

Beginners Guide to Planning a Vegetable Gardening

By Tracey L. Payne



This garden contains mostly storage crops like potatoes, carrots, onions, garlic, and winter cabbage. An ATV was driven back and forth over freshly cultivated soil to mark out approximately 3 foot wide beds. The wheel tracks from the quad make excellent garden paths. As can be seen in the picture below.



Who will be doing the work? Will the garden be a group project with family members or friends who will work willingly through the season to a fall harvest, or will you be handling the hoe alone, in between camping and swimming?

What do you and your family like to eat? Although the vegetables pictured in the garden catalog look delicious, there is no value in taking up gardening space with vegetables that no one eats. Make a list of your family's favorite vegetables, ranked in order of preference. This will make a useful guide in deciding how much to plant of each. Successive plantings of certain crops, such as beans, will give you a long harvest period and increase your yield while saving space. List recommended varieties and planting dates.

How do you plan to use the produce from your garden? If you plan to can, freeze, dry, or store part of the produce, this will be a factor not only in planning the size of the garden but also in plant selection since some varieties have much better keeping quality than others. Make sure the varieties you select are adapted to your area and intended use.

How much space is available? That is, how much area can be converted into usable garden space, not simply how much empty ground is available.

Helpful Suggestions

- Plan the garden on paper first. Draw a map showing the arrangement and spacing of crop.
- Order seeds by January or February. Some plants may be started indoors as early as mid-February.
- Place the tall and trellised crops on the north side of the garden so they won't shade the shorter vegetables.

Locating the Garden

Vegetables grow best in a level area with loose, well-drained soil, and at least six hours of sun (8-10 hours is ideal). Use contour rows or terraces on sloped or hillside sites to avoid erosion. South-facing slopes are warmer and less subject to damaging frosts.

Avoid placing the garden in low spots, at the base of a hill, or at the foot of a slope bordered by a solid fence. Such areas are slow to warm up in the spring and frost settles in these places since cold air naturally drains into low areas.

Avoid windy locations. If you must plant in a windy spot, build or grow a windbreak. Locate near a reliable and accessible supply of water if possible. Choose a spot near your home so it is convenient to work in the garden when you have a few minutes. Avoid planting near trees and shrubs; they compete for nutrients and water, and may cause excessive shading.

Sites too close to buildings may result in plants not receiving enough sunlight. If possible, observe shading patterns through the growing season before starting the garden. If you have a shaded area you wish to use anyway, plant it in shade-tolerant crops.

Try not to plant related vegetables in exactly the same location in the garden more often than once in three years. Rotation prevents the buildup of insects and disease. Use old plans as guides for rotating crops.

Many factors influence the growth of -plants: water, light, air, temperature, humidity, nutrients, soil. Growth depends on a favorable combination of these factors. Any one of them, out of balance with the others, can reduce or even entirely prevent the growth of plants. Thus, the factor which is least available will often limit the extent of plant growth.

Require Bright Sunlight		
Beans	Corn	Potatoes
Broccoli	Cucumbers	Squash
Cauliflower	Onions	Strawberry

Tolerate Partial Shade		
Beets	Celery	Parsley
Brussels Sprouts	Chard	Radish
Cabbage	Spinach	Kale
Carrots	Lettuce	Turnips

A Garden Plan

The following is the plan for my own vegetable garden (planted in double rows) from 1988 in the Houston area. That year I had a garden that was about 500 square feet and a small plastic covered green house that was approximately 8 feet by 10 feet. I planted the cucumbers and the tomatoes in the green house.

The crop per person information was obtained from Harrowsmith's Northern Gardener by Jennifer Bennett. Harrowsmith has recently published an updated, 15 year anniversary edition of this useful book.

