



Basic Gardening Manual for Northern Manitoba



Northern Manitoba Basic Gardening Guide

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Northern Gardening

Gardening is an activity that was important in northern and remote communities in the past. Historical reports from 250 years ago tell about successful potato and turnip gardens as far north as York Factory. Discussions with elders today provide an idea of past events relating to garden development. People grew gardens, built root-houses and stored their own food as a way of feeding their families. Gardening was a way to provide a variety of food in the diet. By reclaiming the knowledge of gardening, people can improve their nutrition and health.

How can we help more people discover the benefits of gardening?

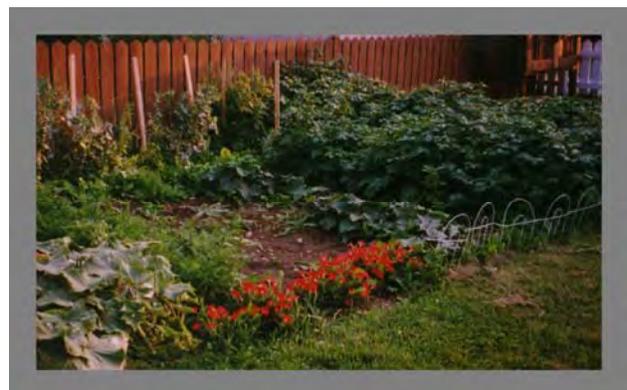
1. Talk to people in the community about gardening—many people had gardens in the past and have lots of experience and knowledge.
2. Find people who are interested in learning to grow gardens
3. Look for a good place to have a garden.
4. Each gardener can teach another person about gardening
5. Communities can arrange workshops using local resources to share knowledge about gardening
6. Band Councils or Community Councils can be asked for support
7. Schools can be encouraged to start youth gardening clubs
8. Youth gardening projects can be organized during summer holidays

9. Local stores can be asked to sell gardening supplies

You and the gardeners in your area may have other ideas to share. Once people harvest and taste some of their homegrown produce, they are excited about gardening and start planning for next year! It grows on you!

The north has a short growing season if you count the days between spring frost and fall frost. In the north however, we're lucky because each day in the summer is a long one. The main idea is to have the plants start growing right after the last spring frost in June. That way, plants can take advantage of the longest days of the year. The plants need heat, water and attention during this time, so they grow quickly while the weather is good.

Harvesting can start in August and can be completed by September when the cold weather starts.



A Northern Manitoba Garden

Gardening Calendar

Growing a garden can be an enjoyable past time and it can provide you and your family with fresh, delicious produce. But if you're new to gardening, what needs to be done and when? The following Gardening Calendar lists the basics of what needs to be done for a successful gardening season. Information on each of the tasks, is included throughout this book.

Location

By looking at old garden sites you will find some hints about a good place for a garden. Most gardens are found on the side of a hill, facing south or southeast, with a row of trees on the north and west sides. In many cases, they are found on an island or a riverbank. The gardeners knew that the sun would warm up the soil on the south side first in the spring, and that the sun would shine longer than on the north side.

The sloping ground would allow for water drainage after heavy rains. Cold winds usually blow from the north or northwest, so plants in the garden needed protection from these winds. This is the reason for not locating the garden at the top of a hill. Valleys or lowlands are not good places for gardens, either, because of the increased risk of frost settling in low-lying areas.

If brush is being cleared for a new garden site, leave a row or two of trees on the north and west sides, and plan on leaving about twenty feet of cleared land before the garden actually starts. If

Gardening Calendar	
Time	Task
Jan/Feb	Receive and order seed catalogues and plan for ordering and spring planting
February	Order seeds and plants from seed company
March/April	Plant bedding plants if growing own ex:e. cabbage, tomatoes, peppers, flowers, etc.
Early May	Purchase any additional seeds Till Garden and prepare for planting Clean last season's vegetables out of storage area
May/June	Plant garden when danger of frost is past Cover any bedding plants that are susceptible to frost
Summer	Thin plants if needed i.e. carrots, radishes, lettuce Water Garden during dry periods – one inch water/week Weed Garden regularly, hill potatoes Check for insects Stake tomatoes and peas Plant another set of quick growing vegetables ex: lettuce and radishes Enjoy vegetables in meals and snacks
August/September	Harvest Garden Store and preserve vegetables Clean debris off garden Till garden in preparation for spring planting
Winter	Check stored vegetables for signs of spoilage and discard any that are spoiled (rotten, mouldy, etc.) Enjoy stored vegetables in meals and snacks

the tree roots from the shelterbelt are too close, they will remove water and nutrients, which would result in stunted garden plants.

The gardeners knew, too, that gardens near rivers and lakes are protected from frost much later in the fall than are inland gardens. Being close to water is helpful during the summer especially if it is a dry growing season. Water can be carried or pumped to the plants to help them grow during the dry spells.

For convenience, the garden should be near the house. It should be in a sunny location away from tree roots.

Vegetables cannot compete with shade trees for food and moisture.

Locate your garden:

- Near the house
- In a Sunny location free from shade
- Away from trees
- Close to water

Soil

Soil is an important factor in gardening. In northern Manitoba, it is a major limiting factor to good vegetable production. If the soil in your area is not good for plant growth, you will have to improve the soil before your first crop is ever planted.

What is good soil? It is a mixture of minerals, organic matter, water, air and living plants and animals (called microorganisms). The best soil for gardening is loam, because of its texture. If you're interested in determining what kind of

soil you have in your garden spot, you can try the method on the next page.

Loam is the best soil for gardening. Clay and sandy soils can be used if improved.

Texture refers to the way a soil feels and the way it handles when wet or dry. The north has a lot of clay soil. It is sticky when wet, becomes very slippery when soaked and packs like pavement when dry. Therefore, clay is not good for gardening on its own. To turn it into loam, sand and muskeg from the bush have to be mixed with the clay. Some communities have very sandy soil or very rocky places. The best way to garden in these communities is to build a frame (like a sandbox) and then fill it with a mixture of good soil.

Gardeners in the past made compost and added it to the garden soil. Compost is a mixture of kitchen scraps, such as coffee grounds, tea bags, egg shells and orange peels, mixed with dried leaves, potato tops from the garden and a little bit of garden soil. This is all piled in a bin and allowed to rot over the summer to form a loose soil like peat or muskeg.

The advantage to compost is that it contains nutrients for plants. Nutrients give plants the energy to grow faster, bigger and produce more for harvest. Northern clay and sandy soils are naturally low in nutrients. Adding compost, waste fish and animal manures are ways gardeners can add nutrients to the

soil for plants. Fertilizer in a bag is another way. Soil testing provides the information on how much fertilizer to use.

