

OL 305 Assignment Four Discussion

Online Learning: OL 305

The Urban Garden: A Small Vegetable Garden for Family Food & Nutrition

Center for Sustainable Development

<https://nonprofit.csd-i.org/urban-garden-vegetable-garden-family-food-nutrition/>

How to Grow Food in the City. How your nonprofit can start a small space vegetable garden program: Fresh vegetables for at-risk urban families.

This week's resources:

OL 305 Assignment Four Homework Instructions

OL 305 Assignment Four Discussion

Manure in the Home Garden

OSU Nitrogen-Phosphorus-Potassium Values Of Organic Fertilizers

UGA How to Convert an Inorganic Fertilizer Recommendation to an Organic One

IDEP 4 Healthy Soil

Comparison of Coconut Coir and Sphagnum Peat as Soil-less Media Components for Plant Growth

Discussion 4. Soil Part Two: Soft open texture, nutrients—and the importance of worms for making compost!

In discussion three we discussed trying to find weed free soil for your containers. If you were unable to, we also discussed a couple of systems for killing weed seeds using solar heat.

This Week's Goal: Prepare potting soil and fill at least one container.

This week we're going to look at improving the quality of your soil prior to planting. There are two goals here. The first is to make sure that your soil has enough nutrients for your plants. The second is to make sure that your soil does not become compacted and is well aerated so that water can penetrate easily and there is enough air and water for the beneficial flora and fauna living in your soil. So the techniques discussed below will address both of these issues.

We will look at two techniques to do this organically. The first is adding organic amendments to your soil prior to filling a container. The second is making compost in your containers while vegetables are growing in the containers. This will improve the quality of your soil in the short-term—and in the long term too.

SOIL BUILDING TECHNIQUE 1.

Two ways to build soil by adding organic amendments:

1. Edward C Smith in his great book "[Incredible Vegetables from Self Watering Containers](#)" suggests adding limestone, blood meal, colloidal phosphate, greensand and azomite.

Here is his formula:

- One 20 quart bag of mature high quality compost
- One 20 quart bag of homemade or ready-made planting mixture (sphagnum peat, vermiculite or perlite, and limestone)
- 1/3 cup blood meal (for nitrogen)
- 1/3 cup colloidal phosphate (for phosphorus)
- 1/3 cup greensand (for potassium and trace elements)
- 1 tablespoon azomite (for trace minerals)

He carefully mixes all of these components together and then moistens the soil with water before placing it into his planters.

2. Where I live, I unfortunately don't have access to these organic amendments. So I make my own potting mix by combining my normal container soil with coarse coconut fiber (coir), compost and amendments such as chicken manure and worm compost.

Here is my formula:

My containers are 10 inches deep by 12 inches wide by 25 inches long. They hold 42 L, or 11 gallons, or 1.5 ft.³

Soil Mixture

The soil mixture is 75% soil and 25% coarse (not fine like peat moss) coir. I then add chicken manure and worm compost and mix it all up.

For approximately one container I mix:

75% Soil:	31.5 Liters	8.3 Gallons	1.1 ft. ³
25% Coarse Coir:	10.5 Liters	2.8 Gallons	0.4 ft. ³
Chicken Manure:	1/2 Gallon	8 Cups	
Worm Compost:	1/2 Gallon	8 Cups	



Left

I have a plastic storage box that I use for mixing the container soil.

Left to right: worm compost, measuring cup, chicken manure, coir and beneath—the solarized soil.

Right

Here you can see the mixed soil with the visible coarse coir—well incorporated. This is the child's size shovel that I use for mixing.



Test Your Soil. Prior to getting started building your soil a good idea might be to take a soil test. You can buy inexpensive soil testing kits at your garden nursery and also online.

This way, you can find out if perhaps soil is lacking in one key ingredient and make sure that your soil amendments will address that issue

One of the seed companies from assignment two, Ferry Morse has an [inexpensive soil testing kit](#). Lowe's and Home Depot also sell soil test kits.

[Amazon has a huge selection to choose from.](#)

I purchased the [Environmental Concepts 1662 Professional Soil Test Kit with 40 Tests](#) because it allowed me to do 40 tests—it should last me a number of years. Many of the other kits only had enough for one or two tests.

Vermiculite, Perlite and Coir (Coconut Fiber)

Perlite, vermiculite and coir are used in vegetable containers to improve drainage, prevent compacted soil and increase moisture retention. They lighten the soil, allow more air around the roots of plants and both help retain water and improve drainage.

Where I live I don't have access to perlite and vermiculite. And I had a bad problem with soil compaction in my containers. So I found that I can get coconut fiber—or coir—and that is a good alternative. Coir comes in fine and coarse. Fine is very fine just like peat moss, and course has larger pieces like the coarse fibers on the outside of a coconut shell. So it does a good job of lightening the soil.

I've tried using fine coir for starting seeds but I don't feel that the seedlings last as long in the coir as they do in peat moss—so I've shifted back to peat moss for germinating seeds.

