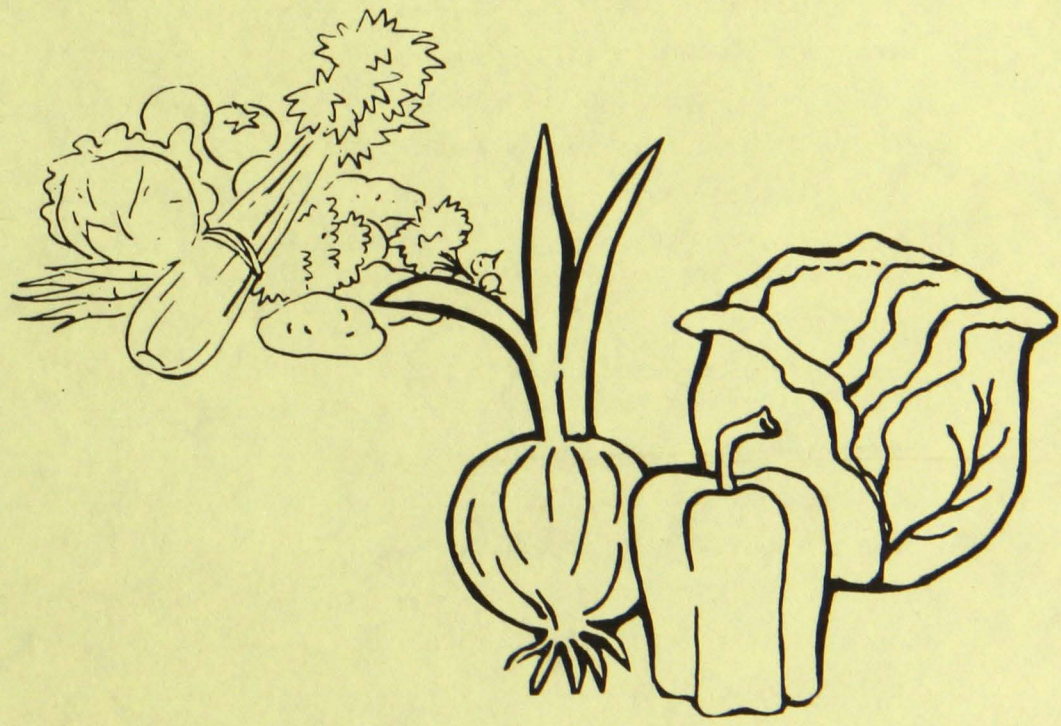


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VEGETABLE GARDENING HINTS

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I. TYPES OF VEGETABLE GARDENS

A. Early Spring or Salad Garden

1. Crops mature in 25-30 days.
2. Well suited where space is limited.
3. Well suited for youngsters.
4. Consider midget or dwarf varieties.
5. Direct seed cress, lettuce, green onions, radish, peas, cabbage.
6. Use transplants for beets, carrots, parsley, chives, herbs, kale, collards and cabbage.

B. Summer Garden

1. Crops mature in 45-70 days.
2. Direct seed beans, beets, carrots, lettuce, sweet corn and turnips.
3. Use transplants for cabbage, cucumbers, peppers, tomatoes, summer squash, kale and collards.

C. Fall Garden

1. Crops mature in 70-110 days.
2. Direct seed radish, cabbage, broccoli, cauliflower, collards, kale, sweet corn, pole beans, turnips, melons, cucumbers, rutabagas, mustard, squash and pumpkin.
3. May use transplants for cabbage, broccoli, peppers, herbs, tomatoes, onions and vine crops.
4. Start vine crops indoors 10-14 days prior to transplanting. Start in containers (Jiffy 7's, Jiffy 9, Ferto Pots, Jiffy Pots, pint size milk cartons) that can be planted directly into the ground or plant removed without disturbing the roots. If Jiffy 7's or similar containers are used, cover with soil.

II. CONSIDERATIONS IN PLANNING THE GARDEN

A. Size of Garden

1. Land or space available.
2. Size of family.
3. Age of gardener.
4. Experience of gardener.
5. Time available: A garden 30 x 50 will require the expenditure of one man's spare time.
6. Availability of tools and equipment.

B. Ideal Location of Garden

1. Good soil
2. Adequate light
3. Level site
4. Good drainage
5. Close to water supply
6. Close to house
7. Protection from wind
8. Avoid wet spots and frost pockets

C. What to Plant

1. Size and location of garden
 - a. Maxi--wide variety of vegetables
 - b. Mini--salad vegetables
 - c. Shady--crops tolerant to partial shade (carrots, radish, lettuce, beets)
2. Consider the likes of the family.
3. Consider the following when selecting kinds and varieties of vegetables:
 - a. Adaptability--e.g., maturity, size, use, productivity, resistance to insects and disease, nutritional value, growth habits.
 - b. Recommended variety lists available at County Extension Offices.
 - c. Hybrids are superior to standard varieties in most cases.
 - d. Purchase treated seed or treat seed with fungicide (Captan) prior to planting.

D. Amount of Seed to Purchase

1. Determine the amounts you need (see "Planting Chart for Vegetables" included in this book).
2. Purchase only what you need.

E. Where to Obtain Seeds and Plants

1. Local garden and feed stores
2. Seed catalogs
3. Collect, process and save your own seeds. (Recommended only in special cases. Not recommended for the beginner. If you wish to do this, call the Area Extension Office in Duluth, 726-8126, for details.)

III. MAKING THE PLAN

A. Make Plan to Fit Your Needs

1. Make plan to scale and adapt scale to garden size (e.g., 1" equals 2 or 4 feet).
2. Make a list of vegetables to be grown.
3. Determine your space needs for each vegetable (see "Planting Chart for Vegetables").
4. Plant on contour or across slope if slope is more than 1½ percent, (a drop of 1½ feet in 100 feet).

5. Keep garden fully planted or ground occupied for maximum efficiency of space.
 - a. In small gardens plan intensively, e.g.:
 - (1) Radish may be seeded in the same row with beets, carrots, lettuce, rutabagas, tomatoes, cucumbers, pepper and squash.
 - (2) Lettuce may be seeded with tomatoes, cucumbers, squash and peppers.
 - (3) After the peas are harvested, plant radish, lettuce, beets and beans.
6. Place perennial vegetables along one side of the garden.
7. Place tall vegetables so they will not shade shorter ones.
8. Stake or cage tomatoes to save space.
9. Grow bush-type squash to save space.
10. Grow pole beans and cucumbers on a trellis or cage support to save space.
11. To insure adequate pollination, plant corn in many short rows rather than 1 or 2 long rows. If not possible, hand pollinate to insure well-filled ears.
12. Avoid planting too close to large trees and tall hedges or windbreaks. If needed, give additional water and fertilizer.
13. Locate garden so as to have at least 8 hours of sunlight. (Refer to sheet "Light Requirements of Vegetables".)

