





# The Gardener's Handbook



THE  
GARDENER'S  
HANDBOOK



# Table of Contents

## CHOOSING A LOCATION ..... 10

- **Getting Enough Sun for Your Vegetable Garden**
- **Making the Garden Spot Suit Your Flowers**
- **Making Your Flowers Suit Your Garden Spot**
- **Other Elements to Consider**
- **Choosing a Spot that Looks Good**
  - Consider the Purpose*
  - Use What You Already Have*
  - Cover Up Problem Areas*
  - Make it Suit Your Overall Look*
- **Laying Out the Outline**

## PREPARING THE LAND ..... 15

- **Removing Weeds and Grass**
  - Use Your Shovel*
  - Make Some Sod*
- **Loosening the Dirt**
  - Use Your Handy-Dandy Shovel Again*
  - Let a Machine Do the Work with a Tiller*
  - Using a Garden Rake*
- **Amending the Ground**
  - A Look at Nutrients*
  - Adding Nutrients to Your Dirt*
  - A Look at pH*
  - Amending the pH*
  - A Look at Texture*
  - Testing the Texture of Your Dirt*
  - Improving the Texture*
  - Using Horse Manure*
  - Other Organic Additives*
- **Another Option for Preparing Your Garden Bed**

**PLANTING YOUR GARDEN .....24**■ **Selecting Healthy Plants for Your Garden**

Nursery Quality  
 Foliage  
 Plant Shape  
 Insects and Disease  
 Roots  
 Stem  
 Weeds  
 Root Ball  
 Flowers Vs. Buds

■ **Choosing Between Plants and Seeds**■ **Planting Seeds in Your Garden Bed**■ **Planting Plants in Your Garden**

Choosing the Best Time  
 Preparing the Plants for Transplant  
 Digging the Hole  
 Removing the Plant from the Pot  
 Helping a Root Bound Plant  
 Plants in Peat Pots  
 Watering Your New Plant

**MULCHING YOUR GARDEN .....30**■ **Chipped Hardwood Bark Mulch**■ **Cedar Mulch**■ **Softwood Bark Mulch**■ **Compost as Mulch**■ **Crushed Corncobs**■ **Hay**■ **Spent Hops**■ **Buckwheat Hulls**■ **Cocoa-bean Hulls**■ **Peanut Hulls**■ **Pecan Shells**■ **Lawn Clippings**■ **Leafmold**■ **Leaves**■ **Pine Needles**■ **Cypress Mulch**

- **Manure**
- **Wood Chips**
- **Mushroom Soil**
- **Peat Moss**
- **Sawdust**
- **Straw**
- **Groundcover Plants**
- **Crushed Rock, Pebbles, and Gravel**
- **Black Plastic Sheets**
- **Clear Plastic**
- **Landscape Cloth**
- **Aluminum Coated Foil and Plastic Sheets**
- **Rubber Tire Mulch**
- **Choosing the Mulch that is Best for You**
- **Applying the Mulch**

**KEEPING TRACK OF YOUR PLANTS .....41**

- **Keeping the Information That Came with the Plant**
- **Using Stakes**
- **Keeping a Garden Journal**

**MAINTAINING YOUR GARDEN .....43**

- **Watering Your Plants**
- **Weeding Your Plants**
- **Deadheading Your Plants**
- **Staking Your Plants**

**GETTING RID OF INSECTS .....46**

- **Spittlebugs**
- **Ladybugs (or Lady Beetles)**
- **Fungus Gnats**
- **Viburnum Leaf Beetle**
- **Identifying Leaf Galls**
- **Natural Pesticides**
  - Insecticidal Soap*
  - Bacillus Thuringiensis (Bt)*

Neem  
 Horticultural Oil  
 Pyrethrins  
 Sabadilla  
 Rotenone

**GETTING RID OF FUNGAL GROWTH .....56**

**WHEN TO HARVEST VEGETABLES .....57**

- **Asparagus**
- **Beans**
- **Beets**
- **Broccoli**
- **Brussel Sprouts**
- **Cabbage**
- **Carrots**
- **Cauliflower**
- **Corn**
- **Cucumbers**
- **Eggplant**
- **Garlic**
- **Kale**
- **Kohlrabi**
- **Leeks**
- **Lettuce**
- **Muskmelon**
- **Onions**
- **Parsnips**
- **Peas**
- **Potatoes**
- **Pumpkins**
- **Radishes**
- **Rutabaga**
- **Swiss Chard**
- **Spinach**
- **Squash**
- **Tomatoes**
- **Turnips**
- **Watermelon**



**LONG LASTING PERENNIALS .....64**

- **Bellflower (*Companula*)**
- **Black-eyed Susan (*Rudbeckia*)**
- **Blanket Flower (*Gaillardia*)**
- **Catmint (*Nepeta*)**
- **Coneflower (*Echinacea purpurea*)**
- **Fringed Bleeding Heart (*Dicentra Formosa* and *Dicentra eximia*)**
- **Fumewort (*Corydalis lutea*)**
- **Gayfeather or Blazing Star (*Liatris*)**
- **Pin Cushion Flower (*Scabiosa*)**
- **Pinks (*Dianthus*)**
- **Red Hot Poker (*Kniphofia*)**
- **Red Valerian (*Centranthus*)**
- **Spiderwort (*Tradescantia*)**
- **Spike Speedwell (*Veronica spicata*)**
- **Stonecrop (*Sedum*)**
- **Tickseed (*Coreopsis*)**
- **Yarrow (*Achillea*)**

**PERENNIALS THAT ARE EASY TO GROW .....72**

- **Allegheny Foam Flower (*Tiarella cordifolia*)**
- **Blazing Star (*Liatris spicata*)**
- **Globe Thistle (*Echinops ritro*)**
- **Hosta**
- **Meadow Rue (*Thalictrum aquilegifolium*)**
- **Peony (*Paeonia*)**
- **Russian Sage (*Perovskia atriplicifolia*)**
- **Sea Thrift**
- **Siberian Iris (*Iris siberica*)**
- **Turtlehead (*Chelone lyonni*)**

**STARTING PLANTS FROM SEED .....76**

- **Deciding When to Start the Seeds**
- **Gathering the Proper Equipment**
- **Getting the Potting Mix Ready**
- **Planting Your Seed**
- **Covering Your Seed with Potting Mix and Setting it Up to Grow**

- *Giving Your Seed Light, Heat, and Air*
- *What to Do When Plants Appear*
- *Transplanting Your Seedlings*
- *Thinning Out the Seedlings*
- *Putting Your Seedlings Outside*

**CREATING YOUR OWN COMPOST .....82**

- *Worm Composting*
- *Backyard Composting*

**SUMMARY .....87**

So, you have decided to grow a garden. Congratulations! A garden, whether it is a flower garden or a vegetable garden, has many benefits – and it is so easy to do!

If you have decided to grow fruits or vegetables with your garden, you will be pleasantly surprised by how much better the food tastes when you grow it yourself. Not only can you enjoy vine-ripened goodies that have the added flavor only nature can provide, you will also have the satisfaction of knowing that you grew your fruit and veggies on your own. And, don't forget, it is convenient and pleasurable to have a variety of tasty treats growing in your own backyard.

A flower garden provides you with a magnificent retreat where you can relax after a stressful day. Similarly, it adds beauty and value to your home when done right. Not only that, you can actually take care of problematic areas in your yard with a little creativity and a few flowers, shrubs, and trees.

Whether you are planting a flower garden or a vegetable garden, you will discover that one of the great satisfactions of gardening is just getting out there and getting your hands dirty. Gardening is a great activity for reducing anxiety and reducing stress as you feel yourself getting closer to nature.

Yet, you might be asking yourself: How do I start a garden? What do I need to have in order to grow a garden? Are there any tricks of the trade I should know? Is it costly? How do I maintain my garden once I get it started? Will it take all of my time? With this easy gardening guide, you will discover the answers to these questions and to many more – before you know it, you will be out there putting your green thumb to work!

## CHOOSING A LOCATION

The first thing you will need to consider when planning a garden is the location. If you will be planting a vegetable garden, you will likely need to choose a location that receives a great deal of sunlight. This is because most vegetables require eight hours or more of sunlight in order to grow properly and to form strong roots and stems.

### ■ *Getting Enough Sun for Your Vegetable Garden*

Since you will need a great deal of sunlight for your vegetable garden, you should never plant it next to large trees that will cast shadows throughout the day. Similarly, it is generally best not avoid planting a vegetable garden right next to a building or a home. The shadow cast by the home can prevent adequate sunlight from reaching your garden. If you aren't sure about a specific area, take a day to monitor the position of the sun and the shade it produces in the area you are considering for your garden. You don't need to stand out there all day! Rather, check on the area once per hour in order to get an idea of how much sunlight the area receives.

### ■ *Making the Garden Spot Suit Your Flowers*

If you are planting a flower garden, you have a bit more flexibility when it comes to the amount of sunlight your garden needs to receive. This is because there are flowers that love shade, flowers that love sun, and flowers that love everything in between. If you have already looked at different types of flowers and have your heart set on certain ones, however, you will need to plan the location of your garden accordingly.

Most nurseries include tags with their flowers that describe the ideal growing conditions for the flower, including the amount of sunlight it requires. Look at the tag to determine if the flowers you like require shade, partial shade, partial sun, or full sun. If you notice that all of the flowers you have selected require shade, such as the Hosta and the Lily of the Valley, you will want to choose a shady location for

your garden. This might be beneath a tree or even under a balcony or porch. If, on the other hand, the flowers you selected enjoy full sun, you will need to select a location that requires a great deal of sunlight during the day.

You may discover that you enjoy a mixed bag of flowers. For example, some may prefer partial shade while others prefer full sun. In this case, you might need to choose a couple different locations and two or more gardens. Or, you will have to decide which type of flower you would like to specialize in. In general, there are more flowers to choose from if you decide to go with those requiring full sun to partial sun. On the other hand, full shade and partial shade flowers are often easier to care for.

### ■ *Making Your Flowers Suit Your Garden Spot*

You can also use the reverse approach to selecting a garden spot for your flower garden. Perhaps you already have a spot in mind that you feel would be just perfect, but you have not taken a look at flowers yet. Monitor the area you have selected and determine if it gets more than eight hours of sunlight per day. If it does, you should go with full sun plants for that area. If it receives about five or six hours of sunlight per day, partial sun plants are ideal. Full sun plants might still survive in this spot, but their stems may become spindly and require staking, as they do not receive the amount of sun necessary to grow strong.

If the garden spot you have selected receives two to four hours of sunlight, partial shade flowers are ideal. If the area receives less than two hours of sunlight per day, you should stick with full shade flowers. You will also discover that there are some flowers that are quite versatile and can handle anywhere from full shade to partial sun or from partial shade to full sun. These flowers are often easier to care for because of this versatility. So, if you are still uncomfortable with determining the amount of sunlight your area receives, you might want to stick with these flowers.

### ■ *Other Elements to Consider*

When selecting a garden spot, you also need to keep in mind that afternoon sun is hotter and drier than the morning sun. Therefore,

the time of day when the sun hits your garden spot will have an impact on how often it will need to be watered and how damaging the sun can potentially be. Furthermore, most flowers turn to face the sun. Therefore, your garden sitting outside your west window may not be viewable during the afternoon when the flowers face away from you.

In addition to the amount and type of sun the area receives, you also need to consider wind. Certain areas can create wind tunnels, which can be damaging to your plants. The less wind an area receives, the better it will be for your garden. You should also consider foot traffic. After all, you don't want to grow a beautiful garden in a spot where it will be frequently trampled on by people or by animals.

### ■ *Choosing a Spot that Looks Good*

Of course, you also need to work at selecting a spot for your garden that looks good. The middle of your yard may receive the perfect amount of sunlight for your garden – but it might not look so good to grow a vegetable garden there! Therefore, another consideration when choosing a location is the aesthetic appeal.

#### *Consider the Purpose*

There are many factors to consider when choosing a spot for your garden that looks good. First, you need to determine the overall purpose of your garden. If you are planting flowers to landscape the home and to give it a trimmed and well-kept look, you might actually have several small garden areas in your yard. For example, you might put trim around the bottom of large trees and plant flowers there. You might also plant flowers around the outside perimeter of your home or along your driveway in order to create a neat and tidy appearance.

#### *Use What You Already Have*

If, on the other hand, you are looking to add a little flair to your yard that goes beyond looking neat and tidy, you will need to select a spot that will look attractive and that does not look out of place. Consider the lay out of your land and the natural curves it already possesses and create a garden that works within that lay out rather than against it.

I have planted several gardens in my yard. Each has its own unique character and the locations I chose were for different reasons. For example, the first garden I planted was in a shade garden. I chose this spot because there was a natural cove about ten feet wide that was already there from the previous owners. On one side, a small grove of pine trees was already in place. On the other side, some wild bushes and trees had been allowed to grow.

We decided to place a small shed in the back end of this cove because the trees provided excellent wind protection. Then, I lined either side of the cove and planted shade loving flowers. The result is a beautiful mixture of wild flowers and bushes growing behind my well-trimmed display of flowers. I took an area that was already a part of my land and turned it into my own secret garden.

#### *Cover Up Problem Areas*

Another element to consider when deciding where to plant your garden is if there are certain areas that need cleaning up or that need to be disguised. With a little imagination and work, you can take an eyesore and change it in to a work of beauty.

The second garden I planted was in response to a problem with our land. It seems that the previous owner used to burn his garbage in the back yard rather than have it picked up and disposed of properly. We tried several times to clean this area, but the burned garbage seemed to reach endlessly beneath the ground. This made mowing difficult and it was a concern for us because we have children.

I decided to take this dangerous eyesore and turn it into a family area. I placed brick trim all the way around the area that was affected by the garbage pile and planted flowers inside. Much of the garbage had deteriorated enough that I still had dirt to plant the flowers in without needing to remove all of the garbage. In addition, I selected flowers that I knew would be able to withstand growing conditions that were less than perfect – such as Daylilies and Irises.

I also built a small brick patio in the center of this garden. On this patio, I placed a swinging bench chair that faces toward the playground area we created for our children. Now, I can sit and watch them as they play while enjoying the beautiful surroundings of my garden.

### ***Make it Suit Your Overall Look***

My largest flower garden is growing right next to my patio. Our home had a nice patio already in place when we moved in, but it had a rusty and unattractive fence running around its perimeter. In addition, there was no landscaping near the patio and the grass was in poor shape. In fact, there were several stones in the grassy area near the patio that lead us to believe it was once used as a driveway.

We removed the rusty fence, which helped open up the patio and make it far more attractive. Then, we created a large garden that runs along the entire front of the patio. Within the garden, we have built a brick pathway as well as two garden ponds complete with waterfalls, water plants, and koi. Now, the patio serves as a great spot where we can sit and enjoy the beauty of the garden while listening to the trickling fall of water.

Keep the same considerations in mind when selecting a spot for your garden. What will the purpose of the garden be? Is it purely for enjoyment or will it also be helping you deal with a problem with your land? Who will enjoy your garden? How will you and others enjoy the garden? How does the garden fit within your current landscape and the lay out of your home? How does the garden take advantage of the natural beauty your land already possesses?

### **■ *Laying Out the Outline***

After you have decided where you will place your garden, you need to plan out the outline. Do you want your garden to be in a circular shape? A rectangle? Perhaps you want to create some natural looking curves as the outline for your garden.