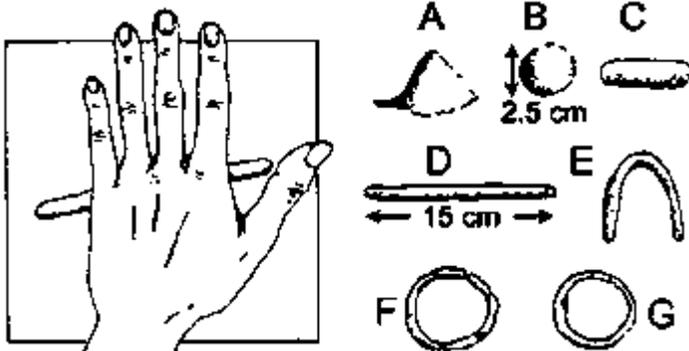


Save Time and expense by using soil mix only in the row or planting hole where you'll sow the seeds.

What is your soil type?

Drip water onto about one tablespoon of fine soil held in your hand. Squeeze and roll the soil until it just starts to stick to your hand. The extent to which it can then be shaped as in the drawing below, gives a rough idea of its texture class.

Method and drawings after Ilaco (1985)



(A) **Sand** - Soil remains loose and single-grained and can be heaped, but not formed

(B) **Sand loam** - Can be shaped into a ball that easily falls apart. With more silt (C) it can be rolled into a short thick cylinder and is called a **silt loam**

(D) **Loam** - About equal sand, silt and clay and can be rolled into a thick thread about 15 cm long that breaks when bent

(E) **Clay loam** - Soil can be rolled as above but can also be bent carefully to a U shape without breaking

(F) **Light clay** - Soil feels smooth and can be bent into a circle with some cracks

(G) **Clay** - Handles like plasticine and can be bent into a circle without cracks

Garden Tools

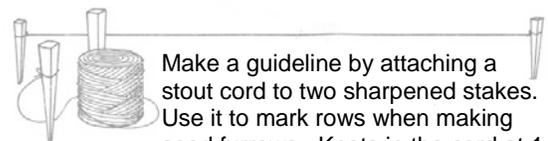
Only a few simple tools are needed for a small garden:

- spade or shovel (for digging holes)
- digging fork (for turning over soil)
- hoe (for weeding and making seed furrows)
- rake (for levelling and cleaning off debris)
- trowel (for planting)
- planting line (string)
- watering can or garden hose for watering the garden
- sprayer (for insects or weeds)
- tiller for larger gardens and a wheel barrow for moving plants or when moving your harvest in from the garden in the fall

Labour Savers



Hoe (left) is used for weeding and making seed furrows; spading fork (centre), for turning over soil; shovel (right), for digging holes.



Make a guideline by attaching a stout cord to two sharpened stakes. Use it to mark rows when making seed furrows. Knots in the cord at 1-foot intervals help indicate distance.

If you need to buy garden tools, examine the joint between the wooden handle and metal working part. Make certain that the implement is well crafted, fits snugly and is not loose.

Fencing

Fencing is another point to consider for a successful garden. People or animals in the garden will disturb the plants and pack down the soil, causing the growth rate of the plants to slow down.

Preparing your Garden Spot

If you have not had a chance to prepare ground for planting earlier in the year (or even the year before), limit yourself to a small plot you can weed by hand as weed seedlings come up. It is far preferable to have a small, successful vegetable plot, than a large one overrun with weeds.

Before you plant any seeds, the seedbed must be well worked to a depth of eight to ten inches. It is best if the ground has been turned in the fall. If that is not possible, it can be worked in the spring. For large gardens, a rotovator is handy. If your garden is small, this can be accomplished with a shovel or garden fork. In any case, you will have to rake it thoroughly to break up lumps, remove rubbish and smooth and level the plot. The ideal conditions for seeds are weed-free soil that is moist and warm.

Digging or tilling the soil is important in gardening. It is difficult for plant roots to grow in hard-packed soils. Rototilling or digging with a shovel or fork in the fall makes the garden ready for spring planting.

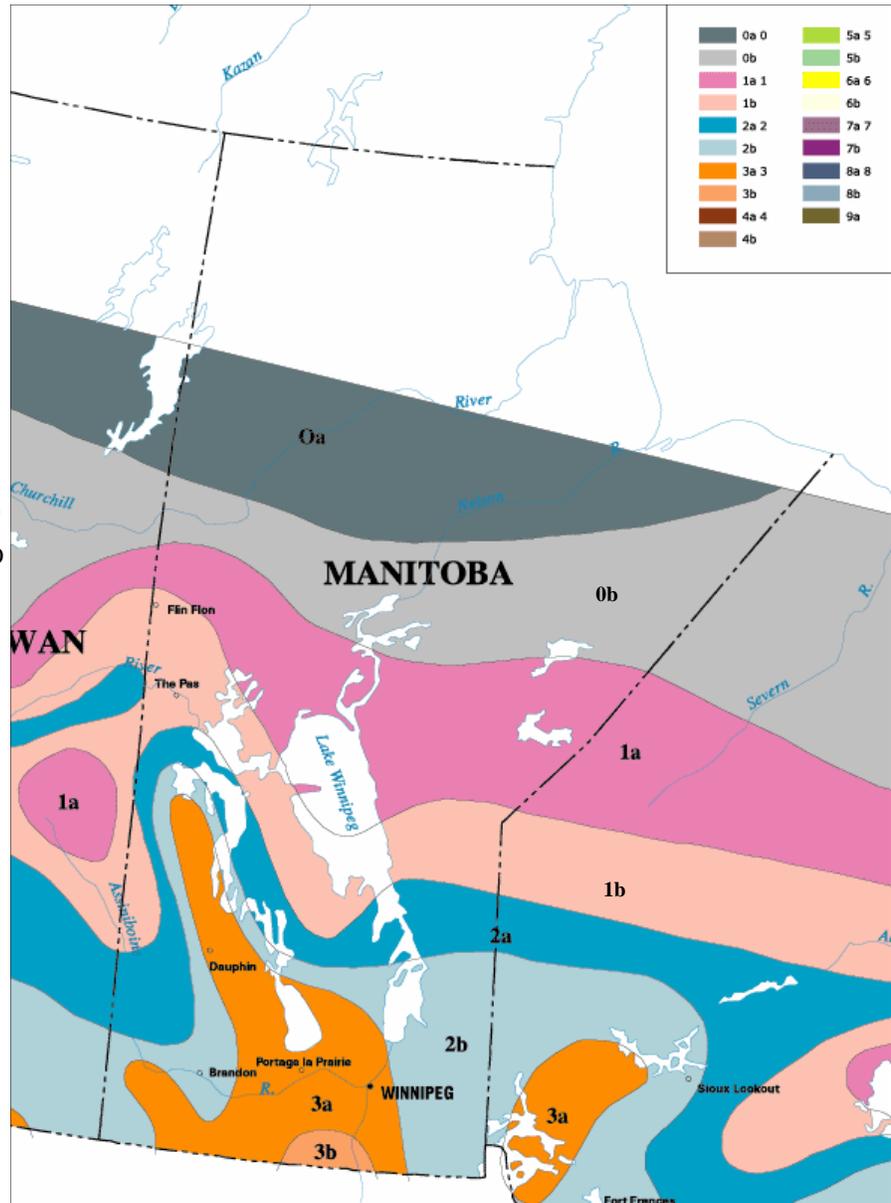


Work your garden to a depth of 8-10 inches.

