

GARDENBREEZY · USDA ZONES 3–10

Organic Gardening Handbook

The Ultimate Seed-to-Harvest Guide

39 vegetables, 37 herbs, and companion flowers. A complete seed-to-harvest handbook for home gardens in USDA Zones 3–10.



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14 Steps to Organic Gardening & Growing Organic Food

This is the absolute minimum amount of information you need to know about growing your own organic food from seed. Follow these 14 steps and you'll be on the right track!

1. **Think about the vegetables and herbs you enjoy eating.** Make a list of those you enjoy most, and think about which are hardest to find or most expensive to buy in stores – those are the ones you'll want to grow. Winter **squash, hot peppers, lettuce, herbs, tomato** and **watermelons** are the usual popular choices. Don't be afraid to try **new varieties**.

Now you can find seeds that grow in your exact grow zone. Use the **grow zone lookup tool** to filter seeds for your zone.

2. **Divide the crops you want to grow** into **cool-season crops** (which do best in the spring and the fall) - and - **warm-season crops** (which do best in the summer).

Common cool-season crops include **beets, broccoli, cabbage, carrots, cauliflower, collard greens, kale, lettuce** and **other salad greens, peas, radishes, spinach** and **turnips**. These crops can survive cold weather (even some frost).

Popular **warm-season crops** include **beans, corn, cucumbers, eggplant, okra, peppers, pumpkins, squash, tomatoes, and watermelons**. These crops need very warm weather to grow and cannot survive frost at all.



3. Further divide the crops you want to grow into crops that can be grown from seed in the garden and those that are usually planted in a house or greenhouse and moved (or **transplanted**) into the garden as small plants.

Of the crops listed above in step 2, **broccoli, cabbage, cauliflower, collard greens, eggplant, kale, peppers, and tomatoes** should almost always be transplanted by new gardeners (basically this means to start your seeds indoors!)

Cucumbers, pumpkins, and watermelons are sometimes transplanted and sometimes not (and basically this is saying that you can just directly plant the seeds into the garden).

4. Using your lists from steps 2 and 3, above, figure out which seeds you want to start with. Late winter, is usually the best time to buy the seeds you need. **Click here to sign-up to receive our LEARN GROW HARVEST Newsletter.** You can always unsubscribe. We will ALWAYS respect your privacy.

5. In April, or as early after that as you can, find a garden spot.

Use containers, build a raised bed, dig up your front yard, or whatever else you can think of. **6 Tips for Gardening in Containers**

If you have a choice, your garden location should be flat and exposed to full sun all day.

6. Use whatever tool(s) you have handy to **break up the soil throughout your garden.** If at all possible, add some **fertilizer** and **soil amendments.**

Talk to an experienced person at a good garden store for suggestions about what to buy, emphasizing that you want to grow organically.

DID YOU KNOW? You can even have your local garden shop test your soil and provide recommendations for special soil amendments.

7. **Mark off the areas you plan to grow in with sticks.** Leave paths in between that are at least 12 inches wide.

8. **Use your tool(s) to prepare smooth beds** where the topmost soil is very fine (no large lumps).

9. **Start planting seeds of cool-season crops** (again, this can happen as early as the beginning of April for many crops).

Leave space for the **warm season crops**, which will not get planted until late May or early June (or plant very quick growing crops that will be finished by early June).

Starting your seeds indoors is a great way to get a “jump start” on your garden. By starting your seeds indoors a few weeks before your last frost, you should have plenty of small seedlings ready to be transplanted into your garden beds once planting season begins. **Tips for Successfully Starting Your Seeds**

By far the easiest way to start your seeds indoors is to use **Seed Starting Soil Pellets.** To use them, place them in a large tray. Fill the tray with enough hot water to cover the pellets. This will start to expand the pellets and get them ready for planting. Once the pellets are fully expanded, if there is any extra water remaining in your tray, gently drain.

Seedlings are tender and have been sheltered their whole young lives. Like a toddler, those newborn plants need an extra step in their growing cycle. In order to transition successfully from inside to outside, they need a bit of loving care, also called hardening off. **9 Steps to Harden Off Seedlings**

10. **Weed your garden regularly** (at least once a week), and put down leaves, straw, newspaper, and/or cardboard around your crops to keep weeds from growing. Harvest crops as they mature.

14 Steps to Organic Gardening & Growing Organic Food

11. When all danger of frost has passed (in late May or early June), it's time to **start your warm-season crops** and plant them in the garden as quickly as you can.
12. Continue weeding and harvesting through the summer, watering your garden thoroughly (for one hour or more) once a week if it has not rained.
13. As cold weather approaches in October, **begin replacing warm-season crops with cool-season crops** as the warm-season crops begin to die.
14. **Harvest your garden** for as long as you can! (read about **season extension techniques** and **floating row covers**)





Seed Planting & Spacing Cheat Sheet

Vegetable	Spacing b/w Plants "	Spacing b/w Rows "	Depth to Plant Seed "
Artichokes	36-48	48-60	1
Beans (Bush)	2-3	18-24	1
Beans (Pole)	4-6	30-36	1
Beets	2-3	12-18	1
Broccoli	3	24-36	1/2
Brussel Sprouts	24	24-36	1/2
Cabbage	18-24	24-36	1/2
Carrot	2-4	12-24	1/4
Cauliflower	18-24	24-36	1/2
Celery	8-10	24-30	1/4
Chard	9-12	18-24	1
Chicory	12-18	24-36	1
Chinese Cabbage	8-12	18-30	1/2
Collards	12	18-24	1/2
Cucumber	12	18-72	1/2
Eggplant	18-24	24-36	1/4
Kale	8-12	18-24	1/2
Kohlrabi	5-6	18-24	1/4
Leek	6-9	12-18	1/8
Lettuce	6-12	12-18	1/8
Mustard	6-12	12-24	1/2
Onion	1-2	12-18	1/4
Parsnip	2-4	18-24	1/2
Pea, Shelling	1-2	18-24	2
Pepper	18-24	24-36	1/2
Pumpkin	24-48	60-120	1
Radish	1-6	12-18	1/2
Rhubarb	30-36	36-48	1/2
Rutabaga	6-8	18-24	1/2
Spinach	2-4	12-24	1/2
Squash, Summer	24-46	18-48	1
Squash, Winter	24-48	60-120	1
Tomato	18-36	24-48	1/2
Turnip	2-4	12-24	1/2
Watermelon	24-72	60-120	1



What Does “Organic” Mean?



Weeds compete with desirable plants for light, water, and nutrients. Insects, bacteria, fungi, viruses, and other creatures eat the leaves, stems, seeds, and fruits of those same desirable plants. Weeds and pests have always been among the greatest challenges for gardeners and farmers, and for most of human history, the only way to deal with them was to use simple, non-chemical methods – hoeing or hand pulling of weeds, for example, removing the eggs, larvae or adults of crop-destroying insects, or pulling up plants that were obviously sick with some kind of disease.

Over time, particularly in the 19th century, a number of compounds were developed or discovered naturally occurring in plants and animals that served to kill insects, fungi, and other living things. Though there was some awareness of the toxicity of these compounds to humans (many of the substances used were based on arsenic and other poisons), they still seemed like a godsend and were widely used in agriculture.

In the 20th century, more sophisticated understanding of chemistry and biology (together with a huge research push, including the effort to make poisonous gases for use in World War I and World War II) led to the development of much more potent chemicals, including the first herbicides, or compounds that kill plants. As with the simpler chemicals that came before them, these new compounds – now known collectively as “pesticides” – were eagerly embraced by farmers and gardeners. In addition to better controlling insects and diseases, they offered the promise of simplifying **weed management**, which is some of the most difficult work of growing food. Together with the breeding of new crop varieties and the widespread use of so-called “synthetic” fertilizers (which are made through the petroleum-based capture of nitrogen from the atmosphere and the extraction of other nutrients through mining of the earth’s crust), pesticides led to the “Green Revolution” of the latter half of the 20th century, a time of dramatically increased global food production. This huge increase in food production has helped to feed a global population went from under two billion in the year 1900 to more than six billion in the year 2000.

As time has passed, however, pesticides and synthetic fertilizers have been shown to have a number of unintended consequences. Pesticides can (and, it has been shown, often do) kill or harm organisms other than the target pest, and may remain on our food and in the environment for many years before being broken down into harmless chemicals. Many insects, plants, and other organisms have also become resistant to widely used

What Does “Organic” Mean?

pesticides, resulting in a never-ending arms race between pests and pesticide manufacturers. Both pesticides and **fertilizers** can end up in ground water and surface water, killing fish, causing algal blooms, and otherwise damaging important habitat. Synthetic fertilizers have also encouraged a simplistic concept of soil fertility – the idea that plants need only be provided with nitrogen, phosphorus, and potassium -- at the expense of long-term soil health.

For these and other reasons, large numbers of farmers, food processing companies, and consumers have moved and are moving toward a model of agricultural production known as “organic.” The term “organic” has both informal and formal meanings. To many food consumers today, it refers to something more-or-less vaguely “natural” (grown without pesticides, for example) that’s somehow better (or less bad) for the environment and your health than something that isn’t organic.

The formal definition of “organic” does have a lot in common with this idea, but there’s more to it than simply the absence of synthetic pesticides. To organic farmers, food processing companies, scientists, and government regulators, the term “organic” refers specifically to food production that follows the rules of the United States Department of Agriculture’s National Organic Program, or NOP. NOP provides very specific guidelines about both chemicals and practices that are allowed in the production and processing of foods that end up being certified as organic by the USDA and other certifying agencies. It’s worth noting that the NOP does allow the use of some substances – including pesticides – that are toxic to humans and/or other organisms, but which are believed to be less harmful to human health and the environment than analogous chemicals used

in so-called “conventional” agriculture. One example of such a substance is pyrethrin-based insecticides, which are derived from flowers (especially chrysanthemums). While pyrethrins are toxic to humans, they break down quickly in the environment into harmless compounds.

Other formal aspects of “organicness” have to do with the use of food additives and preservatives, for example, and with how animals are treated, rather than with what chemicals are used in food production. To determine whether or not a particular compound or practice is or is not considered organic under the NOP, check the **NOP web page**. In particular, you may want to look at what’s called the **National List of Allowed and Prohibited Substances**, which tells you what synthetic substances you may and may not use in an organic farm, garden, or food processing setting.

It is perhaps worth noting that some farmers, food consumers, and others do not like the NOP very much – they feel it does not go far enough in specifying an environmentally and socially responsible set of practices for agriculture and the food industry (the NOP says little, for example, about how agricultural workers should be housed, paid, or otherwise treated, such that they can still be exploited in organic food production and processing just as they have long been in the conventional system). However, the NOP is an evolving program and it may in the future tighten regulations about what is permitted in the production of “organic” foods. For now, the NOP represents a substantial step away from the mainstream food system of the last 50 or so years.



Why Garden Organically?

For starters, it's possible to ask "why not garden organically?"

Much of the damage to the environment caused by "conventional" production methods results from growing large, continuous areas of the same crop. Backyard gardeners who grow only a few plants of many different kinds often have few pest problems without doing anything at all. Those backyard gardeners who use lots of pesticides are those who unwilling to pull weeds, have a low tolerance for cosmetic damage to their vegetables and fruits, or otherwise seek a great deal of control over what grows and what does not. If you are willing to pull weeds (or use non-chemical tools to prevent their growth), are willing to tolerate some cosmetic damage to your produce, and are willing to accept that in any given year some crops may not do well, you have the attitudes needed to get along just fine as an organic gardener.

Why else garden organically? Well, there's no question that many of the compounds used in conventional agriculture are poisons. If you don't have these poisons around and don't use them in your garden, you and your children, neighbors, and pets will not be touching, inhaling, or consuming them (at least not on the foods you grow yourself). You will also not be contributing to the total environmental load of these compounds.

If you use organic **soil amendments** such as **compost**, fertilize with organically approved **fertilizers**, and generally pay attention to your soil, you may also end up with "better" soil than that of many conventional gardeners.

Good soil has many earthworms and other organisms in it, is loose, is easy to dig in, is easy for your plants' roots to grow through, and is able to hold large amounts of water and nutrients and make them available to your plants.

Conventional gardening and farming methods can be very harmful to the soil.

It should be emphasized that the use of organic methods DOES NOT automatically make a gardener or farmer a better steward of the environment than a conventional gardener or farmer. There are conventional farmers and gardeners who do an excellent job of caring for their soil and plants and who use pesticides as little as possible. At the same time, there are organic farmers and gardeners who do a terrible job of caring for their soil and plants and who shouldn't be allowed to grow house plants, let alone food. It is not the intention of this book to dissect the relative merits of organic and conventional production, but only to provide guidance in basic, sustainable organic gardening.





Why Grow Organic Food?



There are as many reasons to garden as there are gardeners. With a little land, a few **seeds** and tools, and some **fertilizer**, anyone willing to put in the time and effort can grow a wide variety of delicious and nutritious vegetables.

Growing your own vegetables can cost significantly less than buying them (unless you pay yourself to work in the garden), and the food you grow may be more nutritious than equivalent produce purchased at grocery stores. We live in an age in which food marketing is all about cholesterol, fiber, and this or that type of fat.

Gardening helps you turn away from this absurdity and return to the idea of eating whole, nutritious, delicious food, as opposed to whatever “nutrients” the latest scientists, marketers, and journalists have told us might be best (or worst) for our health.

Similarly, in an era in which many Americans are almost completely sedentary (or go to great lengths to “exercise”), gardening is a form of activity (strenuous or not-so-strenuous, as you choose) that has a useful end product and doesn’t require wearing lycra tights.

For those overwhelmed by the pace of modern life, gardening can provide a focused, mindful break from constant noise and rush.

For others, the feeling of stewardship of a piece of land, of soil and plants, is important.

For those with children, gardening can be an excellent way to introduce children to the natural world and to food production and preparation. Finally, many just plain find it enjoyable.



Hybrid vs. Open-Pollinated (Heirloom) Plants

Most garden plants are either open-pollinated, which means that they are the result of mating between two plants that look very much like they do, or hybrid, which means they are the result of mating between two plants that are different in one or more characteristics (for example, mating between a tomato plant that bears small fruit but is resistant to disease and a tomato plant that bears large fruit but is not resistant to disease might give rise to a tomato plant that bears large fruit and is resistant to disease).

Mating two different plants together like this is called hybridization.

Hybridization can be very beneficial from a gardening point of view, because the hybrid often combines good traits from each parent. Hybrids occur naturally, but gardeners and farmers and scientists have created many more of them, and most garden centers and seed companies sell hybrid plants or seeds. Hybrids are not without their negative aspects.

One problem with hybrids is that the hybrid plant is a mixed-up combination of two different sets of genetic material. If it tries to mate with another plant, even another plant of the same hybrid type, it may not be able to have any offspring (“children”) at all, or it will have offspring but they will look very different from their parents, and will usually fail to show the desired characteristic(s) of the parents. For example, if the large-fruited, disease-resistant tomato plant mentioned above were allowed to mate with another similar plant, the offspring might have small fruits and lack disease resistance – the benefits of creating the hybrid to begin with would have disappeared in producing the next generation.



This means that you cannot save the seeds of hybrid plants and grow them the next year – you must buy them from a store or seed company every year.

The stores and seed companies get them from farmers or scientists who repeat the original mating every year to produce seeds with the desired good trait(s).

If you are growing an heirloom/open-pollinated variety, you can keep your own seeds from year to year.

Note: All the varieties in this handbook are 100% open-pollinated heirloom / non-hybrid. Save seed from plants that grow true.



6 Factors to Considering What to Grow

Start by thinking about what you'd like to grow.

Here 6 factors to consider:

1. How much of the year is left?

If you are planning your garden during the winter, or as late in the spring as May, you can still potentially grow anything you want. As you get later in the year, however, more and more different crops are eliminated from the list of crops you can plant. Why is this? It has to do with the “days to maturity” needed for different crops. Just as a person takes about 18 years to reach physical maturity, each different crop needs at least a certain number of days to grow from seed to the point where it is harvestable. Some plants like **radishes** and **lettuce** can be harvested in as little as 30 days, but others like peppers and watermelons and Brussels sprouts may need as many as 120 frost-free days to give you a crop. If there aren't enough warm days left in the year for a plant to produce what you want, planting that plant will be a waste of space in your garden.

2. Geographic Location

All of the crops discussed in this manual can be grown in southern Wisconsin (and, more generally) the upper Midwest, but some of them are harder to grow than others because of the relatively short growing season in this area. Tomatoes, peppers, eggplant, melons, and squash are sensitive to cold (particularly when the plants are young) and must be protected from it in special ways and/or planted within a narrow time window. Most common fruits, vegetables, herbs, and flowers do best in full sun, so gardeners whose garden space is significantly shaded by trees or buildings will have a limited set of crops to grow even if they live far to the south of Wisconsin.

3. Space

If your garden is small (say, less than 8 m or 25 ft on a side), there are certain crops you may not want to grow, just because they take up too much space (and will thereby keep you from growing much else). Unfortunately, this list includes popular favorites such as corn, potatoes, melons, squash, and pumpkins (and perhaps



6 Factors to Considering What to Grow

cucumbers, though they can be trained up wood, string, or metal structures called trellises so that they take less space). These plants are fun to grow and are still discussed in this manual, but if you choose to grow them you should do so with the knowledge that they may get very, very big and will tend to shade out or literally overrun your other crops.

Some compact crops for small gardens are beans, beets, cabbage, carrots, greens (lettuce, **spinach**, and many other types), onions, radishes, and turnips.

4. Your own desires

Some gardeners only care about growing tomatoes, while others like to have as much diversity as possible. Most gardeners fall somewhere in between. All of these strategies are fine, with the possible exception of growing only one crop year after year – this can lead to a buildup of pest and disease problems (ideally, you'll grow at least a few different crops and "rotate" them around the garden so that no crop grows in the same place two years in a row).

Before you order seeds or start digging in the garden, think about what you want. If there's something you really like (whether it's tomatoes, salad greens, strawberries, flowers, or something else), you'll want to plan your garden around that. Some of your choices may be driven by what's available in local grocery stores or farmers' markets and at what price. Decent potatoes and onions, for example, are cheap and widely available in stores and farmers' markets, so growers with limited space often skip these crops (though both are fun to grow, especially if you want to try varieties with unusual colors, shapes, or flavors).

Some gardeners really want to have asparagus, rhubarb, or fruit. Keep in mind that many such perennial crops do not yield anything for at least two or three years after planting. If you aren't sure how long you'll have your garden plot, don't plant these crops. In general, if you don't have any particular desires, read the quick reference guide to vegetable planting and the crop pages and try a bunch of different crops to find out what you like. Keep notes on what does well in your soils and your climate.

5. Simplicity

It is easy to feel overwhelmed in the garden. For this reason alone, beginning gardeners may do well to choose as few as four crops (perhaps **peas, tomatoes, cucumbers, and lettuce**), and try to grow these successfully before doing more the second year.

6. Difficulty of growing some crops

For various reasons, some plants are harder to grow than others. Eggplant, for example, can be difficult to grow because (in some locations, at least) they need to be protected from many different pests while also being kept warm. There are many plants (garlic, tomatoes, and squash, for example) that will produce for you without enormous effort on your part, but where a little extra care and attention can make for a much better crop. In general, if you follow the planting and care suggestions in this manual, you should have success with at least some crops each year. Even professional farmers lose crops to weeds, pests, disease, or simply a lack of time needed to perform adequate care.



7 Steps for Determining Where & When to Grow



Once you have a list of crops you might want to grow, think about where and when you'll grow those crops.

Follow these 7 steps to get started:

1. If you want to, you should be able to **make all of the garden space “work” all the time.** As soon as a crop is done producing, you can plant another different crop right away, at least as long as there is enough space for that crop and enough of the gardening season left for the crop to reach maturity. Most of your garden can produce two or even three different crops in a season. For example, beans and tomatoes (which need warm weather to grow well) can follow early crops of lettuce, **spinach**, radishes, or shallots (green onions) all of which are quick-growing and cold-tolerant. In general, whenever an open space appears in your garden, fill it with something else (or mulch it). If you don't fill it, the weeds will. See garden plans for help figuring out how to do this.
2. **Plan for the long-season crops first, and you'll be able to fit in the shorter-season crops around them.** If you choose to grow them, perennial crops like asparagus, rhubarb, and raspberries take up sections of your garden for multiple entire years. Other crops like Brussels sprouts, leeks, and parsnips tie up your garden space for just about the whole growing season (100 days or more). Figure out where these crops will go, then worry about fitting in the medium-season crops (plants like eggplant, tomatoes, broccoli that take 65-90 days to grow). The fast-growing crops (30- 60 days) can then be squeezed in around the others.
3. **Consider using beds.** Rectangular beds are handy because they allow you a lot of flexibility to deal with plants of varying sizes. If you divide your whole garden into beds 1 m (40 in) across (and however wide you choose), each bed can be used to grow either three equally spaced rows of small crops (like salad greens), two equally spaced rows of medium-sized crops (like beans)

7 Steps for Determining Where & When to Grow

or a single central row of a large crop (like tomatoes). You can, of course, plant things in rows (or any which way you choose), but rectangular beds with one, two, or three rows are simple and efficient. See beds for diagrams and additional explanation.

4. **Arrange your large plants so they won't shade the others.** Some plants (tomatoes, corn, and Jerusalem artichokes, for example) can shade out others. Put these plants where they have enough room and won't block the light (often in a bed at the edge of your plot). In general, the rows in your garden should run north-south to allow light to get to all of the plants as the sun moves from east to west across the sky.
5. **Leave enough room between the rows to allow you to walk and remove weeds.** In general, the spaces required by the plants themselves will be fine for this, but a little bit too much space is better than not enough space.
6. **Make use of vertical space.** In a small garden, you have a lot of vertical space, but not much horizontal space. Stake or cage your tomatoes, trellis your peas and cucumbers (provide them with structures made of wood, metal, and/or string to grow on), and you'll have more room for other crops.

7. **Rotate crops so related plants don't stay in the same place.** Broccoli, cabbage, Brussels sprouts, collard greens, kale, radishes, kohlrabi, rutabagas, turnips, and cauliflower are all very closely related (they're in the same plant family, known as "Brassicaceae," or the mustard family). As a result, they take the same nutrients out of the soil and are vulnerable to the same pests and diseases. As much as you can, move these crops around your garden so that no two related crops occupy the same space for two years in a row. There are other groupings of plants that should not follow each other: Potatoes, tomatoes, peppers, and eggplant are in the family "Solanaceae" (sunloving family); Carrot, parsley, celery, parsley, dill, and parsnip are in the family "Apiaceae" (carrot and parsley family); summer squash, winter squash, pumpkins, watermelon, cantaloupe, and cucumber are in the family "Cucurbitaceae" (gourd family); Chicory, endive, salsify, dandelion, lettuce, Jerusalem artichoke, sunflowers, and globe artichoke are in the family "Asteraceae" (aster family); Beets, chard and **spinach** are in the family "Chenopodiaceae" (goatsfoot family); and onion, garlic, leek, and chives are in the family "Liliaceae" (lily family).



Where Should the Garden Be?

If you are gardening in a community garden, you may have no choice at all about where to garden – you get a plot, and that’s where your garden is.

If you do have a choice, your garden should be out in the open, fully exposed to the sun. Most vegetables, flowers, herbs, and fruits do best if they are not in the shade - but there are still a lot of varieties you can plant that **tolerate partial shade**.

You can even think outside the box and use shopping bags like the one pictured to the right. They make great planting containers and they’re easy to move around. This container was used to grow some **Kale**.

THE RULE FOR A GREEN THUMB:

If you grow it for the fruit or the root, you need full sun.

If you grow it for the leaves, stems, or sprouts, partial shade is all you need.

One thing that’s important to remember is that the roots of trees and shrubs also compete with your garden for water. If possible, your garden should be close to a source of water.

Soil matters a lot – if possible, choose a place for your garden where the soil is deep, without rocks. If you want to, you can contact a local university extension service and have your soil tested for various properties important for agriculture.

If your **soil** is shallow or rocky, though, that’s o.k. – it can be improved. If you are near old housing (built before the 1970s), you may also want to have your soil tested for lead. Lead from paint can stay in soils for a long time and end up in your food. Exposure to lead is very harmful, especially for the brains of small children.





Gardening Through the Different Seasons



Spring and early summer - getting started with planting

Once your plot is prepared, mark out the beds or rows you plan to use, and start planting whatever crop(s) are appropriate to the season, following recommendations for spacing, **fertilizer**, etc. given in the **quick reference guide to vegetable planting**.

It's tempting to think that you can or should plant your whole garden at once, but because some crops cannot tolerate cold at the beginning of the season, the garden will fill up only gradually.

Summer and early fall - planting and harvest

As you move through the summer and early fall, some plants will reach maturity and you'll want to take them out, potentially replacing them with other crops (see **garden plans** for suggestions on how to plan out these successive plantings).

Other plants (long-season crops like **parsnips** or **winter squash**) will just stay in place, growing all season long.

Weeding is CRITICAL. You can do a little weeding each day, or you can weed thoroughly once a week, but if you wait more than a week to weed, you're asking for trouble.

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At this stage, **watering** can also be important, especially if there is no rain. It is likely that in almost any year you will need to water at least a few times, particularly after planting seeds into dry soil.

Fall - preparing for frost and dealing with it when it comes

As the days get shorter and the weather gets colder in the fall, some plants will begin to die even before there is a frost. **Check the weather online** or in the newspaper for predictions of the first frost in your area (“frost” occurs at or close to a temperature of 0 C/32 F).

When there is about to be a frost, there are a number of things you may wish to do in your garden before the frost, including harvesting all remaining tomatoes, peppers, eggplant, and cucumbers, and potentially covering some of your greens or other vegetables with floating row cover to keep them warm.

Besides protecting what you already have in the ground, you might want to consider the use of floating row cover or some other **season extension technique** like a cold frame to start a late crop of greens (especially **spinach**). With a cold frame, you can plant spinach in September and harvest it in October, November, or even early December.

Anything that is killed by frost will tell you that it has been killed – the leaves and stems will wilt and turn black, then quickly dry up. Frost-killed plants can be removed from the garden and put in your compost, but certain crops (**pumpkins** and **winter squash**, in particular) can be left in the garden through several more frosts, even though the plants themselves are dead.

There will usually be a number of frosts before there is a “hard” frost (a “hard” frost occurs at temperatures near -4 C/25 F). A hard frost will kill much of what remains in your garden, though certain crops (particularly **kale, broccoli, brussels sprouts, cabbage**, and related plants) can survive a hard frost and even keep growing afterward if the weather warms up a little.



Late Fall - preparing the garden for winter

As the weather becomes consistently cold (in late October and early November, in the upper Midwest), you can work at preparing your garden for winter. There are several aspects to winter preparation:

1. cleaning and putting away tools,
2. **use of mulch** and/or planting of cover crops, and
3. planting of certain crops that will survive the winter and grow early in the spring (**view a list of cold hardy plants**).

Putting away hoses, sprinklers, and other tools should take relatively little time. Hoses and sprinklers always have some water in them, and when it freezes and expands, it can

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damage these tools. For this reason, hoses and sprinklers should ideally go in a place where they will not freeze. If this is not possible, put them in any sheltered place.

Now is also a good time to clean the soil off tools like spades, hoes, and rakes and put them in any sheltered place – cold alone won't hurt these tools, but exposure to wind, rain, and snow will damage the handles and loosen the heads.

Dry off any floating row covers you may have used, fold them up, and put them away in a sheltered place. Gather up any wooden stakes and other wooden structures you have built and stack them under shelter to reduce rotting. Tomato cages and metal stakes should be pulled out of the soil but left outside – the exposure to the elements will help kill any disease-causing organisms that may be on them.

Whether you choose to **mulch** or plant a cover crop on your garden after your vegetables are gone is up to you (as a third option, many gardeners choose to do nothing at all, but just leave the garden exposed over the winter). **Use of mulch** is recommended – you could cover your whole garden with as much as 15 cm (6 in) of mulch in the form of newspaper, straw, or leaves, possibly putting compost, manure, or another **soil amendment** underneath the mulch.

Mulch will protect the soil from erosion caused by wind and water over the winter, protect perennial plants like asparagus and flowers from the damage caused by cold, prevent weed growth in the spring, and enrich the soil in the long term as it is incorporated in. Use of cover crops is more common on a farm scale than in the garden, and beginning gardeners are unlikely to want to use them, but you could choose to plant rye grass, hairy vetch, or another cover crop in any areas of your garden that are not occupied by perennials. If planted thickly, cover crops provide many of the benefits of mulch. Hairy vetch is a legume (it takes nitrogen out of the air and makes it available for plant growth), and it enriches the soil in a way that mulch does not.

Cover crops should be planted in late September or early October so they have a chance to get established before the weather becomes very cold.

In October or early November, you may also wish to plant certain crops. While it can seem strange to put living plants in the ground when the air is cold and the soil feels colder, crops like **Garlic** and **Artichokes** can be planted at this time. These plants can tolerate cold and wet soils, and many will actually grow a bit before going dormant (sitting and waiting) through the coldest part of the winter.

Besides giving them a head start in the spring, planting these crops in the late fall means that you have less work to do in the spring. Potatoes and artichokes will not grow in the fall, but they are difficult to store inside through the winter, and they store very well in the ground.

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Winter and early Spring - resting and planning

When you've done however much (or little) work you want to do to prepare your garden for winter, there's not much to do until January or February, which is when many gardeners start to think about what they want to grow and begin ordering seeds (**enter the seed shop**).

If you are interested in starting plants inside, February is not too early to begin preparing for this. **Expanding seed starting soil pods** will come in handy and make starting your seeds indoors much easier.

In March, in addition to starting plants inside, gardeners with cold frames (see **season extension techniques**) may use them either to start an early crop of greens (especially **spinach**) or to start plants like **broccoli** that will later get transplanted outside the cold frame.





Your First Few Days in the Garden

So, you have some kind of more-or-less detailed plan for the year, and you step into your garden plot in April (or May or June, or whenever).

Where do you start?

The first thing to do is just look around.

What's there?

Is there anything growing already, and if so, can you tell what it is? Dig some small holes in the soil – how easy is it to dig in and what does it look like? Are there any places that are wetter than others?

Once you have looked around, you need to prepare the plot for planting.

Depending on the size of the garden, the tools you have to work with, your physical fitness, and your level of experience, it may take you a number of sessions in the garden to get this work done.

The best thing you can do for yourself as the final step of your preparation is to **mulch** your garden heavily. This will keep **weeds** from growing as you gradually work to fill the garden up with vegetables.

Here are some other important topics to read through:

1. Introduction to soil
2. Understanding soil amendments and why you should use them
3. Guide to starting seeds indoors
4. How to “thin” your seedlings
5. What materials to use as mulch





Understanding & Managing Weeds in Your Garden



If you aren't willing to put in the time and energy to manage weeds, you just can't be a successful organic gardener. Sorry. On the bright side, with some mulch and a modest, regular time commitment to weeding, you can keep ahead of the weeds.

Why are weeds such a problem?

You won't be able to see most of them, but if you dig a shovelful of soil out of the ground, there are almost certainly thousands of weed seeds in it. Scientists and farmers call this large mass of seeds the "weed seed bank." Each of the seeds in this bank is alive and waiting for the right conditions to germinate and grow. Unfortunately, when conditions are right for your tomatoes, okra, or peas, they are also right for at least some of those weed seeds, and you need to take action to keep the weeds from out-competing your desired plants.

To make matters worse weed-wise, most gardening involves what are called annual plants, which must be grown from seed every year. While annual plants often grow quickly, they start out small and often do not compete well early in their lives with other plants that are trying to claim the same sunlight, water, and soil nutrients. Some plants are particularly poor at competing with weeds. Onions and their relatives, for example, have only a few narrow leaves that allow a lot of light to reach the ground around them. Light striking the ground encourages weeds to grow. Some other annual plants like tomatoes get large and have a plant structure more suited to shading out competitors, but they take long enough to reach their "adult" size that for much of the season there is a lot of exposed ground around for weeds to grow in. The saying "Nature abhors a vacuum" certainly applies to weeds.

Understanding & Managing Weeds in Your Garden

– if you don't prevent it somehow, any open, exposed soil will grow weeds.

Unfortunately for gardeners, some of the seeds in the weed seed bank can (and do) wait for years, or even decades, before germinating. As a result, even if you do a perfect job of weeding your garden (thereby preventing weeds from growing, flowering and adding new seeds to the bank), you will still have weeds every year. If you weed regularly, however, you should have less and less trouble with weeds as the years go by. appropriate to the season, following recommendations for spacing, fertilizer, etc. given in the quick reference guide to vegetable planting.

What makes a plant a weed?

In one sense, a weed is anything you don't want in your garden. Weeds range from the harmless and easy to manage (so-called "volunteer" tomatoes, for example, that grow from the seeds of fruit you didn't harvest the past year) to the nasty (such as Canada thistle, which can take over and ruin your garden unless you take aggressive steps to control it). One person's weed may be another person's treasure (the herb chamomile is one example of this – some people love it and some hate it).



