



# FOOD FROM USED WATER

## Making the Previously Impossible Happen

*The lack of gardening activities in so many rural villages is distressing. There is more than enough ground available, swept clean and baking in the hot sun. But who can grow vegetables without water? Finding water, carrying water, waiting for the turn at the tap dominates village life.*

In a recent speech the Minister of DWAF identified explicit targets on which government will focus:

- ◆ The Department will ensure that in the next five years, all households will have easy access to clean running water.
- ◆ By December this year, the Department will provide clean and potable water to the 10th million South African since 1994.

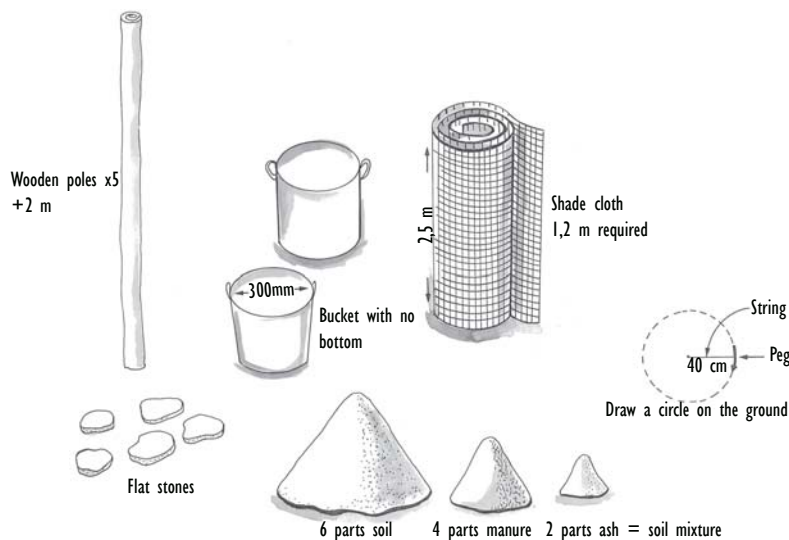
### MAKING THE MOST OF THIS NEWFOUND SOURCE OF WATER

Of course this precious water is not intended for gardening and, in many cases, still has to



be carried from the nearest standpipe in plastic containers. Despite this, many households have shown that this newfound source of water can be used for growing vegetables successfully. They save the water that has been used for washing clothes and utensils and feet, so-called grey water, and use it for gardening.

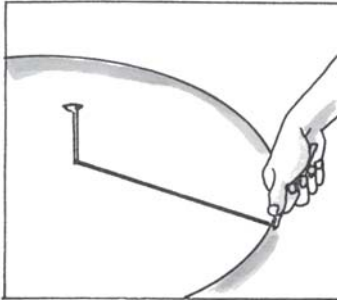
One of the most innovative and user-friendly ways of doing this is the "tower garden". It is not a new idea and South African developments are derived from what was seen in Kenya by a small group of people on a visit to assess treadle pumps. Vegetables are grown in a column of soil that fills a bag. Each day the available grey water is



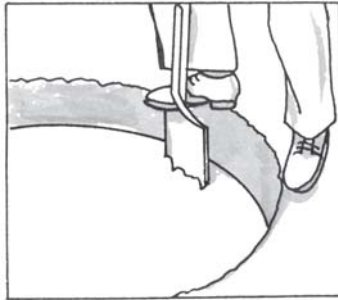
Materials required for building a "tower garden".



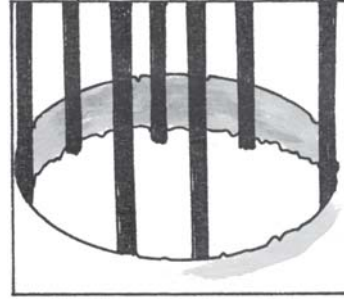
# IRRIGATION TALK BY CHARLES CROSBY II



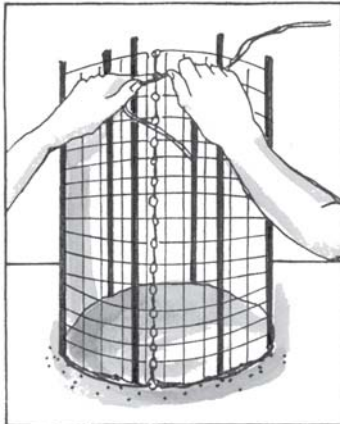
Mark out the circle - 40 cm for 2,5 m wide shade cloth.



Dig out the bottom layer of the tower.



