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Home Vegetable Garden
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Home Vegetable Garden

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YOUR VEGETABLE GARDEN is a source of food and enjoyment. No one is likely to get better than the home gardener who has a well-planned and cared-for garden. Not only can the home gardener have fresher vegetables than he can buy, but he can grow high-quality varieties that seldom can be purchased.

A garden also provides wholesome recreation for the city or suburban family. Working in a garden can be very relaxing after a long day at the office. Gardening

can be as simple or as complicated as you care to make it. It can be a very rewarding hobby with only a small investment.

Locating the Garden

Success of the garden depends greatly on location. Even though you are probably limited in choice of location, you should consider the following factors.

- **GOOD SOIL** — A loose, fertile, level, well-drained soil is best.

- **SUNLIGHT** — Sunlight is necessary to produce high-quality vegetables. Do not plant near buildings, trees or shrubs that may shade your garden.

- **OTHER PLANTS** — Avoid a location near trees and shrubs because they compete with the garden crops for soil moisture and plant food.

- **WATER SUPPLY** — Where possible, have a water supply near your garden site.

RECOMMENDED VARIETIES

ASPARAGUS

— Mary Washington
BEANS, LIMA: (Large seeded) — Fordhook 242; (Small seeded) — Thorngreen, Thaxter; (Pole) — King of the Garden.

BEANS, SNAP: (Bush Green) — Provider, Contender, Spartan Arrow, Tenderette, Tendercrop, Improved Tendergreen, Bush Blue Lake, Romano; (Snap Yellow) — Cherokee Wax, Eastern Butter Wax, Kinghorn Special; (Horticultural) — French Horticultural; (Pole) — Blue Lake, Kentucky Wonder.

BETS — Crosby Green Top, Ruby Queen, Detroit Dark Red, Long Season.

BROCCOLI — Green Comet, Spartan Early, Waltham 29.

BRUSSELS SPROUTS — Jade Cross, Long Island Improved.

CABBAGE: (Early) — C-C Cross, Stonehead, Yellows Resistant Golden Acre, Byster Market (Midseason) — Market Prize, Market Topper, Greenback, Marion Market, Red Acre (Late) — Chieftain (Savoy), Sparty King F. Hybrid, Badger Ballhead.

CARROTS — Nantes, Danvers, Spantonweet, Spavon Bonus.

CAULIFLOWER: (Spring) — Snowball M, Snowball A, Super Snowball, Snow King; (Fall) — Snowball Imperial, Snowball 25, Royal Purple, Greenball.

CELERY — Golden Self Bunching, Summer Pascal, Tall Green Light, Utah 52-70.

CHINESE CABBAGE — Michini.

COLLARDS — Vates.

CUCUMBERS: (Slicing) — Burpee Hybrid, Challenger, Gemini, Marketmore, Spafant Vador, Triumph, Satisfy, Meridian; (Pickling) — Wisconsin SMR 58, Crusader, Pioneer, Spartan Champion, Spartan Progress.

EGGPLANT — Black Magic, Black Beauty.

ENDIVE: (Escarole — Smooth Leaved) — Florida Deep Heart, Full Heart Batavian; (Curled) — Green Curled, Salad King.

GARLIC — Creole, Italian.

KALE — Vates.

KOHLRABI — Early White Vienna.

LEKES — American Flag.

LETTUCE: (Butterhead) — Chesib, Summer Bibb, Buttercrunch; (Crisp Head) — Fulton, Spartan Lakes; (Leaf) — Grand Rapids, Salad Bowl, Dominer; (Romaine) — Paris Island.

MUSKMELON — Burpee Hybrid, Burpee Hybrid, Gold Star, satcico, Howell Spartan.

MUSTARD — Tendergreen, Green Wave.

OKRA — Dwarf Green Long Pod, Clemson Spineless, Emerald.

ONION: (Sets) — Ebanzer; (Transplants) — Sweet Spanish, (Seeds) — Spartan Era, Downing Yellow Globe, Spartan Gem; (Bunching) — Beltville Bunching, White Portugal.

PARSLEY — Perfection, Curled Dwarf.

PARSNIP — All America, Model.

PEAS — Freezonia, Greater Progress, Little Marvel, Frosty, Perfected Freezer, Wando (heat tolerant); (Early Podded) — Dwarf Gray Sugar.

PEPPER: (Sweet) — Canasa, Vineclade, Pear Piper, Spartan Emerald, Spartan Garnet, California Wonder, Delaware Bella, Bell Boy, Keystone Resistant Giant, Yolo Wonder; (Hot) — Hot Portugal, Bunsman Wax, Hungarian Wax, Large Red Cherry.

POP CORN — Michigan Hybrid No. 1A (white), Purdue 215, (Yellow), Jopop 7 (white).