How to manage weeds?

The single best way to manage weeds is not to allow them to grow in the first place. Having soil exposed encourages weeds to grow, so keeping as much of your soil covered as much of the time as possible is goal number one. While you might want to expose your whole garden at the beginning of the season to add fertilizers or soil amendments, and you will need to uncover parts of it to plant certain seeds, most of your garden can be covered most of the time with mulch of some kind or other. See the entries under mulch for a discussion of different materials for mulching and how to use them. Weeds will still germinate under your mulch, but many of them will be unable to push through the mulch, and those that do make it through the mulch will be weak and easier to pull out than if they had grown from unmulched soil.

Whether you mulch or not, you will still have to deal with at least some weeds. Organic farmers use many different tools to kill or remove weeds, but in a garden your two main options are hand weeding (often with some kind of small tool to help you) and weeding with a hoe (see tools). However you weed, it is critical to remove the roots of your weeds. If you rip off or slice off only the tops, the roots will send up new stems and leaves and it will be even harder to get the roots out than it would have been before. It is often easiest to weed after a rain or after watering your garden because the roots come up more easily. However, if you pull weeds out of wet soil and let them sit in contact with the ground in your garden, you'll be surprised by how many of them can reestablish their connection to the soil and survive. For this reason it's important to physically remove pulled weeds from your garden (to your **compost pile**, for example), or at least to make sure that their roots can't reach the soil.

Understanding & Managing Weeds in Your Garden

Hand weeding

Gardeners with small plots (and those who are very conscientious users of mulch) may never do anything other than weed by hand. At one level, hand weeding is simple – find a weed, pull it up. In practice, pulling weeds so that you get the roots out takes some practice, and may involve a trowel, some kind of probing tool, or even a spade for large weeds (see tools for pictures of these implements). Weeds can also sometimes be difficult to tell apart from your desired crops. This can happen, for example, when you are growing plants from seed and the young plants have just emerged from the soil. There may be weeds growing in with them, but you can't tell the weeds apart from your seedlings. Usually all you need to do is wait a few days to a week and let all of the plants grow a bit bigger, at which point you should be able to tell them apart and pull the weeds. If your plants are small (or the weeds are big), you may need to use one hand to hold down the soil around your desired plants while you pull nearby weeds with your other hand.



What to do with weeds once you pull them out

If your garden is large and/or there are large exposed spaces (between young tomato plants, for example), you may want to use a hoe to dig out weeds (see tools). Using a hoe involves a chopping motion that you will need to figure out on your own. Remember, though, that your goal is to uproot weeds, not to just cut their stems off. If you have a hoe with a narrow head and want to try it out, you may be able to hoe out even very small weeds from close to small plants. A hoe should be kept sharp, and if you use a hoe a lot (especially in hard or rocky soil), you will need to sharpen it periodically with a file or bench grinder.

What you do with weeds once you've pulled or hoed them out of the ground depends on several things. If it's wet out (or likely to rain soon), weeds that you leave sitting on top of the soil may re-root themselves and start growing again, so it is important to take the weeds out of the garden, perhaps to a **compost pile**. If it's dry out, you can arrange the weeds around your desired plants and use them as a form of mulch to keep other weeds from growing. If the weeds have begun to produce seeds, it's important to take them out of the garden and put them somewhere other than your compost pile (some composting methods kill weed seeds, but others do not).



Introduction to Soil



You probably can't choose where to garden, and whatever soil you have in your gardens is the soil you have to work with.

Having said that, you can:

1. work to understand the soil you have, or
2. make some attempts to improve (or maintain) its suitability for gardening.

What is soil?

If you're not familiar with soil, it may all look sort of blackishgrey and crumbly. Soils are quite variable, however – soils a few hundred meters or yards apart can have different properties and support the growth of different crops. Any soil is a complex, constantly changing mix, made up of several components: minerals, organic matter, and living organisms.

Organic Matter

Organic matter is a fancy term for broken-up formerly living things. When animals and plants die, they are gradually broken up into smaller pieces. Some of these pieces are eaten or carried away by creatures large and small, but some of them end up getting incorporated into the topmost layer of soil. Though organic matter almost never makes up more than 10% of soil, and may make up as little as 1 or 2%, it has a disproportionately large impact on a soil's potential to support plant growth. Like the mineral portion of the soil, organic matter gradually releases the elements it contains for plant growth.

If you think about where the organic matter comes from, however, it makes sense that it would be even more important than the

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mineral part – dead living things might logically be assumed to contain most or all of the elements needed to grow live living things, while the mineral part of the soil only holds some of these elements.

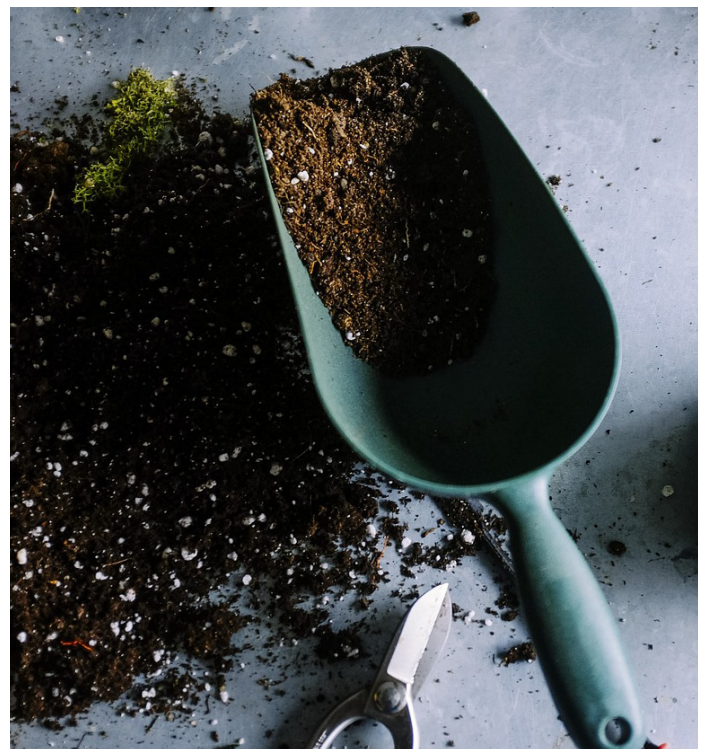
Organic matter is also even better than clay at holding water and any additional nutrients you might apply in the form of **fertilizer**. Plants can then pick these up from the organic matter and use them to grow. Organic matter makes soils less dense, easier to move around with tools, easier for plants' roots to grow through. It tends to make soil look dark, and it tends to be concentrated near the soil surface. If you have a soil that seems to be low in organic matter, that's something you can do something about. Even if your soil seems rich in organic matter, you can always add more (good gardeners do). You might think you could just add any dead things that you have on hand (woodchips, leaves, whatever), but unfortunately it's not that simple – not all dead things are created equal. Wood and dry fall leaves are not very nutritious at all compared to stuff that's wet, green, or otherwise closer to being alive (freshly cut green grass, freshly pulled weeds, manure, coffee grounds, banana peels, etc.). Neither the really dry, bland stuff nor the wet, green juicy stuff is something you want to add to your soil – the best thing to do is make a blend, and the best way to blend them is to compost them. See the **compost** page for more details on how to create useful organic matter for your soil.

If you don't want to bother **composting**, or you need to improve your soil in a hurry, you can go to a garden center or hardware store and buy bags of organic matter (composted manure or any other soil amendment) that you can add to your soil right away. If you buy something that's already composted, there's really no limit other than the size of your pocketbook and the strength of your back to how often or how much organic matter you

can safely add to your soil. See **preparing a new garden plot** for instructions on how to incorporate organic matter into your soil (you can use these instructions even if you are already gardening).

Minerals

If you pick up a handful of soil, between 90 and 99% of what you're holding was originally rock. Over millions of years, water and wind and freezing and thawing wear rocks into small or very small pieces. Soil scientists group these pieces into three categories by size. Sand particles are the largest, ranging in size from 2.1 millimeters (1/12 in) down to 0.05 millimeters (1/500 in) in diameter. Silt particles are next smallest, ranging in size from 0.05 millimeters (1/500 inch) down to 0.002 millimeters (less than 1/12,500 in). Clay particles are even smaller – so small that individual particles cannot be distinguished even under a fairly powerful microscope.



Introduction to Soil

Theoretically, a soil could be all sand, all silt, or all clay, but most soils are made of at least some of each of these three particles. The soil triangle (see picture at right) is a tool used by soil scientists to classify soils. You may not be able to tell exactly where your soil fits on the triangle, but the soil itself can tell you something. Just feeling it is a good start -- sand feels coarse and rough between your fingers, silt feels gritty, and clay feels sticky (at least when wet). You can also learn what's in your soil by watching it over time. If, when your soil is dry, for example, it develops large cracks, it probably has a high clay content. If you can walk on it without getting your shoes dirty even when it is wet, it probably has a high sand content.



Sand, silt, and clay come from hard, dead rocks, so you might think that these soil components would do little more than serve as a physical medium for plants to put their roots into. In fact, however, they play very important roles in assisting plant growth. Rocks are made of some of the same essential elements that

our bodies are, and the soil mineral particles that come from them gradually release these elements such that plants can take them up. Clay (and to a lesser extent silt) also plays important roles with respect to water availability and the usefulness of any fertilizer that you might apply.

Clay particles are very small and very numerous, and therefore have an enormous total surface area which also happens to be electrically charged. Important plant nutrients that we apply in fertilizers are also electrically charged, and the nutrients interact with the charged clay and stick to it such that they stay around until plant roots need them. Because clay particles are small and numerous, there are also many small spaces between them where water can be held very firmly – this too can be taken up by plants as needed. Soils that lack clay must be watered and fertilized often because the soil can't balance, or "buffer," the availability of nutrients like it could if there were clay present.

Because different plants have different needs, there's no particular mixture of sand, silt, and clay that's ideal for all vegetables. In theory, you could change the properties of your soil by adding large amounts of one or the other sizes of minerals. While people do occasionally do this (by adding sand, for example, to help soils drain better), the more common way to improve soil for gardening is to try to increase the soil's organic matter content (see below).

Living Organisms

While soil itself is not alive, any soil that is good for growing vegetables contains enormous numbers of living organisms.

Most of these creatures are far too small for you to see. Bacteria are the most abundant of these – 28 g (1 oz) of soil can contain more

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than 30 billion of them! Fungi (related to mushrooms) are almost as abundant, followed by other less familiar forms of microscopic life. These tiny creatures break down dead things, making the nutrients they contain available for plant growth. Less numerous but also very important are the creatures we can see – earthworms, insects, small mammals (mice, moles, voles), and others.

These creatures also help recycle nutrients, and they also make tunnels that help air and water move through the soil. Whether they're plants you want or ones you don't (like **weeds**), plants themselves are important to the soil. Plants called legumes (a group that includes beans and peas) collect nitrogen from the air and make it available in the soil for other organisms to use.

All plants put roots through the soil, and when these die and decay, the resulting channels help with air and water movement.

Plants with very deep roots can help bring nutrients up from very deep in the ground that are otherwise unavailable.

A quick note on soil health and soil erosion

As discussed above, soil is not just a place for your plants to stick their roots. While gardening inevitably involves some disturbance of the soil, you cannot dig it up, turn it over, or move it from one place to another and expect it to be the same as it was before.

There are a few informal rules to be followed for long-term soil health (and good yields of vegetables, fruits, herbs, and flowers):

1. When you harvest produce from your garden, you are removing nutrients.

These must get returned somehow. Some combination of **fertilizer**, **soil amendments**, and/or **mulch** is essential.

2. Soil with nothing growing on it is vulnerable to erosion, which is the removal by blowing wind and flowing water of the mineral and organic particles needed to support plant growth. Because it is concentrated near the soil surface, organic matter is especially vulnerable to erosion. Soil erosion often happens a little bit at a time, without anyone noticing, though heavy rains may leave channels in the soil that tell you soil has been removed and carried away. In nature, bare, exposed soil is rare and soil erosion rates are low. If there is a natural disaster like a mudslide or volcanic eruption that leaves the soil uncovered, there may be a lot of erosion for a short time, but plants quickly take advantage of the open space to grow. In these circumstances, erosion is usually brought under control fairly quickly without any human intervention. In gardens, however, we not only uncover and disturb soil repeatedly, but we try to prevent plants (weeds) from covering it up again. This can lead to substantial erosion, which in the long run can make your garden much less productive. Soil is hard to replace once it's gone – in an undisturbed forest or grassland, it can take 500 to 1,000 years to produce 2.5 cm (1 in) of soil. For this reason, gardeners have a responsibility to keep soil covered as much of the time as possible – if not with plants, then with mulch of some sort. Mulching is particularly important over the winter, when winds are strong and there are no living plants, and in the spring, when plants are small and it rains frequently.

Read more about **Soil Amendments** and **Fertilizers**



Soil Amendments



Note: This section will make more sense if you read the fertilizers and soil sections first.

Soil amendments are not fertilizers

As discussed in the **fertilizers** section, plants need a number of different nutrients to survive. These nutrients can be purchased and applied to soil in concentrated forms called fertilizers.

Fertilizers are rated according to how much they contain of three critical plant nutrients:

Nitrogen (N),
Phosphorus (P), and
Potassium (K)

Most fertilizers have labels that give you concentrations of N, P, and K as three numbers, like 4-6-4 or 6-2-0.

IMPORTANT: In the same place where they sell fertilizers, many garden stores also sell other products that are not really fertilizers but might seem like it at first glance.

These products, which this guide calls soil amendments, contain some of the same nutrients that fertilizers do, but in much, much smaller amounts. Soil amendments that have N-P-K labels may have numbers like 0-0.5-0, for example. Because they contain so few core plant nutrients, these products are not an effective way to provide most garden plants with nutrients.

Soil Amendments

What soil amendments are, and why you should use them

Soil amendments are made from a wide variety of materials, and they can be purchased in garden stores or made at home (if you have the materials, space, and time to make them). Manure from cows or horses is often used, as are various household and kitchen wastes (vegetable peels and cores, grass clippings, etc.). To make a soil amendment, these materials are processed somehow, usually by being made into compost.

Though this process can actually result in the loss of some nutrients, it makes the materials into a stable form of organic matter that is highly beneficial for your soil (see **Intro to Soil** for a discussion of organic matter and why it's important). You might wonder why gardeners don't just add materials like manure, kitchen waste, and yard waste directly to their soil. There are several reasons for this. Fresh manure is neither very pleasant to handle nor very stable in the soil (it and the nutrients it contains can wash away, evaporate, etc.).

Manure can also carry disease-causing organisms that are killed by the process of composting. Other materials are harmless enough from health and environmental perspectives, but if you add them to your soil unprocessed, the result can actually be the removal of nutrients from your soil, at least in the short term. This occurs because the materials you add to the soil don't just sit there – various creatures start to eat them immediately, and if the food you give them does not contain all of the nutrients they need to grow and reproduce, they will scavenge (collect) the nutrients out of the soil around them.



How much soil amendment to apply

Unlike fertilizers, which can be over applied, there is no upper limit to how much soil amendment you can safely put in the soil – the amount you put in depends on how much time, money, and energy you want to spend buying, making, and applying the stuff. It's safe to say that you should add at least a small amount of some sort of soil amendment to part of your garden every year, and to the whole garden if you can. Gardeners who make their own compost (or who are willing to buy a lot of it) sometimes add as much as 5 cm (2 in) of compost across their whole gardens each year.

How to apply soil amendments

Soil amendments can be spread on a garden at any time of year, though it can make the most sense to do this at either the beginning of the year (when you are preparing a bed for planting) or at the end of the year (when you are preparing the garden for winter – see the **garden through the season**). Dump your soil amendment on the ground in a pile, and use a spade, spading fork, or garden rake to spread it around to the desired thickness. Then, use a spade or spading fork to work it into the ground. It doesn't have to go in deeply -- a depth 20 cm (8 in) or less is enough; just get it off the surface (it will break down faster and be less useful on the surface).

Soil Amendments

Mulch can count as a soil amendment

This section will make more sense if you read the mulch section first. Organic gardening is much easier if you use leaves, straw, newspaper, or some other kind of **mulch** to help control weeds. With the exception of plastic and landscape fabric, most materials used as mulch can be dug into the ground as described above once they are done performing their job.

Like **compost** and other soil amendments that you might make or purchase, these mulch materials contain organic material and can benefit your soil. They tend to contain very few nutrients, however (the fact that nothing wants to eat them this is partly why they make effective mulches).

Because mulches are nutrient-poor, if you incorporate large amounts of mulch and want to plant in the same place right away, you'll want to add extra fertilizer to feed the organisms that are eating the mulch. If you don't, they'll take the **fertilizer** you intended for your plants and use it to complete their meals.



Guide to Starting Seeds Indoors

Starting Your Seeds Inside

This page should be also read: **Tips for Successfully Starting Your Seeds**

Some seeds can be planted directly in your garden (**aka: direct sow**). Other plants, however, are more often started inside, either because they cannot handle the cold conditions of the early growing season or because they need a longer season to grow that they need to start growing while there is still snow on the ground (or both).

If you start plants inside, you raise them to a certain size and then transplant them out into your garden (see **transplanting**).

Starting plants inside can be very fun and rewarding, but most beginning gardeners will want to buy **seed starting soil pods**. All you need to do is add water, add your seeds, and watch them grow.

Common Seed Starting Mistakes and How to Avoid Them

Over or Under Watering:

You want your seeds to get enough water, but not too much. Soggy, water-logged conditions will promote mold, especially in a “greenhouse” type growing environment. To avoid disrupting the soil when watering, use a spray bottle with a “mister” nozzle instead of a heavy stream of water, say from a watering can. Don’t let your soil dry out, check daily!



Guide to Starting Seeds Indoors

Growing in Low-Light Conditions:

South facing windows may work well, as long as the spot isn't drafty and daylight lengths are greater than 12 hours. If possible it's a good idea to supplement with grow lights. Up to 18 hours of light, will speed up growth. Make sure to read the directions for each grow light as it's a common mistake to place the light source too far away from the plants.

Temperatures Too Cool for Root Growth:

Cool temperatures on the surface encourage compact growth, but roots need warmth. By adding bottom heat with a seedling heat mat it will encourage healthy root growth, which makes for healthy plants. Make sure to use a media that won't dry out too quickly with bottom heat.

Not Starting Enough Seeds:

It's also a good idea to plant more seeds than you will need. This will allow you to pick the healthiest starts to plant. Because, don't forget ... **thinning** will be one of the most important things you will need to do.

Direct Sow

Most Root Crops & Cold-Hardy Plants

Artichoke	Kohlrabi	Squash
Arugula	Leeks	Swiss Chard
Asparagus	Lettuce	Turnips
Beans	Mescum Greens	Zucchini
Beets	Melons	Basil
Broccoli	Okra	Borage
Brussels Sprouts	Onions	Chicory
Cabbage	Parsnips	Chives
Carrots	Peas	Cilantro
Cauliflower	Pumpkins	Dill
Cucumber	Radicchio	Garlic Chives
Endive	Radish	Mint
Garlic	Rhubarb	Parsley
Gourds	Rutabage	Savory
Kale	Shallots	Tarragon
	Spinach	

Start Indoors

Tender Varieties & Heat Loving Plants

Artichoke	Leeks	Cilantro
Beans	Mescum Greens	Dill
Bok Choy	Melon	Garlic Chives
Broccoli	Mustard Greens	Lemon Balm
Brussels Sprouts	Okra	Lovage
Cabbage	Onions	Marjoram
Cauliflower	Peppers	Mint
Celery	Pumpkin	Oregano
Collard Greens	Radicchio	Parsley
Cucumber	Squash	Rosemary
Eggplant	Tomatillo	Sage
Endive	Tomato	Savory
Gourds	Zucchini	Tarragon
Lettuce	Basil	Thyme
Kale	Chervil	



Thinning Your Seedlings

If, like most gardeners, you want to make sure to have good, full rows of plants, you will probably want to thin at least some of your vegetables, flowers, and herbs.

What is “thinning”?

You prepare for thinning by planting seeds more densely (meaning closer together) than you actually want your plants to grow. After the plants emerge from the soil, let them grow for a little while (a week or two, for most crops), then pull up some of the plants such that the remaining plants (the biggest, healthiest looking ones) are approximately the distance apart recommended.

Why thin?

While you may think you don’t want to waste seeds, seeds are generally inexpensive. It’s much better to plant seeds thickly and need to thin the resulting plants than to plant seeds far apart and find that too few of them have germinated to give you the crop you want.

Seeds also must literally push their way out of the soil. If you plant them close together, they help each other with this sometimes very difficult task.

In some cases, the plants that you pull out while you’re thinning can be transplanted



Thinning Your Seedlings

elsewhere if desired. **Broccoli, cabbage, kale,** and their relatives fit in this category, as do a variety of other plants.

In other cases, the plants you pull out should just be added to the compost pile. **Beets, carrots, parsnips, cucumbers, melons, and squash** are among the plants that cannot be pulled out and planted elsewhere.

If you plant seeds densely, it is very important to make sure that you do thin the plants out. If you don't, the plants will be too close together and will compete with each other for light, water, and nutrients. They will stay small and will not produce much of what you want (leaf, fruit, root, etc.).

A variation on thinning is the planting of plants in a small, dense seedbed. If, for example, you want to create warm growing conditions for **basil** seedlings, you can plant 50 or 100 seeds very close together (say, in a square 60 cm/24 in on a side), then cover them with a cold frame (see season extension techniques) or a floating row cover. When the plants are about 10 cm (4 in) tall, you can dig them all up and transplant them into rows so they are about 60 cm (24 in) apart. Once they're that big, they can live without the extra heat.

Something similar is also commonly done for broccoli, cauliflower, cabbage, kale, collards, and related plants. For these plants, the purpose of the cover is not extra heat but protection from flea beetles (see pests). The flea beetles can eat the very small seedlings to death, but not the larger transplants.

An Important Gardening Lesson

A small number of plants planted the proper distance apart will almost always give you a larger and higher-quality harvest than a larger number of plants planted too close together.

Follow recommended plant spacings!



Transplanting

Before you transplant

Some plants will grow anywhere, in any soil, but many transplants do best in soils that have been fertilized (read about **Using, Buying, and Applying Organic Fertilizers**) or otherwise prepared in special ways. Often, this preparation can be done immediately before transplanting, but sometimes it needs to happen a week or more in advance. For some crops (especially tomatoes, eggplant, and melons) your preparations may include laying **plastic mulch**.

Types of Transplants

Transplants are of three general types:

1. Bare-root transplants are transplants that consist of a green, living top with one or more leaves and a set of exposed roots (no soil). Strawberry plants and onion and leek “sets” are often sold this way. They need to be carefully protected from drying out before you put them in the garden.
2. Potted transplants are (surprise!) transplants that are grown in pots of some sort (many commercial nurseries use shallow plastic trays, or flats). Tomatoes, peppers, eggplant, herbs, and many other



Transplanting

plants are sold this way (or you can grow them at home). Potted transplants usually have stems, leaves, and roots growing in at least a little bit of soil. They must also be protected from drying out before transplanting.

3. Bulbs and bulb-like plant parts are not exactly transplants, but many are planted more like transplants than seeds. Garlic, potatoes, sweet potatoes, Jerusalem artichokes, rhubarb, asparagus, and many flowers are planted similarly. Most (but not all) bulbs can be stored for long periods.

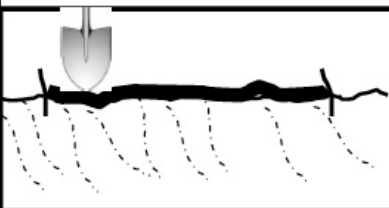
Transplanting without plastic mulch

Transplanting *without* plastic mulch

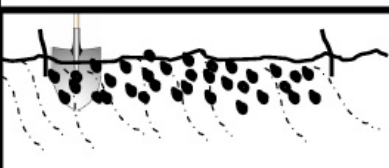
1. Determine how much space will be needed for your plant(s) *at their maximum size*. DO NOT underestimate this! Mark the area off with sticks.



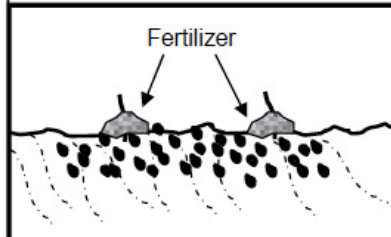
2. If the soils in your garden are dry, dense, and hard, or have not been treated well in the past, spread composted manure or some other **soil amendment** (NOT **fertilizer**) in the marked area. The more, the better. If you have already done this while preparing your garden, skip to step 4.



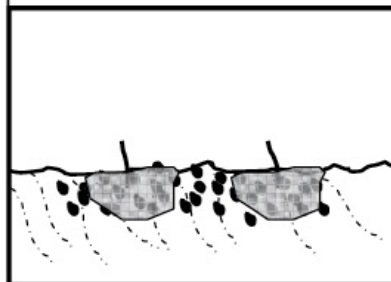
3. Use a spade or rototiller to dig the soil into the top 15 cm (6 in) or so of soil. Use your spade and/or a hoe or garden rake to break up large clumps and make a smooth bed.



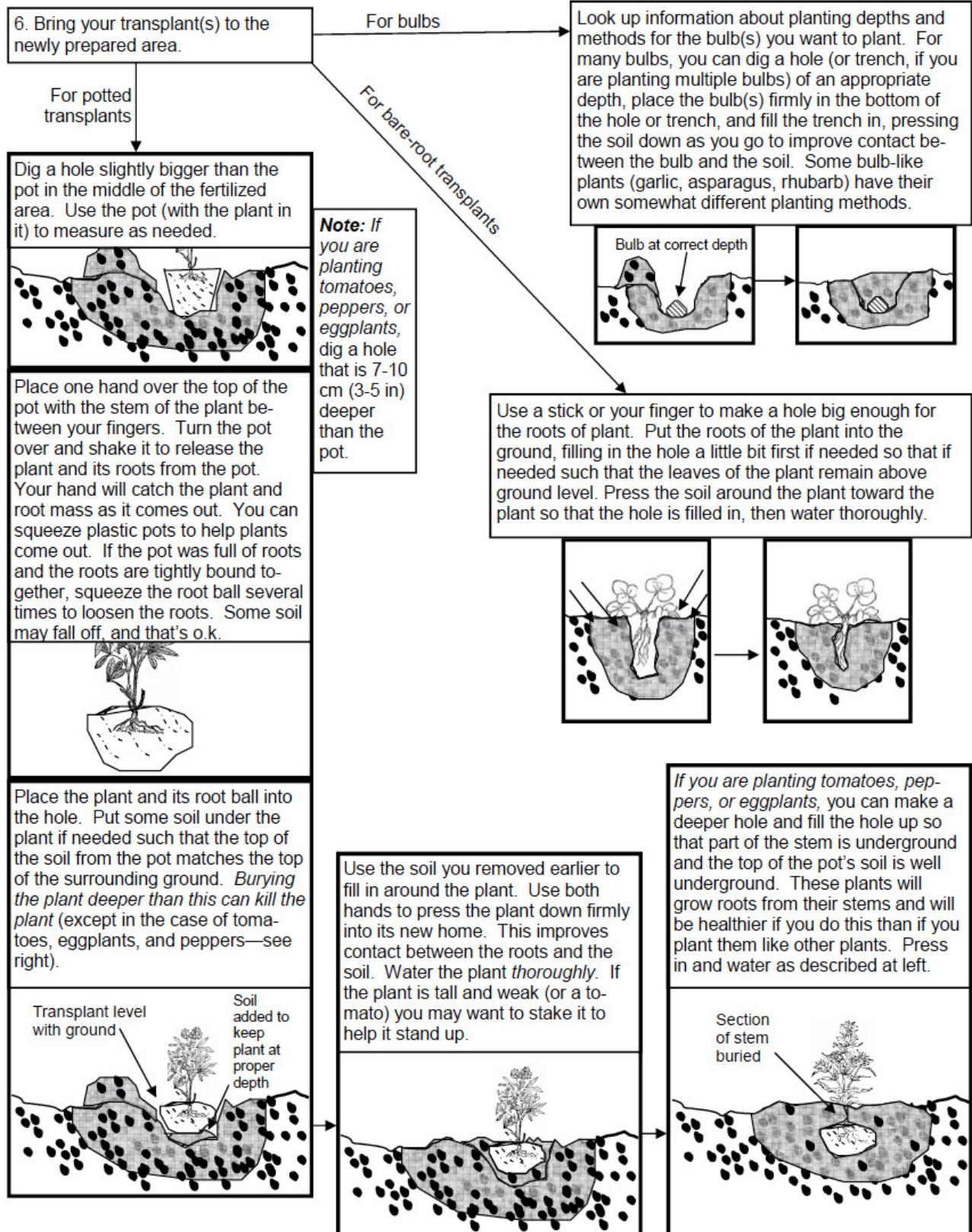
4. Measure and mark the location(s) for your plants with sticks. Read the fact sheet for your crop to determine how much (if any) fertilizer is needed for each plant. If fertilizer is needed, put it in a pile at the base of the stick.



5. Remove the stick(s) and use your hand or a trowel to dig the fertilizer into the soil where your plant(s) will be. Keep the fertilizer in a small area (about 25 cm wide and 20 cm deep, or 10 inches wide and 8 inches deep). Replace the stakes, marking the center of each fertilized area.



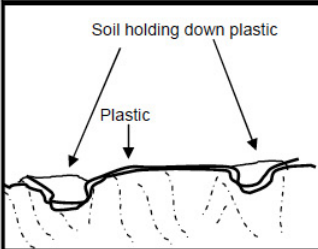
Transplanting



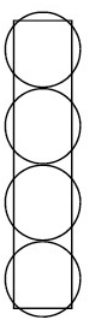
Transplanting

Transplanting with plastic mulch

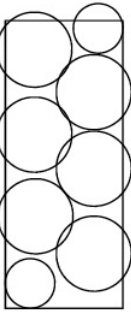
Transplanting with plastic mulch



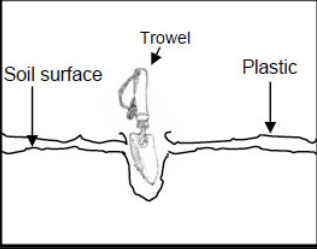
1. Figure out how much space you need and how you will lay your plants out, then lay plastic mulch to match (see **laying and removing plastic mulch**). Keep in mind that many plants planted in plastic (especially eggplants and tomatoes) can end up 1 m (3 ft) or more wide. Depending on the layout of your garden and the width of the plastic you have bought, you may want to lay your plastic and arrange your plants in various different ways (overhead views of two possibilities are shown below). Mark the planned location of each plant with a stick.



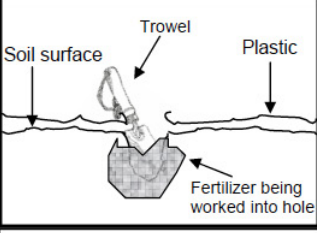
Narrow plastic with a single row of large plants.



Wider plastic with two staggered rows of plants, including plants of two different sizes.

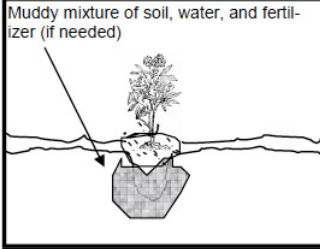


2. Use your fingers, a stick, or a trowel to make a hole through the plastic and into the soil underneath. Keep the hole in the plastic as small as you possibly can (the bigger it is, the more weeds will grow through it). If the pot of the plant you are going to plant is fairly big (bigger than 10 cm or 4 in across), you may want to remove some soil. If the pot is smaller, you will not need to remove any soil at all — you can just loosen it. For tomatoes, peppers, and eggplants (the plants most commonly planted into plastic), you should dig a hole 8-10 cm (3-4 in) deeper than the pot is tall.

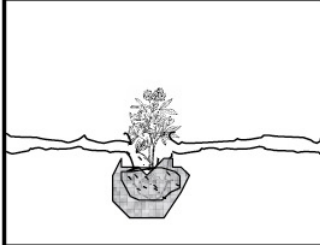


3. Read the fact sheet for your crop to determine how much (if any) fertilizer is needed for each plant. If fertilizer is needed, put it in the hole and use your fingers or a trowel to work it into the soil around the hole. Again, try to keep the hole in the plastic small.

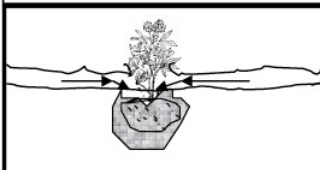
4. Put water into the hole until the soil around the hole is well soaked and muddy.



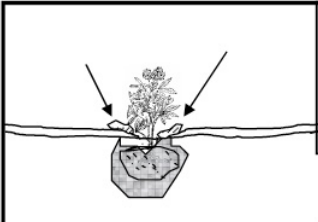
5. Remove your plant from its pot as described on the previous page. Set it in the hole. You may need to stretch the plastic to do this.