Vegetables	Crop / person	Growing area (sq. ft.)
Beans	112g	25
Beets	10 - 20 '	20
Broccoli	10 plants	15
Cabbage	5 plants	15
Carrot	25 '	30
Cauliflower	5 plants	15
Cucumbers	1 plant	20
Lettuce	10 '	20
Onions	1 box	25
Onions	multipliers	8
Peas	100 g	25
Spinach	30'	25
Swiss Chard	30'	25
Tomatoes	10 plants	30
Radishes	5'	5
Dill	3 plants	5
Chives	1 plant	2
Parsley	3 plants	5
Oregano	3 plants	5
Sage	3 plants	5



Broad Beans are hardy to zone 2 and are the earliest seeds that can be direct seeded into the soil. They have beautifully scented flowers that attract beneficial insects to the garden. Bush Beans and Pole Beans however; need very warm soil, and should not be planted until the beginning of June.

Vegetable Seeds

Selecting your vegetable seeds is one of the most enjoyable gardening pastimes. Thumbing through colorful catalogs and dreaming of the season's harvest make winter seem a little warmer.

Keep notes about the seeds you purchase - their germination quality, vigor of plants, tendency toward insects and disease problems, etc. From this information you can determine whether a seed company is not meeting your needs or whether the varieties you have chosen are unsuitable for your area or gardening style. For example, if powdery mildew is a big problem on squash-family plants in your area, the next year you may want to look for mildew-resistant varieties.

Depth for Planting Vegetable Seeds

The depth to cover seeds when you plant them depends on a number of factors, such as the size of the seed, the type of soil you have, and the season of the year. As a general rule, vegetable and flower

seeds should be covered about four to five times their lateral diameter or width (not their length). There are exceptions, however; read the packet directions. Some seeds require light for germination and should not be covered at all. These instructions apply to seeds planted both indoors and out.



There are many options of pots and plug trays available to home gardeners. Use them with a watering mat (an inexpensive polyester blanket cut into sections works) underneath to keep moisture into contact with the bottom of the pot or tray instead of completely draining away.

Starting Seeds Indoors

To successfully start seeds indoors, first be sure you have enough light. More homegrown seedlings are probably lost to this one factor than to any other. Vegetable seedlings grown under low-light conditions will most likely be leggy and weak, and many will fall over under their own weight after they are 3 to 4 inches tall. If you do not have a sunny room or back porch with a southern exposure, you will probably need supplemental lights. A simple, fluorescent shop light with one warm-white and one cool-white bulb (or with gro-lights) will suffice.

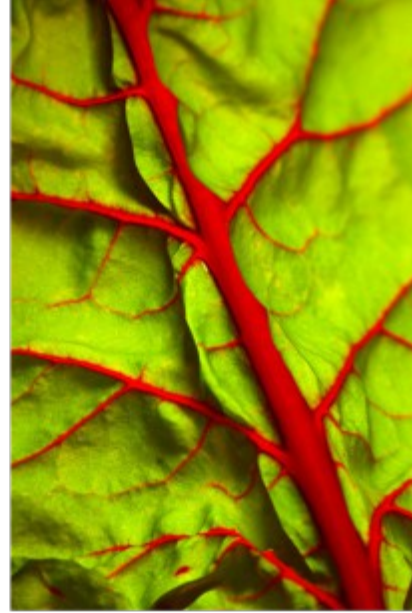
It is probably easiest to use a soilless or peat-lite mix to start seedlings, since garden soil contains disease organisms which can be highly destructive to small plants. You can mix your own peat-lite mix if you prefer -- 50 percent vermiculite or perlite and 50 percent fine sphagnum peat, by volume, is

excellent for starting seeds. Fertilizer at half the normal strength may be added to the mixture. Mix all together well.

Many types of containers can be used to start seeds. Flats or other large containers may be planted in rows and the seedlings grown until they have one or two sets of true leaves. At that point they are transplanted into other containers for growing to the size to transplant outdoors. Also, seedlings may be started in pots, old cans, cut-off milk cartons, margarine tubs, egg cartons, or other throwaways. The "pop-out" trays found at garden centers are easy to use and re-usable. Peat pots are nice, especially for large seeds and herbs. Sow one or two large seeds, or 10 to 12 small herb seeds, directly in each peat pot. Thin the former to one seedling per pot, but allow all the herb seeds to grow together. They hold each other up and grow much better than if sown singly. When transplant time comes, they are strong enough to take some dividing if desired. Peat pots may be planted directly in the garden; remove one side and do not allow the edges of the pot to stick out above the soil, since they will act as a wick, and moisture will evaporate from this exposed surface.

