



The ULTIMATE Watering System

*Saves 70% Water*

**A  
Guide  
to the  
Correct  
Installation  
& Efficient  
Use of  
Leaky Hose**

**MADE IN AUSTRALIA FROM 62% RE-CYCLED MATERIALS**

## **What is Leeaky Hose?**

Simply the most environmental and resource friendly product developed this century.

Made from recycled rubber and plastics, Leeaky Hose can save more than 70% of that precious resource - water. It also lends itself to recycling previously used water and disposing of sewerage effluent safely and usefully.

And it is also friendly to Australia. It is made in Australia by Australians and a wholly owned Australian company. As it is made to an Australian patent no licensing fees are paid to any overseas organisation.

## **Leeaky Hose . . . . .**

- Saves up to 70% of irrigation water
- Is made from 62% recycled materials
- Is 100% made in Australia and by an 100% Australian owned company
- Distributes water evenly to plant roots without run-off or creating a surface crust
- Uses totally standard fittings
- Delivers water to soil on demand (clay)
- Can aerate soil, improve clay soil
- Is easy to install
- Easier to use and maintain than soaker or drip systems
- Operates in low pressure conditions
- When used below the soil it does not encourage weed growth
- Has no sprinkler heads to clog or act as home for insects.

## **How Leeaky Hose Works**

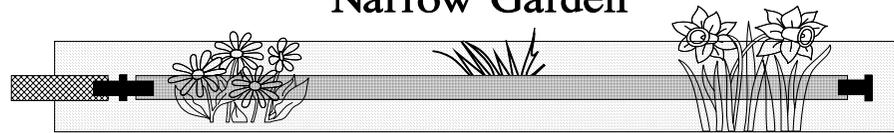
Leeaky Hose takes advantage of the remarkable fact that water acts as its own conductor in the ground. Its slow, but consistent release rate enables water to flow through soil similarly to ink in blotting paper. This capillary action of water is the principle on which the Coolgardie safe was designed.

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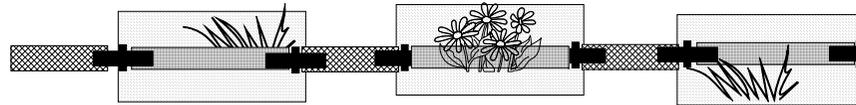
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# Installation Examples