6. Use your hand to work the roots of the plant down and into the muddy soil mixture. For some plants (like sweet potatoes) you should make sure that the leaves and stem are above ground level and the roots are below ground. For other plants (like tomatoes, peppers, and eggplant), you should try to bury at least some of the stem of the plant underground (it will grow roots and make the plant stronger).



7. Sweep your hand under the plastic to move soil in and over the plants roots. Press it down firmly to give the plant good contact with the soil.



8. Use soil (not from under the plastic), leaves, pine needles, or small stones to weight down the plastic so that it does not move up and over the plant's leaves (if it does, the plant will get too hot and die).

9. Water the plant(s) thoroughly. After this watering, make sure to water the plants only if the soil underneath the plastic is truly dry (put your hand under the plastic as needed to check). The plastic holds water very well (this is partly what it's for!).



Watering

Many beginner gardeners tend to over water their gardens (as do some experienced gardeners). In general, watering is important in three situations:

1. when you have crops growing, the weather is warm, and it has not rained for 1-2 weeks,
 2. when you have just transplanted a crop and it is not likely to rain within the next 24 hours,
 3. when you have just seeded a crop and it is not likely to rain within the next week.
- In the first situation, it may make sense to water the whole garden. In the second and third situations, you may only need to water the newly planted plants or seeds.

If you're not sure whether or not to water, do this: pull back any **mulch**, and dig a hole about 10-12 cm (4-5 in) deep. Take some soil from the bottom of the hole and try to squeeze it into a ball. If it sticks together, you don't need to water (unless you have a bunch of young, small plants with short roots).

If the soil does not stick in a ball, you may need to water. Sandy soil (see **soil**) will not ever form a ball, but if it sticks to your fingers, it's wet enough. However you water, it's best to water thoroughly (meaning, wetting the soil to a depth of 12-15 cm/5- 6 in). Getting water down that far encourages plants to grow deep, strong roots. Getting water that deep can



Watering

take considerable time, and as a result, most gardeners tend to water too shallowly.

There is no single recommendation for how long to water, but if your soil seems to be dry based on the test above, it may take as much as several hours to water your garden thoroughly (the method you use to water will determine the time it takes). As tempting as it can be when you're standing in the garden with a hose in your hand, it's generally not a good idea to try to water your whole garden by hand – you just won't be willing to stand there long enough to do the job properly.

If you just need to water a few seeds or transplants, and your soil is reasonably moist (from rain or another recent watering), you can get away with a quick hand watering. Overwatering is as bad for plant roots as underwatering. Water your soil until it is moist to the desired depth, but not until the soil is muddy or has water standing on top. Unless you are using drip hoses (and your soil is very dry), watering all night long is a bad idea.

There are, in general, three ways to water your garden – by hand, with an overhead sprinkler, or with a drip hose or soaker hose at the surface of the ground.



Hand Watering

You can water small portions of your garden using a hose with some kind of watering attachment mounted on the end. There are many kinds of devices – some look a bit like guns and have a trigger you pull to release the water, some look like long wands with fat knobs at the end from which the water comes out. Most of these tools are poorly made. If you can, buy one that is all metal (ideally brass). You could just use a hose with nothing on the end at all, but the flow of water that comes out of a hose can be very strong, and can easily dig up seeds that you've just planted. As mentioned above, trying to water your whole garden by hand is a recipe for underwatering.

Overhead watering with sprinklers

Overhead watering is just what it sounds like: some sort of device (usually a sprinkler) sprays water over the plants, and it falls down onto the ground. Overhead watering is simple, but inefficient, because a lot of the water sprayed into the air evaporates before it hits the ground. Besides the fact that it can damage the leaves of your plants, watering in the middle of the day in hot weather can cause as much as 80% loss of water to evaporation. Overhead watering should always be done in the morning (before 9 or 10 a.m.) or in the evening (after 5 or 6 p.m.).

There are many kinds of sprinklers that vary in cost, efficiency, and durability, as well as in terms of the area of ground they can cover without being moved. “Fixed” sprinklers spray water out in the same pattern (usually a square or a circle) all the time. “Oscillating” sprinklers spray water vertically along a tube that moves back and forth and can be set to cover a circle or any part of a circle. “Rotary” sprinklers

Watering

spray water sideways and can be set to cover a circle or any part of a circle.

Most sprinklers are badly designed and/or cheaply manufactured. In general, the best sprinklers are made with metal parts, while the worst ones are all plastic or are plastic with a few metal parts. Dramm is one company that makes good, all-metal sprinklers.

Surface level watering with drip hoses or soaker hoses

Drip hoses and soaker hoses are much more efficient ways to water your garden than are sprinklers. Drip hoses are hoses that have small holes cut at regular intervals on one side of the hose, while soaker hoses have small holes cut at irregular intervals all around the hose. Whichever kind you use (drip hoses are better but not available at some garden stores), arrange the hose to cover the parts of your garden you want watered, and the hose will slowly but steadily release water into the soil.

Drip and soaker hoses water more slowly than sprinklers, but they use much less water to do the same job. They are also superior because they don't wet plant leaves or stems, which can encourage various diseases. Unlike sprinklers, they can be used even in the middle of the day.

More watering tips

If possible, put your hoses and other watering tools away before winter in a place where they will not freeze. At the very least, put them in a covered place where they will not get snowed on or exposed to sun and wind. Use of mulch helps the soil retain water and can reduce the need for watering.





Weeding



If you aren't willing to put in the time and energy to manage weeds, you just can't be a successful organic gardener. Sorry. On the bright side, with some **mulch** and a modest, regular time commitment to weeding, you can keep ahead of the weeds.

Why are weeds such a problem?

You won't be able to see most of them, but if you dig a shovelful of soil out of the ground, there are almost certainly thousands of weed seeds in it. Scientists and farmers call this large mass of seeds the "weed seed bank." Each of the seeds in this bank is alive and waiting for the right conditions to germinate and grow. Unfortunately, when conditions are right for

your tomatoes, okra, or peas, they are also right for at least some of those weed seeds, and you need to take action to keep the weeds from out-competing your desired plants.

To make matters worse weed-wise, most gardening involves what are called annual plants, which must be grown from seed every year. While annual plants often grow quickly, they start out small and often do not compete well early in their lives with other plants that are trying to claim the same sunlight, water, and soil nutrients. Some plants are particularly poor at competing with weeds. Onions and their relatives, for example, have only a few narrow leaves that allow a lot of light to reach the ground around them. Light striking the

Weeding

ground encourages weeds to grow. Some other annual plants like tomatoes get large and have a plant structure more suited to shading out competitors, but they take long enough to reach their “adult” size that for much of the season there is a lot of exposed ground around for weeds to grow in. The saying “Nature abhors a vacuum” certainly applies to weeds – if you don’t prevent it somehow, any open, exposed soil will grow weeds.

Unfortunately for gardeners, some of the seeds in the weed seed bank can (and do) wait for years, or even decades, before germinating. As a result, even if you do a perfect job of weeding your garden (thereby preventing weeds from growing, flowering and adding new seeds to the bank), you will still have weeds every year. If you weed regularly, however, you should have less and less trouble with weeds as the years go by.



What makes a plant a weed?

In one sense, a weed is anything you don’t want in your garden. Weeds range from the harmless and easy to manage (so-called “volunteer” tomatoes, for example, that grow from the seeds of fruit you didn’t harvest the past year) to the nasty (such as Canada thistle, which can take over and ruin your garden unless you take aggressive steps to control it). One person’s weed may be another person’s treasure (the herb chamomile is one example of this – some people love it and some hate it).

How to manage weeds?

The single best way to manage weeds is not to allow them to grow in the first place. Having soil exposed encourages weeds to grow, so keeping as much of your soil covered as much of the time as possible is goal number one. While you might want to expose your whole garden at the beginning of the season to add fertilizers or soil amendments, and you will need to uncover parts of it to plant certain seeds, most of your garden can be covered most of the time with mulch of some kind or other. See the entries under mulch for a discussion of different materials for mulching and how to use them. Weeds will still germinate under your mulch, but many of them will be unable to push through the mulch, and those that do make it through the mulch will be weak and easier to pull out than if they had grown from unmulched soil.

Whether you mulch or not, you will still have to deal with at least some weeds. Organic farmers use many different tools to kill or remove weeds, but in a garden your two main options are hand weeding (often with some kind of small tool to help you) and weeding with a hoe (see tools). However you weed, it is critical to remove the roots of your weeds. If you rip off

Weeding

or slice off only the tops, the roots will send up new stems and leaves and it will be even harder to get the roots out than it would have been before. It is often easiest to weed after a rain or after watering your garden because the roots come up more easily. However, if you pull weeds out of wet soil and let them sit in contact with the ground in your garden, you'll be surprised by how many of them can reestablish their connection to the soil and survive. For this reason it's important to physically remove pulled weeds from your garden (to your **compost pile**, for example), or at least to make sure that their roots can't reach the soil.

Hand weeding

Gardeners with small plots (and those who are very conscientious users of mulch) may never do anything other than weed by hand. At one level, hand weeding is simple – find a weed, pull it up. In practice, pulling weeds so that you get the roots out takes some practice, and may involve a trowel, some kind of probing tool, or even a spade for large weeds (see tools for pictures of these implements). Weeds can also sometimes be difficult to tell apart from your desired crops. This can happen, for example, when you are growing plants from seed and the young plants have just emerged from the soil. There may be weeds growing in with them, but you can't tell the weeds apart from your seedlings. Usually all you need to do is wait a few days to a week and let all of the plants grow a bit bigger, at which point you should be able to tell them apart and pull the weeds. If your plants are small (or the weeds are big), you may need to use one hand to hold down the soil around your desired plants while you pull nearby weeds with your other hand.

Weeding with a hoe

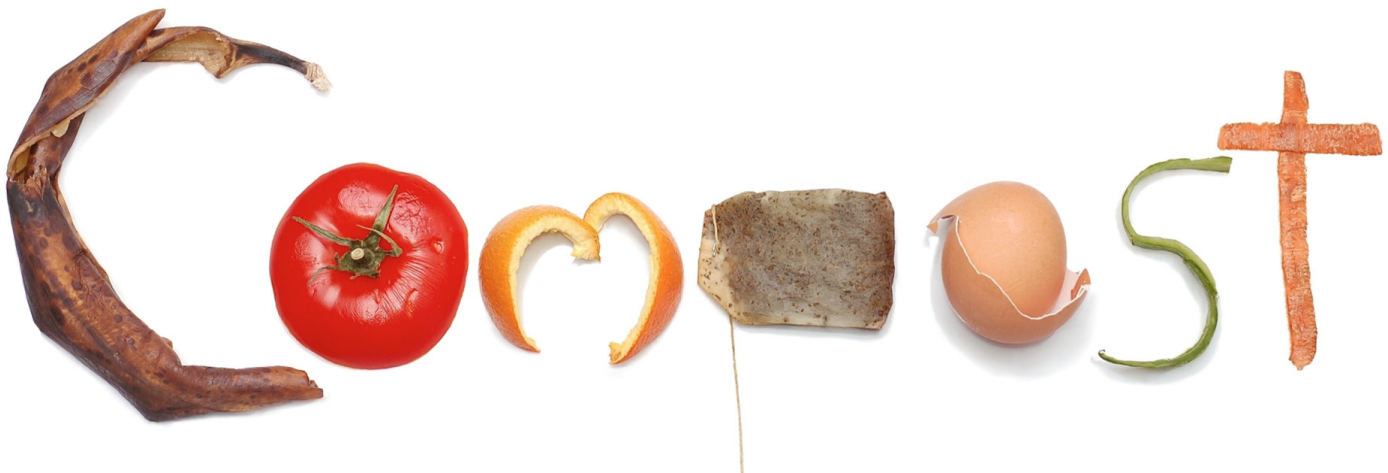
If your garden is large and/or there are large exposed spaces (between young tomato plants, for example), you may want to use a hoe to dig out weeds (see tools). Using a hoe involves a chopping motion that you will need to figure out on your own. Remember, though, that your goal is to uproot weeds, not to just cut their stems off. If you have a hoe with a narrow head and want to try it out, you may be able to hoe out even very small weeds from close to small plants. A hoe should be kept sharp, and if you use a hoe a lot (especially in hard or rocky soil), you will need to sharpen it periodically with a file or bench grinder.

What to do with weeds once you pull them out

What you do with weeds once you've pulled or hoed them out of the ground depends on several things. If it's wet out (or likely to rain soon), weeds that you leave sitting on top of the soil may re-root themselves and start growing again, so it is important to take the weeds out of the garden, perhaps to a **compost pile**. If it's dry out, you can arrange the weeds around your desired plants and use them as a form of mulch to keep other weeds from growing. If the weeds have begun to produce seeds, it's important to take them out of the garden and put them somewhere other than your compost pile (some composting methods kill weed seeds, but others do not).



Introduction to Composting



What is compost?

As a verb, “to compost” or “composting” refers to the process used to make compost. In general, this process involves mixing together a variety of food wastes, yard wastes, and/or other compounds in proportions that are favorable for the growth and reproduction of bacteria.

Compost” is both a noun and a verb. As a noun, it refers to decayed organic matter, which is a fancy term for formerly living things (plant and/or animal) that have been broken down by the feeding of bacteria and other tiny creatures into something that looks more or less like soil. This organic matter (see soil for a discussion of organic matter) is a useful addition to soil, and compost is sometimes talked about as though it were a fertilizer.

While it does contain nutrients plants need, compost is really more of a soil amendment, whose primary benefit to the soil is an increase in organic matter content rather than a significant increase in the levels of particular nutrients.

As discussed under **soil**, higher organic matter yields a number of benefits – higher water retention of the soil, improved retention and availability to plants of any fertilizer that you do apply, increased numbers of soil-dwelling organisms, etc., etc.

Within the compost “pile” (you might want to read: **How to Build a Compost Pile**) made of these materials, bacteria begin to feed and multiply. These bacteria occur naturally on the surfaces of many living things and do not need to be added to the pile to make composting happen. The bacteria eat and eat and reproduce and reproduce until most of the readily available nutrients are used up. This process, which can take as little as a few weeks or as long as months (depending on how much or little you manage the pile) usually results in a substantial decrease in volume of the ingredients used to make the initial compost pile. Loss of 40-60% of the volume of your initial pile is not uncommon. If you manage the pile at all well, the material you end up with should look (as mentioned above) and smell more or less like soil.

Introduction to Composting

Why compost?

There are many reasons. At the most abstract level, composting takes non-toxic materials that would otherwise end up in landfills and returns them to the soil in a useful form.

Food production should be a closed loop, meaning that food wastes (and perhaps human manure, as well) are returned to the soils used to produce the food to begin with. At present, most food production in the United States represents open loops – food comes from places, and food wastes end up in other places.

Composting is a small step toward closing food loops. Of more relevance to individual gardeners, compost itself improves garden soils in various ways (as discussed above). Well-managed “hot” composting can kill weeds and any seeds they might be carrying, so it’s a safe way to return the weeds you kill to your garden. Scientists have also recently begun to document a phenomenon noticed for some time by organic farmers, which is that application of compost to soils can actually help to prevent various plant diseases, particularly fungal ones. Why and how this works is still not very well understood. For those who like physical work and are seeking “useful” excuses to be outside, **building and managing a compost pile** can also be just plain fun.

You should not feel like they need to compost, though if you do not you will still want to add purchased compost or some other soil amendment to your soil on a regular basis. You will also need to put your weeds and other garden waste somewhere – many people choose to do “pseudocomposting,” which involves just heaping these materials up out of the way somewhere. They will decay this way, but more slowly than if you compost them as described below. This form of composting

does not necessarily kill weeds or weed seeds and the piles can in fact become homes for more weeds.

Pseudocomposting with kitchen waste (eggshells, fruit peels, coffee grounds, etc.) can also attract raccoons, possums, and other undesirable pests. To help keep these pests away, you can cover your kitchen wastes with layers of newspaper, cardboard, or leaves.



Conditions needed for composting

There are four important conditions that must be met for composting to occur:

1. **Proper pile size** – As bacteria feed in a compost pile, they generate heat as a by-product (piles can get as hot as 82 C/180 F). The bacteria that do the best job of composting thrive on this heat, but they can only maintain the proper heat level if the pile they start working in is big enough. As a rule of thumb, a cubical pile 1 m (3 feet) on a side is the minimum size to start with. A pile larger than that is fine, as long as it gets enough air. It’s possible to compost on as large a scale as you want to -- some cities compost vegetable and

Introduction to Composting

yard waste, making piles called “windrows” that are hundreds of meters (yards) long, 2 meters (about 6.5 ft) high, and about 1-2 m (3-6.5 ft) wide.

- 2. Sufficient air movement** – To do the work of digesting dead things, bacteria need air. To allow air movement throughout the pile, the piles you make shouldn't be too big (see notes on size above). If you use a bin or container of some sort to hold your compost, it should have a lot of holes on all sides to allow air movement. To get air to all parts of the compost pile, gardeners who manage their compost carefully also tend to “turn” a compost pile two or three times at intervals from 4-14 days.

This involves digging up the pile with a spade or spading fork and moving it to a spot right next door to the old location. If your compost pile does not have enough air moving into it, the oxygen-dependent “aerobic” bacteria that you want will be unable to live and reproduce, and undesirable “anaerobic” bacteria will take over. The anaerobic bacteria can survive without oxygen, and while they will keep breaking down the materials in your compost pile, they do it very slowly compared to the aerobic bacteria. They also make your compost pile smell bad.

- 3. Sufficient water availability** – Like all living thing, the bacteria that do the work of composting need water to live and reproduce. Watering your compost pile too much encourages anaerobic bacteria (see above under “air movement”), but you should water it thoroughly if you dig into it and it appears dry 15-30 cm (6-12 in) into the pile. To water it, poke deep holes with a stick or the handle of a garden tool, and put the water into these.

- 4. A proper carbon-to-nitrogen ratio** – Living things are mostly water, but if you take away the water, most of what remains is carbon, which is used for all sorts of purposes (in plants, for example, carbon makes up most of the weight of cellulose, the material that plants use to build their stems). Another critical element is nitrogen, which all living things use to make proteins. Nitrogen is needed in much smaller amounts than carbon, but nitrogen is also rarer in nature. As a general rule, the bacteria that do the work of composting need 30 units (kilograms, pounds, whatever) of carbon for every 1 unit of nitrogen that's available to them. This so-called “carbon to nitrogen ratio” (or C:N ratio) of 30 to 1 (also written 30:1) is what the gardener tries to provide when selecting materials to put in a compost pile. While you might think that this would require fancy chemical analysis of your yard or kitchen waste, most gardeners do this only very approximately and the process of composting works out just fine.



Choosing ingredients for the compost pile

To reach the 30:1 carbon to nitrogen ratio mentioned above, gardeners tend to mix so-called “browns” (dry, dead materials like dry leaves, straw, or newspaper) with “greens” (wet, recently living things like freshly cut green grass, banana peels, apple cores, coffee grounds, etc.). The browns are high in carbon – straw, for example, has a C:N ratio of about 100:1. The greens are also mostly carbon, but they contain more nitrogen than the browns, and act as the nitrogen source for composting. Coffee grounds, for example, have a C:N ratio of something like 20:1. You may realize without doing any formal math that you need to use greater amounts of green materials than brown materials to weight the C:N ratio closer toward 30:1.

The table below provides carbon to nitrogen ratios for a few commonly used materials. There are many formulas you can use to figure out how much to use of each of these materials to reach the 30:1 target, but a simple way to think about it is as follows. If you have two units (wheelbarrows, carts, garbage cans, bags, whatever) full of manure or coffee grounds that are each 20:1, and one unit of leaves that is 60:1, you can add the carbon amounts of the three units together ($20 + 20 + 60 = 100$) and divide by 3 to get 33. The resulting compost should have a C:N ratio of about 33:1. Don't worry too much about the numbers – what's most important is to understand the idea of browns and greens and to put a little more green than brown into each pile. Note that the table is in no way a comprehensive list of compostable materials.

Almost anything that has at some point been alive can be composted, though you do need to think about possible contamination with toxic materials.

Human hair, for example, is a rich nitrogen source, and farmers used to collect it from barbers and compost it. Now, however, human hair is often treated with chemicals that you wouldn't want to put in your pile. Meat and dairy products can be used in composting, but you should only add them to your pile if you are going to manage your pile carefully so that it gets hot. If you don't manage it, a pile with meat and dairy in it will smell bad and attract vermin. Do not put feces from dogs or other carnivorous animals in a compost pile, as these materials can carry disease. You can compost with wood chips or sawdust as your brown materials, but the carbon content of wood products is so high (with C:N ratios as high as 600:1) that you must have large amounts of good green materials to ensure that your wood products break down completely.

Some Materials for Possible Use in Composting

"Browns" (Carbon sources)	Carbon:Nitrogen ratio (C:N)
Wood chips or sawdust	300-600:1
Newspaper	50-200:1
Pine needles	60-110:1
Straw	70-100:1
Straw (from wheat or oats)	80-100:1
Corn stalks	60:1
Dry leaves	60:1
Peat moss	60:1
Horse manure (with straw mixed in)	60:1
Horse manure (pure)	25-35:1 (on the edge between green and brown)

"Greens" (Nitrogen sources)	Carbon:Nitrogen ratio (C:N)
Fruit or vegetable waste (cores, peels, etc.)	10-35:1
Cow manure (pure)	20:1
Coffee grounds	20:1
Sea weed and lake weed	20:1
Grass clippings (green and wet)	20:1
Mixed table scraps	15:1
Alfalfa hay (dried)	15:1



How to Build a Compost Pile

This section will make more sense if you read the Intro to Composting section first.

The building of a pile has several steps:

1. Gather the needed amounts of green and brown composting materials with the 30:1 carbon to nitrogen ration in mind. If necessary, cut or chop your materials into small pieces. Keep your greens and browns separate at this point.
Remember that you want to build a pile that is at least 1 m (3 feet) on a side.
2. On the location where you plan to compost, place two layers of sticks at right angles to each other. The sticks will increase air movement into the pile.
3. Start building your pile using alternating thin layers of green and brown materials. As you add each layer, try to mix it with the last layer using a spade or spading fork.
4. Every 30 cm (12 in) or so, water the new layers thoroughly.
5. Let the pile sit for a 1-2 weeks. It should get warm or even hot to the touch, and should start to shrink. What happens next depends on how much work you want to do. If you want to use your compost soon, proceed to step 6. If not, just let it sit – bacteria will continue to feed for as long as you let the pile sit, though the process of composting will slow down very much after a few weeks.
6. If you want to “finish” your compost quickly, you should “turn” the pile after its first 1-2 weeks. Many gardeners turn their piles by using a spade or spading fork (see tools) to move the pile a piece at a time into a new location right next to the old one. In the process, they mix the pile up and let air into the center of the pile. If the pile has dried out, water it in stages as you turn it.
7. If you have turned your pile, it will probably get hot again and should continue to shrink. After another 1-2 weeks, you can turn the pile again as described above.
8. After the second turning, wait 1-2 more weeks, and your compost should be “finished.” Finished compost should look more or less like soil, with few or no recognizable pieces of the materials you started with. If your compost doesn’t seem finished, even after two turnings, you may have started with too little green material (a common problem), let the pile dry out too much, or created too large or too small a pile.
Gardeners who compost a lot and like to keep things tidy sometimes have three bins right next to each other. A pile is started in bin 1, turned into bin 2 after a week or so, turned into bin 3 after another week, and then spread in the garden after one more week. All three bins can be filled at once with compost in various stages of formation.



Introduction to Fertilizers

An introduction to elements essential for plant growth

Like people and all other organisms, plants need many different nutrients to grow. Nutrients needed in large amounts are sometimes called “macronutrients,” while nutrients needed in smaller amounts are called “micronutrients.” The following table lists macro and micronutrients needed by plants, the percentage of an average plant that is made up of each nutrient, and the relative number of atoms of each nutrient needed for healthy growth. Note that even the macronutrients account for only a small percentage of the weight of a dried plant – almost all the rest of its weight is made of the element carbon (C). If you were to analyze a living plant (that is, one that had not been dried out), you would find that most of its weight was composed of water.

It is worth noting that many of these nutrients are not actually used by plants in the pure, elemental form shown in the table above. Nitrogen (N), for example, is most abundant on our world in the form of a gas, which consists of two N atoms bonded to each other make the molecule dinitrogen, or N_2 . This gas makes up 78 percent of the atmosphere, but plants can’t use it. They rely instead on several other forms of nitrogen, including nitrate (NO_3^-), ammonium (NH_4^+), and nitrite (NO_2^-). These molecules are created by a number of biological and nonbiological processes that occur in the atmosphere, in the soil, and in the roots of special plants called legumes.

Humans can (and do) also create large volumes of the plant-available forms of nitrogen using industrial processes. These processes require large amounts of fossil fuels, and the nitrogen fertilizers that result from them are not used in organic food production. Nitrogen-containing fertilizers used in organic production are made instead from animal wastes (manure), animal parts (bones, blood, feathers, etc.), or nutrientdense plant products (ground-up seeds or fruits).

Like nitrogen, other plant macro and micronutrients exist in forms that are available to plants and forms that are not available to plants. They can be made into fertilizers using methods that are considered either acceptable or unacceptable for organic production.





Buying & Applying Fertilizers

Why use organic fertilizers?

It's fair to ask why organic farmers, gardeners, and consumers should care about how plants get their nutrients. After all, nitrogen is nitrogen, yes? Well, yes and no. To a plant, a molecule of ammonium (NH_4^+) is indeed a molecule of molecule of ammonium, no matter where it comes from. But that molecule of ammonium can get to the plant in ways that have either good or not-so-good consequences elsewhere. One concern about production of conventional (non-organic) fertilizers has to do with reliance on fossil fuels (coal, oil, and natural gas).

As mentioned above, making plant-available forms of nitrogen in conventional industrial ways requires large amounts of fossil fuels. Fossil fuels are increasingly scarce, which is one problem, but scientists who study global warming feel that we need to cut use of fossil fuels even before we run out of them because the carbon dioxide and other gases that result from burning fossil fuels are changing global climate.

Organic fertilizers can be produced with much less fossil fuel input. Another reason to use organic fertilizers instead of conventional, fossil fuel-based fertilizers has to do with how they release nutrients into the soil. When farmers apply conventional fertilizers to their fields, the nitrogen they contain is all immediately available to plants. Unfortunately, plants can't use it all (or even most of it) right away, and the unused portion tends to leave the field, either evaporating or getting washed away. When nitrogen gets into the air and into ground and surface water, it disrupts various natural systems.



Organic fertilizers come in large particles that break up slowly and release their nitrogen over a much longer period of time. While this can sometimes mean that plants don't get as much nitrogen all at once as they might like, it does mean that at least some nitrogen is available to support plant growth over a long time period, and less nitrogen is free to evaporate or wash away. The same is true for other macro and micronutrients.

Buying organic fertilizers

Broadly speaking, there are two types of organic fertilizers – those that provide macronutrients, and those that provide micronutrients.

Buying & Applying Fertilizer

Because organic fertilizers are made from complex living things, even the macronutrient fertilizers contain some micronutrients. However, the two are sometimes sold separately.

Like conventional fertilizers, organic macronutrient fertilizers are usually labeled prominently with three numbers. You might see a bag of composted turkey manure, for example, labeled 4-6-4 or 5-2-4. The three numbers represent available percentages of nitrogen (N), phosphorus (P), and potassium (K), in that order (N-P-K). If you put 100 units (kg, lb, whatever) of a manure-based 4-6-4 fertilizer on your crops, 4 units out of 100 would be nitrogen in a form available for plant growth, 6 units would be phosphorus in a form available for plant growth, and 4 units would be potassium in a form available for plant growth. The remaining 86 units would be various forms of carbon, together with small amounts of other nutrients.

Most common fertilizers contain nitrogen, phosphorus, and potassium as described above, but if you look at the table of necessary plant nutrients, you'll notice that plants also need significant amounts of calcium, magnesium, and sulfur. You might think these nutrients would be added to every fertilizer as well, but they aren't. In a nutshell, the explanation of this is that calcium, magnesium, and sulfur are more readily available in soils than are nitrogen, phosphorus, and potassium. This is partly a function of the fact that they are more stable in soil than the others. When a plant dies, much of the nitrogen it contains leaves the soil fairly quickly by one route or another, but most of the calcium it contains stays in the soil to be taken up later by other plants.

You can certainly buy organic fertilizers that contain calcium, magnesium, and sulfur, and many gardeners would do well in particular to apply calcium to their soils (you can't have too much of it, and it is critical for crops like tomatoes, cucumbers, and melons), but most of the time you will buy fertilizers based on their N-P-K ratings. Nitrogen particularly encourages growth of leaves, while phosphorus and potassium particularly encourage root growth.

So. Which organic fertilizer to buy, and how much to buy? Beginning organic gardeners would do well to start off the season with one 18-22 kg (40-50 lb) bag of general, all-purpose organic fertilizer. What you buy will depend on what products are available in garden stores in your area. N-P-K ratings vary widely, but in general you should look for something fairly balanced (N = P = K), like the 4-6-4 fertilizer mentioned above. If you see **fertilizers** with numbers that add up to more than 15, or where one of the numbers is more than 8, they are probably NOT organic and should be avoided (there are organic exceptions to this rule – fertilizers made from bat guano can be 0-13-0).

If you are a farmer or know a farmer who has livestock (cows, pigs, chickens, turkeys, etc.), you may be able to use the manure of your animals as fertilizer, but you'll need to be careful – fresh, raw manure (especially from chickens and turkeys) is too concentrated to apply directly to crops. It must either be composted somehow (see **compost**) or mixed well with soil a week or two before you plant your crops. The nutrient content of animal manure varies a lot. When you buy fertilizer, you may also wish to buy soil amendments, which are not fertilizers but improve your soil's ability to make use of any fertilizer you do buy.

Buying & Applying Fertilizer

Applying organic fertilizers

If you have purchased an organic fertilizer that is fairly balanced (see above), you can apply it in one or more of three ways:

1. When preparing a bed for planting, scatter fertilizer over the surface of a bed before you dig into the soil. The fertilizer will end up incorporated randomly in the soil, and plant roots will find it and use it. For some plants (lettuce and other salad greens, radishes, and carrots, to name a few) this is enough fertilizer to ensure a good crop. How much fertilizer you scatter around depends on how strong it is – read the package for suggested application rates. If you cannot find a suggested rate for bed preparation in a vegetable garden, try applying it at rate of about 2.3 kg per 10 square meters (5 lb per 100 square feet). A garden bed 1 m wide and just over 9 m long (40 in wide and 30 ft long) would take that amount of fertilizer. If you only fertilize one way, this would be the way to do it.
2. Some plants, especially those that are transplanted and that produce large fruits (tomatoes, eggplants, and melons, for example) benefit from more fertilizer than the scattering method above provides. While it's still good to fertilize the planting bed as described, you should also add some fertilizer to each planting hole before the plant goes in, working it into the soil so it's not all in one place. This provides a more concentrated source of nutrients for these plants to grow with. The crop pages for these crops discuss how much fertilizer to use; also see **transplanting** for pictures of what this might look like.
3. Some plants (onions, broccoli, cauliflower, cabbages, and kale, to name a few) also benefit from scattered fertilizer, but are too small when they are young to make use of fertilizer applied as described in method 2, above. Instead, wait until these plants are about halfway toward maturity, then fertilize them again at the same rate you used in preparing the bed.





Introduction to Mulch

What is mulch?

Mulch is any material that you spread over the soil to protect the soil from erosion, conserve moisture, and keep weeds from growing.

Materials used for mulching can be:

1. Natural, such as leaves and straw
2. Processed natural materials, such as newspaper and cardboard, or
3. Manufactured materials such as plastic and landscape fabric (a material also made of plastic, but much more durable than ordinary plastic).

For organic gardeners in particular, the suppression of weeds is perhaps the most obvious short-term benefit of mulch, but moisture conservation and erosion prevention are significant whether you notice them or not.

Mulch can also increase earthworm activity and protect other beneficial organisms

that live on and in the soil. In addition, old mulch that is breaking down and no longer effective as a weed barrier can often be incorporated into the soil, thereby improving the soil's organic matter content (see soil for a discussion of why this is beneficial).

Mulch is typically used in one of two ways.

You can either:

1. Prepare a bed, put mulch on it, and transplant plants through the mulch or
2. Prepare a bed, plant seeds into it, wait for the seedlings to get big enough that they won't be buried by the mulch, and then mulch around them carefully.

Many crops that are grown from seed in the garden never get mulched because it's just too much trouble to put mulch around them without burying them. Use your hands or a hoe.





Materials to Use for Mulch

When you put mulch on your soil, you are deliberately putting on something intended to discourage plant growth. Mulches do this by blocking light (which penetrates the soil and encourages weeds to grow) and by physically preventing weeds from coming out of the ground. You want them to do this for as long as possible, or at least as long as you have a crop in the ground that you want to protect from weeds.

