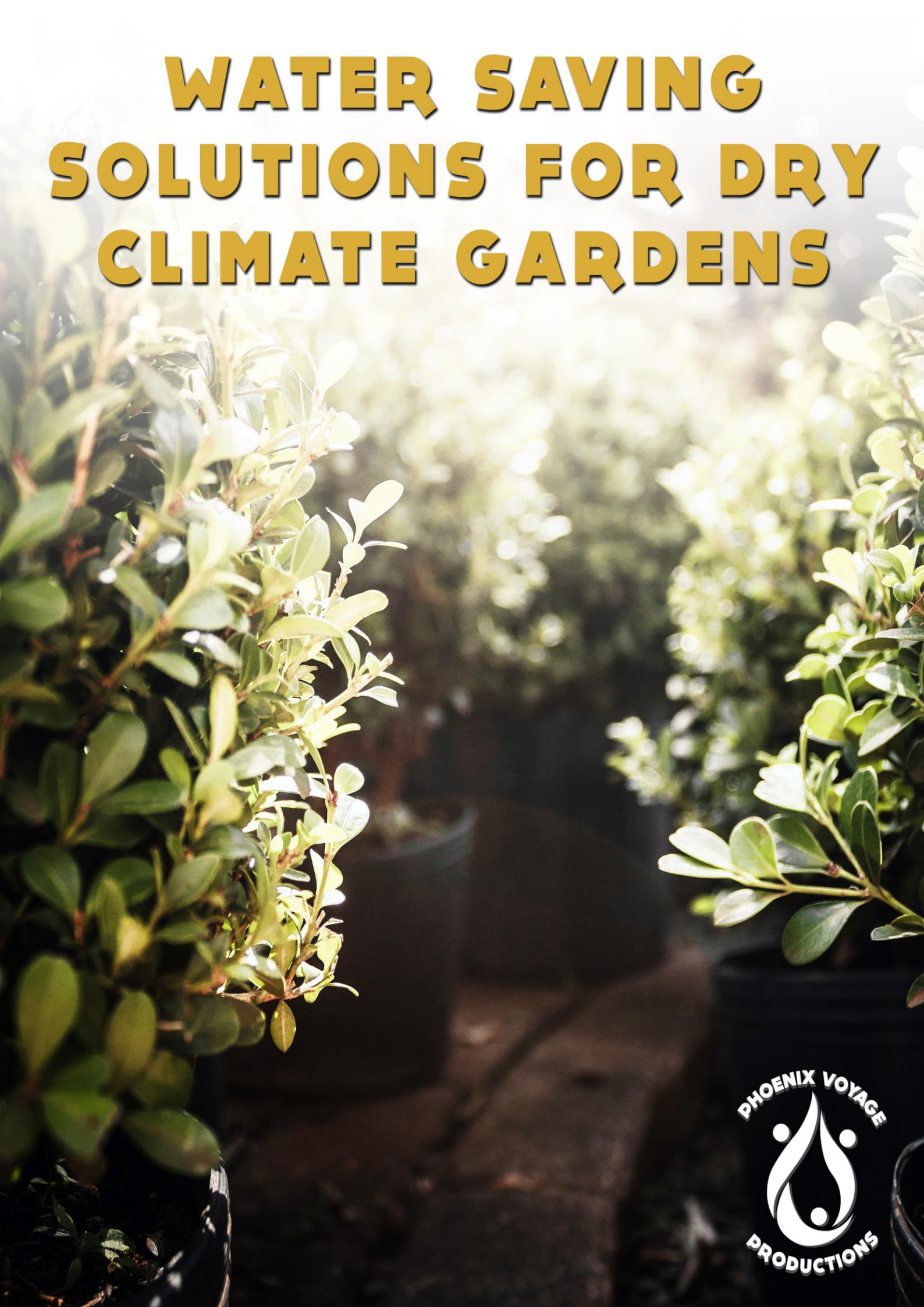
WATER SAVING SOLUTIONS FOR DRY CLIMATE GARDENS



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Water Saving Solutions for Dry Climate Gardens

Water is always the most pressing concern for dry climate gardeners. If you live in a climate where rainfall is intermittent, or scarce, you may struggle to give the plants in your garden enough water to survive. Water conservation should be a primary concern. Fortunately, permaculture offers solutions for saving water in areas where water scarcity is a concern.

Crucially, permaculture water saving solutions look at the big picture. They look at the problem wholistically, working out ways to protect the water cycle long-term, as well as taking into account the short term needs of people and plants. What is more, these water saving solutions are easy to implement – and cost little to put into action.

Planting For Rain

Permaculture gardeners do not only look at how they can water their garden, but how, in creating their gardens, they can actually help to preserve the world's water cycle. Trees and plants play a crucial role in making rain. When landscapes become barren and free of vegetation, rainfall levels decrease. By planting trees and shrubs that can survive in the environment where we live, we can help to protect and maintain natural cycles. By 're-greening' deserts, we can even increase rainfall in certain areas.

