

SOIL

Prepare Your Perfect Garden

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by Tess Pennington

"If I wanted to have a happy garden, I must ally myself with my soil; study and help it to the utmost, untiringly. Always, the soil must come first." - Marion Cran

Growing your own food successfully is a constant process of learning which techniques work best for you and your plants. More often than not, we learn from the mistakes we make along the way, or through simple bits of advice from other gardeners. These short cuts handed down from other gardeners can save us valuable time. If you do not have any friends who are gardeners, consider contacting your local Master Gardeners Association. They regularly have classes and can provide you with indispensable knowledge of native plants that grow in your area, how to cultivate the soil, companion gardening, reducing weeds and more.

The advice I have learned along the way is the importance of preparation of the garden beforehand. By doing so, it will give your garden beds time to condition and ensure there are beneficial bacteria present in the soil before planting. Knowing how big your garden beds are, what quality your soil is and how many plants you can plant are important questions to ask yourself before you get your garden started. Keeping a gardening journal with ideas and plans will help you stay organized along the way. As well, there are many gardening apps for phones that can be used too.

One of the largest adversaries against the garden is time. While we all have the best of intentions in the beginning of the summer and plan on spending more time tinkering in the garden, neglect and time spent away from the garden can prevent it from thriving.

FOLLOW THE LAW – THE GARDENING LAW, THAT IS

What you may not realize is there are laws that you must follow to ensure your plants have the best environment to thrive in. These gardening laws are essential in giving your plants a fighting chance at giving you a big harvest.

1. Start with good quality seeds. Seed quality plays an important role in a successful garden. As such, it is important to know seed characteristics such as trueness to variety, germination percentage, purity, vigor, and appearance are important to farmers planting crops and to homeowners establishing lawns and gardens. Further, growing heirloom seed varieties will ensure you can collect the seeds for subsequent harvests.

2. Feed the soil. Your plants need nutrients in order to grow healthy and produce fruit and vegetables. Ensuring they have these present in the soil will save you time and money on fertilizer. More on composting to follow.

3. Balance the amount of sunlight with the ideal temperatures. Who knew gardening was a balancing act. But in order to get a good harvest, you have to balance

the amount of sunlight your plants gets with the ideal temperature. If your garden or patio area receives full sun all day long, it can wreak havoc on your gardening endeavors. Keep in mind that plants need at least six to eight hours of sunlight to grow to their maximum potential. That said, the temperature plays a key role in plant health. Keeping plants between 70-90 degrees F will help the plants grow to their potential. Transplants especially will benefit from shade cloth. There are different percentages of shade cloth ranging from 25% – 70% or more. This will allow you block out the heat from the sun and help the plant thrive. All you need to do is drape the cloth over a support structure. Many gardeners use ladders, PVC hoop-style structures, or purchase products specifically manufactured to support shade cloth.

4. Regular watering will prevent plant stress. Having an irrigation system in place with a timer will be less work for you and will ensure your plants are getting a balanced amount of moisture at each watering. This also will help you not over-water your plants which can be just as bad as not watering at all.

5. Protect the roots with mulch. Mulching the roots is a trade secret many successful gardeners use to protect the plant's delicate root structures and prevent weeds from growing. You can use fallen leaves, straw, wood chips or newspaper to shade the roots. This will keep the roots moist and not stress the plant out during the warmest parts of the day. As well, the natural mulch will compost down over time and help your soil in the process.

6. Talk to your plants. I know that I'm going to get some comments about how crazy I am for listing this, but I believe in talking to your plants. While there is no evidence to suggest that plants respond to affection, some plants do have a limited ability to communicate with one another. Though plants lack the ability to receive and process sound waves, evidence suggests that some plants can communicate with each other through the use of chemical signals. Additionally, vibrations that travel through the soil or in the air may have an effect on plant growth. It may be possible for plants to pick up on the vibrations created by human speech and maybe even by the chemical signals that humans release without knowing it.

7. Give your plants some friends. Many use companion planting in organic gardens to let nature do most of the work instead of chemicals. In theory, using this type of gardening, essentially creates an agroecosystem. Nothing goes to waste and everything is interdependent. The bi-products of these plants (dead heads, frail looking plants, etc.) can be used as soil conditioners. This makes for great efficiency and good use of space.

