



To broadcast fertilizer, scatter it on top of soil, like sprinkling cinnamon-sugar on toast.

transplant in spring. This gives the soil microorganisms time to break down the fertilizer into a form that the plants can use. After a season or two of organic gardening, you will be able to fertilize at planting time without needing to wait. For “in the hole” fertilizer applications, fertilize when you transplant your starts.

When to apply chemical fertilizer. If you choose to use a chemical fertilizer, follow the directions on the package.

Seeds or transplants?

Before planting your garden, you must decide which crops to seed directly into the soil and which crops to transplant into the garden as plant starts.

Seeds can be less expensive than plant starts, so direct seeding can give you more plants for less money. Seeds also give you a bigger choice of plant varieties, because most stores have space for only a few varieties of plant starts.

Transplanting has its advantages too. Many favorite summer crops need a longer growing season than we have in New York. Plant starts for these crops are grown in a warm greenhouse, so they get a jump on the growing season. When you transplant

them into your garden, you give them plenty of time to produce a crop before the first frost kills them. Also, weeds can crowd out young plants, but transplants are already big enough to get a head start on weeds.

Direct seed leafy greens and crops with large seeds or long taproots.

Transplant long-season crops like tomatoes, tomatillos, and eggplant. These crops from tropical or subtropical climates need an early start in a greenhouse to ripen fruit in our short summers.

Many other crops can be either direct seeded or transplanted. These include members of the cabbage family, the beet family, the onion family, and many herbs. Experiment to see what works for you.

Knowing when to plant

Whether you plant seeds directly in the garden or use transplants, it is important to plant each crop at the right time. Air and soil temperatures are important for healthy plant growth, so plants that go into the garden too early or too late may do poorly.

Your seed packet will tell you the minimum soil temperature the seeds need to germinate. Gardening calendars may list dates when the soil is warm enough, but temperatures can change from year to year. Checking the actual temperature with a soil thermometer will help you plant at the right time.

Direct seeding

Reading a seed packet

All seed packets list the same basic information: when to plant, how deep to plant, distance between plants, and days until harvest. Learning to read seed packets will help you to make good decisions when you grow crops from seed.

Buying and storing seeds

Try to buy only enough seeds for this one planting year. Some seeds can last for several years if you store them properly, but they germinate best in the year stamped on the packet. You can store leftover seeds in a cool, dry place like a closet or basement. Put leftover seed packets in a sealed jar with a drying agent (such as a silica packet from a pill bottle) to absorb moisture.



What seeds need to germinate

To germinate, or break out of their shells and begin to grow, seeds need moisture and warmth.

Soil temperature affects germination. In spring when the soil is cold, seeds will sometimes rot before they have a chance to sprout. You might be able to plant large seeds like beans, peas, and corn in cold soils if you pre-sprout the seeds.

To pre-sprout, spread the seeds out between two layers of damp paper towels, and place the towels in a plastic bag. Keep the bag in a warm place until you see small roots breaking out of the seeds. Once the seeds have sprouted, plant them as usual. Handle them carefully to avoid breaking off the tiny roots.

Preparing your seedbed

Loosen the soil with a digging fork or shovel, then rake the seedbed smooth to create a loose, even “tabletop” to your bed.

To make less work for yourself, spread your compost and any fertilizer you are broadcasting before you loosen the soil. Mix the compost and fertilizer in as you work the bed.

Sowing patterns

When you sow your seeds, you can choose one of these patterns: row planting, banded planting, or hill planting.

Row planting. Seed packets usually have directions for planting in long, single rows. The packet will tell you how deep the rows should be, how far apart to plant the seeds, and how far apart to space the rows.

Draw rows in the soil using your finger or the edge of a garden tool. You can sow large seeds in the rows one-by-one. For smaller seeds, you

Choosing seeds or transplants		
Direct seed		
<i>Large seeds</i>	<i>Deep taproots</i>	<i>Other</i>
Corn	Radishes	Garlic (cloves)
Beans	Beets	Leaf lettuce
Peas	Turnips	Arugula
Zucchini	Carrots	Mustard
Cucumbers	Rutabga	Potatoes
	Parsnips	
Transplant Only		
<i>Long-season Crops</i>		
Tomatoes	Tomatillos	Eggplant
Hot peppers	Bell peppers	Pumpkins/Melons
Direct Seed or Transplant		
<i>Cabbage family</i>	<i>Beet family</i>	<i>Onion family</i>
Broccoli	Chard	Onions
Cauliflower	Spinach	Leeks
Collard greens		Chives
Cabbage	<i>Herbs</i>	<i>Other</i>
Kale	Basil	Head lettuce
Kohlrabi	Parsley	Leaf lettuce
Bok choy	Cilantro	Arugula



Plants with deep taproots, like beets and carrots, should be direct-seeded.

can tap the seeds out of the packet or sprinkle them down the row using your thumb and pointer finger. Once the seeds are in place, check your seed packet to see how deep the seeds should be, and cover them with that amount of soil. Wait until you sow all the seeds before covering them so you can see if you missed any spots.

Some of the seeds will not germinate, and others will be eaten by birds or other garden pests. As insurance, sow twice as many seeds as you need and plan to thin the seedbed later.

Row planting works for all plants, but the distance you must leave between rows may waste space in a small garden. You may want to use a different sowing pattern for some crops.

Banded planting. You can sow seeds in a wide row instead of long, single rows. Radishes, spinach, beans, peas, beets, lettuce, and carrots grow especially well in banded rows.

Outline your banded row with stakes or twine, or draw the outline in the soil with your hand or the edge of a garden tool. Broadcast your seeds evenly in the row. Sow more seeds than

How to read a seed packet

General seed type
TOMATOES

Specific variety
TM877 Gold Nugget
CHERRY TOMATO

Distance between mature plants
18-30"

How much sun the plant needs
full sun

Number of days it takes for the first leaves to come up
6-14

Days from sowing until harvest
60 days

Year when seed will germinate best
2010

How deep to sow the seeds
1/4"

How warm the soil needs to be for seeds to sprout
70-90°

PLEASE READ OUR SEED WARRANTY BEFORE OPENING THIS ENVELOPE

When to start your seeds indoors and outdoors, in relation to average last frost date. (Some crops, like tomatoes, are not suited to sowing outdoors.)

TOMATOES *Lycopersicon esculentum*
Sowing Indoors-Start seeds in sterile seedling mix, 6-8 weeks before your average last frost date. Water lightly after planted and cover with a grow dome or plastic to ensure that seeds do not dry out. When the first set of true leaves have emerged, transplant into a larger pot, burying the stem to a point just below the first set of leaves. At this point, make sure not to overwater, so the stem will have time to adapt in the soil and develop roots.
Sowing Outdoors-Not recommended.
Growing Tips-Cover the young plants with floating row covers or protect them with "Wallo' Waters" to help promote good early growth. The use of Red Plastic Mulch can also increase yields.
Fertilization Tips-As transplants, fertilize with fish emulsion or dilute fertilizer solution every 10-14 days. Apply 1/2 cup of our blended organic fertilizer into the soil around each plant. A handful of bone meal should also be added around each plant if the soil is acidic.
Seed Specs-Min. germ. standard: 80%. Usual seed life: 3 years.

Thin Plants to 18-30"

Light Requirements full sun

Days To Germination 6-14

Soil Temp. For Germ. 70-90°

Seed Depth 1/4"

Territorial Seed Company
P.O. Box 158, Cottage Grove, Oregon 97424

Phone orders and catalog requests: 541-942-9547
 Fax orders: 888-657-3131
 Web site: <http://www.territorial-seed.com>

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you think you need. Rake them in and gently cover them with the correct depth of soil. As the seedlings grow, thin some of the plants to give the others room to grow. You can read more about thinning on page 32.

Weeding a banded planting can be more time-consuming than weeding a row planting because you cannot easily run a hoe between your crops.

Hill planting. A “hill” is grouping of seeds planted close to each other in a small cluster. This is a good way to plant larger vegetables with big seeds, like watermelon, squash, corn, and cucumbers. Planting several seeds in each cluster helps you make sure that at least one seed will germinate and grow.

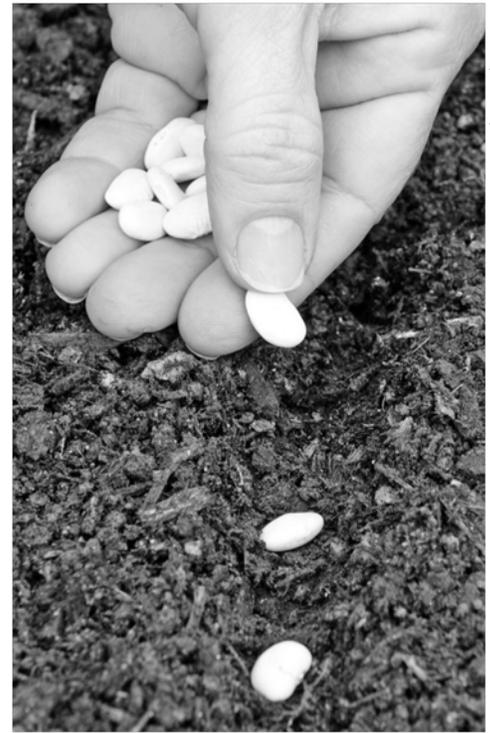
Look at the planting depth on your seed packet, then poke 4 or 5 holes in a small cluster. Put one seed in each hole and gently cover the seeds with soil. After the seeds germinate, thin each cluster to two or three plants. When the seedlings get bigger, thin each cluster to one plant. Cut the smaller seedlings to the ground and let the strongest seedling grow. The distance between clusters should be the same as the crop’s footprint.

