

Circular 559

# Grow Your Own Vegetables

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Extension Service, University Park, Pennsylvania



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*A good garden contributes to the well-being of the family by supplying foods that might not otherwise be provided. Fresh vegetables direct from the garden are superior in quality to those generally sold on the market and in addition, are readily available when wanted. Since many families now have home freezers, even more of the garden vegetables can be utilized than when canning and natural storage were the only means of preservation.*

*This publication, intended for state-wide distribution, gives general information on vegetable gardening. Any gardener using it also needs local information, especially on the earliest and latest safe planting dates for vegetables and any special garden practices and varieties that are best for his location. Gardeners may get local information from their county agent. This publication will not go into the details of preserving and using vegetables or of insect and disease control for garden crops.*

*Detailed information on the culture of specific crops and other phases of gardening can be obtained from the county agent or the Cooperative Extension Service of The Pennsylvania State University.*

### **Where to Make a Garden**

1. Select an area with good soil if possible.
2. Avoid the vicinity of trees and large shrubs.
3. Keep the garden near the house. If possible, locate the garden where it can be irrigated.
4. If space is available, plan to rotate or change the garden area every few years.
5. Choose a place which has enough slope for surface water drainage and sufficient air drainage to prevent possible pockets of frost.

### **When to Plant**

1. Time of first planting depends upon location, as influenced by latitude, altitude, exposure of the garden, and kind of vegetables to be planted.
2. By May 15, southern and southeastern sections generally are free from frosty weather. By May 20, there is little danger of frost in most of Pennsylvania. As late as June 1, frost may occur in high altitudes of central and northern Pennsylvania.
3. Vegetable crops may be classified into four groups according to their temperature requirements:
  - (a) "Very hardy" crops include the vegetables that are not injured by severe midwinter freezing, such as asparagus, horseradish, parsnip, rhubarb, salsify, and winter onion.
  - (b) "Hardy" crops thrive during cool weather and will withstand frosts of spring and early fall, but not severe freezing. Such crops are cabbage, cauliflower, beet, carrot, turnip, lettuce, endive, onion, pea, radish, and spinach. All crops falling in groups (a) and (b) may be planted with safety as early in the spring as the ground can be prepared.
  - (c) "Tender" crops are those which are quickly injured by frost, such as snap bean, sweet corn, cucumber, squash, and tomato.
  - (d) "Very tender" crops are those that may be injured by continued cool weather without frost. They should not be planted until the ground has become warm. Such crops are lima bean, eggplant, cantaloupe, and pepper.
4. Many vegetables in groups (c) and (d) benefit from plastic mulches. Besides controlling weeds and conserving moisture, the plastic mulch will generally tend to warm the soil.

### **What to Plant**

1. Develop a balanced garden by having the three main groups of

vegetables (root crops, fruit crops, and leafy crops) well represented.

2. In a small garden, it will not pay to grow crops which use much space and yield a comparatively small return, such as melons, cucumbers, and pumpkins.
3. Tomatoes may be grown in any garden.
4. The personal preferences of the family must be considered.

#### **How to Plant**

1. Keep the garden area producing crops throughout the entire growing season.
2. Companion cropping or intercropping is a desirable practice if the plot is small. Companion cropping is the growing of two or more crops in the same row, or in alternate rows. For example, a couple of rows of onion sets, for green onions, can be planted between rows of cabbage, the onions being pulled before the cabbage needs the room.
3. Succession cropping is practiced by planting one crop after another on the same ground in the same season. An example is to plant beans after the early peas are harvested.
4. Do not plant the same or closely related crops in succession.
5. Plant long season crops together. Quick maturing crops should be planted together and harvested and the area then planted to a single late crop.
6. Too close planting should be avoided.
7. Allow enough space between rows to permit cultivation and natural spread of the plants.
8. Extensive plantings of one or two easy-to-grow crops are usually wasteful. Several small plantings should be made throughout the season.

#### **Making a Plan**

1. Plan your garden well in advance of planting time to insure maximum production from the land available.
2. On paper, draw a plan to scale that outlines the size of the garden, the kinds and varieties of vegetables you intend to plant, their location, the amount of each to be grown, the spacing of crops, the direction of rows, the date when each crop is to be planted, and whether succession or companion cropping is to be used.
3. Rotate vegetables within the garden.
4. If possible, rotate garden site, or perhaps divide garden site in half and keep half of garden in soil-improving crops.

5. Plant long rows to save time in care and cultivation. You may plant several crops in the same row if the distance between rows is about the same. Check the chart on page 8 for crops with similar space requirements.
6. Plant tall crops, such as sweet corn, pole beans, or staked tomatoes together. If possible, plant them on the side of the garden where they will not shade other lower-growing crops.
7. A poor job of planning often leads to haphazard care and poor results.

Figure 1. — Small garden plan.