Regardless of the type of container chosen, fill it 3/4 full with seed-starting mixture and sow the seeds. Cover to the specified depth and water the mix. If your home is dry, it may help to cover the containers with plastic wrap to maintain a steadier moisture level. Seeds and seedlings are extremely sensitive to drying out. They should not be kept soaking wet, however, since this condition is conducive to "damping-off," a fungal disease deadly to seedlings. Damping-off can be prevented or diminished by sprinkling milled sphagnum moss, which contains a natural fungicide, on top of the soil. Place a tiny (<5") inexpensive fan 3 or 4 feet away from your seedlings to ensure air movement. This is an effective remedy for damping off.

Another option is to use peat pellets or cubes, which are preformed and require no additional soil mix. The pellets or cubes are soaked until thoroughly wet, then seeds are planted in the holes provided. The whole pellet or cube may then be planted without disturbing the roots. The only disadvantage to this method is the expense.



Rain bow chard is very easy to grow and a great alternative to spinach which preforms poorly, trying to set seed, once the days become longer.

Starting Seeds Outdoors

Many seeds may be sown directly in the garden. If your garden soil is quite sandy, or is mellow with a high content of organic matter, the seeds may be planted deeper. Young seedlings can emerge quite easily from a sandy or organic soil. If your garden soil is heavy with a high silt and/or clay content, however, the seeds should be covered only two to three times their diameter. In such soils it may be helpful to apply a band of sand, fine compost, or vermiculite 4 inches wide and 1/4 inch thick along the row after your seeds are planted. This will help retain soil moisture and reduce crusting, making it easier for seedlings to push through the soil surface. Soil temperature has an effect on the speed of seed germination. In the spring, soil is often cold, and seeds of some plants will rot before they have a chance to sprout.

. . . Do not plant your seeds until you see that the soil is warm enough to produce seedlings from weed seeds. Usually by the third week in May here. . . .

Moisture can also be retained with shallow mulch or by covering the row with a board until the seeds have sprouted. This is a very good technique for planting peas particularly if crows are a problem in your garden. Shading the area may be helpful to keep the soil cooler for seed germination, especially when planting cool-weather crops in summer.

Row Planting

A string stretched between stakes will provide a guide for nice straight rows, if desired. Use a hoe handle, a special furrow hoe, or a grub hoe to make a furrow of the appropriate depth for the seed being planted. I like to use a 1X4 inch board that is about 3 feet long. I use it on its edge to make the furrow. Sow seed thinly; it may help to mix very small seeds with coarse sand to distribute the seeds more evenly. Draw the soil over the seed, removing stones and large clods. I sometimes use a plastic kitchen colander for this chore. Firm the soil over the seeds with the flat side of the same 1X4 board and water to improve soil/seed contact. When plants have grown to 4 to 6 inches tall, thin according to seed packet instructions to provide adequate room for growth.

Broadcast Planting

Many crops can be sown in wide rows or beds instead of long, single rows. Crops such as spinach, bean, pea, beet, lettuce, and carrot are especially suited to this type of culture. Seed should be sown evenly over the area, then raked-in with a rake or three-pronged hand cultivator. Firm the soil over the seeds, then thin young plants to allow room for growth.

Hill Planting

Larger vegetables such as squash, and pumpkins may be planted in hills. The soil is mounded to a foot or so in diameter, at the recommended spacing. Plant four to six seeds per hill, firming the soil well. Thin the seedlings to three to five plants per hill.



Onion, cabbage, broccoli, and lettuce transplants in plug trays, placed in a makeshift cold frame for hardening off, before planting into the garden. It is very beneficial to leave transplants outside in a sheltered location for a couple of days before planting into the garden. This cold frame has two covers for protecting the transplants. A polyester fabric (row cover) and plastic wrapped around plastic sewer pipes with a wooden rod through the centre for ease of rolling out.