POTATO: (Early) — Onaway, Irish Cobbler, Norland, Superior (Midseason) — Norgold Russet, Chippenaw, Cherokee, Norchlo; (Late) — Katahdin, Sebago, Russet Rural, Kennebec, Russet Burbank (For Mack Soil) — Cherokee, Chippenaw, Katahdin, Norland, Sebago, Superior, Kennebec.

POTATO, SWEET — Acadian, Centennial, Copperrick Goldrush.

PUMPKIN: (Small) — Small Sugar, Spookie; (Medium) — Cheyenne Bush, Cinderella Dush; Young's Beauty; (Large) — Conoclastic Field, Jack-O-Lantern; (Very Large) — Big Max, Mammoth.

RADISH — Cavalier, Cherry Belle, Icicle (white), Champion.

RHUBARB — Canada Red, MacDonald, Valentine, Victoria.

RUTABAGA — Maomber, American Purple Top.

SALSIFY — Mammoth Sandwich Island.

SPINACH — Viking, Long Standing Bloomsdale, America, New Zealand (not true spinach).

SQUASH: (Summer Yellow) — Seneca Prolific Hybrid, Seneca Baby Crookneck, Seneca Butterbar, Early Prolific Straightneck; (Summer Green) — Zucchini, Cocozilla, Chefton, St. Pat Scallops; (Winter — storage) — Gold Nugget, Table Queen, Butternut, Buttercup, Kindred, Perfection, Sweet Potato.

SWEET CORN: (Early) — Butter Vee; (Midseason) — Bravo, Silver Sweet, Trail Blazer, Golden Jubilee; (Main Crop) — Golden Queen, Silver Queen (white).

TOMATO: (Early) — Spring Set (VF), Midseason — Campbell 1327 (VF), Heinz 1350 (VF), Superonic VF, Heinz 1439 VF, Roma VF (paste); (Late) — (VF), Heinz 1435 (VF), Roma VF (paste); Late — Burpee VF, Royal Ace VF, Manaface, San Marzano (paste); (Yellow) — Golden Boy, Sunray; (Cherry) — Small Fry, Droplet, Large Red Cherry, Yellow Pear, Yellow Plum, Yellow Cherry.

TURNIP — Tokyo Cross, Purple White Globe, Just Right.

WATERMELON — Summer Festival, Seedless Hybrid 313, Sweet Princess, Crimson Sweet.

- **CONVENIENCE** — Your garden should be near your house where you can work in it when you have a few minutes.

Plan Your Garden

After choosing a garden site, the next step is to plan the arrangement of crops. Consider each of the points listed below. Then plan your garden on paper.

Size — Size depends on space available, the quantity of vegetables you will need, the kinds of vegetables and the amount of work and time you can devote to the garden. Make the garden just large enough so that it will be interesting and enjoyable to work in, but not so large that it will become a burden and not receive proper care.

Kinds of Vegetables — Choose vegetables that you and your family enjoy. If your garden plot is small, concentrate on crops with a home garden "freshness" not generally found in stores. These include:

Asparagus	Radishes
Beans	Spinach
Broccoli	Sweet Corn
Leaf Lettuce	Tomatoes
Peas	

Some vegetables take up so much space that they should seldom be planted in small gardens (25 feet by 25 feet or smaller). These include:

Cucumbers	Potatoes
Melons	Squash (vine type)

If only a very small area is available, grow especially productive crops — snap beans, tomatoes, summer squash, peppers, etc. You can also stake tomato plants and beans to conserve space and reduce the amount of ground rot on the fruit.

Amounts — The amount of each vegetable to plant will depend upon the needs and desires of your family.

Growth Characteristics — Group vegetables in your garden according to their growing season and growth characteristics. Plant perennial crops, such as asparagus and rhubarb, along one side of the garden so that they will be out of the way when you spade or plow. Group early-planted crops at one end of the garden so that you can spade or plow as you plant. Wherever possible, plant tall-growing crops to the north or west of lower-growing crops to avoid shading.

Spacing Between Rows — Proper spacing between rows is important to allow for growth of plants, ease of cultivation and efficient use of space. Recommended spacings are given in the planting chart (p. 6). Allow enough space between rows for convenient cultivation with your tools.

Successive Plantings — Plan for continuous harvest by successive plantings. Three or four small plantings of corn, beans and lettuce, for example, are better than a single large planting. It is also important to use early, mid-season and late maturing varieties in conjunction with successive plantings to insure a continuous harvest.

Early and Late Gardens — Most gardens should attempt to make several different plantings in their garden instead of at one time after the danger of frost is over. This will allow you to garden a little at a time without having to do all of the planting in one day.

Crop Rotation — Rotate crops from year to year to prevent common plant diseases that overwinter in the soil. Rotate crops from one side of the garden to the other.