Length — 50 Feet

	2'	Asparagus
	2½'	Early cabbage and lettuce (1)
	2½'	Onion-sets (2)
Width — 25 Feet	2½'	Parsley plants—Carrots and Radishes (3)—Beets
	2½'	Early peas April 1 (4)—Late peas April 10 (4). Followed by late cabbage July 15
	3'	Early snap beans May 1. Followed by broccoli July 15
	2½'	Midseason snap beans May 1. Followed by fall cauliflower July 15
	2'	Tomatoes staked (5)—Pepper plants
	3½'	Staked tomatoes
	2'	

- (1) Intercropping lettuce plants between cabbage.
- (2) Set onions thickly. Thin out when large enough to eat.
- (3) Radishes seeded sparingly with carrots.
- (4) Peas sown in double rows 6 inches apart.
- (5) Intercropping early spinach, radishes, and leaf lettuce between rows of staked tomatoes.

### Small Garden Plan

The city, urban, or backyard garden is small, but it can be efficient. This 25- by 50-foot garden (Figure 1) should produce most of the vegetables for canning, freezing, and fresh use — exclusive of potatoes and corn — necessary for two persons for one year. Sweet corn is one of the borderline crops. Owing to the high quality of freshly picked corn, nearly every gardener wants to include it in his plans. The amount of food value produced is small compared with that of some other crops, and there is hardly room for it in a small garden. Sweet corn can be included in this plan by eliminating one row of tomatoes and the row of midseason snap beans.

A garden this size will require about one-half hour's work a day to obtain maximum production. To increase the production of this

small garden, plant cucumbers and pole beans along the back fence, or on a trellis against the garage. Plan succession plantings carefully to assure crops in late summer and fall. Early crops planted after the dates indicated on the plan will not be harvested in time to plant the later crops.

### **Large Garden Plan**

A complete farm garden has rows spaced for cultivation with a small garden tractor. Since the farmer usually has more land to use than the urban or backyard gardener, succession cropping and interplanting might not be followed. Late plantings for fall crops, however, should not be overlooked. This plot should produce enough vegetables — exclusive of potatoes — for a family of five for one year. See Figure 2.

### **Seeds**

1. Order seeds well in advance of planting time.
2. The garden plan should show the size of plantings and the quantity of seed required.
3. Table 1 shows the quantity of seed required for a given space, but allowance should be made for the possible need to replant.
4. Select crops and varieties that are known to be adapted to the locality. A list of current recommended varieties and hybrids for Pennsylvania growing conditions is available from your local Cooperative Extension Service office.
5. Disease-resistant strains and varieties of many important vegetables are now generally available, so there is little reason to risk crop loss by planting susceptible kinds.
6. Consult the catalogs of several companies so you can have a wide selection of varieties and types of vegetables.
7. Seed should be treated to kill disease organisms on the surface of the seed and to prevent seed decay and damping-off. You can treat seed yourself but you'll save time and effort if you buy seed that is already treated. Information on the kind of treatment the seed has received will appear on the seed package.
8. It is best not to use seed more than one year old. If you do, sow the seed thicker to insure a good stand of plants. It usually does not pay to save your own seed unless you have a variety not available from any other source. Do not save seed from an F<sub>1</sub> hybrid vegetable.

### **Plants**

1. Some vegetables do best when they are started indoors and then

Figure 2.—Plan of a farm garden for a family of five persons.\*

Length—150 Feet; Width—70 Feet

1	4'	Asparagus—rhubarb—chives—horseradish—herbs—winter onions
	4'	Onion sets to mature—thinnings used for green onions (April)
2	2½'	Onion seed to mature—thinnings used for green onions (April)
	2½'	Early spinach—lettuce—turnips—cress—kohlrabi (April). Followed by snap beans (June 15-July 1)
	2½'	Early peas (April). Followed by beets and late carrots (June 15-July 1)
	2½'	Second early peas (April). Followed by late celery—cauliflower—broccoli (June 15-July 1)
	2½'	Late peas (April). Followed by late endive—Chinese cabbage—lettuce (July 1-15) or late turnips (July 15 to August 1)
	2½'	Early beets—early carrots (April). Followed by late spinach or snap beans (July 20)
	2½'	Early cabbage—broccoli—cauliflower (April). Followed by spinach or kale (July 15-August 1)
	2½'	Parsnips—salsify—Swiss chard—New Zealand spinach—parsley (April) (Seeded with marker of early and second early radishes).
	2½'	Cabbage—Brussel sprouts—early celery (May)
	2½'	Second plantings of beets—carrots—kohlrabi—lettuce (May)
3	4'	Cucumbers—muskmelons—summer pumpkins—winter squash (May 15)
	4'	Sweet corn
	2½'	Sweet corn (May 1) (May 20) (June 15) (July 1)
	2½'	Sweet corn
	2½'	Snap beans (May 1-15)
	2½'	Green shell beans—dry shell beans (May 20)
	2½'	Lima beans (May 20)
	2½'	Lima beans (May 20)
	4'	Tomatoes—sweet and sharp peppers—eggplant (May 20)
	4'	Late cabbage (June 15)
	2½'	Late cabbage (June 15)
	2½'	Late cabbage (June 15)

Dates are for Central Pennsylvania.