As a result, a good mulch material should be:

1. Capable of blocking light and weeds (so it does a good job of blocking downward movement of light and upward movement of growing weeds)
2. Durable (so it can continue doing its job for several months or more, even when exposed to heat, light, and moisture; one aspect of durability has to do with how many nutrients there are in the material – materials that are low in nutrients tend to make good mulches because they do not encourage weeds by releasing nutrients and are not themselves eaten quickly by microorganisms).

More obviously, a good mulch material should also be readily available, affordable, easy to use, and easy to dispose.

A partial list of possible mulches and their benefits and drawbacks:

Plastic Mulch

What it is plastic mulch? Key features:

Big sheets of plastic. Plastic mulch has a number of benefits that other mulches do not -- in particular, the heat it traps can speed plant growth throughout the growing season, and especially during the cool weather at the beginning and end of the garden season (see season extension techniques for a discussion of this). It is also very, very effective at keeping down weeds. Unfortunately, you have to buy it, you cannot incorporate it into the soil (so it offers no long-term benefit to soil quality), and you have to throw it away, after which it will spend forever taking up space in a landfill.

Weed/light blocking capability:

Excellent (buy plastic you cannot see through at all).

Durability:

Will last a whole growing season.

Availability:

Special agricultural plastic is available at many garden stores or through mail/internet companies in rolls or folded sheets. If you cannot find this, you can buy large sheets of plastic at any hardware store, though this plastic can be unnecessarily heavy.

Cost:

Moderately expensive – buying a big roll or sheet can be cost-effective, because you can use small pieces of it over time.

Materials to Use for Mulch

Ease of use and disposal:

Not too complicated, but not as simple as most other mulches. See laying and removing plastic mulch for tips on how to use this material. Should NOT be incorporated into the soil at the end of the growing season, but must be pulled up and thrown away.

Landscape Fabric

What it is Landscape Fabric? Key features:

Large sheets made up of plastic strips woven together. Unlike plastic mulch, landscape fabric lets air and water through to the soil while also providing the benefit of warming the soil. Because it lasts for multiple years, it can be very helpful in growing perennial herbs, fruits, and vegetables, but it is too expensive for most growers to use on a large scale.

Weed/light blocking capability:

Excellent.

Durability:

Will last multiple years if cared for properly.

Availability:

Landscape fabric is available at many garden stores and through mail/internet retailers in rolls or folded sheets.

Cost:

Quite expensive.

Ease of use and disposal:

Not too complicated, but not as simple as most other mulches. See laying and removing plastic mulch and season extension techniques for tips on using this material. Can be used for multiple years, either left in one place in the garden or moved around. When it begins to fall apart, the fabric should NOT be incorporated into the soil, but must be pulled up and thrown away.



Newspaper

What it is it? Key features:

It's newspaper, either shredded or in large sheets (large sheets make for better mulch). Avoid colorful, shiny paper. Newspaper ink used to contain lead, but this is no longer the case in the United States. Do avoid colorful, shiny newspaper, as this can contain harmful compounds.

Weed/light blocking capability:

Good, especially if paired with another mulch (see "ease of use" below).

Durability:

Good.

Availability:

Easily available – collect it yourself or go to a nearby recycling facility.

Cost:

Little or none.

Ease of use and disposal:

Newspaper is very easy to use. After preparing a bed for planting, lay newspaper down on the bed 6-8 sheets deep, watering it to fit it to the soil. You can put a little bit of soil on top here and there to hold the newspaper down, or you can put on a layer of another mulch like leaves or straw (the combination of newspaper and straw or leaves can be almost effective as plastic, and is also biodegradable). Cut holes through the newspaper to put in plants. Newspaper can be incorporated into the soil at the end of the growing season.

Materials to Use for Mulch

Cardboard

What it is it? Key features:

Brown, thick, corrugated cardboard, used in shipping and packing boxes. Avoid colorful, thin cardboard used for cereal boxes and other food packaging. Cardboard is very good at blocking weeds and is more durable than most other biodegradable mulches. If you have problem weeds like Canada thistles (see weeds) and you do not want to use plastic mulch to keep them under control, cardboard may help you. Apply several offset layers of cardboard so no soil is exposed.

Weed/light blocking capability:

Excellent.

Durability:

Very Good.

Availability:

Readily available. Collect it yourself from boxes you use, or visit a recycling facility nearby. Many businesses will also be happy to have you take away some of their cardboard.

Cost:

Little or none.

Ease of use and disposal:

Cardboard is pretty easy to use. Wet the cardboard (it takes a while to absorb water), prepare a bed for planting, and arrange the cardboard over the bed, using small amounts of soil to hold the cardboard down. When the cardboard is new, it can be hard to make it fit to the shape of your beds – keep wetting it and it will flatten out eventually. Over time, the cardboard will get soft and ragged and can be incorporated into the soil at the end of the growing season.

Leaves

What it is it? Key features:

Dried leaves collected in the fall, either whole or shredded. Leaves are one of the most widely available mulches, and when applied thickly (about 15 cm/6 in deep – more if you have them), they will keep down weeds for much of the growing season. Water the leaves after applying them to keep them from blowing away.

Weed/light blocking capability:

Good.

Durability:

Good.

Availability:

Good – either collect your own (if you have a yard), or collect them from homeowners who put them in bags. Many cities and towns also have facilities where you can pick up leaves for free.

Cost:

Free.

Ease of use and disposal:

Leaves are easy to move around and spread on beds, at least when they are dry. Wet leaves can be very heavy. Leaves can be incorporated into the soil at the end of the growing season



Materials to Use for Mulch



Straw

What it is it? Key features:

Cut, dried stems of wheat, oats, or other grains. One of the reasons to use straw in some situations is that it is not quite so dense as most other mulches, even when wet. As a result, it can be used to protect overwintering crops like garlic, which are able to grow up through the mulch in the spring. If you tried to use leaves for the same purpose, they would mat down such that you had to move them away from the garlic plants to let the plants grow out of the soil. The fact that straw is less dense than leaves or cardboard also means that some weeds can come up through it, but many fewer than if you did not mulch at all. When you apply straw, break it up from the tight sheets that it tends to form. Apply straw as thickly as you can – at least 12 cm (5 in) of loose straw if possible. Water the straw after applying it to keep it from blowing away. Straw can be incorporated into the soil at the end of the growing season. DO NOT confuse straw with hay when buying mulch. Both hay and straw are dry when you get them, but when hay was cut it was wet and green. As a result, it is nutrient-rich, and it will tend to rot (and smell bad) instead of serving as a good mulch.

Weed/light blocking capability:

Low to medium (sometimes this is a good thing)

Durability:

Medium – tends to pack down and can blow away in strong winds. May need to add more straw through the season if it is your only mulch.

Availability:

Unless you are a farmer, straw must be purchased at a farm, garden store, or hardware center.

Cost:

A bale of straw about 90 cm x 46 cm x 36 cm (36 in x 18 in x 14 in) can cost anywhere from \$3 to \$8. If suppliers are asking more than that, you might want to try another kind of mulch.

Ease of use and disposal:

Straw can be incorporated into the soil at the end of the growing season.

Materials to Use for Mulch



Grass Clippings

What it is it? Key features:

Dried, cut grass. Any grass you use should be completely dry and brown. DO NOT use green, freshly cut grass. Like hay (discussed with straw, above), grass is usually cut when it is green, wet, and rich in nutrients. Wet grass, and dry grass that is still green, is better used to make compost or another soil amendment than mulch. If you are thinking about using grass clippings for mulch, make sure that the lawns they come from have not been treated with toxic chemicals. Unfortunately, many homeowners use pesticides and herbicides on their lawns that last on grass clippings for a long time.

Weed/light blocking capability:

Good.

Durability:

Not great – grass tends to break down fairly quickly because the stems are thin and there are enough nutrients for soil organisms to eat the grass. You may need to add mulch multiple times through the season to keep weeds down.

Availability:

Depends – must be dry and chemical free. If you can produce your own, good. If not, be careful about where you get them. Some cities and towns collect these and give them out for free.

Cost:

Free.

Ease of use and disposal:

Very simple to use – one of the easiest mulches to spread around plants. Breaks down quickly, and can be incorporated into the soil at the end of the growing season.

There are many, many other materials you could use for mulching, including cocoa bean hulls (a by-product of chocolate production), corn cobs, and pine needles.

Materials to Use for Mulch

Materials NOT to use as mulch

There are also some materials you should not use as mulch, or at least not in certain places. While they do keep down weeds, woodchips, sawdust, and bark chips all contain a protein called lignin, which lasts for hundreds of years in the soil and sucks up nutrients that would otherwise be available to your plants. Generally, these materials should not be used as mulch in any bed where you are growing annual vegetables, herbs, flowers, or fruits. If you have permanent paths or plantings of trees around your garden, these woody materials can be used for mulch in these locations. Other materials like manure (from cows, horses, pigs, etc.) are much too nutrient-rich for mulch and are better used as fertilizer or soil amendments.



Season Extension Techniques

Why try to extend the season?

In the upper Midwest, the gardening season is not very long. Some crops that are fun to grow (watermelons, for example) need a long, warm growing season that is hard to provide without using some kind of special method. Other crops like **spinach** can be grown easily enough, but use of a season extension technique allows you to harvest the crop early in the spring and/or well into the winter. Finally, some season extension techniques (particularly the use of “**floating row covers**”) also serve as important pest controls for organic gardeners.

What are some common season extension techniques?

There are many ways to get more crops out of your garden in a given year. Some of the most appropriate for gardeners:

1. **Selection of appropriate varieties** — Every vegetable (and fruit and flower) is available in multiple varieties. Some of these varieties



are more cold-tolerant than others and will start to grow earlier in the spring (or survive later into the fall) than others. Some varieties also mature more quickly than others, and can therefore be planted and harvested in a narrower window of time (whenever in the season you plant them). See choosing plant varieties for more information.

2. **Locating your garden appropriately** — Many gardeners do not have a choice about where to garden. If you do have a choice, however, avoid low ground. Cold air sinks into low spaces, and the temperature difference between the top of a hill (even a very small hill) and the neighboring valley can be multiple degrees.
3. **Use of cold frames (as pictured)** — Cold frames are boxes with glass lids that act as miniature greenhouses to trap the sun's heat. Even a very basic cold frame can be used at the beginning or end of the gardening season to add weeks of extra growing time. Cold frames need not be fancy — any old window set on top of a wood frame works fine (see picture below).
4. **Use of plastic mulch** — **Plastic mulch** is a layer of plastic that you put over the soil and weight down at its edges. The plastic warms the soil underneath it, greatly helping plants that need higher temperatures to grow (this is true not only early and late in the season, but even in the middle, when Midwestern temperatures are a little low for some really heat-loving crops like eggplant and watermelons). Plastic mulch also retains moisture, reducing the need to water your garden, keeps down weeds, reducing the work of weeding, and can reduce problems with some pests and

Season Extension Techniques

diseases. See laying and removing plastic mulch for tips on how to get started with this technique. Unfortunately, plastic mulch can only be used once and then must be thrown away. There is a material called landscape fabric that serves the same purpose and can be reused multiple times, but it is significantly more expensive than regular black plastic. With landscape fabric, you also need a scissors or a sharp knife to cut holes for your plants.

- 5. Use of floating row covers** — Floating row covers are pieces of plastic or (more often) strong, fabric-like material that are placed over crops and anchored around their edges with soil, rocks, or something else. Floating row covers serve as miniature greenhouses, trapping heat and moisture while also keeping pests out. Row covers are light enough that they sit lightly (or “floats”) over the crops so that in most cases nothing needs to be put in between the crop and the row cover. A few crops (tomatoes, peppers, and summer squash) have sensitive tops and you should use wire hoops to keep the row cover from touching the plants. Floating row covers can be used together with plastic mulch to help plants grow even faster in cool weather. Most of the time, row covers are used for both their heatretaining benefits and their power to keep out pests. Sometimes, as with young brassicas (broccoli, cauliflower, and their relatives), the pest-related benefits alone justify the use of floating row covers. If young brassicas are not kept covered, small insects called flea beetles will eat them to death. Once the plants get larger, the row cover can be removed and the plants will survive flea beetle damage.



Floating Row Covers

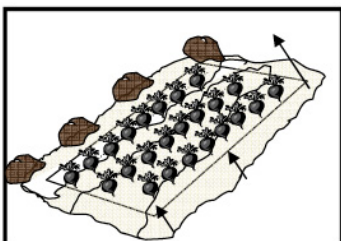
Floating row covers are useful for extending the length of your growing season (see season extension techniques for a discussion of this idea). Even during the middle of the growing season, the extra heat they provide and the moisture they retain can speed up the growth of your crops.

They are also helpful in keeping certain pests off your crops. There are many different kinds and brands of floating row covers. They come in sheets of sizes ranging in width from about 3 to 30 m (10-100 ft) and in length from 8-300 m (25-1000 ft). Some covers are made of clear plastic, and these are intended to be used once and then thrown away or recycled (if possible). Most, however, are made of a something that looks like a thin but strong white cloth (it's actually a material called spunbonded polyester).

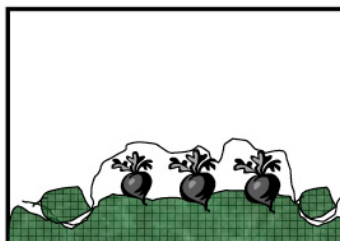
Some brands are thicker than others. The thicker the fabric, the more heat and moisture it traps, and the longer it will last in your garden (most row covers can be used for two to four years if stored carefully inside when not in use; at some point they have too many holes to be effective).

Buy the heaviest row cover you can find and afford.

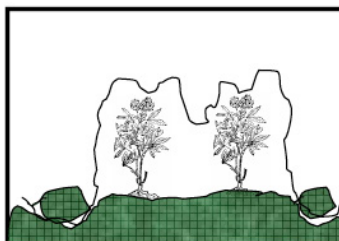
To use floating row covers follow the instructions below. If you are growing plants from seed, start at step 1. If you are growing plants from transplants, start at step 9.



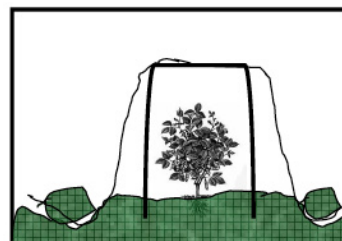
7. Unfortunately, weeds also do well in the conditions under a row cover. To weed under the row cover, lift the soil off three of the edges of the row cover with your hands and peel the sheet carefully back over the fourth side without disturbing the soil on that side. When you are done weeding, move the row cover back over the bed and use a spade to move the soil back over the three free sides. Make sure to leave the extra material in the middle as before. Weed again later as needed.



8. As your plants get bigger, they will push up the row cover — this is why it's important to leave the extra material on top of the bed. You can leave the row cover on until the plants are literally pushing it off, at which point you should remove it, shake it out, let it dry, and store it (or use it somewhere else). If the plants do not push the row cover off, you generally do not have to remove it except to harvest. There are a few crops, however — strawberries, melons, summer and winter squash, and cucumbers—that **MUST** be uncovered when they are about to flower. These crops are pollinated by insects that cannot visit the flowers when the row cover is on.



9. (for transplants only) Plant your transplants (see **transplanting** for help; for tomatoes and peppers, see step 10). Cover the bed with floating row cover as described in steps 1-5, making sure to leave plenty of extra material over the bed so that the plants have room to grow. Water and weed as described in steps 6-8, removing the row cover only if the plants are so big that they are about to push it off. With the exception of strawberries, melons, summer and winter squash, and cucumbers, you may choose to leave certain crops covered for their whole lifespan.



10. (for tomatoes and peppers only) Plant your peppers or tomatoes (see **transplanting**). Place wood or wire hoops over the plants at intervals along the bed. To do this, you can buy a spool of heavy-duty wire and cut sections off it, open up wire coathangers, or cut flexible branches off small trees. Cover the hoops with floating row cover as described in steps 1-5. Arrange the row cover so it fits well but not tightly over the hoops. The hoops keep the row cover from touching the tips of the plants stems, which are very sensitive. Remove the row cover when the plants have filled the available space.



Dealing with Pests in the Garden

As in so many areas of life, the best pest control in organic gardening is prevention. As much as possible within the space of your garden, rotate (move) your crops around the garden so that no crop is planted in the same place for at least three years.

Not only should you keep the same plant from going in the same place, but keep other related plants out, too. This will help save your plants from both diseases and pests that build up in the soil around the roots of a particular kind of plant.

In addition, it's good to grow as many different crops as you feel comfortable taking care of. Besides giving you some harvest even if one of your crops is completely destroyed by pests, this diversity is itself a form of pest control – pests move quickly through large plantings of the same crop, but more slowly through small plantings of diverse crops.

Most plants have few defenses when they are small, but as they grow older, their stems get thicker and less tasty for insects, and they develop the ability to release bitter or otherwise unpleasant substances in response to insect feeding. Their resistance to disease also increases.

If you have used the various preventative tactics mentioned above and you still have insect pest problems, there are some compounds that are used as organic pesticides. Keep in mind that these compounds are not like some of the conventional insecticides you might have used in the past – if they are o.k. for use in organic production, they are less toxic to your health, or at least break down more quickly in the

environment than standard pesticides. Most of these compounds only kill insects when the insects are very small (larvae, or worm-like creatures, rather than adults). Also, most of these compounds are only effective for a day or two after you apply them, after which point they are destroyed by sunlight, rain, or just exposure to the air.



Dealing with Pests in the Garden

Use a molasses spray to keep bugs off your plants.

Organic molasses mixed with a few simple ingredients sprayed on plants, will help drive off harmful insects while giving your plants a boost. Insects like a very specific window of sugar content in plants. If you raise that, they will not want to eat it and if they do will die. Insects cannot bloat or release gas, therefore sugars create gas and it basically kills them from the inside out.

Though bugs hate it, plants love it.

Adding molasses to the soil in your garden helps to increase the microbial activity resulting in soil that holds moisture better and is also easier to plant in. When soil microbes are exposed to simple sugars, they multiply quickly. As microbes go through their living cycle, they add important nutrients to the soil, therefore, the more the merrier. You can also rid your yard of fire ants by spraying this over your grass too. This is the most inexpensive way to add sugars and ward off harmful insects to your garden and vegetable plants.

Simple Molasses recipe for soil and plants:
(spray bi-weekly directly onto the leaves)

- 3 T. organic molasses
- 1T. liquid organic garlic
- 1T. liquid organic fertilizer
- 1 gallon of water





Common Gardening Problems & How to Cure Them

Seedlings do not emerge after planting:

It's possible that not enough time has passed. Make sure your soil is not too dry and that the temperature is correct for starting whatever seeds you're trying to grow. Wondering what plants grow best during specific times of the year? Read **Gardening Through the Different Seasons**.

Seedlings wilt and fall over/young plants die:

It's possible your seedlings are suffering from "damping off", which is a fungal disease. You might also have root maggots, cutworms, rotting roots, dry soil or could be over-fertilizing. Avoid overwatering and check for grubs at the base of your plants. Keep your garden free of rotting plant matter and weeds. Try treating the soil with a fungicide and avoid over-watering. Suspecting pests? Read **Dealing With Pests & Insects**.

Plants wilt:

It's likely your plants are suffering from too much or too little water. Roots may be rotting or you may have root knot nematodes. Try watering deeply, and more consistently. If soil is soggy, stop watering all together for a while and let the soil dry up a bit. Practice good crop rotation, and plant disease resistant varieties. Do you think you're overwatering? Read more on **Watering**.

Plants are "spindly" & weak:

Your plant may not have enough light. It also may have been watered too much. Are your plants crowded or planted too close together? Your plant could be getting too much nitrogen as well. Ensure your plants get 6-8 hours of sunlight every day, improve drainage, and thin your plants further apart. Avoid excess fertilizing. Wondering **Where You Should Plant a Garden?**



Plants grow slowly with light green leaves:

It sounds like your plant isn't getting enough light. Make sure the temperatures are warm enough for the variety of plant you're growing and check how much you're watering your plant. Do not overwater, and try to improve your drainage. Check your pH levels and try adding some amendments to your soil if you feel it might be a nutrient deficiency. Read more about **Soil Amendments**.

Growth is stunted, yellowing of the leaves:

Your plant probably is suffering from insufficient nutrients. Use a complete fertilizer, and try incorporating aged manure into your soil. Insects, disease, poor drainage and acidic soil are likely culprits as well. Test your pH and remove affected plants from garden if you suspect disease.

Leaves are yellow but do not wilt:

Test your soil for deficiencies and ensure that your plant is getting enough sunlight. Thin plants if necessary and move to a sunnier location if they are getting too shaded in the garden. Learn more with our **Intro to Soil**.

Common Gardening Problems & How to Cure Them

Brown spots on leaves:

This usually occurs from chemical burns or over fertilizing. It also could be the result of too cold of temperatures or a potassium deficiency. If your soil seems dry, try watering more frequently. If you've over-fertilized, remove fertilizers from the soil by overwatering for a day or two. If you're lacking potassium in your soil, try adding some wood ash, aged compost or aged manure. **Using, Buying and Applying Organic Fertilizers.**

Leaves look scorched, then fall off:

"Burnt" looking leaves can be the effect of salt damage, low temperatures, dry soil or over fertilizing. To protect from cold temperatures, use a floating row cover in the garden. If you've salted your walk-ways or driveways, make sure the water running off isn't going into your garden, this would be the cause of your "burnt" looking plants. Water deeply and regularly, and don't over fertilize.

Leaves are curled or scrunched together:

When the leaves curl, this could mean several things. It could be from a disease, moisture imbalance, aphids or from too much herbicide. Treat aphids by spraying leaves with water and using an organic insecticidal spray. Remove your affected plants if you suspect disease. Keep the soil evenly moist and try adding mulch around your plants suffering from curled leaves.

Leaves have tiny white spots:

White spots usually mean you have spider mites. Spray affected areas with an organic insecticidal spray.

Powdery white coating on tops of leaves:

Sounds like powdery mildew. This usually occurs when your plants are dry but the area around them is humid and moist. Try planting in full sun, and provide adequate spacing between your plants to promote good air circulation.

Blossom end of tomatoes are rotten:

"Blossom end rot" on **tomato plants** is the result of either a calcium deficiency, soil that is too compact, root injury, and/or inconsistent watering. Mulch around plants that are affected to promote even soil moisture. You can also incorporate lime into your soil to help with the calcium deficiency. Don't forget to add some aged compost and organic matter into your soil. Read our **Intro to Mulch**.

No fruit:

When you have beautiful plants that don't produce fruit, there can be several reasons to blame. The first is, too much nitrogen. There's also the possibility of no pollination so you might want to try some hand pollination techniques. If your plants are mature enough to start setting fruit and the temperatures are right then try adding some nitrogen rich fertilizers and pollinate the blossoms with a small brush or gently shake the plant.





How to Grow Organic Artichoke from Seed



Planting Season



Winter



Early Spring



Summer



Autumn

Depth to Plant

Spacing Between Plants

Days to Germinate (Sprout)

Germination Soil Temp.

Plant Height

No. of Plants per sq. ft.

Soil Needs

0.25" deep

Space plants about 2'-4' apart

7-21 days

70F-80F

Appx. 3' - 5' tall

1 plant requires app. 9 sq. ft.

Prefers soil with pH levels of 6.0-7.0.

Latin Name
Cynara Scolymus

Grow Zones
7+

Days to Maturity
85-120

Hardiness Temp.
65F-80F

Plant Size
Appx. 3'-4' Tall, 4' Wide

Light Needs
Full Sun

About Artichoke

Artichokes have a preference for a long, frost-free season. They do not grow well when there is heavy frost or snow. The temperature should not be under 55°F at night. For best results, plant them on the average date of last frost for your area.

How to Grow Artichoke

Artichokes need rich, well-drained soil that will hold moisture. They also need as much sun as possible. 8 hours of sunlight is ideal.

When to Grow

Start Artichokes indoors 7-8 weeks before last frost. Sow seeds 1/2 inch deep. Space plants approximately 2-4 feet apart. You can also sow directly into the ground once the threat of frost is over.

How to Harvest

The flowering buds will develop during the summer months and will reach full maturity during fall.

Harvest when the buds have started to flower. Pick them and enjoy!



How to Grow Organic Arugula from Seed



Planting Season



Winter



Early Spring



Summer



Late Autumn

Depth to Plant	Spacing Between Plants	Days to Germinate (Sprout)	Germination Soil Temp.	Sun Needs	Good Plant Companions	Soil Needs	Harvest Instructions
0.5" deep	Space plants about 6" apart	4-7 days	40F-55F	Full sun / partial shade	Beets, carrots, celery, and cucumbers	Prefers soil with pH levels of 6.0-7.0. Soil should be kept evenly moist	Harvest when leaves are 2-3" long

How to Grow and Harvest Arugula

Arugula is a hardy plant and does not have any strong preferences with regard to growing conditions. It can be grown in any well-drained fairly fertile spot or container. Arugula prefers cool weather, and is frost hardy enough that it will bear right through winter in a cold frame or unheated greenhouse. The arugula plant is grown as a longer leaved open lettuce. It is a small plant, with a compact root system, so it is easy to grow in containers or in a flat on a sunny windowsill. It is also good for intercropping between longer season plants.

When to Plant

Plant seeds outdoors in spring as soon as the soil can be worked. Make additional plantings every three weeks as long as the cool weather lasts. For winter harvests, sow seeds in mid-fall.

How to Plant

Dig a shallow trench with the tip of your garden spade to mark the row where you would like to plant the arugula. Sprinkle the seeds from the packet into the trench trying to space the seedlings out by somewhere between 1/4" and 1". If you want to harvest full sized leaves, increase the spacing, or thin the plants out once they are established. Plant in rows approximately 6 inches apart. Cover lightly with soil, the arugula seeds need light to germinate. If they are deeply buried, they will not germinate.

When to Harvest

Arugula leaves can be harvested once they are about 2-3 inches long, which can be as soon as 2-3 weeks after the plants germinate under ideal conditions. Cut individual leaves or pull up whole plants. The leaves are best when young, but they retain good flavor until the



Vegetable Grow Guides

How to Grow Organic Arugula from Seed

plant starts to bolt. The flowers are also edible. If the plant does bolt, you can throw some of the flowers in with your salad greens. Once the flowers are set, the leaves will start to taste more bitter.



How to Grow Organic Asparagus from Seed



Planting Season



Winter



Spring



Summer



Autumn

Depth to Plant	Spacing Between Plants	Spacing Between Rows	Days to Germinate (Sprout)	Germination Soil Temp.	Plant Height	No. of Plants per sq. ft.	Soil Needs
0.25" deep	Space plants about 10"-12" apart	Make rows about 12"-18" apart	7-21 days	75F-85F	Appx. 3' - 5' tall	1 plant requires app. 3 sq. ft.	Prefers soil with pH levels of 6.5-7.5.

About Asparagus

Asparagus can be considered a power food among veggies. It is packed with vitamins and minerals, delivering a more complete balance than any other. Asparagus is a good source of vitamin A, B6 and C, as well as iron, potassium, riboflavin, niacin, and thiamine. It is high in fiber and low in carbohydrates, contains no fat, no cholesterol and has only 20 calories per 1/2 cup serving. One serving of asparagus also provides more folic acid (1/2 the recommended allowance) and glutathione than any other vegetables. Studies conducted by the National Cancer Institute found that glutathione, a potent cancer fighting agent, was higher in asparagus than any other food tested. An established bed of 25 asparagus plants will produce about 10 pounds of asparagus per year.

Since asparagus is a perennial vegetable, and can produce for up to 30-50 years, it is very important to prepare the soil properly. The best soil is sandy, well drained loam,

heavily enriched with well-rotted manure and compost. Ground prepared in this way dries out quickly in early spring, to spur the early growth of the spears. The pH should be about 7.5. Average garden soil, however, will support a good asparagus crop, provided it drains well. Rocky New England soil will hamper the development of strait spears. Fertilization application: 4 pounds of 5-10-10 per 100 square feet, or generous quantities of bone meal or ground phosphate rock and wood ash. Asparagus craves phosphorus, which is usually abundant in composted manure and kitchen waste compost. If you can fit it in your gardening schedule, prepare the asparagus bed in the late summer or fall to be ready for planting the following spring. This provides a chance to plant a nitrogen fixing green manure crop like buckwheat. Asparagus has a pretty good appetite for nitrogen.



Vegetable Grow Guides

How to Grow Organic Asparagus from Seed

How to Grow

Planting asparagus from seed has some advantages and disadvantages. It is a little bit more work, but typically costs much less also. The biggest disadvantage is you will have to wait an extra year to harvest your first spears.

Asparagus seeds can be started indoors, or sown directly in the garden.

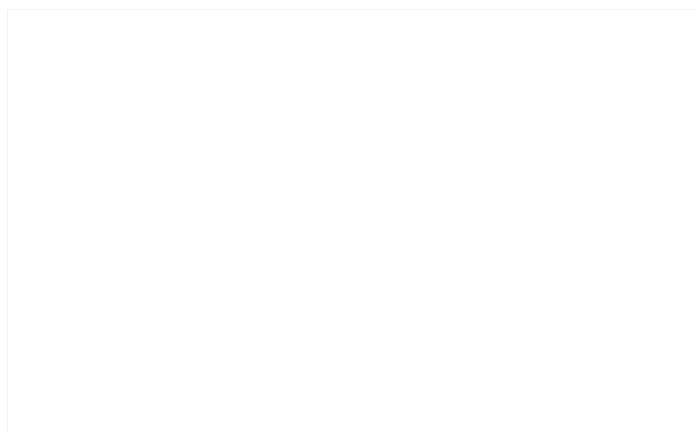
Asparagus seeds started indoors should be started in 4 inch pots approximately 3 months before the last frost. They will germinate best at daytime temperatures at around 75-80 F, and a low temperature at night of around 65F. It may take as long as 3 weeks for the asparagus seeds to germinate. To hasten germination, soak the seed for 48 hours in water prior to planting. Sow the seeds approximately 1/2" to 3/4" deep in rows approximately 2 feet wide. Seedlings should be transplanted or thinned to a minimum of 3-4 inches between plants. These seedlings should grow for a summer, and the following year the 'yearlings' should be transplanted to the permanent asparagus bed.

Dealing with Asparagus Pests

Asparagus beetles are the main pest that damages asparagus fronds. There are two common species, the common asparagus beetle (black, white, and red-orange) and the spotted asparagus beetle (red-orange with black spots), both of which are about 1/3 inch long. They can effectively be hand picked from the plants when found, look for them in the morning when it is too cool for them to fly.

The beetles overwinter in the plant debris, so removing fronds in winter will reduce their numbers eventually. Lady beetles and several small wasp species are major asparagus beetle predators that are naturally occurring.

Asparagus beetle eggs look like stubby brown hairs. Wipe them off the spears with a damp cloth. Asparagus beetle larvae are soft, grey, slug-like creatures with black heads are unable to crawl back up into position if swept off the plants. Many gardeners allow their chickens to pick through the asparagus beds for 3-5 days over winter to eliminate any leftover beetles. If you have a problem, and don't raise poultry, setup a spring trap crop. Don't cut the spears in spring within this plot, and patrol often to collect as many adult asparagus beetles as possible. In late summer cut the fronds 2 inches from the ground and compost them. In three weeks or so, you can harvest a fall crop of spears from your trap crop plot.





How to Grow Organic Beans from Seed



Planting Season



Winter



Spring



Summer



Autumn

Depth to Plant

Spacing Between Plants

Spacing Between Rows

Days to Germinate (Sprout)

Germination Soil Temp.

1/2" deep

Bush beans seeds should be planted 4" apart

Pole beans seeds should be planted 5" apart

Make rows about 18" apart

5-10 days

70F-85F

About Beans

Beans can be grown in average soil, almost anywhere in the United States. They grow best if the soil is well drained and the summer is consistently warm. Seeds will rot in the ground in cold, damp weather. Since Beans are subject to downy mildew, they should not be grown where there are cold summer fogs.

When to Plant

After the soil is sufficiently warm - temperatures above 75 degrees. Beans are easily killed by frost. Plan on an average of 10-20 plants per person.

Some gardeners recommend pre-soaking seeds prior to planting, but research indicates soaked seeds absorb water too quickly, causing the outer coats to spill out essential nutrients, which encourages seed rot. Yields can increase 50-100% by inoculating with Rhizobium bacteria. To inoculate, simply roll seeds in the powder prior to planting.

When to Plant

Bush Beans: Germination in 7 days. Plant seeds 2 inches apart, 1 1/2 inches deep in rows 2 feet apart. Thin to about 6-8 plants per foot of row. Bean plants produce the bulk of their crop for a 2 week period. Rather than plant the entire row, sections should be planted at 2 week intervals until mid-July or 8 weeks before the first killing frost. This will assure a steady crop all summer. Harvest: Average 50 days.

Wax, Lima Beans: Germination in 10 days. Plant seeds 3-4 inches apart, with eyes down, 1 inch deep in rows 2 feet apart. Two plantings a month apart produce a prolonged harvest. Harvest: Average 65-75 days.