What Zone are You In?

Often, when gardeners are selecting plants, the seed packet will make reference to the growing zone. What does this mean?

The hardiness map is divided into nine major zones: the harshest is 0 and the mildest is 8. Relatively few plants are suited to zone 0. Sub-zones (e.g., 4a or 4b, 5a or 5b) are also noted in the map legend. Some significant local factors, such as micro-topography, amount of shelter and subtle local variations in snow cover, are too small to be captured on the map. Year-to-year variations in weather and gardening techniques can also have a significant impact on plant survival in any particular location.



Use the zone as a reference point when selecting which varieties and plants will grow in your area. As well, select those with the lowest number of days to maturity. Refer to the section How to Read a Seed Packet on page 10 .

Select varieties and plants suitable for the zone you live in.

What to Plant

When people are starting their first garden, they often rush in and want to plant everything. If everything does not grow, they think they are poor gardeners. This is not so.

Vegetables can be divided into groups according to the way they grow. This helps to decide what to plant. Remember to plant only those vegetables that you and your family enjoy.

A. Hardy and short-season crops

These are vegetables that can be planted by putting seeds directly into the garden. These crops grow well in northern conditions and should be included in a first-time garden:

- beets
- carrots
- leaf lettuce
- onion sets
- peas
- potatoes
- radishes
- swiss chard
- turnips



Seed these hardy plants directly in to the garden.

B. Hardy, cool-loving and long-season crops

These are vegetables that grow well in cool climate but need a longer season than the one we have. The way to get around this is to start seeds in the house about 6 weeks

before the garden will be planted. The little plants that



grow are called bedding plants or transplants. You can grow your own or, if you are near a larger community these bedding plants can be bought from a commercial greenhouse. Examples of these crops are:

- broccoli
- cabbage
- cauliflower
- celery
- onions from seed
- some varieties of tomatoes (ex: sub - arctic Maxi)



These plants need to be started indoors.

C. Tender, Heat-loving and Short-season Crops

These are vegetables that need protection from the cool winds and a build-up of heat. They can be seeded directly into the garden after the danger of spring frost is past.

Examples are:

- bush wax beans and green beans
- early maturing varieties of corn



Seed in Garden when danger of frost is past.

D. Tender, Heat-loving and Long-season Crops

These are vegetables that grow best when planted in a plastic-covered shelter or greenhouse. They cannot grow and produce when the night temperatures are cool (ex: below 5 C.) These include:

- cucumbers
- peppers
- pumpkins
- squash
- tomatoes
- zucchini

These plants need protection.

E. Perennial and Self Seeding Vegetables

These are crops that keep growing year after year if planted in a good location.

There are abandoned, forgotten garden spots in the north where these plants are still surviving. Those include:

- chives
- horse radish
- rhubarb
- mint
- dill

These are long-lived perennials

Varieties

Varieties refer to the selection within each crop type. For example, there are many varieties of potatoes. A variety like Norland is early maturing, has a red skin, is good for boiling and stores well until December. The Shepody variety is early-maturing, white-skinned, is good for boiling and baking and stores well until the spring. The Russet

Burbank, or Netted Gem variety is a late-maturing, white-skinned potato that is good for baking.



Cucumbers grown in an old bathtub in Northern Manitoba

When gardening in the north, varieties that grow best under short-season, long days generally cool growing conditions and in clay soils can be selected. Keeping harvest records on each variety can help make this choice – a blank harvest record is at the end of this manual.

Good seed is essential for a good garden. The cost of seed, compared with the value of the vegetables harvested, is a small expense. Seed catalogues and seed displays are an excellent source of information and can be great reading. The following Manitoba seed companies offer catalogues and information:

T & T Seeds Ph: 204-895-9964, Box 1710
Winnipeg, MB R3C 3P6 or
www.ttseeds.com

McFayden Seed Co. Ltd. 1-800-205-7111,
30-9th St. Brandon, R7A 6N4 or
www.mcfayden.com

Lindenberg Seeds Ph: 204-727-0575, 803
Princess Ave. Brandon, MB R7A 0P5

Check the following table for varieties that will grow in northern climates. improve soil warming.

Preliminary List of Vegetables for Northern Gardens	
Vegetable	Variety Name (days to maturity)
Leaf Lettuce	Buttercrunch (60 days), Simpson Elite (48 days), Esmeralda (53 days), Baby Star (65 days), Grand Rapids (45 days) - make two or three successive plantings
Radish	Cherry Belle (24 days), Champion (23 days), French Breakfast (20 days), Scarlet Globe (25 days), Lobuk Sweet Radish (55 days) - make two or three successive plantings and thin
Beets	Scarlet Supreme (48 days), Ruby Queen (55 days), Yellow Detroit (55 days)
Swiss Chard	Bright Lights (40 days), Fordhook Giant (55 days), Perpetual (50 days)
Turnip	Royal Crown (55 days), Early Snowball (45 days)
Carrot	Baby Spike (55 days), Little Finger (60 days), Scarlet Nantes (68 days) - thinning required
Cucumber	Straight 8 (58 days), 702 Burpless (50 days)
Potato	Shepody, Viking, Norland—hilling required
Pea	Spring (57 days), Alaska (55 days) - use net for climbing
Onions	Dacong Tall Green Onion (65 days), Yellow Onion—Candy hybrid (85 days); use onion sets (bulbs), pick as green onions
Tomato	Sub-Arctic Plenty (45 days), Siberia (53 days), Native Sun (50 days Yellow) - start as transplants

All these varieties can be found at T&T Seeds and retail outlets that carry Mackenzie Seeds (Canadian Tire, Wal-Mart, etc.).

When choosing vegetable varieties always select types with short days to maturity. Protect from wind and use raised beds to

Always check what year the seeds were packed. Usually seeds that are two or three years old can be sowed, but new seeds perform best.

Always purchase seed that is Canada #1 Standard seed quality.

See the information on the following page about how to read a seed package.

When to Plant

Planting and seeding dates vary depending on the location of your community. Experienced gardeners are good sources of local information. As a general guide, the following can be used.