Grouping shows:—1. Perennial crops. 2. Early maturing crops followed by succession crops. 3. Crops occupying the ground all season.

\* Distance between rows may be varied according to soil conditions.

Table 1. — Planting Guide

Vegetable	Seed per 100 feet	Plants per 100 feet <sup>a</sup>	Space between rows feet <sup>d</sup>	Space between plants in row, inches	Depth of planting, inches	Approximate field planting dates <sup>e</sup>	Time to maturity, days
Asparagus <sup>b</sup>	½ oz	50-75	4	18-24	6-8	April	2-3 yr.
Beans, dwarf snap	8 oz		1½-3	3-4	1-1½	May 1-Aug. 1	50-65
Beans, pole snap	4 oz		4	4-8	1-1½	May 15-June 1	50-75
Beans, green shell	8 oz		2-3	2-4	1-1½	May 15-July 1	90-100
Beans, dry shell	8 oz		2-3	2-4	1-1½	May 15-June 1	90-100
Beans, dwarf lima	1 lb		1½-3	4-8	1-1½	May 20-June 10	75-80
Beans, pole lima	8 oz		4	6-8	1-1½	May 20-June 1	80-100
Beets	1 oz		1-1½	1-3	½-1	April 1-July 10	50-70
Broccoli, early <sup>b</sup>	¼ oz	60	3	12-24	plants	April 1-15	75-100
Broccoli, late	¼ oz	60	3	18-24	plants	June 15-July 10	90-100
Brussels sprouts <sup>b</sup>	¼ oz	60	3	18-24	plants	May 15-June 15	90-130
Cabbage, early <sup>b</sup>	¼ oz	70	2-3	9-18	plants	April 15-May 20	60-90
Cabbage, late	¼ oz	60	2-3	9-24	½	June 15-July 1	90-120
Cabbage, Chinese	¼ oz		1½-3	10-18	½	July 15	75-100
Carrots	½ oz		1-2	1-3	¼-½	April 1-July 10	55-90
Cauliflower, early <sup>b</sup>	¼ oz	60	2-3	12-18	plants	April 1-15	75-100
Cauliflower, late	¼ oz	60	2-3	12-18	½	June 15-July 10	90-120
Celery, early <sup>b</sup>	¼ oz	200	2-3	4-6	plants	April 20-May 15	75-100
Celery, late	¼ oz	200	2-3	6	¾	July 1-15	100-120
Celeriac <sup>b</sup>	¼ oz	200	2	4	¾	July 1-15	90-115
Chicory	½ oz		1½-2	4-10	¼-½	June 15	120-130
Chives		100	2-3	1-1½	plants	April	
Corn, sweet (early)	¼ lb		2½-3	8-10	1½	May 1-July 1	70-80
Corn, sweet (late)	¼ lb		2½-3	10-12	1½	May 1-July 1	85-100
Cress (upland)	¼ oz		1-1½	2-4	¼-½	May 1-June 15	60-80
Cucumber <sup>c</sup>	½ oz		3-6	12	1-1½	May 10-June 15	60-80
Dandelion							75-200
Endive <sup>b</sup>	¼ oz		1½-2	8-12	¼-½	May 1-July 15	60-90
Horseradish		100	3-4	12-15	6	April 1-15	180
Kale <sup>b</sup>	¼ oz		1½-2	12-24	½	July 15-Aug. 1	50-200
Kohlrabi <sup>b</sup>	¼ oz		1½-2	4-6	½	April 1-Aug. 1	60-75
Leek	½ oz		1½-2	3-4	½	April 1-15	130-180
Lettuce <sup>b</sup>	¼ oz		1-2	9-15	1-1½	April 1-Aug. 1	45-75
Muskmelon <sup>c</sup>	½ oz		5-6	12-24	1-1½	May 15	85-100
Onion (plants) <sup>b</sup>	½ oz	600	1½-2	3-4	plants	April 1-15	110
Onion, sets	2 lb		1-2	1-3	½	April 1-15	100-120
Onion (for sets)	2 oz		1-1½	crowded	¼-½	April 1-15	90-100
Parsley <sup>b</sup>	½ oz		1-1½	4-12	¼-½	April 1-Aug. 1	60-90
Parsnip	½ oz		1½-2	3-4	¼-½	April 15-30	95-110
Peas	1 lb		2-3	2-3	1-1½	April	50-80
Pepper <sup>b</sup>	¼ oz	80	1½-3	12-24	plants	May 20-June 1	70-90
Potato, sweet	1 pk	80	3-3½	12-18	plants	May 20	115-125
Pumpkin (vine)	½ oz		6-10	36-60	1	May 20-June 1	90-110
Radish	1 oz		1	1	½	April-Aug.	25-35
Rhubarb <sup>b</sup>	1 oz	25	3-4	2-3	plants	April	2 yr
Rutabaga	¼ oz		1½-2	5-8	½	July 1	90-120