Erosion — If your garden is on a hill, plant the rows across the slope rather than up and down. A winter cover crop would also help reduce erosion.

Vegetable Varieties and Sources

Most of the new vegetable varieties released each year yield better and have better quality than older varieties. However, excellent older or standard varieties should not be discarded just because newer ones are available. Try out a few varieties each year to see how they perform before discarding proven varieties.

Experienced gardeners buy most of their seed through seed catalogs because many more varieties are offered for sale, especially the newer ones. Catalogs of most seed companies are available from December through spring and include information that cannot be printed on small packets, such as varieties recommended for home freezing, disease-resistant varieties, hybrid varieties, etc. Names and addresses of seed companies can be obtained from garden magazines.

You can plant most vegetable seeds directly into the garden and they will be ready for harvest before frost. However, you will want to hasten the maturity of tomatoes, peppers, cabbage, cauliflower, broccoli and perhaps other vegetables, by transplanting small plants into the garden. You can usually buy better quality transplants than you can grow yourself. If you want to grow your own, start them indoors at the proper time (as stated on seed packages) and then move them to a cold frame as the weather warms up. The main advantage of producing your own is that you can grow the variety that you want.

Many other excellent varieties besides those listed in this bulletin are available through seed catalogs.

Soil

Soils which contain a good supply of organic matter are more easily tilled, more productive and hold more water than soils containing little organic matter. Well-rotted manure, compost, shredded peat, and sewer sludge are common sources of organic matter. Planting a green manure crop, such as rye in late August, and plowing it in down in the spring with 1 lb. of actual N/1,000 sq. ft. is another way of adding organic matter.

Well-rotted barnyard or stable manure is the best source of organic matter for gardens. For best results, spread at the rate of ½ ton/1,000 sq. ft. before the soil is plowed or spaded, whether the soil is plowed in the fall or spring. When using

this amount of manure, reduce the recommended amount of commercial fertilizer by one-half.

Apply a complete fertilizer such as 5-20-20 (30 lb./1,000 sq. ft.) before planting and add supplemental nitrogen (1 lb. of actual N/1,000 sq. ft.) around July 4. Ammonium nitrate (33% N) and urea (46% N) are most commonly used to provide supplemental nitrogen. Three lbs. of ammonium nitrate or 2 lbs. of urea will provide 1 lb. of actual N/1,000 sq. ft.

Place the fertilizer in a band about 4 inches to the side of plants or in a ring about 4 inches away from individual plants such as tomatoes or broadcast it between the rows. Work the fertilizer into the soil for best results.

Starter Solutions

Starter solutions made up largely of all-soluble phosphate may have a pronounced influence on early growth and yields because they help to promote good root growth. A typical analysis of a starter solution fertilizer is 10-55-10. Follow the directions on the container.

Composting

MATERIALS USED — Compost is an artificial or synthetic manure prepared by fermenting or decomposing such natural materials as grass clippings, leaves, sod, straw, vegetable refuse, manure, mushroom soil, corn stalks, asparagus stems, sunflower heads, weeds and other easily decomposable plant material.

RECOMMENDED PROCEDURE

Compost can be prepared in any quantity, using the following method:

1. Spread a portion of materials to be composted in a layer 6 to 8 inches thick.
2. Sprinkle this material with a small amount of complete commercial fertilizer such as 5-20-20 or 6-12-12, (3 cups per bushel of compost) or mix in some animal manure. Adding small amounts of dolomitic limestone (½ cups per bushel of compost) will counteract excessive acidity, resulting in conditions more favorable for decomposition.
3. Wet the layer down but not enough to wash the fertilizer away.
4. Form additional layers 6 to 8 inches thick on top of the first one until all material is in the pile.
5. Add additional layers on top as new material becomes available.
6. Add a small amount of fertile soil to each layer to hasten bacterial action and decomposition.
7. Keep the pile moist.
8. The length of time for decomposing materials varies from 6 weeks to 6 months, or more.
9. The rate of decomposition can be hastened by turning the pile over 2 or 3 times at 2-week intervals.

SIMPLIFIED PROCEDURE

1. Place material to be composted in a pile, preferably adding small amounts of commercial fertilizer or animal manure as the pile is built up.

2. Turn over and water occasionally.
3. Use when decomposed.
4. This method may require 2 or more years before complete decomposition occurs.

Planting

Plant in a freshly prepared seedbed; otherwise, weeds are likely to come up before the plants. Keep the ground worked where late sowings are to be made to prevent weeds from starting.

When to Plant—How early you can plant depends on the hardness of the vegetables and the climate in your area. Certain vegetables can withstand frost, while others cannot. The Planting Chart lists the planting times for all vegetables.

