SUBMISSION No.
102

Gutter Water Storage and Diversion Drainage System..

People are going to extreme lengths to save water. We have people who put in expensive systems to save Grey Water, or even Kitchen Water with all its problems of soap fats, and detergents. Some other people are pushing the use of sewerage water, to be recycled in some cleaner form. The simplest, and cheapest method to save water is to salvage the water that falls on the roof of our houses. It is clean, non contaminated water, that is captured in our gutters, but in the main is allowed to run to waste in the drainage system.

The simple answer is to place a water diverter on each down pipe, and that this water is then stored in a tank. When the tank is full the diverter then allows the water to drain into the normal drainage system. However if you use some of the tank water, the diverter automatically fills the tank up first, then diverts the flow of water down the normal drainage system.

Features of the " Gutter Water Storage and Diversion Drainage System" are as follows : -

The Diversion Box is 30cm long and 20cm wide. The depth of the box is 8 cm. The size of the box is ample to cope with any sudden down pour or rain. Remember you have up to half a dozen down pipes to cope with any excessive volume of rain.

The box is sealed, except for the top and bottom, that connect to the two ends of the down pipe, plus the outlet to the storage tank. The diverter outlet is at the bottom side of the box, and by reversing the box the water can be collected from either side. A galvanized plate 8 cm wide and 25 cm long is welded to the bottom of the box, and is slightly bent so that any water entering the box is diverted into the storage tank. When the storage tank is full, the box is designed to divert the water down the normal drainage system.

Provision has been made so that all openings in the box will be sealed. The attached drawing gives working detail as to the operation of the water deflector.

The entire system is sealed against any bugs or mosquitoes etc. Any foreign matter or leaf rubbish, can be kept out of the drainage system by using a gutter strainer, that is fitted into the drain hole of the gutter.( These are readily available from Plumbers Supplies.)

The water collected in this manner is clean, and can be used for any domestic purpose. The women will love washing their hair in this soft clean water, while the master of the house can enjoy his whisky and water, after a hard days work.

# Self Watering Tree Guard.

This frame is designed to be a means of self watering, which does not require any form of power. It is not harmful to the environment, and once used can be reused over and over again.

Four straight steel wires, 86 cm. long are welded to three rings, as per attached drawing. This is the manufactured shape, designed to pack one into the other, for economy of space during transport.

At the site for planting, the wires of the frame are bent, so that the four spikes are parallel and then driven straight into the ground. If conditions are windy, extra clips can be driven into the ground at an angle ( as per drawing ) to give extra stability.

The wires in the upper part of the frame, are bent out, so as to hold taught a piece of plastic coated cloth, which is 60 cm square.

In the center of the above cloth is a star shaped hole, which must be directly above the plant. The star shaped hole is essential, so as to minimize the surface tension, relative to the condensed water.

Once in place there is no further action necessary. The cloth will collect the condensed water, and deposit it onto the plant. If it rains the plant will get all the water direct on and around the plant. If the wind blows the rain, the plant will get its share of water, from the covering cloth, as well as the direct rain from the side of the frame.

Once the plant is established , the frame can be used over and over again. What is important is that the atmospheric vapor ( dew ) is collected and concentrated on the plant, and when the plant matures and is well established, the frame can be reused on new seedlings.

The frame and collecting square of fabric, are all commercial products that are common in our community. The manufactured frame does not in itself cause any pollution, it requires no power, what so ever, and is totally automatic.

# THE WATER TREE.

The water tree is the extension of the principal relative to the " Self Watering Tree Guard" only in this case the purpose is to harvest the water for domestic use on a farm. The basic principal is to collect water, which has condensed on steel plates, there are no moving parts, nor is there any form of energy used to collect the water. In simple terms nature does the work.

Knowing the limitations of structural machinery on a farm, the central tower is made of four ( or more ) steel frames. Each frame is 120 cm. square and 240 cm. tall. The frames are made of heavy angle iron, and have provision for mounting the condensing plates.

As the Water Tree offers considerable resistance to the wind it is necessary to have substantial foundations for the tower, and duel cables at each corner of the tower.

Once the tower has been completed, a small hand operated boom crane, is mounted on a central pivot at the top of the tower. This crane will help in erecting the condensing plates, and would be essential for any maintenance that may be necessary.

To facilitate the erection of the condensing plates, or any repairs that may be necessary, there will be ladder access in the central column of the tower, together with service platforms as needed.