Pole Beans: Germination in 8 to 14 days. Set 3 rough barked, 6 foot poles in the ground, tepee fashion, and tie together at the top. Leave 3 to 4 feet between the pole groups. Make a hill at the base of each pole, enriched with compost or well-rotted manure, and plant



Vegetable Grow Guides

How to Grow Organic Beans from Seed

6-8 seeds in each. After the second pair of true leaves appear, thin to 3 plants per pole. With regular harvesting, the pole beans should bear all summer.

Harvest: 65 days.

How to Harvest

Watch plants carefully as beans start to form and harvest every 2-3 days. Beans are ready to pick when the pods are well formed and rounded and snap readily if bent in half. Wax beans should have a good yellow color. Be sure to lift up the bean plants and look under the foliage to pick every ripe bean. This will promote a continued crop. If beans are left on the plants too long, the seeds overdevelop and the pods become tough. Poorly formed pods are caused by too dry soil, poor infertile soil, or insect damage. Lima beans are picked when the pods are well filled and still green in color. If the pods are yellowing, the beans are too mature and can be left on the vine and picked later to use as dry beans.



How to Grow Organic Broccoli from Seed



Planting Season



Winter



Spring



Summer



Autumn

Depth to Plant	Spacing Between Plants	Spacing Between Rows	Days to Germinate (Sprout)	Germination Soil Temp.	Plant Height	No. of Plants per sq. ft.	Soil Needs
1/4" deep	Space plants about 18" apart	Make rows about 18"-24" apart	14-21 days	60F-85F	Appx. 24"-30" tall	1 plant per sq. ft.	Prefers soil with pH levels of 6.0-7.5.

About Broccoli

Broccoli is an annual cool-season crop hardy to frosts and light freezing, often overlooked and overcooked. Broccoli is sensitive to the heat, if the weather is too hot, it will flower quickly and won't produce an edible head, it tends to grow best in the fall due to the more predictable cool weather. To prevent spreading clubroot and other soil-borne diseases, don't compost brassica roots. Some gardeners won't compost any part of the plant. Also, rotate the placement of brassica plants in your garden so they aren't in the same 10-foot radius for at least 3 consecutive years. Some experts recommend a rotation of 7 years. Headed broccoli is the most common form in the United States, with big central heads closely packed with buds.

When to Plant

Start seed indoors 6 weeks before the last killing frost, for early spring crop. (In midsummer, start another crop of seedlings for August planting and late fall crop.) Set out seedlings in late April, early May. Broccoli is hardier than cauliflower, and can withstand several frosts and still keep producing.

How to Plant

In rows 2 1/2 feet apart, with 18 inches to 2 feet between the plants. Plant spacing is variable, more space between plants leads to larger heads with less side shoots, while smaller spacing leads to smaller heads and more side shoots.



Vegetable Grow Guides

How to Grow Organic Broccoli from Seed

How to Harvest

The first crop will be the central flower head, which resembles a green cauliflower. Cut it off with a sharp knife at an angle to a 4-6 inch stem, be sure to leave some leaves on the stalk, as many types will then produce side shoots from the leaf axis. Try to cut the head off at an angle, to help ensure water can not gather on the newly cut stem which leads to rot and disease. Be sure the head is cut before it cracks apart and separates; otherwise the plant will quickly flower and go to seed. When the terminal flower head is cut off, smaller side shoots will develop a continual harvest. Home grown broccoli will most likely not grow heads as large as supermarket varieties.



How to Grow Organic Brussels Sprouts from Seed



Planting Season



Winter



Spring



Summer



Autumn

Depth to Plant

Spacing Between Plants

Spacing Between Rows

Days to Germinate (Sprout)

Germination Soil Temp.

Plant Height

Soil Needs

1/4" deep

Space plants about 24-30" apart

Make rows about 3' apart. These are large plants

7-21 days

65F-80F

Appx. 3'-4' tall

Prefers soil with pH levels of 6.0-6.8.

About Brussels Sprouts

Brussel sprout or Brussel sprouts is a common misspelling of this particular vegetable (should be Brussels for both). The name originates from the city of Brussels, Belgium where it has long been popular, and may have originated from. Brussels sprouts are an annual cool season crop, hardy to frosts and light freezes. There are two basic varieties: (1) the dwarf ("Jade Cross") which matures early and is winter hardy, but more difficult to harvest and (2) the taller ("Long Island Improved"), which is less hardy but easier to harvest.

Brussels sprouts have shallow roots, so as they become top heavy, you may need to stake them, particularly if exposed to strong winds. As with other brassicas, Brussels Sprouts are susceptible to pests and diseases that must be kept under control early in the season. As with other brassicas, composting roots should be avoided. Brussels Sprouts should not be grown within a 10 foot radius of any brassica growing location within the last 3 years, preferably 7

years. Brussels Sprouts are high in calcium and iron, as well as a good source of vitamins A and C.

When to Plant

Start seed indoors in early May so plants are ready to set out in June or early July. The sprouts develop best in cool weather.

How to Plant

In rows 3 feet apart, with 30 inches between the plants.

Harvesting Brussels Sprouts

Brussels Sprouts generally take about 3 months until they are ready to harvest. The sprouts will mature from the bottom up. When sprouts first appear, the lower leaf should be cut off. The sprouts should be picked green when about an inch or so in diameter. To pick them, you can either twist them off,



Vegetable Grow Guides

How to Grow Organic Brussels Sprouts from Seed

or better yet get a sharp knife and cut them off. Each plant should yield about 1 quart of sprouts. Harvest continues well into the cold fall months. Light snow does not seem to stop their developing, and even improves their flavor. Harvests of frozen sprouts from plants in January have been reported.

For maximum vitamin C, harvest when the temperature is around freezing. Some say never to harvest unless you've had at least two frosts, because frost improves flavor. It has also been reported that sprouts can be harvested through the summer and still be tender, if continuously picked when they reach the size of marbles. If you want to harvest all at once instead of continuously, cut or pinch off the stalk top 4-8 weeks before your intended harvest time. After harvest, remove the entire plant from the ground to minimize the chance of disease next season. Some gardeners in severely cold climates may prefer to dig plants still loaded with sprouts and keep them in a cool, light place where they will continue to ripen.



How to Grow Organic Cabbage from Seed



Planting Season



Winter



Spring



Summer



Autumn

Depth to Plant	Spacing Between Plants	Spacing Between Rows	Days to Germinate (Sprout)	Germination Soil Temp.	Plant Height	No. of Plants per sq. ft.	Soil Needs
1/4" deep	Space plants about 12"-24" apart	Make rows about 18"-24" apart	7-21 days	75F-85F	Appx. 24" tall	1 plant per sq. ft.	Prefers soil with pH levels of 6.5-7.5

About Cabbage

Cabbage is an annual cool-season crop, hardy to frost and light freezes. A smaller cabbage head has better flavor and can stay in the field longer without splitting. To keep them small, plant close together or, when the head is almost full, give the plant a sharp twist to sever the roots.

Cabbage is a wide spreading foliage plant with handsome leaves that form a tight, hard ball head on a strong central stem. Young plants may bolt if grown at 50F for a long time; however mature plants of late varieties improve flavor in cold weather.

When to Plant

Start seed indoors in early February for setting out when ground is workable for July harvest; in mid-March for setting out May 1 for August harvest; and in mid-May for setting out in early July for October harvest. Adjustments can be made to this schedule depending on the local climate.

How to Plant

In rows 2 1/2 feet apart, with 12-16 inches between plants. For late varieties, rows 3 feet apart and plants 2 feet apart.

Harvesting Cabbage

Heads must feel hard and solid before cutting. When harvesting, use a sharp knife to cut the head off at the base of the plant, keeping a few outer leaves to protect the head. The heads must be harvested promptly, or they deteriorate in the field. If there is ample cool and dry storage space, the heads may be harvested and stored for use. Or the ripe heads can be stored in the field by stopping plant growth. To do this, pull the plant up slightly from the ground until a few roots can be heard snapping. This will hold the plant for a short while until it can be picked. Some European gardeners have reported success in storing cabbage plants by burying them upside down in a deep soil pit with a thin straw flooring and covering them completely with



Vegetable Grow Guides

How to Grow Organic Cabbage from Seed

soil to just below the frost line, with another straw mulch on top.



How to Grow Organic Carrots from Seed



Planting Season



Winter



Spring



Summer



Autumn

Depth to Plant	Spacing Between Plants	Spacing Between Rows	Days to Germinate (Sprout)	Germination Soil Temp.	Plant Height	No. of Plants per sq. ft.	Soil Needs
1/4" deep	Space plants about 2"-4" apart	Make rows about 12" apart	7-21 days	75F-85F	Appx. 12" tall	Appx. 16 plants per sq. ft.	Prefers soil with pH levels of 5.5-6.5

About Carrots

Carrots are an annual cool-season crop, half-hardy to frost and light freezes. They develop quite normally under a variety of temperature conditions, except very warm temperatures. It is often said that frost, or cold weather will make them even sweeter.

Carrots grow quickly at first, sending down a tiny orange root that expands and develops more quickly toward the end of its growing period. As with all root crops, rapid, steady development produces the best results. Keep the row weed free with light shallow cultivation or heavy mulching. The seedlings must have steady moisture to develop well, with less moisture as the roots mature. Too much moisture at the end of maturing will cause the roots to crack. To prevent greening the shoulders, hill up dirt around the greens.

When to Plant

Carrots are hardy, and can be planted as soon as the ground can be worked. For a continual crop, sections of the row can be planted every 2 weeks to late May. For a fall crop, more sowings can be started in late July.

How to Plant

Since carrot seed germinates slowly, it can be mixed with radish or leaf lettuce, which germinate quickly and mark the row. The pulling of radish and leaf lettuce plants will also provide some natural thinning. Carrots do not transplant well, so start them outdoors once the soil is at least 45 degrees F.

Sow seeds evenly in a very shallow furrow, about 1/4 inch deep, and keep seeds moist so they will germinate.

Space rows about 12" apart and when the first leaves emerge, thin to 1" apart; when true leaves emerge, thin to 3" apart.



How to Grow Organic Carrots from Seed

If you delay final thinning a bit, you can use the removed roots as baby carrots.

How to Harvest

Mature carrots will be ready in about 2 months, although some gardeners find them more succulent when they are pulled earlier than this. A tiny head or crown of orange will appear at the soil line when the carrots are maturing. The diameter of the carrot is a good indication of its maturity level. If the diameter is about what you would expect, the length probably is also. The only way to really know is to pull a few up. Pull only those carrots needed since they remain fresh in the ground for some time. The late summer crop can be harvested in winter if mulched, a light frost is said to sweeten the carrot's flavor. The darkest and greenest tops indicate the largest carrots. Carrots store very well in the fridge when covered in water.



How to Grow Organic Cauliflower from Seed



Planting Season



Winter



Spring



Summer



Autumn

Depth to Plant	Spacing Between Plants	Spacing Between Rows	Days to Germinate (Sprout)	Germination Soil Temp.	Plant Height	No. of Plants per sq. ft.	Soil Needs
1/4" deep	Space plants about 24" apart	Make rows about 24"-36" apart	7-21 days	75F-85F	Appx. 2' tall	Appx. 1/2 plant per sq. ft.	Prefers soil with pH levels of 6.5-7.0

About Cauliflower

Cauliflower is an annual cool-season crop, half-hardy to frost and light freezes. To prevent spreading clubroot and other soil-borne diseases, don't compost any brassica roots. Pull and destroy all infected plants. Also rotate brassica plants on at least a 3 year basis, preferably on a 7 year basis.

The plant has broad green-blue foliage that develops a central flower head. This increases in size to a large, cabbage-sized head of condensed flowers. By tradition the head is blanched (covered from the sun) to bleach it white. Spacing between plants determines head size: the closer together, the smaller the head. When heads start forming, prevent yellowing by tying several upright leaves loosely together with string, covering the rest of the head from direct exposure to sunlight.

The trick to cauliflower is to keep it growing steadily once the seedlings are planted outdoors. So much, however, depends on

proper growing weather - ideally, a cool, long, sunny season with ample moisture or irrigation. When the center begins to develop a tight flower head about the size of a McIntosh apple, loosely tie the outer leaves with twine. Do not tie too tightly, as there must be some air circulation. This will cause the flower head to bleach white in about 1 to 2 weeks.

When to Plant

Cauliflower can be difficult to grow as a spring crop because it tends to bolt in the heat. It is generally easier to grow as a fall crop for this reason. It is the most sensitive of the brassicas to frost. Cauliflower should not be transplanted outdoors until all danger of frost is past, unless covered. It also needs to mature before hot summer weather arrives. A compromise might be to choose an intermediate starting date and cover the plants when set out to protect them from the cold. For fall crop, start seed in mid-June to set out transplants in late July. Allow 2 to 3 months growing time before first frost.



Vegetable Grow Guides

How to Grow Organic Cauliflower from Seed

How to Plant

In rows 2 1/2 to 3 feet apart, with 2 feet between plants. Plant transplants 1" deeper than they were grown in starting pots, and cover with netting to protect from pests.

How to Harvest

Cauliflower is ready to harvest in approximately 60-80 days from transplant date. As soon as the compact head is formed and blanched, it should be cut off with a sharp knife, along with several of the leaves for protection. The head should look full, and will likely be slightly smaller than supermarket varieties. Harvest when the curds of the head are still smooth. If too many heads ripen at once, cut them anyway and store in a cool, dark place for several weeks. Ripened heads left on the plant will rot and deteriorate rapidly.



How to Grow Organic Celery from Seed



Planting Season



Winter



Spring



Summer



Autumn

Depth to Plant	Spacing Between Plants	Spacing Between Rows	Days to Germinate (Sprout)	Germination Soil Temp.	Plant Height	No. of Plants per sq. ft.	Soil Needs
1/4" deep	Space plants about 6"-8" apart	Make rows about 24" apart	7-21 days	75F-85F	Appx. 2' tall	Appx. 1-2 plant per sq. ft.	Prefers soil with pH levels of 6.0-7.0

About Celery

Celery, celeriac, and lovage are three closely related plants that are grown similarly. Celery is grown for its stems, celeriac for its large, rounded, strong-flavored root (good in soups), and lovage is an herb grown for its leaves and stems (which are also good in soups and other foods). All three plants can be grown from seed in the garden, but they grow slowly and are more likely to be successful if seedlings are grown indoors to a height of about 12 cm (5 in) and then transplanted. All must be watered regularly and harvested before frost.

When to Plant

Celery seed is usually started indoors about 10 weeks before it is time to set the plants outdoors - that is, after the soil is warm and the air temperature settled. The seed is minute and finicky, and is started in much the same manner as African violet seed, in closed containers to keep seedlings moist. Soak seeds overnight to help germination. Transplant

seedlings outside when they are 4-6 inches tall and night temperatures don't fall below 40F. Water plants before they are transplanted. Some gardeners who have a long frost-free autumn season can seed a late winter crop directly.

How to Plant

When seedlings are set out they need a quick start, which is usually provided by watering the plants with a water-soluble, high-nitrogen fertilizer. Since the plants have fine, almost hair-like roots, use a heavy mulch to keep down weeds.

How to Harvest

Celery should be ready for harvest approximately 3 months after transplants are set out; 4 months from the day the seed was started. Cut plants at the base, just beneath the crown, with a sharp knife and remove some of the outer leaves. Celery will easily keep for several weeks if stored in a cool, dark



Vegetable Grow Guides

How to Grow Organic Celery from Seed

place. It will keep well in the refrigerator if cut up and covered in water.



How to Grow Organic Chives from Seed (AKA Garlic Chives)



Planting Season



Winter



Spring



Summer



Autumn

Depth to Plant	Spacing Between Plants	Days to Germinate (Sprout)	Germination Soil Temp.	Sun Needs	Good Companions	Soil Needs	Harvest Instructions
1/4" deep	Space plants about 4"-6" apart	7-14 days	60F-70F	Full Sun	Carrots	Well drained and fertilized	Snip greens as needed or harvest entire plant to use all at once.

When to Plant

Chives are grown best in cooler weather, are cold hardy and usually are planted early in the spring. Chives can quickly take over your garden if you allow the plant to go to seed. Chives are also very easily transplanted in case you wanted to dig up the plants and move them to another area.

Sow your chive seeds directly into the soil as soon as it is workable and at least 60 degrees F. Choose an area that is well drained, and add several inches of compost or organic matter around the plants to help fertilize the soil and to help cut down on weeds.

How to Plant

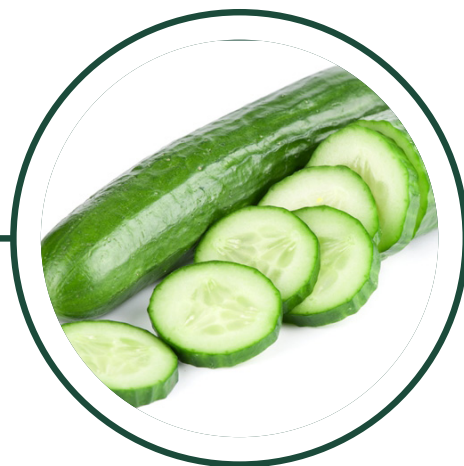
Remember to water consistently throughout the season and use plenty of mulch. When the flowers bloom, make sure to remove them so that the seeds aren't spread throughout your garden. The flowers are edible. Chives will thrive if they are divided regularly. Let the newly divided plants grow for several weeks before you harvest from them.

How to Harvest

If you're harvesting them from seedlings, they will be ready after about 60 days. When harvesting them, cut the greens down to the base, within 1-2 inches from the soil line. Harvest as needed, 3 or 4 times during the first year, and after that you can cut them back monthly. Enjoy the edible flowers that arrive usually in May or June. Use chives fresh or frozen, as dried chives can lose their flavor.



How to Grow Organic Cucumber from Seed



Planting Season



Winter



Spring



Summer



Autumn

Depth to Plant	Spacing Between Plants	Spacing Between Rows	Days to Germinate (Sprout)	Germination Soil Temp.	No. of Plants per sq. ft.	Soil Needs
1/2" deep	Space plants about 24" apart	Make rows about 48" apart	7-21 days	75F-85F	Appx. 1 plant per sq. ft.	Prefers soil with pH levels of 6.5-7.0

About Cucumbers

Grow cucumbers where a long, warm growing season, minimum 65 days, can be assured. Cucumbers are a warm-season crop, very tender to frost and light freezing. Cucumbers are difficult to grow where there are foggy, damp summers, as the plants are subject to mildews.

When to Plant

Once started, the cucumber vine grows along quite rapidly, putting out hairy stems with large, attractive leaves. The vines produce tendrils and can be trained to climb readily. The male (pollen-bearing) flowers will appear on the plant first, but do not produce fruit. A week or so later the female flowers appear, and produce the oval, elongated cucumber. The modern gynoecious (all-female) varieties are popular because they start bearing as soon as the first flowers appear. Seed packets contain enough of the good male pollen carrier to assure proper fertilization of these newer varieties.

Cucumbers self regulate how many fruits they can carry at one time. In order to maximize production, harvest fruits as soon as they reach picking size. Pick daily, because under ideal conditions, cucumber fruits can double in size in just one day.

How to Plant

Where there is ample space and vines can sprawl, the simplest way is to plant cucumbers in hills, with several plants placed together in close proximity in a small mound of soil. Space hills 4 feet apart each way and plant about 8 seeds per hill. Thin to the 3 strongest plants when the seedlings are about 4 inches high. Since cucumbers grow rapidly once started, the ground should be prepared well in advance. Work a deep planting hole where each hill will be. Add a spade full of well-rotted manure, and a generous handful of 5-10-10 or bone meal and rock potash. Work in well and cover with soil before planting the seeds about an inch deep. The same soil preparation works



Vegetable Grow Guides

How to Grow Organic Cucumber from Seed

well if the vines are to be trained on a support or grown in patio tubs.

How to Harvest

Cucumbers should be ready to harvest in approximately 50 - 70 days. Never work around wet cucumber vines, as they are susceptible to many diseases that spread when leaves are wet. Since more than 50 percent of the cucumber is water, the fruit must be picked when it is succulent and green (immature) for best taste. If the fruit starts to turn yellow, it is past its prime and the seeds will be dark and ripe (many varieties will taste bitter or pithy even before then turn yellow). Harvest cucumbers every 2-3 days (daily in hot weather), and promptly pick the fruits as they reach the desired size. If any mature cucumbers are left on the plants, production will stop, so harvest carefully and remove any badly shaped or mature fruits.

Depending on variety and size of the fruit, one cucumber plant will typically bear 10 - 20 fruits, which would total about 2 - 3 pounds of cucumbers. A pound of cucumbers yields about a pint of pickles, and six healthy plants of pickling varieties will produce enough cucumbers in one season to produce more than a dozen pints of pickles.



How to Grow Organic Eggplant from Seed



Planting Season



Winter



Spring



Summer



Autumn

Depth to Plant	Spacing Between Plants	Spacing Between Rows	Days to Germinate (Sprout)	Germination Soil Temp.	Plant Height	No. of Plants per sq. ft.	Soil Needs
1/4" deep	Space plants about 2' apart	Make rows about 3' apart	7-21 days	80F-90F	Appx. 24"-72" tall	Appx. 1 plant per sq. ft.	Prefers soil with pH levels of 5.5-6.5

About Eggplant

Eggplant is a versatile fruit often used in Italian dishes such as ratatouille, caponata, and lasagna. Eggplant easily absorbs the flavors of whatever sauce it is cooked in. Interestingly, all parts of the plant are poisonous, except the fruit.

Eggplants require a long, warm growing season, as they're sensitive to cool climates and are extremely sensitive to any frost and light freezing. Four months of 60-85 degree temperatures is the ideal climate. In the cooler spring climates, the plants must be started indoors. They can be grown successfully in containers in city gardens.

When to Plant

Start seed indoors to allow at least 10 weeks for young plants to develop. When the seedlings are about 3 inches tall, transplant them to individual pots; when they are about 6 inches high, they are ready to be planted

outdoors. Harden off seedlings and plant outdoors when days and nights are warm.

How to Plant

In rows 3 feet apart, with 2 feet between plants. Where cutworms are a problem, protect seedlings with a paper collar. Each plant should bear an average of 4 fruits.

Make sure outdoor soil temperature is at least 55-60F before transplanting; otherwise they will become stunted, turn yellow, and are slow to bear. Difficulties growing eggplant are often related to cool weather conditions. Plant them in the hottest, sunniest spot available and cover with plastic jugs (bottom cut out, cap off) until leaves poke through the top. As frost approaches, pinch back new blossoms so that plant nutrients are channeled into the remaining fruits.



Vegetable Grow Guides

How to Grow Organic Eggplant from Seed

How to Harvest

A glossy coating on the fruit is a sign of readiness. Dull coatings or seeds that have turned brown indicate overripe fruits. Eggplants should be picked as soon as they are ripe, with slightly immature fruits tasting best.

Because the stem is woody, cut, do not pull, the fruit from the plant. Store picked fruit in a cool place until it is eaten.

Eggplant deteriorates rapidly, so don't wait too long to use it.



How to Grow Organic Fennel from Seed



Planting Season



Winter



Spring



Summer



Autumn

Depth to Plant	Spacing Between Plants	Soil Needs	Days to Germinate (Sprout)	Germination Soil Temp.	Sun Needs	Good Plant Companions	Harvest Instructions
1/8" deep	Space plants about 10" apart	pH of 6.5-8.0	7-14 days	50F-70F	Full Sun	Dill	Harvest Bulb Before It Goes to Seed

About Fennel

Fennel is a unique herb and vegetable. The entire plant can be consumed. Enjoy fennel cooked or eaten raw. Fennel is very easy to grow and care for. It's been known to grow wild as an invasive herb/vegetable alongside roads in many coastal areas but wild fennel is quite different from domestic fennel and will not produce bulbs.

When to Plant

Fennel is known as a perennial that ought to be planted sometime after the last frost of the winter. Seeds germinate once soil temperatures can be measured between 50° F and 70° F. It takes up to a hundred days to mature.

How to Plant

Try sowing seeds directly into your gardens, because transplanting fennel usually doesn't work very well. Make sure you've had the last frost of the season and plant them about one inch deep, and about ten or twelve inches apart. Space fennel seeds in rows 13" apart. Keep watered well until seeds germinate, sometime between 7 - 14 days.

If you're growing fennel in containers, make sure one plant has at least 5 gallons of soil. Fennel can develop an intense root system.

How to Harvest

Harvest after about 80-100 days. Try growing multiple plants if you're interested in harvesting the bulb and seeds. Let a few plants go to seed and harvest a few bulbs before the plant bolts.



Vegetable Grow Guides

How to Grow Organic Fennel from Seed

Harvest the bulbs when they are approximately the same size as a tennis ball. Once the plant bolts, the flavor will be ruined so try to harvest it before them. Cut the bulb and stalks off right at the soil line.

Try harvesting a little of the fennel leaves at a time, as needed but don't cut too much at one time.

If you're looking to harvest the seeds, harvest those in the fall when the plants have turned brown. You can do so by easily shaking the plant into a bag or container. Save a few seeds for using as herbs in your kitchen, and put a few away to start your crop next year.



How to Grow Organic Garlic from Seed



Planting Season



Winter



Spring



Summer



Autumn

Depth to Plant	Spacing Between Plants	Spacing Between Rows	Days to Germinate (Sprout)	Germination Soil Temp.	Plant Height	No. of Plants per sq. ft.	Soil Needs
2" deep	Space plants about 4" apart	Space plants about 8"-12" apart	7-21 days	65F-75F	Appx. 12"-24" tall	Appx. 16 plants per sq. ft.	pH of 6.5-7.0

How to Plant Garlic

Garlic can be planted in the spring as soon as the ground can be worked, but fall planting is recommended. Bulbs will grow bigger and more flavorful when you plant them in the fall. Plant 6 to 8 weeks before your first hard frost. In southern areas, February or March can be a better time to plant.

Key Planting Info:

1. Break apart cloves from bulb but keep the papery husk on each individual clove.
2. Ensure soil is well-drained with plenty of organic matter. Plant in Full Sun.
3. Plant 4 inches apart & 2 inches deep, in their upright position (the wide end down and pointed end facing up).
4. Come springtime, shoots will begin to emerge.

How to Take Care of Garlic

Northern states should mulch with straw for overwintering. Remove mulch in the spring after the threat of frost is over. (Young shoots can't survive in temps below 20°F on their own. Keep them under cover.)

Cut off any flowering shoots that come up in the springtime. They will decrease the size of the bulb.

Fertilize with nitrogen, especially if you see yellowing leaves.

Water once every 3-5 days during bulb-ing (mid-May through June).



How to Grow Organic Garlic from Seed

How to Harvest

You'll know it's time to harvest your garlic when the tops are yellow and they begin to fall over. Harvest the garlic before the tops are completely dry.

Gently lift the bulbs with a spade or garden fork. When you remove them from the soil, carefully brush off the soil and let them cure in an airy, shady spot for two weeks. Try hanging them upside down on a string. The key to curing them is making sure that they have good air circulation.

How to Store Garlic

Your garlic will be ready to store when the wrappers are dry and papery and the roots are also very dry. The head of the root should be hard and the cloves should come apart easily.

Remove all dirt, roots & leaves. Keep the papery wrapper on—but remove any dirty parts.

Bulbs should be stored in a cool (40 degrees F), dark, dry place, for several months.

The flavor of your garlic will increase as your bulbs are curing and drying.

Remember: Make sure you save a few cloves of garlic from each head to plant again next year.



How to Grow Organic Kale from Seed



Planting Season



Winter



Spring



Summer



Autumn

Depth to Plant	Spacing Between Plants	Spacing Between Rows	Days to Germinate (Sprout)	Germination Soil Temp.	Plant Height	No. of Plants per sq. ft.	Soil Needs
1/4" deep	Space plants about 10" apart	Space plants about 18"-24" apart	7-21 days	65F-85F	Appx. 18"-36" tall	Appx. 1 plant per sq. ft.	pH of 6.0-7.5

About Kale

Kale is a very easy vegetable to grow. It is generally more disease and pest resistant than other brassicas.

Kale also occupies less space than other brassicas. Use it as a spinach substitute in a wide variety of dishes. Kale maintains body and crunch which makes it a good substitute in dishes where spinach might not be suitable; its especially delicious in stir-fry dishes. It is recommended to cook over high heat to bring out the best flavor and prevent bitterness.

Many specialty growers are planting kale in wide beds only 1/2 to 12 inches apart and harvesting kale small as salad greens. In England, close plantings of kale have been shown to prevent aphid infestations through visual masking.

How to Plant

Kale can be planted pretty much anywhere in the United States where there's a cool fall growing season. It's a cool-season crop, hardy to frosts and light freezes. Kale's flavor is reported to improve and sweeten with frost.

Plant Kale in rows 18 inches to 2 feet apart.

When the seedlings are 3 or more inches high, thin plants to 10 inches apart (read about thinning) and use the thinnings for salads or as a cooked vegetable.



Vegetable Grow Guides

How to Grow Organic Kale from Seed

How to Harvest

Kale can be harvested within approximately 1 month of becoming established. Leaf color is the best sign of crop readiness. Rich green leaves of firm texture are ready for cutting. If too dark and heavy, the leaves are tough and not as flavorful. Kale leaves for cooking should generally be about the size of your hand. The small, tender leaves can be eaten uncooked, and are often added to salads. Cut the leaves frequently to encourage new growth, but avoid picking the terminal bud(at the top of the plant). When cold weather begins, mulch the plants with straw, salt hay, or the like, they will continue producing well into winter, and they may even taste more flavorful.



How to Grow Organic Kohlrabi from Seed



Planting Season



Winter



Spring



Summer



Autumn

Depth to Plant	Spacing Between Plants	Spacing Between Rows	Days to Germinate (Sprout)	Germination Soil Temp.	Plant Height	No. of Plants per sq. ft.	Soil Needs
1/4" deep	Space plants about 6" apart	Space plants about 12" apart	7-21 days	75F-85F	Appx. 2' tall	1 plant per 3 sq. ft.	Prefers loose average soil

About Kohlrabi

Kohlrabi has been said to have a cabbage or turnip taste, but is milder and more sweet. It grows above ground, similar to that of a turnip. The bulbs can be white, green or purple depending on variety.

How to Plant

Grow Kohlrabi in loose, average soil. Direct-sow your seeds 4 to 6 weeks before the last frost in your growing zone; about 1/4 inch deep, and 10 seeds per foot. You can start your seedlings indoors 6 to 8 weeks before the last frost as well. Transplant your seedlings when they are about 4 inches tall. Thin to 5 inches apart in rows of 1 foot apart.

How to Harvest

Try harvesting the young leaves for stir-fries. Harvest full bulbs when they are about 2 inches in diameter. When cooking, use the stem as you would turnips. Store your Kohlrabi for several weeks in the refrigerator, or several months in a cool root cellar.



How to Grow Organic Leeks from Seed



Planting Season



Winter



Early Spring



Summer



Autumn

Depth to Plant	Spacing Between Plants	Days to Germinate (Sprout)	Germination Soil Temp.	Sun Needs	Soil Needs	Good Plant Companions	Harvest Instructions
1/2" deep	Thin to 1" apart	8-20 days	60F-65F	Full sun or light shade	pH of 6.5-7.0	Peppers	Remove green tops & store in fridge for up to 2 weeks

About Leeks

Plant leeks in the spring, and late in the summer or fall. They are often harvested until the ground freezes in cooler climates.

When to Plant

If you're starting your leeks by seed, sow them indoors 8-10 weeks before the last frost. Plant them 1/2 inch deep & thin to 1 inch apart when the seedlings are about 3-4" tall. Leeks prefer temperatures of 60-65 degrees when being transplanted. Harden them off by moving them outdoors as soon as your soil is workable.

How to Plant

Plant leek seedlings 8-10 inches apart. Water well and make sure all of the roots are covered. Add additional soil around the plant as it grows to produce the long white stalks, that you so typically may see in culinary dishes.

When to Harvest

Harvest your leeks when they reach a large, ideal size for cooking. Loosen the soil around the plant before pulling them, so you don't break them off. Allow your leeks to stay in the ground just before the ground freezes or use mulch or hay to over-winterize leeks if you live in milder climates.

Cut green tops off of leeks and store in a plastic bag in the refrigerator for up to two weeks.



How to Grow Organic Lettuce from Seed



Planting Season



Winter



Spring



Summer



Autumn

Depth to Plant	Spacing Between Plants	Spacing Between Rows	Days to Germinate (Sprout)	Germination Soil Temp.	Plant Height	No. of Plants per sq. ft.	Soil Needs
1/4" deep	Space plants about 6" apart Loose leaf can be very close together	Space plants about 12"-14" apart	7-14 days	40F-80F	Appx. 12" tall	Appx. 4 plants per sq. ft.	pH of 6.5-7.5

About Lettuce

Lettuce can be grown practically anywhere. Lettuce is a cool-season vegetable, with an ideal temperature of 50-60 degrees. It does poorly in hot weather, and is tolerant to some frost and light freezes. The leafy types mature quickly and are more suited for warm climates. Cos is also more heat tolerant. It will prefer a little shade during the warmer part of the season. It can be grown year round with proper varieties, and some additional winter protection. Lettuce will generally grow best in the spring and fall seasons.