Transplants for the Garden

Most gardeners use transplants in their gardens at some time or another to give long-season plants a chance to grow to maturity under their preferred weather conditions, or just to lengthen the harvest season. Cool-season crops, such as head lettuce, broccoli, and others, would not have a chance to reach their prime harvest stage in most places in Burns Lake in the spring if not given those extra weeks indoors to get a head start.

Due to the amount of time, attention, and need for controlled growing conditions, many gardeners prefer to purchase plants for their gardens. However, for a larger choice in varieties and the control of plant production from seed to harvest, others choose to start their own.

Annual Plants

Transplants of annual vegetables and flowers should be stocky, healthy, free from disease, and have good roots. They should not be too small or too mature (tomatoes will transplant all right with fruits already on them, but many other plants will drop flowers or fruit after transplanting). Be sure plants have been hardened-off so they will easily adapt to environmental changes, but they should not be so hardened that they are woody and yellow. Successful transplanting is achieved by interrupting plant

growth as little as possible. This is one of the advantages of using peat pots or peat pellets, which do not have to be removed when transplanting.

Have the garden soil prepared before transplanting. All additives which require time to break down, such as manure, limestone, rock fertilizer, and green manure, should be incorporated at least several weeks before planting. Quick-acting (hydrated) lime, fertilizer, and well-decayed compost may be added just before planting.

Transplant on a cloudy day, in late afternoon, or in early evening to prevent wilting. It helps to water the plants several hours before transplanting. Handle plants carefully. Avoid disturbing the roots or bruising the stems.

Dig a hole large enough to hold the roots of the plants. Set the plants slightly deeper than previously planted and at recommended intervals. Tomatoes are an exception to the rule of how deep to plant; they will develop roots all along the stems, and you can plant deep enough to leave only two or three sets of leaves exposed. Press soil firmly around the roots of transplants. Pour about a cup of starter solution in the hole around the plant. Use a solution about half the strength recommended for that type of plant during the normal growing season. Use fish emulsion or well diluted manure tea. For a few days after transplanting, protect the plants from wind and sun by placing a piece of newspaper or cardboard on their south sides, or by covering with jugs, baskets, or flower pots. Water the plants once or twice during the next week if there is insufficient rain.

Perennial Plants

When buying small fruit plants and perennial crowns, such as asparagus order early or buy from reliable local outlets. If you are buying "bargain" sale plants, watch for plants that have dried out excessively or have been damaged by heat, etc. Select varieties that will do well in your growing conditions. For perennial plants, it will pay to do some research to find out what the major disease and insect pests are and buy resistant varieties. Dormant bare root plants and one- or two-year-old crowns are preferred. Look for roots that are full, slightly moist, and have color. Roots that are dry-brown or soggy-black are indicative of poor storage and will probably not give good results. Check crowns for signs of viable buds. Inspect plants for signs of insects or disease.

Once you have the plants, do not allow the roots to shrivel and dry out. Keep the roots moist (but not soaking wet) by misting occasionally, and do not allow them to freeze or be exposed to high temperatures. If it is necessary to keep the crowns for more than a few days, place in cold storage (not freezing) or else bury the roots (heel) in a trench of moist soil in a shaded location. Pack soil firmly against roots to eliminate any air pockets. Transplant crowns according to directions, digging holes large enough to give the roots plenty of room to spread. Remove any roots which are discolored or dried out. Perennial plants appreciate a dose of compost mixed into the bottom of the hole

Once transplanted, shade the plants if necessary and water when needed. This extra care at the beginning of their growth will result in more productive, healthier plants.

Ease of Transplanting

Easily Survive	Require Care	Not Transplanted*
Broccoli Cabbage Cauliflower Lettuce Onions Tomatoes	Celery Cucumber Peppers Squash	Beans Beet Carrot Pea Radish Spinach Turnip

*Most of these kinds of vegetables have long tap roots that are negative effected by transplant container.



There are many versions of drip tape available at better garden stores. They are a very useful long term investment for the success of a vegetable garden. Used with a electronic time or a flow metre drip tape distributes water right to the base of the plants. No watering the weeds in between the rows.

