

Discover News-sheet for colleagues in Africa

June 2017



Coping with drought 2. Conserve water and grow drought resistant plants.

Dear Friends

1. Catch water when it rains

- a) If your garden is on a slope, even a gentle slope, plant grass bands along the contours. Such grasses could be citronella, lemon grass, vetiver or napier (elephant grass). Always think about using multipurpose grasses. Vetiver grass has the deepest roots for steep slopes. The rain collects soil and flows down the slope, but when it meets the grass wall the water soaks into the ground and terraces begin to form.
- b) Collect water from the roofs, ideally with rain-water catchment tanks.
- c) Water may also be collected on sloping land by building basins and lining them with clay or concrete. Or dig an "L" shaped trench, with the vertical arm uphill and the horizontal arm below.
- d) Make dams on water courses. Sand dams (simply dams filled with sand or silt) help to minimise evaporation. The water soaks into the surrounding area which can then be planted.



Vetiver grass in the REAP garden in Kisumu, Kenya. After only one year, terraces had begun to build behind the vetiver plants. Vetiver grass grows 1.5 metres (4 – 6 feet) tall – it can be trimmed to about 25cm (10inches) and the trimmings used for thatching or mulch.

2. Conserve the water you have, use it sparingly and maintain soil fertility

- a) Plant trees. Tree canopies provide shade and fallen leaves cover the soil. When covered with leaves, the soil surface does not reach the same high temperatures as soil exposed to the midday sun. Evaporation is thus greatly reduced.
- b) Mulch. The soil temperature is further reduced if you use mulch, water loss by evaporation is therefore also reduced and the ground remains moist. As the mulch decomposes it increases soil fertility. Crop residues are ideal for mulching. Where mulch is present, a much higher proportion of the rain soaks into the ground.

- c) Water the plants seldom, but with a lot of water. As the surface soil becomes drier, the plant sends its roots deeper in search of water.
- d) Zero or minimum tillage: Do not dig or plough. Use mulch. Digging and ploughing compacts the soil. Leaving plant roots in the ground aerates the soil as they decompose.
- e) Prepare your land in good time and sow the seeds straight into the ground.
- f) Increase the amount of humus in the soil. Humus increases fertility and holds moisture. This can be done:



Tithonia diversifolia

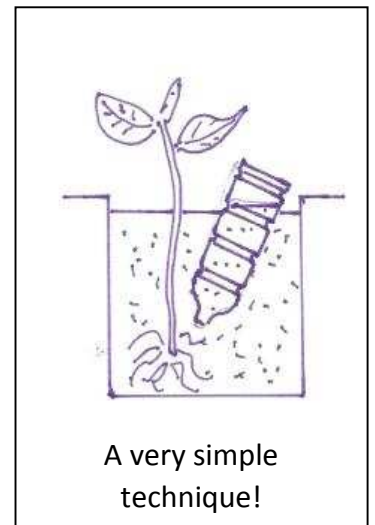
- i) by making compost and applying it to the soil.
- ii) by growing a green manure, using such as *Tithonia diversifolia*, *Tephrosia vogeleii*, *Mucuna puriens* or *Lablab purpureus*– and then working this into the soil.
- iii) by planting nitrogen fixing trees like calliandra, *Sesbania sesban*, *Leuceana glauca*. Their leaves also fertilise the soil.
- iv) in larger gardens, by practising agroforestry, using such trees as *Ficus natalensis* or *Albizia coriaria*.

3. Water the plants and not the entire field



A keyhole garden in Karamoja,
Uganda

- a) Use plastic bottles to funnel the water direct to the plant roots.
- b) Make keyhole gardens as kitchen gardens.
- c) Dig “Zai holes”. That means, for each plant or tree, dig a hole, fill with good natural compost and ensure that the soil level around the plant is below that of the surrounding area.
- d) Use drip irrigation. I.e. water runs by gravity from a tank through specially manufactured rubber or plastic pipes which have holes at intervals – at which points the plants must be in place.
- e) Make bag gardens.



A very simple
technique!

4. Grow crops that need little water or that can withstand drought

Rediscover your traditional vegetables that have proven themselves to be hardy and nutritious! These include African spinach, ochre, jute, cowpea, vegetables in the sesame family, black night shade, amaranth, sorghum, pigeon pea, tepary beans and pumpkin.



An artemisia field in Zambia prepared with Zai holes for hot weather



Grain amaranth

Root crops are also robust, because they simply sit and wait for the rains to come, e.g. sweet potato, cassava, Irish potatoes.

Maize was introduced to Africa and has become a staple food. But maize does not withstand drought!

Fruit trees that are drought resistant include cashew, guava, date, prickly pear cactus, avocado pear, jack fruit, mango and papaya.

Shade trees that are drought resistant and medicinal include *Azadirachta indica* (neem), *Tamarindus indica*, *Erythrina abyssinica* (red hot poker tree), *Spathodea campanulata* (African tulip tree), *Mangifera indica* (mango) and *Vitellaria paradoxa* (shea butter tree).

I hope these ideas help. I wish you success, and no more suffering during future periods of drought. Many thanks to Kenja Thomas in Kasese and Rehema Namyalo in Masaka, both in Uganda, and Bob Mann in the UK, for their help with this newsletter.

Keith

More useful information:

Videos on permaculture: <https://www.youtube.com/watch?v=fpumHV-F0iQ> and <https://www.youtube.com/watch?v=6h3ZfpTcTC4>

REAP: Using tithonia as fertiliser: <http://reap-eastafrica.org/reap/wp-content/uploads/2015/12/Tithonia.pdf>

The importance of earthworms: <https://www.accessagriculture.org/wonder-earthworms>