- **In Central Manitoba: seed around June 1.**
- **In the Thompson area: seed around June 10.**
- **In the far North: seed around June 15.**

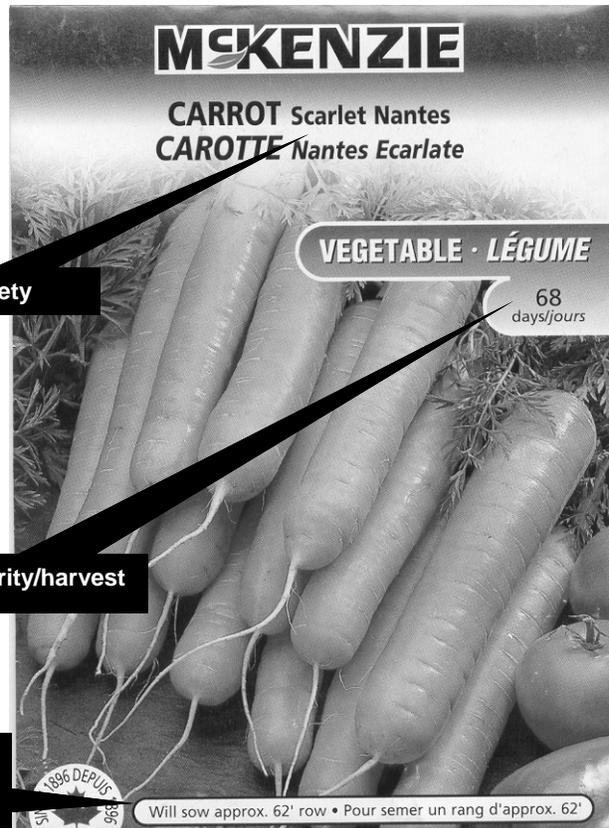
Rather than referring only to the calendar, many gardeners use what

nature as a planting guide. For example, the guide of waiting until the poplar trees are in leaf before planting potatoes is one that has worked for many Northerners. Do you know of other such guides?



Reading a Seed Package

Lots of books and web sites provide such information, but the most accessible source for you may well be the information on the seed packages you buy at the store. At right, you see a typical seed package.



The information on the seed package includes how long it will take your plants to germinate, how long until harvest, planting depth, distance apart and general planting information.

Some seed packages will tell you that the plants need thinning, what zone they will grow and instructions for care.



Planting Plan

Once you have decided *what* to plant, the next step is to set up a planting plan. This helps to figure out how much seed to buy, how far apart to space the seeds and how much room the plants will take up in the garden.

The following plans use only a hoe to weed between the rows. They are examples of ways to set up your garden.

See the table on page 14 to determine which vegetables will grow in your area, how far apart the seeds need to be and how many seeds you will need to buy.

Remember though, that the table lists quantities needed for a 50 foot row. If you're growing a smaller garden, you will need fewer seed and plants.

Two sample planting plans follow. Make substitutions to suit yourself - grow what your family likes.

To have a successful garden, you need only - use a spade or fork, loosen the soil to a depth of eight to 10 inches. Fertilize with 16-20-0.

It is recommended the rows of seed be planted north to south to allow for maximum sunlight. If ground slopes, run rows across the slope to prevent erosion.

Use varieties that are cold-tolerate or faster maturing. By transplanting cabbage, head lettuce and beets, you can speed up the harvesting season.

Provide sufficient water, enough space for plants to grow, control weeds and insects and you will be amazed at how much you can produce. Even a garden in a small area can help reduce the cost of food and can provide fresh plentiful produce.



A small garden along a fence.



Laying Out the Garden

Once you have chosen the location for your garden plot, make a diagram of it on which you can map out where you will plant each crop. See example diagram.

Each vegetable needs a certain ideal space in which to grow. Do not try to crowd plants into less space than they need (see table on back page) Cucumbers, squash and melons often sprawl for yards in all directions. Radishes need very little space. Corn grows tall, as do asparagus and pole beans. Their height makes it necessary to plant them where they will not shade other plants. Brussels sprouts and cabbage grow to a hefty size and need plenty of room.

Fast maturing crops (see table on page 14) can be planted throughout the summer. A long row of

lettuce planted all at once will

produce more salad than you can possibly eat. It is more practical to plant short rows of fast-maturing vegetable and to make successive plantings at two or three week intervals.

If possible, plan the garden so that the tall plants will be at the north side where they will not cast shade on smaller plants. It is also, best to run rows across a slope to help prevent water runoff and soil erosion.

To allow for cultivation, place perennial vegetables on the edge of the garden, about three feet from the grass line. Plant vine crops in the centre of the garden, and the other crops on each side with two rows of early vegetables along the edges of the vine crops. These will be out of the way when the vine crops spread.

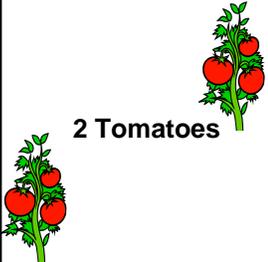
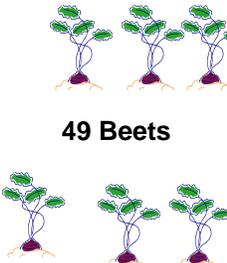
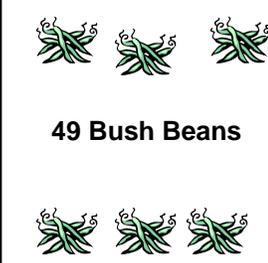
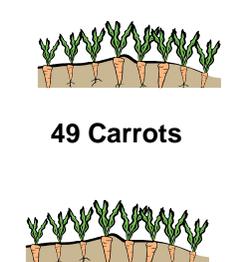
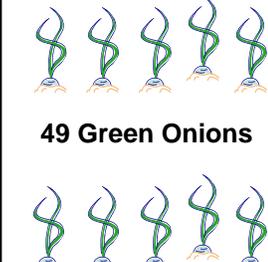
The square, or almost square, garden is usually easier to handle than a long narrow one. However, the shape of the garden is sometimes determined by the area available.

Example Garden Layout

N

Tall Plants i.e. Corn, Staked Tomatoes, Pole Beans, Potatoes			
Tall Plants i.e. Corn, Staked Tomatoes, Pole Beans, Potatoes			
Perennials, Vegetables & Bush Fruits i.e. Asparagus, Rhubarb, Dill, Raspberries	Perennials, Vegetables & Bush Fruits	Perennials, Vegetables & Bush Fruits	Main Crop Vegetables i.e. Beans, Onions, Beets, Carrots, etc.
			Early Vegetables i.e. Lettuce, Radish
			Vine Crops i.e. Peas, Cucumbers, etc.
			Early Vegetables i.e. Lettuce, Radish
			Main Crop Vegetables i.e. Beans, Onions, Beets, Carrots, etc.
			Strawberries

Planting Plan for an All Space Garden

 <p>2 Potatoes</p>	 <p>2 Potatoes</p>	 <p>2 Tomatoes</p>
 <p>49 Beets</p>	 <p>4 Cabbage</p>	 <p>49 Bush Beans</p>
 <p>49 Carrots</p>	 <p>16 Leaf Lettuce 200 Radish</p>	 <p>49 Green Onions</p>

- Aim for a minimum 6 inch depth of soil
- 3. Nutrients**
- Mix an animal manure or compost or moose, rabbit or horse droppings or 1/3 pound of a water soluble fertilizer such as 16-20-0 or 11-48-0
- 4. Seeds**
- 4 sprouted potatoes (not all potatoes from the store will sprout you need to buy *seed* potatoes)
 - 2 plants of bush tomatoes
 - 4 plants of cabbage
 - 1 packet of red beet seeds
 - 1 pack of green bush bean seeds

6 feet

6 feet

An All Space/Small Space Garden

Supplies needed

1. Frame

- 4 logs or boards at least 6 feet long.
- Nail the corners together or notch them like a log cabin to make a square.

