA/PERISCOOP, a French language press agency based in Montpellier. [Photo: C. Harris, IDRC]

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