Planning a Garden Part 2

Garden Preparation:

When we say Raised Beds, most people envision wooden boxes filled with soil. However, the term refers to any planting area that has been raised up. Raising up the planting area improves drainage and helps soil warm up earlier. By creating separate walking paths and planting areas, you can improve the soil structure of the planting areas by not compacting it with your feet.



Planting areas should be 24'' - 36'' wide and pathways should be 12'' - 24'' wide. Smaller planting areas are not an efficient use of space and wider areas will make it too hard to reach into the planting area without stepping on the soil. If you have an especially large garden, you will likely want at least one extra wide pathway 36'' - 48'' wide running down the middle of your garden for wheelbarrow access. After tilling your soil, mark off where your planting areas will be with wooden stakes on either side of your garden and then run twine between them. Shovel soil out from your pathways into the planting area. Now make a solemn commitment to never step on the planting area!

Watering and Irrigation

If you are starting a new garden, you need to consider your water source. Plants need at least an 1" of water per week during the growing season. For every day that temperatures are over 90 degrees in a given week, your garden will need an additional inch of water. For reference, this is 2/3 of a gallon of water per square foot of garden space, so a 500 square foot garden will need 330 gallons of water a week!

Luckily, it usually rains during the summer here. By getting a cheap rain gauge, you can track weekly rainfall in your yard. Just be sure to pick a day to remember to check and empty your gauge so you know week to week what you've gotten. You can also check rainfall totals at <u>www.wunderground.com</u> and looking at their monthly calendar. If we've gotten less than an inch of water that week, you will need to water.

		0.12 in	0.13 in	0.12 in	0.13 in
5 Rain . 6 Rain	7 Rain	8 Tstorm	9 Snow ① 章	10 Partly Cloudy	11 Overcast
Actual: 48° 30° Actual: 62° 24°	Actual: 72° 42°	Actual: 61º 47º	Actual: 53° 24°	Actual: 52° 20°	Actual: 59° 30°
0.01 in 0.09 in		0.62 in	🔅 MM in	0.00 in	Ø 0.00 in
Average: 47° 26° Average: 48° 27°	Average: 48° 27°	Average: 48° 27°	Average: 48° 27°	Average: 49° 27°	Average: 49° 27°
0.12 in 0.13 in	0.12 in	0.13 in	0.12 in	Ø 0.13 in	Ø 0.12 in

During this week, we only got 0.75 inches of rain, so we would need to water some.

Getting the leaves of your plants wet can spread disease, which is why plants often get sick and die during periods of prolonged rainfall. (We'll talk about how to treat plant disease at another workshop.) The best way to prevent water-borne disease is to use Drip Irrigation.





Drip Irrigation uses special hoses with spaced holes in them to drip out water on the soil surface, close to the roots of the plants. There is no splashing of water and soil onto leaves, thus reducing the opportunities for plant diseases to spread. However, drip irrigation costs money to set up and it's fairly easy to damage the hoses, so you have replacement costs to deal with too.

Overhead Sprinklers are a cheaper option that are much easier to install. If you are watering with an overhead sprinkler, it's important that you try to water only in the morning. This gives the leaves time to dry out during the day, helping to prevent the spread of disease. You can purchase a cheap timer for your spigot that will automatically turn on and off your hose, so you can set it to run from 4am to 8am and have plenty of time for the sun to dry off your leaves.



If you are watering with a **hose by hand**, then please water the soil and don't spray the leaves! It's the roots that suck up water into the plant, so there is absolutely no reason to ever spray the leaves of your plants! Wet leaves = disease! Again, watering in the morning is best, but if your schedule doesn't allow for that, then water as early in the afternoon as you can. Watering at night is the worst, as the cool, damp ours of the night will greatly encourage the growth of bad bacteria and fungi. Keep in mind the 2/3 of a gallon per square foot rule of thumb for watering. You can measure your water flow by timing how long it takes to fill up a five gallon bucket. Again, if you have a 500 square foot garden, you'll need to add 330 gallons of water every week it doesn't rain. With this in mind, please consider buying a sprinkler or drip hose!

Timing of Watering:

It's important to water very deeply once or twice a week rather than watering lightly every day. Frequent, light watering encourages shallow root growth and basically addicts your plants to frequent water. The shallow roots make the plants more susceptible to drought and getting blown over in a storm. Watering once or twice a week encourages plants to send roots deep into the soil in search of water, making them hardier. Water once a week for 4-6 hours when temps are at 70 degrees or below. Water twice a week for 4 hours each time if temps stay in the 80s. If temps stay in the 90s for a prolonged period of time, then consider a third weekly watering if plants look like they are suffering from the heat.

Mulch:

Do Not Leave Soil Uncovered. Ever.

Bare soil causes all kinds of problems:

- It encourages weeds to grow
- It increases the amount of water your garden needs
- It helps diseases and pests to spread
- It makes it harder for beneficial soil life to survive
- It can damage soil structure

Therefore, you should cover your garden with mulch as much as possible. 6-8" of mulch at all times is ideal, except in the early spring when you can uncover your soil for a few weeks to encourage it to warm up for spring planting. Once you've planted stuff, however, the mulch goes back on!

