

# GARDENING

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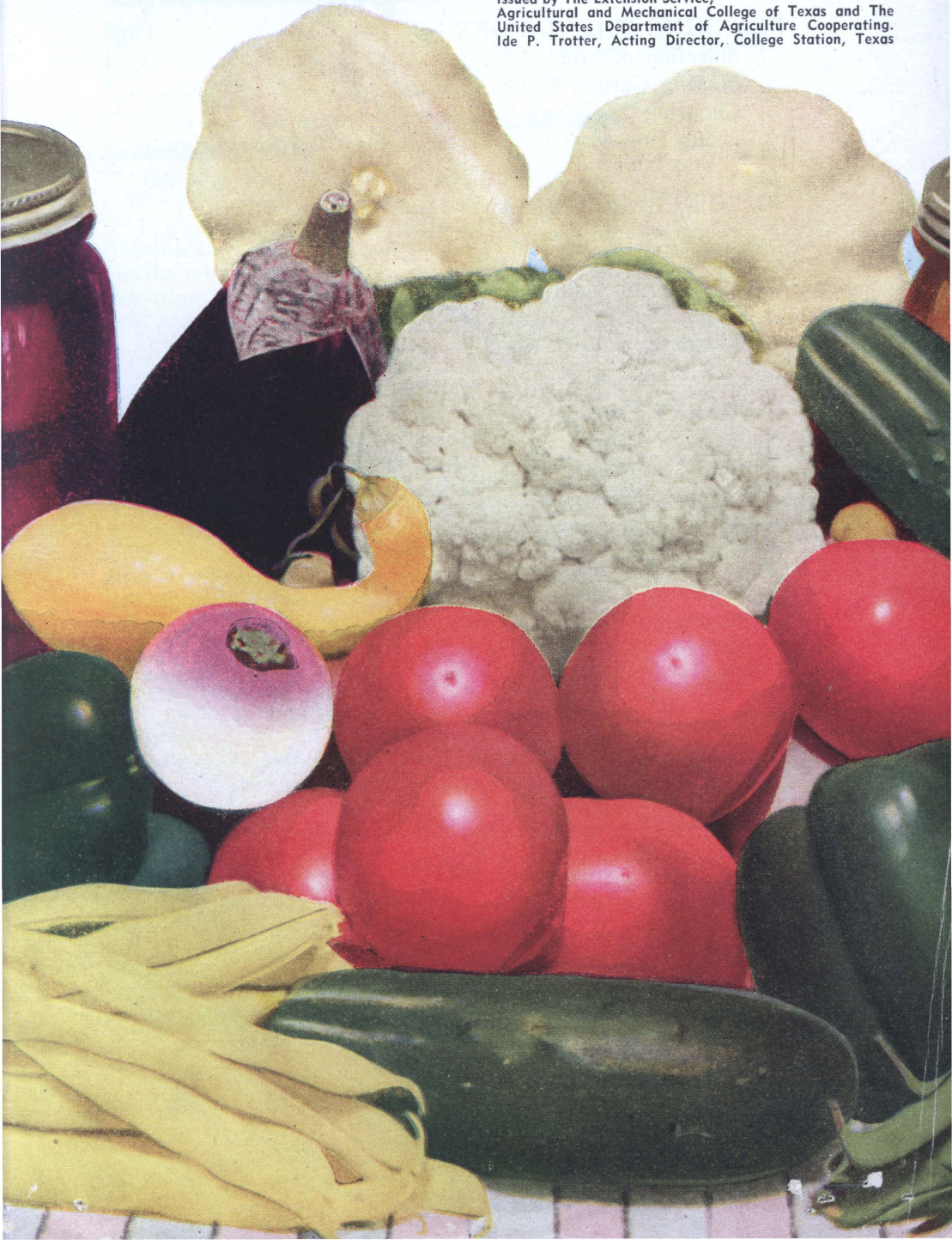
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by

**J. F. ROSBOROUGH and C. R. HEATON**

*Extension Horticulturists*

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Ide P. Trotter, Acting Director, College Station, Texas



1957

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## BULLETIN B-70

### Table of Contents

	Page
PLANNING THE GARDEN	
Selection of Site.....	1
Making Garden Plans.....	2
Choosing Tools and Equipment.....	2
Using Hotbed or Cold Frame to Start Certain Early Vegetables .....	3
SOIL PREPARATION AND IMPROVEMENT	
Preparing the Soil.....	4
Using Commercial Fertilizer.....	5
Making and Using Compost.....	6
Using Barnyard Fertilizers.....	6
Testing Garden Soils.....	7
PLANTING THE VEGETABLES	
Time of Planting.....	8
How to Plant.....	8
Seed Treatment .....	9
Seed Inoculation .....	9
CARE OF VEGETABLES	
General Garden Pointers.....	10
Proper Cultivation .....	11
Vegetable Variety and Methods Planting Guide.....	12-13
Mulching the Garden.....	14
Watering the Garden.....	14
USEFUL INFORMATION ON SPECIFIC VEGETABLES .....	15
PREVENT INSECT DAMAGE.....	22
PLANT DISEASES IN GARDENS.....	23
REFERENCES ON GARDENING.....	24

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# Gardening

By J. F. ROSBOROUGH AND C. R. HEATON, *Extension Horticulturists*



## PLANNING THE GARDEN

### Selection of Site

The selection of a suitable site for a garden may mean the difference between success, partial success or complete failure.

If possible, the site should be in the vicinity of the house for convenience in planning and working the garden and in harvesting the crop. Nearness to an adequate supply of good water for irrigation also is important. This is especially true in areas of light rainfall.

In selecting a garden plot which will produce good vegetables, the following points should be considered:

1. A deep, rich, sandy or sandy loam soil which crumbles easily, and which has a ten to twelve inch top soil and well drained, porous, clay subsoil is preferred. Choose a place which has enough slope for surface water drainage and sufficient air drainage to prevent a possible pocketing of frost. Almost any type of soil can be used if properly prepared and fertilized, but the sandy or loam types are more easily worked and warm up more quickly in the spring. They also become workable soon after a rain or irrigation, respond more readily to fertilizers, and are injured less by trampling when wet. Gravelly soil types usually are deficient in organic matter, but when supplemented with stable fertilizer, compost or green manure crops to increase fertility and water holding capacity, they may become satisfactory garden soils. Heavy clay or black land soils usually are more fertile than others but are low in organic matter and hard to work.