A good idea is to draw the outline on a piece of paper first in order to get an idea of how you would like the garden to look. Then, use an extension cord or a hose to form the design in just the way you want it. The nice thing about using an extension cord or a hose is that you can easily change the layout if you don't like the way it looks. I have also used white spray paint and sprayed the grass to form the outline. This provides you with a guide when digging out the garden bed.



## PREPARING THE LAND

Now that you have selected a location for your garden, you need to prepare the land. This means removing weeds and grass, loosening the dirt, and amending the ground if necessary.

### ■ *Removing Weeds and Grass*

There are several products available on the market that are designed to permanently remove and kill weeds and grass. Do not use these products to prepare your garden bed. These products destroy the nutrients in the ground and can make it virtually impossible to grow anything in that area for a year or more.

### *Use Your Shovel*

If you are planning to plant your garden in an area that has weeds or grass, the best way to remove the vegetation is with a shovel. Using a spade, dig a couple inches into the surface of your garden plot. The exact depth you will need to dig depends on the type of vegetation you are removing. If it is mostly grass, a couple inches should be plenty.

Once you have started a hole at the proper depth, you should be able to use your spade to essentially skim the surface of your garden plot. Do this by holding the spade at an angle that is almost parallel to the ground. The goal is not to dig deep into your garden. Rather, the goal is to simply take off the top layer of the ground in order to get rid of the grass. Dispose of the grass and weed layers you have removed, preferably in a compost pile if you have one started. If you don't, this is the perfect time to start one! (You will learn more about how to do that later in this guide).

### *Make Some Sod*

If the grass you are removing from the garden plot is nice, healthy grass, you might also remove it by cutting it into sod. In this way, you can transplant the grass to another area of your lawn that might

need it. To cut the grass into sod, use your spade to cut out rectangular shapes within the grass. After you have cut out the outline, slip the spade beneath the shape to loosen up the roots underneath.

After the grass has been adequately loosened, you can roll the rectangular piece of sod up and place it in a cart or wheelbarrow. Then, take the sod to the new location and lay it down flat on the ground. Then, piece together all of your pieces of sod until the area is filled completely. Be sure to water the sod thoroughly. It should be very wet in order to help the roots take hold. Continue watering the area at least once per day for one to two weeks.

### ■ *Loosening the Dirt*

The next step to preparing the land for your garden is to loosen the dirt. This is an important step because loosened dirt makes it easier for the roots of your plants to grow and to spread. This also helps them create a stronger hold within the dirt. The better the roots grow, the healthier and stronger your plants will be.

#### *Use Your Handy-Dandy Shovel Again*

You have a couple options available to you for loosening the dirt. Your first option is to use your spade. To loosen the dirt with your spade, you will shovel the entire area to the depth the spade allows. Each time you dig up a load of dirt with the spade, turn the clump of dirt upside down and move on to the next section of the garden plot.

If your dirt is somewhat sandy, flipping the dirt clumps upside down may be all that is needed to loosen the dirt. If your dirt has a great deal of clay to it, however, the ground will likely remain in a hard clump when you dig it out of the ground. If the dirt does not break apart and loosen when you dig it up and flip it upside down, you will need to use your spade to break the dirt apart.

#### *Let a Machine Do the Work with a Tiller*

An easier way to loosen the dirt for your garden plot is to use a tiller. A tiller is a machine with rotating blades at the bottom that are specifically designed to tear up dirt for a garden. These tools can be

pushed and pulled while you remain in a standing position, similar to a push lawn mower.

If you are creating a small garden, you really don't need a large tiller. Large tillers are more expensive than smaller models and can be quite heavy and cumbersome to operate. On the other hand, they are capable of covering a greater surface at one time. I personally use the Mantis brand tiller. This tiller is small, lightweight, and easy to use. I have had it for about five years and it is still running strong and I have never had to replace any of its parts.

Using a tiller is a much simpler method for loosening the dirt in your garden plot, but it is more expensive to purchase a tiller than it is to purchase a spade. Therefore, it is up to you whether or not it is worth the expense.

An added bonus to a tiller is that you do not necessarily have to remove the grass and weeds before loosening the dirt. A tiller can tear right through the grass and weeds for you. Be careful when using this option, however, because some weeds will propagate when they are chopped up. If you do decide to use the tiller to cut through the weeds and grass while also loosening the dirt, you will need to comb through the dirt with a garden rake in order to remove the grass and weeds. Otherwise, they can re-establish themselves in your garden.

### **Using a Garden Rake**

A garden rake is not the same as a leaf rake. Both garden rakes and leaf rakes have a long handle and tines at the end, but the design of the tines is different. The tines of a leaf rake are loose and long in order to allow the rake to glide softly over the ground without damaging the grass. Garden rakes, on the other hand, have shorter tines that bend at a 90 degree angle. The tines of a garden rake are also very stiff because they are meant to rake through the ground, not over it.

After you have tilled the entire garden plot area, use your garden rake to comb through the loosened dirt. If the dirt has been adequately loosened, it will sift right through the tines while they catch hold of the grass, weeds, and other plant debris that needs to be removed. When you are all done, the dirt should be smoothed out flat with several ruts running through it that have been created by the tines of the rake.

Even if you do remove the grass and weeds from your garden area before you loosen the dirt, you should use the garden rake as your final step of the dirt loosening process. This is true whether you use a tiller to loosen the dirt or a spade. In this way, you can be assured all large clumps of dirt have been broken down and you also have a nice, smooth surface to work with.

### ■ *Amending the Ground*

No matter how great you think your dirt is, it can always use a little help to make it better. There are two primary factors used to evaluate dirt: fertility and texture. The fertility of your dirt is determined by its pH balance and nutrients. The texture is how large the particles of dirt are and how well they hold together.

#### *A Look at Nutrients*

There are three nutrients all plants need to be healthy. These are phosphorus, nitrogen, and potassium. Phosphorus helps the roots grow, which is particularly important for flowering bulbs and for root veggies such as carrots. Bone meal is a natural additive that can be found at your gardening store that will help boost the levels of phosphorus in your dirt. Some fertilizers also contain high levels of phosphorus. Generally, these fertilizers are advertised as bloom boosters because phosphorus is necessary for plants to produce their flowers.

Nitrogen is necessary to ensure healthy leaves and stems. When you add nitrogen to the dirt, it does not stay there for long because it gets used up by plants and decaying matter. Nitrogen is also water soluble, which means it can wash out of your dirt rather quickly. Therefore, nitrogen needs to be replenished in your dirt in order to produce the best growth. At the same time, too much nitrogen will cause the foliage to go wild and take away from the fruit and flowers of the plant. So, it is important to maintain the proper balance.

Potassium is good for the overall health of your plants. It helps the plants grow while also helping to boost their immune system. Potassium is also water soluble, so it needs to be replenished as well. There are several additional trace elements that are also beneficial to your dirt. These include magnesium, calcium, molybdenum, and zinc.

### ***Adding Nutrients to Your Dirt***

If your dirt is lacking nutrients, you will need to decide between adding organic or inorganic materials in order to amend it. Inorganic fertilizers work quickly and are generally cheaper than organic fertilizers, but they do not actually improve your soil. Rather, they are designed to feed the plant itself. Therefore, they are not a good choice when preparing a garden bed that does not have plants yet. In addition, fertilizers can actually cause damage to your soil in the long run because of their high salt content. Some studies have also indicated that plants build a resistance to inorganic fertilizers, which causes them to require more and more in order to remain healthy.

Organic fertilizers take more time to work, but are beneficial because they treat the actual dirt and they release nutrients over time. The best organic fertilizer should include phosphorus, nitrogen, and potassium. You can also add your own organic nutrients, such as bone meal for phosphorus, fish emulsion and manure for nitrogen, and wood ash for potassium. By purchasing a testing kit from your home improvement or garden center, you will be able to determine which nutrients your dirt needs.

### ***A Look at pH***

The pH balance of your dirt refers to its acidity or alkalinity. Your dirt will fall somewhere on a scale ranging from 1.0 to 14.0. The lower the number, the more acidic your dirt is. Conversely, a higher number means your dirt is more alkaline. A reading of 7.0 is considered neutral. The pH of your dirt is important because certain nutrients are only made available to your plants if the dirt is within a certain pH range.

For those most part, a score of 6.2 - 6.8 is considered to be ideal. Some plants, such as heathers, rhododendrons, and blueberries, prefer soil that is very acidic. On the other hand, plants such as clematis and lilacs prefer alkaline soil. To determine the pH level of your dirt, you can purchase testing kits from your home improvement or garden store. Your Cooperative Extension office may also be willing to come out and test your dirt for a small fee.

### ***Amending the pH***

If your dirt is not within the proper range for the plants you will be planting, you can purchase additives to help make it more acidic or

alkaline. Adding lime to your dirt will help increase the alkalinity, while adding sulfur will decrease it. It does, however, take time to change the pH of dirt. It should also be done in stages in order to prevent shocking your plants if you already have some planted. In general, it is best to add about five pounds of sulfur or lime to 100 square feet of garden. If you still haven't added your plants, however, you can add much more in order to get it to the proper pH level. Keep in mind, however, that your dirt will change back to its natural pH level if you do not continue to treat it.

### ***A Look at Texture***

The texture of your soil is also important to allow your plants to establish their roots and to aid in moisture drainage and retention. If your dirt is sandy, it is made of larger particles. This allows air, water, and plant roots to move very easily. This can be a drawback because the roots of the plant may not be able to get enough water before it seeps completely through. Certain plants, such as those with bulbs, thrive in sandy soil because they prefer excellent drainage. In addition, the sandy soil prevents the water from sitting on the bulbs and causing them to rot.

The opposite end of the texture spectrum is clay. Clay particles are very small and, as such, they are capable of packing together very tightly. This allows very little room for air, water, and roots. Therefore, water tends to rest on the roots of plants in clay for a longer period of time. This can be beneficial to certain plants requiring continual moisture. In addition, gardens with clay dirt usually do not need to be watered as often as those with sandy dirt because the water is held by the clay.

### ***Testing the Texture of Your Dirt***

It is actually quite simple to test the texture of your dirt. Scoop a handful of dirt and form a ball. Then, tap the ball. If it breaks apart easily, your dirt is sandy. If you can press the dirt between your finger and your thumb in order to create a ribbon of dirt, you have clay dirt.

The majority of dirt is somewhere between sandy and clay filled. Ideally, your garden should consist of sandy loam dirt. In this case, the dirt is light and allows water and air to move easily. At the same time it is tilth, which means it has a texture similar to fine bread

crumbs. This can typically be achieved by adding organic matter, which is dead plant or animal materials, to your dirt.

You can also get an idea of how much sand and clay is in your dirt by taking a handful of dirt and placing it in a jar filled with water. Place a lid on the jar and shake it all up until it looks like some kind of dirt milkshake. Then, set the jar aside and let the dirt settle. You will notice that the dirt settles in layers. The bottom layer is the sand and the top layer is the clay. In between is a layer of silt, which is the material found at the bottom of ponds that is also found in all dirt. By looking at the top and bottom layers, you can get a good idea of the ratio of clay to sand in your dirt.

### ***Improving the Texture***

You should never try to change your dirt from sandy to clay filled or from clay to sandy dirt. Trying to mix these components together can result in a type of solid cement-like dirt. If you have a great deal of clay in your soil, it can be beneficial to add a little bit of sand, but there are much better ways to amend the texture of your soil.

In general, the more nutrients your ground has, the better. The same holds true for organic matter. All dirt has some organic matter, but rarely enough. Adding organic matter will improve the tilth of your dirt because it creates what is known as humus when it decays. If your dirt is sandy, the organic matter will help it to better retain water. If your dirt is clay filled, on the other hand, it will help make the dirt looser. This allows water, air, and roots to better penetrate the ground. Regardless of the type of dirt you have, organic matter helps encourage microbial activity. This is beneficial because it provides nutritional benefits to your dirt.

### ***Using Horse Manure***

For me, the best way to amend the ground with organic matter is to use horse manure because it adds nutrients and improves on the texture of the dirt. Horse manure can be purchased from most garden supply stores. Many farms and stables also have it for sale. Or, if you happen to know someone with horses, they will probably be more than happy to supply you with some!

Horse manure that has had a chance to sit out in the sun for a year or two is the ideal horse manure to use when amending the ground

for your garden. This manure has had time to decompose and break down to the point that it actually no longer smells and it looks and feels like dirt. This manure can be spread over the entire top of your garden plot and even worked into the ground.

If the horse manure you have access to is fresher, you need to use more caution when adding it to your dirt. Often, it is better to add this manure after you have planted your flowers or vegetables. This way, you can place the manure around the plants in a way that prevents them from actually touching their stems. Fresh horse manure contains ammonia and heats up while under the sun and, if it is touching your plants at the time, it can actually burn their stems. In addition, it has an unpleasant odor.

Horse manure is not your only natural option for amending the dirt. You can also purchase castings. Castings, which are earthworm droppings, can also be purchased from most garden centers. Or, you can maintain your own earthworm composting bin and collect your own castings. You will learn more about how to do this in the composting section of this guide.

### **Other Organic Additives**

Your compost is also an excellent source of organic matter because it is made of dead plant material. Peat moss is another option for plant organic matter. It is inexpensive to purchase and is great at loosening clay dirt. Peat moss can, however, be very dusty. Therefore, it is best to wet it before using it in order to make it easier to work with. Even grass clippings and other plant debris can be great for amending your soil, just be sure the plants and clippings you use do not have seeds. Otherwise, you will have a lot of weeding to do!

If it will be awhile before you plant your garden, you can also plant cover crops (also known as green manure) in your plot. Cover crops are plants, such as clover and vetch, that are planted and grown in a plot that will not be immediately used. These crops help keep the dirt loose and prevent weeds from growing. At the same time, they add nitrogen to the dirt and can be tilled directly into the ground when you are ready to plant.

Now that you have finished amending your dirt, we can officially start referring to it as soil! It has gone from being a brown, dirty mess



that does not support a healthy and happy garden to soil that is ready to produce tasty veggies or beautiful flowers.

### ■ **Another Option for Preparing Your Garden Bed**

Another option you have available to you is to smother the grass and weeds in the garden area. With this method, you don't have to remove the weeds and grass and you don't have to worry about loosening the dirt. On the downside, it can be a bit more expensive if you do not already have good soil available on your property.

To smother the dirt, you will need to place a thick layer of newspaper over the entire garden area. It will take about eight to ten sheets to make the newspaper thick enough. Then, wet the newspaper thoroughly and cover it with about four to six inches of good soil. You can get this soil from somewhere else on your property or you can purchase it from a nursery or other garden supply store.

The smother method works by preventing sunlight from reaching the weeds and grass. Eventually, the newspaper decomposes and the weeds and grass are killed off. Some weeds usually manage to poke through with this method, but they can be easily hand weeded out later.

## PLANTING YOUR GARDEN

Now that you have a garden bed filled with rich soil, it is time to start planting in it! From here, you have two choices. You can either plant seeds or purchase mature plants. Or, you may choose to do a combination of both.

### ■ *Selecting Healthy Plants for Your Garden*

When you first walk into a nursery, every plant may look healthy and of high quality. Unfortunately, this isn't always the case. In addition to being disappointed by the performance of the plant if you choose one that is unhealthy, you also may bring some diseases back to your other plants or to your soil. Therefore, you need to take a few steps to make sure the plants you select are healthy and perfect for adding to your garden.

