

Organic Food Production

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A fundamental concept of Earthships is that gray water from the sink or tub is recycled and purified by feeding into an indoor planter before being used to flush the toilet.

Earthship create an environment in which plants are not only asthetic and contributing to the heath of our environment, but are also highly functional and play a direct role in the maintenance of the home.

Having plants that produce food within this environment makes sense and takes sustainable and independent living to another level.

Growing food in an Earthship is all about your own personal desires and lots of investigation.

When deciding what to grow, pick those plants that interest you and research the varieties.

If there is a particular plant you definitely want in your home, experiment a little and plant two of them in varying conditions. The results will depend on a variety of factors: the amount of sunlight/shade the plant recieves, the soil quality or the plants they are situated next to (for a great reference on companion planting see "Carrots Love Tomatoes: Secrets of Companion Planting for Successful Gardening" by Louise Riotte). Often you can get quite different results even when plants are within five feet of one another.

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Michael Reynolds

A prime example are two *Dracaena* plants, often called “Spikes” in plant nurseries, that were planted at the Phoenix at the same time. One plant is shaded for approximately 2.5 hours more than the other, and it has grown to over five feet within two years; while the other plant hasn’t surpassed three feet.

In an Earthship, many perennials will not work because they need to die back in the winter, so here in the Phoenix we tend to grow annuals and tropicals. Some tender perennials can do well. One example is a Butterfly Bush (*Buddleja davidii*), it grows up to six feet wide by nine feet tall. It does, however, need to be cut back every year when it starts showing signs of stress.

As far as banana trees, which are highly popular for Earthship planters, buy only dwarf banana trees. These can still reach a height of 12-15 feet, can handle most light conditions, and bear fruit at a young age.

If you are absolutely set on having a non-citrus tree in your home, one option can be to purchase a grafted tree from your local nursery. Grafting is the process of joining a stem piece to another plant in such a way that the parts are united by living tissue and continue to grow. Grafting in no way harms the tree, or the fruit produced; it simply allows the tree to be able to survive in a planter’s environment. If your local nursery doesn’t carry grafted trees, they should be able to direct you to a distributor.

If you are short on planter space, you can create some extra growing capacity by simulating small planters in the form of buckets hung from the ceiling. Each



bucket, like a planter, starts with a 4" layer of gravel, then sand and finally soil. To achieve the entry of water at a low level as with planters, insert a PVC tube that rises slightly above the soil level and extends down into the gravel. The PVC tube will allow you to "bottom water" the planter bucket, which will encourage the roots to reach the water and grow more quickly.

Pruning can improve the health of an ailing plant, make trees stronger and more productive, or direct growth to more desirable areas. Most plants can benefit from proper pruning, although some can be much more particular. In the case of grape vines, while they like to have their new growth cut back each year, they will bear fruit considerably better if their old growth is not pruned back. Some shorter-lived vegetables, such as broccoli or lettuce, can be pruned back considerably and continue to grow (the Phoenix has an eggplant that has come back for three years now.)



For best results, it is advisable to use a neutral or slightly acidic soil in your planter. The majority of plants, including food producing plants, prefer the soil to hover between 7.4-6.0 on the pH scale. Inexpensive, easy to use, pH test kits are available at most garden supply stores, where you can also get any amendments you may need to adjust your soil's pH.

The only time you should use sterilized soil is if you know you have soil-born harmful insects (such as cutworm) or disease (such as blight or powdery mildew) present in your soil, and you are trying to germinate seeds, or starting young plants.



Healthy soil is the key to healthy plants, and healthy plants attract fewer insect pests and are less susceptible to disease. Most insect pests (such as aphids and scale) will not kill your plant, but they will weaken it—which invites diseases and molds that may kill it. Not all bugs are harmful, there is a large number of beneficial species that can help you with a pest problem. The aphid midge (*Aphidoletes aphidimyza*) and convergent lady beetles (*Hippodamia convergens*) are two that will voraciously attack aphids. The white fly parasite (*Encarsia formosa*) can control white flies, mealy bugs, and so on. Many species of beneficial insects and mites are now available from commercial insectaries, and your local garden supply store or nursery should be able to order them for you.

If you don't want to introduce any beneficial insects into your home, you can try a number of ways to control an insect pest problem. Removing any infested leaves and discarding outside the home, vacuuming flying pests (like the adult white fly), and using colored sticky traps to control or monitor a variety of species. These traps are effective for white flies, fungus gnats, and imported cabbage worms. However, they will work only as monitors for thrips and aphids. Pests like mealy bugs and aphids can be physically injured and removed from plants with a strong spray of water.

Dusting the surface of dry soil with diatomaceous earth (a nontoxic mineral product, mined from fossilized shell remains of an algae known as diatoms) will dehydrate and subsequently kill any soft-bodied insect. A mixture of 1-3

teaspoons of household soap with one gallon of water can be sprayed on the plant to help control aphids, mites, and white flies. There are also organic insecticidal sprays (many containing pyrethrin, which is derived from the flowers of pyrethrum daisies, *Chrysanthemum cinerariifolium* and *C. coccineum*) that are highly effective. With any sprays, always test on a small amount of leaves before spraying the entire plant to ensure it won't be damaged.

You will find that weeds are not much of a problem in your indoor greenhouse. Screen doors help prevent weed seeds from entering the building and also help to keep any beneficial insects you may have. The only way to deal organically with weeds that may creep in, is to gently pull them out by hand.

Plants are fairly resistant to the household materials you put down the drain, including shampoo, soap and washing machine detergent, due to the large quantities of water that they are mixed with. We would, however, always recommend that you use biodegradable products. Harsher products such as bleach, paint thinner and turpentine should not be introduced to your planter and must be disposed of in another way.

All our kitchen sinks are directed to the septic system and black water cell (where the waste from the toilet goes) for a variety of reasons, including the amount of grease that can be disposed of through them.

Heather's best advice is to enjoy your plants and don't stress; your plants are living organisms and the happier you are, the happier your plants will be.

See below for a complete list of food producing plants grown at the Phoenix Earthship as of October 2009:

Veggies

Broccoli

Cabbage

Green Onions

Broccolo

Carrots