



# Guide to constructing tyre gardens

Colin Hudson

**A key way for urban and peri-urban communities to improve nutrition and livelihoods is by raising their own vegetable crops; but how to overcome the problems of poor quality soil and lack of space? Tyre gardens may prove a simple, water-efficient and low-cost solution.**

**Tyre gardens are 'environmentally-friendly', as they re-use old tyres and require no chemical pesticides. They also minimize the use of water and maximize the use of fertilizer.**

**M**any people would like to grow their own vegetables and herbs, but lack either decent soil or sufficient space to do so. Tyre gardens may be the solution: they are easy to manage and produce good-quality produce cheaply, even in the most unpromising situations.

The gardens are 'environmentally friendly', as they re-use old tyres and require no chemical pesticides. They also minimize the use of water and maximize the use of fertilizer (whether organic or inorganic).

Gardening using tyres is not a new idea. Individual tyres have been used by innovative gardeners in the West Indies for many years. But, the form of tyre garden described in this article is novel. It is the result of 13 years of experience at Edgehill in Barbados.

## What is a tyre garden?

A tyre garden is any assembly of car, truck or tractor tyres acting as containers for a good growing medium in which plants can be easily managed. The tyres can be arranged singly or in large groups; in rows or in circles; propped against a fence or left free-standing. They can range from only one tyre, to up to six or seven tyres high. Some are used for ornamental plants, but most are used for vegetables and herbs.

## Obtaining the tyres

You should have no problem getting used car tyres from any repair shop. You will find truck tyres at larger repair shops, bus companies, and trucking companies.

## Drilling the tyres

Start off by drilling a 6.25cm hole in one wall of each tyre with a keyhole saw. This

hole is for drainage or watering, depending on the position of the tyre.

When tyre gardens become popular in a country we recommend that tyre-repair shops should equip themselves with a keyhole saw. If you do not have access to a keyhole saw, use a sharp knife to cut holes in the tyre walls providing they do not have steel belting.

## Under the tyres

If there is any possibility of tree roots growing up into the tyre garden, lay down a sheet of thick plastic, or a similar impervious cover. Invading plant roots must not be allowed to rob water and nutrients from your crop. Of course, if the tyre garden is built on a paved area, there is no need for any sheeting.

## Arranging the tyres

Arrange the bottom layer of tyres so that the hole in the tyre is facing down. Make sure that water can leave the drainage hole easily. There are many possible ways of arranging the tyres. Some are shown in Figure 1.

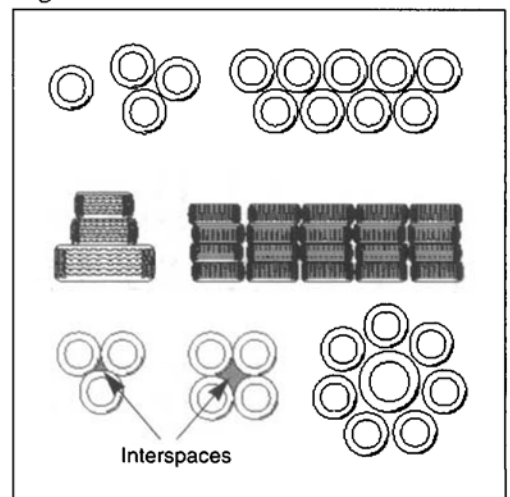


Figure 1. Various arrangements of tyres can be used.

A factsheet on tyre gardens has been published by the Caribbean Agricultural Research and Development Institute, with support from the Canadian High Commission in Barbados.

# irrigation and the small farmer

Once you are satisfied with the pattern of the bottom layer of tyres, fill them with any suitable material to support root growth. Usually this will be soil or sub-soil dug nearby, but it can be anything which is both reasonably well-drained and reasonably good at holding moisture; in Barbados, for example, we use flyash (soot) from a sugar factory. Don't forget to push the filling material well into the walls of the tyre, otherwise, the soil level will sink during the first few waterings.