Above all, visit your garden regularly. When you spend time in the garden, you will be less likely to neglect it. By following these simple laws of gardening, you can have a successful garden, year after year.

SOIL QUALITY AND PLANT NUTRITION

While soil type varies from region to region, most plants thrive in slightly acidic, sandy loamy soil. However, few of us possess this perfect soil balance. Therefore, you may have to condition your soil to get the right balance. There are many ways to test your soil, but one of the best ways to test of soil condition is that age-old gesture of the gardener— is to test it by hand. Pick up about half a cup of earth in your hand. Now squeeze the soil together so that it forms a ball. If the ball of earth can readily be shattered by pressing with your fingers or dropping it from a height of 3 feet or so, it is dry enough to dig. If the ball keeps its shape or breaks only with difficulty into solid sections rather than loose soil, it still contains too much water. Clay soil that is too wet will feel slick when rubbed between thumb and forefinger. If it is very wet (75 to 100 percent moisture), the mass will be pliable, and a ribbon of earth can be drawn out and pressed with your finger. Working soil too wet can spoil its texture for the whole season.”

ESSENTIAL NUTRIENTS FOR SOIL

There are essential nutrients that should be present in soil in order for a plant to thrive. These nutrients are broken down by primary, intermediate and micronutrients.

The **primary nutrients** form the basis of the N-P-K label on commercial fertilizer bags. These major nutrients usually are lacking from the soil first because plants use large amounts for their growth and survival. Understanding what these primary elements do to benefit plants will help you stay on top of any deficiencies the plants may have.

- Nitrogen - Helps plants with rapid growth, increasing seed and fruit production and improving the quality of leaf and forage crops.
- Phosphorous - Helps with the transformation of solar energy into chemical energy; proper plant maturation; withstanding stress, effects rapid growth, encourages blooming and root growth.
- Potassium - Potassium is absorbed by plants in larger amounts than any other mineral element except nitrogen and, in some cases, calcium. As well, this nutrient helps in the building of protein, photosynthesis, fruit quality and reduction of diseases.

Intermediate nutrients include: sulfur, magnesium, and calcium. These are referred to as macronutrients and are usually present in the soil, so fertilization is not always needed. Also, when creating a more acidic soil, large amounts of Calcium and Magnesium should be added when lime is applied. Sulfur is usually found in sufficient amounts from the slow decomposition of soil organic matter, an important reason for not throwing out grass clippings and leaves.

- Sulfur - Essential plant food for production of protein that helps to promote activity and development of enzymes and vitamins. As well, it assists in chlorophyll formation, improves root growth and seed production and helps with vigorous plant growth and resistance to cold.
- Magnesium - Magnesium is part of the chlorophyll in all green plants and essential for photosynthesis. It also helps activate many plant enzymes needed for growth.
- Calcium - Calcium, an essential part of plant cell wall structure, provides for normal transport and retention of other elements as well as strength in the plant. It is also thought to counteract the effect of alkali salts and organic acids within a plant.

The remaining essential elements are the **micronutrients** and are required in very small quantities. Recycling organic matter such as grass clippings and tree leaves is an excellent way of providing micronutrients (as well as macronutrients) to growing plants.

- Boron – This element helps in the use of nutrients and regulates other nutrients, aids in the production of sugar and carbohydrates and is essential for seed and fruit development.
- Copper - Important for reproductive growth and aids in root metabolism and helps in the utilization of proteins.
- Iron - Essential for formation of chlorophyll.
- Chloride - Aids plant metabolism. Chloride is naturally found in the soil.
- Manganese - Functions with enzyme systems involved in breakdown of carbohydrates, and nitrogen metabolism. Soil is a source of manganese.
- Molybdenum - Helps in the use of nitrogen. Soil is a source of molybdenum.
- Zinc - Essential for the transformation of carbohydrates. Regulates consumption of sugars and is part of the enzyme systems which regulate plant growth.

START EARLY AND STAY ORGANIZED!