Planting depth

How deep to plant seeds depends on the crop. Check your seed packet for information. If there are no directions on the seed packet, then follow this general rule: Sow as deep as four times the longest part of the seed. If the seed is about ¼ inch long, then plant it about 1 inch deep. But if your soil is particularly heavy, sow seeds only two or

three times as deep as the longest part of the seed. In heavy soil, cover the seeds with light potting soil instead of garden soil. The potting soil will make it easier for seedlings to push through.

In any kind of soil, seeds that are sown too deep may never germinate. If seeds are not deep enough, they may wash away, dry out, or be carried off by birds or insects before they germinate.



Sow twice as many seeds as you need and thin the seedbed later.

Watering seeds

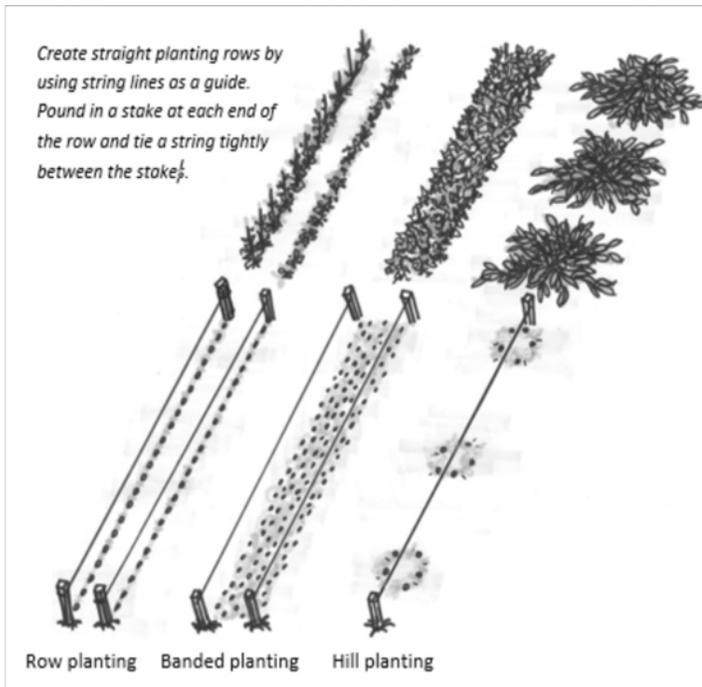
Seeds need moisture to germinate. Mist or lightly water often enough to keep a seedbed moist but not soggy. The soil should feel like a wrung-out sponge. Water new seedbeds every day or two. If the weather is very dry and hot, you may need to water a new seedbed several times a day.

Use a hose nozzle with a mist setting to avoid pushing the seeds too deep into the soil or washing them out. Water the seedbed until water begins to puddle. Let the water soak in, then continue watering until it puddles again. You may have to start and stop a few times to get the seedbed evenly moist.

Seedlings have shallow, tender roots, so you will have to water often until the roots grow deeper and are stronger. As the plants grow, increase the amount of water so that moisture goes deeper into the soil. Let the soil dry slightly between waterings.

Minimum soil temperatures for germination	
Crop	Temperature (°F)
Beans, snap	48-50
Cabbage	38-40
Carrots	39-41
Corn*	60-65
Eggplant	55-60
Melons	55-60
Onions	34-36
Peas	34-36
Peppers	55-60
Potatoes	39-41
Radishes	48-50
Tomatoes	50-55
*Supersweet varieties are especially sensitive to low temperatures.	

For more information
Collecting and Storing Seeds from Your Garden
 Available at:
<https://blogs.cornell.edu/>



Thinning

When you thin, you remove some seedlings to give the remaining ones space to grow strong roots and leaves. Thinning lets the remaining plants fill out their footprint.

A vegetable garden is not productive when plants are growing too close together. Plants that are too close together compete with each other for sunlight, water, air, and nutrients. They are also easy targets for diseases and pests such as slugs.

Begin to thin seedlings as soon as plants develop their first set of true leaves. These are their mature leaves, which look different from their seed leaves. Thin about once a week until the plants are as far apart as they are supposed to be for mature growth. Remove the seedlings that look weaker and let the stronger ones grow. Gently pull up the weaker seedlings or snip them off at the ground. Water the seedbed well after thinning to keep the remaining plants from drying out. Some thinned seedlings, like lettuce, beets, chard, kale, collard greens, and spinach, can be eaten as “baby greens.”

Transplanting

Instead of sowing seeds, you can start off with transplants. Broccoli, cabbage, cauliflower, eggplant, tomatoes, and peppers all do well when transplanted into a garden as seedlings.

When you buy seedlings, choose stocky, disease-free plants. Transplants should have a few sets of leaves and well-developed

roots. Avoid plants that look yellow, are woody, or are already flowering. Also avoid plants that have been in the pot so long that roots are long and wound together. To check the root system on smaller plants in plastic pots, gently tip the plant out of the pot into your hand. Do this by tapping the bottom of the pot while holding the main stem between your middle and pointer fingers just above the soil.

Sometimes transplants have just come from the greenhouse and did not have time to “harden off.” When plants are hardened off, they are moved outdoors from the warm, humid greenhouse to get used to garden conditions. Harden off your young transplants when you bring them home. Take them outside during the day, and bring them in at night. Also expose them to a bit more sunlight each day. Do this for 3 to 5 days.

Space your transplants according to their footprint so they have plenty of room to grow. Nursery transplants often come with more than one plant in a single pot. If you are able to gently separate the roots without breaking them, you can plant each seedling separately. If the seedlings are too hard to separate, choose the healthiest looking plant and cut off the rest at soil level to keep them from competing with each other. Remember that even a well-weeded garden will produce less if the plants are too close together.

Transplant starts in early morning or early evening to prevent wilting. Water the starts several hours before transplanting them. Handle them carefully to avoid damaging roots or bruising stems.

How to transplant

Dig a hole that is wider and slightly deeper than the root ball. The hole should be big enough that the top of the root ball does not stick up above the soil line. Place fertilizer in the planting hole and mix it into the soil in the bottom of the hole. (You do not have to do this if you added fertilizer when you prepared your bed.)

Set the transplant gently in the hole. The bottom leaves should be at or just below the top of the planting hole. Tomatoes are an exception. Dig a deeper hole, cut off the bottom sets of leaves,

For more information and pictures:

See “Common Garden Tools’ in the Appendix





These squash were planted using the hill planting method. Each cluster has been thinned down to the strongest plant.

and plant the tomato so that only two or three sets of leaves are above soil level.

Gently backfill the hole with loose soil, being careful not to compact it. Be sure that the root ball is not sticking up above soil level.

Water the transplant well, but gently. This first watering keeps the young plant from drying out and helps settle the soil into any large air pockets below the surface. You may need to add more soil if the area around the transplant sinks during the first watering.

To make sure that your transplants take root, keep them well watered during their first week in the garden.

Protecting young plants

Extra care during the first few weeks of a newly planted garden pays off big later in the season.



Courtesy of FEE International via Flickr

Transplant in early morning or early evening to prevent wilting.

Early protection. For the first few days after transplanting, protect young plants from wind and sun.

Use newspaper or cardboard to shield the south side of transplants, where the sun is strongest. Use plastic bottles with the bottoms cut off to protect tender young plants from cold and from bird and insect damage.

Row covers. These covers can be used to protect both transplants and direct-sown seeds. They provide a few degrees of protection during a cold snap. Secure the edges to protect crops from insects, cats, and other uninvited garden visitors. You can bury the edges in the soil or hold them in place with bricks, rocks, or landscape staples.

Row covers come in a variety of materials. You can drape greenhouse plastic, lightweight row cover fabric, or landscape fabric over metal or plastic tubing to form small, low tunnels. These materials will last several seasons. You can also use plastic sheeting, but it may last only one season.

Lightweight fabrics like Reemay are called “floating row covers.” They can go directly over the new seedlings and transplants to protect them while they grow. To use a floating row cover, lay the fabric loosely over the bed to allow room for plants to grow. Remember to secure the edges.

Install row covers after sowing your seeds, after your seedlings

TIP

If you are not sure how deep to plant your seeds, follow this general rule: Sow four times as deep as the longest part of the seed.

come up, or after transplanting. Check underneath your row cover now and then to make sure you did not accidentally trap pests in with your plants.

Remove or loosen row covers to increase airflow if temperatures underneath get too hot. Also remove row covers when cucumbers, squash, or other plants that produce fruit begin to bloom. That will let pollinating insects reach the flowers.