2. Sites having steep slopes, poor surface and subsurface drainage, heavy shade, rocks, excessive shrubs or trees, or shallow topsoil should be avoided if possible. A site should be situated so that it has at least six hours of sunlight daily, especially for tomatoes, eggplant, peppers and lima beans. Leafy crops such as leaf lettuce, mustard, collards, spinach, chard and kale will tolerate some shade but as a general rule, fruit and seed-bearing crops are less tolerant of shade. Usually a green scum on the top soil indicates poor drainage and should be avoided, or adequate provision made for drainage. A site which is well drained and which produces a rank, quick growth of weeds or grass should produce good vegetables.

It is difficult to give definite pointers on site selection and on other factors influencing gardening under varying conditions. The gardener must study the ground and the responses of various kinds of vegetables to certain treatments, and as a result of his findings alter or improve methods or practices from season to season.

If the gardener has sufficient land, serious consideration should be given to rotating garden sites from year to year. The benefits of rotation are: (1) the soil receives the rest it needs, and the gardener has opportunity to rebuild it with cover crops and other methods; (2) with more than 500 different kinds of harmful disease organisms which may infect garden soils, constant production of certain vegetables on the same site encourages severe infection; (3) growing the same vegetables on the same site encourages severe damages from insects.

Once a site has been selected, fence it, or provide whatever protection is needed against livestock and predatory animals.

### **Making Garden Plans**

For even the experienced gardener a plan on paper is most helpful. By choosing the kinds of vegetables you want to plant before planting time, you can make purchases of seed, and if certain varieties are not available locally, you can place your orders and still obtain the seed in time for planting. There is no perfect plan that will fit all gardens. It is best to group vegetables together according to the proper time for planting. In general vegetables are divided into three groups: early, midseason and late. The early group, such as English peas, carrots, spinach, beets, cabbage, and onions should be planted in one section of the garden, midseason vegetables should be planted in another part; and late vegetables in still another part. If possible, the slow growing types of vegetables should be planted so that they will not be shaded by tall ones. The garden fence may often be used to advantage in providing a trellis for pole beans or other vegetables of this type.

A garden plan on paper will help the gardener to avoid repeated plantings of the same vegetables in the same part of the garden. Where such vegetables as tomatoes, squash, and potatoes are planted year after year on the same spot, the soil becomes disease infected, and heavy losses of plants may result.

### **Choosing Tools and Equipment**

Every gardener needs a hoe, a rake and a spading fork or round-pointed shovel. For large gardens a good wheel hoe or hand cultivator multiplies the gardener's efficiency many times.

Sharp, well kept tools make for quick and efficient work. When water connections are available, a garden hose and sprinkler will also be of value.

### **Using a Hotbed or Cold Frame to Start Certain Early Vegetables**

To grow an early garden it is necessary to start such crops as cabbage, cauliflower, tomatoes, egg plant, and peppers in a protected place and then transplant them to the open garden. A hotbed is excellent for this purpose. At least 18 inches of manure should be used in this bed and another inch added for every week beyond four weeks that there is frost danger. For hardening the plants, cold frames are used. They are built like the hotbeds except that no manure is used. The beds are heated by the sun during the day and this warmth is held in by the covering during the night.

For a very early start, seed may be planted in a shallow box in the house or hotbed. When the first two true leaves have developed and the plants begin to crowd they should be transplanted to a cold frame and spaced four inches each way. The small plants may be set in a small plant box 18 inches x 30 inches



Tomato plant of suitable size for transplanting, about 8 inches tall.

and 4 inches deep, which will hold 28 plants. Or they may be placed in tin cans, pots or berry boxes until danger of frost is over, when they will be planted in the garden. Plants should be hardened off before being moved to the field in order to withstand better any adverse conditions they may meet. This is done by gradually exposing them in hotbed or cold frame to day temperature and by withholding water from them. They should be watered about 12 hours before being transplanted. Keep as much soil about the roots as possible when transplanting them. Set them out in the garden to the depth of the first leaf. Press soil firmly about the roots. In warm weather shade the plants with a covering such as newspapers until growth has begun.

## **SOIL PREPARATION AND IMPROVEMENT**

### **Preparing the Soil**

The location, the type of soil, drainage, physical condition, season of year, amount of rainfall, and other factors alter the procedure or steps in preparing garden sites for planting.

An old garden site of deep, open, sandy soil, will need only light, shallow cultivation. Here late winter or early spring preparation is sufficient to insure good production. However, new sites on poorly drained spots, on tight, shallow soils, or on rocky or sodded land should be cleaned off, drained and broken thoroughly in the fall or early winter. Sod lands to be used for gardens will be improved if they are planted in field crops one season before they are planted in vegetables.

After the sites have been prepared, determine the depth to break the ground. If the subsoil is near the surface do not "turn up" more than one inch of it per season. If possible the soil should be broken to a depth of 8 to 10 inches.

In breaking plots, cut up crop residue and weeds finely and turn under completely unless it is diseased vegetable material which should be removed and burned.

For fall and winter garden preparation, leave the surface rough. A rough surface holds water better and makes spring preparation easier.

As spring gardening time approaches, the roughly plowed garden should be pulverized thoroughly several times well in advance of planting. Rows should be prepared to suit the locality and the type of vegetable to be planted. For most vegetables 18 to 36 inch rows are adequate. Cucumbers, squash and some other vegetables require more space.

In general, flat culture requires less work and is better than growing the crops on raised beds or ridges. Ridges, however, are advisable on poorly drained areas, where heavy rainfall occurs, or where the furrow type of irrigation is to be used.



Before the seeds are planted, clods must be broken up and all interfering trash removed by proper use of the rake.

Soils should not be worked when too wet. This results in poor condition of the land and, in general, a poor garden.

### **Using Commercial Fertilizers**

If barnyard fertilizers cannot be obtained, commercial fertilizers are good for vegetable production in light sandy or sandy loam soils. Generally the use of both types is better than either one alone. On small plots used intensively, commercial fertilizers may be sown broadcast and thoroughly harrowed or raked into the upper three or four inches of soil. When fertilizer is used in drills beneath the rows, it should be placed about two inches to one side and slightly below where the seeds are to be planted. Apply three to six pounds per 100 feet of row and mix it thoroughly with the soil a week or 10 days before planting seeds. Some gardeners use fertilizer too freely. For most sections of the state complete fertilizers such as 5-10-5 or 4-12-4, are considered best for vegetable production; this analysis, however, varies in some sections.

