VEGETABLES

HUMBER NURSERIES 'GREEN THUMB GUIDE'

PREPARING THE SOIL
A gardener would be very lucky indeed to have soil that is easily worked, high in nutrients, and well drained. It will more likely be sand or heavy clay, and improving the soil will be the first task. Almost any soil can be improved by adding organic matter in generous amounts - it should be at least one-third of the final mix. If you spread a 2 inch layer of composted manure and work it in to a 6 inch depth you will have a good mix. Composted manure is preferred, but fresh manure, the results of your own compost pile, peat moss, sawdust, and straw are all organic and improve the soil texture.
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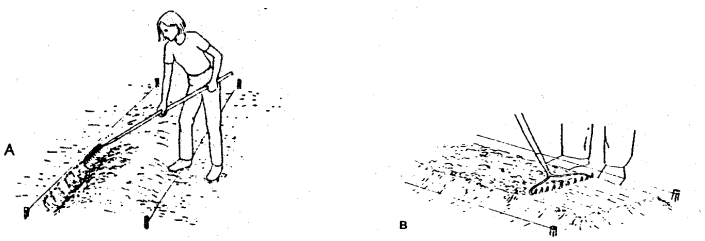
RAISED BEDS
After digging the soil for your proposed vegetable garden, a series of beds raised to about 6 inches will produce superior results. For this purpose you will probably need to purchase a good triple-mix soil to be delivered in bulk. Raised beds warm up earlier in spring and assure good drainage and good aeration (see illustration). The bed can be any length, but only as deep as can be conveniently worked from the paths between, so that it is not necessary to step into the bed and cause compaction.



Form raised beds by (A) raking about 4 to 6 inches of topsoil from the path onto the bed and (B) smoothing the top of the bed with the back of the rake.

Remove the topsoil from the areas where the paths between the beds will be and add it to the beds. Alternately, bring in enough soil-building material to bring up the beds to their proper height – 4 to 12 inches higher than the surrounding soil.

FERTILIZER
To ensure a good supply of the major nutrients and all the benefits of trace elements, apply a granular fertilizer such as Pink at the rate recommended on the package.
Apply in early spring when working up the soil before planting. Many crops respond to an additional side dressing 4 to 6 weeks after planting. You may also use a water soluble fertilizer such as Nutrite Tomato & Vegetable Food.

Side-dress tomatoes after the first flower clusters have set fruit.

WATERING
Some garden plants can recover quickly after lack of water has caused them to wilt. Do not let this happen to vegetables!!!
A regular supply of water is essential. Soil structure and weather conditions make it difficult to suggest a watering schedule. One can only be alert and check plants frequently. Digging a few test holes with a trowel will show if the soil is moist down to root level.

MULCHING
When seedling plants have put on some growth and the soil has warmed up, add two to four inches of organic mulch. Mulch covers the top of the soil and is not worked in. Organic mulches can be turned in to the ground in fall to further improve it. Use compost, straw or sawdust (but not peat moss) on the soil surface. Mulches help retain moisture in the soil, keep plant roots cool and assist in preventing weeds.

FROST HARDY VEGETABLES
(These can stand a degree of coolness or even light frost)

For mid-April planting:
Asparagus, broccoli, Brussels sprouts, cabbage, Chinese cabbage, kohlrabi, leaf lettuce, onions, parsley, radish, rhubarb, peas, spinach, turnip, kale and parsnip.

SEMI-HARDY VEGETABLES
(Can stand some degree of coolness)

For planting in late April or Early May:
Beet, carrot, cauliflower, celery, chard, endive, head lettuce, most herbs and potatoes.

FROST TENDER VEGETABLES
(Plant only after risk of frost is over - in Southern Ontario, usually after the 24th of May)
Beans, corn, cucumber, eggplant, melon, okra, pepper, pumpkin, squash, tomato and watermelon.

THINGS THAT BUG VEGETABLES

A variety of insect pests and diseases are likely to attack your vegetable garden. Minimize the problem with good cultural practices: prepare the ground thoroughly; plant healthy stock and use disease resistant varieties, especially Heirloom vegetables; plant each crop at the right time (refer to the chart on planting times); keep the garden free of weeds and debris to remove the breeding ground for insects and disease; fertilize adequately, (healthy plants are more resistant to insect and disease attack); rotate crops each year.