#### *Nursery Quality*

The first thing you need to examine is the overall quality of the nursery. Do the plants seem to be generally well cared for and healthy? Do the employees seem to understand how to care for the plants? Are they able to provide you with proper advice for their care and maintenance? All of these factors will help you determine if you should turn around and run out of the nursery or if it just might be a good place to purchase a healthy plant.

#### *Foliage*

Next, take a look at the foliage of the plants for sale. Once you find a plant you are interested in purchasing, check to be sure the leaves are shiny, green, and lush. If the leaves are yellowing or wilting, it is best to leave it at the nursery. These plants probably are not diseased, so they will not cause harm to your garden. Rather, the wilting and yellow color is a sign that the plant is stressed. You can never be sure if a stressed plant will recover. If you are feeling confident in your gardening skills, you might still take this one home if it is on sale for a great price. Or, ask one of the employees if he or she will discount the plant for you because of its condition.

## **Plant Shape**

After inspecting the foliage of the plant, look at its overall shape. A compact plant that is full and has multiple stems is usually better than a tall plant. In fact, a tall plant is often an indication that the plant has been straining to find light. As a result, it can grow to be thin and spindly, which means the plant may break easily or may require staking in order to keep it upright once you place it in your garden.

## **Insects and Disease**

In order to keep the other plants in your garden safe, you will also need to inspect the plant for signs of insects and diseases. To do this, look at both sides of the leaves as well as in the potting soil. If you see holes, blackened areas, spots, distortions, or mushy areas, the plant may be infected. A sticky feeling on the leaves or on the soil are also bad signs.

## **Roots**

We discussed plants that are root bound earlier in this guide. It is best to avoid root bound plants whenever possible because being root bound is stressful on the plant, as is snipping away at the roots later. Of course, you cannot always tell if a plant is root bound while it is at the store because it is inside a pot. You can, however, look for roots growing out of the bottom of the pot or even roots that have grown to the top of the soil. Both are signs that the plant has become root bound. You may want to stay away from these plants because it can take some time for them to recover from the condition.

On the other end of the spectrum, you may find a plant that easily lifts out of the pot and has no signs of roots. This indicates the plant was recently repotted. In this case, it is usually best to let the plant remain in the pot for awhile before attempting to transplant it to your garden.

## **Stem**

The stem of the plant is another important area to inspect. If the plant you are considering purchasing is thick or woody, check for cracks or scars from previous breaks. Prior damage to the stems can

still cause the plant to be weakened overall, so it is best to stay away from those that have been damaged.

### **Weeds**

You should also look for weeds growing in the pot along with the plant. Weeds in the pot are a sign that the plant has been neglected. In addition, it means your plant has been fighting with the weed for nutrients. As a result, it can be weak and unhealthy. Furthermore, you do not want to bring new weeds home with you when you purchase a new plant.

### **Root Ball**

If you are purchasing a balled-and-burlapped shrub or tree, you should also inspect the root ball. It should feel solid and should not appear to be broken. If it has been broken, the roots may have become dried out and the plant will have a difficult time adjusting and growing.

### **Flowers Vs. Buds**

It is also best to purchase new plants before they have flowered. If you are purchasing a plant at about the time it should flower, select those with buds rather than those that have flowered. Budded plants transplant better than those with flowers. In addition, the flowers often wilt away when transplanted. Plants with buds, on the other hand, will usually still bloom and provide you with wonderful flowers to enjoy in your garden rather than in the store.

In the end, nearly any plant may be able to be saved. So, if you see one that you really have to have but you know it isn't healthy, you can still go ahead and purchase it. Just be prepared to give it a little pampering. If it is diseased or has insects, however, it is not worth risking the health of your other plants.

## ■ **Choosing Between Plants and Seeds**

With vegetable gardening, there are certain plants that are generally best to start from seed while others are better to be started as plants. Beans, corn, radishes, and most other common vegetable plants are ok to start from seed outdoors. Vegetable that are

generally best to start as plants include tomatoes and green peppers. You may choose to grow some of these seeds indoors until they are ready to be planted outdoors. You will learn more about growing plants from seeds indoors later in this guide.

### ■ **Planting Seeds in Your Garden Bed**

When sowing the seeds in your vegetable or flower garden, it is important to read the back of the packaging to determine how deep the seeds should be planted and how far apart your seeds should be spaced. Depth is important because this ensures the roots of your plants will be able to reach the proper depths to keep your plants healthy and strong.

Spacing is also important because your plants can choke each other out as they fight for space and nutrients if they are planted too closely together. At the same time, you want to utilize your space to its fullest. Therefore, you don't want to plant your plants further apart than necessary.

### ■ **Planting Plants in Your Garden**

When purchasing plants to add to your garden, planting instructions should be included with the plant. If not, speak to one of the employees at the nursery to learn how far apart you should space the plants. So far as the depth, simply plant the plant deep enough that your soil just covers the top of the soil the plant is currently in. If you plant your plant deeper than this, the stem can rot. On the other hand, the roots will dry out if you do not plant it deep enough.

### **Choosing the Best Time**

Keep in mind that the best time to plant plants is on an overcast day that is not very windy, as this is the least stressful condition for plants. Nonetheless, you have to work within your schedule as well. This may mean planting on a windy day or in the middle of a hot day.

### **Preparing the Plants for Transplant**

Whether the conditions are ideal for planting or not, there are a few steps you can take to make the process easier on your plants. First,

water the plants while they are still in their pots on the day before you plan to plant them. In addition, you should never remove the plant from its pot and let it sit out before planting because this will cause the roots to dry out and become damaged.

### ***Digging the Hole***

Of course, you will need to dig a hole to place your plant in. You should dig your hole to be twice as big as the perimeter of the pot the plant is in. This helps ensure the dirt is nice and loose around the plant once you place it in the ground. Then, you will remove the plant from the pot and place it in the hole. After the plant is in place, backfill the hole and gently push the ground down around it so it is in place. Do not push too hard, however, as you can damage the roots or even the stem. Instead, allow the water you will apply later to help push the dirt down into place.

### ***Removing the Plant from the Pot***

Removing plants from pots that are not peat pots can be tricky at times. You should never pull on the plant from near its top. Rather, you should first squeeze the flowerpot in order to help loosen the dirt around the roots and make the plant easier to remove. Then, fan your hand over the top of the pot while allowing the stem of the plant to poke through from between your fingers. Turn the pot upside down, and the plant should fall out into your hand. Keep your hand and the plant upside down until you place it upright in the hole you have prepared for it.

If the plant does not come out easily after you have squeezed the outside of the pot, you might need to give it a little extra help. If the pot is large enough, you might use a small hand garden shovel to scrape around the outside of the soil inside the pot. This can help further loosen it and help you remove the plant. If the pot is small, you might need to grab the stem of the plant in the area just above the soil to help pull it out. You should, however, continue squeezing the flowerpot as you do this to help with the process.

### ***Helping a Root Bound Plant***

Once the plant is removed, you might notice that your plant is root bound. As plants grow and become bigger, they need to be either placed in the ground or transplanted to a larger pot. Unfortunately, nurseries rarely transplant the plants as necessary. As a result, the

growing roots have nowhere to go. This causes them to start to wrap around the soil the plant is planted in.

A root bound plant is easy to identify. First, the dirt will maintain the shape of the flowerpot after the plant has been removed. Second, you will notice roots wrapped around the outside of the dirt. These roots hold the dirt in place, which is why it maintains its shape.

Planting a plant that is root bound is not healthy for the plant. The roots have started a poor growing pattern. In fact, many of them are working their way back up to the top of the dirt. Of course, plants need their roots to go down into the ground so they can gather nutrients and form a strong hold. Therefore, you need to break this growth pattern before placing the plant in the ground.

In order to fix a root bound plant, you will need a pair of pruning shears or a knife. You then need to cut away all of the roots you see on the outside of the plant. You do not need to cut the roots completely off the plant. Rather, slice through them so they hang down and no longer wrap around the soil. You will know the plant is ready to be placed in the ground when you are able to move the soil around freely and it is no longer taking the shape of the pot.

### ***Plants in Peat Pots***

Some plants are sold in peat pots. In this case, you will not need to remove the plant from the pot before planting it. Rather, you should place the entire plant in the ground and the peat pot will help add nutrients to the ground.

### ***Watering Your New Plant***

After you place your plant in the ground, whether it was root bound or not, you need to water it thoroughly. Transplanting a plant from a flowerpot can be quite shocking to the plant, particularly if you had to cut away its root bound roots. Watering your plant right away will help it overcome that shock. It will also help it start to form its strong root system.

Most plants should be watered every day for about a week after they have been planted in order to ensure they take root and become properly established in the garden. You should, however, read any directions that may have been included with your plant because some require more watering while others prefer less.

## MULCHING YOUR GARDEN

Now that you have planted your garden, it is time to mulch it. Mulch can be comprised of organic materials or synthetic materials. No matter what type of mulch you choose to use for your garden, it serves the same basic purpose: to prevent weeds from growing, to help the ground maintain its moisture, and to maintain soil temperature.

Mulch has several other benefits in addition to these main three. For example, it prevents soil splashing, which occurs when bits of soil splash on your plants when they are being watered or while it is raining. Soil splashing can be particularly damaging to your plants if your soil has become contaminated with soil-borne diseases. In addition, soil splashing can lead to erosion of your garden's soil. Mulch also prevents the surface of your soil from crusting, or becoming too hard. When your soil surfaces crusts, it makes it more difficult for it to absorb water and move within your soil.

Mulch can also provide a protective barrier around trees and shrubs. When placed around these plants, it prevents them from becoming damaged by lawn equipment. In addition, it creates a tidy and attractive appearance. For plants in general, mulch helps create a stronger root system as well. This is because the plant will create roots to anchor to the soil as well as additional roots for the mulch.

In general, organic mulches are the most beneficial for your garden. This is because organic mulches such as chipped bark, shredded trees, straw, compost, and shredded leaves help add nutrients to the soil as they decompose. Each of these organic mulches is slightly different and has its own unique benefits and characteristics. In addition, some can be found at your home already, while others may need to be purchased from the store.

### ■ *Chipped Hardwood Bark Mulch*

Chipped hardwood bark mulch, which is made from grounded up or chipped trees, can often be purchased at a low cost or even given



away for free at township landfills. Getting your chipped hardwood bark mulch this way, however, does put you at risk of bringing home mulch made from diseased trees. Therefore, it is best to compost this mulch for a year before you apply it to your garden.

You can also purchase chipped hardwood bark from most garden centers. It makes for a great mulch because it is fibrous and has the ability to interlock with other pieces. This helps prevent the mulch from getting washed away by a hard rainfall. It is also heavy enough to help your garden retain its moisture during dry summer months, while still being light and airy enough to allow water and air to permeate it.

Chipped hardwood bark mulch also has natural anti-insect and anti-fungal properties that are beneficial to your garden. It also provides nutrients to the ground as it decomposes and does not take away any nitrogen from the ground as it decomposes as some other forms of organic mulch can.

### ■ *Cedar Mulch*

Cedar mulch has similar properties to chipped hardwood bark mulch. In addition, cedar mulch will not erode. It does not, however, have insect repellent properties like chipped hardwood bark mulch. Therefore, a mixture of cedar mulch and chipped hardwood bark mulch can be an excellent mulch for any garden.

### ■ *Softwood Bark Mulch*

Softwood bark mulch is created from fir, pine, and redwood trees. It can be purchased in a variety of different sizes and is long-lasting. It is a great choice for foundation plantings, but it does not have the ability to interlock like chipped hardwood bark mulch. For this reason, softwood bark mulch can wash away in strong rains such as those experienced in the Gulf Coast region. This is particularly true of large nuggets, which have a tendency to float in water.

Like chipped hardwood bark mulch, softwood bark mulch has natural anti-fungus and anti-insect properties. For the best weed control, you should add two to three inches of softwood bark to your garden. It also will not rob nitrogen from your garden soil.

Softwood bark can, however, attract termites and other types of insects. Since pine bark mulch has a tendency to flake or chip, it is great for use as a soil amendment or for use in potting soils as well.

### ■ *Compost as Mulch*

Even your compost can serve as a mulch for your garden. When used in this way, it is often referred to as native mulch. Since compost consists of items such as grass clippings, leaves, soft-wood bush prunings, plants, coffee grounds and other types of kitchen waste, it is also great for providing your garden with much needed nutrients.

In some cases, you need to use caution when using compost as a mulch. This really depends on what you have added to your compost pile. If you have added white wood, it does not compost well and can promote fungal growth and attract insects such as termites. If you use your compost as a mulch, do not include white wood in your compost pile. Or, be sure to blend it with hardwood bark in order to gain the beneficial anti-fungus and anti-insect properties.

Native mulch can also be purchased from some garden centers and landscape centers. In this case, it generally includes only brush and grass. Nonetheless, you cannot be sure of what types of woods are in the compost. It is also sometimes called hardwood mulch in an attempt to sound as if it is hardwood bark mulch. Therefore, be careful when ordering mulch and be sure it is hardwood bark mulch or else be prepared to mix your hardwood mulch with hardwood bark.

### ■ *Crushed Corncobs*

Crushed corncobs are an inexpensive type of mulch that has an excellent cushioning effect. In fact, they are often used on playgrounds as well. You can usually purchase crushed corncobs in their natural state or dyed.

### ■ *Hay*

Hay is often used in farm and rural gardens because it is generally readily available and inexpensive. Using aged bales of hay can further

improve its ability to reduce weed growth. Fresh hay, on the other hand, can actually encourage weed growth because it usually contains weed seeds. Hay should not be applied to the garden until after the ground has become warmed. Otherwise, voles and mice may tunnel under it to keep warm.

### ■ *Spent Hops*

Spent hops are often readily available from breweries. They can be somewhat smelly after they are first applied to the garden, but the scent will go away in a few weeks.

### ■ *Buckwheat Hulls*

Buckwheat hulls are a fluffy type of mulch. They are excellent for use around annual and perennial flowers.

### ■ *Cocoa-bean Hulls*

Cocoa-bean hulls provide a rich, brown color to your garden and smell like tasty chocolate. If you choose to use cocoa-bean hulls as a mulch, you should only apply a thin layer. Otherwise, they may become moldy and slimy. If you do apply a layer that is more than three inches thick, you should rake the mulch on occasion in order to stir the hulls. This will help reduce the amount of dampness they retain and make it less likely for mold to grow.

### ■ *Peanut Hulls*

Peanut hulls can often be purchased at garden centers or directly from peanut growers and peanut processors. Peanut hulls are excellent for the garden because they provide nitrogen to the soil as they break down.

### ■ *Pecan Shells*

Pecan shells are long lasting and quite attractive. They are dark brown in color and are highly effective in helping the soil retain its

moisture. If you do not live in an area where pecans are processed, however, you may have a difficult time finding them for your garden.

### ■ **Lawn Clippings**

Everyone has lawn clippings! And, they also make a great mulch. Lawn clippings are great for keeping on your lawn, as they provide nutrients to your lawn's soil. They can, however, also be collected and used in your garden.

If you do choose to use lawn clippings as a mulch in your garden, it is best to wait until the lawn clippings have dried out before you using them. If you apply them while they are still fresh, then will become compacted and will generate heat as they decompose. This can cause damage to your plants.