Nitrate of soda or sulfate of ammonia may be used profitably in moderate amounts as a side dressing for most vegetable crops



during the growing and fruiting season. Usually one to two pounds per 100 feet of row is sufficient. In side dressing, place the fertilizer well away from the base of the plants out in the feeder roots area. Work it well into the soil, and water it.

Commercial fertilizers often can be used to advantage by dissolving one pound of one type, 5-10-5 for example, in five gallons of water. Place about a pint of this "starter solution" around each plant. It will take about 5 to 10 gallons for 100 feet of row.

### **Making and Using Compost**

Compost is made by piling soil, manure, crop residue, lawn clippings or similar materials in alternate layers, usually with a flat top and vertical sides in order that the organic matter will rot down without leaching. Layers of soil two to three inches thick should alternate with layers of organic materials twice as thick. If the manure is not high in nitrate a few handfuls of a complete commercial fertilizer which is high in nitrogen should be used with each layer to hasten decay. The compost pile should be kept moist at all times.

Every three or four months the compost heap should be completely stirred or turned. About 12 months usually is sufficient to make excellent compost.

Compost varies greatly in chemical and physical properties, depending upon the materials used, the degree of decomposition, and the mixing. It should not be considered at a satisfactory garden fertilizer alone. Its greatest values are in improving the physical condition of the soil, growing seedlings for transplanting, and for mulching.

If compost is well rotted, it may be applied and mixed with the soil a few weeks prior to planting. If it is poorly decomposed, fall application to the spring garden plot is a good practice. The amount to use per given unit depends on the condition of the soil, what is to be grown, and many other factors, but the gardener is not likely to use too much.

### **Using Barnyard Fertilizers**

Extensive use of barnyard fertilizer on vegetable gardens is important. It should be plowed or spaded well into the soil, and used also as a heavy top dressing when fitting the land for planting.

Poultry and sheep fertilizers are excellent for vegetable production, but these should be used sparingly, as they are very strong and may burn the plants.

Animal manures should be supplemented with phosphorus. One hundred pounds phosphorus should be added to each ton of horse or cow fertilizer and 100 pounds to each ½ ton of sheep or poultry fertilizer.

Manures not well decomposed should be applied broadcast over the garden in the late fall or winter, before spring planting time. Apply a three to four inch layer (15 to 20 tons per acre, or one bushel per 25 square feet) just before breaking the ground in the winter or very early spring.

### **Testing Garden Soils**

If a garden site has been selected carefully with attention given to soil type, drainage, necessary organic matter, plant foods, and other conditioning, a complete soils analysis is seldom necessary. High quality vegetables usually can be produced in quantity. The only soil testing which seems advisable is for acidity or alkalinity. Good soil types seldom will be too acid, so the only testing really necessary is in those areas where soil is known to have a high lime content. An inexperienced person can make this test easily and quickly with an inexpensive soil testing kit.

Most vegetable plants prefer a slightly acid soil. Adding lime to soils not only reduces acidity, but in general, improves the physical condition or structure of certain heavy clay soils.

Where lime is applied, it should be spread after plowing and forked, spaded or harrowed into the top three to six inches of soil. Lime should not be applied along with commercial fertilizers or manure, as it may keep the plants from getting some of the plant foods otherwise available.

In many areas of Texas, the soils are alkaline or high in lime. A reduction of the soil alkalinity is desirable for best growth and production of many vegetables. Alkalinity of soils may be reduced, or an acid condition created, by the use of aluminum sulphate, sulphur, barnyard fertilizer or commercial fertilizers which are acid in reaction. Correction of lime soils to some extent may be expected with the application of one pound of aluminum sulphate per square yard.



## PLANTING THE VEGETABLES

### Time of Planting

One of the most important factors in growing vegetables successfully is timing the planting or transplanting of each vegetable so that it will have all of the advantages of local conditions. Factors, such as rainfall, altitude, temperature variations, and length of growing season vary so greatly over Texas that only general information can be given.

The following table gives a very general guide as to when various kinds of vegetables may be planted best under most Texas conditions. By determining the average dates of the last frost in the spring and the first fall frost in a given locality, approximate planting dates may be estimated by the use of this table:

Early—Spring Plantings		Late—Spring or Summer Plantings		Late—Summer or Fall Plantings
4 to 6 Weeks Before Frost-Free Date	2 to 4 Weeks Before Frost-Free Date	Frost-Free Date	2 to 6 Weeks After Frost-Free Date	(6 to 8 Weeks Before Fall Freeze)
Asparagus Cabbage plants English peas Lettuce Onions Potatoes Spinach	Beets Carrots Chard English peas Lettuce Mustard Parsley Radishes	Beans Beets Corn, sweet Squash Tomato plants	Beans, snap Beets Corn, sweet Cucumbers Field peas Okra Peppers Sweet potatoes	Beets Collards Kale Mustard Spinach Turnips

### How to Plant

We will assume that you have selected the site, planned the garden, obtained necessary equipment, and prepared and fertilized the garden, and have done other necessary jobs before actually planting.

You are now ready to begin planting. The old "Thumb" rule of planting seeds to a depth twice their diameter has many exceptions. In light soils, seeds should be planted deeper than in heavier ones. Fall sown seed should not only be planted deeper, but 20 to 25 per cent more seed should be used for a given area than for spring planting.

Some seed are so small that proper planting is difficult. Mixing coarse sand or similar material with the seed helps to avoid sowing them too thickly.

Plant the seed in a moist (not wet), well-conditioned row and cover immediately. Firm the soil well. Mulching on top of the planted row is desirable, especially in dry areas or in hot, dry weather in all areas. This practice will be discussed in more detail elsewhere.

To obtain straight rows in the garden and to conserve space, stretch a string tightly along the line of the row. Planting seed by hand is practical and satisfactory in a small garden if the work is carefully done, and if a small hoe is used to open the furrows. Quick maturing vegetables such as radishes, beets, lettuce and mustard may be followed by planting of later maturing crops.

The tables on pages 12 and 13 give pertinent information on how to plant, adapted varieties, hardiness, and other pointers. Too much emphasis cannot be placed on the use of *adapted varieties* and other practices known to be good, any one of which may mean the difference between success or failure in the gardening undertaking.