	Dandelion	1/2 oz	100	1-2	3-6	1/4-1/2	April-Sept	175-200
Endive <sup>b</sup>	1/4 oz			1 1/2-2	8-12	1/4-1/2	May 1-July 15	60-90
Horseradish		100		3-4	12-15	6	April 1-15	180
Kale <sup>b</sup>	1/4 oz			1 1/2-2	12-24	1/2	July 15-Aug. 1	50-200
Kohlrabi <sup>b</sup>	1/4 oz			1 1/2-2	4-6	1/2	April 1-Aug. 1	60-75
Leek	1/2 oz			1 1/2-2	3-4	1/2	April 1-15	130-180
Lettuce <sup>b</sup>	1/4 oz			1-2	9-15	1-1 1/2	April 1-Aug. 1	45-75
Muskmelon <sup>c</sup>	1/2 oz			5-6	12-24	1-1 1/2	May 15	85-100
Onion (plants) <sup>b</sup>	1/2 oz	600		1 1/2-2	3-4	plants	April 1-15	110
Onion, sets	2 lb			1-2	1-3	1/2	April 1-15	100-120
Onion (for sets)	2 oz			1-1 1/4	crowded	1/4-1/2	April 1-15	90-100
Parsley <sup>b</sup>	1/2 oz			1-1 1/2	4-12	1/4-1/2	April 1-Aug. 1	60-90
Parsnip	1/2 oz			1 1/2-2	3-4	1/4-1/2	April 15-30	95-110
Peas	1 lb			2-3	2-3	1-1 1/2	April	50-80
Pepper <sup>b</sup>	1/4 oz	80		1 1/2-3	12-24	plants	May 20-June 1	70-90
Potato, sweet	1 pk	80		3-3 1/2	12-18	plants	May 20	115-125
Pumpkin (vine)	1/2 oz			6-10	36-60	1	May 20-June 1	90-110
Radish	1 oz			1	1	1/2	April-Aug.	25-35
Rhubarb <sup>b</sup>	1 oz	25		3-4	2-3	plants	April	2 yr
Rutabaga	1/4 oz			1 1/2-2	5-8	1/2	July 1	90-120
Salsify	1 oz			1-1 1/2	2-4	1/2	April 1-15	140-150
Spinach	1 oz			1-1 1/2	2-4	1/2	April and August	40-60
Spinach, New Zealand	1 oz			3-4	24-36	1	April 15	60-80
Squash, winter	1 oz			6-10	36-60	1	May 15-June 1	90-110
Squash, summer <sup>c</sup>	1 oz			3-5	36-60	1	May 15-June 1	50-80
Swiss chard	1 oz			1 1/2-3	6-12	1/2-1	April 15	50-60
Tomato <sup>b</sup>	1/4 oz	40		3-5	36-60	plants	May 20-June 1	75-100
Tomato, staked <sup>b</sup>	1/4 oz	75		3-4	15-24	plants	May 20-June 1	75-100
Turnip	1/2 oz			1-2	2-6	1/4-1/2	April-July 25	50-80
Watermelon <sup>c</sup>	1/2 oz			6-10	24-36	1	May 20-June 1	70-95

<sup>a</sup> Exact amounts will vary according to planting distances.

<sup>b</sup> Crops that can be started indoors and transplanted to the field.

<sup>c</sup> Crops that require special treatment for transplanting.

<sup>d</sup> For wheel hoe cultivation; distance between rows may depend upon type of cultivator to be used.

<sup>e</sup> Dates for Central Pennsylvania.

transplanted into a garden.

2. The plants should be healthy, stocky, medium-sized, disease-free, and insect-free, with good roots.
3. Do not use plants with spots on the leaves, brown lesions on the stems, or knots on the roots.
4. Avoid using plants that are tender, yellow, spindly, or too large.
5. Obtain plants in containers (pots, bands, flats, boxes, etc.) so that the root systems are intact. Your plants should not be disturbed any more than necessary.
6. Plants growing individually in peat type containers offer the advantage of practically no transplanting shock.

### **Growing Early Plants**

Many gardeners find it practical to buy their vegetable plants from a commercial plant grower or garden center. In some areas, however, good plants of desired varieties are not available, so growing your own seedlings is necessary.

Plants may be grown in a hotbed or in a sunny window, and preferably under balanced lighting. Start the plants in a seed flat, if a hotbed is used, or in a box about 3 inches deep for use in a window.

To germinate seed, use a medium that is free of disease organisms and weed seed. Sphagnum moss, vermiculite, and mixtures of peat and perlite or peat and vermiculite are very satisfactory for seed germination.

A new advanced method of producing transplants at home has been introduced. Garden centers, plant growers, and seed catalogs offer compressed peat encased in a plastic net. When water is applied, the peat expands to form a pellet large enough to support an individual plant. Seeds are then pressed directly into the pellets, which contain enough plant nutrients to grow the plants to full garden-planting size. When the plant has grown and is ready for transplanting, it is planted pellet and all and continues to grow without set-back.