2. Soil

- Use local soil and
- Add muskeg or peat from the bush if it's sandy
- Add sand and muskeg or peat if it's sticky clay

- 1 packet of carrot seeds
- 1 packet of leaf lettuce
- 1 packet of radish seeds
- 1 pound bag of onion sets

5. Tools

- hoe, garden trowel, string, row markers (sticks will work)
- bucket or watering can – if there is no rain, give all the plants a good drink once a week

PLANTING GUIDE FOR THE HOME VEGETABLE GARDEN

Kinds	Distance between Rows, Feet	Distance within rows, inches	Amount of seed, or # of plants per 50-foot row	Depth to cover, inches	Days to Emergence (good temp & moisture)	Number of days to seeding to harvest	Approximate yield per 50-foot row	How to use or store
Bean (bush) (pole)	2 2	2-3 8-12	4 oz. 4 oz.	1 1/2 - 2 1 1/2 - 2	7-10	52-70 65-70	30-50 qt.	Fresh, fresh frozen, canned, pickled
Beet	11/2	1-3	1/2 oz.	1/2	4-10	55-70	250 roots	Fresh, pickled, canned, cool cellar
Broccoli Early Late	21/2 21/2	18 18	1 packet 1 packet.	transplants 1/2	4-10	60-80	30-40 qt.	Fresh, fresh frozen
Cabbage Early Late	21/2	18	1 packet.	transplants 1/2	4-10	60-80 100-105	30 heads	Fresh, raw Fresh, raw, kraut, or storage
Carrot	11/2-2	1-2	1/4 oz.	1/2	6-18	60-75	30-75 lb.	Fresh, raw, canned, cool cellar
Cauliflower	21/2	18	1 packet.	transplants	5-10	60-80	30 heads	Fresh, fresh frozen
Chard, Swiss	2	8-12	1/2 oz.	1/2	4-10	50-60	Use all season	Fresh
Corn	21/2-3	12-18	2 oz.	1-2	5-8	60-100	45-75 ears	Fresh, fresh frozen, canned
Cucumber Slicing Pickling	4 4	12-24 12-24	1/8 oz. 1/8 oz.	1/2-1 1/2-1	6-10	65-75 60-70	100-150 50-150 fruits	Raw, Pickled
Lettuce (leaf) (head)	11/2 11/2	6 12	1 packet. 1 packet.	1/4 1/4	6-8	40-50 50-75	100 50 heads	Raw Raw
Onion Transplants Seeds or sets	11/2 11/2	3 2-3	1 packet of Seed, 1/2 lb sets	transplants Seed 1/2 Sets 1	6-10	115-135 95	50-75 lb.	Raw, fresh, dry dark cool storage
Parsnips	11/2-2	2-4	1/4 oz.	1/2	14	120-150	150-300 roots	Store sand, moss, sawdust; or leave in ground over winter
Pea	11/2-3	2	4 oz.	11/2-2	6-10	60-80	20-40 qt. pods	Fresh, fresh frozen, canned
Potatoes	2-3	12	5 lbs cut to 1.5 oz	4	4-11	As soon as big enough	60-100 lbs	Fresh, stored
Pumpkin	6-8	36-48	1 oz.	1	4-10	110-130	30-50 fruits	Fresh, store dry
Radish	1	1	1/2 oz.	1/4	4-10	25-35	30-100 bunches	Fresh
Rutabaga	2	6	1/2 oz.	1/4	4-10	110-130	100 lb.	Fresh, stored
Spinach	11/2	4-6	1/2 oz.	1/2	5-12	40-45	1-2 bu.	Fresh, fresh frozen
Squash	6-8	36-48	1 oz.	1	4-6	90-115	100 fruits	Fresh, store dry
Tomato Staked Not Staked	2 3	18-24 36	25-33 plants 17 plants	transplants	6-12	100-130	150-300	Fresh, canned
Turnip	11/2-2	3-4	1/2 oz.	1/4	3-8	50-70	150 roots	Fresh

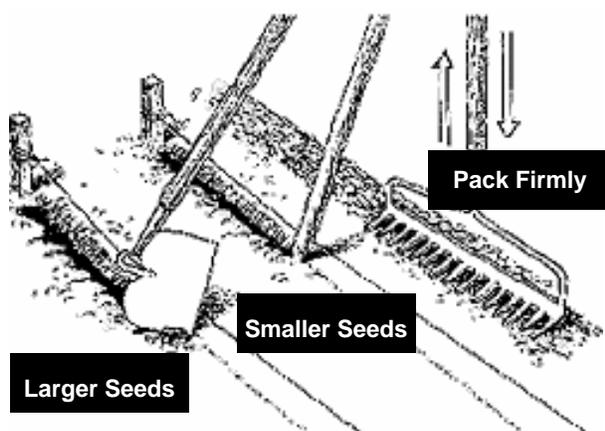
Planting your Garden

During the warm days of spring, you will wonder when it is safe to plant your garden. The best time varies from place to place in the province. Generally, planting before May 15th isn't recommended because of the danger of frost. The best way to find out is to ask an experienced gardener in your area and follow his/her advice. As a general guide, the following can be used.

- **In Central Manitoba: seed around June 1**
- **In the Thompson area: seed around June 10**
- **In the far North: seed around June 15**

A string pulled tightly between two stakes (sticks will work) acts as a good guide for straight rows. The furrow into which you put your seed can be traced along the string with the edge of the hoe or the end of a stick. It is moved along the garden as you finish each row.

Try to keep an even depth so that all the seeds are planted at the same depth and

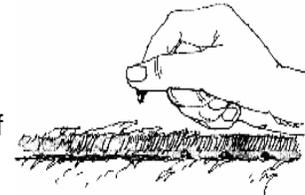


will be uniform. If it is sunny and warm when you are seeding, do not leave the trenches open any longer than necessary, because valuable soil moisture will evaporate. Open, sow, fill, firm, and pack one row at a time.

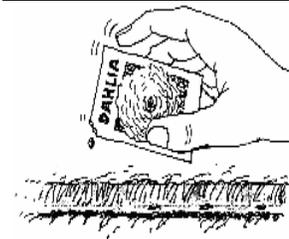
The seed packet will tell how deep the seeds should be placed as well as the distance between seeds – refer to the info on page 14.