Gardens should be kept on the job 12 months in the year. There is no place in Texas where some vegetable cannot be grown in all months of the year. Make successive plantings for a continuous supply of fresh, crisp, nutritious vegetables. Plant so that none will go to waste.

### **Seed Treatment**

Seed treatment has for its chief purposes: (1) to control diseases borne on the seed coat; (2) to aid germination of seeds under adverse weather conditions. Though the need for seed treatment is universal, the necessity is greatest where rainfall is heavy, humidity and temperatures high, and disease outbreaks are more common.

The most effective disease control program is *prevention*. Seed treatment is only one of several ways of preventing disease. Keeping garden sites clean of diseased crop residue, practicing site rotation, using good seed, resistant varieties, and keeping the plants in excellent growing condition, all have a tremendous influence on holding disease damages to the minimum.

For most non-legume seeds, commercial organic mercury compounds are very effective. For the average size garden, one 10-cent package is sufficient. Exercise care in using the material. Follow directions and observe the precautions given on the container.

### **Seed Inoculation**

Inoculating legume vegetable seeds, such as beans and peas, is done to place nitrogen gathering bacteria in the soil. These bacteria take nitrogen out of the air and place it in the soil for plant use. This is a practice peculiar to legumes. Response to this inoculation process varies but its use is good insurance every season.

Small, inexpensive packages of the material may be purchased from most seed or drug stores. For the average gardener, one 10-cent package is sufficient for all legume plantings during the season. Directions on the container should be followed for maximum response.

Remember that both inoculating dust and mercury compounds cannot be used on the same seed. The two treatments are distinct and should not be confused.

## **CARE OF VEGETABLES**

### **General Garden Pointers**

Regardless of care and judgment used in the selection of a site, soil preparation, fertilization, adapted varieties, and other factors, little return can be expected if the garden vegetables are not properly cared for.

In later paragraphs, some of the major points on care will be given. Here are a few of the minor, though important, practices which should be observed:

1. In order to keep fruiting vegetables in full production longer, do not permit fruits to remain on the plants after the normal harvesting time arrives. Clear the plants of matured fruits even though it is surplus.

2. Disease spread and damage is encouraged by going into the garden immediately after rains or when heavy dews are on the vegetables.

3. After young vegetables reach a height of 2 to 2½ inches, thin out to proper spacing.

4. When skips occur in vegetable rows due to poor germination or because of harvesting, plant or transplant the same vegetable or a companion crop in these spaces.

5. If you've crowded the planting season, watch out for frosty nights. Tin cans, fruit jars, hot caps, or newspaper covers give excellent protection from frost. If frost catches you "un-awares," protect plants from the sun for a few hours the next morning if possible and thoroughly spray the plants with water. This will tend to reduce frost damage.

6. If fruiting vegetables grow luxuriantly with but little fruiting, this will indicate an excess of nitrogen. Try side dressing with three to four pounds of superphosphate per 100 feet of row to help balance the plant nutrients.

7. During hot, dry weather provide the vegetables with plenty of water, as well as partial shade to prevent sun damage.

8. Old spring plants of tomatoes, eggplant, okra and peppers, if fertilized, worked, mulched, and watered will yield excellent fall crops.

9. When yellowing or chlorosis of vegetables occurs in the high lime sections of the state, mix one pound of copperas in five gallons of water or in 10 pounds of barnyard fertilizer. Use this mixture on 20 to 30 feet of row space, several inches from the plant. Mix well into the soil.

10. If there is a good supply of water and the soil is fertile, try planting companion crops. Such combinations as radishes with beets or carrots, corn with squash, pumpkins, or beans and lettuce with early cabbage should do well.

### **Cultivate Properly**

Thorough, systematic cultivation is necessary to the production of an abundance of highest quality vegetables. To maintain good physical condition of the soil, it's a good practice to cultivate at weekly intervals. This also helps to provide proper soil aeration, saves soil moisture, furnishes a loose area which can be penetrated easily by the roots, and keeps down weeds and grasses. On farms where sites are large enough, the garden rows may be far enough apart to allow cultivation with horse drawn plows.



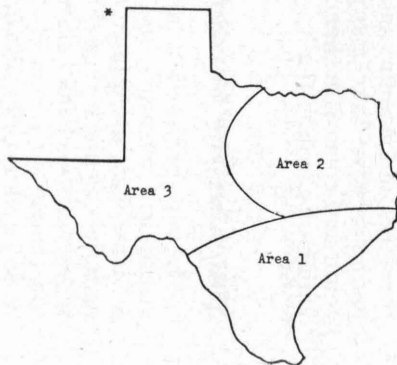
After each rain, plants should be cultivated as soon as the soil is fit. The first cultivation or hoeing should be soon after the plants are up.

## VEGETABLE VARIETY AND METHODS PLANTING GUIDE

NAME OF VEGETABLE	VARIETY TO PLANT	In These Areas *(See Map)	Seeds or Plants per 100 Feet of Row	Rows Apart (Inches)	Plants Apart in Rows	Depth of Planting	No. Days Ready for Use	Hardiness
Asparagus (G) (A)	Mary Washington.....	1, 2 & 3	60-80	24-36	15-20	8-10	2-3 yrs.	Very hardy
	Martha Washington.....	1, 2, 3						
Beans, Snap Bush	Giant Stringless.....	1	1 pint	24-36	2-4	1-2	45-65	Tender
	Burpee Stringless.....	1, 2						
Beans, Snap Pole	Kentucky Wonder.....	1, 2, 3	½ pint	24-36	4-6	1-2	45-65	Tender
Beans, Lime Bush	Henderson's Bush.....	1, 3	½ pint	24-36	3-4	1-2	60-75	Tender
	Jackson Wonder.....	2						
Beans, Lima Pole	Florida Speckled.....	1, 2	½ pint	24-36	4-6	1-2	60-80	Tender
Beets (C) (E) (F)	Detroit Dark Red.....	1, 2, 3	1 oz.	24-36	2-3	1	50-120	Hardy
	Crosby's Egyptian.....	1, 2, 3						
Cabbage (B) (C) (G)	Copenhagen.....	1	75-100	30-36	12-18	2-3 (D)	90-110	Hardy
	Chas. Wakefield.....	1, 2, 3						
	Early Jersey Wakefield.....	2, 3						
Carrots (C)	Red Core Chantenay.....	1, 2, 3	1 oz.	24-36	2-3	½-¾	75-100	Hardy
	Danver's Half-Long.....	1, 2, 3						
Chard, Swiss (E)	Lucullus.....	1, 2, 3	1 oz.	24-36	6-8	½-¾	50-120	Hardy
Collards (D) (G)	Georgia.....	2	¼ oz.	30-36	12-18	½-¾	100-130	Hardy
Corn, Sweet (C) (F)	Honey June.....	1, 2, 3	¼ pint	30-36	18-24	1½-2	70-100	Tender
	Ioana.....	1, 2						
Cucumbers	A & C.....	1	1 oz.	48	48-72	1	60-80	Tender
	Early Fortune.....	1, 2, 3						
Kale (E)	Dwarf Blue Scotch.....	1, 2, 3	¼ oz.	24-36	6-8	½-¾	90-100	Hardy
Lettuce, Head	Imperial 847.....	1	½ oz.	24-36	4-6	½-¾	60-90	Hardy
	New York No. 12.....	2, 3						
Lettuce, Leaf (C)	Black Seeded Simpson.....	1	½ oz.	24-36	4-6	½-¾	20-80	Hardy
	Grand Rapids.....	2, 3						
Mustard (C)	Tendergreen.....	1, 2, 3	2 oz.	24-36	1	½-¾	45-60	Hardy
	Florida Broadleaf.....	1, 2, 3						
Okra	White Velvet.....	1, 2, 3	1 oz.	30-36	24-36	1	90-130	Tender
Onions, Plants (D)	Bermuda.....	1, 2, 3	400	24-36	3-4	1½-2½	30-40	Hardy