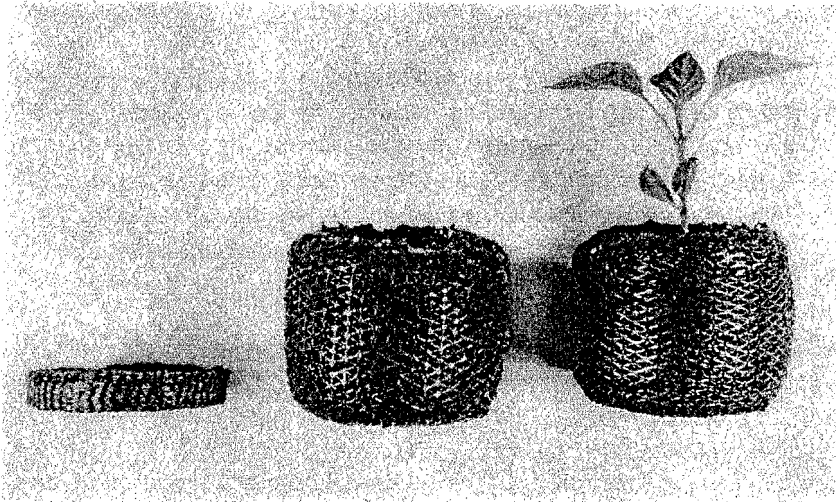
If soil is to be used for germinating seed, it must be sterilized to eliminate soil-borne disease and damping-off. A loam soil which does not get hard or form a crust is best for growing plants. Such soil is not always available but can be made by mixing one part each of loamy soil or compost, well-rotted manure or peat moss, and sand. Screen the mixture through a half-inch screen. The proportions should be adjusted to the condition of the soil available. Firm and level the soil in shallow boxes or flats about 3 inches deep.

Sow the seed in rows 2 inches apart, and cover with one-eighth to one-fourth inch of soil. After seeding, water the boxes or flats

carefully with a fine spray. A plastic film or glass plate cover over the seeded container helps reduce drying until plants are up. Remove the cover just before the first seedlings are due to emerge.

When the plants have their first true leaves, about two weeks after they come up, they should be transplanted to stand about 2 inches apart each way.

Water, applied carefully, is essential to good plant growth. Water the soil thoroughly and as often as necessary to prevent drying out. Too much water encourages soft, succulent growth and damping-off, while too little water produces very hard plants. Avoid both extremes for the most productive plants. Plants grown under these conditions are not well suited to withstand adverse outdoor conditions. Plants should be hardened-off before they are transplanted to the garden.



Peat pellets are one of the best media for starting plants. Compressed peat pellet (left) is shown before water has been added. Moistened pellet (center) expands to form a net-covered fiber pot. Seeds are then pressed into the fiber. Plant growing from peat pellet (right). After the plant has grown, you transplant everything.

#### **Hardening-off Plants**

Plants should be gradually hardened, or toughened, for a week to 10 days before planting in the open garden. This is done by slowing down their rate of growth to prepare them to withstand such conditions as chilling, drying winds, shortages of water, or high temperatures. Cabbage, lettuce, onion, and many other plants can be hardened to withstand frost; others, such as tomatoes and peppers, cannot. Withholding water and lowering the temperature are the best ways to harden a plant.

### **Tools and Equipment**

1. Have all your equipment and tools ready before you begin to work the soil.
2. Use of well-adapted tools in preparing garden soil greatly reduces cultivating work.
3. Clean, sharp, high-grade tools reduce garden labor. Select a few standard tools that practice has shown are well adapted to general conditions.
4. Hand tools include hoe, steel rake, spade and spading fork, bucket or watering can, hand duster or sprayer, and line for making straight rows.
5. A trowel and a dibble for setting out plants and a weeder for weeding and thinning will be useful in any size garden.
6. Except for very small gardens, a wheel hoe is necessary and a wheelbarrow or cart is desirable.
7. Many gardeners today rent equipment for soil preparation. The rotary tiller has been widely adopted for such purposes. It can prepare light to medium soils for planting in one operation.
8. Country gardeners, in increasing numbers, are turning to small farm and garden tractors for land preparation, cultivation, lawn mowing, and hauling sprayers in gardens and orchards. Those who garden every year and have large homesteads usually find this equipment a good investment.
9. A seed drill is also desirable for larger gardens.

### **The Garden Soil**

The ideal garden soil is fertile, deep, easily crumbled, well-drained, and high in organic matter. Thorough soil preparation before planting is needed for growing garden crops. The deeper the soil is worked the greater is its capacity for holding air and moisture.

Adequate amounts of organic matter in a soil result in quicker growth. Such soil holds more water, is mellower, more easily penetrated by the roots, and richer in food materials.

Every gardener should have a soil test made. This will show the pH level, or acidity of the soil, and the level of plant nutrients. Soil tests are available from Penn State's soil testing laboratory and from various commercial concerns.

Vegetables grow best on soils that are only slightly acid. Proper applications of lime to acid soils will increase the production of most vegetables. Too much lime applied to a soil may be just as bad as too little. Apply liming materials only if the soil test indicates a need.

Except where heavy applications of manure are made, a mixed fertilizer containing nitrogen, phosphate, and potash — will fit garden needs best. Various formulas or combinations are used. A commercial fertilizer having a ratio of 1-2-1, such as one containing 5 percent nitrogen, 10 percent phosphate, and 5 percent potash, will give good results. The label on such fertilizer will read 5-10-5. Another common garden fertilizer is 5-10-10.