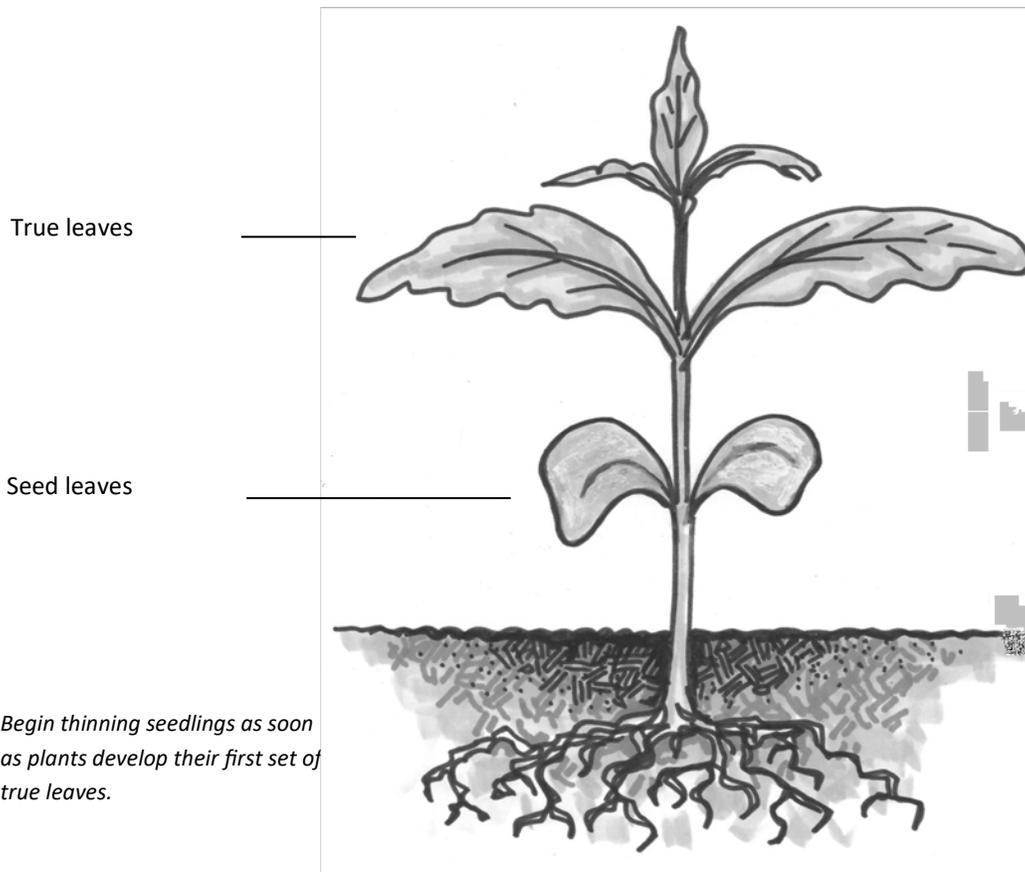
Courtesy of www.istockphoto.com



Courtesy of OSU Extension

Remove the bottoms from plastic bottles, then place the bottles over your seedlings to protect them from birds and cold temperatures.

The plant start on the left has been in its pot too long. Choose transplants that are stocky and disease-free, like the one on the right.



Begin thinning seedlings as soon as plants develop their first set of true leaves.



Vertical gardening

Vertical gardening is the use of trellises, nets, strings, cages, or poles to support plants as they grow upward. Plants grown vertically take up much less space than plants grown on the ground.

Good candidates for vertical gardening are vining and sprawling plants like cucumbers, tomatoes, melons, and pole beans. Some plants attach themselves to the support, but others need to be tied on. Install support structures at planting time to avoid accidentally damaging your plants. It is also easier to train plants onto a structure from the time they begin to grow.

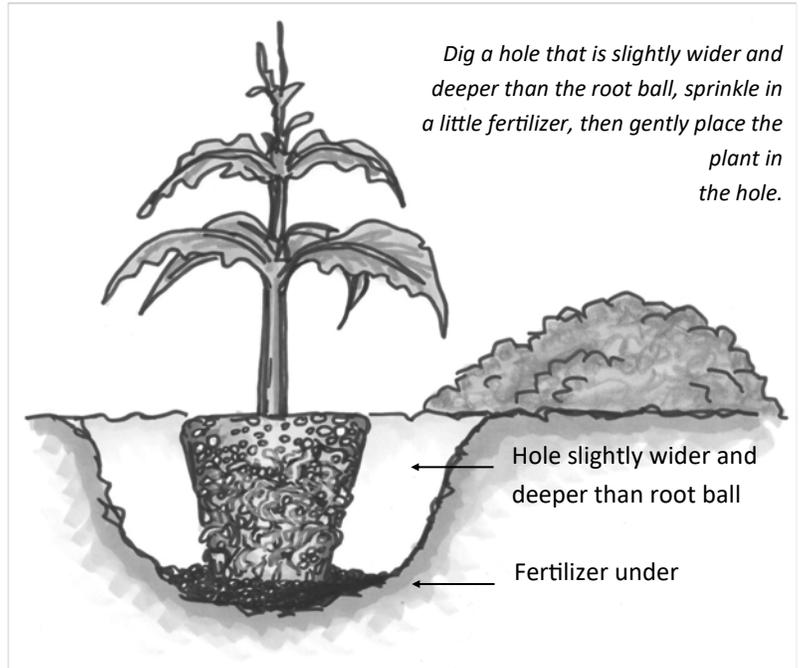
You can buy tomato cages and other support structures at hardware stores and nurseries, but many gardeners save money by building their own out of materials they have on hand.

When trellising heavy fruits like squash and melons, tie old cloth or nylons under the fruit to support it and keep it from dropping off the vine.

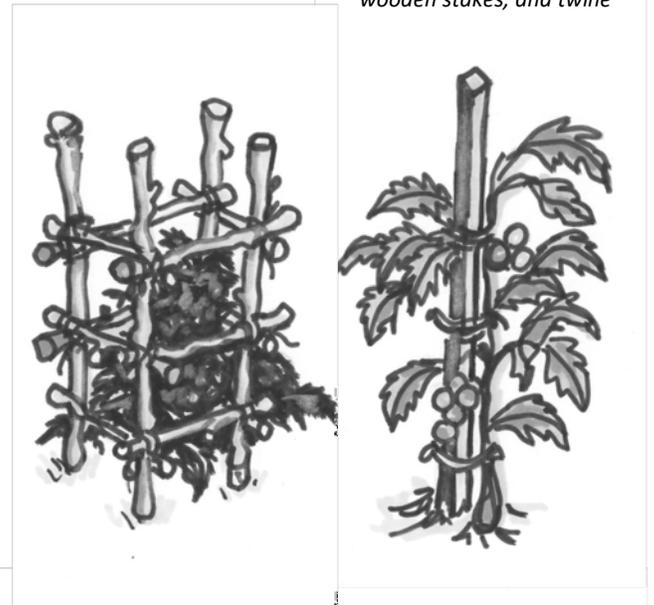
Because vertically grown plants are more exposed, they dry out faster and need more water than when they are spread over the ground. Keep them well watered.

When plants are grown vertically, they are often grown closer together. Soil under these plants should be deep and well drained so that plant roots can reach downward to find water and nutrients.

Vertical plantings are tall, so they cast a shadow. Locate them on the north side of the garden to avoid shading your other plants. Plant shade-tolerant crops near vertical ones to get the most use from your growing space.



Tomato stakes can be expensive. Make your own tomato supports with common materials like bamboo, wooden stakes, and twine



Courtesy of J.James/



Container gardening

If you have decided to garden using containers there are some steps you want to take to ensure your plants stay healthy. When choosing a container make sure no toxic material has previously been inside and the drainage holes are at the bottom. There should be enough space provided for the roots and soil of your fully grown plant. We recommend cleaning a used or recycled container with soapy water followed by a disinfectant solution of 1 part bleach to 9 parts water.

At the end of the gardening season, compost your remaining materials and thoroughly clean containers as described above. To maintain a healthy garden you should plant using a soil recipe seen on page 37 and water only when the top of the soil is dry to the touch. Peat can be especially beneficial when using small seed starting containers, because its excellent water and nutrient holding capacity. The low pH of peat can balance the high pH of composts, soils and high alkaline tap water.

The amount of light needed for a plant depends on the species and should be judged on the growth rate and how quickly the plant dries out to prevent damage. Fertilizer is another key ingredient to keep plants happy. Plants need food too! The process of deadheading or removing unattractive dead flower heads can allow new growth,. Common issues include excess salts and low fertility due to a lack of fertilizer.

Garden soil recipe for larger containers:
+ One part mature compost
+ One part perlite
+ One part garden soil

Garden soil recipe for smaller containers:
+ One part peat moss
+ One part perlite
+ One part mature compost



Courtesy of Charlie Dave via Flickr

When choosing your container, there should be enough space provided for the roots and soil of your fully grown plant.

Get Creative! Give your garden a more rustic look by using old crates, drawers, toolboxes, wheelbarrows etc. Add soil fabric or water absorbing pebbles to the bottom to promote drainage and filtration.



