

OWNERS MANUAL

Rain Barrel Harvesting and Gardening Watering System

for the Ruby Alton House
Demonstration Project
661 Isabella Pt. Road, Salt Spring Island, BC



Forward

This manual has been prepared to help the owner of the Ruby Alton House (The Islands Trust Fund) understand the rain barrel catchment and garden water supply system.

The system was completed and operational in June 2005, and demonstrates a simple, inexpensive method of using rain barrels to automatically water a small garden. It should provide a supplementary source of garden water if operated and maintained in accord with these instructions, and the safety guidelines.

The manual has been prepared by The Gulf Islands Rainwater Connection Ltd. — the company that designed and oversaw the installation of the system. It is not warranted that all possible situations are addressed in this manual. The owner/operator of the system is responsible to contact the Rainwater Connection immediately if questions arise.

1. Summary Description

The rain barrel and small garden water system described below was a part of a larger demonstration of rainwater harvesting for the Alton house. This component of the project is a demonstration of how two barrels, a simple pump and a light timer can be combined to create an automatic watering system capable of running up to fifty drip emitters, each averaging 1 gallon per hour. This system was originally developed by The Rainwater Connection for a system which automatically waters 50 deck pots for 2 weeks using two 50 gallon rain barrels. In this case only a small demonstration drip watering system was installed in a small garden.

2. System Description, Operation and Maintenance

2.1 The Rainwater Catchment System

Rainwater is collected from the small shed roof over the side door porch. The existing gutters and two downspouts were cleaned and reused. The water from each downspout was directed to two rain barrels.

Two approaches are used to clean the water before it enters the rain barrels.



One barrel is fed directly from the aluminum downspout. A knee high panty hose is attached to collect debris. This is an excellent water filter, but they need to be cleaned out quite often. The barrel top also has a coarse debris screen.



The other barrel is fed by a piped system incorporating a debris pigtail and a nearly horizontal pipe. Some of the needles and black debris collect in this cleanable section of pipe. This type of pipe cleaning system is often used by those collecting into larger tanks that are more difficult to clean out.

Cleaning the pipe and filters:

The panty hose can be cleaned several times before it needs to be replaced. It is cleaned by removing and soaking it in hot water. Some people like to add a very small amount of bleach to this water. Most of the debris is removed by banging it against the side of a washtub, and running tap water through it.

The white barrel also has a bag type filter which is cleaned in the same manner as the panty hose.

The debris pigtail and the horizontal pipe should be cleaned whenever significant amounts of debris collect. A 3 inch toilet brush can be used, or a 2-3 inch brush attached to a plumbers snake. Ideally the pipe is cleaned during the rain when water is already running through the pipe. Alternatively, a small stream of water from the garden hose will suffice.

2.2 The Rain Barrels



Panty hose (rear tank) and pool bag filters. Note: Vacuum breaker on white tank.

Two barrels are used. The green one (donated by Mouats Hardware) is produced by Gardeners Supply Company (www.gardeners.com) and holds 62 imperial gallons. It is equipped with an internal overflow connecting to an expandable hose outside. The screening will prevent mosquito breeding as well as stopping larger debris from entering the barrel.

The white barrel (donated by Windsor Plywood) is a 45 imperial gallon recycled barrel that has been used for food storage. This barrel has been adopted for rainwater use by cutting a hole in the top the right size for an inexpensive pond basket. The white "bag" is a pool filter available at any spa shop. This hole in the top also allows one to hold a wrench to

tighten up a standard marine bulkhead fitting near the bottom which allows the attachment of a hose or small tap.

NOTE: The blue versions of these recycled barrels have held non-toxic materials such as soaps, and the black ones have contained toxic substances such as oil or chemicals and should be used with care and only after a very thorough cleaning.

These two barrels are connected by a hose at the bottom so they will fill and empty together. This hose is easily disconnected for barrel cleaning or storage during the winter.

These barrels will not likely be filled with rain from this small porch roof during the dry summer months. They can however, be filled with piped stream water from the hose bib (tap) on the north wall of the house. The storage in the barrel allows the water to warm up to rainfall temperature, and also allows time for chlorine (commonly present in piped water from a water district) to dissipate.

Maintaining the Barrels:

Both barrels are robust and can be moved and cleaned without damage. The recycled ones are strong enough to withstand moderate freezing although it is not recommended to leave water in them during the winter.

In the fall (after garden watering season) it is recommended that the two barrels be cleaned and stored for the winter. This requires the following steps.

