Roland Bunch, Five Years in Africa

We recently received a report from Roland Bunch regarding his efforts to promote green manures and cover crops in Africa.

Mr. Bunch's main point is that soil fertility has steadily declined, due mainly to shortening and elimination of the fallow period required to keep the land healthy and productive. Bunch reports:

Figure 1. Farmers and program personnel in Mozambique are impressed about the incredible ability to survive a drought of the high-protein 60-day cowpeas that they have planted for the first time. All the crops in the background were stunted by last year's drought. *Source: Roland Bunch report.*

"Back in 2009-10, during a 6-nation study I carried out in Africa for World Renew, I realized that because 80% of smallholder farmers in sub-Saharan Africa now have less than 2 hectares of land (roughly 5 acres), they are no longer able every year to have 3/4 of their land sitting idle (ie in a fallow) and still feed their families with what's left. Fallowing is the way by which African farmers have kept their soil fertile for some 3,000 years. But as their plots have diminished in size (mostly because of population growth, but also because a lot of land has become wasteland), they have gradually reduced their customary fallow periods from 15 years to 10 years, 8 years, 4 years, and down to nothing. In most of sub-Saharan Africa, fallowing is now a thing of the past; it is in its death throes."

He also asserts that "as fallowing dies out, the organic matter content of farmers' soils starts dropping, crop yields diminish, and people go hungry. My study found that yields of staple foods were decreasing by about 5 to 10% per year!"

Most affected are around 15 lowland, drought-prone countries in Africa.

Since fertilizers are not cost effective on poor soils Bunch contends that "green manure/cover crops are the only feasible and sustainable route farmers can take." He adds "A farmer using gm/ccs can produce over 100 tons of biomass (green weight) on two hectares of land. By way of comparison, I have never heard of a smallholder farmer ever making and applying more than 10 tons of compost in a

year. This quantity of biomass is more than enough not only to maintain the fields' fertility, but to gradually restore the soil, even on wastelands, to its naturally high fertility."

Realizing that each location and farming system would require different leguminous green manure/cover crops (gm/cc), Bunch set a goal to "identify or develop in each of ten nations, at least one widely applicable, successful green manure/cover crop system and promote it to the point that it is spreading spontaneously from one farmer to another." After five years Bunch reports "in five countries we have already developed very good gm/cc systems, and in two others we have identified excellent already-existing systems."
In brief, the systems being promoted are:

- Mali – *Gliricidia sepium* for light shade, soil improvement and fodder
- Cameroon – *Tephrosia vogelii* for a one year fallow period (existing system)
- Kenya – *Gliricidia sepium* on terrace faces
- Rwanda – *Mucuna pruriens* (velvetbean) as a cover crop for bananas and *Lablab purpureus* intercropped with maize
- Tanzania – *Lablab purpureus* intercropped with maize and ongoing experiments with four or five other gm/ccs with maize (existing system)
- Zambia – *Cajanus cajan* (Pigeon Pea) ratooned and intercropped with maize
- Mozambique – *Cajanus cajan* (Pigeon Pea) and *Vigna unguiculata* (Cowpea) intercropped with maize.

Bunch points out that we are already seeing famine, food shortages and child stunting in many of the lowland, drought-stricken countries. The situation is desperate for many people but there is hope that including green manures and cover crops in cropping systems can restore soil health and productivity.

Figure 2. Savings group members walk through their plot of 4-year-old gliricidia trees in central Mali. The furrows below the trees are where crops have been planted each year.
Source: Roland Bunch report.

Figure 3. Ratooned pigeon pea plants intercropped with maize in Mozambique. The stunted maize plants in among the pigeon peas are testimony to the effects of the drought on most other crops. (This field has received only two rain storms since the week it was planted.)
Source: Roland Bunch report.

To read his full report, go to http://foodfirst.org/wp-content/uploads/2016/02/AfricaReportFinal2.pdf (http://foodfirst.org/wp-content/uploads/2016/02/AfricaReportFinal2.pdf).

In 2012, Roland Bunch published an extremely helpful guide to assist farmers and extension workers choose the most promising legumes to evaluate for their systems. The book *Restoring the Soil: A Guide for Using Green Manure/Cover Crops to Improve the Food Security of Smallholder Farmers* is available free of charge to download from the FAO: http://www.fao.org/ag/ca/CA-Publications/Restoring_the_Soil.pdf (http://www.fao.org/ag/ca/CA-Publications/Restoring_the_Soil.pdf).