When applying grass clippings as a garden mulch, you should create a layer that is about two inches thick. This will provide you with optimum weed control if you have already sufficiently removed all weeds before adding the mulch. You may want to build up the layers of grass clipping mulch over time in order to prevent using fresh clippings or clippings that have not been adequately dried. If you use fresh clippings, it will create a solid mat of mulch over your garden.

Lawn clippings can let off a scent for the first week or two as they decompose, even after they have been dried. After this period has passed, the scent will subside. You should also avoid using grass clippings if your lawn has been treated with fungicides, pesticides, or herbicides because these chemicals can have a negative impact on your plants.

### ■ **Leafmold**

Leafmold can either be acquired from a municipal composting facility or you can choose to make your own. To make your own, you simply need to gather leaves in the autumn and allow them to decompose over the winter. Then, apply them to your garden in the spring. Exercise caution when using leaf mold as a mulch, however, because it has a tendency to create a crust that prevents water from getting to your soil. Therefore, you may need to stir it occasionally with a rake in order to prevent this from happening. It is, however, an excellent amendment to your soil.

## ■ Leaves

Instead of using leafmold, you may choose to use freshly fallen leaves as a mulch. To do this, you should first chop the leaves up with your lawnmower because whole leaves tend to blow away. At the same time, you do not want the leaves to be finely shredded because this will prevent water from penetrating adequately.

After chopping the leaves, apply a two to three inch thick layer on your garden in order to get maximum weed control. Beech and oak leaves are excellent for helping make your soil more acidic.

Regardless of the leaves you use, they will improve your soil as they decompose. Once they have decomposed, mix them into your soil and add a new layer to add the best nutrients to your ground.

## ■ Pine Needles

Another readily available natural mulch is pine needles. Pine needles can be an attractive mulch as they are fluffy and light colored. They also allow water to penetrate quite easily. Pine needles are a particularly good mulch for acid loving plants like rhododendrons, azaleas, and blueberries. In addition, they provide a great cushioning effect on garden paths and create a lovely pine scent when walked on. Generally, a two inch layer of pine needles is sufficient.

## ■ Cypress Mulch

Cypress mulch is commonly available at garden centers and home improvement stores. It is golden yellow in color and, because of its already light color, does not really fade as much as other types of mulch. It provides a good barrier to weeds and is a good choice for creating a layer of mulch requiring little maintenance.

## ■ Manure

The manure you used to add texture and nutrients to your garden may also serve as your mulch. Just remember to compost the manure for at least six months before using it. Not only is this important in order to prevent damaging your plants, it also makes it less likely that weed seeds in the manure will grow.

### ■ *Wood Chips*

Wood chips can often be obtained for a nominal fee from utility companies, arborists, and municipal yard waste facilities. It can also be purchased from most home improvement stores and garden centers. Wood chips, which are made from different sized pieces of wood and bark, last for a very long time and are also great for laying on paths and walkways. A two to three inch layer will provide your garden with excellent weed control.

Exercise caution when purchasing wood chips, however, because smaller wood chips may decompose quickly. As they decompose, they take nitrogen from the soil, which you will need to replace with nitrogen fertilizers or other additives. Wood chips may also attract termites and other insects. It is also best to stay away from colored wood chips. Colored wood chips may look attractive, but they do not retain water like natural wood chips and do not break down and add nutrients to your soil.

### ■ *Mushroom Soil*

Mushroom soil can often be purchased from garden centers. Or, you might be able to get some for a low cost if you live near commercial mushroom growers. In either case, it is relatively inexpensive and makes for a pleasant natural mulch.

### ■ *Peat Moss*

Peat moss can be quite attractive when applied in thick layers as a mulch. The best type of peat moss to use for this purpose is that which is course-grade. It can, however, be somewhat expensive when needed for large garden areas. In addition, you need to make sure to keep your peat moss moist at all times. This is because it actually repels water when it is allowed to dry rather than absorb it.

### ■ *Sawdust*

Sawdust can be purchased for a low cost from timber mills or other businesses that process wood. You should use caution with sawdust,

however, because it can actually cause your soil to lose nitrogen as it decomposes. If you choose to use sawdust as a mulch, you will need to apply fertilizers that are rich in nitrogen on a regular basis. It does make a great choice for garden paths, however, where you do not necessarily want your flowers to grow anyway.

### ■ *Straw*

Straw is another mulch option, though it does not have the same ornamental quality as many other forms of mulch. It is great for providing your perennials with protection over the winter. It is also good to use in muddy areas or areas where you will need extra traction during the winter months. It is also an excellent choice for vegetable gardens because it tends to decompose rapidly, which means you will need to replenish it regularly in order to discourage weed growth. Straw does, however, help improve the quality of your soil greatly as it decays.

### ■ *Groundcover Plants*

Groundcover plants are another option for mulching your garden. Groundcover plants include periwinkle, ivy, mondo grass, pachysandra, and liriopse. All of these plants are low growing and have a spreading tendency. Although these plants will spread to cover the entire ground area of your garden, they will not interfere with the growth of your other plants.

### ■ *Crushed Rock, Pebbles, and Gravel*

Another landscaping option is crushed rock, pebbles, and gravel. Crushed rock, pebbles, and gravel are not a good choice for use in gardens because it does not help retain water and it does not decompose and add nutrients to the soil. In addition, they tend to reflect solar radiation, which can make the landscape very hot in the summer. Therefore, crushed rock, pebbles, and gravel are best used for walkways or areas where you do not intend to plant flowers or other plants.

If you do decide to use crushed rock, pebbles, or gravel for your garden, you will only need to apply a one inch thick layer in order to

achieve adequate weed control. You should not, however, use crushed rock, pebbles, or gravel around acid-loving plants. These rocks add alkaline elements to the soil, which will disrupt the pH balance you require.

### ■ **Black Plastic Sheets**

Black plastic sheets, which is actually a black polyethylene film, is very good at preventing weeds from growing in the garden and is also helpful with retaining water in the soil. Since it is so good at holding water, it is better to not use black plastic in areas that already drain slowly because it can cause your soil to stay too wet. In turn, this can lead to root disease problems. To help with this problem and to help the water flow better, you may need to cut some holes in your black plastic. Or, purchase black plastic with numerous small drainage holes already formed within it.

Black plastic breaks down quickly when exposed to sunlight, which causes it to become very ineffective as a form of mulch. If the black plastic is buried in soil, however, it will last for several years. Most gardeners who use black plastic cover it with a layer of pine needles, wood chips, or other form of mulch in order to help it last longer and to disguise its artificial look. Covering the black plastic sheets with mulch also helps prevent it from becoming too warm.

### ■ **Clear Plastic**

Unlike black plastic, clear plastic sheets do not suppress the growth of weeds because it allows light to come through. In turn, this increases the heat of your soil, which can cause an increase in the amount of weeds you see in the spring. Unless you plan to cover the clear plastic with another type of mulch, it usually is not a good mulch choice.

### ■ **Landscape Cloth**

Landscape cloth, which is also commonly called woven ground cloth, is similar to black plastic sheets. Yet, instead of being a solid sheet of polyethylene film, it is made of woven plastic, fabric, or paper. Landscape cloth is then treated in order to help it resist decomposition.



Since landscape cloth is woven, it allows water and air to flow through it much better than black plastic sheets. In addition, landscape cloth helps prevent weed growth, though some types of grass and weeds can still poke through the holes in the cloth. In addition, it needs to be anchored down so it is not pushed up by perennial weeds growing beneath.

To obtain the optimum temperature, moisture, and weed control when using landscape cloth, it is best to add several inches of another form of mulch on top. In addition, this will make the garden look more natural and attractive.

### ■ **Aluminum Coated Foil and Plastic Sheets**

Aluminum coated foil and plastic sheets are excellent weed barriers. In addition, they decompose very slowly, which means you will not have to replace them often. On the downside, they do not create a very attractive look for the garden and are quite expensive.

### ■ **Rubber Tire Mulch**

Ground rubber tires are also sold as a form of mulch. This mulch never decomposes, so you will never need to replace it. The overall effectiveness of ground rubber tires in respect to weed control and moisture retention is not fully understood yet because this is a relatively new form of mulch. It does, however, provide a soft and clean barrier. Therefore, many homeowners choose to use this mulch around playground equipment in order to keep it safe for their children.

### ■ **Choosing the Mulch that is Best for You**

All in all, the mulch you choose mostly comes down to your personal preferences and your unique needs. Just keep in mind that a mulch that is coarse or cut in bigger pieces will last longer and will provide a better barrier against weeds than a finer mulch. On the other hand, a fine mulch breaks down faster and adds nutrients to your soil more quickly. This, of course, can be much better for the health of your plants.

Fine mulches also tend to blow around more on windy days than do larger pieces, which can be quite messy after a storm or particularly windy day. Most professional landscapers use a combination of both in order to provide the best maintenance while also adding nutrients to the soil.

With organic mulches, you will need to be prepared to replace them as needed. The type of mulch you select will determine how often you need to replenish the mulch. In addition, your garden will require less and less mulch as your plants grow and mature. This is particularly true of a perennial garden because your flowers will grow back bigger and healthier each year if properly cared for.

### ■ *Applying the Mulch*

Regardless of the type of mulch you decide to use, it needs to be applied to your garden immediately after planting your plants before weeds have the chance to grow. The best time to mulch is in the early spring, which is before weeds have had a chance to germinate and is when your plants are at their weakest state. If you have started your garden later in the season, however, you should still mulch it right away in order to help get your garden established and to protect it.

When applying mulch, you should apply a layer of mulch that is about two to four inches thick and take care to prevent direct contact between your mulch and the stems of your plants. If you pile mulch up around the stems, it can cause the stems to rot. In addition the mulch can provide a hiding place for garden pests as they chew on your plants, such as voles and mice.

You should also take care to keep mulch away from the walls of any buildings on your property, particularly your home. This is because subterranean termites nest in soil and they eat wood products, which can include the supports and walls of your home or other structures. Even if the perimeter of your home has been treated against termites, they can use your mulch as a bridge to cross to your buildings. Six to twelve inches away from structures is the general rule for keeping them safe.

## KEEPING TRACK OF YOUR PLANTS

Now that you are starting to put your plants in the ground, you need to consider how you will keep track of them. This is important for both flower gardens and vegetable gardens because knowing what plants you have where helps you when it comes to providing them with the proper care.

### ■ *Keeping the Information That Came with the Plant*

The first step to keeping proper record of your plants is to keep whatever information came with your plant. If you purchased seeds, keep the packet the seeds came in. If you purchased a plant, it most likely came with a plastic insert that was either placed in the soil or tied to the plant. This insert provides you with valuable information regarding how to properly care for the plant.

If the seeds or plants you purchased did not come with information on how to care for the plant, you might want to consider purchasing a plant encyclopedia. These books can generally be found at garden centers, though you might consider going to a major book retail chain to find a wider variety. Using these books, all you need is the name of your plant to look up valuable information for its proper care and even for propagation. If you purchase a new variety of plant or one that is more unusual, however, you may have a difficult time locating information in one of these books.

The Internet can also be a valuable resource for learning more about the plants you purchased. This source also tends to have more current information since it is much easier to update than a book. In addition, you may be able to locate some gardening forums or chatboards on which you can discuss your particular plant with other gardeners.

### ■ *Using Stakes*

Stakes in your garden are a great way to keep track of your plants. You can purchase wooden stakes that look like Popsicle sticks from

most garden supply stores. If you cannot find any there, then look at a craft and hobby store instead. Using a permanent marker, you can write the name of the plant directly on the stake.

Another option is to cut up vertical blinds, which is what I did for my gardens. The plastic strips used to make vertical blinds cut very easily and are water resistant. In addition, permanent markers write very well on their surface. If you have an old set of vertical blinds that you were going to throw away anyway, a great alternative is to cut them into strips that are about three to four inches long. You can literally get over 100 stakes from just one blind!

Using the labels you have placed next to your plants, you can quickly and easily identify your plants. Then, cross-reference the name with the information you have gathered about your plant. In that way, you can be sure to prune, fertilize, and provide other care for the plant at the most appropriate time. This will also help you if the plant begins to look unhealthy because you will know what the plant is and have a better chance of learning how to care for it.

### ■ *Keeping a Garden Journal*

If you are really serious about your garden, you might also consider keeping a garden journal. In a garden journal, you can record information such as how well the flower did in the garden, when it bloomed, and any problems you encountered with the flower. This will help you be better prepared for the flower the following season if it is a perennial.

Maintaining a garden journal also helps you determine what your favorite flowers are and which ones you would like to have more of. In addition, it can help you decide what flowers you might need to add to your garden and where. For example, you might decide that you need more flowers that bloom in the late spring because you currently do not seem to have many that do. Or, you might decide that you need more white flowers because most of your current flowers are shades of blue and purple and you think white would create a nice contrast.

## MAINTAINING YOUR GARDEN

Now, all that is left is for you to maintain your garden and to enjoy the fruits of your labor. To care for your garden, you will need to provide your plants with adequate water, keep the garden weeded, deadhead flowers as necessary, and stake those plants that need it.

### ■ *Watering Your Plants*

In general, your plants will need about one inch of water per week. If you get regular rain, you may not need to water your plants by hand. If you don't think you can judge the amount of rainfall you receive each week, purchase a rain gauge.

A rain gauge is a simple instrument that you can place in your garden. It generally has some sort of stake or post that is meant to be anchored into the ground. A clear tube with measured numbers is located at the top. This tube collects the rain as it falls and allows you to easily determine how much rainfall you have received. It is important to check the rain gauge after each rainfall, however, as it will lose water through evaporation and provide you with an inaccurate read if you only read it once per week.

If you do not naturally receive enough rainwater for your plants, you will need to water them with a hose or with a watering can. Keep in mind that it is best for plants to receive smaller amounts of water throughout the week rather than a large amount of water all at once, as this helps build stronger roots.

Of course, if you can only get outside to water your plants once per week, that is better than none. Plants that are not adequately watered will become drought stressed and it is difficult, if not impossible, for a plant to recover from drought stress during the same growing season.

### ■ *Weeding Your Plants*

Weeding is also an important aspect of maintaining your garden. Weeds fight your plants for water and for nutrients. In addition, their

roots or vines can wrap around your other plants and cause them damage. Similarly, they can block sun away from your plants and prevent them from receiving adequate sun.

Weeds will be a continual nuisance, no matter how well you weeded the garden bed and mulched the area. Seeds of weeds are spread in many ways – from birds, to the wind, to even the bottom of your shoes. In addition, weeds tend to be very hardy and do not need ideal growing conditions to flourish. Therefore, you should always be prepared to do a bit of weeding in your garden.

For the most part, weeds can be easily removed by simply pulling them out. This is particularly true if you have done a good job of laying down mulch, as the weeds should mostly be rooted in the mulch and not in the soil.

To remove weeds, you will need to grab the plant by the stem in a location as near to the ground as possible. If the weed is resistant, however, you will need to remove it by digging it out with a spade or a small hand shovel. The right tool for the job depends on how large the plant is and how deep its root system has developed. It is important to remove all of the roots of the weed, as some weeds can grow back even if only a small part of the root is left behind.