Some truck tyres have very stiff walls which can lie too close together and make it difficult to fill properly; you can get round this by propping the walls open with pieces of stone or bits of wood before filling.

Place the next layer of tyres on top of the first. If this second layer is to be the top layer — so the tyre garden is two tyres high — place the tyres with the holes pointing upwards (see next section). If the tyres are to be more than two tyres high, make sure that the holes point downwards (for drainage) in all the layers *up to the top one*; but also remember to ensure that the drainage hole is not in danger of being blocked by resting too closely on the tyre below. Each layer of tyres added (except the top layer) is filled with the same material as the lower tyres (see Figure 2).

## The top layer of tyres

This is the most important layer of the tyre garden!

Place each tyre in the top layer with the hole facing upwards and in the most convenient position for watering (ie. on the outer edge of the arrangement if it is a free-standing tyre array, or on the side nearest to you if the tyre garden is up against a fence).

Next, spread a layer of gravel around the lower wall of each tyre (Figure 2). Then push a tube through the hole until it rests on the gravel ring below. The reason we recommend 6.25cm holes is that the cheapest tube can be made by pushing small PET bottles together. However the tube is made, cut or flare the bottom in some way so that the water will pass freely and quickly into the ring of gravel.

Finally, fill the top layer of tyres with a first-class growing medium and push well onto the rim of grit (see diagram). In Barbados we use a compost made out of chicken litter, flyash, bagasse, filter mud and furnace ash from sugar factories. This is an excellent medium for both seeds and mature plants. It is sold under the trade name Black Gold.

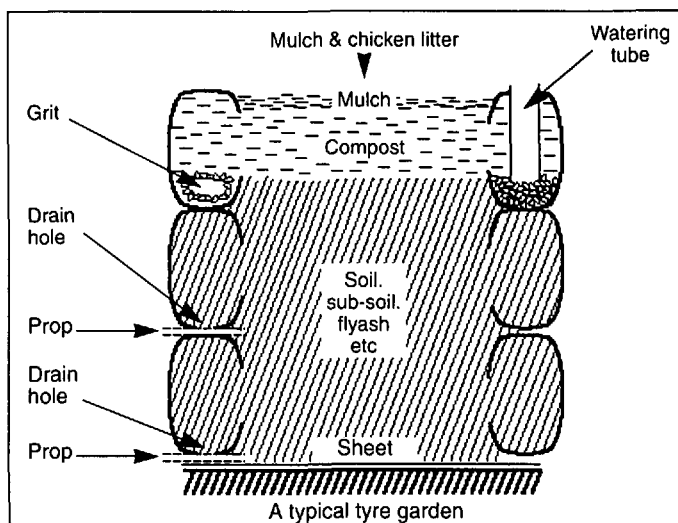


Figure 2. Diagram of cross section of tyres.

## The interspaces

Every time three or four tyres touch, the interspaces will create another 'chamber' for growing plants. Fill these triangular or rectangular chambers with the same material you used for the lower layers, up to about 12cm from the top. Then finish filling with the same 'good' medium used in the top layer of tyres. These spaces do not have a special watering-point and have to be watered directly with a hose or bucket when the tyres are being watered (see below). Because it is not always easy to get tyres exactly the same size, they may not fit together neatly. You can push stones or bits of wood into the spaces left between the tyres to prevent the soil in the chambers from being washed out.

## Painting

It is essential to paint the tyres white to keep them cool; there is an added bonus — some insects 'orientate themselves' to their host-plants by the brightness of the sky. When the area below their flight path is also bright, they become confused and many will go elsewhere. Use either emulsion paint or carbide residue.

## Planting

The tyre garden is now ready to be sown or planted up. Transplanting is far preferable in order to maximize the use of the tyre garden.