What is more, by increasing the level of green, growing things in dry climate gardens, we can increase shading and moisture retention in the soil, and make it easier to grow the food we need to survive.

Creating a Basin & Swales to Store Rainwater

If you live in a dry climate, you may be wondering how to increase plant cover and tree cover where you live. It may seem difficult in low rainfall areas to get anything green to thrive. Permaculture offers a range of water management solutions that make it possible to grow plants even in the most arid of environments.

By creating catchment basins and on-contour swales, or ditches filled with organic matter, we can make sure that whatever rainfall does occur is stored within the landscape. These moister areas can then be planted up with native plants, which further help to take up and store the water in these areas.

Creating oases in arid areas, however, does take time. Vegetation and water wise gardening practices can re-green arid areas over a number of years. But in the short term, gardeners can still do a number of things to make sure they can grow their own food when rainwater is in short supply.

Mulching to Conserve Water

One permaculture method that can help to grow food in dry climate gardens is mulching. Placing layers of organic matter around plants can help to slow evaporation of water from the surrounding soil.

But mulching is not the whole solution. Of course, in certain locations, rainfall may be so low during certain seasons that irrigation of some sort will be required. Most dry climate gardeners cannot wait for rain, but must find ways to water their gardens.

Ollas: Clay Pot Irrigation

Clay pot irrigation, often using a type of clay pot called as olla, is one valuable solution for dry climate gardeners. Clay pot irrigation has been used for generations to reduce the amount of water used in growing food in arid climates, and to make sure that all the water that is used gets directly to where it is needed.

When we water from above, wetting the soil surface, much of the water we use evaporates in the heat of the sun before it can be taken up by plant roots. By setting permeable clay pots into the soil, and filling these with water, we can make sure that the water gets to where it is needed.

What are Ollas?

An olla is an unglazed ceramic pot, usually used for cooking or for storage. These traditional clay vessels are ideal for clay pot irrigation. They have a wide, short neck and a wider belly and were widely used in Roman times, in Spain, Catalonia, and amongst Native tribes in the American South West. Similar, unglazed pots have been used around the world, first for cooking and storage, but later also for agricultural use – to irrigate crops.

This practice is believed to have been introduced to the Americas by Spanish settlers in colonial times. It is now regaining popularity as more and more people become aware of ecologically sound dry climate gardening practices.

How Does Clay Pot Irrigation Work?

Unglazed clay pots such as ollas are ideal for irrigation, as water seeks through the unglazed walls of the vessel slowly, over time, where it can be taken up by the roots of neighbouring plants. Water is drawn through the pottery by suction, which develops due to soil-moisture tension and the capillary action of soil and plant roots. Clay is a porous material, allowing water to permeate the container. Caps placed on top of the ollas used for irrigation further reduces evaporation and caps can also collect rain.

Interestingly, the 'sweating' of water through a clay vessel can also be used as a natural refrigeration method. When hung in a warm climate, ollas are filled with water which gradually begins to seep out through the walls. The evaporation of the water from the outside of the vessel cools it, allowing contents placed within it subsequently to remain cool. Porous clay pots can also be used to filter water.

The Benefits of Clay Pot Irrigation

There are a number of benefits to clay pot irrigation when compared to surface watering. These include:

- Water savings of around 70%.
- A reduction in the frequency of watering that is required.
- Easier uptake of water, due to delivery close to plant roots.
- Soil conservation – watering on the surface can increase soil erosion, deplete nutrients and damage the soil ecosystem. Watering into clay pots can be better for the soil in your garden.

DIY Clay Pot Irrigation

Ollas or other permeable clay pots can often be sourced relatively easily and cheaply. However, if you cannot find these where you live, you may still be able to make your own.

One of the easiest ways to make your own pots for clay pot irrigation is to use ceramic plant pots, which may be more readily available where you live. Clay plant pots will usually be unglazed, but it is important to make sure that they are or the water will not pass through the walls. The main issue with using clay plant pots is that they usually have holes at the base. These holes can be plugged with raw clay or other materials, however, and they can be buried up to their tops in your garden, filled with water, and topped by ceramic bases that are usually used to catch run-off water below clay plant pots.

You may also be able to make your own clay irrigation pots using clay from your own garden or the surrounding area. Whether or not this is an option will, or course, depend on the clay content of the soil where you live. Outdoors fire pits or firing mounds can be used (with care) to fire clay vessels using traditional, tribal techniques without the use of a modern kiln. Firing clay to around 1,000 F will turn it into pottery.

Placing Clay Pots and Getting Started With Clay Pot Irrigation

Once you have sourced (or created) your clay pots, it is time to place these in your garden. How many vessels are required and how large these should be will, of course, depend on the size of your garden, where it is located, and which plants you wish to grow and their water needs.

First, decide where you will place your olla.