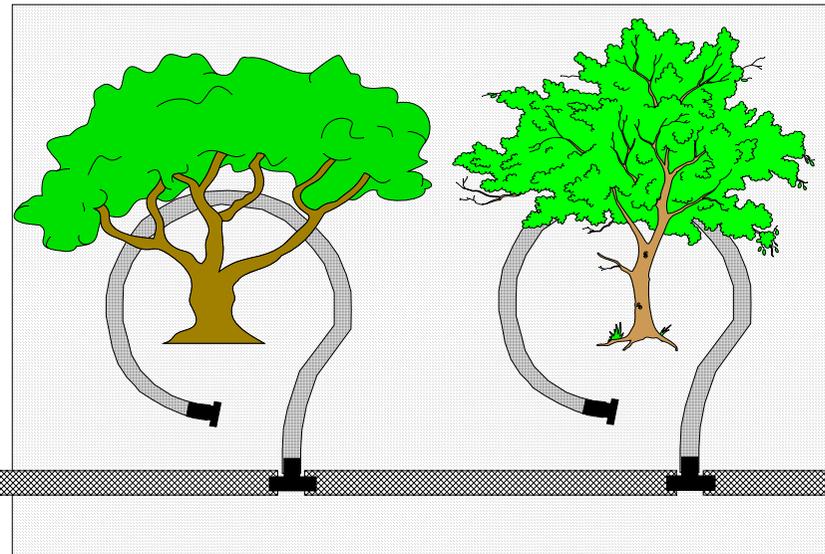
## Narrow Garden



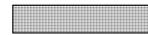
## Patches of Garden



## Widely spaced shrubs or trees



## Installation Examples (Continued)



Leaky Hose



Solid garden hose or poly-pipe

### Suggested Fittings



Standard  
Joiner



Tee  
Joiner



Elbow  
Joiner



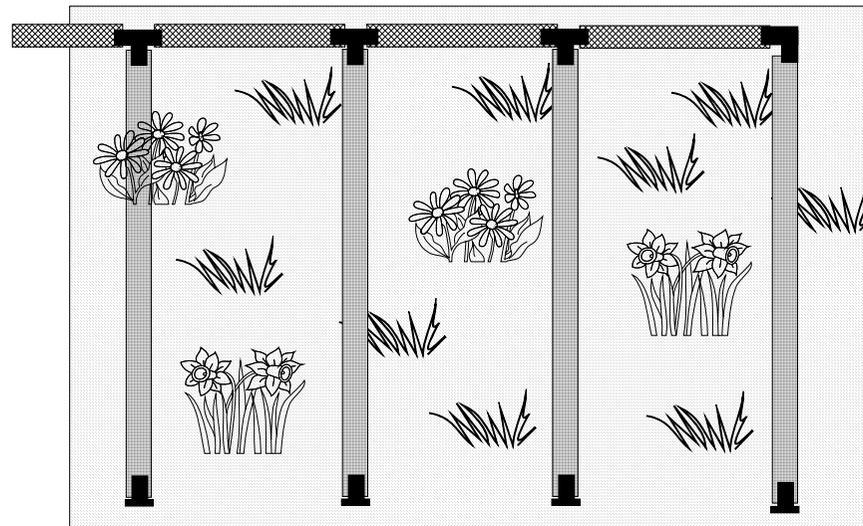
End  
Plug



Ratchet  
Clip

Ratchet Clips are recommended to firmly secure hose and fittings.

### Wide garden, lawn or vegetable patch



## **Overhead Vs Below Ground Watering**

Heavy surface watering is generally bad irrigation. Above ground watering (& flood irrigation) has a tendency to encourage shallow roots, which, in turn are quickly affected by hot temperatures and dry winds leaching any water stored in the top 2-4 centimetres of soil. Also heavy surface watering can force the finer soil particles in the soil to migrate downwards, which reduces the surface soil density and eventually creates a denser layer that slows down the movement of air and water from the surface, and the growth of roots through it.

One of the most telling arguments is that water penetration from above ground is a lot slower than the below ground capillary action. Even in ideal soils water penetration from above is around 1 cm per hour. So the effects of 2 hours above ground watering one night can be sucked from the soil by hot winds the following morning.

**Root Blocking** - Previously made underground watering products have been susceptible to blocking by root invasion. Apart from the physical holes in these products, they retain water which attracts roots (and insects) to these holes. They often become inoperable within 12 months.

When Leaky Hose is turned off, the residual water is gradually sucked out by the surrounding soil and it does not attract roots to its walls.- and the lack of physical holes makes it impossible for them to penetrate.

**Insect/Rodent Infestation** - Because it does not have any physical holes in it, Leaky Hose is not subject to infestation by ants or termites, which normally look for any underground highway. There are also no drippers or sprayers beckoning to spiders and insects to set up house.

## **Not Just Water Saving**

When used below ground Leaky Hose offers a number of other benefits over and above its water saving ability.

When used on a regular cycle, air is pumped through the ground each time the hose is turned on. This in turn aerates the soil, improves aerobic action in the soil, and lifts nitrogen levels. One site in Queensland measured a 300% increase in soil nitrogen in one 12-month period.

Of course underground watering does not encourage germination of weed seeds on the surface, reducing the need for weeding or Weedicides.

**Plant Shock**

Intermittent watering is one of the greatest causes of plant shock, which reflects in the plant's rate of growth, its blooms, and the quality of its fruit. Leaky Hose systems ensure that the water is placed into the soil root zone below ground and is not easily dried out by hot temperatures or wind.

**Better and Better**

The true benefits to your plants and trees really begin to show from the second year onwards as the roots are trained down deeper, and a thriving worm culture has been encouraged. Optimum growth is realised from a consistent level of moisture, nutrients and air. With regular use of Leaky Hose the plants are not shocked even in abnormal weather conditions.