## Mulching

Tropical soils must be covered to stop the sun's rays striking the soil surface. This is called 'mulching' and is as important for the tyre garden as it is for field production or normal gardening techniques. In Barbados,

## Crop rotation

To a large degree, you can control the build-up of soil pests and diseases by good crop rotation — not planting the same crop twice in the same place. Some of the rotations we have used successfully in Barbados are shown below.

*Crops grown in free-standing tyre gardens*

- Beans (bodie or sword beans are especially good)
- Mixture of lettuce and carrot
- Cabbage family (radish, broccoli, cabbage, etc.)
- Mixture of sweet pepper and parsley (parsley likes some shade from the sweetpepper)
- Sweet potato (eat the young tips as well as the tubers)
- Mixture of onion and beet

*Tyre gardens which are against a fence on which crops like spinach and snake gourd can climb*

- Snake gourd
- Cherry tomato
- Okra
- Spinach
- Egg plant
- Corn

## about the author

Dr Colin Hudson is an agronomist and MD of Carib Agro Industries Ltd, Edgehill, St. Thomas, Barbados.



Colin Hudson

A tyre garden will produce vegetables the value of which will cover set-up costs within six months.

we use chicken litter as our fertilizer source because it is both a good mulch and a good nutrient source.

## Controlling pests

An important aspect of the tyre-garden system is that it encourages a good mix of vegetables and herbs. This is the key to encouraging the predators and parasites which naturally control the most common pests (biological control).

But a few caterpillar pests in the West Indies have no significant natural enemies. One of these is the cabbage-white butterfly (*Ascia monuste monuste*) and you may find it necessary to apply a bacterial controlling agent called *Bacillus thuringiensis*. This bacteria kills butterfly and moth caterpillars rapidly but does not harm the natural enemies of other pests. It is also completely safe for human beings. It can be bought commercially under the names Dipel or Bactospine.

## Controlling disease

Diseases are controlled by using resistant crops or varieties and carrying out sensible garden hygiene, including the removal of dead leaves and rotting fruits. The control of soil-borne diseases is achieved by rotation. Do not use *sprays* as you may disturb the biological control of pests.

Use plant species which are highly resistant to disease whenever possible. For example, snake gourd (*Trichosanthes cucumerina*) is much better than cucumber or zucchini squash because it is not susceptible to powdery mildew; likewise, the old 'native' dessert cherry tomato varieties which are adapted to high temperatures and are relatively disease-

resistant, are preferable to larger North American varieties; and so on. Ministry of Agriculture extension officers or their equivalent should be able to advise on the best varieties and crops to grow in the tyre garden.

## Watering the garden

When you can see your plants wilting, that particular unit needs to be recharged with water. Using a hose or bucket, pour water into the watering tube and disperse it rapidly round the tyre in the ring of gravel. Truck tyres require about 10 litres of water, whereas car tyres need rather less than 4 litres at each watering. If you see an appreciable amount of water draining from the bottom of the tyres, reduce the amount of water given each time.

Experience shows that this watering method can use as little as half the amount needed for traditional gardening methods, so do not be surprised if you only have to water twice per week, even in the driest weather. If the tyre garden comprises a large number of tyres, it is advisable to use a drip irrigation system — this is less work and improves irrigation uniformity. The tyre garden at Edgehill is currently made up of 2000 tyres, 600 of which are used to maintain a collection of medicinal plants.

## Fertilize the garden

A thin layer of chicken litter every three weeks is an ideal fertilizer for the tyre garden. It provides a slow release of nutrients and acts as a mulch at the same time. Provided some other mulch is used, however, inorganic fertilizers are also fine. Use a complete nutrient fertilizer (with minor trace elements as well as nitrogen, phosphorus and potassium).

## Cost effectiveness

Experience in Barbados suggests that even 'professionally built' tyre gardens will produce vegetables whose value exceeds the purchase price of the tyre garden within six months. The tyre garden can be expected to last at least 20 years — surely, this is good economics. ■