IV. SOIL PREPARATION

- A. Fall spading or plowing is best, especially for heavy soil. Work in organic matter in the fall.
- B. Sandy soils with cover crops should be spaded or plowed in the spring.
- C. Plow or spade sod well in advance of planting, preferably in the fall.
- D. Remove sod if plowing or spading is delayed, treat for white grubs and wireworms. (Obtain Agricultural Extension Service Special Report 5: "Weed, Insect, and Disease Control Guide for Commercial Vegetable Growers" from your County Extension Office.)
- E. Don't work soil if it sticks to spade or plow.
- F. Soil Amendments: Sawdust, wood chips and shavings, composted bark, peat, compost, straw and old hay.
 1. To make marked improvement of the soil by a soil amendment, add 25-50 percent by volume of amendment. Addition of 3 inches of sawdust in top 9 inches of soil makes a 25% mix. A 33% mix is obtained if the garden is tilled only to a 6-inch depth. Prior to addition of sawdust, wood chips and shavings, be sure to add 3.5 pounds of ammonium nitrate or 5.5 pounds of ammonium sulfate per 1000 square feet. Apply 75 pounds of straw and old hay per 100 square feet. Add ½ pound of ammonium nitrate per 100 square feet and rototill hay and straw very thoroughly into soil. When adding peat, compost, or well-composted bark or wood chips, it is not necessary to add additional fertilizer as needed for sawdust, bark, chips, straw, hay or shavings.

G. Fertilizers

1. Organic
 - a. Compost, manures, peat, dried blood, linseed meal, cottonseed meal, tankage and leaves improve soil texture and add nutrients to the soil.

- (1) Compost--apply 3-4 bushels per 100 square feet of garden area.
 - (2) Barnyard manure--apply 3-4 bushels per 100 square feet of garden area.
 - (3) Poultry, hog, sheep, mink manure--apply 2 bushels per 100 square feet of garden area.
 - (4) Le aves--apply 8-10 bushels per 100 square feet, work into soil.
 - (5) Peat--apply 5-6 bushels per 100 square feet of garden area.
 - (6) Dried blood--apply 1-2 pounds per 100 square feet of garden area. (Used mostly as a side dressing.)
 - (7) Tankage--apply 3-4 pounds per 100 square feet.
 - (8) Linseed meal--apply 3 pounds per 100 square feet of garden area.
 - (9) Cottonseed meal--apply 3-4 pounds per 100 square feet of garden area.
2. Inorganic
- a. Complete fertilizer formulations include three minerals; namely, Nitrogen, Phosphorous and Potassium.
 - (1) Formulas like 5-10-10, 5-20-20, 10-10-10, 17-17-17, 8-32-16, 8-24-24 are satisfactory for vegetable production. If large quantities of annual manures are used, the formulas with less nitrogen are recommended, such as 5-10-10 and 10-20-20.
 - b. Time of application.
 - (1) At planting or a few days before planting.
 - (2) Second application after thinning of vegetables or mid-summer if necessary.
 - (3) On very sandy soils it may be advisable to apply all of the fertilizer as a side dressing at 3-4 week intervals after seed emergence.
 - c. Method of application may vary.
 - (1) Broadcast, apply in row, apply as a side dressing, apply in hills, rake or rototill to a depth of 2-3 inches. Row and side dressing applications are more economical than broadcast applications.
 - d. Rate of application (determined by soil test).
 - (1) 3-4 pounds per 100 square feet is a general recommendation.
 - (2) 1 pound per 25 lineal feet of row as a side dressing.

H. Lime

1. Reason for liming.
 - a. Reduces acidity.
 - b. Helps to loosen heavy clay soils.
 - c. Speeds up decay of organic matter and the liberation of nitrogen.
2. Test Soil
 - a. Home test kits (not very reliable when used by the beginner).
 - b. Laboratory test--contact your County Extension Office for details.
3. Application rate determined by soil test.
 - a. If pH of soil is between 6-6.8, it is optimal.*
 - b. If pH is between 5.5 and 6, add 3 pounds of ground limestone per 100 square feet on sandy soils and 5 pounds on heavier soils.*
 - c. If pH reading is between 5 and 5.5, use double the above amounts per 100 square feet.*

*It is best to apply this in the fall and thoroughly mix into the soil.

V. PLANTING GARDEN

A. Time

1. Plant very hardy kinds when ground can be worked, usually when crocus and daffodils are out, or when soil temperatures at a 4-inch depth are 33-35°F.
2. Plant hardy kinds when the soil temperatures have reached 35-40°F.
3. Plant tender kinds when soil temperatures have reached 40-50°F. Also, this may be the time to make a second planting of hardy kinds.
4. Plant very tender kinds when soil temperatures have reached 50-60°F. This is also the time to plant hardy kinds for late fall harvest. Be sure to see that soil moisture is adequate for germination of the seeds.

B. Depth of Planting

1. Small seeded vegetables-- $\frac{1}{4}$ to $\frac{1}{2}$ inch deep.
2. Large seeded vegetables--1 to 2 inches deep.

VI. USE OF MULCHES

A. Purpose

1. Conserves moisture.
2. Increases soil temperature; characteristic of clear plastic materials.
3. Reduces soil temperature; black plastic may reduce soil temperatures.
4. Smothers weeds.
5. Reduces disease.
6. Keeps crops clean.

B. Materials

1. Petroleum; clear, black and slitted plastic; aluminum foil; newspaper; cardboard; straw; hay; grass clippings; sawdust shavings; rice hulls; pine needles; ground corn cobs; and peanut hulls.

C. Most beneficial for

1. Tomatoes, peppers, eggplant, sweet corn, potatoes, cucumbers, melons, squash, edible soybeans.

VII. WEED CONTROL

A. Early, shallow, frequent cultivation

B. Mulches

C. Chemical*

1. Dacthal--most practical for small home gardens.
2. Dalapon
3. Atrazine
4. Treflan

VIII. HARVESTING

1. Harvest at the proper time and frequently enough to insure continued productivity of high quality produce. (Refer to sheet on harvesting.)

*See Agricultural Extension Service Special Report 5, "Weed Insect, Disease Control Guide for Commercial Vegetable Growers." Check with your county agent before purchasing or application of a weed control chemical.

HOW TO GARDEN WITH LESS USE OF PESTICIDES

Severity of pest attacks varies from year to year and place to place.

1. Environmental Factors
 - a. Amount of rain, heavy dews, air and soil temperatures and relative humidity.
 - b. Kind, amount and tolerance of plants grown.
 - c. Presence of the pest in an active form.

These three must be in balance for the pest to multiply, spread and pose a major problem for the gardener.

Example #1:

1. The environment is favorable for the pest to grow and spread but if the host plant is resistant--no serious attack will develop.
 - a. Cucumbers resistant to scab, mildew, mosaic, angular leaf spot.
 - b. Cabbage resistant to yellows.
 - c. Tomato resistant to fusarium, verticillium wilt and nemotodes.
 - d. Beans resistant to bacterial blight, mosaic and rust.
 - e. Potatoes resistant to scab, verticillium wilt, early and late blight.
 - f. Lettuce resistant to mosaic.
 - g. Onions resistant to pink root.
2. Select adapted disease resistant varieties from seed catalogs.