How to Plant Seeds—Some simple steps for sowing seeds are given below:

1. Plant in straight rows. This not only adds to the eye appeal of your garden, it makes cultivation, insect control, and harvesting easier. To mark a row, drive 2 stakes into the ground at each end of the garden and draw a string taut between them.
2. Mark the rows. Shallow furrows suitable for small seeds can be made by drawing a hoe handle along the strip.
3. Sow the seeds in hills or space them evenly in the row (drilling). Squash, melons and cucumbers are commonly planted in hills at definite intervals in the row.
4. Space seeds properly in the row. The number of seeds to sow per foot is usually listed on the seed packet.

Weed Control

Cultivation—Cultivate as often as necessary to keep weeds under control. Avoid deep cultivation; it destroys plant roots and is less effective than shallow cultivation.

Mulches—A very effective means of controlling weeds is to cover soil between rows of vegetables with a mulch. Cucumbers, eggplant, lima beans, melons, okra, peppers, potatoes, pumpkins, squash and tomatoes are some of the crops which benefit most from mulching. Besides controlling weeds, the mulch will conserve moisture and keep the fruits clean. However, certain types of insects (slugs, millipedes, and similar pests) are often more numerous when mulches are used.

Mulching materials include leaves, grass clippings, peat moss, sawdust, ground corncoals, straw, hay, shavings, paper, cardboard and black plastic. Apply loose mulches 2 to 4 inches deep and completely cover the soil to prevent weed growth. (Don't cover the row until seedlings are 1-2 inches tall.) Organic mulches (sawdust, straw, corncoals, etc.) decompose during the growing season, however, and the soil organisms that cause them to rot compete with the plants for nitrogen. Therefore, it will be necessary to supply extra nitrogen to compensate for this. A pound of actual nitrogen per 100 pounds of fresh sawdust or other dry organic material should be satisfactory. Ap-

ply the nitrogen at least twice, and preferably more often during the season to make certain that it is present when needed.

Black plastic can also be used as a mulch and has additional advantages of warming the soil and hastening maturity. It does not breakdown readily and should be removed in the fall. Clear plastic should not be used because weed growth under it will compete with the vegetable plants. Use plastic 3 to 4 ft. wide and 1½ mils thick. The soil should be fertilized before putting the plastic down.

Place the plastic over the given area and cover the edges with soil to hold it in place. Cut holes at the desired spacing and place the transplants (tomatoes and vine crops) or seed (squash) in the soil. Anchor the plastic around the hill with soil or rocks to prevent wind blowing the plastic. Plants can be watered through the holes where the plants were placed.

Black plastic is sold at many garden stores, through mail order catalogs, seed and nursery catalogs and by companies advertising in garden magazines.

Chemical weed control is generally not recommended for the home garden.

Pest and Disease Control

Vegetables are damaged by insect and disease-causing organisms throughout the growing season. When weather and other conditions favor these pests, a large part of the garden crop may be destroyed before harvest. Proper application of chemicals prevents most insect and disease losses.

Insecticides and fungicides, although effective in controlling a large number of garden pests, will not eradicate all insects or cure all diseases. Plant diseases can rarely be cured, but must be controlled by prevention.

The following measures will help reduce losses by insects and diseases:

1. Use fertile, well-drained soil and a good grade fertilizer.
2. Plant crops that are suited to the soil and climate. (Order seeds from local seed companies or those located in the Midwest or Northeast).
3. Control weeds and grass, which provide protection for insects and diseases.
4. Purchase disease-free seed.
5. Buy insecticide-fungicide treated seed to protect against decay, damping-off organisms and certain insects.
6. Purchase disease-free plants; make sure they do not have swellings on the roots, cankers on the stems or spots on the leaves.
7. Grow disease-resistant varieties if available. These are available for only a few diseases of certain crops. Some of these varieties are highly resistant; others give partial protection; for example, Verticillium and Fusarium wilt-resistant tomatoes.
8. Destroy plants of each annual crop as soon as harvest is completed.
9. Stay out of the garden when plants are wet.
10. Avoid unnecessary use of insecticides that may kill beneficial insects.

Since most bacteria, fungi and some

home garden insects live in the soil from one growing season to the next, much of their damage can be avoided by relocating the garden or rotating the crops.

Closely related crops like melons and cucumbers or tomatoes, potatoes, peppers and eggplant should not succeed each other because, in many cases, they are all damaged by the same pests. Also, if a garden is to be planted on sod land with high population of white grubs or wireworms, wait at least 2 years after plowing or spading the land before planting; otherwise it is necessary to treat the soil with a chemical.

Wilt Diseases—Tomatoes, potatoes, eggplant, muskmelon and cucumbers are very susceptible to wilt. Planting available resistant varieties is the most satisfactory control practice. Rotation with non-susceptible crops is useful in the case of fungus wilts in reducing the population of the organisms in the soil.