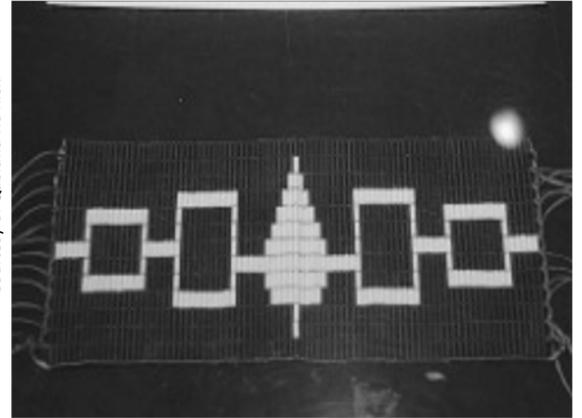
Courtesy of Clipp2nd via flickr



Exploring culture in gardens: The Three Sisters

Upstate New York is the traditional homeland of the Native American confederacy known as the Iroquois, also called the Haudenosaunee. Their customs and stories surrounding food have influenced gardening techniques and plant breeding programs in this area. One particular method is a crop management system called the Three Sisters. The Three Sisters system refers to the planting of corn, pole beans, and squash or pumpkins together on hills. The hills provide support around the base of the plants, so they are not as prone to damage from wind. This also helps create a uniform stand of corn. The corn forms a support for the beans, and the squash covers the soil, helping to control weeds. Beans are in the legume family, and legumes take nitrogen from the air and convert it into a form that plants can use. This is important because corn demands a fairly high amount of nitrogen. The nitrogen "left" in the hill by the beans is available for next year's corn crop. The practice of planting more than one type of crop together is called intercropping. This kind of growing method is extensively used in other countries such as Mexico and Bolivia. The Three Sisters system has supported cultures whose people have and still are working with the land in a sustainable and conscious way even today.

Courtesy of Qabluna via flickr



The Hiawatha Belt symbolizes the unity of the original five Haudenosaunee nations, connected by the Great Law of Peace. Each white square and the tree in the center represents one of the original five nations- Seneca, Cayuga, Onondagas, Oneida, and Mohawk

To learn more about the Three Sisters: Gardening.cals.cornell.edu

Today, the Three Sisters System continues to support cultures of people who work the land in a sustainable and conscious way.

Courtesy of Andy Clordia via flickr



Courtesy of Rochester Roots



In a Native American "Three Sisters" garden corn stalks support bean and squash vines.



Corn, Beans, and Squash

For more information:
See “Trellises and Vertical Gardening”
in the Appendix on page 88

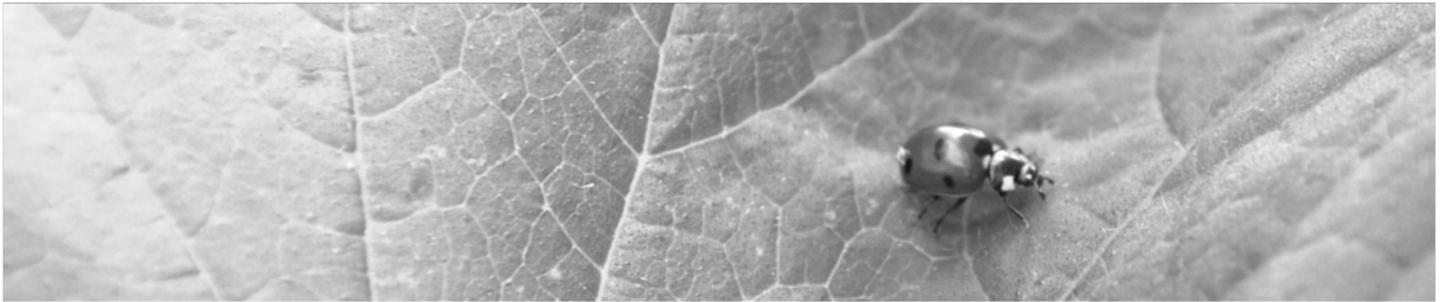


Locate vertical plantings on the north side of your garden to avoid shading other plants.



When trellising heavy fruits like squash and melons, tie old cloth or nylons under the fruits to support them and prevent them from dropping off the vine.





Chapter 4: Caring for Your Growing Garden

TOPICS IN THIS CHAPTER:

Watering
Fertilizing during the growing season
Weeding
Using Integrated Pest Management (IPM)
Identifying common pests

For more information on rainwater management, visit

SaveTheRain.us/resources

Now that your garden is planted, you can focus on keeping it healthy. Maintenance can be the most time-consuming part of vegetable gardening, but it is good for your plants—and for you too! Gardening is a time for quiet thinking, and it gives you and your family a chance to enjoy exercise, fresh air, and good company. If harvest time is the “destination,” then garden maintenance is the “journey.” In this chapter you will learn about watering, fertilizing during the growing season, weeding, and recognizing and controlling pests.

Watering

Plants need water to be healthy and productive. In the Northeast, vegetable gardens need regular watering in summer because we get so little rainfall during the warmer months. As you plan your garden, think about how you will give your plants the water they need.

Sandy, clay, and loamy soil types absorb water differently. Water moves through sandy soil about twice as fast as it moves through clay soil, so it takes longer to water clay soil. Loamy soil lies between these two extremes—it holds onto water *and* drains well, making it the best soil for growing plants.

No matter what soil type you have, your watering should be deep and infrequent. In general, watering 2 or 3 times a week is enough. Seedbeds and new transplants are exceptions—they need water every day or two. If you are not sure if the soil is moist enough, you can use your hands to feel for moisture below the first inch or two of soil. If it feels like a wrung-out sponge, it is just right!

You can also check your watering by filling a jar or yogurt container with garden soil and placing it near plants before you water them. If the soil at the bottom of the container is still bone-dry after you water, you will need to keep going so that the water reaches the roots of your plants. Aim for plant roots instead of leaves when you water.



Methods of watering

There are three basic watering methods: hand watering with a hose or watering can; soaker hoses and drip irrigation systems; and portable sprinklers. The method you choose will depend on the size of your garden, your budget, and your available time.

Hand watering with a hose or watering can deliver water directly to plants roots and cuts down on waste. Water deeply but gently. Remember, hand watering takes time. Be careful to water all parts of your beds where plants are growing.

For leaf lettuce and other greens growing close together, it is okay to get water on the leaves. Aim your hose upward so the water falls down on the bed like a gentle rain. Water until the soil stays “shiny” for 10 to 15 seconds after watering. This tells you that the soil has soaked up as much water as it can.

For all other crops, especially cucumbers and tomatoes, keep the leaves dry when you water. Water gently at the base of the plant and avoid blasting the soil, seeds, or roots with a heavy stream of water.

Soaker hoses and drip irrigation systems are less wasteful than overhead watering with a sprinkler. A drip system slowly places

water right over the plant roots. Soaker hoses and emitter drip lines have tiny holes that let water seep or drip slowly along the length of the hose.

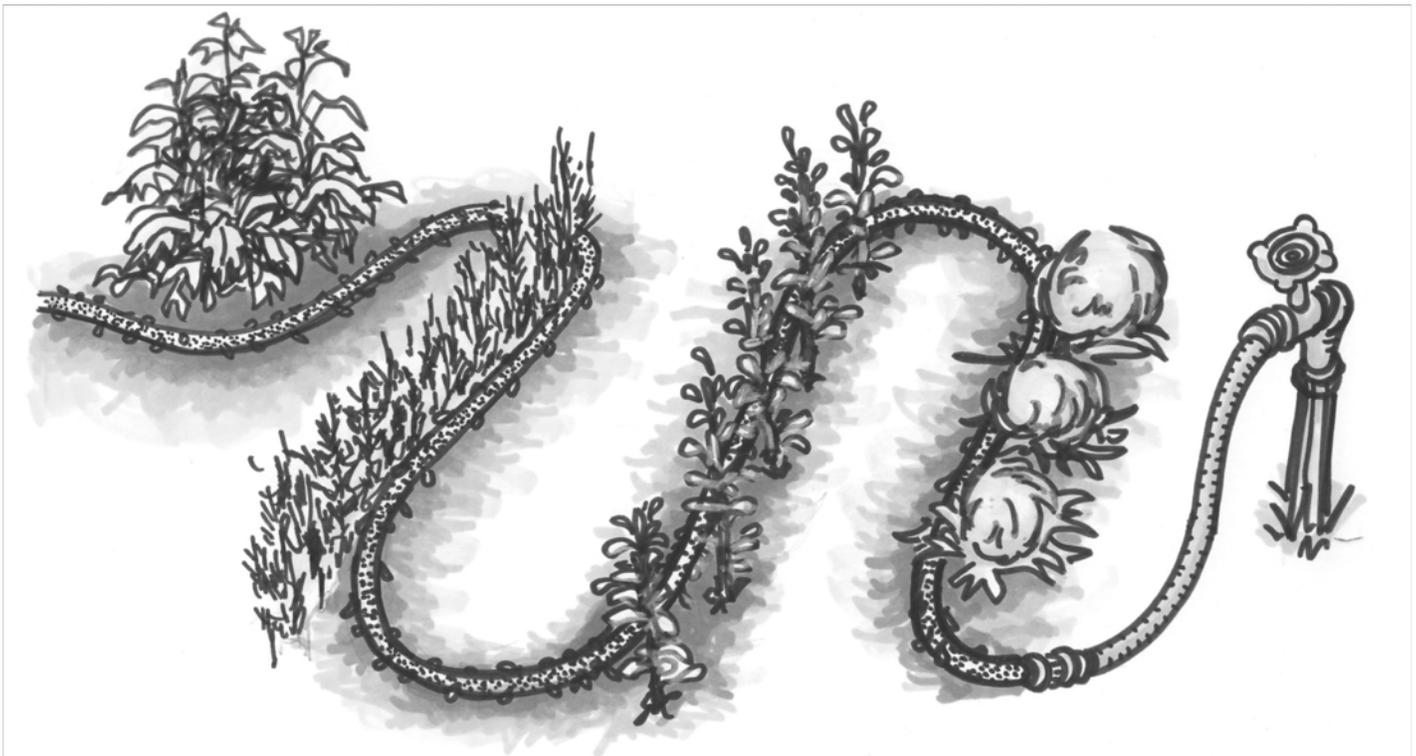
Emitter-type drip systems deliver water to individual plants. You can change an emitter system anytime during the growing season as you add or remove plants. A disadvantage of emitter systems is that they can be expensive and difficult to set up.