Parsley (E)	Shallots.....	1, 2, 3	1/8 oz.	24-36	2-3	1/2-3/4	75-90	Hardy
Peas, Field (C)	Blackeyed.....	1, 2, 3	1-2 oz.	24-36	6-8	2-3	75-90	Tender
	Crowder.....	1, 2, 3						
	Cream.....	2						
Peas, English	Laxton's Progress.....	1, 2, 3	2 lbs.	24-36	3-4	3-4	50-75	Hardy
	First and Best.....	1						
	Little Marvel.....	3						
	Everbearing.....	2						
Pepper (D)	World Beater.....	1, 2, 3	50-75	36	12-24	2-3	130-150	Tender
	California Wonder.....	1, 2, 3						
Potato, Irish	Bliss Triumph.....	1, 2, 3	5-8 lbs.	30-36	12-15	3-5	75-100	Half Hardy
	Cobbler.....	1, 2, 3						
	Katadin.....	1, 2						
Potatoes, Sweet (B) (D)	Porto Rica.....	1, 2, 3	50-75	36-42	12-18	3-5	130-150	Half Hardy
	Maryland Sweet.....	3						
Radish (C)	Scarlet Globe.....	1, 2, 3	1 oz.	24-36	1/2-1	1/2-3/4	30-65	Hardy
Spinach (C) (E) *	Bloomsdale Savoy.....	1, 2, 3	1 oz.	24-36	3-5	1/2-3/4	60-90	Hardy
Tomatoes (B) (D)	Prichard.....	1, 2	35-50	48	30-36	2-4	100-120	Very Tender
	Rutgers.....	1, 2						
	Marglobe.....	1, 2						
	June Pink.....	3						
	Porter.....	2, 3						
Turnips (C)	Purple Top Shogoin.....	1, 2, 3	1/2 oz.	24-36	3-5	1/2-3/4	60-75	Hardy
	White Globe 7-Top.....	1, 2, 3						

- (A) Buy healthy one-year crowns from reliable nursery.  
 (B) Plants from cold frame, or buy from local seed or plant store.  
 (C) Make successive plantings at 2 to 4 week intervals.  
 (D) Set plants one inch deeper than when in pot or plant bed.  
 (E) Soak in warm water overnight before planting to hasten germination.  
 (F) Thinnings may be transplanted.  
 (G) Heavy feeder—use barnyard fertilizer liberally.