Soil insects – (Grubs, wireworms, leatherjackets, cutworms) – use beneficial nematodes in late May to early fall. Diatomaceous Earth is also helpful.
Root maggots - They attack onion, radish, cabbage and turnip and must be controlled before maggots hatch. Companion plantings work quite well here.
Slugs & Snails – Night feeders that attack the foliage of most plants and even the fruit of some such as tomatoes. Place small mounds of Slug Bait Pellets around the garden. Moisten slightly and cover with boards etc. to keep them out of reach of dogs, cats and birds. Diatomaceous Earth also works as well as does companion planting.
Foliage eaters – Caterpillars, beetles, grasshoppers. Use BTK, Diatomaceous Earth, or companion planting.
Sap-sucking insects – Aphids, mites, thrips, leafhoppers. Apply controls as soon as insects or their damage are noticed.
Plant diseases – The most common fungus diseases can be prevented by having a protective coating of fungicide on the leaves before infection occurs. Repeat applications are required every 7 to 10 days, particularly in cool wet weather. Use Garden Sulphur as well as companion planting.

LOVE/HATE RELATIONSHIPS

Vegetable	Perfect Matches	Mismatches
Beans	Brassicas, carrot	Fennel, onion
Beets	Brassicas esp. kohlrabi, bush beans, onion	Pole beans
Brassicas	Pea, potato, garlic, cucumber, bush beans	Pole beans, strawberry
Carrot	Leek, lettuce, pea, onion, garlic, tomato	Dill
Cucumber	Legumes, radish	Potato, aromatic herbs especially sage
Lettuce	Carrot, radish, cucumber, strawberry	
Corn	Pole beans, potato, cucumber	Tomatoes
Onion	Lettuce, tomato, leek	Legumes
Peas	Beans, carrot, cucumber, potato, corn	Onion, garlic
Potato	Legumes, brassicas, corn	Cucumber, tomato, cherries
Sweet pepper	Eggplant	Brassicas
Tomato	Asparagus, carrot, onion, garlic radish	Potato, fennel, kohlrabi, corn

CONTROL OF INSECT PESTS
Chemical insecticides are regulated by government and require rigorous testing before becoming available to the home gardener. Even so, care should be used. Read the instructions for safe application, particularly in relation to the safe interval between treatment and harvest. See also Green Thumb Guide # GT 337 *Companion Plants for Insect Pests and Disease* for answers to problems with vegetables, pests, and diseases.

FERTILIZER

Nitrogen
As the basic constituent protein in all living cells, nitrogen increases the proportion of water in the cells, makes plant leaves larger, greener, darker and induces lush growth. It also makes the root system more efficient in absorbing other nutrients from the soil.

While nitrogen is essential to all plants at all times, it has special significance in the feeding of plants where the leaf structure is of special importance such as foliage house plants, leaf vegetables and spring lawns.

Nitrogen is the first element to disappear from an unreplenished soil. When a plant is not getting enough nitrogen, leaves first turn pale green then yellow, starting at the bottom of the plant and working upward, with new growth the last to be affected.

Phosphorus
Phosphorus is vital to the growth of individual cells and, in fact, growth is not possible without it. Since it is most active near the fastest growing parts of the plant, it is important in flower and fruit production. It is essential in the uptake of nitrogen, in cell-wall building and the formation of starch and cellulose for food storage in the root system.

Phosphorus encourages the growth processes of flowering, fruiting and rooting and is therefore important in increasing the yield of all indoor and outdoor flowering plants, trees, shrubs, small fruits, flowering vegetables and all vegetables where the root is taken.

A plant starved of phosphorus usually has dark green leaves, and may develop a faint reddish or purple colour. Growth is stunted and maturity delayed. Older leaves become dry and black, and then die. Stems are slender.

Potassium (Potash)
Aiding in the formation of protein, potassium is important in the formation of leaves and growing tips. It provides cell elasticity and strength and increases the plant's resistance to disease and cold.

Like nitrogen, potassium is important to leaf growth, and its main contribution to cell elasticity and strength makes it vital where stem strength is important in bearing heavy yields or where the stem is taken as food (e.g. rhubarb, asparagus, chives, etc.).

Potassium deficiency first shows up in older growth as mottling, spots, distorted growth or yellow leaves.

Planting Times Are Important

Optimum crop production is greatly affected by planting times in both the seeding and setting out of plants. Some seeds demand cool soil conditions; other seeds and some plants are cold tolerant. Other seeds will germinate and plants thrive only when conditions are warm.

Cool-weather seeds can be planted as soon as the ground is workable; cool-tolerant seeds may be planted at the same time and later. Plant warm-weather seeds when trees are approaching bud break and the more tender plants, such as tomatoes and peppers should not be planted until the last danger of frost is past. Setting warm-weather seeds out too soon can result in rot and the same applies to warm-weather plants. In fact, a tomato plant set out in very late spring will produce the same abundant crop as one set out in early spring, and without the danger of loss.