Soaker hoses and drip irrigation systems help reduce leaf diseases because they keep water off leaves. They cut down on weeds by watering plant roots and not bare soil.

A typical drip system runs for 1 or 2 hours, once or twice a week. Be careful not to overwater. The surface may look dry even if the soil underneath is still wet. If in doubt, check the soil.

Portable overhead sprinklers take less of the gardener’s time than other watering methods—you can just turn them on and walk away. But sprinklers wet plant leaves, so they can cause leaf diseases. They also waste water by watering paths and other bare spots in the garden, encouraging weeds to grow.

If you use an oscillating or rotating sprinkler, raise it above the tallest plants so that the plants do not block the flow of water. If



Soaker hoses and drip irrigation systems place water directly at plant roots. They help reduce diseases and weeds. Avoid overwatering. Even in hot weather, deep watering two to three times a week is sufficient.





Do not wait for plants to wilt before you water them.

you run more than one sprinkler at once, place sprinklers so their patterns overlap to make sure all your plants get water. If water runs off into your paths, you need to water at a slower rate. Overhead sprinklers lose water to evaporation and wind, so avoid using them in windy weather.

How often to water

No matter how you water your garden, the goal is to water the roots of your plants at about the same rate that the soil dries out. Take into account your soil, your plants, and recent weather as you think about how much and how often to water your garden. Clay soil holds much more water than sandy soil. Larger plants use more water than seedlings, but shallow roots mean seedlings dry out fast. Hot, windy weather also dries the soil. Watch your plants to figure out when to water. If your plants begin to wilt, you waited too long.

Different plants, different watering needs

Germinating seeds and seedlings need to stay moist all the time, but be careful not to wash them away. Water them with a gentle spray every day or two. In hot weather, you may need to water twice a day.

Developing plants need deep, infrequent watering to encourage root growth. Water at least 6 inches deep and then let the top inch or two of soil dry out completely before watering again.

Shallow-rooted plants like lettuce, and onions draw water from the top 1 foot of soil. Once your shallow-rooted crops are established, allow the top inch or 2 of soil to dry out and then thoroughly soak the area around the roots.

Deep-rooted plants like tomatoes, parsnips, and winter squash draw water from the top 2 feet of soil. They need water less often than shallow-rooted plants, but they need more water each time to reach their deep roots. In general, properly

watered crops develop healthy root systems and need a deep watering only 2 to 3 times a week in hot weather.

Common watering problems

Avoid these common watering problems:

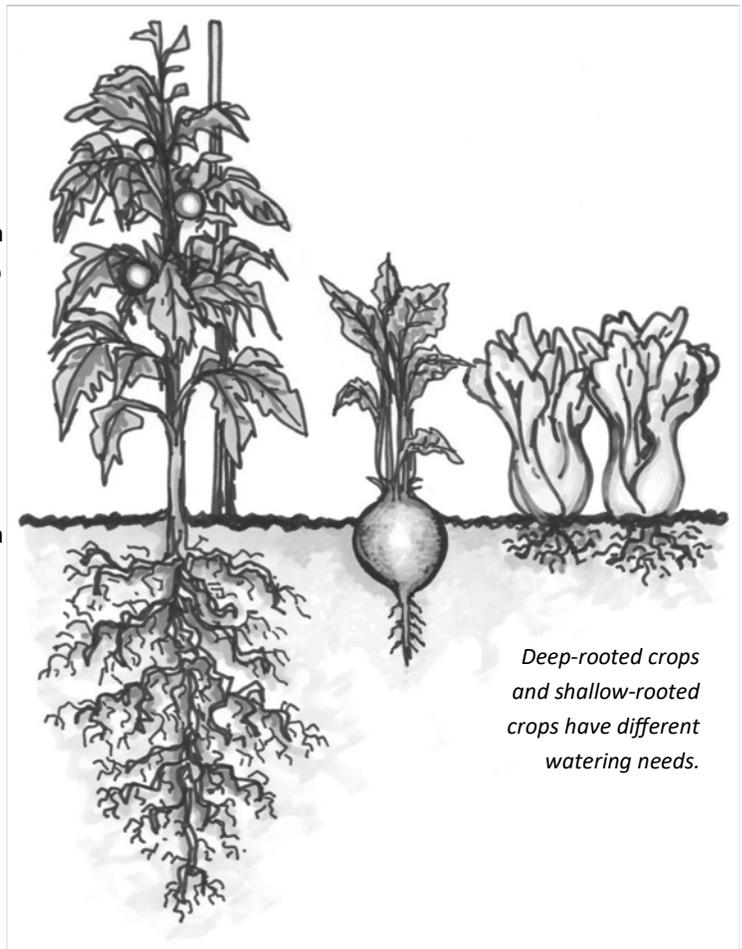
Frequent, shallow watering. Plants develop roots near the soil surface. These plants are easily stressed by dry weather and disturbances from weeding.

Overwatering. Plants can drown when soil pores fill up with water, leaving no oxygen for plant roots. Too much water also leaches away nutrients and can cause pollution.

Waiting too long to water. Plants dry out very quickly in hot weather. Watch your plants and water them as soon as they look like they need it.

Fertilizing during the growing season

Plants need nitrogen for healthy growth. If your plants look pale green or yellow and their growth slows down about 4 to 5 weeks after planting, they may need more nitrogen. Side-dress a small amount of quick-release nitrogen fertilizer, like fish fertilizer, and then water the plants. Do not give extra nitrogen to plants grown for their fruits, like tomatoes, cucumbers, squash, and peas. That extra dose of nitrogen can make these plants produce only leaves and no fruit.



Deep-rooted crops and shallow-rooted crops have different watering needs.

Weeding

Weeds are just plants growing in the wrong place, but they compete with your crops for sunlight, water, nutrients, and space to grow. This can be a big problem, especially when your crops are still young and small. Weeds can also bring pests and diseases into your garden. By controlling weeds, you give your plants a better chance to succeed.

Weed seeds can stay alive for years and will come to the surface when you begin to work the soil. Removing weeds before they make seeds will save you time and work in the years to come. The easiest way to control weeds is to stop them from getting started in the first place. Begin with a well-prepared seedbed, which means getting rid of all weeds before you plant. There are many ways to keep your garden weed-free. Try a few of them to see what works best for you.

Organic mulches. Use materials like shredded leaves, straw, or compost, over a layer of cardboard or newspaper to help control weeds. These mulches also add organic matter to the soil as they break down. They keep the soil loose, so weeds that do come up are easier to pull. Add several layers of newspaper or cardboard and 2 to 3 inches of mulch to smother weeds. A few types of leaves, such as walnut, oak, and cottonwood leaves, can stunt the growth of your plants. Avoid using them.

Plastic mulch. Black plastic does a good job of blocking light and stopping weed growth. (Clear plastic does not stop weeds, so do not use it for weed control.) You can use black plastic to kill weeds in an empty bed, or to control weeds in a bed full of transplants, like peppers. Cut holes in the plastic for your plants to grow through, and make the openings big enough for watering by hand. If you are using drip irrigation or soaker hoses, place the tubing on the soil before laying down the plastic.



Weeds are just plants growing in the wrong place, but they compete with your crops for sunlight, water, nutrients, and space.

Landscape fabric. This fabric lets moisture pass through to the soil, so you can continue to water your plants as you normally would. One disadvantage of landscape fabric is that it is thicker than plastic and can cool the soil instead of warming it.

Water management. Just like crops, weeds need water to germinate and grow. How you water can mean more weeds or fewer weeds. Drip irrigation, soaker hoses, and careful hand watering all put water close to your plants and leave unplanted soil dry. That means fewer weeds will grow. Sprinklers water a large area, including unplanted soil. That encourages more weeds to grow.

Close spacing. When plants are as close together as they can be, their outer leaves touch and form an umbrella that shades out weeds. On the other hand, close spacing can make it harder to find weeds that do grow. Also, you need to pull weeds by hand because hoeing could damage your crop. (See the footprint sizes of common crops on page 7 to find out how close you can space plants.)