Place large seeds, such as beans and peas, individually at the specified distances.

Sow small seeds, such as carrots and lettuce, by tearing off a corner of the seed packet, holding the packet horizontally, and gently tapping it with the finger as it is moved along the row.



Space small seeds evenly by rubbing a pinch between fingers; or tap them directly from the packet.



Some times these small seeds are difficult to plant the correct distance apart. Don't worry about this too much as you can thin them later after they start to grow.

After planting each row, cover the seeds with soil and press the soil firmly around them. When the whole plot is finished, rake it very lightly along the row.

Don't forget to place small-labeled stakes to show where each row is and what is in it. Also, write the variety on your planting plan – if you have great success with that variety, you will want to remember it for next year.

Seeds must have continuously moist soil around them until they sprout. Check for moisture every day, and if the soil seems too dry, water it lightly. Do not over water: soggy soil can cause the larger seeds to rot the soil should be damp, not waterlogged.

Watch for germination. Cold soil and cool weather both impede seed sprouting. Check the table on page 14 to see when you can expect seeds to emerge. Some plants can take as long as of two weeks to emerge so don't get discouraged. If however, after three weeks, nothing has happened, plant a new row. Something has happened to prevent germination. Perhaps the soil was too dry or too cold, the furrow was too deep, or the surface had a crust too hard for seedlings to push through.

To extend the season of crops such as beans, lettuce, peas and radishes, make two or three sowings at intervals of 10 days. This will ensure a supply all summer.

When the seedlings are well up, thin the plants to the distances recommended in the table. Do this on a dull day or in the evening when the soil is somewhat moist.

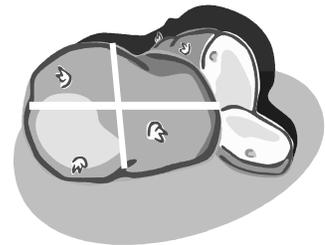
Potato Growing

Potato plants prefer deep, well drained, easily crumbled and fertile soil. Work the soil well, down to approximately the 30 to 50 cm (12 – 18 inch) level. Organic matter, such as manure or compost, may be incorporated to improve soil structure and fertility.

Seed potatoes must be properly cut. The seed pieces should be block-shaped with at least one good eye per seed piece (two is better). Small potatoes weighing

under 85g (3 oz.) should be planted whole. Larger potatoes can be

cut into halves, or quarters; usually one vertical and one horizontal cut spaced as needed to include eyes. The average seed piece should weight 40 to 70 g (1 ½ to 2 ½ ounces). Plant seed pieces about 30 cm (12 inches) apart in the row and about 70-90 cm (28 to 36 inches) between the rows.



Each seed piece should have one or two eyes.



Potatoes grown in Northern Manitoba

Potatoes in the home garden are often planted too deep. The heavier the soil, the shallower the planting should be. In heavy soils, a depth of 5cm (2 inches) is recommended. For lighter soils, about 8 cm (3 inches) is deep enough. Plant the potato seed pieces in moist but not overly wet soil.

Usually, when planting potatoes in small gardens, a trench is opened with a hand hoe or individual holes are dug with a spade or garden fork. Fertilizer is placed in the row or individual holes and then covered with a 2.5 cm (1 inch) layer of dirt.

Do not plant potatoes in the same location year after year as diseases will build up in the soil.

Many people believe that to have an early crop, potatoes should be planted as soon as the frost is out of the ground. However, since potatoes will not start to grow until the soil is warm, this is not good practice. For best results, plant the main crop of potatoes two weeks before the last killing frost is expected. Under favorable conditions, potato stocks begin to develop as soon as they are planted. Do not plant in soil that is too cold (less than 7° C) as this delays emergence and may cause stock pieces to rot.

The potato is a cool season crop that tolerates a little frost. Potatoes will take from 10 days to three weeks to emerge depending on the dormancy of the seed

potato and the temperature of the soil.

Hilling is a gradual process of building soil up into a hill around the potato plant. Soil covers potatoes and prevents greening of any potatoes that form near the surface. Potatoes must *not* be exposed to light at all or they will turn green and bitter. A little hilling at the time of every cultivation is suggested. Small weeds found between the potato plants are smothered and killed. The use of chemical weed killers is generally not recommended in the home garden.

Growing and Planting Transplants

Cabbage, cauliflower, broccoli, kale, brussels sprouts, and tomatoes are grown under cover for 6 to 8 weeks before they are transplanted to the garden. In some areas successful crops of head lettuce, corn, cucumbers, squash, and other crops can also be grown from transplants.

Transplants can be grown in a sunny window, cold frame, hotbed, plastic crop shelter, greenhouse or any combination of two or more.

The most commonly used containers for growing transplants are shallow wooden boxes, usually called flats or in individual containers for each plant. Individual containers are popular because the plants can be transplanted without disturbing the roots. Some plants (ex: cucumbers) do not like their roots disturbed so if starting

cucumbers, grow them in individual peat pots and plant the pots directly into the garden. This minimizes root disturbance.

Peat pots, plant bands, paper and plastic drinking cups, old milk containers, and soup tins are also useful, can often be found around the home and are inexpensive. When you use cups or tins, remember to punch holes in the bottom of them so water won't collect in the bottom and drown your plants.

In the fall before freeze-up, collect as much good sandy loam topsoil, well-decomposed peat or compost, and sand as you will need to fill your containers. Store the soil in a convenient place.

During the winter build the flats and collect the plastic and paper drinking cups or soup cans or order peat pots or plant bands. Order all your supplies and seeds early and store them in a cool, dry place.

Two weeks before seeding, move the potting soil and sand inside to thaw. When it has thawed, thoroughly mix 2 parts of soil, 1 part peat or compost, 1 part of sand. For each 10 litres of the mixture, add 10g of a water soluble plant-starter fertilizer.

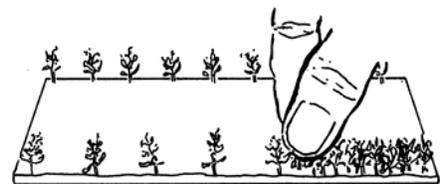
Add enough water to wet the soil thoroughly. Remember to punch drainage holes in the bottom of the paper and plastic cups and tins. Where necessary, place a sheet of newspaper in the bottom of flats

and other containers to prevent the soil from coming out the bottom. Fill the containers. Gently firm the soil and level the surface, leaving the soil level 6mm (1/4 in.) below the top of the container.

Sow the seed in one of the following ways:

- Spread the seeds evenly over the surface of a flat or a large can, gently press the seeds into the soil with a small piece of lumber, and cover the seeds with 3-mm (1/8 in.) of soil or sand. When the seedlings have two true leaves, transplant them to individual containers or space them out evenly in a flat.