Each condensing plate would be a standard size piece of heavy galvanised steel, the estimated size could be 200 cm. by 100 cm. The plate would be supported by a heavy steel bracket, which would be securely attached to the tower and supported along the top of the plate. The bottom of the plate would be cut at an angle, so that any gutter fixed to the plate would collect the condensed water and funnel it to the central tower. The water would then feed into a system of pipes that would convey the water to a storage tank at the bottom of the tower.

Each level of plates would involve four plates at each corner of the tower plus two plates on each side of the tower, This would give a total of 12 plates at each level of plates, or 24 plates for each section of the tower. Assuming there are four sections to the tower, and allowing for the fact that there are no plates at ground level, this would mean there would be 84 plates, which in turn would be condensing water on both sides of the plates.

The efficiency of the Water Tree would be increased if it was erected in a comparatively sheltered area, that is known for its frosty conditions.

The important thing is that this project will bring domestic water to the farmer, with no harm to the environment. I repeat let nature do the work.

# The Water Tree Mark 2.

## Preamble.

The "Self Watering Tree Guard" and the "Water Tree" are two examples of using nature to produce water out of the atmosphere. Nothing turned, nothing moved, but it clearly indicates that nature can be harnessed to assist mankind.

"Water Tree Mark 2" is an example of what can be done when the natural elements are harnessed, and used to achieve a more efficient outcome. For example the sun can be used as a source of heat, to operate a refrigerator, which in turn can chill water that circulates between steel plates, and thus improve the efficiency for the collection of condensed moisture. The circulation of the chilled water can be improved by using a series of water pumps, that are powered by a Savernous Roter, which is a very simple horizontal windmill. The attraction is that it is cheap, simple and operates on a horizontal basis. Thus we use the sun, wind and nature, to produce pure clean water.

## Description of Water Tree Mark 2.

The tower for The Water Tree Mark 2, will carry a much bigger load, and exposure to strong winds. In addition the condensing plates are twice as heavy, as there are two condensing plates on each supporting arm. It is also an advantage to build the tower higher, which would give it better exposure to moisture laden winds. Thus the tower has to be much stronger to carry the basic load, and it is desirable that it be as tall as is practical.

Once the plant has been set up there is virtually no maintenance. In the daytime the sun is used as a source of heat, the rays being focused on a sealed refrigeration unit. It is based on what was called a Kerro Fridge.Instead of a kerosene wick lamp, the heat is generated by concentrating the suns rays by using Fresnel lenses. In the daytime this produces chilled water, which is circulated between twin plates. The beauty of this system is that even on the hottest day, the plates get relatively colder, and thus continue to condense the moisture out of the atmosphere. At night time the refrigeration system, known as the ( Absorption System) does not work as there is no sun. However as the sun goes down the steel plates get colder, and so natural condensation takes place on the cold sheet steel

Natural circulation of the chilled water, is improved by using a series of small centrifugal pumps, powered by a vertical shaft connected to a Savernous Roter at the head of the tower.

The Water Tree Mark 2 is similar to the original Water Tree, except that this tower is powered by the sun and the wind.. In order to use these energies, the tower is designed to make maximum use of these resources. This is particularly so in the design of the Condensing Plates. Whereas the Water Tree had one plate of steel to collect the condensed water, we can now increase the efficiency by making each condensing arm carry two sheets of steel, separated by a copper coil, which circulates chilled water. The

tube of the copper coil is flattened into an oblong shape, so that the copper coil has maximum contact with the steel sheets.

To get maximum efficiency from the chilled water, it is desirable to circulate the chilled water as quickly as possible. Thus each plate will have a simple circulating centrifugal pump, going at all times. The power will come from the Savernous Roter at the head of the tower, and a shaft will be fitted from the top of the tower down to the lowest condensing plate. Each pump will get its power from the rotating shaft

Because of the rotation of the Savernous Roter, it is not possible to mount a service crane in the same way as the Water Tree. This will necessitate a platform being built below the. rotating blades of the Savernous Roter, on which there will be a small crane designed to service any of the condensing plates.

The platform and the service crane, have a special significance at the farm sight. Once the contractor has erected the tower, and everything is working. The farmer is on his own, This is where the internal ladders and safety platforms are so necessary. The farmer can service every part of the tower from the central core. Any major damage to one of the collector plates, can be removed and repaired, but only because he has a crane that will enable him to move any plate as necessary

The vital message is that the farmer must be given the means to be independent, and not having to rely on carting water, to keep the farm running. The important thing is that the structure is in place, then the sun and the wind will do all the work.