Be sure to wear garden gloves while weeding. Digging around in the dirt will, obviously, get your hands dirty – including underneath your fingernails. This dirt can sometimes be quite difficult to remove. In addition, soil tends to suck the moisture from your hands and leaves them feeling dry and rough. Of course, gloves also help protect your hands from getting hurt by thorns or other prickly plants. You should be able to find a good pair of gardening gloves at your local home improvement store, garden center, or nursery.

There are products available on the market that can be sprayed on your garden to help prevent weed growth. Personally, I prefer not to use these products as it robs the garden soil from nutrients and may potentially damage plants I do care about. If you choose to use one of these products, do so with the understanding that it may harm more of your garden than you really want it to.

### ■ *Deadheading Your Plants*

Deadheading, which is pruning away the spent blossoms on your plants, is particularly important in a flower garden. In some cases,

you can deadhead by simply plucking the spent blossoms off, but it is usually best to use a pair of pruning shears in order to prevent damaging the stem and to create a neat appearance.

Deadheading serves several purposes. With some flowers, removing the spent blossoms helps to encourage new blooms. This is because the spent flowers are preparing to seed, which takes a great deal of energy on the plant's part. Therefore, it focuses all of its energy on the process. When you deadhead the flower, it removes the need to seed and the plant is free to flower once more.

If you want to prevent your plants from spreading, deadheading is essential. Since this removes the flowers before they have a chance to seed, you do not need to worry about the flower dropping seeds and spreading to areas of your garden where you do not want the flower to grow.

Of course, deadheading also helps keep your garden looking attractive and fresh. Spent blooms usually are not very attractive to look at and, in fact, give a garden a neglected appearance.

If you have a vegetable garden, the same concept applies for harvesting the veggies from your plants. If you harvest them while they are still young, the plant will be more likely to produce additional vegetables for you to enjoy.

### ■ *Staking Your Plants*

Some plants grow very tall and, as such, require staking. Staking helps keep your garden looking tidy and cared for, as it keeps your plants upright. In addition, staking is beneficial to your tall plants. Tall plants that are not staked may become top heavy and begin to bend downward. This makes it difficult for the plant to receive the sun that it needs and it also places stress on the stem. The stress on the stem can ultimately cause it to snap and damage the plant.

Some plants with vines also benefit from staking. In a vegetable garden, it can sometimes be a good idea to stake cucumbers, for example, in order to prevent them from spreading throughout the garden and interfering with the growth of other plants.

## GETTING RID OF INSECTS

Another problem you may encounter in your garden is insects. While some insects, such as earthworms and ladybugs, can be beneficial to your garden, there are several that are not so helpful. In fact, they will eat your plants or build homes on them that will slowly suck the nutrients away. For this reason, it is important to be able to recognize harmful insects and to know how to prevent them or get them out of your garden, as well as to know which ones aren't really causing your plants any problems at all.

### ■ *Spittlebugs*

Spittlebugs are commonly found in the garden, though most gardeners have never seen one. In fact, there are about 23,000 different species of these little critters – but they are very good at hiding within your plants. Their favorite plants include pine trees, junipers, legumes, strawberries, and goldenrod.

If you have seen any evidence of spittlebugs, it is the frothy formation you may have seen on your plants. Spittlebug nymphs secrete a special liquid, which they then turn into bubbles by pumping or moving their bodies. After forming these bubbles, they cover themselves with their hind legs and the froth. This froth helps protect the spittlebug from its predators. It also insulates the spittlebug from extreme temperatures and prevents them from becoming dehydrated.

Spittlebugs lay their eggs in later summer, and these eggs remain on the plant debris over the winter. In early spring, the eggs hatch and go through five stages of development before becoming adults. When they hatch in the early spring, the nymphs attach themselves to the plant they were hatched on and begin to feed. At this point, the spittlebug nymphs are green and wingless, though they are practically invisible while within the spittle.

Adult spittlebugs are brown or black and are about 1/8 to 1/4 inch long. They do form wings as adults and look similar to their relative,



the leafhopper, but with a broader body. Their faces look similar to the face of a frog, which has earned them the nickname of froghopper.

The damage inflicted on your plants from spittlebugs is minimal, despite the fact that they feed on the sap of the plant. In addition, their populations are generally very small. Therefore, it is not necessary to use pesticides to rid your plants of spittlebugs. In addition, a strong water blast from your hose is often all it takes to remove the spittlebug nymph from a plant. If you do not do anything to remove the spittlebugs, they will be gone from your plants within a few weeks on their own.

A severe infestation of spittlebugs can weaken plants, stunt their growth, and reduce their yield. If you are concerned that your infestation is serious, you should remove all plant debris in the fall and till your soil in order to decrease the egg population.

### ■ **Ladybugs (or Lady Beetles)**

Ladybugs are very beneficial to your garden, as they eat other insects that are harmful. Yet, many gardeners inadvertently kill these beneficial insects while they are young because they do not recognize them while they are in this stage. While still a nymph, ladybugs actually resemble tiny black alligators that are about half their adult length. They also contain orange, red, or white markings. This coloration and overall look can make ladybug nymphs look a bit frightening, despite their kind nature and helpful garden habits.

During the winter, ladybugs prefer to rest in dry areas that provide them adequate protection, such as house shingles, tree bark, and in the attics of homes. In the early spring, they come out from hiding. They begin feeding and laying their eggs immediately. In fact, one female ladybug will lay up to 1,000 eggs in a period that is just over three months. When the young hatch, they begin feeding immediately as well.

In just the three weeks it takes for the ladybug nymph to pupate, it will eat approximately 400 harmful aphids. In all, a ladybug eats about 5,000 aphids during its entire lifetime. In addition, they eat whitefly pupa, soft scale, spider mites, and thrips – all of which can cause harm to your garden.

## ■ *Fungus Gnats*

Fungus gnats are tiny insects, about 1/8 inch long, that resemble very small mosquitoes. They are often first noticed around new seedlings, on which they like to prey. Since fungus gnats are so tiny, they are capable of entering a greenhouse or home through even the tiniest of openings. Therefore, even your indoor plants are not safe from these pests. In addition, their eggs are known to hitch a ride in damp bags of soil bought from stores or in the soil of a plant that may have been outside.

Adult fungus gnats do not really cause much direct damage to plants, though they can be a nuisance to you as they fly about. The larva, however, can cause a great deal of damage to seedlings and other young plants because they feed on their tender roots. Although it is not yet known for certain, most experts also believe they feed on the developing callus of plant cuttings. This results in a delay in new root development.

The overall stress fungus gnats place on a plant causes it to become weaker. This makes it easier for disease pathogens to gain entryway to the plant and cause further damage. The first sign of a fungus gnat larva infestation is usually wilting, which is followed by an overall decline in the plant's health.

The fungus gnat lays its eggs in the cracks on the surface of soil. The larva hatches within six days after being laid, at which time they begin feeding on the roots of the plant. After feeding for approximately two weeks, they pupate within the soil. In less than a week, they come out of the soil in adult form and start the cycle once more. Most of the fungus gnats born are females, which helps their population grow quickly. In fact, just one female fungus gnat can lay anywhere from 100 to 300 eggs at a time.

To check your soil for fungus gnats, you can place yellow sticky cards in a standing position on the surface of your soil. This will attract the adult gnats and hold them in place, which will give you an idea of how large your fungus gnat population is.

To draw out the larva, you can place a potato slice on the surface of your soil. When they begin feeding on the potato slices, you can collect them and dispose of them properly. Make sure you do not allow the potato slices to dry up, however, as this will only encourage

the larva to return to the roots of your plants. This also helps you determine what stage your population is in and when the larva is feeding. If you choose to use pesticides to get rid of your fungus gnats, it is best to do so at this time.

If you decide to build a greenhouse, be sure to thoroughly clean it out before beginning new seedlings. Things such as weeds and soil on the floor of the greenhouse will attract fungus gnats to the area.

If you are having a real problem with fungus gnats, avoid using potting mixes in your garden that have fresh compost additives. The high microbial activity of these mixes tends to attract fungus gnats. It is also best to use a potting mix that has been well drained, as fungus gnats are attracted to soil that remains moist. For this reason, potting mixes that are left outdoors and allowed to remain wet may also contain the larva of fungus gnats. In addition, the larva enjoys eating any organic material found in your soil.

If everything you have done to prevent fungus gnats has not worked, you can try a few different biological methods for getting rid of them. A bacteria called *Bacillus thuringiensis* has proven to be effective in getting rid of fungus gnats while their larva is in the feeding stage. It is important to apply this when the larva are eating because they must eat the bacteria in order to be affected. This bacteria is sold under the brand name of Gnatrol, though it is only active for two days and will need to be reapplied accordingly.

A nematode called *Steinernema feltiae* is also effective when used to soak the soil of the garden. These worms enter the fungus gnat larva and release a bacterium that is lethal to them.

Both *Steinernema feliae* and *Bacillus thuringiensis* are living organisms. Therefore, you probably won't find them available at your local garden center. Rather, you will probably need to order them from a catalogue. During the seed starting season, you might also find them available in some nurseries.

If you cannot find these biological eradicators, you can purchase a general flying insect spray or a spray created specifically for gnats. Be sure to purchase one containing pyrethrins. These sprays will, however, only kill the adult fungus gnats and you will need to apply multiple applications.

## ■ *Viburnum Leaf Beetle*

The viburnum leaf beetle, of VLB, is an insect that is native to both Asia and Europe. It has, however, been a North American garden pest since it was first spotted in Canada's Ottawa-Hull region in 1978.

The viburnum leaf beetle is a relative of the elm leaf beetle and is capable of quickly stripping away the leaves of viburnum plants. This is because both the adult beetle and the larva enjoy eating the leaves of these plants. Although an initial infestation of the viburnum leaf beetle will not completely kill the plant, it will eventually die if it is defoliated by the insect for two to three consecutive years.

The viburnum leaf beetle has a fairly bland appearance and, therefore, is easy to overlook. The adults, which measure about  $\frac{1}{4}$  inch in length, are dull brown. In addition, their eggs are very tiny. The larvae of the viburnum leaf beetles grow to about  $\frac{1}{2}$  inch long and are a greenish-yellow color, which helps them to blend into the foliage.

During the winter, the viburnum leaf beetles remain in egg form on the branches of the plant. In May, they hatch and the larvae feed on the new leaves that have developed on the plant. New larvae are very tiny and, therefore, are easy to overlook when they first emerge. Similarly, the damage they cause to the plant may initially go unnoticed. This is because the holes can be as tiny as a pinhole. After about a month of feeding on the plant, however, it is hard to miss the damage they have caused.

In June, the larvae will descend to the ground. Here, they will pupate and the adults will emerge in late July. The adults then continue eating the plant. In all, it takes the larvae about eight to ten weeks to become an adult.

In late summer and through to the first frost, the female lays her eggs, which may be as many as 500 in just one season. To do so, she chews holes through the new growth in the plant and lays her eggs within each of the holes. She then covers the holes with excrement and chewed twigs in order to disguise and protect them. Although it can be difficult to spot these holes, you should be able to find them if you look at the underside of the twig. The holes will be found here and they will be in a straight line.

To avoid an infestation of the viburnum leaf beetle, it is best to plant varieties of viburnum that are resistant to these pests. You can get an updated list of the varieties that are the most resistant, as well as those that are most effected, by viewing Cornell University's Viburnum Leaf Beetle Citizen Science list at [www.hort.cornell.edu.vlb.suspects.htm](http://www.hort.cornell.edu.vlb.suspects.htm). Currently, those listed as being resistant to the beetle include:

- David viburnum (*V. davidii*)
- Dawn viburnum (*V. bodnantense*)
- Doublefile viburnum (*V. plicatum*)
- Judd viburnum (*V.xjuddii*)
- Koreanspice viburnum (*V. carlessi*)
- Leatherleaf viburnum (*V. rhytidophyllum*)
- Siebold viburnum (*V. sieboldii*)
- Tea viburnum (*V. setigerum*)

Those listed as being the most susceptible to the beetle include:

- American cranberrybush viburnum (*V. opulus* var. *Americana* – formerly *V. trilobum*)
- Chinese viburnum or Taiwanese viburnum (*V. propinquum*)
- Complex, arrowwood viburnums (*V. dentatum*)
- European cranberrybush viburnum (*V. opulus*)
- Possum-haw, smooth withered viburnum (*V. nudum*)
- Rafinesque viburnum (*V. rafinesquianum*)

If you decide to plant viburnums in your garden, be sure to keep a close eye on them. Closely inspect the small twigs in the early spring before the eggs have a chance to grow in May. Look at the growth from the previous year to see if you can find any scars or holes from egg laying. The warmer temperature of the spring will cause these holes to swell, which can cause the caps to fall off and make them easier to spot. Prune and destroy any infested wood before the eggs have a chance to hatch.

When the leaves on the plant begin to open, check both sides for larvae and prune and destroy any that are infested. If you choose to use chemical pesticides, it is best to apply them while the larvae are still in their early stage. This is because adults will simply fly away or they will drop to the ground to avoid the spray. Your local Extension Office should be able to recommend the best pesticides for your area.

## ■ Identifying Leaf Galls

Leaf galls are not actually insects. Rather, they are bumps or deformities in the leaves of plants, particularly in trees, that indicate an insect or a mite has been feeding on it. The plant forms the gall in response to the irritation it is experiencing, similar to the swelling you receive when bitten by an insect. Unlike your bump, however, the leaf gall will not go away or heal itself on your plant.

You will most likely notice the greatest amount of leaf galls after a particularly mild winter. This is because more insects will survive a mild winter and will awaken quite hungry. Leaf galls generally do not cause a plant or tree to die, but they can cause loss of foliage.

Although a leaf gall is quite unattractive and looks somewhat disturbing, the actual insect does not live inside. In fact, you probably will not notice the leaf gall until after the insect is far from the leaf and even from the plant. Before moving on to the next victim, however, the insect does a great deal of cosmetic damage to the plant. Trees that are most susceptible to developing leaf galls include elm, hackberry, maple, and oak, as each of these trees are favorites of insects that cause leaf galls to form.

Since the insect has already moved on by the time the leaf galls have formed, there usually is not much you can do to treat the problem. If it seems to be a reoccurring problem every season, however, you might want to consider spraying the plant or tree in the early spring in order to prevent an infestation in the first place. Again, your local Extension Office should be able to recommend the best pesticide for your area and for the particular plant needing to be treated.

## ■ Natural Pesticides

To deal with insect infestations, there are several natural pesticides you can use to prevent and to treat infestations should they occur.

### ***Insecticidal Soap***

Insecticidal soap is a combination of fatty acids and either sodium or potassium salts. Insecticidal soaps are effective against insects because they penetrate the outer covering of the insect and cause their cells to collapse.

Insecticidal soaps are among the safest pesticides you can use and they are non-toxic to animals. In addition, they do not leave behind a residue. Therefore, they are great to use in vegetable gardens because they can be safely used right up to time to harvest the crop.

On the other hand, insecticidal soaps must come in direct contact with the pest in order to kill it. As such, they are no longer effective once they dry out. In addition, it is possible for the soap to stress plants or to burn them. This is particularly true when used in full sun or when the temperature is high. Therefore, you should never use them during these conditions.

When purchasing insecticidal soap, be sure to read the label thoroughly. Some plants are particularly sensitive to this pesticide, and they should be listed on the label.