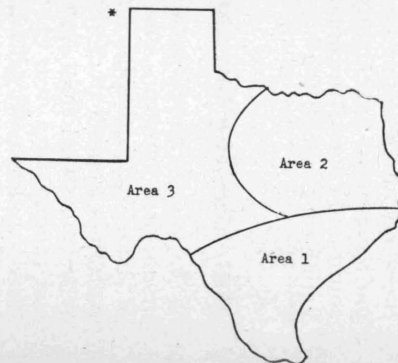




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Beans, Snap Bush	Giant Stringless Burpee Stringless	1 1, 2	1 pint	24-36	2-4	1-2	45-65	Tender
Beans, Snap Pole	Kentucky Wonder	1, 2, 3	½ pint	24-36	4-6	1-2	45-65	Tender
Beans, Lime Bush	Henderson's Bush Jackson Wonder	1, 3 2	½ pint	24-36	3-4	1-2	60-75	Tender
Beans, Lima Pole	Florida Speckled	1, 2	½ pint	24-36	4-6	1-2	60-80	Tender
Beets (C) (E) (F)	Detroit Dark Red Crosby's Egyptian	1, 2, 3 1, 2, 3	1 oz.	24-36	2-3	1	50-120	Hardy
Cabbage (B) (C) (G)	Copenhagen Chas. Wakefield Early Jersey Wakefield	1 1, 2, 3 2, 3	75-100	30-36	12-18	2-3 (D)	90-110	Hardy
Carrots (C)	Red Core Chantenay Danver's Half-Long	1, 2, 3 1, 2, 3	1 oz.	24-36	2-3	½-¾	75-100	Hardy
Chard, Swiss (E)	Lucullus	1, 2, 3	1 oz.	24-36	6-8	½-¾	50-120	Hardy
Collards (D) (G)	Georgia	2	¼ oz.	30-36	12-18	½-¾	100-130	Hardy
Corn, Sweet (C) (F)	Honey June Ioana	1, 2, 3 1, 2	¼ pint	30-36	18-24	1½-2	70-100	Tender
Cucumbers	A & C Early Fortune	1 1, 2, 3	1 oz.	48	48-72	1	60-80	Tender
Kale (E)	Dwarf Blue Scotch	1, 2, 3	¼ oz.	24-36	6-8	½-¾	90-100	Hardy
Lettuce, Head	Imperial 847 New York No. 12	1 2, 3	½ oz.	24-36	4-6	½-¾	60-90	Hardy
Lettuce, Leaf (C)	Black Seeded Simpson Grand Rapids	1 2, 3	½ oz.	24-36	4-6	½-¾	20-80	Hardy
Mustard (C)	Tendergreen Florida Broadleaf	1, 2, 3 1, 2, 3	2 oz.	24-36	1	½-¾	45-60	Hardy
Okra	White Velvet	1, 2, 3	1 oz.	30-36	24-36	1	90-130	Tender
Onions, Plants (D)	Bermuda Sweet Spanish	1, 2, 3 2, 3	400	24-36	3-4	1½-2½	30-40	Hardy
Onions, Sets	Bermuda Sweet Spanish Shallots	1, 2, 3 2, 3 1, 2	2 quarts	24-36	2-3	½-1	45-75	Hardy
Parsley (E)	Moss Curled	1, 2, 3	¼ oz.	24-36	2-3	½-¾	75-90	Hardy
Peas, Field (C)	Blackeyed Crowder Cream	1, 2, 3 1, 2, 3 2	1-2 oz.	24-36	6-8	2-3	75-90	Tender
Peas, English	Laxton's Progress First and Best Little Marvel Everbearing	1, 2, 3 1 3 2	2 lbs.	24-36	3-4	3-4	50-75	Hardy
Pepper (D)	World Beater California Wonder	1, 2, 3 1, 2, 3	50-75	36	12-24	2-3	130-150	Tender
Potato, Irish	Bliss Triumph Cobbler Katadin	1, 2, 3 1, 2, 3 1, 2	5-8 lbs.	30-36	12-15	3-5	75-100	Half Hardy
Potatoes, Sweet (B) (D)	Porto Rica Maryland Sweet	1, 2, 3 3	50-75	36-42	12-18	3-5	130-150	Half Hardy
Radish (C)	Scarlet Globe	1, 2, 3	1 oz.	24-36	½-1	½-¾	30-65	Hardy
Spinach (C) (E)	Bloomsdale Savoy	1, 2, 3	1 oz.	24-36	3-5	½-¾	60-90	Hardy
Tomatoes (B) (D)	Prichard Rutgers Marglobe June Pink Porter	1, 2 1, 2 1, 2 3 2, 3	35-50	48	30-36	2-4	100-120	Very Tender
Turnips (C)	Purple Top Shogoin White Globe 7-Top	1, 2, 3 1, 2, 3	½ oz.	24-36	3-5	½-¾	60-75	Hardy

- (A) Buy healthy one-year crowns from reliable nursery.  
 (B) Plants from cold frame, or buy from local seed or plant store.  
 (C) Make successive plantings at 2 to 4 week intervals.  
 (D) Set plants one inch deeper than when in pot or plant bed.  
 (E) Soak in warm water overnight before planting to hasten germination.  
 (F) Thinnings may be transplanted.  
 (G) Heavy feeder—use barnyard fertilizer liberally.



Cultivation after planting should be shallow, and should be done as soon after each rain or irrigation as the soil will permit. Great care should be exercised, however, not to cultivate when the soil is too wet.

There are no set rules for cultivating a garden. The type of soil, weather, kind of vegetable, and other conditions influence the kind and amount of cultivation necessary. The individual gardener must take many of these influencing factors into account and cope with them. The practice of regular, shallow cultivation on through the harvesting season is a good one.

### **Mulching the Garden**

In non-irrigated localities which have frequent periods of insufficient moisture and high temperature, a two inch mulch of straw, hay, dried lawn clippings, cotton burs, leaves or similar materials applied over the surface of the ground will help conserve moisture, hold down weeds and grasses and reduce the soil temperature near the surface. Before mulching, all growing weeds and grasses should be removed and the soil thoroughly conditioned for best plant growth.

Mulching tomatoes, beans, cucumbers, and squash keeps the fruit from direct contact with the soil.

After mulch materials have served their purpose, turn them under for organic matter. This should be done several weeks before further planting. To aid and speed up decomposition, commercial fertilizer, high in nitrogen, should be broadcast on the mulch just prior to turning.

### **Watering the Garden**

In most localities, the vegetable garden will do best with a moisture supply equivalent to about an inch of rain per week during the main growing season. This means about 28,000 gallons of water per acre or 900 gallons on a 30 x 50 foot garden weekly.

Thorough watering of the soil to a depth of four to six inches once weekly is preferable to more frequent light waterings, which encourage shallow rooting. Shallow roots are poor feeders, damage more readily from high winds, and suffer more severely in hot weather.

In preparing the garden plot, plan for an adequate water supply, and run the garden rows and irrigation furrows properly for watering.

It is considered best to water in early morning, applying the water gently to the soil rather than on the plants.

## USEFUL INFORMATION ON SPECIFIC VEGETABLES

The next few pages are devoted to a brief discussion of specific information on some of the popular vegetables which can be grown in the home garden in most all areas of Texas.

No attempt will be made here to discuss such points as preservation and commercial phases of production and marketing, but will be confined largely to home production.

ASPARAGUS is easy to grow and care for, yet few home gardeners ever attempt it. In late fall or early spring place the one-year-old roots 15 to 24 inches apart in rows that are three feet apart. The roots are put in a trench one foot deep and as the plants start to grow, soil is pulled around the young shoots until the furrow is completely levelled off.

Asparagus needs lots of plant food which can be furnished by plowing manure into the furrows, and by a heavy application (two to four pounds per 25 row feet) of a 5-10-5 fertilizer. Repeat these applications every year.

Shoots should not be cut at all during the first growing season and for only three or four weeks the second year. In the third season, they may be cut for a period of ten weeks or more. Cut shoots just below the surface of the ground, cutting off all the shoots every day or every other day during the harvest season to force out new ones. At the end of the season the tops should not be cut off until they have died in the fall, and then all tops should be cut and diced under, using them as green manure.

Six to ten crowns per member of the family is considered adequate. The easiest and most satisfactory way to start asparagus is to buy crowns from a reliable nursery.

BEANS of all popular types should be planted only after the soil warms up in the spring and danger of frost is past. Repeat plantings at three to four week intervals through spring and early summer for a continuous fresh supply. Inoculate seeds before planting. Bush type beans will grow to a limited extent in frame gardens. Save the seed for next season's plantings.

BEETS are usually planted as soon as the ground is dry and warm enough in the spring. Care should be taken not to plant seeds too thick, for what looks like one seed is usually two or three sticking together. To get even shaped beets it is best to thin the young plants to stand two inches apart in the row.

