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Garden Soils and Vegetable Selection in North Texas

A vegetable garden can be one of the most rewarding landscape projects you've ever taken on! More and more people are taking an interest in vegetable gardening, not only from a hobbyist's interest, but also from finding a home garden to be a very practical and cost-effective way to bring home the very freshest possible produce. The organic food movement is also responsible for encouraging more interest in the home garden - after all, you'll know everything that's been done to your home garden's vegetables the whole time you care for them.

Now comes the question from many a new gardener - "How do I do this?" That's exactly the question this handout should help with.

I. Preparing a Vegetable Garden

What should a garden soil do? The "perfect" garden soil varies from crop to crop, but generally, a great garden soil will drain well, have a high content of organic matter to nourish the plant and the beneficial small insects and microbes and fungi within the soil, hold enough moisture that the roots of your plants are never dried out, and is easily worked or tilled - without being so light that your plants topple over or are uprooted in the wind. Sounds impossible, right? Well, it isn't, but it does take some work to turn North Texas gumbo into a soil your plants produce well in.

Most of us in the Dallas area have a clay soil - and not just any clay soil, but a particularly packed hard, nutrient-less, no organic material present and mostly "dead" gumbo that's pretty much opposite of the garden soil described above. Take heart! You can still use the soil you have, it just needs some work. We recommend at least a 2" layer of expanded shale and at least a 2" layer of compost be worked into new garden areas, and at least an inch of fresh compost every time you till the garden for a new season's crop. The expanded shale is a wonderful newer product for our area - it's shale (the stone) that's been run through an enormous rotary kiln to heat and expand the stone, leaving a very porous material that holds tight clays apart, long term, and holds both moisture and air within the stone itself. This should be a one time investment, as the stone won't decompose as your compost will.

The compost, as it degrades, will feed the root systems of your plants and encourage beneficial insects (earthworms, for instance), microbes, and fungi within the garden's soil, all of which have important and varied functions within the soil to produce stronger and healthier plants. Add compost every time you till the garden, and top dress with compost in your flowerbeds and gardens.

The net effect of both of these amendments will be a more easily worked soil, with spaces for both air and water, in an environment much more friendly to plant life. Over time, the earthworms, bacteria, and fungi's life cycles within the soil will change the structure of the soil on

a level too small to be done manually, layering biomass within the structures of the clay. It's a good thing!

As a note, no matter how tempting it may be to do so, never remove the clay soil, no matter how gummy it starts out as, to replace the soil in the garden area with a better draining soil, such as a sandy loam. We have folks ask often about removing the clay anywhere from 8 to 12" deep and filling with a better base soil. Don't do it. The new garden will be a swimming pool, essentially, as water will not drain from it and will pool at the bottom interface between the native and new soils.

After determining how to amend the soil, the next question, logically, is where to place the garden within the yard, and decide how large a garden to create. The correct placement of the garden in the yard is to place it in an area which receives full sun. Plants require a lot of energy to grow, and even more to make the delicious vegetables we're intending to harvest. Help your plants out - give them the sun they need to succeed. As for the size of your garden, how many friends do you want to make with delicious, homegrown food? (An 8x12 or 8x16 garden is a good starting size, usually, but you'll know for sure what your own needs are after you go through your first year. Some crops take up a lot of space!)

II. Succeeding With Soil Nutrition

There's a little (very basic) chemistry that every gardener needs to know to grow a healthy, strong crop in North Texas. Without getting into unnecessary detail, there are three chemical elements that are absolutely necessary - in abundance - to grow plants in a healthy fashion. Those elements are expressed as N-P-K, and those letters stand for the following:

1) N - Nitrogen - the absolutely most essential element for plant growth, nitrogen is necessary for healthy, green leafy growth. You won't get anywhere without it on most vegetables!

2) P - Phosphorus - phosphates are responsible for rooting, blooming, and fruit production. Feed phosphates and see yields increase.

3) K - Potassium - potash is required for the overall vigor of the plant - K isn't as flashy and doesn't push production as visibly as the other two major elements, but a plant low on potassium is a weak and spindly plant indeed.

Most of North Texas' soil is severely deficient in nitrogen, and although many of us have acceptable-to-high levels of phosphates and potash in our soil, a garden in production uses a lot of these two nutrients and they'll have to be added from time to time. What you're looking to do is to maintain a happy medium of all of these nutrients - neither too high, nor too low. Don't worry too much about over-fertilizing your vegetable garden. We mention it as a possibility but most vegetable gardens are underfed, not overfed. As long as you don't go overboard (say, more than 1-2 pounds of a conventional vegetable garden fertilizer per 100 square feet per application), you'll be fine.