**Pressure (Don't !)**

Leaky Hose is a NO pressure system. As water pressure is increased, water friction will force more water out of the first few metres of the hose and starve the hose at the other end. This characteristic has been documented by the Dept. of Engineering at Melbourne University. Leaky Hose will carry water below ground for at least 120 metres from a single water source, so if the end (or the middle) is being starved the most likely cause will be too much pressure.

**Leaky Hose is a NO Pressure System**

Leaky Hose has been designed for Australian conditions and to be used with our wide ranging water sources. The hose will deliver up to 4 litres per metre per hour (4 l/m/h) when laid on the ground (depending on the length of the run) from a water source (head) as low as one metre above the height of the hose. When placed underground this flow rate (from the same pressure) can reduce to 2 litres p/m/h in clay, and slightly greater levels in more porous soil.

**How Deep, How Wide, How Long**

The rate of capillary action of water through the soil varies depending on the size of the soil particles. Water travels more slowly, but further, in fine soils like clay, and more quickly, but not as far, in coarse grained soil like sand. Loam and mountain soils are somewhere in between.

To work out the optimum spacing for Leaky Hose it is recommended that the hose be placed on the ground with water flowing slowly for 24 hours. Then the spread of water to either side should be measured to gauge the optimum spacing for your type of soil.

The following table will give a general indication of spacing of Leaky Hose in each soil type.

<b><u>Soil Type</u></b>	<b><u>Spacing</u></b>
Sand	1.0 metres
Loam	1.7 metres
Clay	2.0 metres

### **Depth.**

When Leaky Hose is placed in the ground the water will travel towards the surface by capillary action. Leaky Hose can be put up to 30cm below ground (15cm in coarse sand) and still provide sufficient water. For shallow rooted plants, ground cover, or lawns your hose should be closer to the surface (2cm to 5cm) and laid in rows between (50cm \ 1mtr) depending on your soil type.

Broad acre irrigators are generally aware of the amount of water required for each plant and, thanks to water's capillary action, Leaky Hose can deliver the capacity required by each plant.

### **Installation**

Leaky Hose should be laid as level as possible in the area to be irrigated. It could leak irregularly for 12 hours or so as the rubber 'cures'. Thereafter the leak rate will be consistent for the full length of the hose. Above ground, covered by mulch, our 13mm hose will deliver water consistently for up to 60 metres from a single input. Below ground, runs of 120 metres have been successfully installed and operated - however the delivery of water is reduced so we recommend a feeder at both ends.

1. Once the hose has been laid out and connected - and before the stopper plugs are placed in - run water through the hose to make sure any dirt is flushed out.
2. Put in end plugs and set flow rate at *double* the final expected flow rate. That is at a rate of at least 4 litres/per metre/per hour. This is the curing process that sets the micropores. The Leaky Hose will leak more at one end, then the leaking area will gradually work its way along the length of the hose. The curing process should be allowed to continue until the hose is all leaking uniformly.
3. Once cured the hose may be buried, or covered with mulch.  
(See *problem solving* for any difficulties).

## **Slopes**

Leeaky Hose works best across slopes. This can be achieved by running normal hose or poly pipe down the slope and running the Leeaky Hose from it.

Should it need to be laid down-slopes of more than 2.5° follow the directions below.

### **Down Slope**

Leeaky Hose can run down slopes more than 2.5°, but a pressure or flow reducer is required every metre of fall. The simplest and most effective method is to work up from the bottom of a run, setting the In-line taps for the right flow at each metre fall level. Slopes of 10° require a tap at about 4.6 metres distant, and this distance increases or decreases with the fall or rise of angle respectively.

This same method should be used if there is a common down-hill pipe feeding lines of Leeaky Hose across the slope. So if the bottom tap is to be set at 4 litres per minute, (e.g. feeding 120 metres of LH) then the one above it should be set at 8 litres per minute (e.g. feeding 120 + 120M) and one above that at 12 lpm and so on up the slope.

## **Fittings**

Leeaky Hose uses standard 13mm fittings such as elbows, "T" joiners and end plugs (the same as those used for drip and spray systems) and are available from most hardwares and nurseries. Nylex, Wingfield, PPI and Hardie fittings are all suitable. Reducers from 19mm/16mm to 13mm are all standard units.