For best results with beets, roll and soak the seed before planting. For thinning either transplant the young plants to skip in the row or use the tops as greens. Beets may be satisfactorily grown in a small frame garden. It is doubtful if saving

beet seeds under Texas conditions is practical. Seeds should be treated with organic mercury material before planting.

CABBAGE may be had from the home garden fully 10 months of the year. In those sections where winter cabbage won't grow it is easy to store. This crop likes a cool growing season, but it will stand some hot weather and will grow on any kind of soil. Plenty of manure will make a good cabbage crop.

Cabbage seed are planted in the hotbed four to six weeks before the plants are needed, and are then planted in rows four inches apart with four to six seed per inch in the row. Seedlings are given their first transplanting when the second pair of leaves appears. They should be set two inches apart to await transplanting to the garden only after all danger of a hard freeze is over.

Varieties should be carefully selected, especially as to time of maturity. The following varieties are important: Charleston Wakefield for earliness; Copenhagen for midseason; and Flat Dutch for the late crop. Seeds should be treated with organic mercury material before planting.

CARROTS require little attention once they are above the ground. Soil in the seed bed should be very fine to allow the small plants to push through. Since carrots will withstand light frosts and freezes they may be planted early.

To have long, smooth carrots, the soil should be broken 8 to 10 inches deep before planting. Since carrot seed often germinate poorly, they may be soaked overnight before planting.

Planting a mixture of carrot and radish seeds helps carrot seedlings to germinate. Seed should always be treated before planting. Saving carrot seed is not considered practical. Where space is scarce, carrots may be grown in a frame garden.

CHARD, SWISS belongs to the beet family and cultural methods of the two plants are about the same. Swiss chard may be planted in early spring, or may be grown as a fall vegetable. It is hardy to cold and will withstand frosty weather.

Chard seed should be soaked overnight and treated with organic mercury materials before planting. Seed saving is not practical. Chard may be grown on a limited scale in frame gardens.

COLLARDS withstand more heat and cold than cabbage and cultivation is the same as for cabbage. They do well in the poorest soil.

Collards are most commonly grown as a fall crop for a supply of winter greens. Seed saving is not practical. Collard seed should be properly treated before planting.

CORN, SWEET requires considerable space and should be grown only in large gardens. Corn soon passes the edible stage and successive plantings should be made every two to four weeks. Late plantings may be made following early crops such as potatoes, beets and lettuce. Suckers should be removed as they appear.

Seed saving is practical for all types except hybrids. Seed should be treated before planting.

CUCUMBERS should be grown only in large gardens as they require a great deal of space and the returns per unit area are relatively small. They should be planted only after frost danger is past. Frequent harvesting will lengthen the time the plants will bear.

Cucumber seeds may be saved easily from smooth, straight specimens which have matured to a golden rich color.

KALE is a hardy greens plant that provides winter greens in many areas. It may be harvested by cutting the entire plant or by removing only the outer leaves while they are young. Treat seed with corrosive sublimate before planting.

LETTUCE is a familiar crop to every gardener; yet it is surprising how few grow good lettuce. It needs cool weather, very fertile soil and plenty of moisture. Of the two distinct types, the leaf kind is the easier to grow, but most gardeners prize more highly a good crop of head lettuce. Seed may be sowed exactly where the crop is to mature, or it may be planted in a seed bed and transplanted. In either case the soil should be in a fine, mellow condition. If planted first in a seed bed, transplantings should be made when the first four leaves are half grown. Land to be planted in lettuce should receive a heavy application of manure or 5-10-5 commercial fertilizer.

Since this is a cool season crop and light frosts do not damage it, lettuce should be planted either in late fall or early spring.

Leaf lettuce does well in a frame garden. Although it is possible to save lettuce seed, it is doubtful if the practice is justified. Seed should be treated with either red copper oxide or zinc oxide. Repeat plantings of leaf lettuce at intervals of two to four weeks for a continuous supply.

MUSTARD is grown in much the same way as spinach. It is a cool weather crop which should not be attempted after the season gets very warm.

Repeat plantings at intervals of two to three weeks during early spring for a continuous supply of greens which may be

grown to a limited extent in frame gardens. Treat seeds with organic mercury material before planting.

OKRA does its best in hot weather. The seed should not be sown until all danger of frost is passed, and the ground is warm.

For best quality okra, pods should be harvested within two or three days after the bloom falls. Seed saving is very easy and practical.

ONION sets are usually planted as early in spring as possible for growing early bunch onions. Where winters are not severe, sets may be planted at any time during the winter. They should be spaced two or three inches apart in the rows with 20 inches between rows.

Dry onion seed are sown as soon as hard frosts are over, in rows far enough apart to allow cultivation, with plants four inches apart in the rows.

Bermuda onions are transplanted to the field from protected hotbeds. Since onion seed germinate slowly, hotbed seed should be sown at least eight weeks before plants are needed.

A row of shallot onions should be in every garden. The planting may be made from seed or from plants.

A row of two of sweet Spanish onion seeds in the frame garden will provide a fresh supply during dry, hot seasons in certain areas.

PARSLEY. A row of parsley a few feet long either in the main or frame garden will furnish enough for garnishing purposes, but more is sometimes desired for use in soups and stews. Parsley is hardy to cold but sensitive to heat, and thrives under the same conditions suitable for kale. Soaking the seed overnight as well as treating with organic mercury materials is advisable.

PEAS, FIELD are heat-loving and were adapted to summer culture. Successive plantings should be made for a long season's supply, if space will permit. The seeds may be easily saved. They should be inoculated before planting.

PEAS, ENGLISH are a cool weather crop and should be planted as early as possible in the spring, as frost and light freezes will not hurt them unless they are in blossom. The smooth round type such as Alaska should be planted first, as the wrinkled type such as Little Marvel germinates better when the soil is warm.

The seed should be inoculated prior to planting. If planted late, a weekly dusting with sulphur is necessary to "hold down" powdery mildew.

PEPPERS stand a good deal of heat and are grown quite similarly to eggplants. Hot pepper should not be planted next

to sweet pepper as the desired qualities of both are impaired by crossing. Anaheim is a popular hot variety.

Plants should be started similar to tomatoes and eggplant under cover, four to six weeks before field planting time. Seeds should be treated with organic mercury compound before going into the hotbed. Seed saving is practical and easy. A few hot pepper plants in the frame garden should supply the family's needs.

