

Agricultural productivity

Clod by clod, drop by drop

All these increases in crop yields that we need to make, where will they come from? Mud, sweat and tears, and selected inputs, for starters. Plus lots more tweaking of what we can do with soil and water.

Remember that bone-shuddering statistic in *Spore** in 2000, that food productivity in some cassava-consuming areas had to increase by 717% to meet regional food needs by the year 2050? Taken from projections prepared for the World Food Summit of 1996, and allowing for changes in diet and consumption patterns, it illustrates the extreme of what is meant by 'feeding the world'.

It is so daunting a target that it stuns most people at first, their silence blurring into incredulity. "There must be some mistake, surely?". "You can't just conjure gains like that out of thin air."

Leaping frogs

Such figures are being thrown around more and more in policy circles, as if agricultural planning has become one of those musical games where people throw a package from one to another in a circle and, when the music stops, the loser is the last person to have caught it, and everyone else wins because they threw it on in time. Some planning!

The increases do look like massive steps forward, and they are often called 'leapfrogging'. In fact, the required increase of 717% is perhaps less drastic, like all problems, when examined in parts. It translates into an increase of 'only' 3.8%, year in, year out. In other areas, such as the sorghum- and millet-consuming Sahel, where over the same period productivity has to increase by 480%, the annual increase is below 3%. It almost begins to look attainable.

But year in, year out means a challenge for the research community: ongoing advances in research, ongoing maintenance and improvement of soil fertility, steady increases in water savings, not to mention allowing for changes in climate and advances in crop protection. All this leaves aside the issues on the other side of the coin: the actual availability of food in terms of presence in the market, and the purchasing power of people to meet their needs.

* see *Spore* 84, special Millennium supplement, page 10

The attraction of drip irrigation is growing fast

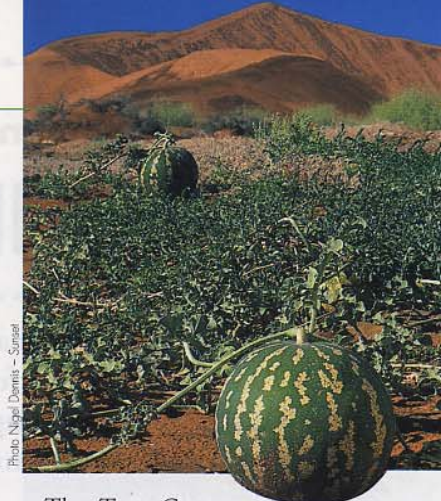


Photo: Nigel Dennis - Sunagel

First amend your soils

The smart talk in agricultural planning is also simple talk. Apart from some rather too obvious calls for the redistribution of food through changing the West's consumption patterns, the key advances are going to have to come mainly in two areas: soil fertility and drought resistance. Those, in a nutshell, were the recommendations put forward to the United Nations' International Panel on Climate Change, held in the Indian capital of New Delhi in October 2002.

The trick for any researcher is to achieve advances which combine two or more benefits. At present, many researchers are converging on a technology called 'soil amendment' which aims to improve both soil fertility and drought resistance. The latter results from better retention of water in the soil around the plant, rather than through any inherent improvement in the ability of the plant to retain water – that is another important focus for research.

Two research teams, one South African, the other Belgian, have recently and independently brought their separate work on soil amendment to a conclusion. Both approaches are based on the use of polymers, which are very loose structures of molecules – imagine a network of very thin fibres linked up, rather like a mini-fishing net or a hair net. In the soil amendment process, a blend of nutrients and polymers is introduced into the soil, where it forms a substance which can store water and nutrients, in some cases up to 300 times its own volume, and slowly releases them into the soil.

The South African version of the technology, marketed as Aqua-Soil, forms a reservoir of water and nutrients which a plant can use on demand, as and when its growing requirements dictate. Aqua-Soil claims to cut down on the need for watering, increases the retentive capacity of soil for a 5-year period, and reduces evaporation, runoff and leaching. After 5 years its efficacy fades; it breaks down into its component parts of carbon dioxide, water, potassium and nitrogen, and has no residual toxicity.

The Terra-Cottem product, the result of long research in Belgium with an eye to applications in the South, is similar in terms of characteristics, process and uses. "The product is specially suited for use in degraded or problematic soils and root zones with little capillarity (ability of the plant to capture water), eg. sandy soils, containers, pots, industrial or municipal areas where little or no maintenance (irrigation, fertilisation, soil treatment) is performed, and to improve the quality and performance of growing media.", says its creator.

There are many other similar products at the research and development stage elsewhere in the world, several in ACP centres. (If you are working on this, why not write to *Spore*? – see page 15). Similar directions are being taken by researchers in such sectors as drip irrigation – to be covered soon in *Spore* – where massive water savings can be gained. What is especially interesting about the Aqua-Soil and Terra-Cottem products is that they were both conceived in public sector university research and then successfully launched into private sector enterprises. This enables these enterprises to operate in those sectors where they cannot expect any immediate return, such as in South Africa's market of emerging farmers or, in the case of the not-for-profit body set up by Terra-Cottem in northern Burkina Faso. But they have understood what more research bodies should be doing: where there is a need, such as the need for a substantial increase in productivity, there is, some way down the dusty road, a market.

✉ Aqua-Soil — PO Box 74794
Lynnwood Ridge 0040, South Africa
Fax: +27 12 346 6048
Email: info@aquasoil.co.za
Website: www.aquasoil.co.za



✉ TerraCottem International
4 Melbray Mews
Hurlingham Road
London SW6 3NS, UK
Fax: +44 20 7384 4031
Email: info@terracottem.com
Website:
www.terracottem.com



Amending poor soils with additives is like darning a worn-out sock. It has a strengthening effect.