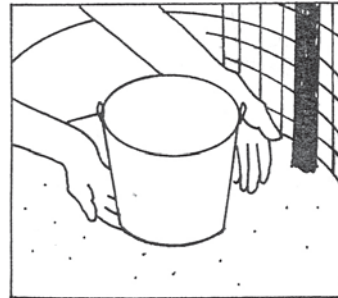
Plant the side poles or droppers firmly into the bottom.



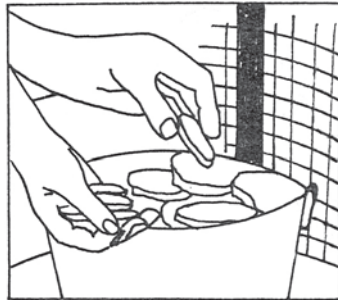
Wrap the shade cloth around the poles and tie the ends together to make a cylinder.



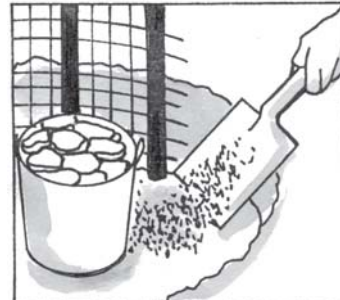
Roll the sides of the shade cloth cylinder down out of the way before filling.



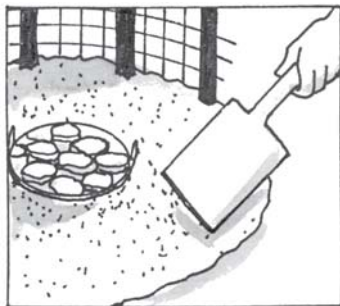
Place the bucket (bottom removed) on the ground in the middle of the tower.



Pack stones carefully in the bucket to make sure that the water does not run through too fast.



Backfill around the bucket with the soil mixture.



Dampen and smooth soil but do not compact.



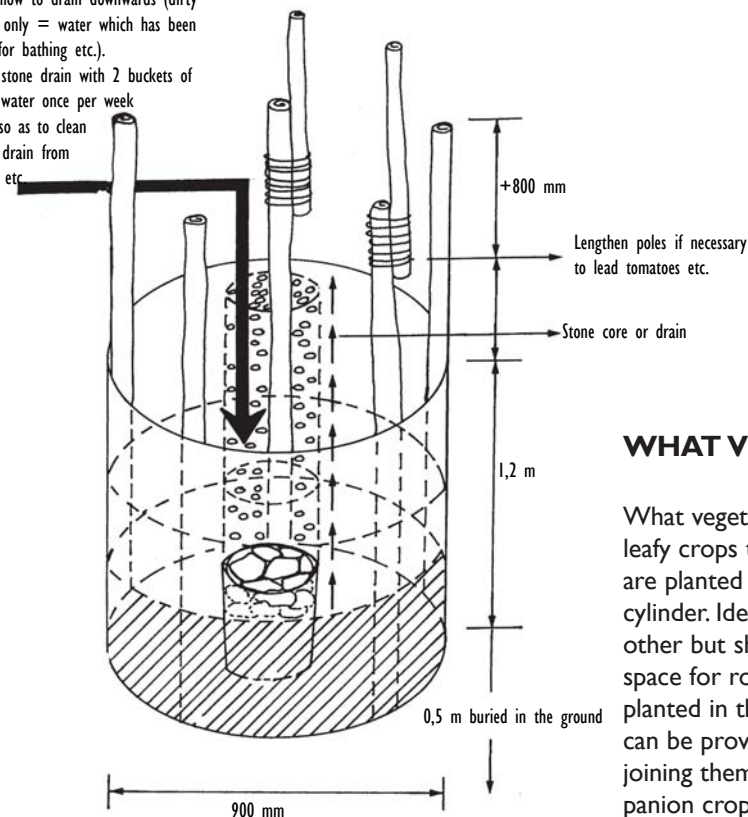
Pull the bucket partially out, leaving the stones in position. Fill the bucket again with stones and backfill with soil. Repeat for each layer.



## 12 IRRIGATION TALK BY CHARLES CROSBY



Pour water directly on the stones only and allow to drain downwards (dirty water only = water which has been used for bathing etc.). Flush stone drain with 2 buckets of clean water once per week only, so as to clean stone drain from soap etc