Example #2:

1. Pest is present, plant is susceptible but environment is unfavorable--no serious attack will occur.

Four basic ways used to control garden pests

1. Exclusion
 - a. This means keeping the pest away from where the plant is growing.
 - (1) Collars for tomatoes to keep out cutworms.
 - (2) Use only certified pest-free seeds by buying from reputable firms.
 - (3) Observe quarantine regulations.
 - (4) Use mulches to reduce rain splattering of plants with soil-borne pests.
 - (5) Use netting to keep out birds and rodents.
 - (6) Use cheese cloth, nylon netting or something similar to keep out leaf hoppers cabbage worms and butterflies from cabbage, cauliflower and broccoli.
 - (7) Avoid working among plants when the foliage is wet, especially in green bush beans.
2. Eradication
 - a. This means controlling the pest after it is already established in your garden.
 - (1) Practice rotation of crops. Only possible in a large garden; not too practical in a small garden.
 - (2) Practice sanitation.
 - (a) At least once a week patrol garden early in the morning; collect and dispose of pests. Insects are sluggish at this time and can be easily collected.
 - (b) Collect and dispose of all infected leaves and insect clusters. Do not place in compost pile.
 - (3) Keep trees and shrubs well pruned to let in light and air.

- (4) Destroy debris piles and diseased plants.
- (5) Control weeds in the area since they harbor insects and disease.
- (6) Plant crops in most suitable locations.
- (7) Stake certain plants to improve light and air conditions.
- (8) Heat treatments
 - (a) Sterilize soil.
 - (b) Treat seeds, bulbs and roots with appropriate chemicals.*
- (9) Destroy alternate hosts
 - (a) Control cedar apple rust--alternate host eastern red cedar of some help.
 - (b) Control aster yellows--alternate host Canadian thistle of some help.

3. Protection

- a. This means protecting against pests.
 - (1) This usually involves applying a chemical to the plant to prevent disease or pest injury.
 - (2) Preparation of soil properly, at the right time and moisture, temperature and proper depth.
 - (3) Plant at the most suitable time for crop in question.
 - (4) Water properly: If less than 1 inch falls per week, irrigate early in the morning so foliage will dry by evening.
 - (5) Avoid deep or close cultivation, careless cultivation that damages roots, weakens plants so they are susceptible to disease and insect infestation.
 - (6) Protect against summer or winter injury:
 - (a) Apples--prune out diseased or dead branches.
 - (b) Roses--prune out diseased, weak wood.
 - (c) Evergreens--wrap in winter.
 - (d) Tomatoes--mulch to reduce blossom-end rot.

4. Immunization

- a. This means immunizing against pests.
 - (1) This involves increasing the resistance of the plant so it can better combat the pest. This can be done by pruning, fertilization or other appropriate cultural practices.
 - (a) Raspberries--prune out diseased canes.
 - (b) Roses--prune out galls and dead wood.
 - (c) Grass--add nitrogen to reduce damage by rust.
 - (2) Grow resistant varieties.
 - (3) Fertilize to maintain vigorous varieties. Well-fertilized plants are healthy and better able to ward off disease and other injuries. Keep potassium on high side to reduce foliage disease losses.

USE BIOLOGICAL CONTROLS

1. Bacterial Control

- a. *Bacillus Thuringiensis* (trade names are Biotrol, Dipel and Thuricide).

2. Predators

- a. to control insects not very practical as yet in areas having short growing seasons.

**Check with your county agent before purchasing or application of any chemical.*

CHEMICAL CONTROL OF PESTS

1. Insects*

- a. Soil insects at planting time (maggots, cutworms, white grubs, wireworms)
 - (1) Diazinon
 - (a) 1 ounce per 100 feet of row in open furrow at seeding time; second application ten days later.
- b. Leaf chewing insects (worms and beetles)
 - (1) Methoxychlor
 - (a) 2 tbsp. 50% Wp per gal of water
 - (2) Carbaryl (Sevin)
 - (a) 1½ tbsp. 50% Wp per gal of water
 - (b) DO NOT USE ON VINE CROPS WHEN IN BLOOM. Sevin is harmful to honeybees. Apply when bee activity is low, such as a cloudy, cool day or in the evening.
 - (3) Malathion
 - (a) 2 tbsp. 25% Wp per gal of water
- c. Leaf-sucking insects (aphids, leafhoppers)
 - (1) Malathion
 - (a) 2 tbsp. 25% Wp per gal of water. (Will not control green peach aphid, found mostly on house plants.**)
 - (2) Diazinon
 - (a) ½ ounce in 6 gal of water or 1½ tsp. in 3 gal of water
- d. Slugs
 - (1) Measurool
 - (a) Early in May sprinkle chemical out of shaker can around garden; do not apply in garden.
 - (2) Culture
 - (a) Clean up weeds, rocks and assorted debris in garden area.
 - (b) Cut grass to 1" height, 2 or 3 mower widths around garden.
 - (c) Leave a 2' unplanted space around garden which should be kept cultivated, especially after each rain.

2. Diseases*

- a. Seed treatment
 - (1) Captan, Thiram--to control pre and post-emergence damping-off of young seedlings.
- b. Foliage blights, septoria, early and late blight of tomato and potato.
 - (1) Maneb
 - (a) 2 tbsp. 80% Wp per gal of water
 - (2) Zineb
 - (a) 2 tbsp. 75% Wp per gal of water

**See Agricultural Extension Service Special Report 5, "Weed, Insect, Disease Control Guide for Commercial Vegetable Growers".*

***Contact your county agent for appropriate chemical.*

HINTS FOR BEGINNING GARDENERS

1. Begin with a small garden plot.
2. Purchase only enough seed that you need. Most seed catalogs will print the weight and/or seed count on their packets. Most have planting instructions. (See "Planting Chart for Vegetables".)
3. 1 ounce of peas or beans will plant a 10 foot row.
1 ounce of corn is enough for a 30 foot row.
1/4 ounce of carrots will plant a 60 foot row.
1/8 ounce cabbage seed is enough for 250 plants.
1/4 ounce of beets will plant a 25 foot row.
1/16 ounce of lettuce will plant a 25 foot row.
4. If possible, plant across the slope.
5. Loosen heavy clay soil. Add 3-4 inches of sawdust; also, add 5-6 pounds of ammonium nitrate per 100 pounds of sawdust. Rototill in very well.
6. Crops that are light feeders: beets, carrots, turnips, radish, parsnip.
7. Crops that are heavy feeders that would benefit from a side dressing during midsummer: corn, tomato, broccoli, cauliflower, brussels sprouts, squash, cucumbers, melons and lettuce.
8. Transplanting
 - a. Divide transplants with a knife rather than tearing plants apart. Cut them in blocks so as not to injure the roots.
 - b. Water immediately after planting. Be sure to include an all-soluble fertilizer in water. Follow instructions on container as to the amount to use.
 - c. Provide shade to reduce wilting.
 - d. Plant in the late afternoon or on a cloudy day in order to reduce transplanting shock.
 - e. Protect transplants from cold or hot, drying winds.

9. Storage

Suggested amounts to store or process for a family of five:

Beets	1/2 to 1 bushel
Carrots	2 to 3 bushels
Turnips & Rutabagas	1 to 2 bushels
Potatoes	12 to 20 bushels
Onions	1 to 2 bushels
Cabbage	25 to 35 heads
Squash	20 to 25 fruits
Dry Beans	8 to 12 quarts
Tomatoes (green)	1 to 2 bushels

10. Do not start too early. (See planting guide based on soil temperatures.)
11. Do not plant too thick. Be sure to thin on time.
12. Remember to side dress certain vegetables during the middle of the growing season; the best time is right after thinning. Apply 1 pound or 1 pint of complete fertilizer per 25 lineal feet of row. Spread lightly $\frac{1}{2}$ pound or $\frac{1}{2}$ pint on one side and the rest on the other side. Lightly mix in with hoe or hand cultivator. Irrigate if necessary.