Irrigation

Adequate soil moisture is essential for good crop growth. A healthy plant is composed of 75 to 90% water, which is used for the plant's vital functions, including photosynthesis, support (rigidity), and transportation of nutrients and sugars to various parts of the plant. During the first few weeks of growth, plants are becoming established and must have water to build their root systems.

. . . vegetable crops need about 1 to 2 inches of water per week in the form of rainwater or irrigation water . .

While growing, vegetable crops need about 1 to 2 inches of water per week in the form of rainwater or irrigation water depending on the type of soil. One thorough watering each week is usually enough for most soils. The soil should be wetted to a depth of 5 to 6 inches each time you water and not watered again until the top few inches begin to dry out. An average garden soil will store 2 to 4 inches of water per foot of depth. Keep a rain gauge near your garden, then supplement rainfall with irrigation water when needed. In addition, there are ways to reduce the amount of water you have to add.

Reducing Water Demands

All of the water added to the garden may not be available to plants, particularly if the soil is a heavy clay. Clay particles hold soil moisture tightly; if, for example, there are 4 1/2 inches of water per foot of this type of soil, there may be as little as 1 1/2 inches of this water available for plants. A higher level of humus in the soil, brought about by the addition and breakdown of organic matter, can increase the amount of water available. By causing clay particles to aggregate (stick together), humus also adds air spaces to tight clays, allowing moisture to drain to lower levels as a reserve, instead of puddling and running off the top of the soil.

The moisture-holding capacity of sandy soils is also improved by additions of organic matter. Though most soil water in sandy soil is available to plants, it drains so quickly that roots are unable to reach water only a few days after a rain. Humus in sandy soil gives the water something to cling to until it is needed by plants. Additions of organic matter, then, is the first step in improving the moisture conditions in your garden.

Mulching is another cultural practice which can significantly decrease the amount of water that must be added to the soil. A 6 to 8 inch organic mulch can cut water needs in half by smothering weeds (which take up and transpire moisture) and by reducing evaporation of moisture directly from the soil. Organic mulches themselves hold some water and increase the humidity level around the plant. Black plastic mulch also conserves moisture but may dramatically increase soil temperatures during the summer if not covered by other mulch materials or foliage.

Shading and the use of windbreaks are other moisture-conserving techniques. Plants that wilt in very sunny areas can benefit from partial shade during the afternoon in summer. Young plants, especially, need protection. Air moving across a plant carries away the moisture on the leaf surfaces, causing the

plant to need more water. In very windy areas, the roots often cannot keep up with leaf demands, and plants wilt. Temporary or permanent windbreaks significantly reduce this stress.

Despite the use of these cultural practices, your garden may need a lot of water. When rainfall is sparse and the sun is hot, watering can benefit your garden with increased yields. It may save the garden altogether in a severe drought.

Resources

Information for this article was gleaned by the author from several sources including the INTERNET. The material was adapted primarily from Extension Publications, from Harrowsmith's Northern Gardener and from the author's own experience.

Recommended Books

"Northern Gardener" by Jennifer Bennett, 1982. Camden House Publishing Ltd. Queen Victoria Road, Camden East, ON ISBN 0-920656-22-6

"Lois Hole's Northern Vegetable Gardening" by Lois Hole, 1995. Lone Pine Publishing, 206, 10426-81 Avenue, Edmonton, AB ISBN 1-55105-029-3 \$14.95 CDN

Mail Order Seed Catalogues

Vesey's Seeds Ltd. Seeds for Shorter Seasons York, Prince Edward Island, COA 1P0 Ph. (902) 368-7333, Fax (902) 566-1620 FREE catalogue

The Cook's Garden Seeds & Supplies for the New American Kitchen Garden. PO Box 535, Londonderry, Vermont 05148 Ph. (802) 824-3400 Fax (802) 824-3027

Stokes Seeds Ltd. Quality Seed since 1881. 39 James St. Box 10, St. Catherine's, ON L2R 6R6 Ph. (905) 688-4300 Fax (905) 684-8411 FREE catalogue