Chemical Treatment of Seed and Soil

To avoid fungal and bacterial diseases carried on the seed, and maggot damage to the seed of cucumbers and sweet corn, put a pinch (less than ¼ teaspoon per half pound of seed) of *Thiram* or *Captan* 75 percent seed protectant, plus a pinch of 40 percent wettable chlordane powder in the package and shake the contents, coating all the seeds with the dust. Diazinon, 50 percent wettable powder, may be used instead of chlordane as a treatment for corn seed. Follow the same instructions. Sift the excess dust from the seed through a fine mesh screen. Do not treat seed already treated by the seedsmen, and do not use treated seed for food. Do not plant moldy or spotted peas and beans or seed infested with weevils. Buy new seed.

Underground—Root-Feeding Insects

The roots, stems, bulbs, tubers and other underground parts of garden plants are often damaged by insects. To control these insects, chemicals must be properly applied to the soil. Some of these insects go through 3 or more generations per year (maggots), others have 1 generation per year (cutworms) and still others require 3 years (white grubs) to 6 years (wireworms) to complete one generation.

Maggots—Maggots are the immature stage of flies. They are whitish or yellowish-white and about ½ inch long when mature. There are onion maggots, cabbage maggots and radish and turnip maggots. The adults of these maggots are grayish flies with numerous black bristles on their abdomens.

Onion Maggot—Apply 3 level teaspoons of 5 percent chlordane dust over the seed of a 25-foot row before the furrow is closed, or ¼ teaspoon of 50 percent diazinon in 1 pint of water to 20 feet of row.

Cabbage Maggot—Before planting, dip the roots of cabbage, broccoli, or cauliflower in a mixture of 2 level tablespoons of 40 percent wettable chlordane powder to 1 gallon of water, or ¼ teaspoon of 50

percent wettable diazinon powder in 1 gallon of water. Instead, if desired, pour $\frac{1}{2}$ pint of this same mixture on the soil next to the stems. NOTE: Keep the mixture stirred while dipping the roots or when pouring it around the plants. Do not apply Chlordane to the edible parts of the plants.

Radish and Turnip Maggots—Apply 3 level tablespoons of 5 percent chlordane dust over the seed of a 25-foot row before the furrow is closed or $\frac{1}{2}$ teaspoon of 50 percent diazinon in 1 pint of water to 20 feet of row.

Cutworms—Cutworms are the immature stage of moths and are usually fat and spongy in appearance and dark colored with various light or darker markings. Adult moths are brown to gray with light and dark markings. The moths are often seen flying around lights at night in mid summer. Apply 5 percent methoxychlor plus 5 percent malathion dust to the soil the same day plants are set in the garden, preferably in the evening. Sprays of these same materials may also be used. NOTE: Do not use methoxychlor on celery.

White Grubs and Wireworms—White grubs are the immature stage of the June beetles and are white, "C" shaped with brown heads, have 6 long thoracic legs and the tip of the abdomen is dark brown or purple. Wireworms are the immature stage of click beetles and are dark brown, have 6 short thoracic legs and are very tough skinned.

For control of these insects where land was in sod within the last 3 years, apply 5 ounces of 40 percent wettable chlordane powder (or $\frac{1}{2}$ teaspoons of a chlordane emulsion containing 6 pounds of actual chemical per gallon), or 3 ounces of 50 percent wettable diazinon powder, or 10 ounces of 14 percent granular diazinon to 1,000 sq. ft. of soil surface. Work immediately into 4 to 6 inches of soil before planting the garden. "Working in" means sifting through the soil, not merely turning over or spading. NOTE: Do not apply chlordane where carrots are grown.

Nematodes—Problems caused by these minute, wormlike animals can be severe since many home gardens are not rotated and most vegetables are highly susceptible to plant parasitic nematodes. Roots of nematode-infected plants may have galls, surface lesions and/or be greatly reduced in number and vigor. Such plants may appear stunted and exhibit a nutrient deficiency. Certain nematodes may attack above-ground plant parts, causing foliar necrosis and distorted leaves or buds. The effort and expense of controlling nematodes in the home garden are compensated by the improved quality and yields.

Crop rotation, and relocating the garden site help reduce nematode damage. If these cultural practices are not feasible or nematode populations are high, consider fumigating the soil with DBCP (Nemagon or Fumazone) or dichloro propenes (D-D, Telone, Vorlex, Terr-O-Cide) or SMDC (Vapam, VPM).

Above ground—Foliage-Feeding Insects

For best control of insects and diseases, spray vegetables each week with a fungicide and/or a bactericide, plus 1 or more insecticides. Start application when the plants emerge and continue through the growing season. Some chemicals have limitations on their use close to harvest. Therefore, read the package label before using any chemical; follow directions carefully.