Mowing. Keep grass cut and get rid of any weeds growing near your vegetable garden. You do not want grasses and weeds to make seeds, which could drift into the garden.

Cover crops. Plant a cover crop every winter. This will help the soil hold onto nutrients and stop weeds from growing in the bare soil during winter. See pages 22 and 23 for more about cover crops.

Rotation. Crop rotation can reduce weed problems. Group crops by family and rotate them into new sections of your garden every year. See page 16 for more about crop rotation.

Using transplants. Transplants have a head start against weed seeds.

Cultivation. Despite your best efforts, you cannot avoid at least some weeds. The best approach is to weed early and weed often. Young, tender weeds are easy to hoe, hand pull, or till. Remove them during the heat of the day between waterings. Do not let them grow, because bigger weeds are harder to get rid of.

How to weed

Hand pulling and hand digging work well in small gardens. A hoe, especially a scuffle hoe, works well in larger areas. Tillers are practical only in large, open areas. They can damage roots or stems if they come too close to your plants. In general, hand weeding and hoeing are the best ways to weed in the home garden, because they let you weed close to your plants without damaging the roots.

Pull or hoe weeds when the soil is damp, but not wet. Working wet soil damages soil structure, especially if the soil is heavy. On the other hand, when the soil is too dry, weeds are hard to remove. Try to weed a day or two after you water or after the rain has stopped.

There are different types of garden hoes. The lightweight Warren hoe has a pointy tip and is good for weeding between plants. The hula or action hoe is a lightweight scuffle hoe. You use it by pushing and pulling it just under the soil surface. It pulls up small weeds, but does not work as well against bigger, older weeds.

Small hand tools like the Korean hand plow are good for weeding small areas and between plants that are close together. Another useful tool is the dandelion digger, also called a weeder or asparagus knife. It works well for prying up weeds with long taproots.

Disposing of weeds

It is best to take weeds out with the trash or put them in your yard waste bin. Some weeds will die as soon as you remove them, but others will re-sprout in your compost pile from just a small piece of stem or root. If you are not sure what type of weeds you have, take them all out to the curb.

Weed triage

If weeds have taken over your garden or you do not have much time, start weeding in order of importance.

First, dig up any weeds that are going to seed. Do not let them form seeds!

Next, remove all grasses and invasive weeds, like bindweed, quackgrass, thistle, and Himalayan blackberry. Never put these weeds in your compost pile, because they can re-sprout from just a small piece of stem or root. Throw them in your yard waste bin.

Finally, when you have the time, remove the other, less-invasive weeds.



Organic mulches control weeds and hold in moisture. When a mulch like straw breaks down, it turns into compost and improves the soil.

Using integrated pest management (IPM)

All gardeners have pest problems from time to time. Plant diseases, insects, slugs, and various animals can damage plants, but they will not necessarily kill them. How you react to a pest problem will depend on how much you value the damaged crop, how much it will cost to fight the pest, your feelings about pesticides, and your personal approach to gardening.

Many gardeners do not like to use pesticides because of potential harm to the gardener, the environment, children, pets, or other living things. Integrated pest management (IPM) is a holistic approach to garden maintenance. It predicts and prevents pest activity before it can take hold, which reduces the need for pesticides. With IPM, you decide how much damage you can tolerate, keep an eye on pest activity, prevent as many pest problems as you can, and control pests using the least toxic method.

Prevention

Remember, “An ounce of prevention is worth a pound of cure.” Before taking any pest control measures, follow these steps:

Grow healthy plants. The most important way to protect your plants is to give them what they need: sunlight, water, air, and

nutrients. Healthy plants have fewer problems with pests.

Choose disease-resistant varieties. Plant breeders have bred disease resistance into many plant varieties. Check seed catalogs and seed packets to see which varieties are resistant.

Rotate your crops. When crops change locations every year, pests have a harder time making a permanent home in your garden.



Black plastic mulch warms the soil, helping you grow heat-loving crops like melons and squash.





Run a scuffle hoe just under the surface of the soil to quickly remove weed seedlings.



Courtesy of Presidio of Monterey via Flickr

Rule out other causes for garden problems. Most problems are caused by human error, such as planting in the wrong spot, overwatering, or not using enough fertilizer. Things like a cat running through the garden or a pesticide drifting from a neighbor's garden can also cause problems that you might think were caused by an insect or disease.

Set a tolerance level. A few holes in the leaves do not mean the whole plant is going to die. Decide how much damage you can live with. You might come to see a few holes as a sign of your garden's healthy ecosystem!

Check plants regularly for insect damage. If you think you have a problem, check your plants several times a week and at different times of the day. Be sure to look at the undersides of leaves, where insects often hide. Catching problems early will make them easier to control.

Remember that not all bugs are bad. Most insects are harmless, helpful, or even necessary to the success of your garden. Make sure that the insects you see are actually a problem before rushing to get rid of them. The chart on the left shows some common beneficial insects. You can invite beneficial insects to your garden by growing a habitat for them. Some flowers, like alyssum and phacelia, attract beneficial insects. Try planting a border of these flowers near your vegetables. Certain vegetable plants will attract pollinators and other beneficial insects if they are allowed to bloom. Try letting a few of your carrot, arugula, or cilantro plants blossom. Also, use a coarse mulch like wood chips as a home for beneficial insects.

Pest control methods

If you find out that insects are the cause of your problem, you will need to bring the pest population back to acceptable levels using physical, biological, or chemical controls.

Physical controls

There are many ways to physically remove pests from plants.

Hand picking large or slow-moving insects, slugs, and snails can keep pests in check in small gardens. Be sure to look for pests on the undersides and in the folds of leaves.

A strong stream of water from your garden hose can knock off, injure, or drown small, soft-bodied pests. This works well on aphids, mites, mealybugs, and spittlebugs. The water must hit the pests directly, so aim at the undersides of leaves too. Spray water early in the day so plants have a chance to dry before evening. You may need to repeat every few days as new insects hatch.

For more information and help troubleshooting plant problems, visit:

Gardening.Cals.Cornell.edu

Use clippers to prune out clusters of insects like aphids, or single leaves that look unhealthy.

Hang netting over your plants, especially corn and bean seedlings, to keep out birds and cats (though maybe not squirrels). Garden netting will last for a few years before it needs replacing.

Floating row cover is a lightweight white fabric used to cover garden beds. It keeps out pests but lets air, light, and water reach the plants growing underneath. Lay down the fabric right after sowing seeds, and bury the edges or hold them in place with bricks, rocks, or landscape staples. You may want to leave the cover on all season. Just loosen it as your plants grow.

Plant collars can protect seedlings from cutworm damage. Use toilet paper tubes, tin cans, or paper cups to form a collar around each seedling. Bury the edge 1 inch deep.

Shiny objects can scare birds away from your crops. Drape shiny ribbon through plantings of tall or vining plants like corn and pole peas and beans. Hang old CDs in the garden. Place shiny pinwheels in your garden beds.

Chicken wire keeps cats, birds, and squirrels from scratching in the soil. After you sow seeds, place the wire directly on the soil or raise it slightly above the bed. Remove it once the seeds start to grow.

Biological controls

Beneficial insects, birds, bats, snakes, frogs, toads, and moles keep insect pests under control in a well-balanced ecosystem. Competition from other microorganisms keeps disease-causing organisms from taking over. When things get out of balance, you can use the following biological methods to control pests:

Encourage beneficial insects like ladybugs, green lacewings, and minute pirate bugs. They eat large numbers of “bad” bugs. You can buy them online or in garden stores.

B.t. (*Bacillus thuringiensis*) is a bacterium that is poisonous to some insects. When a pest insect eats B.t., it stops feeding and dies. B.t. is harmless to most beneficial insects and is safe around humans, plants, and other animals. You can buy B.t. where garden products are sold.

Chemical controls

IPM focuses on using prevention, physical controls, and

biological controls first, but there may be times when you decide to use a pesticide.

Pesticides can be made from either synthetic or natural chemicals. Some are even okay for use in organic gardening. But any chemical method of pest control raises concerns about human safety, toxicity to beneficial insects, runoff, leaching, disposal problems, and possible residue on food crops. Pesticides should be a last resort. Use them only if nothing else works, and always follow the directions on the label.

When choosing a pesticide, be sure that it is labeled for the plant you plan to use it on. This is especially important for edible plants. Choose pesticides that are:

- Least toxic to you
- Most specific to the pest you are targeting
- Least harmful to the environment

Options for organic gardeners:

Insecticidal soap is one of the safer pesticides for control of insect pests. Soap kills by damaging an insect’s outer skeleton. It is useful against soft-bodied pests like aphids, thrips, mites, and some caterpillars. Insecticidal soap is virtually non-toxic to humans and other animals.

Insecticidal soap must touch the pests directly to kill them. It works only while it is still wet, and there is no residue after it dries. It does not kill insect eggs, so repeat sprays often are needed to control newly hatched pests.

Soap can damage certain plants, so be sure to follow label directions.

Neem oil is a natural pesticide that is effective and safe to use in vegetable gardens. It kills fungus growth on plants. It is even used on tomatoes and melons, where fungus can spread too fast for synthetic fungicides to work. Neem is also used to smother insect eggs and soft-bodied pests like aphids, mites, and white flies.