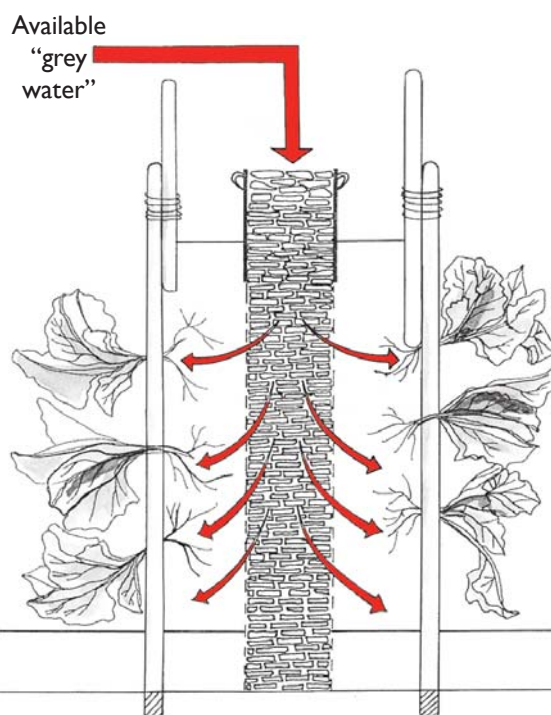


The final dimensions of the Tower Garden.

poured into the bag and the vegetables are planted in holes cut in the sides of the bag itself. The results speak for themselves but like all irrigation the user must master the tricks of the trade, nothing is as simple as it appears at first sight! Initially the housewives were sceptical, they didn't believe you could grow good vegetables successfully with soapy water! The answer to this problem is to clear the system out by pouring two buckets of clean water into the column each Saturday.

### WHAT VEGETABLES CAN BE GROWN?

What vegetables can be grown? The towers are ideal for leafy crops typically the various varieties of spinach that are planted through the holes in the side of the shade net cylinder. Ideally the holes should not be one above the other but should be staggered diagonally providing more space for root development. Tomatoes and onions can be planted in the top layer and if crops require trellising this can be provided by extending the vertical uprights and joining them with wire or string. Where possible companion crops should be grown to facilitate biological control of diseases and pests, garlic and onions are useful in this regard.



The shape of the filling material in the stone column is very important for the even distribution of water through the soil in the tower.

An unexpected benefit is the way in which the vegetables have thrived in severe heat wave conditions that have proved too much for conventionally planted gardens. The reason for this is not quite clear. It may be the free air circulation, lower soil temperature or the better moisture status of the soil. It is not claimed that towers will be able to provide all the food a family needs but the contribution made to nutrition and eating pleasure is very considerable.

### THIS IS LAZY GARDENING

Once people have become familiar with the towers they prefer to position them right at the back door so that it is easy to pour the wastewater into the tower. It is difficult to predict how much water will be required, only time can tell. If water forms a puddle around the bottom of the tower it is an indication that too much water is being applied and the obvious answer is to make a second tower! One of the main attractions of the method is that little labour or attention is required and this appeals to all busy housewives.

### MAKING UP THE TOWER

The way in which the tower works is simple. The soil is contained by the shade cloth "skin" and surrounds a central stone packed drain. The purpose of the stones is to control the



Each day the available "grey water" is poured into the bag...



and the vegetables are planted in holes cut in the sides of the bag.

flow of water so that the soil in the tower is kept at the right water content for growth. The soil mix provides fertility.

The upright poles are not critical. Branch trimmings or fencing standards are suitable and where crops such as tomatoes are planted in the top layer of soil, extensions can be wired on to provide trellising. The selection of the cloth that forms the sides of the tower is, however, critical. All sorts of materials were tried initially in South Africa. In Kenya nylon gunny bags were used but were found to only last about two years. In South Africa sacking, as shown in some of the photographs, did not last the season. Black plastic sheets deteriorated rapidly in the sunlight. Shade netting proved to be far more durable but it was important to use nylon string or fishing line to join up the ends of the shade netting to form a cylinder as shown in the diagram.

Filling the tower with the soil is an art. The soil should be dampened to provide cohesion but not compacted. The water must be distributed evenly throughout the soil

mass and will not penetrate the compacted areas. Similarly the stone filling is critical. When the first attempts were made in South Africa round stones were used and the water simply ran down the centre of the tower and did not filter through evenly into the soil mass. Packing flat stones, or building rubble, carefully solved the problem. It is possible to use smallish round stones provided they are so arranged and packed so that satisfactory water distribution is achieved.



The soil must be fertile and retain moisture and it has been found that a mixture of six parts of soil, four parts of manure and two parts of wood ash is satisfactory. It is likely that people will be able to develop

appropriate soil mixtures utilising locally available material but experimentation will be required.

Tower gardens are in their infancy in South Africa but have the potential to make a real difference in areas where extreme climate and adverse circumstances have lead to household vegetable gardening being considered out of the question. The initial examples are in the Ndonga area near Queenstown in the Eastern Cape and there are two areas in Limpopo Province, both subject to hot arid conditions. One is the Nzhelele valley north of the Soutspansberg and the other Makuleke in the north east of the province.

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