### ***Bacillus Thuringiensis (Bt)***

*Bacillus thuringiensis*, or Bt, is available in about 80 different forms – all of which can be used as a pesticide. Generally, the bacteria are available in a powdered form, which you sprinkle or dust onto the plant. In order to be effective, the insect needs to consume the powder. This is because *Bacillus thuringiensis* is a stomach poison that releases toxins into the insect's stomach. This causes the insect to stop eating and to ultimately die.

*Bacillus thuringiensis* is specific to the types of insects it will infect. Therefore, it is not harmful to humans, pets, bees, or birds. It is, however, very slow acting. In fact, it can take days before the insect stops eating and dies. In addition, it breaks down quickly, particularly in sunlight. It can kill some insects you may not want to be destroyed, such as butterfly larva and can be irritating to the skin.

### ***Neem***

Neem is comprised of AZA0 and liminoids, both of which are from the seed kernels of the fruit from a neem tree. This natural pesticide must be sprayed onto plant leaves in order to be effective. It works by disrupting the hormonal system of the insects and preventing them from developing to their most mature stage. Therefore, it is most effective when used on immature insects and when used on species of insects that must undergo a complete metamorphosis.

Neem is non-toxic to humans. It can be harmful to pets, however, so they should be kept away from treated leaves until they have dried. In addition, neem is slow acting, can be washed away by rain, and breaks down in sunlight. It also destroys all types of insects, so it might kill off those that you do not want to be eliminated.

### **Horticultural Oil**

Horticultural oil is a highly refined form of petroleum oil that is mixed with water and then sprayed on the foliage of plants. It works by coating the insects and causing them to suffocate or become unable to eat.

Horticultural oil has no toxic residue, though it is of a low toxicity to humans, pets, and birds. In addition, it can cause evergreens of a bluish color to lose their blue tint for a period of time and it can cause burning to leaves. Horticultural oil is best to use against insects that are soft bodied.

There are several different grades of horticultural oil. Therefore, you need to be sure you use the one that is correct for the season during which you spray it.

### **Pyrethrins**

Pyrethrins is a derivative of *Chrysanthemum cinerariifolium*. It is usually found in powdered form and is designed to be dusted onto leaves. In this way, it poisons the insects and causes a quick death.

Pyrethrins are quick acting and are a low toxicity to animals. In addition, it degrades within just one day after application. It will, however, kill any insect. Even those you may not want it to kill, such as honeybees. Therefore, it should be used with caution and saved for heavy infestations or for use on insects you are having difficulty killing in other ways.

### **Sabadilla**

Sabadilla is made from grounded sabadilla lily seeds and, therefore, is available as a fine powder. Despite being available as a powder, sabadilla is applied as a spray that acts as a stomach poison. It is very effective against bugs that are a part of the Hemiptera order, which are commonly referred to as “true” bugs. It is, therefore, highly toxic



to bees. It is also irritating to the mucus membranes of mammals, including humans. Therefore, it should also be used as a last resort.

### **Rotenone**

Rotenone is made from the tropical legume roots and is dusted onto the plant. In this way, it inhibits the insect's cellular process and prevents its tissue cells from receiving oxygen. It has low residual effect and it breaks down quickly when exposed to sunlight. It is, however, a broad spectrum pesticide that will destroy many insects you may not want to be killed.

## GETTING RID OF FUNGAL GROWTH

Fungal growth can cause a great deal of harm to your plants as it competes for nutrients and water. In addition, it is quite unattractive and can easily spread from one plant to the next. Therefore, it is best to treat fungal growth immediately in order to eradicate the problem before it gets worse.

Potassium bicarbonate is a great natural solution to getting rid of fungal growth. This additive is sometimes mixed with horticultural oil or other substances in order to make it easier to spread onto plant leaves. It is sold commercially as Kaligreen or as GreenCure. Some gardeners use sodium bicarbonate or baking soda for the same purpose, but potassium bicarbonate has been shown to be safer and more effective for plants.

Potassium bicarbonate should be sprayed at the first sign of disease, or it can be sprayed ahead of time as a form of prevention. Researchers are unsure of why potassium bicarbonate is effective, though it is believed it damages the cell wall and creates a pH that is not ideal for the fungus to grow.

Potassium bicarbonate can last for two to three weeks as a fungal preventive and is safe to use on vegetable plants right up until the time they are harvested. It can, however, burn your plants. This is particularly true when it is used in full sun. Therefore, you should check the label before using it on your plants and it is best to test spray a small area of the plant before using it on the entire plant.

## WHEN TO HARVEST VEGETABLES

Now that you have a beautiful and healthy vegetable garden, if this is the type of garden you have decided to grow, you need to know when is the right time to pluck the tasty veggies from their stems. After all, the main draw to growing your own vegetables is enjoying them fresh from your garden. The only true way to know your veggies are ready is to do a taste test, but there are a few signs to look for when determining when you should start keeping a closer eye on your veggies.

### ■ *Asparagus*

Asparagus should be harvested when the spears are about as thick as your smallest finger and are about six to eight inches tall. To harvest asparagus, you will need to snap them off the plant at ground level. From here, new spears will continue growing. You should stop harvesting about four to six weeks after your first harvest so the plant can produce the foliage it needs to produce food for itself.

### ■ *Beans*

Snap beans should be picked before the seeds inside being noticeably bulging. At this point, the bean should be able to be easily snapped in two. You will need to check your beans daily, as it doesn't take much time for them to go from being tender and tasty to tough if they are left on too long.

### ■ *Beets*

When you thin out the rows of your beets, you can eat and harvest their green tops. When beets are at the best point for picking really is a matter of personal choice, but they are ready to be harvested any time after the shoulders begin protruding at the soil line.

### ■ *Broccoli*

Since the broccoli we consume is actually the unopened flower buds, you need to check your broccoli frequently in order to harvest it at the right time. This is particularly true if you experience a warm up in the weather, which can encourage the flowers to bloom. Usually, broccoli grown in the home garden does not get as big as the broccoli found at the grocery store. In general, the best time to harvest is when the buds are about the size of a match head.

### ■ *Brussel Sprouts*

Brussel sprouts actually mature from the bottom up. Therefore, you should usually harvest them once they are about one inch in diameter. To harvest brussel sprouts, either twist them off or cut them from the stem.

### ■ *Cabbage*

When cabbage is ready to be harvested, the head will feel solid when you squeeze it gently. It is important to harvest cabbage once it is mature. Otherwise, it will continue growing and will split open.

### ■ *Carrots*

It can be difficult to determine when carrots are ready to be harvested. Usually, the tops of the carrots will protrude from the soil line, which will help you determine their diameter. The diameter the carrot needs to reach before being harvested depends on the variety of carrot you plant. In general, an adequate diameter indicates the length is also good. To be certain, however, you will likely need to pull one carrot to see if it is ready. Fortunately, carrots can be left in the ground after they have matured, so it won't harm them to leave them in a little longer than necessary. In fact, many gardeners believe a light frost while the carrots are still in the ground actually helps sweeten the flavor.

### ■ *Cauliflower*

Cauliflower usually will not grow to the same size in the home garden as you will find in the store. You should harvest your

cauliflower when the head looks full. Be sure to harvest it while the curds throughout the head are still smooth to the touch.

### ■ **Corn**

Corn is usually ready to be harvested about three weeks after the silks form. At this time, they will turn brown and dry. When pricked, the kernels of an ear of corn that is ready to pick should emit a milky substance.

### ■ **Cucumbers**

Cucumbers should be checked on a daily basis once they start forming and are best when harvested while young. The exact amount of time it will take for them to reach the best size and length depends on the variety you plant. No matter what variety you have, the cucumbers should feel smooth and firm. If you allow your cucumbers to get too ripe, they may become bitter tasting. Cucumbers can be harvested by twisting them from the vine, though they may need to be cut off instead.

### ■ **Eggplant**

Eggplant usually tastes best when it is still slightly immature. At this time, it should look shiny and feel firm. To harvest eggplant, you should cut it from the plant rather than pulling it.

### ■ **Garlic**

When garlic bulbs are ready, the tops will brown and begin to fall over. You should dig garlic bulbs out of the ground rather than pull them out. In addition, you should allow your garlic bulbs to dry out before you store them. After removing them from the ground, it is best to brush them clean without using water.

### ■ **Kale**

Kale tends to test better when grown in cool weather. The leaves can be harvested throughout the season, but the ones you select should be sturdy and firm with a deep green color.

### ■ **Kohlrabi**

Kohlrabi has the best texture when harvested while it is about two to three inches in diameter. The bulbs tend to get tougher as they get older. To harvest, kohlrabi should be simply pulled or sliced at the base.

### ■ **Leeks**

Leeks should be harvested when they are approximately one inch in diameter.

### ■ **Lettuce**

Heads of lettuce should be harvested when they feel firm and full when gently squeezed. If the weather is particularly hot, the lettuce head will bolt or go to seed instead of filling out as desired. Lettuce leaves can be harvested when the plant gets about four inches tall. Do not harvest the inner leaves yet, however, as these are the younger leaves and they still need to grow. Lettuce leaves can be harvested throughout the summer.

### ■ **Muskmelon**

Since there are so many different varieties of muskmelon, the exact guidelines for harvesting are not always the same. In general, it is time to harvest a muskmelon once it has become beige in color. At this time, the melon should just slip off the vine when it is lifted. In addition, you should be able to smell the sweet scent of the fruit when it is ripe.

### ■ **Onions**

Onions are ready to be dug from the ground when their tops have become ripe and have fallen over. Onions should be allowed to dry in the sun after being harvested.

### ■ **Parsnips**

Parsnips are usually tastier if they are allowed to remain in the ground after the first one or two frosts. In fact, they can be left

there through the winter and then harvested in the spring. If you live in an area with particularly cold winters, however, they should be mulched during the winter if you choose to leave them in.

### ■ **Peas**

Peas are ready to be harvested when the pods feel and look full. They are usually sweeter if harvested before they become fully plumped, though you will likely need to perform a few taste tests to decide if they are sweet enough to be harvested.

### ■ **Potatoes**

Potatoes are ready to be harvested when the plant above the ground begins to flower. If you want full sized potatoes, however, you should wait until the tops of the plant are dried and have turned brown. To harvest potatoes, you should dig out the outer edge of the row in order to avoid slicing into the potatoes.

### ■ **Pumpkins**

Pumpkins should be harvested once they have turned to the color you expect them to become. Otherwise, the vines will start to wither away and stop sending nutrients to the fruit. Pumpkins should be cut from their vines. They should not be left out on the vine if you expect a hard frost.

### ■ **Radishes**

Radishes are capable of maturing rather quickly. When they are ready to be harvested, you will notice their shoulder pushing out from the soil line. Be sure you do not leave them in the ground for too long. If you do, they will become tough and then go to seed rather quickly.

### ■ **Rutabaga**

Rutabaga bulbs are ready to be harvested when they are about three inches in diameter, which should be approximately three months after

setting out. You can, however, leave rutabagas in the ground and dig them up as needed. In fact, cold weather helps improve the flavor, though the plant should be mulched.

### ■ *Swiss Chard*

Swiss chard leaves can be harvested when the plant gets about four inches tall. Do not harvest the inner leaves yet, however, as these are the younger leaves and they still need to grow. Swiss chard can be harvested throughout the summer.

### ■ *Spinach*

Spinach will go to seed quickly if left unattended and not picked at the right time. To harvest spinach, you should cut it out at the soil line before the flower stalk has the opportunity to shoot up.

### ■ *Squash*

Summer squash should be picked while it is young, so it should be checked often. The skin of summer squash should still be tender enough for you to poke your fingernail through. You can tell when winter squash is ready to be harvested by looking at its color. Once it turns to the color you expect it to be you should cut it from the vine. Despite its name, winter squash should not be exposed to frost. So, be sure to cut it away before the first frost hits.

### ■ *Tomatoes*

Tomatoes are ready to be harvested when the entire fruit is the proper color and it feels slightly soft when touched. To harvest tomatoes, you should gently twist the fruit and pull it from the vine.

### ■ *Turnips*

To determine when to harvest turnips, you will need to look at its shoulders that poke above the soil line. They should be ready when the shoulders are about two to two and half inches in diameter. Be



sure to harvest turnips as soon as they become mature. If they are allowed to become overripe, they will become woody.

### ■ **Watermelon**

Watermelon is ready to be harvested when the white spot on the bottom of the fruit has changed to a deep yellow color. Sometimes, you can tell when a watermelon is ready by listening for a change in the sound when you thump it with your finger. When the watermelon is ripe, it should have a hollow sound when thumped.

## LONG LASTING PERENNIALS

As you plan your flower garden, you will most likely want to plant plenty of perennials. Unlike annuals, which only bloom for one season, perennial flowers return year after year. When choosing perennials for your garden, you will need to know the USDA Zone for your area. You can check with your local Extension Office to learn the zone for your area. Or, check a zone map, such as the one that can be accessed from [www.usna.usda.gov/Hardzone/](http://www.usna.usda.gov/Hardzone/)

Many perennials bloom for only a short period of time. For this reason, many gardeners choose to plant a mixture of perennials and annuals in their gardens. If you are looking for long lasting perennials, however, there are plenty for you to choose from.

### ■ **Bellflower (*Companula*)**

Zones: 4-9

Bloom Span: Two months or more, depending on the species

Growing Conditions: An easy to grow and long living plant. Grows best in areas with either cool summers or when grown in partial shade. Will self-sow.

Care: Mow or shear the plant to just a few inches if it begins to look ragged or tired after several blooms. This will help it grow back with a fresher appearance.

Best Species Choices: Blue Chips or Blue Clips (*Campanula carpatica*) and White Chips or White Clips (also *Campanula carpatica*)

### ■ **Black-eyed Susan (*Rudbeckia*)**

Zone: 3-9

Bloom Span: Three months

**Growing Conditions:** Rudbeckia are native plants to many areas of North America, making them particularly easy to grow and adaptable to many different conditions. It does, however, prefer somewhat lean, well-drained soil in full sun.

**Care:** Cut Rudbeckia will last a long time in water. Deadheading spent blooms will help continue the blooming season. Rudbeckia are also an excellent choice for attracting butterflies, which are attracted to their flat petals. In addition, birds enjoy eating their seeds in the winter. They can be easily divided for multiplication.

**Good Species Choices:** Goldsturm (*Rudbeckia fulgida*)

### ■ **Blanket Flower (*Gaillardia*)**

**Zones:** 2-9

**Bloom Span:** Three to Four Months

**Growing Conditions:** Full sun; stems will become floppy if given too much shade

**Care:** Gaillardia's provide attractive yellow petals with burgundy centers. Gaillardia will bloom all summer if provided full sun conditions without deadheading. Deadheading will, however, help keep the plant attractive in appearance. The plant itself does not live very long and, therefore, should be seeded or divided often.

**Good Species Choices:** Burgandy (*Gaillardia*), Goblin – dwarf variety (also *Gaillardia*), and Monarch (also *Gaillardia*)

### ■ **Catmint (*Nepeta*)**

**Zones:** 3-9

**Bloom Span:** Two to three months

**Growing Conditions:** Very drought tolerant, an excellent substitute for lavender if you cannot get it to grow in your garden as most varieties of gray foliage and flowers that are blue-lavender in color.

Care: Nepeta is not the same as catnip, which is somewhat weedy in appearance. Cats are, however, sometimes attracted to this plant. It will continually bloom through the summer if deadheaded.