13. SEED NUMBER AND LONGEVITY CHART

VEGETABLES			FLOWERS		
Plant	Average Longevity In Years	Approximate No. of Seeds Per Ounce	Plant	Average Longevity In Years	Approximate No. of Seeds Per Ounce
Beans	3	60-250	Ageratum	4	238,200
Beet*	5	1,000-1,800	Alyssum	4	80,000
Broccoli	4	6,000-8,500	Aquilegia	2	17,500
Cabbage	4	6,000-8,500	Aster	1-2	19,300
Carrot	3	16,000-33,000	Balsam	5-6	2,800
Cauliflower	4	8,000-16,000	Calendula	5-6	4,200
Celery	3	50,000-100,000	Calif. Poppy	2	14,000
Celeriac	3		Calliopsis	2-3	90,000
Chard	5	1,000-1,800	Candytuft	2-3	11,700
Chicory	3		Carnation	4-5	14,300
Corn	3	110-220	Celosia	4	33,600
Cucumber	5	1,000-1,500	Centaurea	1-3	9,500
Eggplant	4	5,000-6,500	Clarkia	2-3	84,000
Lettuce	5	15,000-30,000	Coleus	2	92,500
Melon	4-5	400-1,200	Cosmos	3-4	5,600
Okra	4		Dahlia	2-3	2,800
Onion	2	7,000-13,000	Delphinium	1	12,700
Parsley	1		Dianthus	4-5	28,000
Parsnip	1	3,000-6,000	Gaillardia	4	12,000
Peas	3	50-160	Geranium	1	
Pepper	2	3,000-4,500	Gysophila	2	33,000
Pumpkin	4	100-175	Hollyhock	2-3	2,800
Radish	4	2,100-4,500	Impatiens	2	50,000
Squash, summer	4	300-400	Larkspur	1-2	12,700
Squash, winter	4	100-175	Lobelia	3-4	785,000
Salsify	1		Marigold	2-3	8,400
Spinach	3	1,800-3,000	Morning Glory	2-3	1,400
Tomato	6-7	8,000-16,000	Nasturtium	6-7	250
Turnip	4	8,000-12,000	Nicotiana	3-4	176,600
Watermelon		125-200	Pansy	1-2	22,400
			Petunia	2-3	252,000
			Poppy	3-5	252,000
			Portulaca	3	281,500
			Salvia	1	9,800
			Scabiosa	2	4,400
			Sweet Peas	4-5	390
			Verbena	1	9,800
			Viola	1	22,400
			Zinnia	4-5	3,350

*Seed balls contain 1 to 3 or more actual seeds. Mono-germ varieties have only one seed.

14. When to Start Seeds Indoors

KIND	DATE TO PLANT	NUMBER OF WEEKS
Brussels Sprouts	April 9 - 16	5 - 6
Cabbage	April 9 - 16	5 - 6
Cauliflower	April 9 - 16	5 - 6
Celery	March 10	10
Collards	April 9 - 16	5 - 6
Cucumber	May 28	2
Eggplant	April 9 - 16	7 - 8
Lettuce	April 30	3 - 4
Melon	May 28	2
Onion	March 1	12
Pepper	April 9 - 16	7 - 8
Pumpkin	May 28	2
Squash	May 28	2
Tomato	April 23 - 30	6 - 7
Watermelon	May 28	2
Alyssum	April 23 - 30	6 - 7
Geranium	March 1	10 - 12
Impatiens	April 9 - 16	7 - 8
Marigold	April 16 - 23	5 - 6
Pansy	March 1	9 - 10
Petunia	April 1 - 9	8 - 9
Salvia	April 9 - 16	7 - 8
Snapdragon	April 9 - 16	7 - 8
Zinnia	May 1 - 7	4 - 5

It is assumed that warm season crops (tomatoes, peppers, eggplant, vine crops) are transplanted into the field the second week in June. If earlier planting is possible adjust seeding dates accordingly.

It is assumed that cool season crops (broccoli, cabbage, cauliflower) are transplanted into the field the third to fourth week in May. If earlier planting is possible adjust seeding dates accordingly.

15. Garden Tools

The following are usually needed: spade or shovel, spading fork, iron rake, hoe, strong cord and stakes.

The following are useful accessories: wheelbarrow, buckets and baskets, wheel hoe (for gardens 4000 square feet or larger in size), water hose and sprinklers, trowels, rototiller (garden tractor for areas of 4000 square feet or larger), hand weeders, sprayers and dusters.

Care of Tools:

1. Clean tools after use.
2. Keep tools in dry place.
3. Keep cutting tools sharp.
4. Have a special place for tools.

SOIL MIXES TO USE TO START SEEDS INDOORS OR IN CONTAINERS OUTDOORS

Commercial Mixes

Redi Earth	Heco 1
Jiffymix	Pro Mix A

Home Mix #1

½ bushel (4 gallons) of #2 grade vermiculite
 ½ bushel (4 gallons) of shredded sphagnum peat moss
 4 tablespoons ground limestone
 1 cup (½ pound) 5-10-5 or ½ cup (¼ pound) 10-10-10

Mix thoroughly and store in plastic or non-metal container.
If needed for better drainage, add one gallon of medium perlite.

Home Mix #2

1 gallon of milled sphagnum peat moss
 1 gallon of #2 grade vermiculite
 1 gallon of medium perlite

Mix thoroughly and store in closed containers.

Fertilizers for Artificial Mixes

Dry granular mixes--1 cup (½ pound) of 5-10-5 per bushel of mix.

Dry all-soluble mixes--1 tablespoon per gallon of water (Trade names: Rapid Grow, Boost-Em, Miracle Grow, Hyponx, Garden Life)

Dry slow-release mixes--1 tablespoon per 1/3 bushel (Trade names: Mag Amp, Osmocote)

MINI GARDENS

Containers

Cans	Jars	Bushel Baskets	Toy Wagons	Raised Beds	
Pails	Crocks	Plastic Bags	Wheelbarrows	Tiered Beds	Boxes

Vegetables to Grow

<u>Beets</u>	<u>Cabbage</u>	<u>Carrot</u>	<u>Cucumber</u>
Formanova (S)	Green Earliana (B)	Baby Finger Nantes (S)	Patio Pik (F)
	Red Acre (F)	Short & Sweet (B)	Tiny Dill (F)
	Stonehead (S)	Tiny Sweet (F)	
<u>Green Beans</u>	<u>Onion</u>	<u>Parsley</u>	<u>Pepper</u>
Tendercrop (S)	Bunching (B,F)	Deep Green (B)	New Ace (B)
	Chives (B,F)		Early Niagra (S)
<u>Lettuce</u>	<u>Summer Squash</u>	<u>Swiss Chard</u>	<u>Tomatoes</u>
Ruby Red (B)	Zucchini (B)	Lucullus (B)	Patio (S)
Grand Rapids (B)	Aristocrat (B)	Rhubarb (B)	Pixie (B)
Tom Thumb (B)		<u>Radish</u>	Small Fry (B)
Butter Crunch(B)		White Icicle (B)	Tanana (F)
Cos-Romaine (B)		Cherry Belle (B)	Tiny Tim (B,F)