Lettuce doesn't do well in very acidic soils, and some say the pH shouldn't be lower than 6.5. A rich, mucky "celery" soil is excellent for lettuce, but the crop will also do well in average garden soil. The best crops are grown in soil that is deeply enriched with well-rotted manure and is well-fertilized before planting, especially with high nitrogen (leaf-stimulating) fertilizers such as 10-8-4, cottonseed meal, or blood meal.

Lettuce is about 95 percent water. It develops rapidly if the growing season is cool and moist. Head lettuce forms a tight, compact cabbage head from a dense rosette of leaves. Bibb develops a loose head of broad succulent leaves with superb flavor. Leaf lettuce has loose crispy or curly leaves that develop from a basal growing point. Cos and romaine also develop from a basal growing point, but the leaves are oblong and grow upright.

When to Plant

Early spring in regions where summers are hot, and again in late summer for a fall crop. Head lettuce, especially, requires a long, cool growing season, and seed is usually started 6 weeks ahead. Transplants can be purchased. When sowing leaf lettuce, rows can be made by mixing several varieties. As the crop wanes, a second sowing can be made or else it can wait until late summer, for fall. During hot weather, sow lettuce in partial shade, as it doesn't do well in the heat, and use heat-resistant varieties.



Vegetable Grow Guides

How to Grow Organic Lettuce from Seed

How to Plant

Seed should be sown thinly in rows 1 foot apart; for leaf types, thin plants to 2-3 inches apart, then thin again by pulling every other plant when half grown. This will encourage thickly developed plants. For head, Bibb, and cos types, space rows 18 inches apart, plants 8-10 inches apart. Closer spacing results in smaller heads, which may be preferable for small families. Specialty growers are spacing lettuce very close for selling baby lettuces, a rapidly growing produce market.



How to Grow Organic Melon from Seed



Planting Season



Winter



Spring



Summer



Autumn

Depth to Plant	Spacing Between Plants	Spacing Between Rows	Days to Germinate (Sprout)	Germination Soil Temp.	Plant Height	No. of Plants per sq. ft.	Soil Needs
1/2" deep	Space plants about 18" apart	Make rows/hills about 5'-6' apart	7-14 days	70F-80F	Grows as a vine	Appx. 1/3 plants per sq. ft.	pH of 6.5-7.5

About Melons

Because melons require a long, warm growing season, their best yields occur in the southern United States (or similar), where there is ample growing time. Home gardeners in cooler regions can usually do fairly well with melons if they start their seeds indoors a month or more ahead of planting out doors, but the vines need consistently warm days and nights to thrive. Melons are a warm-season crop, very tender to frost and light freezes. Plan an average of 2-6 plants per person. Melons generally take up enormous space, and should not be considered for the small vegetable plot. There are compact varieties that produce tasty and prolific fruits. Watermelons and honeydew melons both mature in about 80-100 days of warm weather to mature properly, with smaller personal varieties being on the shorter end of that spectrum. Cantaloupes typically mature in about 75-85 days.

When to Plant

Because of the long growing season, start plants indoors 4 to 5 weeks before outdoor planting time. The soil must be warm and the weather settled with warm days and nights, as the plants are sensitive to cool. If nights are cool, use hot caps to protect the plants. Melons can be sown directly outside, but some gardeners report better germination with pre-sprouted seeds. Consider adding a row cover outdoors, which can be removed a week after plants begin to bloom. The row cover will help by raising the temperature, taming wind, and excluding insects.

How to Plant

If you start melons indoors, use individual cells or peat pots, not flats, as the roots are too succulent to divide. When you direct sow, plant 4-5 seeds in a hill and then thin to the appropriate spacing. The appropriate spacing will depend on whether you train them on a



Vegetable Grow Guides

How to Grow Organic Melon from Seed

trellis or let them spread on the ground. For direct sowing and transplants, cover seedlings with hot caps to protect from frost, speed up their growth, and keep out pests. The vines do best if planted in hills. Rows and hills should be set 5 to 6 feet apart each way, with 2 or 3 plants per hill. Thin to the 2 strongest plants in a week.

How to Harvest

Harvest melons at the peak of freshness for best results. Waiting too long gives you nothing but a mealy mess, not waiting long enough means you might have to throw an inedible treasure out to the chickens. 3-3 1/2 months for cantaloupes; 3 months for midget watermelons.

- Cantaloupes - The easiest way to tell if they are ripe is a color test. The flesh between the netting turns from green to tan. Smooth skinned types will lose their fine peach hairs and begin to feel waxy. Also, if the melon slips off the vine easily with a gentle tug, it is probably ripe. As will all melons, they should smell fruity and lush at the blossom end when ripe.
- Watermelons - Check the tendril nearest where the fruit connects to the vine. When it starts to shrivel and turn brown, the melon is usually ripe. Also examine the rind where the melon rests on the soil. If the spot is yellow, it is probably ripe. If the spot is green or white, it probably hasn't fully ripened yet.



How to Grow Organic Mustard Greens from Seed



Planting Season



Winter



Early Spring



Summer



Autumn

Depth to Plant	Spacing Between Plants	Spacing Between Rows	Days to Germinate (Sprout)	Germination Soil Temp.	Plant Height	No. of Plants per sq. ft.	Soil Needs
1/2" deep	Space plants about 12" apart	Space rows about 1'-2' apart	7-10 days	40F-85F	Leaves are best at 3"-4" tall	1 plant per sq. ft.	pH of 6.5-6.8

About Mustard Greens

Growing mustards are a quick and easy crop to grow in your home garden. They are a spicy green, which will quickly become one of your favorite crops.

When to Plant

When growing from seed, start them outdoors 3 weeks before the last frost. For a more steady harvest, plant seeds about every 3 weeks or every month to give you a successive harvest. Mustard greens prefer cooler weather, so plant late in the summer for a fall harvest, or very early in spring before the summer heat sets in.

How to Plant

Plant seeds a 1/2" deep, and thin to 3 inches.

If you are planting seedlings, space them 3-5 inches apart. Like planting seeds, you can transplant new seedlings every 3 or 4 weeks to get a successive harvest.

When to Harvest

Harvest mustard green leaves when they are young and tender. Older leaves are bitter and tough.

To harvest, pick individual leaves and leave the plant to produce more, or harvest the entire plant to eat all at once.



How to Grow Organic Okra from Seed



Planting Season



Winter



Early Spring



Summer



Autumn

Depth to Plant	Spacing Between Plants	Spacing Between Rows	Days to Germinate (Sprout)	Germination Soil Temp.	Plant Height	No. of Plants per sq. ft.	Soil Needs
1/2" deep	Space plants about 12" apart	Space rows about 1'-2' apart	7-10 days	40F-85F	Leaves are best at 3"-4" tall	1 plant per sq. ft.	pH of 6.5-6.8

About Okra

Okra makes a wonderful side dish and as a thickener for gumbo and stews. It thrives in regions where corn grows well and can reach anywhere from 2-6 feet tall while making an attractive garden border.

When to Plant

Sow okra seeds in fertile, nitrogen rich soil. Wait to sow your seeds until the soil has reached a temp. of at least 60 degrees.

Soak seeds overnight to encourage germination. Plant 1/2 inch deep in light soil and 1 inch deep in heavy soil. Place seeds 3 inches apart and then thin to 1- foot apart.

How to Plant

When your okra seedlings are 4 inches tall, mulch around the plant to keep the weeds down and help with moisture retentions, especially during dry spells. Fertilize with compost tea.

When to Harvest

In 50-60 days your okra will start to be "harvest ready". They will be tough when they are mature. Harvesting or picking frequently will keep the plant producing until it is killed by frost.

Watch out for spines! Wear gloves & long sleeves when harvesting, or try planting a spineless variety such as 'Clemson Spineless'.



How to Grow Organic Onions from Seed



Planting Season



Winter



Spring



Summer



Autumn

Depth to Plant	Spacing Between Plants	Spacing Between Rows	Days to Germinate (Sprout)	Germination Soil Temp.	Plant Height	No. of Plants per sq. ft.	Soil Needs
1/4" deep	Space plants about 3"-4" apart	Make rows about 6"-10" apart	7-14 days	50F-85F	Appx. 12" tall	Appx. 16 plants per sq. ft.	pH of 6.0-7.5

About Onions

Onions are easy to grow, have a fairly short growing period and take up little space in the garden. If you don't have a vegetable garden, plant a few onions in your flower garden or in a pot or box and set them on your patio or in a sunny window.

Onions are a cool-season crop, hardy to frost and light freezes, although certain varieties are exceptions. They can be grown practically everywhere, and prefer a cool- season start. Onions are as hardy as they come. Frosts, freezing temperatures and snow will not kill them. They should have steadily moist soil and even growing weather to mature at a steady pace. Otherwise they bolt to seed or do not form good bulbs. High temperatures and low humidity are advantageous during bulbing and curing.

When to Plant

Onions are relatively hardy, so planting can begin as soon as the soil is dried out and workable in spring. In milder climates(>zone 8), they can be planted in fall for spring harvest. If planted in too cool weather, onions will not form bulbs. Onions can be planted as soon as the garden can be tilled in the spring, usually late March or early April in prime growing regions. Good fertility, adequate soil moisture and cool temperatures aid development

How to Plant

Plant onions 1/4 inch deep and 3 to 4 inches apart in double rows, leaving 6 to 10 inches between rows. Be sure to leave enough room between rows to weed. If the onions are planted closer together, you can harvest every other plant as a green onion so that bulb development of the remaining plants is not impeded.



Vegetable Grow Guides

How to Grow Organic Onion from Seed

How to Harvest

Onions are ready to harvest approximately 150 days after planting seeds, and approximately 100 days after transplanting sets. Green or spring onions are pulled as needed when the stems are about 1/4 inch thick.

Pull green onions anytime after the tops are 6 inches tall. Green onions become stronger in flavor with age and increasing size. They may be used for cooking when they are too strong to eat raw. Sweet onions generally store poorly, whereas pungent varieties store well because of a high content of aromatics, which act as preservatives.

Remove any plants that have formed flower stalks and use immediately. They do not produce good bulbs for dry storage.

For dry onions, those that will be dug and stored, the tops will start to yellow off and fall as the bulbs are maturing probably late July or early August, as can be seen in the nearby image. If the entire row does not ripen uniformly, when the majority of onions are ripe, knock down the foliage of the others with the back of a rake. Dig the onions carefully and allow them to dry in the open sun for a few days. Rinse off the dirt and allow the onions to dry with the tops still attached in the open air for about 2-3 weeks. Then, cut the tops and roots off of the onion, and allow the cuts to air dry for two or three days. This will help to seal the onion and avoid premature spoiling. Store in a porous or net bag in a cool, dry place.

To keep mature onions for a longer period of time, lay them in a single layer on newspaper in a warm, well ventilated place to cure for 2-3 weeks. Leave undisturbed until the outer skin becomes papery and crispy dry. Select unbruised onions, rub off the stringy roots and braid the tops. Braid and hang them in bunches or place in mesh bags and hang away from moisture. If onions are stored in a cool dry place (50 to 60 degrees), they will keep for 6-8 months.

To store scallions or green onions, place them in a jar or vase and put some water in the bottom. You can continue to cut the tips as they grow, and they won't spoil for quite some time.



How to Plant, Grow & Harvest Organic Bulb Onions



Planting Season



Winter



Spring



Summer



Autumn

Depth
to Plant

1"
deep

Spacing
Between
Plants

Space plants
about 4"-6"
apart

Days to
Germinate
(Sprout)

90-100 days

Soil
Needs

pH of 7.0-7.5

When to Plant Bulb Onions

Onion sets are quite hardy and can withstand 20° F frost. They should be set out 4-6 weeks prior to the last expected spring frost. When your plants arrive they should appear to be quite dry. **DO NOT WET THEM NOR STICK THEIR ROOTS IN WATER.** Unpack them and store them in a cool, dry place until it is time to plant. They should last about 3 weeks kept this way. Do not worry that your plants seem dry. They will "shoot" new roots and new, green tops as soon as they are planted.

How to Care for Bulb Onions

Onions have small, inefficient root system and need moist soil. Keep them constantly well watered. But when the plants approach maturity their bulbs stop enlarging and begin to form skins. When this happens, withhold further irrigation and hope it does not rain much. Ideally, the bulbs will mature in very dry soil. This helps the skins to cure and makes your bulbs keep better.

How to Harvest & Store Bulb Onions

After most of the tops have "gone down," lift the bulbs. It may help to gently loosen them with a shovel first. Allow them to lie in the sun for a day or so, then cure and store them.



How to Grow Organic Parsnip from Seed



Planting Season



Winter



Spring
(Feb-Mar)



Summer



Autumn

Depth to Plant	Spacing Between Plants	Spacing Between Rows	Days to Germinate (Sprout)	Germination Soil Temp	Plant Height	No. of Plants per sq. ft.	Soil Needs
1/2" deep	Space plants about 3"-4" apart	Space rows about 18"-24" apart	10-21 days	50F-85F	Up to 3' tall	4 per sq. ft.	Well drained soil with a pH of 6.5

About Parsnips

Parsnips grow best in well-worked, organic soil. Plant in the spring, and you'll have parsnips throughout next winter. Leaving them in the ground until after the first frost will make them sweeter in taste.

When to Plant

Sow seeds 1/2 inch deep & 1 inch apart in rows that are 6 inches apart. Keep moist and wait approximately two weeks for germination to occur.

How to Plant

When they are 6 inches tall, thin them to 3 inches apart. Layer compost around the seedlings and wait until fall to enjoy. You can soak them overnight before planting also to help with better germination.

How to Harvest

Enjoy your homegrown parsnips about 120 days after starting them. Try overwintering parsnips by covering them with a 2-inch layer of mulch.



How to Grow Organic Peas from Seed



Planting Season



Winter



Spring



Summer



Autumn

Depth to Plant	Spacing Between Plants	Spacing Between Rows	Days to Germinate (Sprout)	Germination Soil Temp.	Plant Height	No. of Plants per sq. ft.	Soil Needs
1/2" deep	Space plants about 4"-6" apart	Make rows about 18"-24" apart	7-14 days	40F-75F	Vine	Appx. 8 plants per sq. ft.	pH of 6.0-6.5

About Peas

Peas are a cool season vegetable, and do best in a climate where there are two months of cool growing weather, either spring planting in the northern regions or fall planting in the warmer, southern regions. They are hardy to frost and light freezes.

Peas have smooth or wrinkled seeds. Most of the varieties grown are wrinkled seed, since these are sweeter and more flavorful. The advantage of smooth seed is its toughness in withstanding rot in cold, wet soil, although many wrinkled seed varieties are now treated with a mild fungicide to prevent rotting. Plan on an average of 25-60 plants per person depending on how much you want to freeze, dry, or can for winter. Pole and climbing peas produce over a longer period and up to 5 times more than dwarf bush varieties.

When to Plant

The earlier the better. Seeds should be planted in the spring as soon as the ground can be worked. Do not plant in the hot summer months. Where winters are mild, a second fall crop could be planted in late summer, but where the summers are long and hot, this is not practical as the plants do not thrive, producing poor flowers and a disappointing crop. The simplest way to prolong harvest is to plant early, mid season, and late varieties at one time rather than sowing every 2 weeks. Gardeners with mild winters can plant peas in both spring and fall.

How to Plant

Plant dwarf varieties about 8 seeds to a foot, about 1/2 - 1" deep; and in rows 18-24" apart. Tall-growing varieties should be planted in double rows 4-6 inches apart, 2 1/2 feet between double rows. Supports for climbing vines can be put in at planting time,



Vegetable Grow Guides

How to Grow Organic Peas from Seed

or just as seedlings are 3 inches high. Peas can cross-pollinate, so for seed-saving, space different varieties at least 150' apart. Dwarf varieties don't need a trellis if you plant them close together. For support use twiggy bush, chicken wire fencing, or weatherized trellis netting sold commercially for vine crops.

Peas have fragile roots and don't transplant well. While some gardeners recommend presoaking seeds, research has indicated that presoaked legume seeds absorb water too quickly, split their outer coatings, and spill out essential nutrients, which encourages damping-off seed rot. Yields can increase 50-100% by inoculating with *Rhizobium* bacteria.

How to Harvest

Peas are ready to harvest in approximately 60-70 days. When pods of the peas appear to be swelling with rounded pea forms visible, they are ready for picking. Take a test picking every day or so, and note the appearance of the pods with the sweetest peas. If the pods are left on the vines too long, they become tough and starchy. Pick black eyed peas slightly before maturity. They should still be a light green with a purplish eye. They are still easy to shell at this stage and taste delicious. Pick the pods just before cooking, since they, like corn, deteriorate quickly after harvest. Choose a cool morning, not the heat of the day, or just after a cooling rain. The edible pod peas should be picked when the pods are well developed, but before they become swollen with the outline of peas.

Peas usually develop from the bottom of the vine up. Pull firmly but gently, and hold the vine with one hand so it is not jarred loose from its support when picking. When peas start to ripen, pick them often, and pull all ripe pods present each time to encourage development of more pods; otherwise the crop stops developing. You can pick peas for about 2 weeks once they start coming. After the harvest, turn under the plant residues to improve the soil.



How to Grow Organic Hot Peppers & Chiles from Seed



Planting Season



Winter



Spring

(Indoors in March or 8 weeks prior to transplant)



Summer



Autumn

Depth to Plant	Spacing Between Plants	Spacing Between Rows	Days to Germinate (Sprout)	Germination Soil Temp.	Plant Height	No. of Plants per sq. ft.	Soil Needs
1/4" deep	Space plants about 18" apart	Make rows about 2' apart	Up to 30 days	70F-95F	5'-6' tall	Appx. 1 plants per sq. ft.	pH of 6.0-6.8

About Hot Peppers

Peppers are easily second only to tomatoes as a home gardeners favorite. Try spot planting them around the garden for bursts of beautiful color too.

When to Plant

Pepper roots don't like to be disturbed, so plant them indoors in seed starting pellets two months before your last frost date, usually three or four seeds to a pellet.

How to Plant

Keep your soil moist and about 75°F. They need at least 5 hours of sunlight a day. Once the seedlings are 2 to 3 inches tall, thin them by leaving only the strongest plant.

When your pepper plant seedlings are 4 to 6 inches tall, harden them off for about a week. To avoid shocking the plants, make sure the soil temperature is at least 60°F before moving them outside; this usually occurs 2 to 3 weeks after the last frost.

How to Harvest

Harvest peppers during mild and dry weather by cutting them from the stem. Make sure you wear gloves if you are sensitive to the heat. Most hot peppers will be mature and ready to eat in 70 to 85 days, but some can take as long as 150 days, depending on when you transplanted them. They're mature when they are firm, good sized, and have thick walls. Handle carefully, because nicks and bruises can cause them to rot faster.

Peppers love full sun, but don't plant peppers where tomatoes or eggplants grew previously, because all three are members of the nightshade family and are subject to similar diseases.

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How to Grow Organic Sweet Peppers from Seed



Planting Season



Winter



Spring

(Indoors in March or 8 weeks prior to transplant)



Summer



Autumn

Depth to Plant	Spacing Between Plants	Spacing Between Rows	Days to Germinate (Sprout)	Germination Soil Temp.	Plant Height	No. of Plants per sq. ft.	Soil Needs
1/2" deep	Space plants about 12" apart	Make rows about 1'-2' apart	7-10 days	70F-90F	5'-6' tall	Appx. 1 plant per sq. ft.	pH of 5.5-7.0

About Sweet Peppers

Peppers are easily second only to tomatoes as a home gardeners favorite. Try spot planting them around the garden for bursts of beautiful color too.

When to Plant

Pepper roots don't like to be disturbed, so plant them indoors in seed starting pellets two months before your last frost date, usually three or four seeds to a pellet.

How to Plant

Keep your soil moist and about 75°F. They need at least 5 hours of sunlight a day. Once the seedlings are 2 to 3 inches tall, thin them by leaving only the strongest plant.

When your pepper plant seedlings are 4 to 6 inches tall, harden them off for about a week. To avoid shocking the plants, make sure the soil temperature is at least 60°F before moving them outside; this usually occurs 2 to 3 weeks after the last frost. Peppers love full sun, but don't plant peppers

where tomatoes or eggplants grew previously, because all three are members of the nightshade family and are subject to similar diseases.

How to Harvest

Harvest peppers during mild and dry weather by cutting them from the stem. Most peppers will be mature and ready to eat in 70 to 85 days, but some can take as long as 150 days, depending on when you transplanted them. They're mature when they are firm, good sized, and have thick walls. Handle carefully, because nicks and bruises can cause them to rot faster.



How to Plant, Grow & Harvest Organic Potatoes



Planting Season



Winter



Spring



Summer



Autumn

Depth
to Plant

Spacing
Between
Plants

Spacing
Between
Rows

Germination
Soil Temp

3"-4"
deep

Space plants
about 10"-14"
apart

Space rows
about 24"
apart

55F-70F

How to Prepare Your Potato Seeds

When examining them, chitting, cutting or planting, leave the sprouts on. If you break sprouts off you will delay emergence of the vines; and, you will greatly increase the number of vines that finally do emerge from each potato, greatly reducing the ultimate size of the potatoes you will harvest. All tubers the size of a hen's egg (1-3 ounces), may be planted whole. Ones this size are highly desirable. When cutting larger potatoes into smaller, plantable sizes, each piece should weigh at least 2-4 ounces and must contain two or more strong eyes. Most people cut up larger potatoes into pieces immediately before planting, using a clean, sharp knife. Seed may be allowed to "heal over" for a day prior to planting, but must not be allowed to dry out. Spread the cut pieces out on a table in the shade or one layer deep in a shallow box. Do not put in direct sunlight because this will weaken them.

How to Prepare the Soil

The ideal potato soil is deep, light and loose, a well-drained but moisture retentive loam. Most potato varieties are very aggressive rooting plants, and are able to take full advantage of such soil. In ideal soil, potatoes can make incredible yields. Fortunately, the potato is also very adaptable and will usually produce quite well even where soil conditions are less than perfect. Potatoes do best in soil with a pH ranging from 5.2-6.8. Alkaline soil will tend to make many varieties get scabby. If using compost that is not very "strong," we recommend supplementing it with fertilizer, but not too much. Potatoes given too much nitrogen grow lots of leafy vines but won't produce very many tubers.



Vegetable Grow Guides

How to Grow Organic Potatoes from Seed

Planting Your Potato Seeds

Optimum soil temperature for good growth ranges from 55 deg. F. to 70 deg. F. A small planting of the earliest early potatoes may be attempted by planting 6-8 weeks before the last frost date. The width between rows and overall plant spacing is determined by the size of your garden, however, gardeners can get by with as little as 2 feet between rows. Whatever your row spacing, dig a shallow trench about 6-8 inches deep. Plant the seed pieces 10-14 inches apart in this trench. Using a rake, cover the seed with 3-4 inches of soil-do not fill the trench completely.

Hilling

Sprouts will emerge in about two weeks, depending on the soil temperature. When the stems are about 8 inches high, gently hill the vines up with soil scraped from both sides of the row with a hoe. Leave about half of the vine exposed. Hilling puts the root system deeper where the soil is cooler while the just scraped-up soil creates a light fluffy medium for the tubers to develop into. All tubers will form between the seed piece and the surface of the soil. Another hilling will be needed in another 2-3 weeks and yet another as well, 2 weeks after the second. On subsequent hilling, add only an inch or two of soil to the hill, but make sure there is enough soil atop the forming potatoes that they don't push out of the hill and get exposed to light.

Harvesting Your Potatoes

Normally, seven or eight weeks after planting, the earliest varieties are blossoming. This signifies that early potatoes may be ready, so gently poke into a potato hill by hand to see what you can find while making as little disturbance as possible. The ideal time to harvest is when the vines are dead. It is best to wait until heavy frosts kill the tops off or, if your tubers are fully-sized up but no frost is in sight, you can mow the tops or cut them off by hand with a sickle. But if you can wait for the tops to die back naturally, your harvest will be a little bigger and your potatoes just a tad richer. Dryish soil is definitely an advantage when harvesting; the tubers come up a lot cleaner and with much less effort. After the tops are dead, rest the tubers in the ground, undisturbed for two weeks to "cure," while the skins toughen up, protecting the tubers from scuffing and bruising during harvest and storage. Minor injuries in the skin may heal if allowed to dry. It is better to harvest in the cool morning hours.



How to Grow Organic Pumpkins from Seed



Planting Season



Winter



Spring
(May-June)



Summer



Autumn

Depth
to Plant

Spacing
Between
Plants

Days to
Germinate
(Sprout)

Germination
Soil Temp.

Plant
Height

No. of
Plants per
sq. ft.

Soil
Needs

1"-2"
deep

1 plant needs
20 sq. ft.

7-10 days

65F+

20'-30' long

1 plant needs
20 sq. ft.

Prefers well
drained soil
with a
pH of 5.5-7.5

When to Plant

Pumpkins are very frost sensitive and shouldn't be planted until the soil has reached at least 70 degrees.

Most varieties will take between 85 - 125 days to mature. The larger variety of pumpkin, usually will take the longest time to mature.

How to Plant

Choose a full sun location with 20-30 feet for the vines to grow. Your site also should have good drainage.

Try working some compost into the area where you'll be planting your pumpkins. This will create a nice, rich soil bed.

Plant your seeds 1 - 2 inches deep. Germination usually takes place within 7 - 10 days, and once they do, add a little bit more compost around your seedling. This will help keep weeds down and help to retain moisture.

How to Harvest

When the stem starts to twist and dry, or the shell has started to harden, it's most likely time to harvest. Try piercing the shell of the pumpkin with your fingernail. If the shell is hard, your pumpkin is ready to cut from the vine. Leave about 3 inches of the stem on the pumpkin when removing it from the vine.



How to Grow Organic Radicchio from Seed



Planting Season



Winter



Early Spring



Summer



Autumn

Depth to Plant	Spacing Between Plants	Spacing Between Rows	Days to Germinate (Sprout)	Germination Soil Temp.	Plant Height	No. of Plants per sq. ft.	Soil Needs
1/4" deep	Space plants about 8" apart	Make rows about 1' apart	6-10 days	50F-70F	1'-2' tall	1 plant per sq. ft.	pH of 5.5-6.8

About Radicchio

Radicchio, is similar to cabbage and mostly used as a salad green. It is red and white, slightly bitter and highly nutritious.

When to Plant

Radicchio is a perennial that will come back year after year once established in your garden. Radicchio thrives in cooler temps so try growing it during fall or early springtime.

If your radicchio plants are established, they can handle a little frost. Remember, that radicchio doesn't do well in extreme heat, as it will cause it to go to seed.

How to Plant

Sow radicchio seeds very thinly, 1/4" inch deep. Sprinkle them over the loosely raked soil, and wait for germination to take place. Usually in just a few days. Radicchio also does well in containers as long as your pot is at least 8 inches deep.

How to Harvest

Harvest your radicchio right after the first few light frosts you have. It will help to remove some of the bitterness from the leaves.



How to Grow Organic Radishes from Seed



Planting Season



Winter



Spring



Summer



Autumn

Depth to Plant	Spacing Between Plants	Spacing Between Rows	Days to Germinate (Sprout)	Germination Soil Temp.	Plant Height	No. of Plants per sq. ft.	Soil Needs
1/4" deep	Space plants about 2"-3" apart	Make rows about 8"-10" apart	7-14 days	50F-85F	Appx. 12" tall	16 plants per sq. ft.	pH of 5.6-7.5

About Radishes

Radishes are a fast growing, cool-season crop that can be harvested in as little as twenty days. There are well over 200 varieties: including French radishes, daikon radishes, and other specialty varieties in a surprising array of colors, including white, purple, black, and even green. Eaten raw they can be whole, sliced, diced, or grated. You can also cook and pickle them. Most of them are typically eaten fresh, and make a good addition to salad or a substitute to pepper on a sandwich.

Radishes require a spot with full sun, fertile soil and good drainage. Some varieties can be grown in partial shade. They will thrive in cool, moist soil. In cooler climates they can be planted in both the spring and fall. In warmer climates they should be grown over winter.

When to Plant

Radishes are particularly sensitive to any interruptions to their growth, and consequently are best direct seeded outdoors. They are sensitive to frost, but if required, they can be sown indoors about 2 weeks prior to the first frost. If sown indoors, use a biodegradable pot so that you can plant the whole pot when it comes time to transplant them outdoors to minimize disruptions to their root system. Whether you plant indoors or out, the most important thing is to keep the soil moist. Sow seeds about 1/2" deep and about an inch apart, with 8-12" between rows, depending on how large your variety is. Once the radishes begin to grow, you can thin them to about every 2".

Radishes can be sown wherever there is an empty space, from early spring until early summer, and starting again in the early fall. They make useful "row markers" sown among slow germinating plants like carrots and parsnips. By the time the carrots or parsnips



Vegetable Grow Guides

How to Grow Organic Radishes from Seed

have germinated, it is close to the time to harvest the radishes. Since they germinate in a few days, it makes weeding between the rows much easier.

How to Harvest

Radishes are at their best for a very short time. If they are left in the ground too long, they will develop a sharp taste and a pithy texture, and their roots will eventually split. Radishes are ready to harvest in as little as 20 days, depending on the variety. Once the root has become plump, they are ready to pick. Harvest the whole crop once it matures, and store them in the refrigerator. If harvesting in hot weather, pull radishes from the soil and drop into a bucket of cold water. Remove greens and refrigerate for up to 3 weeks. Storage can be extended up to several months in a properly maintained root cellar.



How to Plant, Grow & Harvest Organic Shallots



Planting Season



Winter



Spring



Summer



Autumn

Depth to Plant

1/4" deep

Spacing Between Plants

Space plants about 4"-6" apart

Days to Germinate (Sprout)

90-100 days

Soil Needs

pH of 7.0-7.5

When to Plant

It is always best to plant in the fall because fall-plantings yield twice as much. Protected by a good mulch and snow cover, shallots, have survived minus 25°F. However, if your winters are unusually severe, you might test-plant a few in fall the first time you grow them and save the rest to plant in spring. The exact time to plant must be learned by experience. What you want is for the bulbs to establish a strong root system, but not to make much, if any, tender top growth before the ground freezes.

Normally, planting 4-6 weeks before hard winter comes is about right. The top growth may appear, make a few inches of growth and die back during winter, but if the bulb hasn't had its food reserves sucked down too hard by making leaves in fall, it will still retain enough vigor to burst into rapid growth as soon as the soil warms up.

How to Plant

Space shallots appx. 4-6 inches apart with the rows 18 inches apart. Plant the bulb root side down, the top of the bulb 1 inch below the surface. Planting too deep grows elongated bulbs that don't store well.

How to Grow

If you want really large bulbs, side dress the plants when growth resumes in spring. Organic gardeners can use chicken manure or any kind of seed meal (cottonseed meal, canola meal, linseed, soybean, etc.) at a rate of about 1/2 to 1 gallon per 50 row feet. When the bulbing begins, any mulch or soil covering the bulbs should be pulled back so the bulbs form on the surface of the soil and dry down.

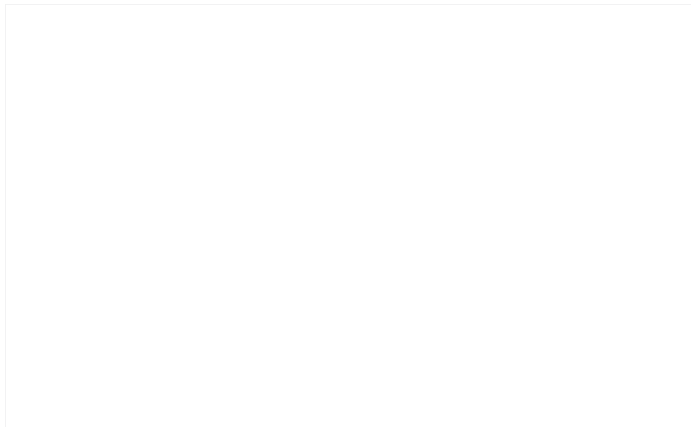


How to Grow Organic Shallots from Seed

How to Harvest

The tops of these species often make very tasty scallions, especially potato onions. However, if you snip off too many sprouts, there will be fewer and smaller bulbs. It is important that the bulbs form tough protective skins. To accomplish this the plants must mature in dry soil. So as the bulbs are forming you should stop watering them.

The time to harvest is when most of the tops have browned off and fallen over. Loosen the soil first with a spading fork and then gently lift the bulbs. Their skins have not hardened yet so it is important to avoid bruising or tearing the skin. The bulbs, with their tops still attached, should be air-dried for 2-3 weeks until the tops have completely shriveled. Then cut the tops off with sharp scissors or pruning shears about 1 inch above the bulb, spread the bulbs out on wire racks in the shade (in a garage) to cure for 2-3 months. By then it will be time to replant or store them for the winter (those you haven't eaten yet).