Fungicide and insecticide dust combinations may be used instead of sprays. Buy dusts ready-mixed. Fungicide and insecticides for spraying may be bought separately or ready-mixed. Pyrethrum for sprays is usually available in liquid form, and Rotenone either as a wettable powder or as a liquid concentrate. Two insecticides other than those listed in the chart of "All-Purpose Insecticide-Fungicide Spray Mixtures For Vegetables" may be used for control of insects on foliage and fruit. They are diazinon and endosulfan (Thiodan). For specific directions for their use, READ THE LABEL. All suggested fungicides and insecticides are available at most agricultural or garden supply and hardware stores.

Many types of hand-operated equipment are available. Whatever its kind, use it to apply treatments to both the top, and especially the underside, of the leaves. Anything less than this coverage often gives inferior results. Spray all parts of the plant to the point of run-off. One quart should cover 50 feet of row when plants are young and about half that distance when full grown. When dusting, apply only a light coating. Approximately 1 ounce of dust is enough for 50 feet of row early in the season, while 2 ounces or more will be required later.

The bacteria, *Bacillus thuringiensis*, is an effective biological (non-chemical) control for the cabbage looper and imported

cabbage worm on cabbage, cauliflower, broccoli, and other crops. It is sold under the trade names of Biotrol, Dipel, and Thuricide. Read the label for the amount to use and other directions. It will not control other pests such as aphids, leafhoppers, grasshoppers, tarnished plant bug and others. For those and other common insects, use the "ALL-PURPOSE SPRAY" Read the label before using any pesticide.

For additional information, write for U.S. Department of Agriculture Home and Garden Bulletin No. 46, "Insect and Diseases of Vegetables in the Home Garden", available from the Superintendent of Documents, U.S. Government Printing Office, Washington, D. C. 20402.

Watering

Water thoroughly once a week during the summer if there is not sufficient rain. Enough water should be added to thoroughly moisten the soil to at least 6 inches in depth. Young plants should be watered after they are transplanted.

Organic Gardening Information

Organic gardening is gardening without using manufactured chemical fertilizers and pesticides. The use of mulches, compost and manures is emphasized. Methods of insect control include the use of resistant varieties, beneficial insects, sanitation, trapping and hand-picking, etc.

Organic gardeners frequently state that vegetables grown organically taste better than those grown otherwise. What they often mean is that home-grown fresh vegetables taste better than store-bought vegetables. This is particularly true with beans, lettuce, sweet corn and tomatoes which usually cannot be purchased garden fresh. The difference in taste is related to the difference in freshness and not the cultural methods. Also, your own vegetables seem to taste better than those produced by someone else.

As a hobby, organic gardening has merit. It is an excellent form of outdoor recreation that promotes physical fitness. Commercially, however, farming without the use of fertilizers and pesticides can not currently feed the existing population, much less the projected population.

The use of parasites and predators (biological control) is very effective where insect damage is not directly on the edible fruits or vegetables. However, when the edible parts are damaged, the parasites and predators are seldom present in sufficient numbers so, can they build up their numbers rapidly enough to prevent this early damage. When additional predators are placed in the garden to hasten the natural build up, control may be gained with less early damage. However, when control is gained, the host insect (pest) is reduced to such low numbers that the parasites and predators leave in search of food or starve to death. When these predators and parasites are gone or in extremely low numbers, the pests and their damage increase and the whole cycle repeats itself. Results of using biological controls in home

INGREDIENTS FOR MIXING YOUR OWN ALL-PURPOSE INSECTICIDE-FUNGICIDE VEGETABLE SPRAY

CHEMICALS	Form of Chemical/Pesticide (the label will show which form and its percent of concentration)	
	Wettable Powder (WP)	Concentrate (EC)
10. Fixed Copper ¹ to control diseases of fungus and bacteria	2 Tbs 0.5% WP	—
400. Manco ² to control fungus diseases	1½ Tbs 90% WP	—
ADD: To the above, one of the following to control insects:		
1. Malathion	5 Tbs 0.5% WP or 2 tsp 50% EC	
and Methoxychlor	2 Tbs 0.5% WP or 4 tsp 25% EC	
OR 2. Rotenone	2 Tbs 0.5% WP	
and Methoxychlor	2 Tbs 0.5% WP or 4 tsp 25% EC	
OR 3. Malathion alone	5 Tbs 0.5% WP or 2 tsp 50% EC	
OR 4. Rotenone alone	2 Tbs 0.5% WP	
OR 5. Pyrethrum alone	—	1 tsp 0.5% EC

¹ Use Fixed Copper primarily to control bacterial diseases of tomatoes, peppers, beans, cucumbers, cabbage and cabbages on spinach and cabbage. It may be used on other vegetables. Fixed Copper can also be used under the following trade names: Tox-Ac Copper Sulfate, Copper A, Biotrol, Dipe, Dipel, Kocide 101, and Copper M-22, and M-45.

