



I would like to share some comments on this important topic made by our good Discover friend and colleague Roger Sharland. Roger heads up the grassroots project REAP in Kenya. I have enjoyed working with him on several occasions. Roger worked formerly in South Sudan where he was involved in a nationwide study. He found that those who had abundant fruit trees and root crops survived the dry seasons much better than others. Why? Because both fruit trees and root crops make use of the rain whenever it falls and do not depend on reliable seasons.

The following are some of his very helpful recommendations:

For food security, grow fruit trees that have become naturalised over generations. Do not grow those that have been manipulated by agronomists for higher yields. For example, grow the local mango (particularly the type grown in Northern Uganda and South Sudan), local established avocado types, local guava etc. rather than grafted varieties, which are not as hardy and suffer when the rains fail. They also age more quickly. In contrast, we have mango trees in many areas that have been bearing fruit for well over 100 years and still have abundant crops. Similarly, the established avocado trees produce abundantly and should not be replaced with the Mexican varieties now being promoted for export.



The jackfruit tree grows very tall, provides shade and high-quality timber, and carries many fruits.

Other useful fruit trees are jackfruit, Java plum and citrus. Most citrus however need to be budded with some of the well-established and proven varieties. Excellent indigenous fruit trees include desert date (Balanites), tamarind, shea butter (*Butyrospermum*), buffalo thorn (*Zizyphus*), jackal berry (*Diospyros*), black plum (*Vitex*) and various species of palm fruit.



Sweet potatoes provide carbohydrate as well as several vitamins and minerals. The leaves may also be eaten as a vegetable.

Moringa, both *Moringa oleifera* and *Moringa stenopetala*, are also very important.

The root crops cassava and sweet potatoes are excellent for food security but should not completely replace grain crops. Older African crops including the different millets and sorghums are far more suited to inconsistent rainfall, but grow traditional varieties rather than those developed for commercial growers. These older varieties of sorghum and millet have characteristics such as going dormant during drought, but it is good if many neighbours grow these crops as well to avoid unacceptable levels of bird

damage. Other crops that are drought resistant are pigeon pea and grain amaranth. Some varieties of pigeon pea are almost shrubs and will last several years.

Maize is not a suitable crop when the rains are unpredictable, as it requires rain at the right time. If there is no rain at tasselling there is little or no yield.

Finally, soil care is also very important. One must keep the soil covered and protected from the hot sun and heavy rains. This can be achieved for example with mulch, green manure/cover crops and intercropping. Do not plough! This turns the soil and exposes it to the heat of the sun which kills micro-organisms and causes water loss through evaporation. I recommend planting vetiver grass along the contours for erosion control and production of mulch. The land upslope from a good vetiver grass hedge holds the rainfall that falls and prevents runoff as well as soil loss. Water is therefore retained much longer on the field.

Roger's comments on soil care are strongly supported by Roland Bunch, an American agriculturalist with vast experience in Africa. He expects catastrophic hunger in Africa, not because of climate change, but because soils have become infertile – because they contain very little organic matter.

Roland writes, "We now have thousands of smallholder farmers who have used green manure /cover crops for at least five or six years. They are producing much better crops, for example about 3 tons per hectare per year of maize (more than 3 times the African average). They are still harvesting about 2.5 tons per hectare even in the years when nearby farmers who have not used green manure /cover crops have almost lost their crops (often harvesting less than 0.2 tons per hectare). Furthermore, once farmers have more than enough maize to eat all through the year, they soon realize that maize is a poor cash crop, and they start growing vegetables and fruits on a commercial scale. The farmers do not need to be motivated - they search out the best market crops and eat much of the produce themselves."



A dense cover of *Centella asiatica*, which is also useful as a medicinal herb.

Some examples of cover crops / green manure:

Cover crops are any low-growing plants that cover the soil. Green manure/cover crops (GM/CC) are those planted specifically to improve the soil texture and nutrients. Most are leguminous. Some examples are *Mucuna pruriens* (mucuna or velvet bean), *Centella asiatica* (Gotu cola), creeping cowpeas, *Lablab purpureas*. Choose a plant that grows well in your garden and provides other benefits, for example food or medicine. GM/CC are often planted into an existing crop near to harvest time and left to grow in the fallow period. As the planting season approaches the prolific growth is then cut back and left on the surface. The roots are left in the ground to increase the humus and nutrient content of the soil.

There are other plants that are not cover crops that can be planted on fallow land to boost the fertility. Such plants include pigeon pea, *Sesbania sesban*, moringa, *Canavalia ensiformis* (jack bean) and *Tithonia diversifolia*.

Ground cover is also achieved with dry mulch. Crop residues left on the ground as mulch slowly decompose and add humus to the soil. For example, maize stalks or bean plants.

With best wishes for your success in the garden

Keith Lindsey