The rate of application of mixed fertilizer is 10 to 35 pounds per 1,000 square feet of garden, depending upon soil fertility and whether manure has been applied. On garden soils low in fertility, use 35 pounds of fertilizer per 1,000 square feet. More detailed information on garden soil management can be obtained from your county agent.

On small plots in which the rows are to be close together, about 25 pounds of fertilizer per 1,000 square feet are broadcast. If the plot is large, with the rows farther apart, part of the fertilizer should be applied broadcast and part in bands along the row. Applications made in bands at planting time about 2 or 3 inches deep and 2 to 3 inches from the seeds or plants, at the rate of 1 to 2 pounds per 100 feet of row, will greatly hasten early growth and maturity.

### Sowing Seeds in the Garden

1. *Plant in a freshly prepared seedbed* — Otherwise the 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.
2. *Plant in straight rows* — This will increase the attractiveness of your garden and make cultivation and harvesting easier.
3. *Plant at proper depth* — The depth of planting varies with kind of seed, type of soil, and season. In general, the smaller the seed the shallower the covering; but all seeds are planted comparatively shallow early in spring and in heavy soils, and slightly deeper later in the season and in sandy soils.
4. *Space seeds properly in the row* — Plants that crowd do not develop properly.
5. *Firm soil after planting* — After the seeds have been covered to the proper depth with fine, moist soil, it is important to firm the soil particles around the seed to hasten germination. It may be easily and quickly done by light tamping with the back of the rake or hoe.

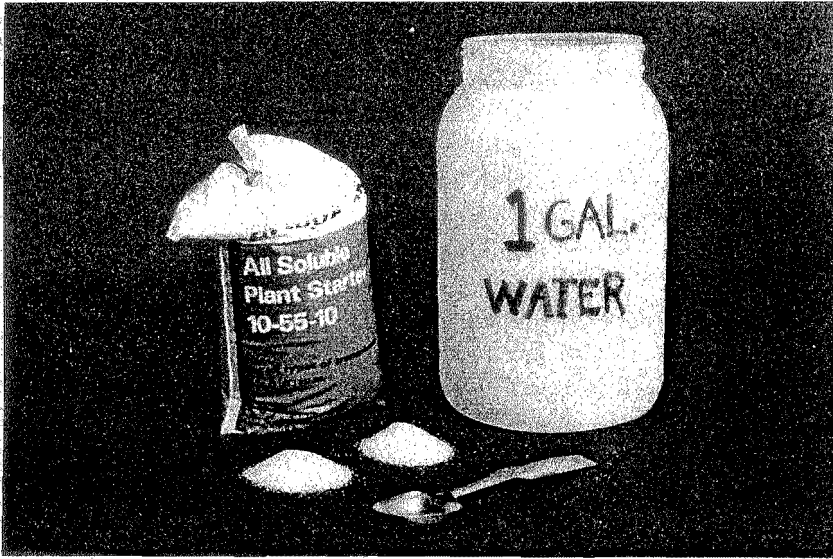
### Transplanting Plants

Plants should not be allowed to get too big before being transplanted.

1. A few hours before transplanting, thoroughly water the soil in

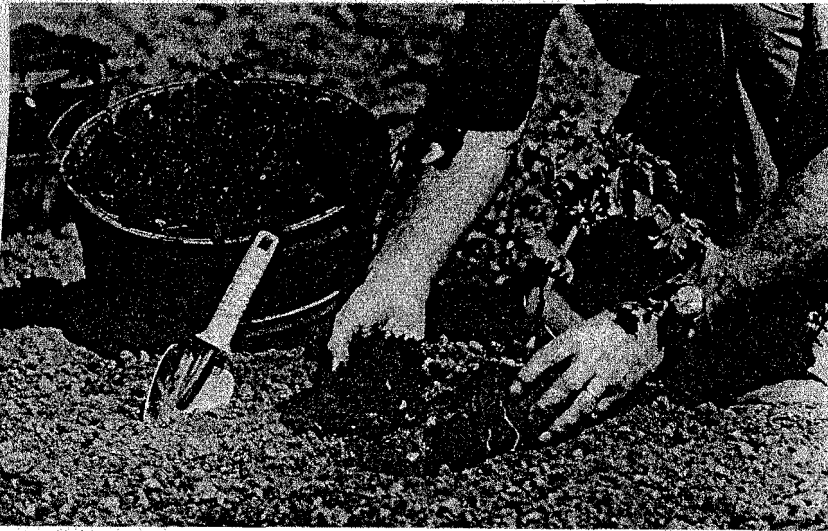
which the plants are growing.

2. Take the plants up carefully so as to disturb the roots and soil about them as little as possible.



Dissolve 10-55-10 or similar all-soluble fertilizer at the rate of 2 tablespoons (1 ounce) per gallon of water. Apply one cup of solution per plant.