² Other trade names are: Manzate, Manzate 200, Dithane M-22, and M-45.

gardens have been largely insignificant and sometimes even disastrous. CAUTION: Live insects shipped into or within Michigan must be shipped under permit. Check with the supplier of such insects as ladybird beetles and praying mantids to insure that a permit has been issued to him. This prevents the introduction of parasites and predators (or pests) which could be more damaging than the insect pest to be controlled.

For those gardeners who want to garden organically, the following suggestions may be helpful:

1. Avoid growing vegetables that are prone to attacks by insects (cabbage, cauliflower, broccoli and potatoes, for example).

2. Use resistant varieties (check seed catalogs for this information). Many new tomato varieties are resistant to verticillium and fusarium diseases and are marked VF in variety listing.

3. Use animal or artificial manure (compost) to build up soil. Large amounts of animal manure are needed to supply the same amount of nitrogen, phosphorus and potash that is recommended for most garden soils. For a new garden plot, an application of 15 to 20 tons of decomposed cattle or horse manure to a half-acre garden is recommended and should be plowed under a month before planting. In succeeding years, 8 to 10 tons of cattle or

horse manure should be applied per acre.

4. Do not use materials infected with diseases or insects for compost.

5. Handpick Colorado potato beetles, tomato hornworms and other insects as they appear.

6. Trap squash bugs under boards placed on soil around plants and destroy every morning.

7. Grow butternut squash if squash vine borers are a problem.

8. Use ashes around strawberry and other plants where slugs are a problem.

9. Applying mineral oil on corn silk 1 day after silking reduces damage from corn earworm.

10. Use rotenone or pyrethrum to control insects that can't be controlled by other methods, following the directions on the label. Both of these insecticides are plant products, have low toxicity, and are commonly used by organic gardeners.

11. Use the suggested non-chemical (disease) control for cabbage looper and imported cabbage worm discussed earlier.

Storing Vegetables

There are some vegetables which can be stored for several months under proper conditions. Carrots, beets, parsnips, salsify, rutabagas, turnips, potatoes and cabbage should be stored as close to 32°F as possible (without freezing) and under high

humidity conditions of 85 to 95% such as in a perforated plastic bag. Root crops can be buried in moist sand or packed in a large garbage can with moist sand or slightly moistened vermiculite to prevent drying out. The can should be buried in the soil and covered with a layer of straw. Parsnips and salsify can be left in the soil and harvested in the spring.

Onions should be stored near 32°F but under lower humidity of about 65 to 75%. Pumpkins and winter squash should be stored above 50°F and under dry conditions for longest storage.

Mature green tomatoes may be harvested prior to frost, and if held at 55°F, may be kept 6-8 weeks. Bring a few at a time out of storage into room temperature for best ripening. Holding tomatoes below this temperature will result in abnormal ripening and much more rot and breakdown.

Popcorn should be harvested when the stalk dries, and allowed to dry on the cob for several months. Remove the kernels as needed for popping. Putting small rolls of blotter paper soaked in a saturated salt solution into tight jars with shelled corn will keep it at the proper moisture content for popping. Putting an apple into a 2-quart jar of shelled popcorn will also maintain the proper humidity. Do not store vegetables with apples or pears.

