



## Home Garden with Worm Composting

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### Introduction

For the climatic conditions in Africa a different approach is needed. Most of the places have shallow soil. Where in Europe the depth of soil is measured on average in meters, the soil in Africa is between 0.5 to 1 meter on average. The actual good topsoil can be as shallow as 20cm. This causes most of the problems in conventional farming and so much more in urban farming and is the main cause of the erosion that are part of Africa. Low rainfall in areas and no access to water is also a major problem. In the major cities where work is more available and salaries are better access to running water is also easy. There any form of gardening is possible.

The problem areas are around the cities in squatter villages and rural villages where money and water are not available. If one has to carry water on your head for up to a kilometer there is no opportunity to grow anything. It is for this part of the rural and poor people that I believe the following method is the best suited.



Fig. 1. A worm bed under plastic where the earthworms are kept and where leftovers and food scraps as well animal manure of goats or cattle are fed to the earthworms.



Fig 2. Plastic cover removed to show that it keeps moisture in even when grass is there and also keeps it dark for the earthworms which are light sensitive.

Every household should be supplied with a small culture of earthworms. *Eisenia fetida* is the best for this purpose. This can be kept next to the house in a small pile and all food scraps can be fed to them. In Europe they use containers but they work just as well on the ground and all one need is a bit of plastic to keep fowls and birds out and to retain moisture. The

earthworms are continually fed on the one side of the heap to a height of 30cm and when the worms have moved to the fresh food, the vermicompost can be removed from the original pile.

When the pile has moved too far to one side, the adding of new food waste is changed to the opposite side.

With this method the earthworms are easy to separate. By taking the cover off the heap where the waste has been converted to vermicompost, it will dry off and the worms will move to the fresh food. This method has been used and proven over many years. The main advantage is that it is simple and easy to manage at no cost. The waste of one household is enough to do a 10X10 meter plot of land.

### What can be used for feeding the earthworms

Any organic waste that is derived from plants and animal waste can be used. Peelings, leftover food, chicken manure, cow dung and even newspapers and leaves can be used. If one is prepared to improvise where no flush toilets is installed, one can install an earthworm toilet and the vermicompost reaped out of it can be used. It is much more hygienic than the direct use of night soil that is used in countries like China. This product has been tested to be completely safe to use. By installing this toilet system all the vermicomposting can be done through it but this need some capital expenditure. The composting time is from 3 to 8 weeks depending on the waste used.

### Gardening method

For the growing of crops all that is needed is seed or seedlings, a hoe and the will to grow a crop. To preserve the topsoil in place the grass and weed cover is hoed off and care should be taken not to remove any soil. The grass or weeds is left in rows as mulch and then a 50cm deep furrow is made between the rows of mulch and the vermicompost is put in the furrow in densely grown crops like carrots etc. at 1liter or a spade full per meter row while if cabbages or wide spaced crops are grown, a hole of 10cm deep at the correct spacing is dug and half a cup of vermicompost is added before planting.



Weeds and grass is hoed off and left for mulch



The little furrow is dug in which the vermicompost and bonemeal is put before seedlings is planted.

Lime or eggshells or bonemeal or any other form of lime may be needed in the high rainfall areas in addition to the vermicompost. Water is only needed on the rows and the mulch will keep the evaporation down. If the crop is grown

in the rainy season, very little or any water is needed. If there is not enough mulch available, paper or any other organic waste that can be collected can be used. As a last resort even plastic can be used but it is not recommended for reasons I will mention.

This is the method of gardening or farming method that is used successfully by many organic farmers in South Africa. The simplicity of the system put it within reach of every one. It may be contradictory to the double dig and other methods but in the extreme climate of Africa this is the only way to improve and maintain the soil in place.

The reasoning behind this method is that the vermicompost supply the necessary microorganisms to the soil together with some plant nutrients. The mulch layer reduces evaporation, supply food to the microbes, keep the soil temperature down and stop weed growth. It is very important to keep soil temperatures down as bare soil in summer can reach temperatures of 70°C and no microorganism can survive such high temperatures. Evaporation figures of 25mm of water removed in 24 hours on bare loose soil has been recorded at that temperature and then it is impossible to grow crops without abundant water and irrigation.



Swiss Chard planted and note the mulch to retain moisture



Newly planted strawberries. Note the heavy mulch on right hand side.

The biggest saving of this method is in water. It is proven that crops grown without chemicals need 80% less water in comparison to conventional practices and that makes it a method that will help households where water is scarce.

#### How much can be grown by this method?

Enough can be produced to feed a normal household and some to share. The advantage is that one does not have to adhere to companion planting for disease or pest control as by not disturbing the soil and the additional microorganisms in the soil, a natural disease and pest control is achieved. The yields is close to if not as good as those obtained with conventional methods. The secret is to keep the surface covered with mulch and to disturb the soil as little as possible. Here is a list of yields on average per 1meter square per crop:- Green Beans 3kg, Spinach or Swiss chard 15kg, Carrots 6kg, Cabbages 6kg and Tomatoes 5kg.



Lettuce grown for the local market. It is reaped in loose leaves, packed and fetch 1\$ US and is very popular with restaurants



Cabbage (Cape Spitz) and weight about 1,5 kg



Cauliflower ready to cut