UPDATE

In a scientific study I just found "A Comparison of Coconut Coir and Sphagnum Peat as Soil-less Media Components for Plant Growth" the authors planted crop seeds in both peat moss and coir and found that growth was impeded in the seedlings growing in coir: "These studies show that coconut coir should be used with great caution." You can download this study from the student resource page and see photos of the stunted plants.

SOIL BUILDING TECHNIQUE 2.

Composting kitchen scraps in your containers.

Because of the challenge that I had with weeds, and until I'm absolutely certain that the problem is solved, I no longer mix my soil between different containers. The reason is that I'm concerned that maybe I had a few containers that had weed seeds in them and after several years of mixing and combining soil I spread those weed seeds around to the rest of my containers.

So for the time being, after I'm done harvesting vegetables, I empty just one container into a large plastic box that I have. I then add the components of my soil mixture described above and mix it all together carefully in the plastic box with a small shovel. **PHOTO with shovel & measuring buckets**


I then put a thin layer of the soil mix in the bottom of the container, add kitchen scraps, a few worms, and then fill the rest of the container up with the soil mixture. Like this:

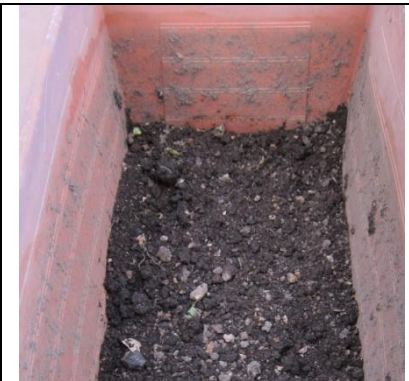


- Add mix of soil and coir: 1 - 1/2 Gallons (1 1/2 to 2 Inches Deep)
- Add Kitchen Scraps: 2 - 3 Inches
- Add a very small handful of worms
- Add soil, coir, chicken manure, and worm compost to 1 inch below top of container.

The reason for the kitchen scraps is that in my urban environment I don't really have a place for a compost bin. So years ago I discovered this technique of adding kitchen scraps to the bottom of my containers. It comes from "[trench composting in raised beds](#)" where you add kitchen scraps in a small trench, cover them with soil and plant your vegetables.

So you get a combination of natural decomposition of the vegetable scraps combined with worms helping out with the process and providing high-quality worm compost to your container. Worms also do a great job of mixing things up a little bit. They will pull things down from the top layers of the container to the bottom layers and vice versa.

That Process Looks This:

	<p>I save all of our kitchen vegetable scraps. Banana peels, onion skins, avocado skins, egg shells. We don't save anything that would be interesting to an animal such as meat scraps or bones—or things that have been cooked with meat. My next-door neighbor even saves her vegetable scraps for me.</p> <p>Just like in a compost bin, these will decompose over time. And, the worms love this stuff! So they help break it down as well creating good compost and providing worm castings which are full of nitrogen, potassium and phosphorus.</p> <p>After harvesting, I will also add the unused portions of vegetable plants and a few leaves from the garden in the container with the kitchen scraps. I have been known (when I suddenly have 10 containers to fill with soil) to go to the local farmers market and gather up bags full of their vegetable scraps to add to my containers.</p> <p>But I NEVER EVER put weeds in my container compost. Never again! Seeds are hiding in those weeds.</p>
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<p>First, I put about an inch and a half of soil mixed with coir in the bottom of one of my containers. Then, I keep this container open for a week or so and add kitchen scraps as they become available.</p>	<p>When I have between two and three inches of kitchen scraps I add a very small handful of worms.</p>	<p>I then fill the container with the soil mixture described above. You can see the coir mixed in with the soil in this photo. I usually like to let this settle for a week before planting as the kitchen scraps will compress a little bit.</p>

This process is quite clean compared to a compost pile which is open for months. My neighbor and I keep a small plastic box for kitchen scraps in our refrigerators—which will fill up in just two or three days. I then take the scraps up to the roof and put them in the open container. I get enough kitchen scraps for a container within a week. I then cover the kitchen scraps with soil. So the kitchen scraps are never exposed long enough to begin to smelling or anything. If you'd like to you can put a partial layer of kitchen scraps into your container and then sprinkle a half of an inch of soil on top to cover them up while you're waiting for the next batch of kitchen scraps to complete the two to three inches.

So this will mean if you start saving kitchen scraps and getting your containers organized they will be ready just in time to receive the seedlings you planted in week two of this course.

Let's Talk About Importance of Worms in the Soil

Earthworms eat the humus and kitchen scraps in the soil, and then convert them into nutrients, this is very good for the soil.

Earthworms will continuously:

- convert humus into nutrients that plants can use
- dig through the soil so that air can enter the soil
- improve soil structure and water drainage
- raise nutrients up from the bottom of the container to supply food for plant roots

I occasionally purchase red worms for gardening. The worms actually live for years and years in the containers so once you have an active population you won't need to add them again. If you don't have access to red worms I've heard that you can go to your local fishing supply store and buy worms there.

In summary, here are several ideas:

1. Think about whether you would like to add any amendments to your soil—whether you purchased it at a garden nursery or are making yourself.

2. Think about whether you would be willing to try the idea of adding kitchen scraps of the bottom of your containers.

3. Think about whether you would be willing to try using worms in your containers.

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