Mulch includes:	Mulch does NOT include:		
 Straw and grass clippings 	 Hay (contains weed seeds) 		
Shredded leaves	Fresh wood chips		
• Wood chips that are at least one year old	Fresh Sawdust		
Compost or composted manure	• These last two will suck nitrogen out of your		
• Shredded paper (the founder of Grow	soil and cause stunted plant growth! The use		
Appalachia swears by shredded office paper)	of wood chips that have sat for a year or		

sawdust that has sat for at least 3 years is	
okay.	

Mulch heavily and mulch often! Mulch is awesome for improving soil health, quality and structure! Mulch conserves water and makes your plants' roots happy! Mulch prevents soil from splashing on your plants' leaves and helps prevent soil born diseases from spreading! Mulch kills weeds! Mulch is a garden miracle!

Companion Planting

Companion planting is the idea of putting different plants next to each other because they will do something beneficial for each other. While there is a lot of non-scientific information floating around on the internet, the basic idea of plant diversity is a sound one. Non-homogenous plantings attract good bugs, repel bad bugs and help improve the structure of the soil. **At its most basic, we recommend about 5% of your garden be devoted to flowering plants.** This include flowering herbs (basil, dill, cilantro, etc), edible flowers like nasturtiums, and non-edible flowers of all kinds. Flowers provide food for predatory insects like lady bugs and wasps, and these critters will do the hard work of eating the bad bugs for you. We'll talk more about insect control in another workshop. For planning purposes, just include some flowers in your garden!

Other Companion Benefits:

- Planting legumes (beans and peas) near plants that need a lot of nitrogen, like corn, tomatoes, and all leafy greens.
- Planting short crops like greens and herbs in front of trellised crops, like tomatoes and cucumbers to maximize the space in your planting beds. Trellises can also be used to create some shade for plants like lettuce and spinach which don't like the summer sun.
- Create diversity in your rows by breaking up big plantings of pest sensitive crops like brassicas, cucurbits, and nightshades. Herbs and flowers can put off chemicals that confuse pests, helping to keep them off your crops.

Bad Companions?

The science behind many common companion planting dos and don'ts is quite questionable, and it can be hard to track down the sources of these recommendations. For the most part, I would not rely on lists of "good" and "bad" companions, as they are likely to be bunk. However, there are plants that do produce toxins that inhibit the growth of other plants. This is called "allelopathy" and the two most common culprits in our yards are walnut trees and rye grass. Walnuts are toxic to members of the Nightshade family and gardens should not be located anywhere near a walnut tree. Rye grass suppresses seed germination, which is why it is commonly used in winter cover crop mixes to help prevent weed seeds from growing in the spring. Cover crops containing rye need to be killed at least 3 weeks before planting to eliminate the allelopathic compounds in the plant material.

Crop Rotation:

Crop rotation is a bit of an advanced subject and something you will master over a few years. With a garden, you only have so much space and you're going to reuse that space year after year. If you plant the same thing in the same spot year after year, that plant will drain nutrients out of the soil and increase the amount of disease and pests. There are three types of crop rotation:

- Seasonal to take advantage of different growing conditions
- Plant families to reduce disease and pest pressures
- Nutrient use (crops use nutrients differently)

Many people think the growing season lasts from May to September, but we actually have a climate that will support growing food 12 months out of the year. Doing this successfully takes some knowledge of varieties and lots of trial and error. You can't grow tomatoes in January, but you can keep your salad bowl filled! A good seasonal rotation for a single planting bed might look like:

Spring	Summer	Fall	Winter
Peas	Peppers	Broccoli	Salad Greens

Thinking seasonally allows you to maximize the productivity of a small piece of land. For now, we want you to concentrate on planning for summer crops, but we will have a Fall Gardening Class coming up in August.

Plant Families

Rotating plant families helps to prevent disease outbreaks and reduce feeding by insect pests that overwinter in the soil. Many plants are susceptible to diseases that are living in the soil. If you plant the same crop in the same spot over and over, the disease pathogens will multiply quickly and infect your plants. By rotating crop families, you starve the bad fungi and bacteria, thus keeping their levels in the soil low. The standard time for rotating to prevent disease is 3 years. If you have a bad outbreak of something, you may want to consider waiting longer than that.

The plant families with the most susceptibility to disease are:

- Nightshades (tomatoes, peppers, potatoes, eggplant)
- Brassicas (cabbage, kale, broccoli, cauliflower, radish, turnips, arugula, etc)
- Cucurbits (cucumbers, squash, melons)
- Grasses (corn)
- Legumes (beans)

Nutrient Use:

Different crops need different types and amounts of nutrients in the soil. Corn and tomatoes are very heavy feeders and you will want to rotate them with crops that are lighter feeders, like potatoes or

carrots. Legumes (beans) will actually fix nitrogen, a very important nutrient, into your soil, so they are good to rotate through your garden to help boost soil fertility. Root crops tend to use up Phosphorus, leaf crops use up nitrogen and fruiting crops use up potassium. By rotating these types of feeders, you will reduce the amount of fertilizer you will need to add to your garden in a given year.

	Year 1	Year 2	Year 3	Year 4
Row 1	Legume	Leafy Green	Fruiting	Root Crop
Row 2	Leafy Greens	Fruiting	Root Crop	Legume
Row 3	Fruiting	Root Crop	Legume	Leafy Green
Row 4	Root Crop	Legume	Leafy Green	Fruiting

Again, Crop Rotation is an important tool for keeping your plants happy and healthy, but it is an advanced technique that you will learn more about as you garden.