

The Aquaponic fish culture system

It is a sophisticated way of integrated aquaculture system which enables one to grow vegetables and rear fish at the same time. The vegetables and the fish have a symbiotic relationship and benefit from each other. This is an ideal system to be placed at the back yard of a modern home or a home at an urban set up and it is very easy to construct and establish. There are two kinds of the systems which are named Aquaponic one and aquaponic two which is an improved version of one.

a) Aquaponic one

The fish tank which is cut open at the top has a capacity of 1000 liters with a tap at the bottom. On top there is a smaller water storage tank of 210 liters. There are two vegetable containers next to each other measuring 115 by 90 by 30 cm and finally a water storage tank with a capacity of 210 liters dug a little bit in the ground next to the second vegetable container



How it works

The fish tank is filled with water up to 850-900l and can be stocked with up to 50-100 fish preferably males. Our tank has been stocked with 32 males.

The water is recycled three times daily for aeration purposes. During the recycling, the tap at the bottom is opened and 400-500 liters of water is released via a pipe to the vegetable container 1 and 2 which are planted with spinach. When releasing the water, the excess murk at the bottom of the pond including fish feacal matter and the excess food sank at the bottom is removed with the water into the vegetables and make excellent fertilizer.

The vegetable containers contain volcanic soil which serves the purpose of removing excess nutrients from the water. This is because the volcanic soil has big pores compared to other types of soils making it ideal for it to harbor micro organisms which in turn

breakdown the organic matter from the water, using up the excess nutrients like ammonia, carbon dioxide and nitrogen gas and in turn release oxygen which serves to aerate the water.

After the water passes through the vegetable containers it falls into the storage tank on the ground. Water from the bottom storage tank is then pumped to the storage tank on top of the fish tank using a hand pump until it is full. Once full, a tap at the bottom of the tank is opened to maximum where water fall back with a lot of pressure into the fish tank up to 900 liters. This serves to aerate the water and add oxygen into the tank.

As the water falls with excess pressure into the fish tank, it is full of oxygen and free from excess nutrients. It is a must for recycling of water to be done 3 times daily (6-7am, 1-2pm and 5-6pm) to ensure that the water has enough oxygen since it is the limiting growth factor of fish.

b) Aquaponic two

The fish tank which is cut open at the top has a capacity of 1000 liters with a tap at the bottom. There are two vegetables container next to each other measuring 115 by 90 by 30 cm and finally a water storage tank dug a little bit in the ground next to the second vegetable container



How it works

The fish tank is filled with water up to 850-900l and can be stocked with up to 50-100 fish preferably males. Our tank has been stocked with 49 males.

The water is recycled three times daily for aeration purposes. During the recycling, the tap at the bottom is opened and 400-500 liters of water is released via a pipe to the vegetable container 1 and 2 which are planted with spinach. When releasing the water, the excess murk at the bottom of the pond including fish faecal matter and the excess

food sank at the bottom is removed with the water into the vegetables and make excellent fertilizer.

The vegetable containers contain volcanic soil which serves the purpose of removing excess nutrients from the water. This is because the volcanic soil has big pores compared to other types of soils making it ideal for it to harbor micro organisms which in turn breakdown the organic matter from the water, using up the excess nutrients like ammonia, carbon dioxide and nitrogen gas and in turn release oxygen which serves to aerate the water.

After the water passes through the vegetable containers it falls into the storage tank on the ground. Water from the storage tank is then pumped back into the fish tank up to 900 liters using a hand pump. During pumping, the water falls on to the bread baskets at the top of the fish tanks which contains lemon grass planted on volcanic soil to remove the excess nutrients left from the water after it passed through the vegetables containers.

As the water falls with excess pressure into the fish tank, it is full of oxygen and free from excess nutrients. It is a must for recycling of water to be done 3 times daily (6-7am, 1-2pm and 5-6pm) to ensure that the water has enough oxygen since it is the limiting growth factor of fish.

The Benefits

At the end of your six months, you will harvest fish for commercial purposes or as your protein supplement and also you will have harvested loads of vegetables for family use or for sale. In a span of two months 2kg of sukuma were harvested and 30 seedlings transplanted to another shamba from aquaponic one, in aquaponic two 1.75kg of spinach were harvested and 40 seedlings also transplanted.

Achievements

A beautiful background and a healthy family.