KEY:

B--Burpee, Clinton, Iowa 52732
 F--Farmers, Faribault, Minnesota 55021
 S--Stokes, 39 James Street, Box 10, St. Catherines, Ontario, Canada

PLANTING GUIDE BASED ON SOIL TEMPERATURES IN DEGREES FARENHEIT

VERY HARDY 33-35° April 25-May 1	HARDY 35-40° May 1-May 20	TENDER 40-50° May 20-June 1	VERY TENDER 50-60° June 1-June 15
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Asparagus	Beets	Beans	Beans
Garlic*	Broccoli	Beets	Beets
Horseradish	Brussels Sprouts**	Broccoli***	Broccoli**
Lettuce	Cabbage	Cabbage***	Cabbage**
Onions	Carrots	Carrots	Carrots
Peas	Chard	Cauliflower***	Cauliflower**
Potatoes (Whole Seed)	Collards	Chard	Chard
Radish	Garlic*	Collards***	Eggplant**
Rhubarb	Horseradish	Kale***	Lettuce
Rutabaga	Kale	Kohlrabi	Muskmelon***
Turnip	Kohlrabi	Lettuce	Peppers**
	Lettuce	Muskmelon	Pumpkin***
	Mustard	Peas	Spinach, (New Zealand)
	Onion Seed	Potatoes (Cut Seed)	Spinach
	Onion Transplants	Pumpkin	Squash**
	Parsley	Spinach, (New Zealand)	Tomatoes**
	Parsnips	Spinach	Watermelon***
	Peas	Squash	
	Potatoes (Whole Seed)	Sweet Corn	
	Radishes	Tomatoes**	
	Rutabaga	Turnip	
	Spinach		

*Better to plant in the fall (October)

**Transplants

***Transplants or direct seed

PLANTING CHART FOR VEGETABLES

VEGETABLES	SUGGESTED EARLIEST PLANTING DATE	SUGGESTED LAST PLANTING DATE	PLANT SPACING		DEPTH TO PLANT- INCHES	SEEDS FOR 50 FEET OF ROW	APPROX. DAYS TO MATURITY	LIKELY YIELD PER 50 FEET OF ROW
			IN ROWS	BETWEEN ROWS				
Bush Snap Beans	May 20	July 10	4	24	1-2	4 oz	48-55	40 qts
Beans, Pole	May 25	June 10	36	36	1-2	1½ oz	65	40 qts
Beets	May 1	July 1	3	24	½-1	½ oz	55-60	200 roots
Broccoli	May 1	*June 15	24	36	¼-½	¼ oz	60	25 plants
Brussels Sprouts	*May 20	*June 10	24	6	¼-½	1 pkt	90	20 plants
Cabbage, early	May 1	**June 10	18	24	¼-½	¼ oz	55-70	35 heads
Cabbage, late	May 20	*June 10	24	36	¼-½	¼ oz	90-100	25 heads
Carrots	May 1	June 20	2-3	18	¼-½	1 pkt	70	300 roots
Cauliflower	**May 1	*June 10	18-24	36	½	1 pkt	60-70	35 heads
Celery	*May 20	*June 5	6-8	24	¼-½	1 pkt	90-100	100 stalks
Cucumber	May 25	**June 10	12-24	60	1	1 pkt	53-60	3/4 bu
Herbs	May 1	*June 1	12	18	¼-½	½ oz	70-100	-----
Kale	May 1	**June 15	10-18	24	¼-½	1 pkt	60-70	60 plants
Kohlrabi	May 10	July 15	4	18	¼-½	1 pkt	60-70	150 bulbs
Leek	May 10	-----	4	18	½	1 pkt	110	150 stalks
Lettuce, head	May 1	**July 10	12	18	¼-½	1 pkt	70-80	50 heads
Lettuce, leaf	May 1	**Aug. 1	4	12	¼-½	1 pkt	40-45	150 plants
Muskmelon	June 1	**June 10	12-24	48	1	½ oz	90	100 melons
New Zealand Spinach	May 1	**June 1	12	30	½	½ oz	70	50 plants
Onions, seed	May 25	June 10	4-6	12	½	¼ oz	90-100	150 bulbs
Onions, sets	May 1	June 10	3-4	12	2	1 lb	90-100	200 bulbs
Parsley	May 1	*June 10	12	18	½	1 pkt	70	50 plants
Parsnip	May 1	May 25	3	24	½-3/4	¼ oz	120	200 roots
Peas	May 1	May 20	2-3	24	1-2	8 oz	55-65	15 lbs
Pepper	*June 5	*June 15	18	30	½	1 pkt	60-70	1½ bu

PLANTING CHART FOR VEGETABLES
PAGE TWO

VEGETABLES	SUGGESTED EARLIEST PLANTING DATE	SUGGESTED LAST DATE FOR PLANTING	PLANT SPACING IN INCHES		DEPTH TO PLANT- INCHES	SEEDS FOR 50 FEET OF ROW	APPROX. DAYS TO MATURITY	LIKELY YIELD PER 50 FEET OF ROW
			IN ROWS	BETWEEN ROWS				
Potato, early	May 1	June 20	12	36	4-5	5 lbs	90	1½ bu
Potato, late	May 20	June 1	12	36	3-4	5 lbs	120	1½ bu
Pumpkin	May 25	**June 10	24	60	1½	½ oz	100	75 lbs
Radish	May 1	Aug. 25	2	12	¼-½	½ oz	22-30	500 roots
Radish, winter	May 20	June 15	3-4	24	¼-½	¼ oz	55-60	75-100 roots
Rutabaga	May 1	**July 1	6-8	24	¼-½	¼ oz	100	75 roots
Spinach	May 1	July 10	6	18	3/4-1	¼ oz	40-50	200 plants
Squash, summer	May 25	**June 25	18-24	60	1	½ oz	50-60	200 squashes
Squash, fall	May 25	*June 10	18-24	60	1	½ oz	90-100	50 squashes
Sweet Corn	May 20	June 15-20	12	36	1-2	2 oz	65-75	60 plants
Swiss Chard	May 1	June 25	6-12	18	½-1	½ oz	60	45 lbs
Tomato	**May 30	*June 15	24	48	1	1 pkt	56-80	2½ bu
Turnip	May 1	July 15	4	18	¼-½	1 pkt	45-60	150 bulbs
Watermelon	*June 1	*June 10	18-24	60	1	½ oz	70-90	15 melons

* Transplants should be used

** Transplants may be used

LIGHT REQUIREMENTS OF VEGETABLES

<u>KIND</u>	<u>FULL SUN</u>	<u>PARTIAL SHADE</u>
Asparagus	x	
Beans	x	
Beets		x
Brussels Sprouts	x	
Cabbage	x	
Carrot		x
Cauliflower	x	
Celery		x
Chard	x	
Corn	x	
Cucumber	x	
Eggplant	x	
Endive		x
Kohlrabi	x	
Lettuce		x
Melon	x	
Onion	x	
Parsnip		x
Pea	x	
Pepper	x	
Pumpkin		x
Radish	x	
Squash	x	
Tomato	x	
Watermelon	x	

Vegetables do best in full sun. Some tolerate partial shade. A total of 5-6 hours of noontday sun is minimum; 8-10 hours is better. Locate sun-loving kinds to receive maximum sun and plant shade tolerant kinds accordingly.