The soil in the Dallas area also tends to be very high pH. pH is a measurement of soil acidity/alkalinity, with pure water being a 7.0, which is in the middle of the scale and neutral. Our soil (and tap water, in our area) is alkaline - high pH, and more plants than not appreciate a mildly acidic soil. Don't sweat this part too much, because a living garden soil will moderate some of the worst excesses of pH and still support healthy plants, but adding used coffee grounds or sulfur

occasionally to the garden area can be helpful to lower pH if you start seeing iron deficiencies in your plants (dark green veins, yellow tissue between on leaves). If your pH is fine and you still see this, then add greensand or iron sulfates as well.

If you would like a detailed analysis of your soil, the Texas A&M Extension Service offers a range of analysis services. Download a price and order form (with instructions on how to go about sending in a sample) at <http://soiltesting.tamu.edu/files/soilwebform.pdf>. The least expensive "routine analysis" will answer most questions that affect a home gardener.

For an average feed for your vegetable garden, for our organic customers we recommend dry molasses at the rate of two pounds per 100 square feet, and another two pounds per 100 square feet of a 4-3-2, 5-3-2, or 6-2-4 balanced organic fertilizer. (Any ratio around these is acceptable.) For heavy fruiting crops (tomatoes, peppers, squash, etc.), add 1/2-1 pound of rock phosphate per 100 sq. ft. to the area as well. For our conventional approach gardeners, add one to two pounds of 8-10-8 or 11-15-11 (Any ratio around these are acceptable) per 100 square feet.

III. Selecting and Planting Your Vegetables - Start to Finish

A frequent question we hear is, "Should I plant seeds or started plants? Isn't it hard to sprout a seed?" We do have preferences for particular plants to be grown from starters, but it's not because seeds are hard to sprout - quite the contrary, if most seeds were all that hard to grow, we wouldn't have weed problems in the lawn! We usually recommend starters on certain plants because they'll produce a longer crop cycle planted as a started plant instead of being sown outside directly from seeds, or take a long time to make a young plant. Many plants will make both of our lists!

Common Vegetables Recommended Only From Seed:

Beans, Beets, Carrots, Corn, Garlic (pods), Peas, Potatoes (seed potatoes), Radishes

Common Vegetables Recommended From Seed Or Starts:

Broccoli, Cabbage, Cauliflower, Chard, Collards, Cucumber, Eggplant, Kale, Lettuce, Muskmelon, Mustard, Okra, Pumpkin, Squash, Watermelons

Common Vegetables Recommended from Starts (preferred):

Onions, Peppers, Tomatoes

The next question would be, "When do I plant which vegetable?" Refer to the attached planting guide for vegetables in North Texas for the common planting times for any particular common vegetable. If you have an unusual vegetable, or one not listed on the handout, almost every seed grower prints instructions on the backs of their seed packaging with planting times related to "x" weeks before or after the last frost in the spring or first frost of the fall. According to the Extension Service, our first frost of the Fall in North Texas is around the 16th of November and our last Spring frost is around the 16th of March. These are just averages and can hit to either side, but it's a good average number to work from for planting.

The next question after that would be, "But how early can I really plant? I want a harvest as soon as possible." Many vegetables can take some cooler weather, and some just can't - tomatoes and peppers, for example - but the urge to have the best producing peppers and tomatoes often have people planting earlier than they probably should. We've seen every conceivable way to try to keep vegetables in-ground warm for late frosts, but the most effective still remains a good frost

cloth carefully applied over the vegetable garden, or a cold frame with plastic. Push the plantings as early as you'd like, as with many crops, the earlier they get set in, the longer (or earlier) the harvest will be, but be prepared to replant if Nature decides you planted too early!

The layout of your vegetable garden is the next consideration, the question we call "Rows or Grids?" By and large, this is a personal preference issue - there's a few vegetables (most notably, corn) which should always be planted in blocks to ensure good wind pollination, but most plants don't care all that much. Generally, we'll lay out small gardens in grids to maximize production per square foot, and row plant larger gardens, which are easier to weed, water, and harvest for most folks. Seeds are planted much more closely together than started plants, and thinned as they grow up an inch or two to remove weaker plants and provide more room for the healthy young plants to grow. (Not every seed sprouts!) Thinning is not a waste of time - young lettuces, cabbages, and other greens are tasty and edible from a very young age, so think of your thinning task as the first harvesting you'll do all year.

After you've prepared your soil, selected your plants and transplanted your seeds and seedlings, now you just need to maintain your plants properly for a while! After your seedlings get tall enough to stand up above mulch, add a 2-4" layer of clean straw or hay (without seedheads) or a conventional mulch to maintain soil moisture and to help prevent weeds from taking hold in your worked area. Weed as you need to, but personally, I take a page from my mother's garden - see a weed seedling, drop another handful of straw on it. Keep weeds out of your garden, as they'll compete for the water, nutrients, and sunshine you'd prefer to see go to your tasty vegetables. Five minutes a week prevents heroic, three-hour weeding sessions six or eight weeks down the line!