- Disconnected the hose connection between the barrels and allow the water to drain out.
- Remove the pump and vacuum breaker from the white barrel - and store inside.
- Tip the barrels on their side to fully empty them, and clean with water and a small brush on a pole handle: e.g. a round boat scrubbing brush.
- If a cleaner is needed to remove any material which may have built up on the sides it is recommended that a heavy duty cleaning solution of hydrogen peroxide be used. This is the preferred cleaner in many situations because it breaks down into water and oxygen. Oxy Jan is a 7% solution of Hydrogen Peroxide sold at Janitors Warehouse stores. 6-10 oz. of this product mixed into 1 gallon of water provides a heavy duty cleaning solution.
- The barrels can be left in place and turned over for the winter or stored elsewhere. Removing the barrels allows the rainwater from the two small gutters to fall directly to the ground.

SAFETY WARNING

With either bleach or Hydrogen Peroxide avoid contact with eyes or skin. In case of contact, flush promptly with abundant water.

- Harmful if swallowed.
- Read and follow the manufactures instructions on the container.
- Both cleaners can mark clothing.
- NEVER use bleach and hydrogen peroxide together because they can react to create a noxious gas.
- DO NOT use any other type of household cleaner which may contain soap or other chemicals which could affect the quality of the collected water.

2.3 Pump

A small submersible pump is installed on the bottom of the white tank. The one chosen for this project is a Little Giant 5 MSPR which costs about \$160 (this one was donated by Slegg Lumber). This pump is known for its reliability AND it can pump vertically up 25 feet which means it has sufficient pressure (about 11 psi) to run most drip water emitters. The pump is equipped with a pump down float switch which turns it off when the water in the tank gets low - and thus prevents burning out the pump (cost about \$90). The Little Giant pump also comes with an optional low level switch (about \$70) which screws right onto the pump. These pressure activated sensors do not always work if there is turbulence in the water (e.g. if there is water coming into the tank during a rain). The hose from the pump is connected to the vacuum breaker with a swivel connector or a threaded union which allows the pump to be removed during the winter or when it is necessary to clean the barrel.

CAUTION

A submersible pump such as the Little Giant is designed to turn and pump water. It can be damaged if the pump is running, but there is no place for the water to go. Ensure that any valves between the pump and the drip emitters are open to allow a free flow of water.

2.4 Vacuum Breaker



The Rainwater Connection

This system is equipped with a vacuum breaker mounted at the high point of the system above the pump and above the hose that runs to the drip watering piping. This is needed for this system because the garden is below the pump. Once the water is flowing and the pump turns off, the water

would continue to siphon out of the barrel. The vacuum breaker interrupts the siphon action after the pump stops. The one used here is a brass Conbraco Atmospheric type vacuum breaker available at specialty plumbing stores for about \$12.

2.5 Light Timer

The pump is plugged into an exterior light timer which can be programmed to turn on and off for short periods on different days of the week. This Noma version was purchased at Slegg Lumber for about \$70. As shown on the next page the timer plugs into the wall and the extension cord from the pump plugs into it (the red wire in the photo).



There are a variety of choices, but look for one that allows run periods as short as 10 minutes; that has a battery back up, and that is simple to program. Don't expect the inexpensive ones to run for more than one or two years.

The light timer should be disconnected and stored inside for winter.

2.6 Hose/Piping to Garden or Pots

Garden hosing connects the pump and vacuum breaker to the drip watering system. In this installation the first section of hose had to take sharp bends and run partially buried for a few feet. To ensure durability high quality $\frac{3}{4}$ inch commercial quality hose was used. In places where the feed line does not have to take sharp bends or is subject to being stepped on, inexpensive poly piping (either $\frac{3}{4}$ " or $\frac{1}{2}$ ") could be used.

2.7 The Drip Watering System

This is a very small system installed to demonstrate the water flows. It includes a standard irrigation filter (about \$17) that collects fine particles that would otherwise clog the emitters. The whirling sprinkler and the adjustable finger sprayer are fun to watch but can use up to 14 gallons per hour each. Most drip systems for pots use small controlled rate drippers that emit $\frac{1}{2}$, 1 or 2 gallons per hour. This system can operate a mix of emitters with a total output of approximately 50 gallons per hour.



As a very rough guide, in average sun and wind conditions, a glazed 16 inch pot would require three 10 minute watering a week from a 2 gallon per hour emitter (i.e. 1 gallon per week). Geraniums might require a bit more, and lavender would require less. This means that one 50 gallon barrel would be sufficient to supply water to about 50 pots.