Good Species Choices: Six Hills Giant (Nepeta) and Dropmore (Nepeta x fassenii). The Dropmore variety does not require deadheading.

### ■ **Coneflower (*Echinacea purpurea*)**

Zones: 3-9

Bloom Span: Two to three months

Growing Conditions: Very drought tolerant, prefers well drained soil and full sun. Stalks can become floppy if it receives too much water.

Care: Although Echinacea grows on tall stalks, it is self supporting and does not require staking. Deadheading extends blooming period. The plant spreads very slowly, though it can be divided easily. Seed heads can remain throughout the winter and provide tasty treats to birds. The flowers themselves are attractive to birds and butterflies.

Good Species Choices: Fragrant Angel (*Echinacea purpurea*), Magnus (also *Echinacea purpurea*), and Art's Pride (*Echinacea*)

### ■ **Fringed Bleeding Heart (*Dicentra Formosa* and *Dicentra eximia*)**

Zones: 2-9

Bloom Span: Three or more months

Growing Conditions: Prefers shade and will tolerate most types of soil

Care: The fringed bleeding heart, which is not the same as the common bleeding heart (*Dicentra spectabilis*), will repeatedly bloom throughout the majority of the summer. *D. Formosa* is a native to the western part of the United States, while *D. eximia* is native to the eastern portion. Therefore, it can handle the humidity found in those

states. The fringed bleeding heart does not have the same pronounced heart shaped flower, though it has attractive foliage and the flowers are still quite attractive. Most of varieties self-seed.

Best Species Choices: Both *Dicentra Formosa* and *Dicentra eximia* are great choices, the Alba variety has a pure white flower

### ■ **Fumewort (*Corydalis lutea*)**

Zones: 4-9

Bloom Span: Four months

Growing Conditions: Prefers partial shade and soil that is well drained. Will easily fill cracks in rocks in the garden or fill up slopes in a woodland garden or along pathways.

Care: Self-sows in any place it can once established. It can, however, take several years for the seed to germinate, which can make it difficult to start your own from seed.

Best Species Choices: *Corydalis lutea* is generally the only species available.

### ■ **Gayfeather or Blazing Star (*Liatris*)**

Zones: 3-9

Bloom Span: Three Months

Growing Conditions: Easy to grow in just about any soil type, but will likely require staking if grown in rich soil. Will grow in partial shade or in full sun.

Care: *Liatris* is a long lived plant and usually does not require division. Although they self seed, they usually do not take over a garden. The flower provides textural interest to the garden and has thin, spiky leaves.

Good Species Choices: Spike Gayfeather (*Liatris spicata*), which comes in shades of purple, pink, and white

### ■ **Pin Cushion Flower (*Scabiosa*)**

Zones: 3-9

Bloom Span: Three or more months

Growing Conditions: Prefer average soil and full sun.

Care: Deadhead for prolonged bloom and improved appearance. The plant should be divided every three to four years. Secondary stems, which can be found coming from the base of the plant, may also be rooted.

Best Species Choices: Butterfly Blue (*Scabiosa caucasica*) and Pink Mist (also *Scabiosa caucasica*)

### ■ **Pinks (*Dianthus*)**

Zones: 3-9

Bloom Span: Two or more months

Growing Conditions: Prefers well-drained soil that is slightly alkaline.

Care: *Dianthus* plants generally do not live very long and, therefore, should be seeded or divided on a regular basis. They naturally have a long bloom time, though some will continue to rebloom with deadheading. Many species are also evergreen, providing color and interest to the garden through the entire season.

Best Species Choices: Bath's Pink (*Dianthus gratianopolitanus*) and Cheddar Pink (*Dianthus deltoids*)

### ■ **Red Hot Poker (*Kniphofia*)**

Zones: 5-9

Bloom Span: Three or more months

Growing Conditions: Prefers well-drained soil in the winter and moist conditions in the summer. Requires winter protection in cooler zones and full sun during the growing season.

Care: Kniphofia is a spiky flower that is attractive to hummingbirds. To get long lasting blooms, be sure to provide it with the correct growing conditions. The plant does not transplant or divide well, though the young side shoots from the plant can often be removed and replanted.

Best Species Choices: Any hybrid variety, particularly Primrose Beauty (Kniphofia)

### ■ **Red Valerian (*Centranthus*)**

Zones: 3-9

Bloom Span: Three to four months

Growing Conditions: Nearly any type of soil will do, though it prefers soil that is dry and lean. In addition, it is longer lasting in cooler climates.

Care: It is difficult to start this flower from seed and is best to propagate with cuttings. It is also best to purchase the plant while in bloom to ensure you get the color you want. These plants usually do not last more than five years and should not be relocated or divided.

Best Species Choices: Albus (*Centranthus ruber*)

### ■ **Spiderwort (*Tradescantia*)**

Zones: 4-9

Bloom Span: Three to four months

Growing Conditions: Prefers cool and moist soil combined with full sun. Will also grow in partial shade.

Care: *Tradescantia* can be a bit of an aggressive plant, therefore you may need to control new plant growth by weeding out young plants as they form. Or, you can crowd them in with other plants. The leaves look a bit like grass containing flower heads with three petals. Each flower actually lasts for just one day, but the plant has so many buds that it blooms for a long period of time.

Good Species Choices: Carmine Glow (*Tradescantia*) and Snowcap (also *Tradescantia*)

### ■ *Spike Speedwell (Veronica spicata)*

Zones: 3-9

Bloom Span: Three to four months, from spring to frost

Growing Conditions: Well-drained soil and drought tolerant

Care: The plant is low growing and contains dense foliage, from which narrow spikes of reds, blues, whites, pinks, and purples grow.

Deadheading will help these plants bloom throughout the summer.

Good Species Choices: Sunny Border Blue (*Veronica*)

### ■ *Stonecrop (Sedum)*

Zones: 3-9

Bloom Span: Two to three months

Growing Conditions: Prefer well drained soil coupled with full sun.

Care: Taller sedum plants are excellent performers that will continue to look great for at least four growing seasons. The flower buds are an attractive addition to the garden well before they actually bloom and continue to be attractive after they have gone to seed, making it unnecessary to deadhead. For those plants that start to look floppy, however, you should shear them back in the early summer. This will form a sturdier plant with a bushier appearance. These plants can go for several years without needing to be divided, but should be divided once the plant begins to thin in the center. They can be propagated through stem cuttings.

Good Species Choices: Autumn Joy (*Sedum*), Bertram Anderson (also *Sedum*), Brilliant (also *Sedum*) Madrona (also *Sedum*)

### ■ *Tickseed (Coreopsis)*

Zones: 3-9



Bloom Span: Three or more months

Growing Conditions: Will grow in nearly any soil, prefers a sunny location.

Care: The plant itself does not live very long, only about two to three years. Allow the plant to self-seed or divide it every two to three years in order to replant its newer sections, which are on the outside. Deadheading is a chore with this plant because its flowers bloom all along its stem. Instead, sheer the entire plant back by 1/3 after it has completed blooming in order to encourage new flower buds.

Best Species Choices: Early Sunrise (*Coreopsis grandiflora*) and Zagreb (*Coreopsis verticillata*)

### ■ **Yarrow (*Achillea*)**

Zones: 2-9

Bloom Span: Three or more months, depending on the species

Growing Conditions: Nearly any type of soil will do, though it prefers soil that is dry and lean. In fact, the plant can become a bit floppy if the soil is too moist or rich.

Care: Deadhead spent blooms for repeat blooming. Cut back the plant to new growth after the second bloom in order to rejuvenate the plant. Divide every three years or so, as it has a tendency to die out in the center.

Best Species Choices: Coronation Gold (*Achillea*), Fire King (*Achillea millefolium*), and Summer Pastels (also *Achillea millefolium*)

## PERENNIALS THAT ARE EASY TO GROW

If you are looking to fill your garden with perennials that are easy to grow and require very little maintenance, you do have several lovely plants to choose from.

### ■ **Allegheny Foam Flower (*Tiarella cordifolia*)**

Zones: 3-9

Bloom Time: Late spring and early summer

Growing Conditions: Prefers shady, woodland settings

Care: These plants, which contain white or pink flowers that look like fuzzy spikes, spread quickly but do not crowd out other plants. Therefore, it is an excellent groundcover and provides color and interest to the garden for all four seasons.

### ■ **Blazing Star (*Liatris spicata*)**

Zones: 3-9

Bloom Time: Mid-summer through fall

Growing Conditions: Drought tolerant and capable of growing in most types of soil, despite being native to marshy areas.

Care: *Liatris spicata* provides continuous spiky blooms atop grassy foliage. Taller varieties may require staking, so choose those that are low growing or compact to avoid staking.

### ■ **Globe Thistle (*Echinops ritro*)**

Zones: 3-9

Bloom Time: Early summer to early fall

Growing Conditions: Does well in all soil types, even dry and poor soil.

Care: Globe thistle is not invasive or weedy. In addition, it does not require dividing. In fact, it has a long taproot and prefers to be left alone. It blooms for a long time and the seed head is just as attractive as the bloom, which means it does not require deadheading in order to stay attractive.

### ■ *Hosta*

Zones: 3-9

Bloom Time: Mid-summer

Growing Conditions: Partial shade, though golden leaf varieties can also handle sun.

Care: The foliage of hostas grows mostly in the early part of the season, during which time they can be a bit attractive to deer and slugs. Therefore, you may need to apply deer deterrent to the flowers early in the season. Growing hostas with thicker leaves will help combat slugs.

### ■ *Meadow Rue (Thalictrum aquilegifolium)*

Zones: 3-9

Bloom Time: Late Spring

Growing Conditions: Will grow in nearly any soil condition.

Care: Meadow Rue pops up late in the season and seems to bloom almost immediately. It only has one bloom, which are fuzzy puffs and do not have petals, but the bloom lasts for many weeks. In addition, the bloom remains attractive throughout the entire time, as does the foliage. It usually does not require dividing.

### ■ **Peony (*Paeonia*)**

Zones: 2-9

Bloom Time: Late spring and early summer

Growing Conditions: Requires a bit of sun and will grow in most soil conditions.

Care: Peonies come in reds, pinks, whites, and yellows and is an old-fashioned garden favorite. It prefers to be left alone once established and does not adjust very quickly when divided. Peony varieties with double blossoms may need staking or nearby plants to lean on. Single flowered varieties, however, are generally capable of standing on their own. The bushy foliage left after blooming is complete remains attractive throughout the growing season.

### ■ **Russian Sage (*Perovskia atriplicifolia*)**

Zones: 3-9

Bloom Time: Mid-summer to fall

Growing Conditions: Russian Sage prefers well drained soil and full sun

Care: These blue flowers continue to get brighter as their blossoms open throughout the season. They get woody stems, which may die back to the ground if planted in a colder climate. In early spring, they should be pruned down to eight to ten inches in order to encourage profuse blooms and new growth. Very few pests are attracted to the plant, not even deer. It does not need to be divided.

### ■ **Sea Thrift**

Zones: 4-9

Bloom Time: Spring to early summer

Growing Conditions: Capable of growing in rocky soil and can withstand sea spray and high winds

Care: These flowers, which come in lilac, pink, red, rose, and white, rest atop stems that shoot up from foliage that looks like a bed of grass. Will continue to bloom if deadheaded and the entire plant can be refreshed by cutting it down to its basal growth, though it is not necessary to maintain the plant.

### ■ **Siberian Iris (*Iris siberica*)**

Zones: 3-9

Bloom Time: Late Spring

Growing Conditions: Grows in just about any conditions, though prefers a bit of sun. Will spread quickly if grown in moist conditions.

Care: Siberian Irises look like other forms of irises, but their leaves do not flop or become scorched following blooming. Therefore, they add texture and interest to the garden long after the blooms are gone. They do require division if they become crowded and they may rebloom in the fall when grown in warmer zones.

### ■ **Turtlehead (*Chelone lyonni*)**

Zones: 2-9

Bloom Time: Late summer to late fall

Growing Conditions: Capable of growing in most any condition, though they will require a little bit of extra moisture if you grow them in a hot, sunny location

Care: These flowers come in red, pink, and white varieties. Deadheading is not necessary, as the seed heads are quite attractive. These plants are long lived and will reach their full size within three to four years.

## STARTING PLANTS FROM SEED

Once you really start getting involved in gardening, you might decide that you would like to start new plants from seed. Or, you may harvest seeds from your perennial plants and decide to grow new plants from your seeds. In either case, there are a few things you should know about starting seeds indoors.

### ■ *Deciding When to Start the Seeds*

First of all, you need to determine when is the best time to start growing the seeds indoors. This is determined by the type of seed you plan to grow, as well as when your area should receive its last frost. This information is determined by the zone your garden is in, as frost dates are provided as a range of when the first and the last one is expected for that area. After determining when the last expected frost date for your area is, check the back of the seed packet to determine how many weeks before this date you should plant the seed.

For example, if you live in Zone 6, which as a Frost Free Date Range from March 30 to April 30, and you want to plant broccoli, you will need to start the seeds about five to seven weeks before the frost free date. Therefore, you will count back seven weeks from March 30, which will be February 9. This means February 9 is the earliest you should start your broccoli seeds indoors. You may want to wait a bit longer, however, just to be safe.

In general, it is a better practice to average the dates of your Frost Free Date Range in order to get a date of April 15. Then, count back seven weeks from there. This way, your young seedlings may only need to be held for a couple weeks before being planted outdoors rather than a month if you have a late spring.

The following list shows the Frost Free Date Range for each Zone:

- Zone 1: June 1 - June 30
- Zone 2: May 1 - May 31

- Zone 3: May 1 - May 31
- Zone 4: May 1 - May 31
- Zone 5: March 30 - April 30
- Zone 6: March 30 - April 30
- Zone 7: March 30 - April 30
- Zone 8: February 28 - March 30
- Zone 9: January 30 - February 28
- Zone 10: January 1 - January 31
- Zone 11: Frost Free Year Round

Use this information to create a planting schedule for all of the seeds you want to start indoors. Keep in mind, different seeds will require different start times. Therefore, your schedule may cover a span of several weeks in order to plant all of your seeds at the proper time.

### ■ *Gathering the Proper Equipment*

There are a few essential items you will need if you wish to start your seeds indoors. First, you will need containers for your seeds. You can purchase pots from a home improvement or gardening store. Or, you can save the flats and containers from plants that you have already purchased and use them to start your seeds. Other options include yogurt cups and egg cartons. If you do use a previously used pot, however, be sure to clean it and disinfect it by soaking it in a solution made of one part bleach to ten parts water. This way, any disease or insects that may be in the pot from the previous plant will not be transferred to your seed and the soil.

You will also need potting soil. Seeds tend to perform best when planted in a soilless mix because they have less inherent problems than garden soil when it comes to providing nutrients, maintaining moisture, and encouraging disease.

Of course, you will also need the seeds that you wish to plant. It is also best to labels such as those previously discussed in the guide.

This will help you keep track of which seeds are what when the label is stuck inside the pot.

To help keep your seeds moist and warm, you will also need plastic covers or bags to place over them as they germinate. You are also going to need plenty of water and a light source for your seeds. Your light source can be a bright window. Or, it can be a high density plant or fluorescent light.

### ■ **Getting the Potting Mix Ready**

To get started with planting your seeds, you will need to loosen and dampen your potting mix. Do this before you place it in the containers you will be using to grow the seeds because it is easier to get the potting mix uniformly moist.