How to Grow Organic Spinach from Seeds



Planting Season



Winter



Spring



Summer



Autumn

Depth to Plant	Spacing Between Plants	Spacing Between Rows	Days to Germinate (Sprout)	Germination Soil Temp.	Plant Height	No. of Plants per sq. ft.	Soil Needs
1/4" deep	Space plants about 3"-8" apart	Make rows about 10" apart	7-14 days	50F-85F	Appx. 24"-36" tall	6-10 plants per sq. ft.	pH of 6.0-7.5

About Spinach

Spinach can grow anywhere there is at least a month and a half of cool growing weather. Spinach is a cool-season crop, hardy to frosts and light freezes.

When to Plant

Spinach can be grown as soon as the ground is workable. The ground can be prepared in the fall and covered with plastic mulch so that it is ready early in the season. In some instances, a fall-sown spinach crop, well mulched will winter over and start growth again in spring. Fall crops usually taste better and suffer no leaf miners or bolting. Also, if you plant a late fall crop and mulch it, a very early crop will come up in spring.

How to Plant

In rows 12 inches apart, space seedlings 3 inches apart. After thinning, cover the plants with row covers to keep the pests away. (New Zealand spinach is a large growing plant and needs 2 foot rows, 1 foot between plants. Soak seeds overnight before planting because it germinates slowly.)

Be sure the rows are kept moist if spring or fall is dry, and side dress with a high-nitrogen fertilizer such as blood meal or fish emulsion when seedlings are 3 inches tall.

How to Harvest

Cut spinach plant off at the base when the leaves are fully developed. Once cut, they will not come back like chard and lettuce. New Zealand spinach sprawls vigorously; when the stems are about 8 inches long, the tip ends should be cut back several inches to keep it under control. Cook or use as leaf lettuce mixed in salads.



How to Grow Organic Sprouts from a Mason Jar



About Sprouts

Growing sprouts at home on your kitchen counter is a great way to grow a little food year-round even if you've packed up things in your outside garden because of it being winter.

Each & every living seed will grow into a plant. It's when that seed begins to grow (germinate) that we call the beginning growth stage of the plant a "sprout". They are a convenient way to have fresh vegetables for salads in any season. Sprouts are said to be rich in digestible energy, vitamins, minerals, amino acids, proteins, and phytochemicals!

They are inexpensive, fast growing, and incredibly nutritious. Children will love sprouting them as well. Toss them on sandwiches or even try them as a garnish for stir-fry's. it under control. Cook or use as leaf lettuce mixed in salads.

The most common sprouts that people are growing these days are:

- Adzuki
- Alfalfa
- Barley Grass
- Broccoli
- Clover
- Fenugreek
- Kale
- Mustard
- Pumpkin Seeds
- Radish
- Rainbow Chard
- Sunflower Seeds
- Watercress
- Wheatgrass

Things You'll Need to Start Growing

- A wide mouth container or mason jar
- Seeds
- Water
- Cheesecloth
- Rubberband

How to Start Growing Your Sprouts

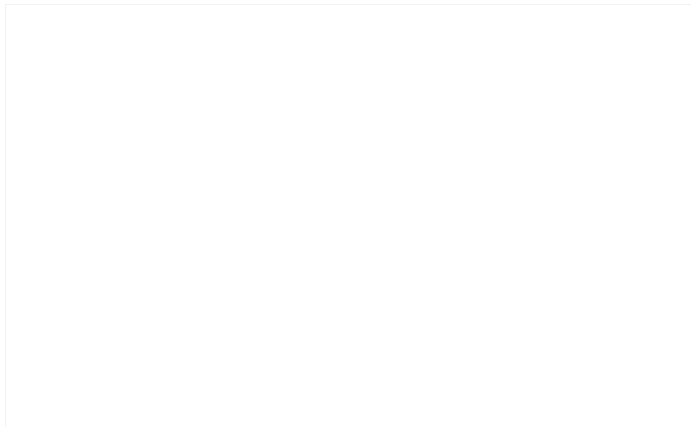
1. Place 1 teaspoon of small seeds into a clean jar and place about 1 cup of water inside. (If you're sprouting adzuki beans, use about 1/4 cup)
2. Let seeds soak overnight or for at least 12 hours.
3. Place the cheesecloth onto the top of your jar or container and secure with a rubberband. Now drain the water from the container.
4. Rinse the seeds with clean filtered water and then place the jar upside down on an angle so that the excess water can drain out easily.
5. Repeat the last step, several times a day until all of your sprouts have germinated and started to grow.
6. You'll be ready to harvest your fresh sprouts in about 3-5 days.
7. When you're ready to start harvesting, rinse one more time with filtered water, drain and store in an airtight container inside of the fridge for up to one week.



How to Grow Organic Sprouts from Seed

All-in-1 Sprout Seed Bank + Mason Jar

- 32 oz. Glass Mason Jar with Sprouting Lid and Mesh Screen
- 6 of our most popular seed sprouting varieties
- Over 1 lb. of sprouting seeds
- Step-by-step sprouting instructions
- Resealable Mylar packaging for long-term seed storage





How to Grow Organic Squash & Zucchini from Seeds



Planting Season



Winter



Spring



Summer



Autumn

Depth to Plant

Spacing Between Plants

Spacing Between Rows

Days to Germinate (Sprout)

Germination Soil Temp.

No. of Plants per sq. ft.

Soil Needs

1/2" deep

Space plants about 2' apart

Make rows about 3' apart

7-14 days

70F-85F

1/2 plants per sq. ft.

pH of 6.0-7.5

About Squash

Squash is a warm-season crop, very tender to frost and light freezes. Plan an average of 2 winter plants per person and two summer plants per 4-6 people. Summer squash can be grown almost anywhere, as the vines develop quickly. Harvest begins in 2 months. Winter squash requires a longer growing season and more garden space for sprawling plants. They generally do not tend to thrive in hot, dry regions where there is a limited water supply.

When to Plant

When the soil is warm and the air temperature settled. Squash are susceptible to frost and cool weather. If the growing season is very short, seed can be started indoors in peat pots for transplanting outdoors 6 weeks later. Use peat pots with the bottom removed; squash do not like to have their taproot disturbed. It is best to transplant before the roots wrap around the pot. For direct sowing wait until the soil temperature is about 60 degrees, or until roses are in bud and lilacs are in bloom.

How to Plant

The hill method is simplest, since the soil can be deeply prepared for each hill before planting. To prepare, dig 18" deep holes, fill partly with well-rotted manure and/or compost; complete filling with a mixture of soil and compost.

Winter squash does not transplant well, but can be sown inside in individual pots to minimize root disturbance. Traditionally 6-8 seeds are placed 1" deep in each hole; when seedlings reach 3 inches, thin to two seedlings.

Summer squash hills should be placed 3 feet apart each way; plant 6 or 7 seeds per hill and thin to the 3 strongest seedlings when the plants are 3 inches high. Or the seeds can be planted sparingly in rows 3 feet apart and thinned to 2 feet apart.

Winter squash hills should be placed 6-8 feet apart each way; thin to the strongest 3 plants when the seedlings are 3 inches high.



Vegetable Grow Guides

How to Grow Organic Squash & Zucchini from Seed

How to Grow & Harvest

The squash area should be kept free of weeds while the plants are young. Black-plastic or very heavy mulch is practical for such spreading vine plants, as weeding is difficult. Feed twice, immediately after thinning to the strongest 3 seedlings and again just before the vines start to “run”. The plants must have adequate moisture all through the growing season. Note: The popular notation that squash and melon cross-pollinate each other is a fallacy, although they can cross pollinate with other plants such as pumpkin.

Raise fruits off the ground to prevent rot. Use an A frame trellis to grow vines upright. Fabric row covers boost and prolong yields. In cooler climates, keep row covers on all season long; when female (fruit) blossoms open, lift the cover for 2 hours in early morning twice a week to ensure bee pollination, which is essential. To keep vines short for row covers, pinch back the end, choose the best blossoms, and permit only 4 fruits per vine.

Summer - 60-70 days. These squash are picked immature before they are fully formed. The skin should be soft and tender, otherwise the squash will be overripe and of poor quality. Check squash plants almost daily when they start to flower, as the fruit will develop in 2 or 3 days in hot growing weather. The vines must be kept picked or the plants will stop producing.

Winter - 90-120 days. When the stems turn a light green yellow color, the squash should be fully ripe. The rind will be thick and tough. Cut, do not pull, the ripe fruit from the plant. Two to three inches of stem must remain for proper storing. This may increase the sugar content.

Winter squash can also be picked before maturity, and can be eaten whole, just like the summer squash varieties. It has been said that rubbing winter squash with oil will help them last for several months.



How to Grow Organic Tomatoes from Seeds



Planting Season



Winter



Spring



Summer



Autumn

Depth to Plant

Spacing Between Plants

Spacing Between Rows

Days to Germinate (Sprout)

Germination Soil Temp.

No. of Plants per sq. ft.

Soil Needs

1/4" deep

Space plants about 2'-3' apart

Make rows about 4' apart

7-14 days

70F-85F

1/2 plants per sq. ft.

pH of 5.5-6.5

About Tomatoes

The tomato is a warm-weather vegetable, it is very tender to frost and light freezes. Never plant near walnut family trees. The walnut trees excrete an acid that inhibits growth of nearby plants.

Plant **basil** nearby to repel flies and mosquitoes, and improve flavor and growth. Bee balm, **chives**, and **mint** will also improve health and flavor.

Corn and tomatoes are attacked by the same worm, and should not be planted next to each other because of this. Kohlrabi stunts tomato growth.

Keep potatoes away also, as they both can get early and late blight.

Also keep cabbage and cauliflower away from your tomato plants.

When to Plant

Tomatoes should not be planted outdoors until day and night temperatures are about 55 degrees. Low temperatures (below 55 degrees) prevent fruit set. Soil temperatures should be at least 55-60F to transplant. Otherwise plants may turn yellow, become stunted and slow to bear. Seed should be started indoors 6-8 weeks before plants are set out. The ideal plant size is 6-10 inches tall.

How to Plant

To start tomatoes indoors, sow seeds using **expanding seed starting soil pods** about 8 weeks before the last frost date for your area. Seedlings will be spindly with less than 12-14 hours of light per day, try to keep them in a warm sunny location.

When seedlings have 4 leaves, transfer to a deeper pot (3-4") and again when 8-10 inches tall. Each time, place the uppermost leaves just above the soil line and remove all lower leaves.



Vegetable Grow Guides

How to Grow Organic Tomatoes from Seed

Transplant (**see: guide to transplanting**) into the garden when the stem above the soil has reached 8-10 inches tall. Be sure to harden them off before transplanting them outdoors. Allow up to 10 days for the tomato plants to harden off to the outside temperature fluctuations.

Set your seedlings out when the temperatures are fairly certain to be above 55 F throughout the night. Seedlings should be spaced about 2 feet apart for early tomatoes and 3 feet apart for main-season types.

Set tomato plants deeply, up to the first set of leaves; roots will form along the stem under ground and strengthen the support for the plant. A lanky seedling can be planted on its side, to the first leaves. It will right itself in a day or so. Use a starter solution (half-rate water-soluble fertilizer) when setting out tomatoes to give them a good, quick start. Listen for cold weather warnings; if late frost seems imminent, cover the plants at night with newspaper tents.



How to Grow

Some sources suggest that indeterminate and larger semi determinate varieties should be pruned of all suckers (tiny leaves and stems in the crotches of other stems) because they may steal nourishment from the fruits (**see: Pruning Your Tomato Plant: A Suckers Guide to Removing Suckers**).

Feed with a starter solution when the first plants are set out and again after the first flowers form. Continue to supplement with a weak fish emulsion or compost tea every 2-3 weeks. If you do not enrich the soil (**see: Guide to Amending Soil**) before planting, feed the tomatoes once a month with about 1/3 cup of 5-10-5 fertilizer scattered in a 2 foot wide band around each plant. Tomato plants need at least an inch of water per week; so water them well, especially during dry spells. If the plants are well mulched (**see: Guide to Mulching**), weeds should not be a problem. Try using a plastic mulch in either a red or black color. The mulch will help prevent weeds and keep soil borne pests from splashing up on the plants, in addition to helping control moisture. A generously moist growing season followed by a severe drought period, will often initiate blossom-end rot, which appears first as a water-soaked mark that develops to a flat, dark leathery spot. It can be discouraged with mulching and consistent water levels. Unlike most crops, you may solarize the soil as you grow tomatoes because they're very heat tolerant. Solarizing helps control disease, particularly verticillium wilt. Wet the soil and cover with clear plastic for the entire season for best results. Hand pollinate in greenhouses (**see: How to Hand Pollinate Your Tomatoes**).

To keep indeterminate plants from making too much leafy growth, prune them to a single main stem by breaking off side shoots as soon as they appear. You will notice these side "suckers" growing between the crotch



Vegetable Grow Guides

How to Grow Organic Tomatoes from Seed

formed between the main stem and the leaf stem. Cut them out while they are small (**see: Pruning Your Tomato Plant: A Suckers Guide to Removing Suckers**). The terminal shoot is pruned off when the plants reach the top of the 5-6 foot stake to stop their growth. These plants are also pruned of suckers, the side shoots that grow between the main stem and the leaf axils to moderate their vegetative growth. Most gardeners prefer to prune their tomato plants to one or two main stems (**see: Spank Your Tomatoes! -Get More Fruit on Every Plant**)

How to Harvest

Pick the fruit when it is red ripe, and check the plants every few days when the harvest starts coming. Store excess tomatoes in the refrigerator, but the flavor is best at room temperature. Tomato flavor starts to decline at temperatures below 55 degrees. When frost threatens, pick the remaining green tomatoes, wrap in newspaper, and keep in a moderately dark, warm place. They will ripen gradually well past the harvest season. Given warm weather and abundant rainfall, tomatoes ripen in 60-85 days from the time seedlings are set out. When the fruits begin to turn red, check the plants every day and pick those that are fully red and firm, but not hard. Overripe tomatoes will fall off the plant and rot quickly. To store an abundance of tomatoes at the end of the year, you can roast them, and store in a little olive oil in the refrigerator.

A very light frost will usually kill a few leaves, but the plant itself will continue to grow and produce. However, anything more severe than a touch of frost is likely to kill the entire plant. If frost is coming you can protect each plant by draping it in plastic sheeting or old bed sheets, or you can pull the plant up by its roots and hang in the basement until the fruit ripens. Neither method is guaranteed to work, and in cool areas an early frost almost always means the end of harvesting tomatoes.

How to Save Seeds

To save seeds from open-pollinated varieties, allow perfect fruits to ripen until they become soft. Cut them in half and squeeze the gel and seeds into a jar. Cover with 3 inches of water and shake well. Allow the mixture to sit at room temperature for 24 hours before pouring out the liquid. Discard the floating seeds, and rinse the larger seeds on the bottom in a strainer and then dry them at room temperature for approximately 2 weeks. If handled and stored properly in a cool dark place, tomato seeds can last up to 6 years.



How to Grow Organic Turnips from Seeds



Planting Season



Winter



Spring



Summer



Autumn

Depth to Plant	Spacing Between Plants	Spacing Between Rows	Days to Germinate (Sprout)	Germination Soil Temp.	Plant Height	No. of Plants per sq. ft.	Soil Needs
1/4" deep	Space plants about 4"-6" apart	Make rows about 18"24" apart	7-14 days	60F-85F	Appx. 12" tall	9 plants per sq. ft.	pH of 6.0-7.5

About Turnips

Turnips and rutabagas are closely related to cabbage (rutabagas are actually a hybrid between turnips and cabbages). Both the white, bulblike stalks (which look like roots) and the leaves are edible. Most traditional varieties produce large, dense bulbs that are harvested after the first frost, store several months, and are eaten either baked or steamed (the leaves, called "turnip greens" are usually eaten either steamed or, if small, added to salads with other greens).

Turnips produce small mild-flavored bulbs that do not store very well but are excellent for eating fresh like radishes. Most varieties are grown either for fresh consumption, for fall harvest, or for greens.

When to Plant

Turnips like cooler weather - especially at night. Turnips have been known to survive temps as low as 25F.

How to Plant

Do not start Turnip seeds indoors. Direct sowing is the best. Sow the seeds about 1/2" deep and space them about 4" - 6" apart.

If you're planting in rows, make them about 18" - 24" apart.



How to Grow Organic Watermelon from Seeds



Planting Season



Winter



Spring



Summer



Autumn

Depth to Plant	Spacing Between Plants	Spacing Between Rows	Days to Germinate (Sprout)	Germination Soil Temp.	Plant Height	No. of Plants per sq. ft.	Soil Needs
1/4" deep	Space plants about 2'-3' apart	Make rows/hills about 5' apart	5-7 days	70F-95F	Appx. 12" tall	1/2 plants per sq. ft.	pH of 6.0-7.5

About Watermelon

Watermelons are a summertime treat enjoyed by young and old alike. There is nothing quite as refreshing as a cool slice of watermelon in the hot summer days of July and August. In addition to tasting great, watermelons are a leading source of lycopene (commonly found in tomatoes), in addition to being a very good source of vitamin A and C.

When to Plant

Because watermelons require a long, warm growing season, their best production in the United States occurs in the South and Southwest regions, where there is ample growing time and warm weather. Home gardeners in cooler regions can usually do fairly well with watermelons if they start seed indoors a month or more ahead of planting outdoors, but the vines need consistently warm days and nights to thrive. Watermelons need at least 80-100 consecutive days of very warm summer temperatures, at least 80 degrees Fahrenheit. Watermelons also prefer

warm nights, above 70 degrees Fahrenheit is preferred. Watermelons are a warm-season crop, very tender to frost and light freezes. Plan an average of 2-6 plants per person. Watermelons generally take up enormous space, and should not be considered for the small vegetable garden. There are compact varieties that produce tasty and prolific fruits.

To get a head start on the long growing season, start plants indoors 4 to 5 weeks before outdoor planting time. The soil must be warm and the weather settled with warm days and nights, as the plants are sensitive to cooler weather. If nights are cool, use hot caps to protect the plants. Melons can be sown directly outside, but some gardeners report better germination with pre-sprouted seeds.

How to Plant

If you start melons indoors, use individual cells or peat pots, not flats, as the roots are too succulent to divide. When you direct sow, plant 2-3 seeds in a hill and then thin the appropriate spacing, depending on whether



Vegetable Grow Guides

How to Grow Organic Watermelon from Seed

you train them on a trellis or let them spread on the ground.

For direct sowing and transplants, cover seedlings with hot caps to protect from frost, speed growth, and keep out pests. The vines do best if planted in hills. Rows and hills should be set 5 to 6 feet apart each way, with 2 or 3 plants per hill. Thin to the 2 strongest plants in a week.

To encourage side shoots, when seedlings have 3 leaves, pinch off the growing end. When new side shoots have 3 leaves, pinch off the central growing area again. When fruits begin to form, pinch back the vine to two leaves beyond the fruit. Make sure fruits on a trellis are supported by netting or pantyhose, and fruits on the ground vines are elevated by empty pots to prevent disease and encourage ripening.

The vines are heavy feeders, and also need adequate moisture as they start to develop. Troughs near the plants can be flooded for effective watering. For fertilizer, give each hill about 1/2 cup of 5-10-5 fertilizer, liquid manure or fish emulsion 3 weeks after planting, and again (if you can find the original hill) after flowers appear. Keep the hills well-watered up to the time fruit starts to fill out. Since weeding and cultivating are such problems with sprawling vine crops, black plastic or thick mulch proves an excellent aid to keeping weeds out, soil moisture in, and melons off the ground as they develop. The plastic mulch should be placed on the ground and anchored before planting, then central holes cut for the hills, with a few extra slits to let rain and hose water filter through. Plain cardboard and newspaper covered appropriately also work well in a smaller garden setting.

How to Harvest

Knowing when to harvest watermelons is the most difficult part of growing them. They should be harvested at the peak of freshness for best results. Waiting too long gives you nothing but a mealy mess. Not waiting long enough means you may have to throw an inedible treasure out to the chickens.

There are several methods to identify a ripe watermelon, most of which are not entirely accurate at best. Some say you should tap them and listen to the sound they make, some say to look at the small tail to determine it's ripeness. The fact is, these are not reliable indicators for all watermelon varieties. The most reliable indicator of ripeness is the color. Ripe watermelons will have darker stripes and the spot the rind rests on will turn from white to golden yellow. Different varieties will darken to different degrees, but this will be your best indicator. If all else fails, plant a variety like Sugar Baby. Its green stripes darken to almost black when it is ripe, which makes the puzzle a little easier.



How to Grow Organic Amaranth from Seed



Planting Season



Winter



Spring



Summer



Autumn

Depth to Plant	Spacing Between Plants	Sun Needs	Days to Germinate (Sprout)	Good Plant Companions	Soil Germination Temp	Soil Needs	Harvest Instructions
1/4" inches deep	Space plants about 12" apart	Full Sun	3-4 days	Okra	60F-90F	Well drained and nitrogen rich	Cut green stems as desired. Harvest seeds by placing flowers in a paper bag and shaking

When to Plant

Sow seeds early in the season and cover lightly with soil. If you're direct sowing, make sure you do so after the threat of frost has passed and the soil has begun to warm up. Generally, amaranth germinates well when the soil has reached at least 60 degrees F., but is not warmer than 90 degrees F.

How to Plant

Amaranth is easy to start from seed, and is best grown when direct sowed into your flower garden. If you want to get a "jump start" on the growing season, you may choose to start the seeds indoors for transplanting later.

Amaranth prefers warm climates, and needs full sun. Water them during dry periods, or once or twice a week as needed. You can also fertilize once or twice during the growing season.

When to Harvest

Amaranth is ready to harvest, when it has reached at least 1-2 feet tall and shows strong stems and blooms. The flowers are long lasting and will last from summer until the first frost.

The flowers are delicious to eat steamed or sauteed, and the greens can be cut and used as greens.



How to Grow Organic Anise from Seed



Planting Season



Winter



Spring



Summer



Autumn

Depth to Plant	Spacing Between Plants	Sun Needs	Days to Germinate (Sprout)	Good Plant Companions	Soil Germination Temp	Soil Needs	Harvest Instructions
1/4" inches deep	Space plants about 12" apart	Full Sun	10-20 days	Beans and Coriander	65F-70F	Dry, light and well drained	Harvest seeds once the flowers have gone to seed

When to Plant

Plant your seeds directly into the garden after the threat of frost has passed. Make sure your planting site is free of weeds and roots. Anise needs to be watered regularly, so if you live in an area prone to long periods of drought, make preparations to keep it well watered.

How to Plant

Because anise seeds are very small, try mixing them with a little bit of sand and using a syringe. Anise needs soil that has warmed to at least 60 degrees F., and should be loose and workable. Space your plants 2 to 3 feet apart and 1/4 inch deep in well cultivated soils.

Water plants at least twice a week until they are about 8 inches high and then begin to reduce water, but keep the soil moist. Try fertilizing your plants with a nitrogen fertilizer sometime before they flower, usually in June or July.

When to Harvest

Harvest anise once the flowers have gone to seed. Dry the flowers in a paper bag until the seeds have all fallen loose and store them in a cool, dry and dark location.



How to Grow Organic Arugula from Seed



Planting Season



Winter



Early Spring



Summer



Late Autumn

Depth to Plant

Spacing Between Plants

Days to Germinate (Sprout)

Germination Soil Temp.

Sun Needs

Good Plant Companions

Soil Needs

Harvest Instructions

0.5" deep

Space plants about 6" apart

4-7 days

40F-55F

Full sun / partial shade

Beets, carrots, celery, and cucumbers

Prefers soil with pH levels of 6.0-7.0. Soil should be kept evenly moist

Harvest when leaves are 2-3" long

How to Grow and Harvest Arugula

Arugula is a hardy plant and does not have any strong preferences with regard to growing conditions. It can be grown in any well-drained fairly fertile spot or container. Arugula prefers cool weather, and is frost hardy enough that it will bear right through winter in a cold frame or unheated greenhouse. The arugula plant is grown as a longer leaved open lettuce. It is a small plant, with a compact root system, so it is easy to grow in containers or in a flat on a sunny windowsill. It is also good for inter-cropping between longer season plants.

When to Plant

Plant seeds outdoors in spring as soon as the soil can be worked. Make additional plantings every three weeks as long as the cool weather lasts. For winter harvests, sow seeds in mid-fall.

How to Plant

Dig a shallow trench with the tip of your garden spade to mark the row where you would like to plant the arugula. Sprinkle the seeds from the packet into the trench trying to space the seedlings out by somewhere between 1/4" and 1". If you want to harvest full sized leaves, increase the spacing, or thin the plants out once they are established. Plant in rows approximately 6 inches apart. Cover lightly with soil, the arugula seeds need light to germinate. If they are deeply buried, they will not germinate.

When to Harvest

Arugula leaves can be harvested once they are about 2-3 inches long, which can be as soon as 2-3 weeks after the plants germinate under ideal conditions. Cut individual leaves or pull up whole plants. The leaves are best when young, but they retain good flavor until the



How to Grow Organic Arugula from Seed

plant starts to bolt. The flowers are also edible. If the plant does bolt, you can throw some of the flowers in with your salad greens. Once the flowers are set, the leaves will start to taste more bitter.



How to Grow Organic Basil from Seed



Planting Season



Winter



Spring



Summer



Autumn

Depth to Plant	Spacing Between Plants	Days to Germinate (Sprout)	Germination Soil Temp.	Sun Needs	Good Plant Companions	Soil Needs	Harvest Instructions
1/2" deep	Space plants about 12" apart	5-10 days	65F-85F	Full sun	Asparagus, beans, beets, cabbage, peppers, eggplant, oregano, & tomatoes	Lighter, sandy-type soil	Snip greens as needed or harvest entire plant to use all at once.

When to Plant

Basil is planted in the spring and dies at the first fall frost. It can be grown year-round indoors or in frost-free climate. Basil also needs daytime temperatures over 70° F and nighttime temps over 50° F. Basil thrives in warmer temperatures. Sow your seeds outdoors in spring, after all danger of frost has passed.

How to Plant

Choose a sunny, sheltered spot that is protected from wind and other temperature extremes. Basil needs at least 6-8 hours of full sun each day, so keep that in mind when choosing a location to start your seeds. Try to space your basil plants about 12 inches apart. There are also dwarf varieties that work well in containers.

When to Harvest

When growing basil, as soon as you see flowers start to appear, make sure you pinch or snip them off. This will help the plant stay focused on producing leaves and will encourage the plant to “branch out” as well. Once your basil plant is about 6 inches tall, start pinching off the tops to encourage branching.



How to Grow Organic Borage from Seed



Planting Season



Winter



Spring



Summer



Autumn

Depth to Plant	Spacing Between Plants	Days to Germinate (Sprout)	Germination Soil Temp.	Sun Needs	Good Plant Companions	Soil Needs	Harvest Instructions
1/2" deep	Space plants about 6"-12" apart	5 days	70F+	Full sun	Tomatoes	Loose and aerated	Harvest flowers once they have bloomed

When to Plant

Sow seeds directly into the garden in loose and aerated soil once the threat of frost has passed. You can also start them indoors 6-8 weeks before your last frost date.

How to Plant

Plant seeds to inch under the soil in rows 12 inches apart. When your plants have reached 6 inches tall, thin your borage with at least 1 foot between each plant. Try sowing borage seeds every four weeks. This will ensure a ready supply of borage flowers for a continuous harvest.

When to Harvest

The leaves may be harvested at anytime and can be used dried or fresh. The plant is best consumed fresh, right after harvest if you're looking for it's characteristic flavor, similar to that of a cucumber.



How to Grow Organic Caraway from Seed



Planting Season



Winter



Spring



Summer



Autumn

Depth to Plant

Spacing Between Plants

Days to Germinate (Sprout)

Germination Soil Temp.

Sun Needs

Good Plant Companions

Soil Needs

Harvest Instructions

1/2" deep

Space plants about 8"-12" apart

5 days

70F+

Full sun

Tomatoes

Well drained, high in organic matter

Collect dry seed heads in late Summer or early Fall

When to Plant

Start your caraway seeds 4-6 weeks prior to your last average frost. Maintain well-moistened soil, until your seedling has broke through the top of the soil. Transplant outdoors after the last frost, ideally on an overcast day.

How to Plant

Caraway prefers full sun or partial shade. Make sure you choose a location with light or sandy, well-drained soil. Water moderately and regularly.

When to Harvest

Harvest the leaves from your caraway plant when it is well established and 6" or taller. Using scissors, cut the stem near the base of the plant and strip the leaves.

The seeds can be harvested late in summer or early fall. Make sure they are fully mature and completely dry. Collect the seed heads & then shake over a bowl, or inside of a bag. You can run them through a screen to separate the seeds from chaff. Store your seeds in a sealed container somewhere dry, & cool out of any sunlight.



How to Grow Organic Cardoon from Seed



Planting Season



Winter



Early Spring



Summer



Autumn

Depth to Plant

Spacing Between Plants

Days to Germinate (Sprout)

Germination Soil Temp.

Sun Needs

Good Plant Companions

Soil Needs

Harvest Instructions

1/2" deep

Space plants about 24" apart

6-12 days

75F+

Full sun or partial shade

Cabbage, kale & mustards

Prefers deep and rich soil, but will grow in any type

Cut stalks off at ground level and trim away the leaves

When to Plant

Sow cardoon seeds directly into your garden 3-4 weeks after your last average frost date or start them early indoors, about 6 weeks before your last frost. Cardoon, which is grown for their leaf-stalks, will be ready for harvest in about 120 to 150 days after planting.

How to Plant

Pick a location that has full sun or partial shade. Make sure the soil is well-drained, and rich in organic matter. Add aged, nutrient dense compost to your planting site. Cardoon prefers a soil pH of 6.0 to 7.0. Sow cardoon seed 1/2 inch deep. Thin cardoon from 18" to 24" inches apart. Space rows 24" inches apart.

When to Harvest

Cardoon will be ready for harvest 4 to 6 weeks after blanching. Cut stalks off at ground level and trim away the leaves.



How to Grow Organic Catmint from Seed



Planting Season



Winter



Spring



Summer



Autumn

Depth to Plant	Spacing Between Plants	Days to Germinate (Sprout)	Germination Soil Temp.	Sun Needs	Good Plant Companions	Soil Needs	Harvest Instructions
1/4" deep	Space plants about 18"-24" apart	7-10 days	60F-70F	Full sun	Lavender	Any soil type, not overly fertile	Harvest leaves once the flowers bloom

When to Plant

Once the threat of frost has passed, sow your seeds into your garden bed that has full sun - partial shade. Catmint prefers soil that drains well. You can also start your catmint seeds indoors 6-8 weeks prior to your last average frost date.

How to Plant

Growing catmint is easy to do. Average, but well drained soil will allow your catmint to thrive. They are drought and heat tolerant and will grow well with little attention. They also can withstand overcrowding. Fertilization, generally isn't required.

Once your catmint has grown to be a few inches tall, pinch back the shoots to promote a "bushy" shape and future growth. It blooms in mid-summer, and after the first harvest, trim your plants back and they will come back. Usually, resulting in 3 harvests within a season.

Catmint is known to be aggressive, and can crowd out other plants so give them their own space, away from other plants in your garden. You can also contain them by using a border or special edging.

When to Harvest

Harvest leaves once the flowers bloom. Cut off the top leaves, stems and flowers. Use them fresh, dried, or frozen. Spread leaves out to dry in a cool and ventilated area.



How to Grow Organic Catnip from Seed



Planting Season



Winter



Spring



Summer



Autumn

Depth to Plant	Spacing Between Plants	Days to Germinate (Sprout)	Germination Soil Temp.	Sun Needs	Good Plant Companions	Soil Needs	Harvest Instructions
1/4" deep	Space plants about 15" apart	7-10 days	60F-70F	Full sun	Hyssop	Moderately fertile	Harvest your catnip either just before or immediately after it blooms

When to Plant

Once the threat of frost has passed, place your transplants or seedlings out into your garden bed. Usually this means starting them indoors a few weeks before your last average frost.

How to Plant

Place catnip plants in a flowerbed. It looks exceptionally well next to purple coneflowers, which blooms about the same time.

Catnip grows well in containers also, and if you have indoor cats, grow several pots outside to rotate to the indoors. The plants need a lot of light, so they'll need to be moved outside every couple of weeks.

Try using smooth sticks, perhaps bamboo, every several inches apart within the canopy of your catnip plants to keep your cat from flattening it.

When to Harvest

Harvest your catnip either just before or immediately after it blooms.

It's best to harvest the plant on a dry day after any dew has dried on the leaves. Usually this is in the late morning or early afternoon. Remove the top portion of the plant; leaves, stems and flowers. Spread the plant out in a dry, well ventilated area that's out of direct sunlight.



How to Grow Organic Chamomile from Seed



Planting Season



Winter



Spring



Summer



Autumn

Depth to Plant

Spacing Between Plants

Days to Germinate (Sprout)

Germination Soil Temp.

