Penn State **Extension**

General Recommendations for Growing Vegetables in Containers

Basic steps include: making sure you have large enough containers, using great potting media, fertilizing, dealing with pests,and waterering.

[http://extension.psu.edu/plants/gardening/fact-sheets/vegetable-gardening/growing-great-container-vegetables/overview/leadImage_galleryzoom]

In 2008 and 2009, the Penn State Southeast Research and Extension Center (SEAREC) near Lancaster, PA and the Franklin County Horticulture Education Center in Chambersburg, PA hosted extensive trial plantings of fruiting vegetables in containers. This program was in response to increased consumer interest in vegetable gardening coupled with many years of related interest in ornamental container planters. Seeds for the trial were purchased from most of the major seed companies. Any tomato, pepper, eggplant, cucumber, or squash that was described in company catalogs or on seed packages in garden stores as ideal for containers or compact was eligible and included in this program.

Generally, all of the plants experienced some measure of success. Peppers, tomatoes and eggplant best fit the space provided by the pot, so work best in confined areas. Cucumbers perform very well, but will produce vines that quickly exceed the size of the pot. Winter squash, summer squash, and zucchini rapidly outgrow their pots and take up large areas. This first fact sheet will deal with generalities of growing vegetables in containers. Other fact sheets in this series will provide specific recommendations and comments for tomatoes, peppers, eggplant, cucumber and squash for the varieties that have been in our trials including pest management and fertilization.

1. Start with large enough containers.

In our trials, we've used 14" and 20" terra cotta colored plastic containers. The 14" pots have proven plenty large for single peppers, eggplants and cucumbers. We recommend 20" pots for most tomatoes as they get very top heavy as the fruit sizes up. Larger containers may also be necessary if you plan to put more than 1 plant per pot. The large soil mass helps to anchor the pots in the wind, provides enough volume for the large root systems of fruiting vegetables, and with so much fruit and foliage the larger volume will help to hold enough water to get through sunny days when the plants are large. Be sure your pots have plenty of drainage holes in the bottom and are nearly as tall as they are wide. Shallow, wide azalea pots do not make good vegetable pots.

Looking up the rows of young plants shortly after the trial was installed. Note the "spaghetti" irrigation lines

2. Use great potting media (soil).

Also, use the right potting media. Look for mixes that are labeled for larger pots as they usually contain coarser bulking materials such as composted bark or coir (at least 25%). Unlike peat moss, coir, the waste product of coconut processing degrades very little during a single growing season. One of the real challenges in keeping plants in pots for a long time is the bio-logical decomposition, thus compaction of organic materials like peat moss. Some peat moss is good, but mixes made primarily of peat moss are much better used for producing young plants for replanting than for large containers. Water retaining crystals may be helpful as they will help to hold water that can be available on hot summer days when plants go through water quickly. You should be able find potting media mixes designed for large containers in any good garden center. Our primary potting media for this trial was PRO Mix BRK (lots of composted pine bark) and a similar media from Frey Brothers.

3. Vegetables will not grow without nutrients (fertilizer).

One of the big advantages of using soilless media is how well they drain excess water which greatly reduces the opportunity for soilborne diseases to get started as well as encourages excellent gas exchange in the root zone. However, this same attribute also reduces the ability of the media to hold onto nutrients. Most mixes come with enough fertilizer blended in to get through about 2 weeks. Based on our experience with other large pots, we applied a pelleted, time re-lease, fertilizer such as Osmocote when we planted the pots. We used the rate on the package which is based on pot size.

An important note on time-release fertilizers: the time that they last is based on temperature (usually 70F). The warmer it is, the faster they release nutrients. A 4-5 month pelleted fertilizer may only last 2 months if the temperatures are above 85F.

Thereafter, every week the plants received an application of liquid fertilizer that was high in potassium, but low in nitrogen. Our primary fertilizer has an analysis 9-15-30 plus micronutrients, but any fertilizer with a similar ratio (1-1.5-3) will work. Look for soluble or liquid fertilizers that are designed for fruiting vegetables such as tomato fertilizers. We have found that this type of fertilizer produces the best tomatoes in field production as well. If you prefer using organic fertilizers, try using a combination of fish emulsion, kelp meal /extract, greensand, and bone meal. Kelp extracts and meal are very advantageous as they are good sources of micronutrients.

Hot peppers in 14" pots bulking up prior to fruiting

4. Just like in-ground vegetables, there are pests to deal with.

Tomatoes in containers get Septoria leaf spot. This starts out as a few spots on your tomato leaves near the base of plant, then will defoliate the plants from the bottom up. Our cucumbers, zucchini and squash got powdery mildew that got out of hand, but still provided plenty of fruit until the mildew killed them outright. The big surprise was the eggplant. Just like soil-grown eggplant, container eggplant attracts flea beetles. Peppers in containers have been disease and insect free in our trials so far. Specific pest management tools will be included on the fact sheets on each type of vegetable.

Powdery Mildew on cucumber

Collapse caused by Bacterial Wilt carried by cucumber beetles on cucumbers

5. Start with pot-friendly varieties.

We looked for varieties that were labeled for containers or described as compact. In general, the seed companies' descriptions were accurate. All of the varieties selected for the trial were more compact than typical garden varieties. The big disappointments were the winter squash and zucchini. All of the varieties trialed were certainly more compact than those intended for a traditional garden. Container plants have short internodes, making them more compact. However, all of the cucurbits (cucumbers, summer squash and winter squash) that we've included in the trial required substantially more space than peppers, tomatoes and eggplant.

6. Watering and irrigation

In our trial plots, we set up this entire study with the type of irrigation system often found at mum and container shrub growers. There are main water lines that feed narrower lines to each pot often referred to as spaghetti lines. This system is very handy as it wastes little water and is set to water the plants on a regular basis. As an added plus, since there were 81 individual containers to water and fertilize at each site, this system was very labor-friendly. At home, we hand watered the plants as needed which rapidly becomes daily as the plants bulk up. Water until it runs out the bottom of the pots. As the plants filled the pots and started making fruit, they sometimes required twice daily waterings. This need for water was especially high with the tomatoes. We don't usually place trays under pots outside, but that may be necessary under the tomatoes if you can only water the plants once a day in July and August. The trays will hold enough water that the plants roots can pull from during a hot, sunny day.

Parsley at 3 per pot. Really handy right by the kitchen door

Other plants that work quite well in containers are: basil, parsley, tarragon, rosemary, most greens, and probably okra. The vegetable pots look right at home among large flower pots on a patio or walkway. Favorite among combination planters was Thai pepper with Lantana and a mix of 3 peppers. Even if you have a more standard vegetable garden it's hard to beat the convenience of a few pots of selected vegetables and herbs right by your door.

The evaluation of these vegetables is largely due to the labor of the Penn State Cooperative Extension, Franklin County Master Gardeners and the staff of the Penn State Southeast Research and Extension Center. Of special note is the work of Hillary Snavely, Summer Horticulture Intern 2009, and Donna Berard, Franklin County Master Gardener.

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