Vegetable Planting Chart

VEGETABLE	Planting Times*	Weeks from Seeding to Transplanting	Depth in (inches)	Amount at 1000	Days to Maturity	Planting Distance (inches)		Row Length (feet)	Estimated Production
						In Rows After Thinning	Between Rows		
Asparagus	April		6 to 8	12 plants	2 to 3 yrs.	12 to 18	48 to 60	20	4 pounds
Beans, Lima	May 20/Jun. 1		1 to 2	16 plants		6 to 8	24 to 30	15	6 pounds shelled
Beans, Snap	Apr. 20/Jun. 30		1 to 2	16 plants	3 to 4	18 to 24	18 to 24	25	25 pounds
Beets	Apr. 20/Jun. 30		1 to 1 1/2	11 plants	2 to 3	18 to 24	18 to 24	15	75 pounds
Broad Beans	Mar. 20/Apr. 20, Jun. 20/30		1 to 1 1/2	11 plants	18 to 24			20	75 pounds
Bushes, Sprouts	Apr. 1:20, Jun. 20:30		(quarts)	15 plants	18 to 24			25	8 pounds
Cabbage	Apr. 1:20, Jun. 20:30		4 to 6	6 plants		15 to 24	24 to 30	12	6 heads
Carrots	Apr. 1:20, Jun. 20:30		1 to 1 1/2	16 plants	1 to 24	18 to 24	18 to 24	15	15 pounds
Cauliflower	Apr. 1:20, Jun. 20:30		(quarts)	16 plants	6 to 8	30 to 36	30 to 36	10	6 pounds
Celery	Apr. 1:20, May 20:30		(quarts)	30 plants	4 to 8	30 to 36	30 to 36	15	30 stalks
Chicory	Jun. 20/Aug. 20		1/4	16 plants	12	24 to 30	24 to 30	25	12 heads
Chives, Cabbage	Jun. 20/Aug. 20		1/4	16 plants	6 to 8	24 to 30	24 to 30	25	12 heads
Cucumbers	May 20/Jun. 20		1 to 2	16 plants	50 to 72	48 to 60	48 to 60	10	8 pounds
Eggplant	May 20/Jun. 1		8 to 10	3 plants	72 to 80	30	36	6	12 fruits
Endive	Mar. 20:Apr. 20, Jun. 20:30		1/2	10 plants	85 to 98	8 to 12	12 to 18	16	10 heads
Kale	Apr. 20:Jun. 20		1/2	115		3 to 15	12 to 18	1	4 heads
Kohlrabi	Mar. 20:Apr. 20, Jun. 20:30		1 to 1 1/2	24 plants	55	4 to 8	18 to 24	12	24 stems
Lettuces	September		1/2	130	130	1 to 2	15 to 18	10	30
Lettuce (leaf)	Mar. 20:Apr. 20, July		1/4 to 1/2	18 plants	72	8 to 15	18 to 24	15	15 heads
Lettuce (lett)	Mar. 20:Apr. 20, July		1/4 to 1/2	1 plant	45 to 50			5	2 1/2 pounds
Mustard	May 20/Jun. 1		1 to 2	1/2 plant	82 to 90	26 to 48	48 to 60	16	18 fruits
Okra	Apr. 20:30		1/2	1/2 plant	35 to 45	12 to 15	18 to 24	10	5 pounds
Onion (leaf)	Mar. 20:Apr. 20		1 to 2	1/2 plant	55 to 58	2 to 3	12 to 18	8	3 pounds
Onion (round)	Mar. 20:Apr. 20		(quarts)	150 plants	50 to 115		12 to 18	10	100 heads
Onion (seed)	Mar. 20:Apr. 10		1/4	1 plant	105 to 130	2 to 3	12 to 18	20	25 pounds
Parsley	Mar. 20:30		1/4 to 1/2	1/2 plant	75 to 85		12 to 18	3 plants	3 bunches
Parsnips	Mar. 20:Apr. 20		1 to 2	1 to 2	120 to 140	3 to 6	24 to 36	15	15 pounds
Peppers	May 20/Jun. 1		(quarts)	6 plants	62 to 80	14 to 18	18 to 24	10	6 pounds
Pop Corn	May 20/Jun. 1		2 to 2 1/2	1/2 plant	90 to 120	10 to 12	20 to 26	25	1 bush
Potatoes	Apr. 20:Jun. 1		5	5 pounds	100 to 120	10 to 12	24 to 36	50	50 pounds
Potatoes, Sweet	Apr. 20:Jun. 1		(quarts)	25 plants	100 to 120	12 to 18	24 to 36	25	30 pounds
Pumpkins	May 20/Jun. 1		1/2	1/2 plant	160 to 180	60 to 72	72 to 96	3 hills	30 pounds
Radishes	Mar. 20:Apr. 20, July		1/2	1 plant	24 to 28	1 to 2	6 to 12	12	8 pounds
Rutabaga	Mar. 20:Apr. 20		(quarts)	3 plants	1 to 2 1/2	36 to 48	48 to 60	15	15 pounds
Spinach	Apr. 1:20		1/2	120 plants	50 to 82	6 to 10	18 to 24	15	15 pounds
Spinach (Summer)	Mar. 20/Jun. 20, July		1/4 to 1/2	1/2 plant	46 to 70	3 to 6	12 to 18	10	5 pounds
Squash (Winter)	May 20/Jun. 1		1 to 1 1/2	1/2 plant	49 to 55	26 to 48	36 to 48	2 hills	24 fruits
Squash (Winter)	Apr. 20:Jun. 20		1 to 1 1/2	1 plant	65 to 110	48 to 60	60 to 72	4 hills	40 fruits
Sweet Corn	Apr. 20:Jun. 20		2 to 2 1/2	1/2 plant	62 to 84	10 to 12	18 to 24	8	40 ears
Sweet Corn	Apr. 1:20		1 1/2	50	8 to 9		18 to 24	8	7 pounds
Tomatoes	May 20/Jun. 1		(quarts)	10 plants	62 to 83	24 to 36	48 to 60	40	3 bushel
Watermelons	May 20/Jun. 1		1 to 2	1/2 plant	58 to 60	4 to 6	18 to 24	20	20 pounds
Watermelons	May 20/Jun. 1		1 to 2	1/2 plant	88 to 90	72 to 96	72 to 96	4 acres	4 acres

* Planting times are based on conditions at East Lansing. Change these times to suit your location.