Sun Needs

Good Plant Companions

Soil Needs

Days to Maturity

1/8" deep

Space plants about 6" apart

10-14 days

60F-70F

Full sun

Cabbage and Onions

pH 7.0-7.5

60-65

When to Plant

Choose a "cool growing season" for planting chamomile. This is when it will thrive best. Also, choose a partly sunny location.

How to Plant

Once your chamomile plant is established, it doesn't require much care. It usually grows best when it's not "fussed over". Too much fertilizer can weaken the flavor. Chamomile is drought tolerant, so only water it in times of prolonged drought.

When to Harvest

Wait to harvest your chamomile once all dew has dried from the plant. Try to harvest the flowers before sunset, as the flowers will close at that time and then re-open again in the morning.

Once you've harvested the flowers, turn them upside down and shake gently to remove any dust or insects that may be stuck inside.

Place the flowers in a very warm place. Usually a closet is a good option, because it will allow your flowers to dry away from any sunlight or moisture.

Now that your herb has dried, remove the stem and keep the flowers. Put them in an airtight container, away from the sun.



How to Grow Organic Chervil from Seed



Planting Season



Winter



Spring



Summer



Autumn

Depth to Plant	Spacing Between Plants	Days to Germinate (Sprout)	Germination Soil Temp.	Sun Needs	Good Plant Companions	Soil Needs	Days to Maturity
1/8" deep	1 pack per 3-4 sq. ft.	7-14 days	55F	Full sun	Radishes	Rich and well drained	60

When to Plant

Sowing your seeds in early spring will provide you with a second crop, late in summertime. The plant will reseed itself quite easily. You can also sow seeds in the fall, and most likely, they will survive the winter and bloom in early spring.

How to Plant

Although most herbs prefer sunny locations, chervil prefers cool, shady locations. Plant this herb only once, and leave a few flowers to go to seed so it can replenish itself year after year. Chervil also makes a wonderful herb to grow indoors in a shady location or windowsill. Thin seedlings to 8 to 12 inches apart.

When to Harvest

Six to eight weeks after you have planted chervil, it will be ready for harvesting. Begin snipping the leaves from the plant when the plant itself is about 6 inches tall. This will delay

the plant from flowering for a little while until summer comes. You can use chervil fresh or dried in many culinary dishes. Also, try adding chopped chervil to butter and then freezing or adding to vinegar to make flavored vinegar for cooking. Cut flowers lend airiness to fresh or dried flower arrangements, and the dried leaves can be added to potpourris.. Now that your herb has dried, remove the stem and keep the flowers. Put them in an airtight container, away from the sun.



How to Grow Organic Cilantro from Seed (AKA Coriander)



Planting Season



Winter
(& every 30 days)



Spring



Summer



Autumn

Depth to Plant

Spacing Between Plants

Days to Germinate (Sprout)

Germination Soil Temp.

Sun Needs

Good Plant Companions

Soil Needs

Days to Maturity

1/2" deep

6"-8" apart

10 days

60F

Full sun

Tomato & Spinach

pH 6.0-6.7

75-100

When to Plant

If you're in a frost free period, and without extreme heat during the summer, you'll have no problem growing cilantro. Basic rule of thumb is if you are in a mild climate, grow cilantro during the summer, and if you're in a tropical climate, stick to growing it during the dry and cooler season.

How to Plant

Cilantro grows a fairly large taproot, and small seedling pots or soil pellets aren't deep enough to accommodate it.

Direct sow your cilantro seeds into the ground, and keep them well watered. Try growing it in rows for an easy harvest or spread the seed over a wide area and rake it in. Just remember cilantro plants can grow up to 2 feet tall. Leave about 5 cm between plants if you're growing it for the leaves. More if you're going to allow them to flower and go to seed.

All you really need is reasonable soil that you can keep well watered. Always grow cilantro

from seed, directly where you need it. Usually it doesn't transplant well. The stress of transplanting cilantro, usually causes it to go straight to seed. You may not get any leaves at all!

When to Harvest

Harvest the cilantro leaves around the base of the plant. Just make sure the plant is fairly established before you start harvesting so it will be able to handle the stress and recover as it continues to grow. Once the flowers have gone to seed, start to re-sow more seeds. That way you won't run out and have a continual harvest of fresh cilantro on your hands. You can harvest the leaves or the entire plant at once.



How to Grow Organic Cumin from Seed



Planting Season



Winter



Spring



Summer



Autumn

Depth to Plant

1/4" deep

Spacing Between Plants

4"-6" apart

Days to Germinate (Sprout)

7-14 days

Germination Soil Temp.

70F

Sun Needs

Full sun

Good Plant Companions

Cucumbers, garlic and cabbage

Soil Needs

pH 7.0-7.5

Days to Maturity

120

When to Plant

Grow cumin by directly sowing the seeds into your garden. Make sure all threat of frost has passed, and plant seeds early in the season.

How to Plant

Choose a location that has full sun. Cumin prefers hot weather but can grow in moist and damp conditions as well. Make sure your soil is well drained, and forgo any nitrogen fertilizers. Nitrogen will result in less fragrant seeds.

Water cumin plants during dry spells.

Plants are very sensitive to frost in both spring and fall.

When to Harvest

Once the pods have turned brown and are dry, they will open up and reseed themselves into the ground. The trick to harvesting the seeds is to catch the pods before they open up fully or before they start to spill their seeds. Harvest your plants and hang them upside down in a dry place. Allow them to dry completely. Shake the plants inside of a paper bag, this is an easy way to collect the seeds. Store them in an airtight container.



How to Grow Organic Dill from Seed



Planting Season



Winter



Spring



Summer



Autumn

Depth to Plant

Spacing Between Plants

Days to Germinate (Sprout)

Germination Soil Temp.

Sun Needs

Good Plant Companions

Soil Needs

Days to Maturity

1/4" deep

18" apart

6-7 days

60F-70F

Full sun

Cabbage

pH 5.5-6.5

50-70

When to Plant

Dill can easily be grown from seed. Direct sow, in early spring. Cover them lightly with soil.

How to Plant

If this is your first attempt at growing herbs, dill is a wonderful variety to try. Dill prefers full sun and soil that is well drained. Dill can be grown in average soil, and also can tolerate dry conditions. Water the plant through periods of drought or once or twice a week. If necessary, use a general purpose fertilizer once or twice a season.

When to Harvest

When you're ready to harvest, look for the dark green leaves, otherwise known as "dill weed". You can harvest the leaves at any time. The young leaves tend to have better flavor. You can harvest the flower heads after the seeds have formed and all flowers have died and dried up. Tie the stems together and hang upside down. Once dry, shake into a paper bag to collect the seeds.



How to Grow Organic Fennel from Seed



Planting Season



Winter



Spring



Summer



Autumn

Depth to Plant	Spacing Between Plants	Soil Needs	Days to Germinate (Sprout)	Germination Soil Temp.	Sun Needs	Good Plant Companions	Harvest Instructions
1/8" deep	Space plants about 10" apart	pH of 6.5-8.0	7-14 days	50F-70F	Full Sun	Dill	Harvest Bulb Before It Goes to Seed

About Fennel

Fennel is a unique herb and vegetable. The entire plant can be consumed. Enjoy fennel cooked or eaten raw. Fennel is very easy to grow and care for. It's been known to grow wild as an invasive herb/vegetable alongside roads in many coastal areas but wild fennel is quite different from domestic fennel and will not produce bulbs.

When to Plant

Fennel is known as a perennial that ought to be planted sometime after the last frost of the winter. Seeds germinate once soil temperatures can be measured between 50° F and 70° F. It takes up to a hundred days to mature.

How to Plant

Try sowing seeds directly into your gardens, because transplanting fennel usually doesn't work very well. Make sure you've had the last frost of the season and plant them about one inch deep, and about ten or twelve inches apart. Space fennel seeds in rows 13" apart. Keep watered well until seeds germinate, sometime between 7 - 14 days. If you're growing fennel in containers, make sure one plant has at least 5 gallons of soil. Fennel can develop an intense root system.

How to Harvest

Harvest after about 80-100 days. Try growing multiple plants if you're interested in harvesting the bulb and seeds. Let a few plants go to seed and harvest a few bulbs before the plant bolts.



How to Grow Organic Fennel from Seed

Harvest the bulbs when they are approximately the same size as a tennis ball. Once the plant bolts, the flavor will be ruined so try to harvest it before them. Cut the bulb and stalks off right at the soil line.

Try harvesting a little of the fennel leaves at a time, as needed but don't cut too much at one time.

If you're looking to harvest the seeds, harvest those in the fall when the plants have turned brown. You can do so by easily shaking the plant into a bag or container. Save a few seeds for using as herbs in your kitchen, and put a few away to start your crop next year.



How to Grow Organic Fenugreek from Seed



Planting Season



Winter



Spring



Summer



Autumn

Depth to Plant

Spacing Between Plants

Days to Germinate (Sprout)

Germination Soil Temp.

Sun Needs

Good Plant Companions

Soil Needs

Days to Maturity

1/4" deep

4" apart

7-10 days

65F

Full sun

Beans

pH 6.5

120-150

When to Plant

Sow fenugreek from late spring to late summer, whenever a bed will be unused for more than eight weeks. Direct seed into your soil about 4 inches apart in all directions.

How to Plant

You may choose to soak the seeds in tap water for 12-24 hours. Plant your seeds in soil, rich with compost material. Seed them densely, not in rows. The seeds will germinate in 1-3 days, and are ready to eat within just a few days, if you're looking to add nutrient dense fenugreek micro-greens to your diet.

When to Harvest

Harvest the seed pods sometime in the fall. Dry them after collection on screens and turn over into the ground as needed.



How to Grow Organic Horehound from Seed



Planting Season



Winter



Spring



Summer



Autumn

Depth to Plant	Spacing Between Plants	Days to Germinate (Sprout)	Germination Soil Temp.	Sun Needs	Good Plant Companions	Soil Needs	Days to Maturity
1/8" deep	18" apart	14-21 days	68F-75F	Full sun	Tomatoes & Peppers	Well drained	75

When to Plant

When starting horehound from seeds, they are best sown during spring time. Seed is most viable when used within three years.

How to Plant

Choose a location that has a good southern exposure, with dry and poor soil. Once your plants are established, the only worry you should have is over population or crowding. Pay attention to your horehound plants, and give care to prevent seeds from forming. Clip any unused flowers, because if it matures and drops its seeds, the plant will quickly over run the entire garden area.

When to Harvest

Try to harvest while the plant is just beginning to flower. Flowering can happen more than once a year, sometime between June and September. During the plants first year of life, it will not produce any flowers but the leaves can be used. Tie the leaves or flowers into bundles and hang in a dry area, out of direct sunlight. Once dried, chop them and store in an airtight container.



How to Grow Organic Hyssop from Seed



Planting Season



Winter



Spring



Summer



Autumn

Depth to Plant	Spacing Between Plants	Days to Germinate (Sprout)	Germination Soil Temp.	Sun Needs	Good Plant Companions	Soil Needs	Days to Maturity
1/2" deep	12"-24" apart	14-21 days	68F	Full sun	Cabbage	Sandy soil	90-120

When to Plant

Hyssop grows best when it is started indoors about 8 weeks before the last frost for your area.

How to Plant

When choosing a location to grow hyssop, remember that the plants should get about 2 feet tall. They will have very bright and vibrant blue flowers and are a favorite of bees. Choose an area with full sunlight. Plant in dry, sandy, light and rocky soil. Water moderately.

When to Harvest

Collect the flowers once they begin to bloom in the early or mid summer. You can also collect the leaves and stems. Continue harvesting as long as the plant is blooming, which usually goes into the fall.



How to Grow Organic Lavender from Seed



Planting Season



Winter



Spring



Summer



Autumn

Depth to Plant	Spacing Between Plants	Days to Germinate (Sprout)	Germination Soil Temp.	Sun Needs	Good Plant Companions	Soil Needs	Days to Maturity
1/4" deep	24" apart	10-28 days	70F-75F	Full sun	Rosemary and oregano	pH 6.5-7.5	180

When to Plant

Sow lavender seeds early in the season. If you want to get a head start on the gardening season, you can plant the seeds indoors six to eight weeks before the last average frost. The goal is to get the plants to bloom in your garden as early as possible. If you're growing them indoors, use a very sunny window or grow lights if you have access to them.

How to Plant

Choose a sunny location to plant lavender. This herb grows well in moist soils, but it must drain well. Lavender is known for being tolerant of droughts as well. Feel free to use a general purpose organic fertilizer once or twice during the growing season.

When to Harvest

Harvest your fragrant lavender when the flowers are in bloom. They make wonderful flower arrangements. Harvest lavender stems early in the morning, when the oils are at their strongest within the plant. Dry, spread out onto a screen or hang upside down.



How to Grow Organic Lemon Balm from Seed



Planting Season



Winter



Spring



Summer



Autumn

Depth to Plant	Spacing Between Plants	Days to Germinate (Sprout)	Germination Soil Temp.	Sun Needs	Good Plant Companions	Soil Needs	Days to Maturity
1/2" deep	12"-36" apart	7-14 days	70F	Part shade or full sun	Basil, parsley, chives, mint and dill	Moist and rich	70

When to Plant

Start your seeds indoors and then transplant them outside, into a larger container. You can do this as soon as the threat of frost has passed and your seedlings have their first set of "true leaves" on them.

How to Plant

Lemon balm will grow about 2 feet tall and has fragrant leaves that are "heart shaped". Choose an area that is either full sun or partial shade. Keep the soil moist, but well drained. The seeds do require light to germinate.

When to Harvest

Harvest leaves from your lemon balm plant at any time. Dry indoors upside down, chop and store for later use. Use leaves fresh or freeze them.



How to Grow Organic Lemon Grass from Seed



Planting Season



Winter



Spring



Summer



Autumn

Depth to Plant

Spacing Between Plants

Days to Germinate (Sprout)

Germination Soil Temp.

Sun Needs

Good Plant Companions

Soil Needs

Days to Maturity

1/2" deep

36"-60" apart

2-7 days

70F-90F

Part shade or full sun

Alfalfa and corn

Warm

70

When to Plant

Germinating lemon grass is easy but does require slightly warmer soil temps. than many of the other herbs you may be familiar with. Starting your seeds indoors is recommended.

How to Plant

Choose a location that has full sun and rich, moist, and loamy soil. You can plant lemon grass in sandy soil, but this will require more consistent watering. Use plenty of mulch.

When to Harvest

The long, grassy leaves should be collected by snipping them off with scissors anywhere from mid summer on.



How to Grow Organic Lovage from Seed



Planting Season



Winter



Spring



Summer



Autumn

Depth to Plant

Spacing Between Plants

Days to Germinate (Sprout)

Germination Soil Temp.

Sun Needs

Good Plant Companions

Soil Needs

Days to Maturity

1/4" deep

36" apart

10-21 days

70F

Partial shade

Borage

Moist

90

When to Plant

Lovage can be easily grown from seed. Just make sure you sow the seeds after the danger of frost has passed. You can also get a jump start on your garden by starting them indoors 6 weeks before your last frost date.

How to Plant

Make sure when you transplant them, they are watered regularly for the first few weeks. Lovage grows best in full sun but will tolerate partial shade. Grow plants in average to rich soil that is well drained. Once your lovage is established, water them only during dry periods. Feel free to use an all purpose fertilizer once or twice a growing season.

When to Harvest

Harvest the leaves from your lovage plant as soon as it is established or 2-3 feet tall. This herb can be used fresh, dried, or frozen.



How to Grow Organic Marigold from Seed



Planting Season



Winter



Spring



Summer



Autumn

Depth to Plant	Spacing Between Plants	Days to Germinate (Sprout)	Germination Soil Temp.	Sun Needs	Good Plant Companions	Soil Needs	Harvest Instructions
1/2" deep	5" apart	5-20 days	70F-75F	Full sun	Broccoli, melons, cabbage, cucumbers, eggplant, gourds, kale, potatoes, squash and tomatoes	Well drained	Harvest when they are 36" tall to collect the seeds

When to Plant

Start your seeds indoors 6-8 weeks before the last frost for your area. You can also direct-sow marigold seeds outside once the soil is warm and the threat of frost has passed.

How to Plant

Choose a location with full sun and average soil. Wash spider mites off with an organic soap spray if you find them. Remove any dead flowers regularly to encourage more blooms.

When to Harvest

Marigolds make long lasting cut flowers, which are excellent for informal flower arrangements. Use them freely in beds, borders, edges, and pots.



How to Grow Organic Marjoram from Seed



Planting Season



Winter



Spring



Summer



Autumn

Depth to Plant	Spacing Between Plants	Days to Germinate (Sprout)	Germination Soil Temp.	Sun Needs	Good Plant Companions	Soil Needs	Days to Maturity
1/2" deep	15" apart	8-14 days	70F	Full sun	Other herbs	pH 6.5-7.5	70

When to Plant

Marjoram plants can easily be started from seeds. Get an early start on growing this herb by starting the seeds indoors before the last frost as a houseplant. If you will be direct sowing them into your garden, do so in spring once the threat of frost has passed.

How to Plant

Marjoram grows best in full sun locations with well drained soil. They can tolerate drought and can do well in average soils. Marjoram is actually very drought resistant and only needs to be watered once or twice a week. There is no need to fertilize this plant. Harvest the flowers as soon as they appear, because the leaves will turn bitter once the flowers set.

When to Harvest

Start harvesting your marjoram as soon as it has produced a few dozen leaves. The young, tender leaves have the best flavor. Harvesting is best done early in the morning when the oils are the strongest. Place the leaves in a dry, cool ventilated area. Once dried, you can put them in the freezer for a later time.



How to Grow Organic Mint from Seed



Planting Season



Winter



Spring



Summer



Autumn

Depth to Plant	Spacing Between Plants	Days to Germinate (Sprout)	Germination Soil Temp.	Sun Needs	Good Plant Companions	Soil Needs	Harvest Instructions
Sprinkle on top of loose soil	12"-18" apart	10-15 days	68F-75F	Full sun to deep shade	Cabbage, kale, cauliflower, onion, radish, tomato	pH 5.6-7.5	Pinch off ends as needed

About Mint

Mint is said to be the easiest to grow out of all herbs. It's great for beginning gardeners and grows best in zones 4-9. Use Mint leaves to add flavoring to a wide array of food and beverages. It also serves as a natural pest deterrent around other vegetables. Chewing on the leaves will freshen your breath and can calm an upset stomach.

When to Plant

Mint is a hardy perennial that can really be started anytime as long as you're about 2 months before your first Fall frost. It also grows well indoors, year-round. Start them inside in late winter, for your Spring planting, or wait until the soil warms up and sow the seeds directly outside in your garden.

How to Plant

When sowing the seeds, do not cover them. They need light to germinate properly and will sprout within 10-15 days if the soil stays around 68 to 75°F. They are ready to transplant into the garden when they have their second set of "real" leaves. If you're sowing them directly out into your garden, consider placing a row cover over them until they sprout.

When to Harvest

Pick the leaves as you need them or harvest a large amount from each mint plant up to three times in one growing season. Cut the stems 1-2 inches from the ground. You can take cuttings from the plants you already have and root them in a little bit of water and then plant them indoors for fresh leaves throughout the winter. If you want to dry the leaves, it's best to harvest them before the plant goes to seed.



How to Grow Organic Oregano from Seed



Planting Season



Winter



Spring



Summer



Autumn

Depth to Plant

Spacing Between Plants

Days to Germinate (Sprout)

Germination Soil Temp.

Sun Needs

Good Plant Companions

Soil Needs

Days to Maturity

1/4" deep

8"-12" apart

8-14 days

70F

Full sun

Broccoli, cabbage, cucumbers and cauliflower

Well drained

35-45

About Mint

Oregano is a sun loving, heat loving plant that does well in areas prone to drought. It is a wonderful companion plant for beans, basil and broccoli. Try growing oregano indoors during the winter months for a fresh, steady supply of this fragrant herb.

When to Plant

Oregano plants can safely be set out into the garden once the risk of frost has passed.

How to Plant

Plants can be started from seeds, divisions or cuttings. Oregano seeds require light to germinate, so just loosen the soil and place seeds directly on top and mist gently when watering. There's no need to cover the seeds with soil when planting. Grow oregano indoors and transplant when temperatures remain above 45 degrees F. Oregano plants should be cut back to the ground and covered with a layer of mulch for over wintering outdoors. You can also grow them inside if you wish to be able to harvest oregano year round.

When to Harvest

Harvest oregano anytime after they have reached 4-6 inches tall. Harvest oregano leaves in the morning hours as soon as the dew has dried for best flavor. Once harvested, use fresh or store leaves whole, placed in freezer bags and frozen. They can also be dried in a dark, well-ventilated area and stored in airtight containers until ready to use.



How to Grow Organic Parsley from Seed



Planting Season



Winter



Spring



Summer



Autumn

Depth to Plant	Spacing Between Plants	Days to Germinate (Sprout)	Germination Soil Temp.	Sun Needs	Good Plant Companions	Soil Needs	Days to Maturity
1/4" deep	9"-12" apart	21 days	70F	Partial shade, full sun	Asparagus, carrot, chives, onions, roses and tomatoes	Rich and moist	75

When to Plant

Parsley is usually grown as an annual but it is actually a biennial. This is especially true in cooler climates. Plants can be started either indoors or out. They tend to transplant easily and starting them indoors allows you to space them more easily when moving them outside.

How to Plant

Parsley seeds like to be sown thinly. They are very small so just sow the seeds on top of your soil and water them in. Germination of these seeds usually takes around two weeks. Parsley will grow slowly, but steadily. Choose a partly sunny location with rich soil. This is a very easy to grow herb that will tolerate poor drainage, & poor soil. Have a spot in your garden that you've been having a hard time getting anything to grow in? Plant parsley there. Chances are, it will thrive wherever you put it.

When to Harvest

Harvest your parsley once the leaves begin to curl. Pick the leaves earlier in the day when the oils are the strongest. You can store the sprigs of parsley in a jar with a little bit of water in the bottom, inside the refrigerator for later use.



How to Grow Organic Rosemary from Seed



Planting Season



Winter



Early Spring



Summer



Autumn

Depth to Plant	Spacing Between Plants	Days to Germinate (Sprout)	Germination Soil Temp.	Sun Needs	Good Plant Companions	Soil Needs	Harvest Instructions
1/4" deep	12"-24" apart	25 days	75F-85F	Full sun	Sage, broccoli, beans, hot peppers	pH 6.0-7.0	Snip off ends as needed

About Rosemary

Rosemary is an evergreen, perennial plant with blue flowers. It is a shrub-like plant that has very fragrant, "needle-like" green leaves. Plants can easily get 5-6 feet tall outdoors if they're hardy and even when planting in containers, they will get 1-3 feet tall. Rosemary can be enjoyed when used with poultry, lamb, in stews, and in soups.

When to Plant

Rosemary seeds can take a while to germinate so start them very early, about three months before warm weather arrives in your area. Do not expect a high germination rate of all of the rosemary seeds you plant, because rosemary naturally has a much lower germination rate when compared to say, basil.

How to Plant

Make sure your newly planted rosemary seeds are either started indoors, or have a shelter over them such as a cloche' or row cover. When they are about 3-4 inches tall they can be transplanted to their permanent home. Try not to disturb them by transplanting them again until they are mature. Have fun with your rosemary plants, and try adding multiple small plants to one large pot to make a rosemary topiary. You can also train them onto hoops or other shapes.

When to Harvest

Prune the stems of your rosemary, as needed, to use fresh. If cooler weather approaches, you may bring small potted rosemary plants indoors and harvest from them throughout the winter. Try drying the leaves, as they store well in airtight containers.



How to Grow Organic Rue from Seed



Planting Season



Winter



Spring



Summer



Autumn

Depth to Plant	Spacing Between Plants	Days to Germinate (Sprout)	Germination Soil Temp.	Sun Needs	Good Plant Companions	Soil Needs	Days to Maturity
1/2" deep	5"-18" apart	7-14 days	68F	Full sun	Fruits (in particular figs), raspberries and lavender	Dry and well drained	75

When to Plant

Rue seeds need a soil temp of at least 70°F for germination. It grows best when started indoors and then transplanted outside after all danger of frost has passed.

How to Plant

Rue is a wonderful beginner gardeners plant, because it doesn't require much over seeing

When to Harvest

Harvesting fresh leaves can cause dermatitis in sensitive people. On hot sunny days, this is especially true because that is when the essential oil is strongest. Take precaution when harvesting and do not consume if you are pregnant.



How to Grow Organic Sage from Seed



Planting Season



Winter



Spring



Summer



Autumn

Depth to Plant	Spacing Between Plants	Days to Germinate (Sprout)	Germination Soil Temp.	Sun Needs	Good Plant Companions	Soil Needs	Days to Maturity
1/2" deep	5"-18" apart	7-14 days	60F-70F	Full sun	Broccoli, cauliflower, rosemary, cabbage, and carrots	pH 6.0-6.5	75

When to Plant

They can be directly seeded into your garden, or started indoors for transplanting later. Start sage seeds indoors, six weeks before the last frost. If planting outdoors, sow seeds after the soil has begun to warm in the spring.

How to Plant

Sage prefers full sun and well drained soil. You can grow them in average soil and it will tolerate dry conditions. Water during drought or once or twice a week. Cut the plants back after blooming to encourage new growth. Add a general purpose fertilizer once a growing season.

When to Harvest

Oftentimes, the leaves and stems of this herb can be found in sausages, pork, sauces, dressings, cheese and stuffing. Sage is the traditional flavor associated with the Thanksgiving holiday.

Harvest and dry the leaves for brewing tea. Store in an airtight container, in a cool and dry place.





How to Grow Organic Salad Burnet from Seed



Planting Season



Winter



Spring



Summer



Autumn

Depth to Plant	Spacing Between Plants	Days to Germinate (Sprout)	Germination Soil Temp.	Sun Needs	Good Plant Companions	Soil Needs	Days to Maturity
1/8" deep	12" apart	14-21 days	60F-70F	Full sun	Mint	pH 6.5-7.5	70

When to Plant

For best results, Salad Burnet should be started indoors 4-5 weeks before the last frost of the spring. Salad Burnet seeds are small and require light for germination. Sow seeds shallowly and keep well moistened. Transplant outdoors after the last frost of the season.

How to Plant

Salad Burnet will grow to heights of a foot taller or more, and produce cucumber-flavored leaves only approximately 2 months after germination. Choose a location that is partial or filtered shade to full sun. It is tolerant of a wide range of soil types, but should always have well drained soil.

When to Harvest

Wait until the plant has reached a height of 6-8" or more to ensure that the plant is stable. At that time, harvest the leaves by cutting them with scissors. Leaves collected prior to blooming will have better taste.



How to Grow Organic Summer Savory from Seed



Planting Season



Winter



Spring



Summer



Autumn

Depth to Plant

Spacing Between Plants

Days to Germinate (Sprout)

Germination Soil Temp.

Sun Needs

Good Plant Companions

Soil Needs

Days to Maturity

1/8" deep

10" apart

10-14 days

60F-70F

Full sun

Onions and Garlic

Well drained

90

When to Plant

Direct sow summer savory seeds into your garden bed. Start in early spring.

How to Plant

Savory prefers full sun and warm climates. They can grow in average soil but it must be well drained. Water them through dry periods or about once a week. You may feel it necessary to fertilize up to twice in one season.

When to Harvest

Harvest savory leaves once the plant reaches a few inches in height. Do not over harvest winter savory. At the end of the season, summer varieties such as this one can be harvested by digging up and drying the entire plant at once.



How to Grow Organic Sunflowers from Seed



Planting Season



Winter



Late Spring



Summer



Autumn

Depth to Plant

Spacing Between Plants

Days to Germinate (Sprout)

Germination Soil Temp.

Sun Needs

Good Plant Companions

Soil Needs

Days to Maturity

1/2" deep

12"-48" apart

7-14 days

69F-75F

Full sun

Corn

Well drained

75

When to Plant

Start your sunflowers indoors about 4 weeks prior to the last frost. Sow them 2-3" beneath the surface of the soil. Keep your seeds well watered while you wait for them to germinate. Transplant outdoors once the threat of frost has passed. This will ensure the largest possible yield of seeds at harvesting time.

How to Plant

Sunflowers can grow to heights of 8 feet or more and provide you with a large quantity of delicious seeds. Choose an area that gets plenty of sun, a minimum of 6-8 hours will be needed. Amend the soil with rich compost and organic fertilizers.

When to Harvest

Harvest the seed heads in late summer or early fall once the back of the flower head has begun to die and turn yellow. This means that the seeds are ready. Simply collect the seed heads and dry them in a well-aerated, dry location.



How to Grow Organic Tarragon from Seed



Planting Season



Winter



Late Spring



Summer



Autumn

Depth to Plant

Spacing Between Plants

Days to Germinate (Sprout)

Germination Soil Temp.

Sun Needs

Good Plant Companions

Soil Needs

Days to Maturity

1/2" deep

12" apart

10-14 days

65F-85F

Full sun

Throughout entire garden

pH 6.5-7.5

90+

When to Plant

Tarragon needs a dry and warm environment to grow, day and night. You can start them indoors 6-8 weeks before the last frost for your area and then transplant the seedlings outdoors when the weather warms up.

How to Plant

Once established, the plants will grow well with little to no attention. You can fertilize, but it's really only necessary in very poor soil. Allow the soil to dry in-between waterings. Remember that tarragon will flourish and do best if the soil is slightly dry.

When to Harvest

You may harvest both the leaves and flowers from the tarragon plant. Store them in a dry, and cool area. You may also freeze or dry the leaves for later use.



How to Grow Organic Thyme from Seed



Planting Season



Winter



Spring



Summer



Autumn

Depth to Plant	Spacing Between Plants	Days to Germinate (Sprout)	Germination Soil Temp.	Sun Needs	Good Plant Companions	Soil Needs	Harvest Instructions
1/2" deep	12" apart	14-28 days	Around 70F	Full sun	Eggplant and Cabbage	pH 7.0	Snip off ends as needed

About Thyme

Thyme can be grown in many climates. It makes for an attractive and fragrant ground cover, and has fragrant, tiny flowers that the bees love. Grow thyme to attract pollinators for your garden. Try using fresh thyme in meat dishes, incorporated into sausage, stuffing or your favorite soup recipe. It also does very well in containers, both inside and outdoors.

When to Plant

Plant seeds when the ground temperature has warmed to at least 70 degrees. Loosen soil and then sprinkle seeds on top. Mist lightly, being careful not to allow the soil to become soggy.

How to Plant

Thyme requires very little care, and will only need to be watered during dry spells. If you're growing it as a perennial, make sure you mulch heavily during harsh winters. If the weather is too harsh, you can bring the plant indoors and grow it throughout winter there. Always prune back stems in the spring for the new growth to emerge.

When to Harvest

Harvest thyme throughout the summer. Try drying the sprigs in a warm, well-ventilated area and then store them in an airtight container. Thyme also freezes very well.



How to Grow Organic Wormwood from Seed



Planting Season



Winter



Spring



Summer



Autumn

Depth to Plant	Spacing Between Plants	Days to Germinate (Sprout)	Germination Soil Temp.	Sun Needs	Good Plant Companions	Soil Needs	Days to Maturity
1/2" deep	36"-48" apart	14-30 days	Around 68F	Full sun	Cabbage	Poor and sandy	65

When to Plant

Wormwood can be grown in the late winter & late summer months. If you are growing it in the winter, make sure all frost has passed or you can move the seeds inside and then back outside once the frost is over.

How to Plant

Direct sow wormwood seeds into the ground and cover with rich and organic compost. This herb needs a lot of room to grow. Keep the seeds watered adequately and remember that wormwood needs light to germinate. This process can take 2-4 weeks. Once they have their first set of "true leaves", you can transplant them outdoors or thin them out to ever 18-20 inches.

When to Harvest

You should be able to start harvesting wormwood once it has been growing for about 2 years. If you harvest during the first year, the leaves won't be as strong. They need about 2 years to full mature. Once harvested, you can also use the oil of the wormwood as an insect spray or antiseptic, and its upper stalks as a potpourri or sachet.



How to Grow Organic Yarrow from Seed



Planting Season



Winter



Spring



Summer



Autumn

Depth to Plant

Spacing Between Plants

Days to Germinate (Sprout)

Germination Soil Temp.

Sun Needs

Good Plant Companions

Soil Needs

Days to Maturity

1/2" deep

24"-36" apart

14-21 days

68F

Full sun

Throughout the garden

pH 5.5-6.8

65

When to Plant

Plant yarrow seeds anytime during the spring or autumn.

How to Plant

Choose a location that is sunny or lightly shaded. Yarrow makes a wonderful herb for landscaping. It prefers a fairly rich, moist soil to grow in but can tolerate droughts for small periods of time. It can be a very forgiving variety to grow in your home garden.

Stake your yarrow plants before the stems flop down towards the ground. Trim them back after each flowering to encourage new blooms.

When to Harvest

The leaf of the yarrow plant is the most desired part. Using a pair of scissors, snip off the flower heads. Harvest them in late summer, and then dry on a large screen or in your dehydrator. Harvest the flowers as soon as they become available.



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