VEGETABLE GROWING HINTS

Easy to Grow Vegetables

Beets	Corn	Leaf lettuce	Squash
Bush beans	Cucumbers	Parsley	Swiss chard
Carrots	Curly cress	Pumpkin	Turnip
Chard	Dill	Radish	
Collards	Kale	Rutabaga	

Greatest Yield for Space and Effort

Beets	Carrots	Onion	Summer squash
Bush bean	Chard	Parsley	Tomato

Crops Which are Harvested More Than Once

Asparagus	Parsley
Chard	Rhubarb
Kale	Spinach
Lettuce	Cress
Mustard	

Crops of Which Only a Few Plants are Needed for the Average Family

Asparagus	Horseradish
Chard	Peppers
Parsley	Rhubarb
Herbs	

Crops Which Can be Grown Vertically by Staking or Trellising

Beans (pole)	Pumpkin
Beans (lima)	Tomatoes
Cucumber	Watermelon
Muskmelon	Squash
Peas (tall)	

Early Maturing Vegetables

<u>Kinds</u>	<u>Approximate Time</u>
Curly Cress.....	10-20 days
Radish.....	22 days
Mustard greens.....	35 days
Scallions.....	40 days
Loosehead lettuce.....	40 days
Spinach.....	42 days
Turnip.....	45 days
Bush bean (snap).....	48 days
Swiss chard.....	60 days
Summer squash.....	50 days
Cucumber.....	53 days
Early peas.....	55 days
Beets.....	55 days
Kale.....	55 days
Kohlrabi.....	55 days
Cabbage.....	56 days

May be Planted as Soon as You Can Prepare Your Garden

Lettuce (leaf, loosehead)
 Onion sets (seed, transplants)
 Peas*
 Carrots*
 Cabbage*
 Broccoli**
 Cauliflower**
 Rutabaga**
 Turnip**
 Kohlrabi*
 Brussels sprouts (transplants)
 Radish
 Cress*
 Chard*
 Beets
 Kale*
 Parsley*

Substitutes for Spinach

Chard	Mustard Greens
Kale	Beet Greens
Collard	Orach
Tampala	
New Zealand Spinach	

* Do best if planted early.
 ** Early plantings may be damaged severely by flea beetles. Refer to Agricultural Extension Service Special Report 5, "Weed, Insect, Disease Control Guide for Commercial Vegetable Growers", available from your county agent.

Plant When Soil Warms Up to 45-50°
(About June 1-June 10)

Potatoes
Sweet Corn
Beans
Cucumbers *
Melons *
Squash *
Pumpkins *

Plant for Fall Crop
Irrigate if Necessary
(First Week of July)

Radish
Broccoli **
Cauliflower **
Cabbage **
Carrots
Chinese Cabbage*
Beets
Kale **
Collards **
Rutabaga *
Turnip

Vegetables for Processing by Freezing ***

Beans	Kale	Peas
Broccoli	Collards	Pepper
Carrots	Mustard Greens	
Cauliflower	Squash	
Chard	Pumpkin	

Vegetables for Pickling

Beets	Pepper
Cauliflower	Watermelon
Cucumbers	Onion
Summer Squash	Tomato

Vegetables for Canning ***

Beans	Potatoes
Carrots	Tomatoes
Peas	

Vegetables for Storing

<u>Warm and Dry--55°</u>	<u>Cold and Dry--36-40°</u>
Pumpkin Squash	Onion

<u>Warm and Moist--55-65°</u>	<u>Cold and Moist--36-40°</u>
Tomato Celery Shallots	Radish Potato Rutabaga Turnip Cabbage

CROPS OCCUPYING THE GROUND ENTIRE GROWING SEASON

Perennial

Asparagus
Chives
Onion
Horseradish
Herbs
Jerusalem Artichoke

Annual

Beans (bush, pole & dry)
Beans (lima, soybean)
Chard
Cucumber
Eggplant
Herbs
Muskmelon
Onions

Parsley
Potatoes
Pumpkins
Squash
Spinach
Tomatoes
Watermelon
Parsnip

- * Transplants may be used.
** Transplants should be used.
*** Refer to canning/freezing bulletins, available from your county agent.

HINTS ABOUT HARVESTING

BEANS, GREEN OR WAX (snap)--Pick when pods reach good size before bulging at individual beans. Hold plant with one hand to prevent breakage; with other detach beans with stem section (to retain freshness longer). More will set on after each picking. Storage in refrigerator--1 to 3 days.

BEANS, LIMA--Pick when pods are fat and beans inside are at stage you like. They are most tender and luscious when still green. Pick pods as for green beans; shell beans by opening pod at stem. Blanching in hot water may help shelling the beans.

BEAN, DRY OR SHELL--Leave pods until plants mature; then cut or pull the entire bush and dry in a well-ventilated area. Do not freeze. Shell out beans and dry thoroughly before storing in jars.

BEEF--Tenderest and best if pulled when about 1½ inches in diameter. For pickling you may want them even younger. Immediately cut off tops leaving one-inch stubs (keeps roots from wilting and prevents excessive "bleeding"). The tops make good greens, cooked or raw. Cook washed beets whole, cool, then slip off skins, slice for pickling or freezing. Storage same as for potatoes. Storage in refrigerator--10 to 14 days.

BROCCOLI--Cut center flower stems when buds are well developed but no flowers are open. Take upper five or six inches of stem, as much as seems tender. Later lateral florets will develop until frost. Storage in refrigerator--2 to 3 days.

BRUSSELS SPROUTS--Lower sprouts are older; remove as they reach desired size by breaking or cutting off. More will develop up the stem. Storage in refrigerator--2 to 3 days.

CABBAGE--Pull entire plant or cut head when head is solid and fully developed but before cracking from overmaturity, or showing sun/heat damage. With sharp knife cut head from base leaves. Store cool and moist (36°-40° relative humidity 85-90%). Storage in refrigerator--7 to 10 days.

CARROT--Pull some experimentally to check size. At desired state, dig entire row (use spading fork to lift roots unbroken). Trim off tops. Late carrots may be left in ground over winter, if mulched well, for early spring harvest. Store same as potatoes (cold and moist--36-40° relative humidity 85%). Storage in refrigerator--7 to 10 days.

CHARD (SWISS)--Remove outer leaves as desired by pulling off at base. Remove mid-rib before blanching. More will form, for summer-long harvest. Storage in refrigerator--1 to 2 days.

CHINESE CABBAGE--When head is large and firm, pull up entire plant; strip away outer leaves and cut off root. Storage in refrigerator--3 to 4 days.

CORN, SWEET--Pull back husk and test kernels with thumbnail. If milky juice exudes, the ear is ready for harvest. If juice is clear, wait a few more days. If kernel is dry and tough, you have waited too long. Break off ears with downward twist; strip away husks and silks; cook or freeze as soon as possible to prevent loss of sweetness. Be sure to blanch and cool properly. Storage in refrigerator --1 to 3 days. Obtain Extension Bulletin 244, Freezing Foods for Home Use, from your county Extension Office.