"How often should I water?" Plant vegetables that appreciate heavier watering (melons, squashes, etc.) to one side of your garden. There is no way to correctly water all of your garden on a fixed schedule. At all. Ever. Air temperature, the depth of your mulch, cloud cover, wind speed, the maturity of the plants' root systems, the soil's organic matter content and drainage, all of these variables make a fixed watering schedule a recipe for failure. The ideal soil moisture testing device still remains - your finger! If your soil is dry down to the second knuckle of your finger in a particular area of your garden, water that area strongly, preferably in the morning. If it's moist when your finger is to the second knuckle - leave it alone. You'll get a good feel for your vegetables in time, on what needs water and what does not, without testing the soil each time, but if you're ever questioning if a plant needs water, it's still my personal favorite method, and we use the "finger test" routinely.

An important part of your garden's maintenance needs to be your fertilization program. Fertilize the garden regularly and as needed - water soluble fertilizers should be applied every five to seven days, and most granular products every four to eight weeks during the growing cycle. Fertilize generously to keep your vegetable garden growing vigorously - well fed plants are healthier plants, less prone to sickness or insect infestation.

"When Good Plants Go Bad." Every garden, no matter how perfectly maintained, will eventually have something go wrong at some point. If you don't know what's damaging your plants, by all means, come and ask us - as we can help with safe solutions for most problems. On occasion, there will be a particular plant, or whole section of vegetables, which do not produce as you wish, or are just hosting insects or diseases to infest the rest of your garden. It may be a bit wrenching,

but every gardener has to learn when to hold on to a plant (treat it), and when to let it go (remove it). Do not be afraid to remove a poorly performing or infested plant.

We'd like to spend a bit of time giving a few pointers on what is probably the single most loved home garden plant - the tomato. Tomatoes need to be protected from all frost, so should not be planted before mid-March at the earliest, with many experienced gardeners waiting until Easter weekend to transplant them to the ground. Common problems we see at the nursery include sunken, blackened ends on tomatoes, tomatoes that don't produce fruit, tomatoes that crack, and tomatoes that have sunken white-to-tan areas irregularly on the tomato, but usually on one side.

Sunken, blackened ends on tomatoes are caused by blossom-end rot, which can be solved with an application of calcium. Plant your tomatoes with rock phosphate (it's calcium phosphate) or apply a sprayable blossom-end rot preventer regularly. Tomato plants that don't produce a yield at all can come from two causes - either a lack of wind or vibration (or insects visiting the blooms) to knock the pollen around within the bloom to cause pollination, or you have a larger-fruited type in very cool or very hot weather. Thump flower clusters every day or two to help the pollen move around if your tomato plants aren't producing. Larger tomato types don't like the stresses of very cool or very hot weather when they're setting fruit, try maintaining even soil moisture and keep your plants well fed to reduce stress on the plants. Tomato cracking is also addressed with proper, even watering, as tomatoes crack when they're going from one extreme of dry to another extreme of being well watered, back and forth. Sunken white-to-tan areas on tomatoes are simple sunburn. If your tomatoes are sunburning, or cracking too much, start harvesting the tomatoes green, when they just start to ripen, and let them ripen on your windowsills inside.

IV: Harvest Time

The timing of harvesting is also important, as bigger is not always better. Carrots and zucchini, for example, are much tastier harvested as younger plants, and tomatoes and peppers harvested regularly will have fewer disease problems and get to making more production sooner than otherwise. When you have an exhausted plant that has reached the end of its' productive cycle, remove it, since a stressed plant is just a harbor waiting for insects and disease.

Tomatoes and peppers, particularly, you should harvest as soon as the fruit has reached the desired size and ripeness. With peppers, the fruit can be harvested when it's the correct size green (which is fine) or you can allow it to become whatever mature color that particular type of pepper becomes (red, yellow, orange, brown, purplish, whatever - there are peppers that mature to each of these colors) before you harvest it, but don't leave the pepper on past the time that it turns good color. Most leafy vegetables are edible any time you care to pull them (cabbages, lettuces, etc.). Many plants will tell you when it's time to harvest them, as your onion and garlic tops will begin to brown, your potatoes will flower or the foliage will start to wither, and so on.

When the time of the first fall frost/freeze comes up, it's likely you'll still have plants (tomatoes, particularly) in production. Harvest every fruit, even green, and allow it to window ripen. Much of it will still be just fine, although some green tomatoes may not have been mature enough to ripen properly.

We hope that you find this information useful. If you'd ever like advice, from vegetable gardening to any landscape question you have around the yard, come by and visit us!