3. Set each plant slightly deeper than before in a hole large enough to take the roots without cramping.



Use a trowel to make holes. Use a soil-compost mixture under and around plants. Firm the soil around each plant.

4. Use starter fertilizer when transplanting to give your plants a faster start. Starter fertilizer is an all-soluble fertilizer high in phosphorus, for example 10-50-10 or 10-52-17. Mix the fertilizer with water (about 2 tablespoons per gallon of water). When you transplant, place about one cup of the solution around the roots of each plant. If a regular starter fertilizer is not available, mix 1 cup of 5-10-5 or similar fertilizer in 12 quarts of water and use one cup of solution for each plant.
5. Press the soil firmly about the roots and cover with dry soil to exclude the air and conserve moisture.
6. Transplant on a cool, cloudy day or in late afternoon.
7. If possible, shade plants for a day or two to prevent wilting when the sun is bright.
8. If dry weather follows transplanting, water the young plants thoroughly at least once a week.

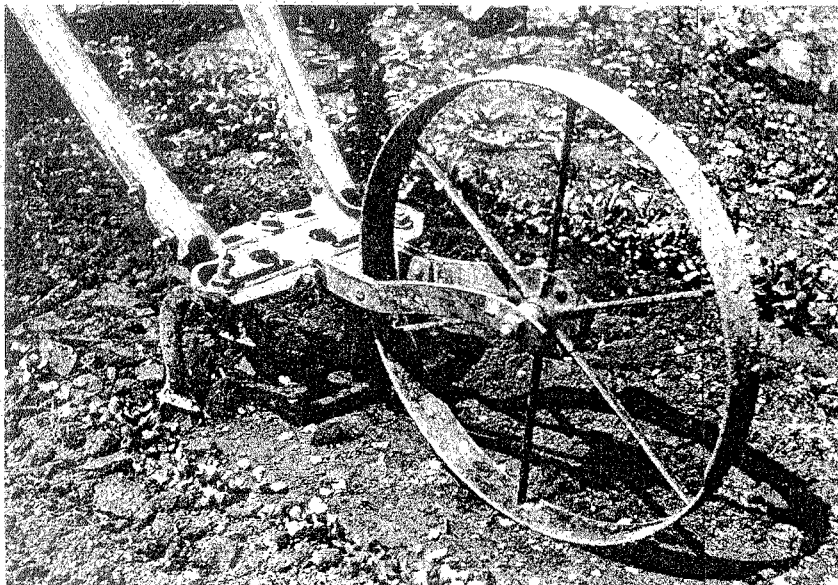
#### **Plant Protection**

1. Plant protectors of various types protect the transplanted plants from wind, sun, and cold in early spring.
2. The added protection also enables the plant to establish itself better and hastens its early growth.
3. Some ventilation is essential, even at first. Ventilation should be increased gradually until the top is completely open.
4. Some growers place plant protectors over the seeds of melons, squash, and similar tender crops to hasten their germination.
5. Plant protectors in northern Pennsylvania often hasten the crop just enough to mature it before fall frost.

#### **Cultivation**

1. Once the garden is planted, cultivation is one of the most important garden jobs.
2. Proper cultivation loosens the soil and permits the rain to soak in so that none of it is lost.
3. It preserves moisture by killing weeds which, if allowed to grow, would rob the crops of both moisture and plant food.
4. It provides favorable conditions so that beneficial bacteria in the soil can do their work.
5. Begin cultivation as soon as plants are up, provided the soil is not too wet.
6. Cultivate as often as necessary to keep weeds under control. Weeds are easily killed when they are small.
7. If a crust has formed on the soil because of hard rains before

the seedlings are up, break the crust by going over the surface with a rake. Care must be taken not to work too deep and disturb the seeds or seedlings.



After each rain, cultivate as soon as the soil is fit. The first cultivation should be soon after plants are up. Cultivate just deep enough to kill the weeds.

8. Roots of many vegetables are near the soil surface and can be damaged easily by a hoe or cultivator if care is not taken when cultivating. As the season progresses set the cultivator shallow, and do not get close enough to the rows to disturb the plant roots.

### **Thinning**

1. Thinning should be done while plants are small and when the soil is moist, so they can be pulled out easily without injuring those that are left.
2. Proper distances to thin various plants are indicated in Table 1 on page 8.
3. Root crops should be thinned before their taproots become fleshy. Onions from seeds, and radishes, can be left in the ground until those that are thinned out are large enough to eat.
4. Carrots should be thinned first when they are 2 to 3 inches tall, so as to stand about 1 inch apart. They can then be left to develop until large enough to be eaten, when alternate plants can be pulled and used, leaving more room for those that are

left.

5. Thinning is rarely practiced with beans, peas, corn, and some other large-seeded plants which produce vigorous seedlings, for a good stand usually is obtained by planting only a few more seeds than the number of plants required.