CUCUMBER--With pruner or sharp knife, sever from vine, leaving a short stem. For slicers, pick when fruit is well developed but not yellowing or hardening. If kept picked, vines bear longer. Harvesting 2 to 3 times per week may be necessary. Storage in refrigerator--5 to 7 days.

EGGPLANT--When fruit is of good size and color, and still hard, sever from stem with sharp knife. Storage in refrigerator--5 to 7 days.

KOHLRABI--Pull entire plant when bulbous base (part you eat) reaches 1½ or 2 inch diameter; trim off root and leaves down to short stubs. Peel entire globe before eating (easy after parboiling). Storage in refrigerator--7 to 10 days.

LETTUCE, HEAD OR BUTTERHEAD--Cut head after well formed. Strip off lower leaves. Storage in refrigerator--3 to 5 days.

LETTUCE, LEAF--Cut outer leaves or pull entire plant at desired stage. Discard root and outer leaves. Storage in refrigerator--1 to 3 days.

MELONS--Experience with different kinds is helpful to determine peak ripeness. Take melons from vines as soon as they separate readily from the stem. They continue to ripen and sweeten for a few days after picking. Some will crack if left on the vine too long. Storage in refrigerator--2 to 3 days.

ONIONS, BULB--After the tops have matured, lift with digging fork. Bulbs come out cleaner if dug in dry weather. Spread gently on screen or shallow trays in airy, shaded, dry place to cure for a week or more. Then remove dirt and outer skin, avoid bruising; do not wash. Store cold and dry (36-40° and low humidity of 40-45%).

ONIONS, GREEN--Pull whenever they reach size preferred. Storage in refrigerator--5 to 7 days.

PARSLEY--Cut off leaves as needed; leave the main plant. Leaves may be oven dried at 200°F then stored in sealed jars.

PARSNIP--After several hard frosts, dig (don't pull) roots. If desired, wait until following spring. Roots are brittle and run deep. Use digging fork to minimize damage. Mulching is necessary to avoid damage from severe frosts. May be stored like carrots.

PEAS--Pick pods from vines as early as peas inside reach acceptable size; before they harden or turn starchy. Shell out peas by opening pods along seam. For edible pod peas, pick as soon as the flat pod attains desired size, before peas enlarge. Storage in refrigerator--2 to 3 days.

PEPPER--Cut from stem with knife or pruner when fruit reaches maximum size and desired color (redness develops at maturity). More fruits form on plants that are kept picked. Storage in refrigerator--3 to 5 days.

POTATOES--Scrub small new potatoes at pea-picking time by unearthing one side and removing tubers. For main harvest, dig plants after tops die or are frosted. With spading fork, lift entire plant to expose tubers for harvest. Store cold and moist (36-40° and relative humidity 85-90%). Do not expose to light.

PUMPKIN--After fruits turn orange and stop enlarging, having a hard rind, cut from the vine with a short stem "handle". Wait until frost if desired but do not allow pumpkins to freeze. Cure for 7 to 10 days at 75-80°, then store warm and dry (55° and 45-50% relative humidity).

RADISHES--Pull when roots reach desired size; tenderest when young. Storage in refrigerator--7 to 10 days.

SQUASH, SUMMER--(Zucchini, summer crookneck, patty pan, straightneck, etc.) With sharp knife, cut with short stem as soon as fruit is well formed but still tender and young (zucchini, 6-8 inches; crookneck, 4-6 inches; patty pan, 1½-4 inches across).

SQUASH, WINTER--(Acorn, hubbard, buttercup, etc.) After fruits mature to final color and skins are hard, cut, leaving a short stem.

TOMATO--Gently "rock off" fruit when well reddened. If stem adheres, rub it off before piling on others in basket to avoid damaging. Well developed green tomatoes gathered before frost in fall will usually ripen on a sunny shelf.

TURNIP--Pull when size desired, before cracking or hardening. Immediately trim off tops to prevent wilting of root.

TABLE A
CONVERSIONS FOR THE HOME GARDENER

FOR DRY INSECTICIDES

For 100 gallons of water	For 50 gallons of water	For 25 gallons of water	For 6¼ gallons of water	For 3 1/8 gallons of water
1 pound	8 ounces	4 ounces	1 ounce	1 tablespoon (level)
2 pounds	1 pound	8 ounces	2 ounces	2 tablespoons (level)
4 pounds	2 pounds	1 pound	4 ounces	4 tablespoons (level)
<p>If manufacturer's instructions call for 1 pint of liquid (abbreviated EC for Emulsion Concentrate) per 100 gallons of water, then use Table B to reduce the proportions to a workable amount.</p>				

TABLE B
CONVERSIONS FOR THE HOME GARDENER

FOR LIQUID INSECTICIDES

For 100 gallons of water	For 50 gallons of water	For 25 gallons of water	For 6¼ gallons of water	For 3 1/8 gallons of water
½ pint	¼ pint (4 fl oz)	4 T (2 fl oz)	1 T (½ fl oz)	½ T (¼ fl oz)
1 pint	½ pint (8 fl oz)	½ pint (4 fl oz)	2 T (1 fl oz)	1 T (½ fl oz)
1 quart	1 pint (16 fl oz)	½ pint (8 fl oz)	4 T (2 fl oz)	2 T (1 fl oz)
<p>T = 1 level tablespoon</p>				

TABLE C

TABLE OF EQUIVALENTS

FOR VOLUME DRY MEASURE OF SOIL, FERTILIZER, ETC.

Cubic Yards	Bushels	Cubic Feet	STANDARD POTS (INCHES I.D.)									
			8	7	6	5	4	3	2½	Squat ⁸	Pan	
1	21.6	27										
	1	1.25	7.5	12	18	30	60	145	335			
		1	6	10	14.5	24	48	116	268		8	16

Note: For equal amounts, read across the line.

TABLE D

TABLE OF EQUIVALENTS

FOR LIQUID MEASURE (VOLUME)

Gal- lons	Quarts	Pints	Fluid Ounces	Cups- ful	Table- spoonsful	Tea- spoonsful	Milli- liters	Liters
1	4	8	128	16	256	768	3785	3.785
	1	2	32	4	64	192	946	.946
		1	16	2	32	96	473	.473
			1	1/8	2	6	29.6	.030
				1	16	48	236	.236
					1	3	15	.015
						1	5	.005
							1	.001

Note: For equal amounts, read across the line.

DISINFECTANT FORMULA: After thoroughly cleaning pots, knives, garden tools, floors, walls and benches with soap and water, rinse with disinfecting solution. Mix 9 parts water with 1 part Clorox or Hilex to make a 10% solution. Renew solution every 2 to 3 hours.