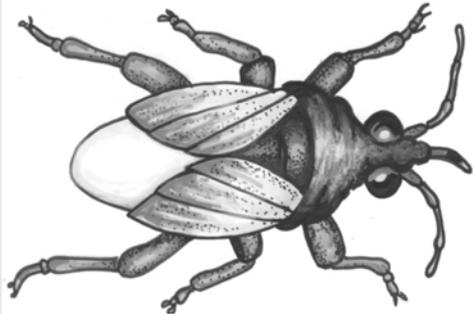
Iron phosphate granules (Sluggo, WorryFree, and Escar-Go). The wheat smell of this non-toxic bait attracts slugs. Slugs stop feeding, dry out, and die in 3 to 6 days after eating the bait. The bait stays active for about 1 week or longer, depending on the weather.

All of these products are sold at most garden centers. Other pesticides are also available. Contact your local Master Gardeners to learn more.

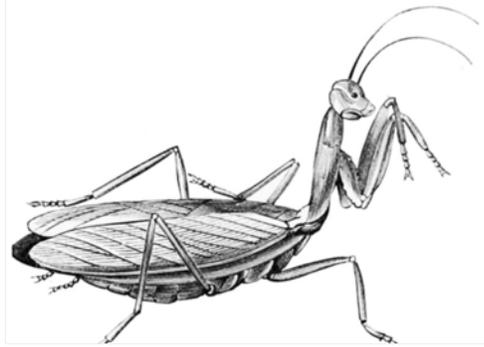


Beneficial Insects

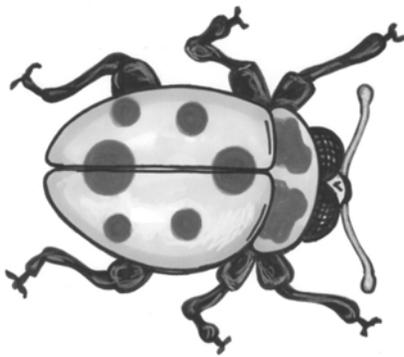
Beneficial insects like these help in your garden by eating pest insects.



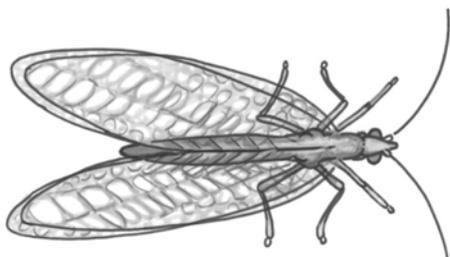
Minute Pirate Bug



Praying Mantis



Ladybug/Lady Beetle



Green Lacewing

Need help identifying an insect?
Ask your local Cooperative Extension!

cce.cornell.edu/localoffices

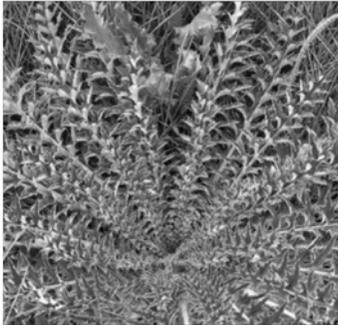
Some invasive weeds can re-sprout from just a small section of root. To be safe, put all weeds in the garbage or yard waste bin, not in your home compost pile.

Invasive Weeds



Giant Hogweed

Compound leaves, up to 5' in diameter



Thistle

Creeping roots, prickly gray green in color



Field Bindweed

Twining, with a flower similar to morning glory



Quackgrass

Creeping rhizomes, fibrous roots

Identifying common pests

Aphids

Aphids are tiny, slow-moving, soft-bodied insects that may be green, yellow, or black, sometimes with wings and sometimes without. They weaken plants by sucking juices from tender growth and spreading disease. Damage includes curled leaves, yellowish spots, and shiny leaves from “honeydew,” a sticky substance the aphids produce.

Why is this pest in my garden? Almost every vegetable has at least one species of aphid that likes to feed on it. Most plants can live with a little aphid damage. Plants that are sickly, stressed, underwatered, under-fertilized, or over-fertilized have trouble protecting themselves from aphids.

Control methods: Keep plants healthy by giving them enough nutrients, water, and sunlight. Use organic fertilizers, which release nitrogen slowly into the soil. Introduce natural predators like ladybugs and green lacewings. Avoid broad-spectrum pesticides, which kill a wide range of insects, including natural predators. Plant “trap crops” like nasturtium to lure aphids away from your vegetables. Use a strong stream of water from a hose to blast aphids off plants or crush the aphids by hand. Be sure to check the undersides of leaves so you get all the aphids on the plant. Insecticidal soap is a good control for aphids, but you have to spray it directly on the aphids to kill them.

Courtesy of www.istockphoto.com



Place netting or chicken wire directly over the soil to keep cats, birds, and squirrels from scratching in your beds and damaging your seedlings.



Plant collars protect against cutworm. Use toilet paper tubes, tin cans, or paper cups to form a tube around each seedling.

Cabbage maggots

Cabbage maggots feed on the stems and roots of cabbage family crops, such as broccoli, cabbage, Brussels sprouts, radishes, and turnips. They stunt the plants, cause them to wilt during the day, and sometimes even kill them. Root crops with cabbage maggot damage may be too full of holes to eat by the time you harvest them.

Why is this pest in my garden? Cabbage maggots can overwinter in old plant material and emerge as adult flies the following spring. Wild mustard is also a home for this pest.

Control methods: Get rid of overwintering sites by cleaning up and destroying plant debris in fall. Also, get rid of any wild mustard around your garden. Cover plants with floating row covers to keep the adult flies from laying eggs on or near the plants. Those eggs will develop into cabbage maggots. A paper disc on the soil around the stems of your plant might help keep maggots from moving off your plants and into the roots.



Cabbage worms

These small green caterpillars are the young form, or larvae, of the imported cabbage butterfly. They attack cabbage family varieties, such as kale, broccoli, and collard greens, by eating large, jagged holes in the leaves. The size of the caterpillars depends on their age. They are usually easy to see on stems or the undersides of leaves.

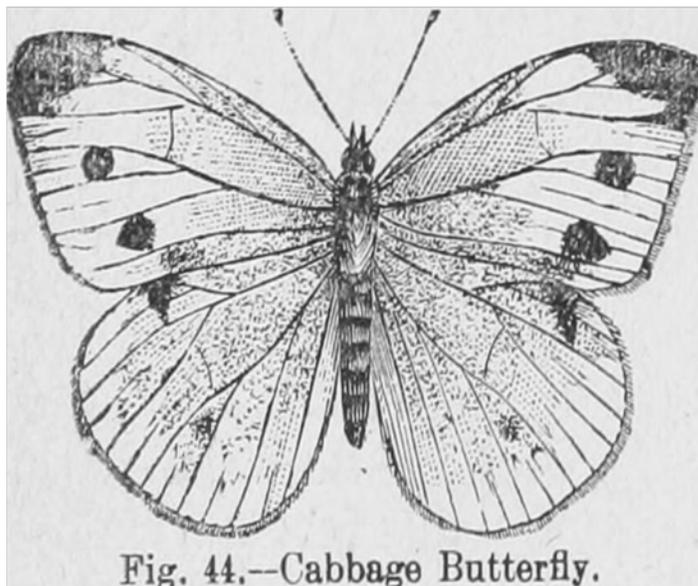
Why is this pest in my garden? Cabbage worms overwinter on cabbage family plants and appear in mid-spring. Leaving cabbage family plants in the garden during winter encourages cabbage worms.

Control methods: Older plants can handle some damage from cabbage worms. Cover young cabbage family plants with floating row cover to prevent the adult butterflies from laying eggs on the plants. Those eggs will develop into cabbage worms. Remove worms by hand picking. Remove cabbage family plants in fall.

Cucumber beetles

These small but easy-to-see beetles look like yellow ladybugs with black spots. They chew holes in cucumber, zucchini, squash, and melon leaves.

As they feed on the plants, they spread plant diseases.



Courtesy of Michigan State Horticulture Society via Flickr

Why is this pest in my garden? Cucumber beetles spend the winter in protected sites, such as under old plant material, in wooded areas, and in cracks of buildings and fence posts. They come out when temperatures reach 50°F in spring. In summer, cucumber beetles like the moist soil under cucumber, melon, and squash fruits.

Control methods: Use floating row covers to protect young squash, melon, and cucumber seedlings. Remove the covers when the plants start to bloom so that bees can pollinate them. Take away hiding spots by growing plants vertically. In late summer, water only the roots of plants to limit cucumber beetle damage. After harvest, remove old plant material, especially roots and fruits. Hand pick and squish cucumber beetles when you see them.