- Sow two or three seeds in each container. When the seedlings have two true leaves, remove all but the most vigorous plant in each container.



See the table on page 14 for information on how long various vegetable seeds take to emerge from the soil.

Keep the containers in a warm place, preferably at 21 to 24°C (70-75°F). As soon as the plants appear, give them as much light as possible. If they are growing in a window, turn the containers every day to assure even, upright growth. If the plants start to grow tall and leggy (spindly), increase the amount of light, or reduce the temperature, or both.

At all times, keep the soil moist but not wet. Over watering causes the seeds to rot and sometimes causes damping-off. If some plants die, stop watering and allow the surface of the soil to dry out, or sprinkle a little dry sand over the surface. Stir up the surface occasionally.

Water the plants once a week with a small amount of solution made by dissolving fertilizer according in the correct amount of water to the label directions.

When daytime temperatures are above 16°C (60°F), move the plants outside. If you do not have cold frames, move the plants back inside when the temperature drops below 10°C (50°F). If you have cold frames, put the plants in them and cover with glass. If there is danger of frost at night, cover the cold frames with blankets. Or provide enough heat to prevent the plants from freezing.

For the first few days that the plants are outside, shade them from direct exposure to the hot sun during the middle of the day. Over the next few days, gradually increase the amount of exposure until they can be given full sun.

When it is warm enough outside (both during the day and when there's no danger of frost at night) set the plants out in the garden. Several hours before transplanting, water the plants thoroughly. Transplant on a

dull day or in the evening. Remove the plants from cups, tins, and plant bands or dig them from flats, keeping as much soil as

possible on the roots. While peat pots do not need to be removed, they will "break down," in the soil, tear the pot partly open. Dig a hole large enough to

bury all the roots and place the plants a little deeper in the soil, than they were in the containers. Fill

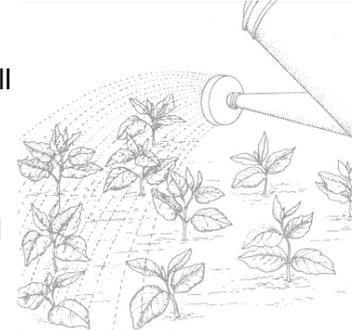
in around the plant with good topsoil. Firm the soil around the roots and water each plant with a solution of water soluble fertilizer mixed according to label directions.



Before planting out seedlings grown in peat pots, tear the pot partly open.



Set the plant at its previous depth; firm the soil with your fingers.



Water the plants immediately in order to settle the soil & prevent wilting.

Garden Maintenance

Once the seeds have sprouted (see the table on page 14 to determine how long this will take) and the transplants have been planted, it will be time to water, weed and watch for insects, diseases and pests.

Watering

Plants need about an inch of water a week, especially if it's warm. If it doesn't rain, water has to be brought to the plants. Rainwater can be collected in barrels for use in the garden or a hose from a water tap water can be pumped from a river or the lake to the garden.

The garden needs about one inch of water a week. Thorough deep watering is more effective than brief shallow ones. Mere sprinkling encourages plant roots to stay on the surface where they are susceptible to hoeing damage and to the drying heat of the sun.

To check how much you've watered, set out an open container in your garden, marked off in half inches. Aim for your garden to get 1 to 1.5 inches of water a week.

Schedule your watering for the morning or early afternoon, so that leaves can dry off before nightfall. Wet leaves are more susceptible to fungus diseases. Overcast days are better than sunny days because the water will evaporate less quickly.

Vegetables contain a lot of water. If grown under dry conditions, some vegetables won't grow well and the harvest will be smaller with the produce tougher to eat.

Weeding

Weeding is necessary. It is not done just to make the garden look nice. Weeds are extra plants growing in the garden that you don't want to harvest. They crowd the plants that you do want. They use up nutrients and water that the crops could be using. By removing the weeds, you remove the competition and the crops have better growing space.

The best time to weed is right after a rain when the ground is soft. The entire plant, roots and all, can then be pulled and removed. It is easier to pull weeds when they are young plants. It is important to pull the weeds before they produce seeds. These seeds fall back into the ground and sprout into new weeds.

If you're unsure whether it's a weed or your vegetables, you can wait until you can see a clear straight line of plants. These will be the vegetables that you planted as weeds don't grow in a straight line.

Thinning your garden

When planting very small seeds, it can be difficult to space them far enough apart and it can seem wasteful to destroy perfectly good seedlings. But it must be done. As the plants start to grow, they will crowd each other and grow twisted and damaged.

Beets, radishes, lettuce and carrots are often too crowded and need to be thinned. If

**Gardens need
1 –1.5 inches of
water a week.**

left un-thinned, radishes will not form bulbs. Carrots will not grow or will grow twisted together. Lettuce will form only small heads.



Thin seedlings when they are about 1 or 2 inches high (see table on page 14 for correct distances to thin). Plants should be thinned before they are too big usually before a second set of leaves appear. Do not try to thin seedlings all at once. A thick row of leaf lettuce can be thinned at first by removing every other plant. Plan on thinning plants more than once and thin again when the lettuce will be large enough to eat. When thinning a thickly seeded row, pull each plant out carefully, lifting straight up. This will prevent disturbing the roots of neighbouring plants. Any weak or damaged plants should be removed and enough of the others to give the ones remaining growing room.

Thinning should take place on a dull day, or in the evening when the soil is moist.

It is possible to transplant well grown seedlings from a thinned row, if you take steps to avoid damaging their roots or stems. Use a small trowel or label stake to dig them up along with a small clump of soil surrounding their roots, and handle them gently. When transplanting small seedlings,

move them into soft, fine, moist soil and shade them with a loose canopy of newspaper or grass clippings.

Insects

Insects that attack plants are different than insects that bother people. Insects damage crops by either chewing up the leaves or by sucking out the plant juices. If the plants have holes in the leaves or if they start to turn yellowish this usually means insects are bothering the plants.

Some common insects are:

- **Flea beetles:** These are tiny black insects that attack radishes and turnips in the spring.
- **Cabbage worms and cabbage loopers:** green worms, which eat large holes in the leaves of cabbage family members
- **Root maggots:** grubs that eat their way through the roots of plants like onions, turnips and radishes

You can control these insects by using a recommended insect control product or home remedies. For example, gardeners in the past used wood ashes in the soil to prevent root maggots when they planted onions. This safer approach to insect control is being reflected in the commercial market where insecticidal (insect controlling product) soaps are available for home gardeners.

Here is a simple recipe for a natural insect spray that you can use in your garden against cabbageworms, caterpillars, aphids and other pesky insects.

Ingredients for Pest Control

6 cloves of garlic
1 onion minced
1 tablespoon cayenne
1 teaspoon dish soap (do not use a detergent)
1 gallon hot water

Blend all the ingredients together.
Let stand for 2 days. Strain before putting in a spray bottle and then spray plants. Although you should always wash vegetables before eating, the mixture described above is not harmful or poisonous to you or other animals and plants.