A COMPARISON OF THE INTERNATIONAL METRIC SYSTEM AND THE ENGLISH SYSTEM OF MEASUREMENT

1 Centimeter = .3937 inches	1 Kilometer = 1000 meters	1 Gallon = 3.785 liters
1 Inch = 2.54 centimeter	1 Kilometer = .62137 miles	1 Gram = 15.43 grains
1 foot = 30.48 centimeter	1 Sq. Centimeter = .155 Sq. inches	1 Ounce = 28.35 grams
1 Meter = 39.37 inches	1 Sq. Decimeter = 100 cu. centimeters	1 Kilogram = 1000 grams
1 Meter = 100 centimeters	1 Cu. Centimeter = .061 cu. inches	1 Kilogram = 2.205 lbs.
1 Meter = 1.094 yards	1 Cu. Decimeter = 1000 Cu. centimeter	1 Pound = 7000 grains
1 Meter = 1000 millimeters	1 Cu. Meter = 100 liters	1 Pound = .4536 kilograms
1 Millimeter = .001 meter	1 Fluid Ounce = 29.54 milliliters	1 Kilogram = 1000 milliliters
1 Yard = .9144 meter	1 Liter = 1000 cu. centimeters	1 Kilogram = 1 liter
1 Mile = 1609.344 meters	1 Liter = 1.057 quarts	

METRIC PREFIXES

Names of multiples of Metric units are formed by adding a prefix to "meter," "gram", or "liter." These prefixes are used also with units other than these three metric ones.

tera — T 10 ¹²	1,000,000,000,000. ONE TRILLION	
giga — G 10 ⁹	1,000,000,000. ONE BILLION	deci — d 10 ⁻² .1 ONE TENTH
mega — M 10 ³	1,000,000. ONE MILLION	centi — c 10 ⁻³ .01 ONE HUNDREDTH
kilo — k 10 ²	1,000. ONE THOUSAND	milli — m 10 ⁻⁶ .001 ONE THOUSANDTH
hecto — h 10 ¹	100. ONE HUNDRED	*micro — μ 10 ⁻⁹ .000001 ONE MILLIONTH
deka — dk 10 ₀	10. TEN	nano — n 10 ⁻¹² .000000001 ONE BILLIONTH
— — — 10 ₁	1. ONE	pico — p 10 ⁻¹⁵ .000000000001 ONE TRILLIONTH

*The special case of one millionth of a meter is called a micron.

CONVERSION TABLE

MULTIPLY	TO OBTAIN	MULTIPLY	TO OBTAIN	MULTIPLY	TO OBTAIN
Bushels by .8	Cu. Feet	Cu. Yards by 764600	Cu. Centimeters	Liters by 1.057	Quarts (Liq.)
Bushels by 4	Pecks	Cu. Yards by 22	Bushels	Thickness (in.) by Length (Ft.)	Board Feet
Bushels by .04545	Cu. Yards	Cu. Yards by 27	Cu. Feet	Meters by 100	Centimeters
Centimeters by 0.3937	Inches	Cu. Yards by 46.656	Cu. Inches	Meters by 3.281	Feet
Centimeters by 0.01	Meters	Cu. Yards by 0.7646	Cu. Meters	Meters by 39.37	Inches
Centimeters by 10	Millimeters	Cu. Yards by 202.0	Gallons	Meters by .01	Kilometers
Cu. Centimeters by .00003531	Cu. Feet	Cu. Yards by 764.6	Liters	Meters by 1000	Millimeters
Cu. Centimeters by .06102	Cu. Inches	Cu. Yards by 1616	Pints (Liq.)	Meters by 1.094	Yards
Cu. Centimeters by .00001	Cu. Meters	Cu. Yards by 807.9	Quarts (Liq.)	Microns by .00001	Meters
Cu. Centimeters by .000001308	Cu. Yards	Fathoms by 6	Feet	Miles by 160900	Centimeters
Cu. Centimeters by .0002642	Gallons	Feet by 30.48	Centimeters	Miles by 5280	Feet
Cu. Centimeters by .001	Liters	Feet by 12	Inches	Miles by 1.609	Kilometers
Cu. Centimeters by .002113	Pints (Liq.)	Feet by 0.3048	Meters	Miles by 1760	Yards
Cu. Centimeters by .001057	Quarts (Liq.)	Feet by 1/3	Yards	Miles per Hr. by 44.70	Centimeters per Sec.
Cu. Feet by .0002832	Cu. Centimeters	Gallons by 3785	Cu. Centimeters	Miles per Hr. by 88	Feet per Min.
Cu. Feet by 1728	Cu. Inches	Gallons by 0.1337	Cu. Feet	Miles per Hr. by 1.467	Feet per Sec.
Cu. Feet by 0.02832	Cu. Meters	Gallons by 231	Cu. Inches	Miles per Hr. by 1.609	Kilometers per Hr.
Cu. Feet by 0.03704	Cu. Yards	Gallons by .003785	Cu. Meters	Miles per Hr. by 0.8684	Knots
Cu. Feet by 7.48052	Gallons	Gallons by .004951	Cu. Yards	Miles per Hr. by 26.82	Meters per Min.
Cu. Feet by 28.32	Liters	Gallons by 3.785	Liters	Millimeters by 0.03937	Inches
Cu. Feet by 59.84	Pints (Liq.)	Gallons by 8	Pints (Liq.)	Ounces by 2	Tablespoons (liq.)
Cu. Feet by 29.92	Quarts (Liq.)	Gallons by 4	Quarts (Liq.)	Ounces by 6	Teaspoons (liq.)
Cu. Feet by 1.25	Bushels	Gallons Water by 8.3453	Lbs. of Water	Ounces by 3	Tablespoons (dry)
Cu. Inches by 16.39	Cu. Centimeters	Grams by 0.03527	Ounces	Ounces by 9	Teaspoons (dry)
Cu. Inches by .0005787	Cu. Feet	Grams by 0.03215	Ounces (Troy)	Ounces by 28.349527	Grams
Cu. Inches by .00001639	Cu. Meters	Grams by .002205	Pounds	Ounces by 0.9115	Ounces (Troy)
Cu. Inches by .00002143	Cu. Yards	Inches by 2.540	Centimeters	Ounces (Fluid) by 1.805	Cu. Inches
Cu. Inches by .004329	Gallons	Kilometers by 100000	Centimeters	Pounds by 16	Ounces
Cu. Inches by .01639	Liters	Kilometers by 3281	Feet	Pounds of Water by 0.01602	Cu. Feet
Cu. Inches by 0.03463	Pints (Liq.)	Kilometers by 1000	Meters	Pounds of Water by 27.68	Cu. Inches
Cu. Inches by 0.01732	Quarts (Liq.)	Kilometers by 0.6214	Miles	Pounds of Water by 0.1198	Gallons
Cu. Meters by 10000	Cu. Centimeters	Kilometers by 1094	Yards	Tablespoons (liq.) by 0.5	Ounces
Cu. Meters by 35.31	Cu. Feet	Liters by 1000	Cu. Centimeters	Tablespoons (dry) by 0.3333	Ounces
Cu. Meters by 61.023	Cu. Inches	Liters by 0.03531	Cu. Feet	Tablespoons by 3	Teaspoons
Cu. Meters by 1.308	Cu. Yards	Liters by 61.02	Cu. Inches	Teaspoons (liq.) by 0.1666	Ounces
Cu. Meters by 264.2	Gallons	Liters by .01	Cu. Meters	Teaspoons (dry) by 0.1111	Ounces
Cu. Meters by 1000	Liters	Liters by .001308	Cu. Yards	Teaspoons by 0.3333	Tablespoons
Cu. Meters by 2113	Pints (Liq.)	Liters by 0.2642	Gallons	Temp (C) + 17.78 by 1.8	Temp (F)
Cu. Meters by 1057	Quarts (Liq.)	Liters by 2.113	Pints (Liq.)	Temp (F)—32 by 5/9	Temp (C)
				Tons (Long) by 2240	Pounds