#### **Watering**

1. Although rainfall is a good source of water, there are usually some dry periods during the growing season when you will have to water your garden. It is important to do it properly.
2. One thorough watering per week, equivalent to about an inch of rain, is enough.
3. An inch of rain is about 28,000 gallons of water per acre or 65 gallons on 100 square feet of garden.
4. Water early enough in the day so that moisture on the plants will dry off before dew appears; this will help prevent disease.
5. A thorough watering should wet the soil to a depth of 4 to 6 inches.
6. Frequent light waterings encourage shallow rooting. The plants are poor feeders, are damaged more readily by high winds, and suffer most severely in hot weather.
7. Apply water gently to the soil and avoid runoff.
8. Apply water with sprinklers or perforated plastic hoses. Adjust them so that they give even distribution over the garden area.

#### **Mulching the Garden**

1. A mulch will:
  - Conserve moisture and maintain uniform moisture.
  - Help keep weeds down.
  - Help prevent erosion.
  - Help prevent soil from packing and crusting.
  - Keep fruits from direct contact with the soil.
2. Plastic mulches generally tend to increase the soil temperature while organic mulches will maintain a cooler temperature.
3. Before mulching, remove all weeds and condition the soil for best plant growth.
4. If porous mulches such as straw, leaves, sawdust, corncobs, or peat moss are used, it may be necessary to irrigate periodically during the season.
5. If non-permeable mulches like polyethylene, paper, or aluminum are used, be sure adequate moisture is available before applying the material.

6. In rainy seasons mulching may be harmful, because it helps keep the soil too wet for adequate aeration.
7. Black polyethylene mulch prevents evaporation from the covered area, thus conserving the moisture for plant use. The increased plant growth on mulched plots results in greater water loss as the plant transpires. Consequently, on lighter, well-drained soil during extremely dry seasons, irrigation is more necessary on polyethylene mulched crops than on non-mulched cultivated crops.
8. Black polyethylene does not break down or disintegrate, so remove it at the end of the season. In some cases it might be used a second year.
9. After certain mulch materials have served their purpose, turn them under for organic matter. Do this several weeks before further planting.
10. To aid and speed up decomposition, commercial fertilizer, high in nitrogen, should be broadcast on the mulch just prior to turning.



Plastic mulch film conserves moisture, controls weeds, warms the soil, and hastens maturity of vegetable crops.

#### **Herbicides in the Home Garden**

1. A general rule is to avoid using chemical weed killers in the home garden. While some vegetables are tolerant of certain chemicals, others are very susceptible.
2. Some vegetables are more susceptible to weed killers in certain stages of their growth than in other stages.

3. Since the garden will have different types of vegetables in many different stages of growth, it is rather dangerous to use chemical weed killers.
4. Herbicides are difficult to apply at proper rates for small areas and a home gardener is also limited in the number of chemicals he can economically use.
5. Drift from weed killers used near the garden may also damage your crops. In recent years much damage has been caused in some home gardens and yards by the careless use of 2,4-D and related weed-control chemicals. Tomatoes, vine crops, beans, and peppers are some of the vegetables most susceptible to 2,4-D.

#### **Harvest Crops at the Right Time**

1. The quality of your vegetables cannot be improved after harvest.
2. Vegetables should be harvested at proper maturity to provide the best food for table, freezing, and canning.
3. Vegetables picked at the peak of maturity and prepared promptly and properly almost always are superior in nutritional content, flavor, and appearance. The secret is freshness and proper handling.
4. For best use of garden products, do not allow all of one crop to approach maturity before using it. For table use select the most advanced specimens, thus lengthening the period of usefulness. In this way a crop may be used two or three weeks longer than if it were neglected and the entire crop allowed to mature.
5. Be careful in digging or picking the crop to avoid injuring the vegetables. Damage of any type will lower both keeping and eating quality.

#### **Storage**

1. Freezing, canning, and natural storage preserve seasonal crops and surplus vegetables.
2. Many important home-garden crops may be made available throughout the year, in a condition closely approaching that of the garden-fresh material, by storing in a home freezer. These crops include asparagus, snap beans, lima beans, peas, spinach, broccoli, cauliflower, and sweet corn. Grow varieties of vegetables adaptable for freezing.
3. Canning provides a convenient and, in some cases, the only satisfactory method for keeping certain vegetables, such as tomatoes and cucumbers, often in the form of relishes or pickles.
4. Natural storage of vegetables (in a storage cellar) is well adapted

where freezing temperatures prevail during winter. Certain vegetables, like cabbage, turnips, parsnips, celery, salisfy, beets, and carrots, will keep best if temperatures are maintained at 32 to 34°F., with humidity as high as possible without moisture condensation.

5. Such vegetables as pumpkins, squash, and sweet potatoes are stored in a moderately dry cellar or basement through fall and winter at 50 to 60°F.
6. To avoid chilling injury store peppers, green tomatoes, and cucumbers for a short time at temperatures between 50 and 60°F at moderately moist humidity.
7. Dry onions (cured full-sized bulbs) store best at a temperature near 32°F as possible, in a dry, well-ventilated place.
8. Store only vegetables of good quality. Select mature, but not over-ripe, vegetables that are free from defects, insect and disease injury. Care should be taken in handling all vegetables for storage in order to avoid bruising and mechanical damage.

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