## **How Clean Should the Water Be?**

As stated above, Leeaky Hose has been designed for Australian conditions. More than 80% of the country has less than 700mm (30") of annual rainfall. While we have generally the best drinking water in the world, we use most of it for washing and flushing wastes. As Leeaky Hose does not block and needs only low pressure, this enables the re-use of nearly all this second hand water for irrigation.

For example, washing water can be pumped into a container on a low stand outside a laundry and used for irrigating garden and flower beds. If this is done the water must be filtered or go into a settling tank as cloth fibres will catch inside Leeaky Hose and gradually block the opening.

**Dam Water - Yes**

Leeaky Hose will not block up with dirty water, though over time particles too large to pass through the wall will accumulate in the hose. It is easily cleaned out by removing the end plug occasionally and flushing the sediment out. In large scale irrigation with rural water and effluent dispersal a backflush system is often installed.

**How Long Does It Last?**

Products made from the same raw materials as Leeaky Hose are still functioning below ground after more than 12 years. Leeaky Hose is made from non-volatile and non-reactive materials and is guaranteed for five years.

**Use for Aquaculture**

Leeaky Hose is now extensively used for aeration and water cycling in ponds and portable tanks, and for growing a wide range of water life, including tropical fish, yabbies, Murray Cod, trout and prawns.

Tests carried out by Macquarie University early in 1993 show a seven times greater oxygenation from LH over traditional methods.

Leeaky Hose also requires a greatly lower air pressure and so requires a lot less energy to achieve the same results.

**Gauging Water Flow Rate**

Leeaky Hose is designed to release water at the rate soil can absorb it.

Putting higher pressure through will only cause wet spots and waste water.

If the hose is spurting instead of beading the pressure is too high.

If used with a high pressure water supply, in-line taps or pressure reducers should be used. To set the flow rate, put an in-line tap between the source and Leeaky Hose, then use the following calculation:

Total length of LH x No of Litres/per metre/per hour = Total No of litres per hour. Divide this by 60 to give No. of metres per minute.

e.g. 60 metres of Leeaky Hose at a 2 lpm flow rate would need

$60M \times 2L = 120$  divided by 60(min) = 2 litres per minute.

Using a 2 litre container and a watch second hand, set your in-line tap at 2 litres per minute.

## Ready Reckoner

LH Total Length	L/L/per Hour	Litres per Minute	Millilitres per minute
10m	20l	0.3l	300ml
15m	30l	0.5l	500ml
20m	40l	0.7l	700ml
25m	50l	0.85	850ml
50m	100l	1.6l	1600ml

### Problem Solving

#### Sediment Accumulation

Leaky Hose is not subject to blocking under normal circumstances, no matter how dirty the water. However sediment can accumulate in the hose and over time the area through which water can leak is reduced. The solution to this is to remove the end plug from each run and flush the system using a slightly higher pressure. When the water starts running clear (or the same colour as the in-going water) the hose should be flushed and the end plug put back in.

#### Iron Deposits

In some areas such as parts of Western Australia, iron deposits created as an excretion of microbic action can be a continuous nuisance. The water can be treated by hydrochloric acid solution. In these circumstances the advice of the local Department of Agriculture should be sought.

#### Holes

Physical holes affect the efficiency of the hose, particularly above ground. The hose should be cut through at the hole and the appropriate sized bayonet joiner used to re-join both sections.

#### Wet Spots

Capillary action of water through soil will not work if the existing soil moisture content is less than 43%. A wet spot either means that the soil the LH is passing through has a low moisture content at that time, or that the surrounding soil has different characteristics - e.g. has more mulch or sand content.

**Known uses of Leaky Hose include:** *Turf Growing in high traffic areas, Reduce plant losses in initial plantings, landscaping, Safe environmental dispersion of effluent water, Naturally fed unattended irrigation systems, Aeration of fish farms and mobile fish transportation tanks, Terrace irrigation without erosion, Reducing needs for herbicide and pesticides in orchards and broad acre planting, Reduce algae bloom in waterways, Cyclic termite control under building slabs, Control rot of power poles, Foundation Stabilisation, Batter Stabilisation, Reducing seedling mortality rates.*

**Distributed By:**