Diseases

Plant diseases take various forms, such as moulds, rots, spots and skin problems in potatoes. Diseases are caused by various agents such as fungus, bacteria or viruses. Get help from experienced gardeners if disease problems are suspected.

Other Garden Pests

Fencing is another point to consider for a successful garden. People or animals in the garden will disturb the plants and pack down the soil, causing the growth rate of the plants to slow down. Pets digging in the garden will disturb plant roots causing the plant to die. Fencing off the garden will keep these pests out of the vegetables.

Hints for a Healthy Garden:

To protect vegetables from diseases and discourage pests, here are a few simple rules to follow.

- Choose seeds of disease-resistant varieties whenever you can.
- Inspect store-bought plants carefully. Spotty or discoloured leaves may be signs of damage, insufficient nutrients, or disease.
- Pull up and throw away any diseased plant. Do not compost it.
- Rotate crops, especially cabbage, its many relatives and potatoes, to prevent the spread of soil-borne diseases.
- Weed often and dispose of any weeds that harbour plant-eating pests.
- Do not work in your garden immediately after a rainstorm. Wet leaves are more vulnerable to damage and disease and walking over rain-soaked soil will harden it.
- After harvesting each crop, destroy any plants remains. If they were healthy, compost them.



Harvest

The best time to harvest vegetables is when they are fully-grown, but before they get tough and woody. In the suggested planting plan, the vegetables should be harvested as follows:

Beans Snap: while pods are still smooth like a pencil and before they bulge

Beets: when the roots are two inches in size

Cabbage: when the heads are heavy and firm

Carrots: pull the roots when firm and bright orange in color

Leaf Lettuce: while leaves are tender and mild-flavoured. Continue picking until seed stalk appears.

Onion: pull when bulb is up to one inch in diameter for use as green onions. For cooking onions, wait until the tops die down.

Potatoes: wait until a frost hits the leaves and then pull the plants and harvest the tubers underneath. You can also take potatoes from under the hill as soon as they are big enough. Don't disturb the plant.

Radishes: Pull roots while firm and bright red in color before they become split, pithy, spongy or woody.

Tomatoes: Pick fruit from plants when pink or red. If cold weather is on the way, pick green tomatoes and let them ripen in the house.

Storage

Elders talk of root houses for storing potatoes and other root crops such as

carrots, turnips and beets. Root houses are holes in the ground that have logs supporting the earth walls and then have a hill of soil covering them. This provides a cool, dark, damp place to store root vegetables for the winter, but prevents them from freezing. Trapper's cabins may have storage places built underneath the building, accessible through a trap door inside the house. This provides a good place to store vegetables if the area is insulated from the cold and if screening is used to keep the mice away.

Home Storage of Vegetables

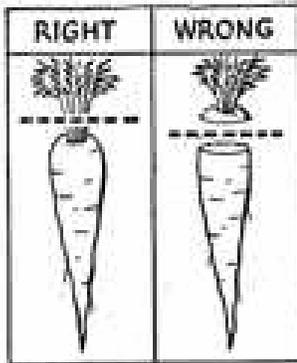
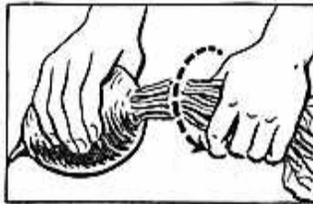
Freezing, canning and drying alter the original state of the vegetable, while storage refers to methods that don't require processing. Ideal storage facilities are often difficult to provide in the average home unless space is specifically built to provide the perfect balance of temperature and humidity. The practical way is to identify areas in the home or outbuildings that will offer naturally suitable conditions.

- root cellar
- basement with dirt floor, which is, cool (1C to 9C) damp suitable for potatoes, root crops
- warmer spaces (6 C to 15C) and drier more suitable for pumpkins and squash
- other ideas hallways, under beds in cool rooms, closets, attic, partially heated garage

Once the space is located, these tips should be remembered:

A) Accurate harvesting is essential

- Do not try to store immature vegetables. (Except green tomatoes)
- Produce should be free of disease and or insect damage.
- Handle carefully avoid cuts and bruising which can increase mould and bacterial decay.
- Harvest before frost damage occurs.
- Leave an inch of stem on any vegetable that has one to prevent drying out and infection, (ex: beets squash, carrots)
- Do not wash before storing, but remove excess soil that could harbour disease, insects, and moulds.



B) Temperatures

- Vegetables are still living parts of plants when picked. Cool the product quickly to remove the field heat before putting into storage.
- Cure (dry and harden) the skins before storing.
- Cool temperatures slow down the decay process and tissue breakdown, but do not allow temperatures to fall below freezing. The best range is between 0° and 5° C.

C) Air Moisture (relative humidity)

- Vegetables consist of about 85 percent water. If air moisture is low, vegetables will shrivel, lose quality and become unusable.
- Try to keep in a container rather than exposed to air.
- Root crops (carrots, beets) can be stored in boxes of fresh sawdust, peat moss or sand.
- Other vegetables requiring moist conditions (see chart below) can be placed in boxes lined with plastic bags, plastic garbage cans or metal cans lined with cardboard. Cut ventilation holes to avoid mustiness.
- An old fridge will also provide cool, humid conditions.



D) Ventilation

- Air circulation is needed to carry away ethylene gases given off by the breathing process of vegetables.
- If conditions are cramped, check produce periodically for signs of mould and remove any decayed items.
- Keep strong-smelling vegetables (ex: cabbage) away from other vegetables and fruits. Wrap in several layers of newspaper or store separately.

E) Other

- Light speeds up degeneration, keep all produce in the dark. Exception, cabbage will stay green rather than fading if stored under artificial lights.
- Do not reuse packing materials from the previous year as they could harbour moulds and disease.
- Protect product from mice and dust.

- **Cool and very moist (1° to 4° C)**

beets

carrots

parsnips

turnip

rutabaga

kohlrabi

very high humidity

keep in piles or bins of layered damp sand

- **Cool and Moist (1° to 4°C)**

cabbage

chinese cabbage

celery

potatoes

moist but no free

moisture



Keep best when placed on slatted shelves or in open slatted crates. Potatoes are dormant right after harvest for several weeks. Do not freeze as they will taste sweet. Bring into room temperature for several days so sugars turn back to starch to remove sweetness.

- **Dry and Warm (9° to 14° C)**

winter squash

pumpkins

will keep until February if spread individually on a shelf

- **Dry and cool (-1° C)**

dried beans

garlic

onions

will keep for six to seven months



Getting started

Each community will have different ideas about what they would like to do.

Reclaiming the knowledge of gardening is a way of getting started on improved



Community Greenhouse—a former hockey arena slated for demolition. Located in Inuvik. [Canadian Gardening Winter 2006](#)