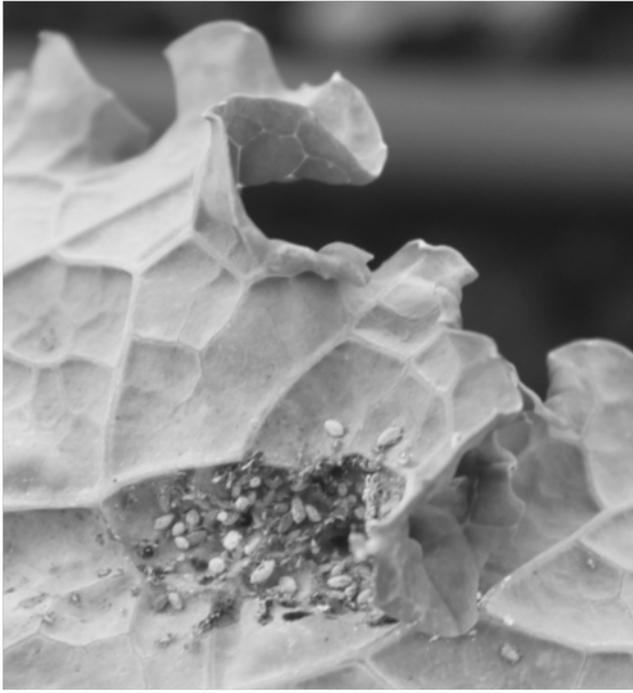
Flea beetles

These tiny, blue-black beetles eat holes in the leaves of many vegetables. Leaves with flea beetle damage look like they have been hit with a spray of tiny bullets. The beetles are about the size of a pinhead and jump like fleas when you get near them.

Why is this pest in my garden? Flea beetles feed on many crops, including beans, beets, cabbage family members, corn, mustard and other greens, eggplant, peppers, potatoes, and tomatoes. They like small, tender leaves and do more damage to young seedlings than older plants, which have “outgrown” them.



Neem oil, iron phosphate granules, and insecticidal soap are some of the pesticide options available to organic gardeners.



Aphids clustered on the underside of a kale leaf.

Control methods: Older plants can handle a lot of flea beetle damage without suffering, so control may not be necessary. You could plant large, healthy transplants that will quickly outgrow flea beetles. Or you could use floating row cover to protect seedlings and small transplants.

Leafminers

Leafminers are tiny white or yellowish maggots that live inside leaves. You will notice leafminer damage before you notice the maggots. Leafminers feed on the plant tissue between the upper and lower surfaces of the leaves. They make squiggly, hollow tunnels as they move through the leaves. If you notice this damage, you can tear one of the mined leaves in half to see the tiny maggot inside. The maggots grow into adult leafminer flies.

Why is this pest in my garden? Leafminers feed on beets, chard, spinach, and other members of the beet family, including common weeds like lamb's quarters and pigweed. They overwinter in the soil near crops that they fed on the year before. Then they come out in April or May to feed on leaves.

Control methods: Place floating row covers over your beet, chard, and spinach plants as soon as you seed them. This will keep leafminer flies from laying eggs on the plants. Crop rotation helps to keep overwintered leafminers from reaching next year's crop. Rotate your beets, chard, and spinach to a new

spot in your garden each season. Keep your garden free of weeds, especially lamb's quarters and pigweed. If you find damaged leaves, cut them off your plants and put them in your green waste or garbage bin, not your compost.

Slugs

Slugs are like snails without a shell. They are soft-bodied and slimy, and can be less than an inch to several inches long. Slug damage on a plant is easy to see. The plant has slime trails and irregular holes with smooth edges.

Why is this pest in my garden? Slugs prefer mild winters, wet springs, moist summers, and watered soil. The amount of slug damage depends mainly on rainfall and nighttime temperatures. Slugs need soil moisture, and they feed only when temperatures are over 50°F. They hide and lay eggs in places like grass, mulch, soil cracks, rocks, boards, debris, and worm tunnels. Slugs lay eggs in fall after rains start, usually in late September and early October. It is best to control slugs before they lay eggs.



Typical cabbage maggot damage on a root crop.

Courtesy of University of Minnesota, Dept. of Entomology



Control methods

Hand picking. Slugs come out at night, so hand pick them off plants about 2 hours after sunset. Slice them in half, sprinkle them with salt, or scrape them into soapy water. In the daytime, turn over boards and other hiding places, and get rid of the slugs you find.

Trap boards. Slugs look for shelter during daylight. Place small, flat boards under plants and between garden rows. Get rid of the slugs you find under the boards each morning.

Beer traps. The smell of yeast attracts slugs. To make a beer trap, cut a 2-inch hole about two-thirds up the side of an empty margarine or yogurt container. Bury the container so the hole is just above ground. Add 2 to 3 inches of beer, and cover with a lid. Instead of beer, you could mix together 1 tablespoon yeast, 1 tablespoon flour, 1 tablespoon sugar, and 1 cup water. Remove dead slugs every day. Replace with new beer or yeast mixture every week.

Trap crops. Slugs love marigolds. Plant marigolds along your vegetable garden border, and hand pick slugs at night.

Baits. Iron phosphate granules (Sluggo, WorryFree, and Escar-Go) kill slugs by freezing up their digestive systems so that they can no longer eat. Slugs cause the most damage to vegetable gardens when plants are young. Use the bait just before or when you plant or seed. If the soil is dry, sprinkle it with water just before putting down the bait. That will encourage slugs to come out of their hiding places. Put out bait again in early fall, before slugs start laying their eggs. Bait once more a little later in fall to kill slugs that just hatched. Read the product label before using.

Squash vine borers

The adult version of this pest is a wasp-like moth with metallic green forewings. The name essentially comes from the way in which the larvae bore into the stems of squashes, pumpkins, gourds, cucumbers and muskmelons. The feeding process



Cucumber beetles look like yellow ladybugs with black spots.

attacks the vascular system of the plant, causing the vines to wilt and die.

Why is this pest in my garden? The emergence of adult moths from the pupae and vine crops are aligned. Eggs are glued to the stems and leafstalks near the base of the plant. The new, young borers feed on the new vine crops and cause damage.

They make cocoons in the soil and overwinter, emerging in the spring to feed again.

Control Methods: The use of row covers can be effective in preventing insects from reaching a crop, but must be securely anchored down on all sides. When the plants begin to bloom, remove covers to allow pollination. Scout your garden early for infestations, looking for borer eggs near the base of the stem and removing them before they hatch. There is one insecticide treatment registered in New York State called kaolin clay that can suppress the borer if the larvae is controlled before entering the stem. After each harvest year destroy leftover crop residue and change planting sites for next year.



Cabbage worms eat large, jagged holes in plant leaves.

Further Reading:

Plant Disease Diagnostic Clinic Factsheets
plantclinic.cornell.edu/factsheets

Vegetable MD (includes some Pest & ID guides in Spanish)
vegetablemdonline.ppath.cornell.edu

Insect Diagnostic Lab Factsheets
idl.entomology.cornell.edu/factsheets



Leafminers create hollow tunnels in spinach, chard, and beet leaves.



Courtesy of Lindsey Shapiro, Root Mass Farm

Leaves with flea beetle damage look like they have been hit with a spray of tiny bullets.

Squash vine borers attack the vascular system to the plant, causing the vines to wilt and die.

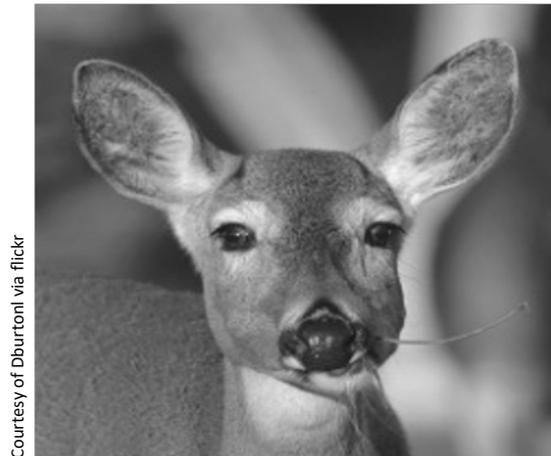


Courtesy of MWM5916 via Flickr



Animal Pests

We also need to keep an eye out for the pests that aren't so small. Common larger pests seen eating our vegetables are deer, woodchucks and rabbits. As deer populations increase, sightings are becoming more common in backyards and gardens. Avoid planting trees close to your house to avoid connectivity with any surrounding forest area. If you have a small garden, a low fence is OK, but a larger garden will need tall fencing. Fencing is the most effective option for keeping your garden from being destroyed. Take a look at the table adjacent to get an idea of what plants deer may avoid in a garden. No one plant is "deer-resistant", but may be less susceptible to a hungry deer.



Courtesy of Dburtonl via flickr

Plant Diseases

Practicing early prevention can potentially save you and your garden or landscape from unwanted plant diseases and stress. Using good judgement and a variety of resources can help determine if a plant is susceptible to or has been affected by a disease. To minimize plant disease, choose disease resistant varieties and a sunny, well drained area to plant. Spacing plants evenly maintains humidity levels and allows rain water to dry faster. The use of cover crops will add nutrients to the soil when plowed next spring. Try rotating crops each year, which can prevent the buildup of diseases over time.

For more information

visit *Oh Deer!*

Available at:

www.gardening.cornell.edu

Plants least likely to be eaten by deer

Herbaceous Perennial	Annual
Rhubarb	Snapdragon
Thyme	Elephants ear, taro
Feverfew	Spider flower
Chinese peony	Tobacco



Courtesy of Anneliese Emmons Dean, thebigbuzz.biz

Slugs are attracted to the smell of yeast and will drown in a "beer trap."