Your gardening can be a year-round endeavor, but to do so, you need to stay on top of your gardening plans. To get your garden plans on track, start planning before the plants hit the soil. These seven tips and pointers can help you stay organized in your endeavors.

Start a garden journal to track garden plans. Beforehand, find out which plants you want to grow and where you plan on placing them. Looking up a garden calendar for your region is a great way to get on the fast track on garden planning. Record your findings in a garden notebook to keep track of your plans. Keep in mind that many herbs thrive in many soil types and seem to grow better in the outer edges of the garden bed where they do not get frequent watering. Tomatoes and corn are heavy feeders and need frequent watering. Therefore placing them in the middle of the garden where water is most present would be advantageous. As well, knowing if plants are shallow rooted like many lettuces and greens are important too because you can plant them around heavier-rooted plants and this will create a living shade for the heavier root systems.

Repair or adjust garden beds. Sometimes, garden beds or garden fencing can become damaged. Before you have planted your garden, make sure the beds or fencing is repaired. Now is a good time to erect trellises or insert sturdy stakes to hold them up. Since you won't want to walk on your garden while it's growing, add a few pathways.

Don't work the soil too early. As advantageous as it is to get a head start on the garden, working the soil too early is a mistake. When the earth is still saturated with melting snow or spring rain, it is easily compacted by treading across it, or even worse, driving heavy equipment on it. In addition, large clumps of wet soil turned over at this time will only bake into impervious clods that will be very difficult to break up later. The best time to work the soil is after the snow has melted and there is no threat of extreme storms. Many gardeners suggest turning the soil when it is *moist* and **not wet**. Turn soil to a depth of 12 inches. You can do this with a tiller, spade or shovel. This will aerate the soil and loosen it up to get it ready for planting.

Clear debris. Removing any leaves, pine needles or debris from the garden will ensure that your transplants will have the best living conditions and the soil will drain efficiently. Because many compost piles are short on carbon-rich materials, add the debris and items you remove into the compost pile.

Declare war against weeds. Weeding now, while the weeds are still young and tender is the best time to remove. Waiting until their root systems have established and the weeds have grown will make it more difficult to remove. As well, by removing them now,

you can add any additional soil amendments to make the soil more fertile. Another method is to cover the bed with a thick (3-4") layer of mulch or use a weed and feed to help keep weed seeds from germinating. As well, you will want to "dead head" and clear dead foliage and add to the compost pile.

Add lots of organic matter. Adding a layer of compost, dehydrated cow manure, shredded leaves, well-rotted horse manure (call nearby stables) to the top layer of the soil will help increase your soil's inner ecosystem. Further, it will retain water more efficiently, be a safe haven for beneficial insects that live in the soil and give nutrients to your plants during the growing season. Most soils can stand a nice addition of organic matter for needed improvement. Mix it with the native soil, 50/50, or even more, if needed. Of course, if the soil stubbornly resists improvement, resort to setting raised beds atop it and filling these bottomless boxes with excellent, organically rich soil.

The spring is the best time to add soil amendments. Resist the urge to dig the bed. Established beds have a complex soil ecosystem which is best left undisturbed. Nutrients added from the top will work their way down into the soil. I usually add a lot of compostable material (egg shells, paper, food scraps, bits of cardboard, etc.), then I add layers of soil amenders, add some water and leave the bed alone. Some of my favorite soil amenders are:

- Earthworm Castings
- Organic Compost
- Phosphate
- Powdered Oyster Shell
- Green Sand

I usually mix these up together in a wheelbarrow and add them to the garden every growing season.

Set up an irrigation system. Setting up an irrigation system that is set to a timer will help you stay organized in your gardening. The best time to water plants is in the early morning for about 25 minutes. This will give the plants time to soak up the moisture before the sun evaporates it.

STAY AHEAD OF THE GAME

Properly preparing your garden beds can easily yield more than double the harvest of an unprepared bed. Now that your beds are cleared of the debris, the soil the just right and there is already a layer of organic material for the plants to feed on, and days are

starting to warm up, it's planting time! You are now months away for your homegrown harvest!