The following chart can be used as a guide for both seeding and setting out of vegetable plants.

NAME	NEEDS COOL SOIL	TOLERATES COOL SOIL	NEEDS WARM SOIL	NAME	NEEDS COOL SOIL	TOLERATES COOL SOIL	NEEDS WARM SOIL
ASPARAGUS		✓		KALE		✓	
POLE BEAN			✓	LETTUCE	✓		
BUSH BEAN			✓	MUSKMELLON			✓
SCARLET RUNNER			✓	ONION	✓		
BEET		✓		PARSNIP		✓	
BROCCOLI		✓		PEAS	✓		
BRUSSEL SPROUTS		✓		PEPPER			✓
CABBAGE		✓		POTATO		✓	
CARROT		✓		PUMPKIN			✓
CAULIFLOWER		✓		RADISH	✓		
CELERY	✓			RUTABAGA		✓	
CHARD		✓		SPINACH	✓		
CHIVES		✓		SQUASH			✓
CORN			✓	TOMATO			✓
CUCUMBER			✓	TURNIP	✓		
EGGPLANT			✓	WATERMELON			✓

GROWING GREAT TOMATOES

TOMATO CULTURE

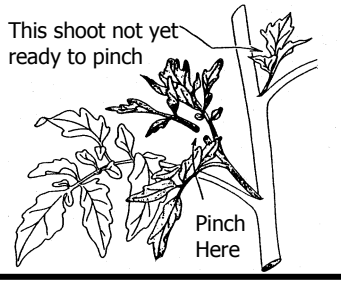
Determinate (bush) vs Indeterminate (climbing)
A tomato variety is determinate if the vine terminates in a flower cluster. These make only moderate growth after the fruits form, are mostly grown without support, and are well adapted to short stake or tomato cage culture.
Indeterminate varieties continue to vine even after fruit has set, ripening over a longer period of time. Grown without support, plants will sprawl and take up a great deal of space. For best results you should stake, trellis, or cage and prune these plants.

When to Plant
Tomatoes are warm weather plants and are not planted out until the danger of frost is well passed (usually the first week of June in Southern Ontario).

Choose the sunniest spot in your garden for growing tomatoes. The soil should be well drained and rich in organic matter. Dig in well-composted manure and a high phosphorous fertilizer, such as Nutrite Tomato Food.

Training Tomatoes
Both bush type (determinate) and vining types (indeterminate) can be allowed to sprawl if the soil is covered with a mulch to keep the fruit clean. Vining types take a great deal of room if grown this way and are usually trained on stakes, trellises or wire cages.

Removing Suckers
Suckers are the side shoots that develop in the axil of the leaves and the main stem. Removing suckers can give you earlier but fewer fruit on a single stem.
Well-supported vines can be allowed to have three or four stems, producing more fruit and with more foliage protection from the sun.
Allow the suckers to grow a few leaves and then pinch them off above the lowest pair (see illustration). This provides some protection to the stems from sunscald.



How to Plant
Tomato plants should be set deep in the soil, with the first leaf just above ground level. Leggy plants can be planted horizontally; roots will develop from the buried stem and produce a sturdier plant.

Fertilizing
The nutrients in your well-prepared soil will be enough until the first fruit are set. Feed them with Nutrite Tomato Food or Nutrite Tomato & Vegetable Food at this point.

Watering
A constant, dependable supply of water is most important. Alternating between wet and dry results in poor performance. Tomatoes must never wilt, and try not to allow water to sit on the leaves for more than 15 minutes after watering. A deep watering around the roots is advisable (or invest in a drip irrigation hose).

Tomato Problems
Blossom-end rot is a common problem; a leathery scar develops on the bottom of the fruit. This is often blamed on a deficiency of calcium. To ensure a supply of calcium, work 2 kg of granulated gypsum per 100 sq. ft. into the soil before planting. It can occur even when calcium is present in sufficient quantity and is more likely caused by irregular watering. Heavily pruned and trained tomatoes seem more prone to this problem than those that are allowed to sprawl.

HEIRLOOM TOMATOES
Heirloom varieties have been in existence for centuries. Many of these older varieties that are being saved from extinction were traditionally grown by Native Americans, and immigrants who brought them from Europe.
Few seed companies list Heirloom varieties in this modern age of New and Improved. They are now being grown for their superior flavour and aroma, as well as resistance to pests and disease.

Where to pinch-out unwanted growth
Before removing suckers or side shoots on a tomato plant, wait until two leaves develop and pinch above them. This practice provides better foliage cover to protect the fruit and stems from sun damage.