When you dampen the potting mix, it should be wet by not soaking to the point where it is dripping. There also should be no dry lumps. Your goal is to get it to the consistency of a sponge that has been rung out. You will use this pre-dampened potting mix to fill your containers, but do not pack it in tightly. Rather, you should fill the containers about 2/3 full and then tap the container on your tabletop to help it settle. Then, use your hand or a small board to gently firm it into place.

### ■ **Planting Your Seed**

Now that your containers have been properly prepared, it is time to plant your seeds. Be sure to read the instructions on the seed package in order to follow any special instructions. Some seeds, for example, need to be soaked or pre-chilled for a period of time before being planted in the pots.

If your seeds are small, you should simply sprinkle them on top of the potting mix. Larger seeds, however, should be counted and planted individually within the container. It is best to plant at least three seeds per container. This is because some seeds are basically duds and, therefore, do not germinate. In addition, some of those that do germinate will not survive.



## ■ **Covering Your Seed with Potting Mix and Setting it Up to Grow**

After your seeds have been planted, you need to cover them with more of the potting mix that you have dampened. Gently firm the potting mix on the top of the seeds. Read the instructions on your seed packet to determine just how much potting mix you should place over your seeds. This will usually be worded as the depth your seed needs to be planted. As a general rule of thumb, the smaller the seed, the less coverage it will require. Some seeds, however, should barely be covered at all because they need the light to help them germinate.

Now that your seeds are properly in place in their pots, you should sprinkle some more water on top. This will help make sure the top layer of your mix does not become dried out. It also helps the potting mix firm up some more and makes sure it has proper contact with the seed.

Your pots should now be covered with some form of loose plastic. You can do this by placing the entire container inside a plastic bag or to laying a sheet of plastic over your container or containers. This way, your seed will receive adequate heat and moisture. Another option is to purchase special trays that are made for starting seeds, which come with clear plastic covers. These containers can be purchased from most home improvement stores and garden centers.

## ■ **Giving Your Seed Light, Heat, and Air**

It is important to the success of your seeds for the container they are in to remain warm and free of drafts. Be sure to check your seeds daily, as most prefer a temperature anywhere from 65 to 70 degrees Fahrenheit. A good spot for storing your seeds in order to give them the proper temperature is on top of the refrigerator. Unless otherwise directed, most seeds do not need light in order to emerge. Or, you can purchase a special seed germination heating mat from your garden center.

If you purchase a heating mat, be sure to place it below the pots your seeds are in because it should be heated from below. You will also most likely need to water your seeds more often if you use a heating mat because they tend to dry the potting mix out.

Regardless of how you decide to keep your seeds at the proper temperature, be sure to provide adequate air flow beneath the plastic. Otherwise, it can become too moist inside the container and mold may grow.

### ■ *What to Do When Plants Appear*

Once your seedlings begin to emerge, you should remove the plastic and move your container to an area that receives indirect light. Make sure your potting mix remains moist, however, but do not allow it to become wet.

When your seedlings first start to poke through your potting mix, they will look curled. As they grow, they will start to unfurl and straighten out. You will most likely notice what seems to be two leaves emerging from your plant. In actuality, these are not leaves. Rather, they are cotyledons, which is the part of the seed that provides food to your plant until the true leaves develop and the plant begins making its food through photosynthesis. When the true leaves appear, you should move your seedlings to a direct light source.

Your seedlings will require about twelve to eighteen hours of light every day. They require such a long amount of light because artificial light and the light from the winter sun are both not intense enough to compete with the summer sun. To ensure your seedlings receive enough artificial light, attach the light to an automatic timer that turns itself on in the morning and shuts itself off at night.

Now that the true leaves have appeared, and because your seeds are currently planted in a soilless potting mix, you will also need to provide your seeds with a supplemental feeding. Be sure to select a fertilizer that is well balanced or that is high in potassium and nitrogen, as this will encourage healthy growth and strong roots.

### ■ *Transplanting Your Seedlings*

It is ok to leave your seedlings in their original containers until it is time to move them to their permanent outdoor location. In some cases, however, it may be best to transplant the seedling to a larger pot after the seedling grows to a couple inches tall and has formed

many sets of leaves. Transplanting the seedling to a three or four inch pot gives its roots more room to grow.

### ■ *Thinning Out the Seedlings*

Since you planted several seeds in each of your pots, you may find that more than one plant has successfully started to grow. Now, it is time to thin them out. Keeping more than one seedling in a pot will cause them to fight for nutrients, water, and sunlight – which can cause all of the plants in the pot to die.

You can attempt to separate the seedlings into separate pots, but the better choice is usually to cut away the weakest plants and leave only one. In this way, the roots of the plant you keep will not be disturbed. For the same reason, you should never attempt to pull out the extra plants, as the roots of the plant or plants you remove may be wrapped around the one you wish to keep.

### ■ *Putting Your Seedlings Outside*

By the time it is the proper outdoor planting time for your seedling, you should have grown a strong, healthy plant. Before you place them in your garden, however, you need to get the plants accustomed to outdoor conditions. To do this, you will need to gradually introduce your plant to the outdoors through a process called hardening off. By hardening off your plant, you give it the opportunity to become acclimated to the outdoor drying winds, sunlight, and changes in climate.

To harden off your plant, place it in a shady spot outside. Over the next several days, gradually increase the amount of sun your plant receives. If it looks like there will be a drop in temperature, however, cover your plant or bring it indoors until the temperature change has passed.

You should gradually increase the amount of time your plant spends outdoors, as well as the amount of sunlight it receives. When you notice that your plants are growing strong, you can finally plant it outdoors. Be sure to water the plant thoroughly before you transplant it, and then water it thoroughly again after placing it in the ground. Also, do not transplant it at the sunniest time of the day, which is around mid-day.

## CREATING YOUR OWN COMPOST

Compost is an excellent additive to the garden. Even better, it is completely free to make. This is because it is simply organic matter that has been allowed to decompose. This organic matter may include items such as kitchen scraps, garden waste, leaves, manure, straw, and grass clippings.

Compost is beneficial to your garden because it helps add microbial activity to your soil, it improves the soil's structure, it helps suppress soil born disease, it attracts beneficial insects, and it holds its nutrients and releases them slowly. You can lay it on top of the garden, or you can till it in. Either way, it is useful throughout the entire growing season. In addition, it is truly impossible to add too much compost to your garden soil.

### ■ *Worm Composting*

There are several different ways to compost. Worm composting, also referred to as vermiculture, is a great way to compost vegetable peelings. This is because the kitchen waste is fed to worms, who help you create an excellent fertilizer for your garden.

To set up a worm composting bin, you only need a container, earthworms, and a type of bedding. The worms you need are called redworms, which are also referred to as brandling worms, manure worms, and red wigglers. Scientifically, they are called *Eisenia foetida*. These are not the same worms you dig up in your backyard. Rather, you will need to order your worms from an organic garden supply company. You should be able to get 500 worms for less than \$20.

Ideally, you should have about 2,000 worms for one pound of food waste per day. Another formula for determining how many worms you need is to use a one to one ration of one pound of worms for one pound of waste. Worms can, however, double their population in just 90 days. So, you might want to start with less worms than you actually need. If you are not sure how much waste you produce, keep track of it for one week and divide that number by seven to determine your average waste per day.

In addition to the worms, you will need a container for your worms to live in. You can purchase special worm bins from organic gardening supply stores. Or, you can simply purchase a plastic tub and poke holes in it so your worms can breathe. Make sure the container is at least eight to twelve inches deep. Since worms like it to be dark, make sure the container you select is colored so it remains dark inside when the lid is on.

Now, you need to create some bedding for your worms. Since worms like moist, but not wet, conditions, you will need bedding capable of maintaining the moisture inside your bin. Ideally, your worms will want an environment that is 75% water.

To create the bed for your worms, you will need to first soak a large amount of shredded cardboard or newspaper. It should only take a few minutes for newspaper to become adequately soaked. Cardboard, however, should be soaked overnight. You should never use any form of manure or garden soil as bedding because these substances release gases that will cause the temperature inside your bin to rise. In turn, this will essentially cook your worms until they die.

Wring out your bedding matter so that it is moist but not dripping wet. Then, place it in the bin along with another gritty substance such as leaves, soil, fine sand, sawdust, cornstarch, or ground eggshells. This gritty substance is necessary to help your worms grind up the food and the paper because they do not have teeth.

To help your worms get established, dig a hole down the middle of the bedding and place them inside the hole. You should not simply place them on top of the bedding. Then, replace the lid and keep the bin in an area that will maintain a moderate temperature. This can be beneath your sink or outside, whatever you are more comfortable with. Keep in mind that the temperature should be anywhere from 40 to 80 degrees Fahrenheit, with 55 to 77 being ideal. In addition, keep your worms out of high traffic areas as excessive noise and vibrations can be harmful to them.

Do not feed your worms for about a week after placing them inside your bin. During this time, they will get established and they will feed off the bedding. After this period of time is complete, you can begin feeding food scraps to your worms. Items that are appropriate include pulverized egg shells, peels from fruit and vegetables, coffee

grounds, and tea bags. You should not place bones, meat scraps, fish, dairy products, or oil foods inside your compost bin. These items will cause your bin to become smelly and will attract rodents and flies.

In addition to avoiding placing certain foods in your worm compost bin, there are a few other things you can do to prevent your compost from becoming smelly. First of all, never feed your worms excessive amounts that they cannot process. If your compost becomes smelly, it will be from the rotting food your worms could not get to, not from the worms or the compost itself.

If your worms seem to eat too slowly, you might want to chop up the vegetable matter before placing it in the bin. This makes it easier for your worms to eat. If this still doesn't seem to work, you may want to increase the number of worms in your bin or decrease the amount of food you feed to them.

After your bin becomes successfully established, it will become entirely self-sufficient. All you will need to do is add your kitchen scraps and occasionally scoop out the worm castings, which is the worm fecal matter. This doesn't just keep your bin clean, it also serves as an outstanding fertilizer for your garden. You might also need to monitor the moisture within the bin. If it gets too wet, place some additional paper inside to soak up the moisture. If it seems to be dry, spray it with a bottle of water to help moisten it again.

To remove the castings your worms have left behind, you should occasionally move all of the contents of your bin to one side. This includes the worms, the bedding, the castings, and the food. Then, pick out any partially decomposed materials and move them to the other side. Place some new food on top of this material and close the bin again. When you return a couple weeks later, the worms should all be on the same side as the food. Then, put on a pair of gloves and remove everything from the side that does not contain the worms.

After removing the contents of your bin, place it in your garden to help fertilize your plants. Then, create a new bed for your worms and start all over again. To help get the cycle started, save a bit of the compost from the previous batch and place that with the new bed.

## ■ *Backyard Composting*

If you do not want to try composting with worms, you can also set up a backyard composting bin. To do this, you will need some form of container or enclosure. You can construct your own bin or you can purchase one from a garden center or mail order garden catalogue.

Generally, it is best to use some sort of enclosed area for your composting bin in order to avoid attracting rodents and other pests. The size of your composting bin depends on how much waste you create and whether or not you intend to also add materials such as garden waste and grass clippings. Just keep in mind that your compost bin needs to be large enough to make it possible for you to occasionally turn your compost to aid in the decomposition process.

Another factor to consider for your compost bin is the amount of surface area of your materials it allows to be exposed to the air. The more of your material that is exposed to the air, the better it will decompose. You can also help increase the surface area of your materials by shredding, chopping, breaking, or mowing materials before you add them to your bin. This will help microorganisms access the material more quickly, which will generate more heat and aid in the breaking down process.

Since decomposition uses a great deal of oxygen, you need to be sure to aerate your compost pile as well. This is why you need to occasionally flip the material inside your bin, as this allows oxygen to get to center of the organic materials where it is used up quickly. Your compost pile will also get oxygen from the wind and from the warm air as it rises through the pile of organic material. This is why it is also important for your bin to be adequately ventilated. If your compost pile does not receive adequate oxygen, it may begin to smell.

To aid in decomposition, your compost pile also needs to be adequately moistened. The overall moisture content of your compost pile should be about 40 to 60%. If it gets to be less than this, the microbial activity will be slowed down or can become completely dormant. If it gets too moist, on the other hand, the aeration will be impeded and nutrients will leach out. This will cause the decomposition to be slowed down and can cause odor.

You can squeeze a handful of your compost pile to determine if it is at the proper moisture level. If it is correct, it should feel like a well-wrung sponge. If your pile becomes too wet, you can turn the pile to dry it out or add dry materials.

The temperature of your compost pile should be anywhere between 90 and 140 degrees Fahrenheit. If it gets higher than this, many important organisms will not be able to adequately do their job. Since the compost pile requires high temperatures to decompose properly, you should expect a slow down in decomposition during the winter in climates that are colder.

After about six months to a year of decomposition, you should be able to use decomposed material in your bin as a fertilizer or a mulch for your garden. Although it takes some time for your initial batch to be prepared for your garden, the process will then become cyclical and you should always have plenty of compost material for any average home garden.



## SUMMARY

This guide has provided you with several of the basics required to have a home garden. Whether you wish to start a perennial garden or a vegetable garden, you are now well prepared to jump in and get started. Now, all that is left is for you to begin experimenting and determining which plants are most suited to your taste and style and to find which grow best in your conditions.

Do not be discouraged if some of the plants you decide to plant in your garden do not grow successfully. No gardener has 100% success with every flower he or she plants. Rather, chalk it up as a learning experience and move on to different types of plants for your garden. Or, if you really have your heart set on growing that particular plant, give it a try again in a different location. Sometimes, you will be amazed by how great a plant does when moved from one spot to another.

Now that you have gotten your feet wet with gardening, you will find that there are so many other aspects of gardening you can explore. You might decide to try your hand at creating a rock garden or a garden that incorporates various types of trees, bushes, and perennials. In fact, such a mixture is the surest way to ensure your garden provides you with color and interest throughout the entire year.

Of course, there is also garden statuary. From water features, to bird baths, to gazing balls, to various forms of statues, you will certainly be able to find décor for your garden that will help you make your garden a truly unique reflection of you and of your personality. Whether you like whimsical gnomes, mystical dragons and fairies, or natural animals and wildlife, you will have no problem finding something you will enjoy.

Then, there is also the water garden. Once you have become comfortable growing flowers in land, you might decide to dig out a garden pond. Perhaps you will use a preformed garden pond or you will go with a liner and create your own shape. Either way, you can create a natural looking garden pond or a formal garden pond. You might add koi and water plants and create a garden that invites other

creatures to hop in, such as frogs and toads. Or, you might create a crystal clear pond with fountains and lights. Whatever your taste, you will certainly have fun experimenting with the many options available to you.

Your garden is also a great way to bring your family together. Whether you work together to grow tasty, fresh vegetables and then enjoy the literal fruits of your labor at the dinner table, or work together to grow colorful, beautiful flowers, you will certainly enjoy the time you spend together in the garden. Or, simply spend time outdoors sitting in or next to your perennial garden, taking in the sweet scents of your flowers and enjoying nature as birds and butterflies flit from one flower to the next.

So, what are you waiting for? Get out there, get your hands dirty, and start experimenting the joys of gardening. It is guaranteed to be a hobby that will continue to grow and add beauty to your home.