Determine Spacing:

Olla are best placed at a spacing of at least around 3ft (or just under 1m). This will mean that they are far enough apart that their wetting zones do not overlap. (Remember, each olla can be used to irrigate a number of plants. In Ecology Actions 2013 newsletter, they recommend the use of 5, 5 gallon ollas to irrigate a garden of 100sq ft. Placing the clay irrigation pots in your garden may initially be a process of trial and error, as you determine the best spacing for your plants' needs.

Next, dig holes for your clay pots.

Place Your Clay Pots in the Soil:

Dig a hole large enough to accommodate each of the vessels you are using. It should be deep enough so that only the top 2 inches (5cm) are above the soil surface. Place the vessels into these holes, and cover them with soil, taking care not to get soil inside your vessels.

Once your ollas are in place, it is time to fill them.

Fill Your Clay Pots With Water:

Once your olla are in place, fill each one completely with water. Note – your clay vessels should always be more than 50% full, as below this level, they will not secrete enough water for the surrounding plants. Once filled, you should only have to top off your olla every 2-3 days.

In addition to filling the olla for the first time, it is also a good idea to top water the surrounding

soil, as this will give the garden a chance to become established. Every time that you transplant very small seedlings into your olla irrigated garden, it is a good idea to overhead-water for the first week or so, until plants' root systems become established, to make sure these seedlings have enough water during their earliest stages of growth.

Placing Caps or Rocks over Your Clay Pots:

Once you have placed and filled your olla, be sure to put on caps, or place rocks to cover the tops of the vessels and reduce evaporation. These caps or other coverings should be easy to remove when you top up the water in the vessels.

Placing Plants around Your Clay Pots:

Finally, once the olla are in place and your garden irrigation system is ready, it is time to place your plants around them. It is best to use mature, well-established transplants where possible, as the roots of more established plants will be better able to reach down into deeper levels of the soil and get the water that they need.

The area directly around the neck of the olla can become overly saturated, which can lead to waterlogging of plant roots. It is generally best to place plants with moderate water requirements at a distance of around 12 inches (30cm) away from the clay pots. Any closer, and they may get too much water, any further away and they may not get enough. Think about the water requirements of each plant before deciding how far from the olla to place them.

Plants should be placed close enough together to minimise evaporation from bare soil, but far enough apart to prevent competition for water and nutrients from becoming a problem. Plant spacing will depend on the plants in question.

Companion Planting:

Placing more than one type of plant together in the same growing area can be beneficial in your clay pot irrigated dry climate garden. Different plants can benefit each other in a whole range of different ways. Combining plants, or creating polycultures, is a good way to improve biodiversity and improve the resilience of your climate-conscious, eco-friendly organic garden.

For example, planting squash, pumpkins with more upright species such as corn, and nitrogen fixers such as beans, can be a beneficial combination. The squash will act as ground cover, further helping to reduce water loss from the soil.

Different plants will also have different rooting characteristics, and will be able to uptake water from different levels within the soil, thereby making the most of the water that seeps from your clay pots.

Maintaining a Clay Pot Irrigated Garden:

In addition to making sure that you keep an eye on the water level in your clay pots and top them up as and when required, it is also important to pay attention to the general health of your garden. The best way to make sure that your clay pot irrigated garden continues to function as it should is to take care of the soil.

Adding Organic Matter to the Soil

Making sure that the soil ecosystem flourishes is largely a case of making sure that soil fertility and soil texture are as good as they can be. Adding organic matter is the best way to care and improve the soil where you live. No matter what kind of soil you have where you live, adding organic matter through mulching and other means can help improve soil nutrient content, moisture retention and texture. Water will pass less effectively to plant roots in soil that is depleted, poor in texture, or compacted. Mulching will help to preserve the soil and in addition to reducing water loss, will also add beneficial nutrients, protect the soil, and improve it over time.

Creating Shade

Another way to ensure that your clay pot irrigated garden thrives is to consider creating shade to protect plants from the sun. While establishing organic cover (from trees and shrubs) is the best long-term solution, in the short term, you can protect your fruit and vegetable garden and reduce water loss during the heat of the day by creating some shade through other means. Erecting shade netting, or even using reclaimed fabrics to create tent-like covers, could be a short-term solution.

Considering Where the Water We Use in Our Gardens Comes From

Harvesting rainwater when it does fall on your land is crucial to long term success in a sustainable organic garden. But where natural rainfall is low, we need to consider even more carefully where the water we use in our gardens comes from.

If you are lucky enough to have a mains water supply where you live, you may take water for watering your plants from the taps in your home. Mains water is sometimes treated, and can cause problems for plants. For this, and for other environmental reasons, it is best to use rainwater that you have collected where possible, or to look for other natural water sources.

Where water comes directly from an underground aquifer, or well, from belong the ground, this is of course, like rain, also part of the natural water cycle. Digging a new well may be a solution to a water crisis in some areas.

It is important to be mindful that water supplies should be conserved as much as possible – in your home as well as in your garden. The key lies in managing your water supply – whatever its source, and in using as little water as possible. Re-greening dry areas, reforming land using permaculture techniques such as creating swales, and using water-wise small-scale techniques like mulching and clay pot irrigation can all help you do just that.