POTATOES, IRISH, may be planted as a spring or fall crop. Spring plantings are usually more prolific and more profitable because favorable weather conditions exist in Texas during the spring months. The seed bed for Irish potatoes must be deep and thoroughly prepared. Certified seed that have been subject to rigid inspection will give high yields, and will repay the grower for the small additional cost. Large seed pieces ranging from one and one-half to two ounces are desirable, because they will produce stronger plants. Irish potatoes are not a poor soil crop. This plant must have an abundance of plant food for heavy yields. Well rotted manure, supplemented with superphosphate and muriate of potash applied at the rate of four to 10 tons per acre is satisfactory. A 5-10-5 commercial mixture used at the rate of 500-100 pounds per acre and applied two weeks before planting is good.

Treat the seed thoroughly before planting. Saving seed for spring planting has not proved satisfactory.

POTATOES, SWEET, are distinctly a warm weather crop that requires a rather long growing season. They should be grown only in larger gardens. Only state certified slips should be used. Slips should be planted on medium height beds and given shallow cultivation only three to five times. For the main potato growing areas, the use of 300 to 500 pounds of a commercial fertilizer that is high in potash has proved best. The fertilizer is applied in the drill ten days to two weeks before setting the plants. Side dressing generally is not recommended.

Sweet potatoes should always be treated before bedding. Potatoes to be used for slip production should have deep salmon-colored flesh, should be as large as a U. S. No. 1 and perfectly sound.

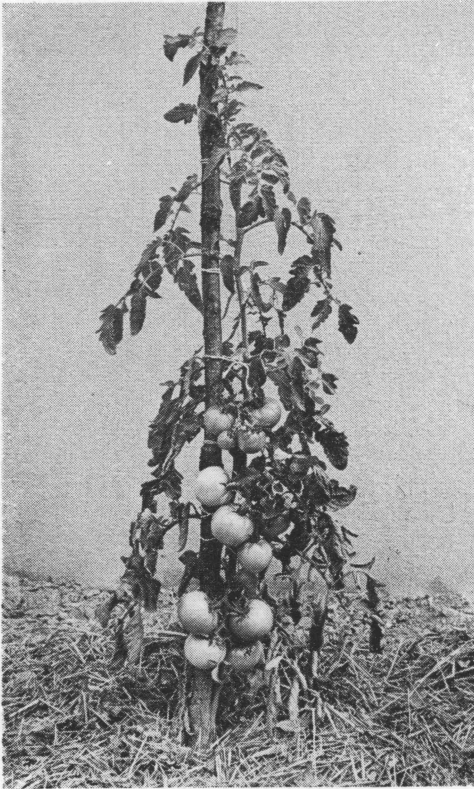
RADISHES must be grown rapidly or they will become tough, bitter and pithy. Seed may be sown as soon as the last hard freeze is over. The button variety matures much sooner than the long type. Scarlet Globe is a favorite variety of the former while Chartiers is an excellent long red type. White Icicle is a mild white variety preferred by some.

Small plantings should be made at intervals of two to four

weeks for a long, continuous supply. Seed treatment is of doubtful value. A supply may be easily grown in the frame garden.

SPINACH is our most important green and is grown easily in practically all sections of Texas. Seed either may be broadcast in beds or drilled in rows, the latter being preferred in the home gardens.

Spinach is a cool weather plant that will not do well in hot



Tomato plant pruned to a single stem and tied to a stake. Note the straw mulch on the soil for conserving moisture.

weather. It should therefore be grown in late fall, winter and early spring. A light freeze does not seriously injure the crop. It needs a great deal of nitrogen which may be obtained by spreading manure the previous season or applying nitrate of soda two or three times during the growing season.

Since spinach will run to seed, small plantings should be made repeatedly, rather than one big planting.

SQUASH. Bush or summer squash may be grown to advantage in small gardens, but the trailing types should be grown in large gardens. General care, soils, and other factors for best growth are about the same as for cucumbers.

TOMATO seed should be sown in a hotbed or in a shallow, indoor box eight to 10 weeks before transplanting to the garden, to get an early crop. When the first pair of true leaves appears they may be transplanted about four inches apart each way, and allowed to grow until they begin to crowd. They are then transplanted four inches apart or put in tin cans with bottoms re-



moved or in berry boxes, and left to grow until ready for the garden.

Main crop tomato plants may be grown in an outer seed bed and transplanted but once. Never remove these plants to the field until all danger of frost is over. Plant in rows three feet apart with the plants three feet apart in the row. Within a



When tomato plants are trained to a stake the side shoots that grow from the axils of the leaves should be broken off. When they are trained in this way plants can be grown closer together. Notice how the plant is tied to the stake by double wrapping with a piece of cloth or raffia.

week after they are transplanted, stake the plants by driving four-foot stakes firmly into the ground close to the plants. They should not be tied too close to the stakes. Begin to prune them immediately, removing all suckers and allowing only one stem to grow. Pruning and staking are not recommended for the hot, dry sections of west and northwest Texas.

Seed saving is easy and practical. All seeds should be treated before planting.

TURNIPS are grown for roots and tops, and both may be secured from the same planting if the crop is properly handled. This is another cool weather crop. Turnips may be broadcast, but they thrive better when drilled thickly in rows. When the tops are large enough for greens the plants should be thinned.

Seed treatment and seed saving are of doubtful value.

### **PREVENT INSECT DAMAGE**

The control of insects which attack garden vegetables is essential to successful gardening. There are two classes of insects: those which chew holes in the leaves or fruit, and those which suck the juice from the foliage, stem, or fruit. With these facts in mind the gardener may examine the type of damage that is done and then proceed to apply the proper material to control the pest. Insects such as the Colorado potato beetle, cabbage worm, and flea beetles which eat holes in foliage may be destroyed by dusting the plants with calcium arsenate, arsenate of lead or cryolite. Calcium arsenate may be applied without being mixed with other materials. Arsenate of lead may be mixed with lime in the proportion of one part of arsenate of lead to two parts of lime. If the plants are to be sprayed, it is better to use arsenate of lead, mixing a tablespoonful to one gallon of water. The average gardener will find that a small plunger type dust gun is an easy and effective way of destroying chewing insects.

Arsenate of lead, calcium arsenate and cryolite are of no use against sucking insects. These insects do not feed on the vegetative portion of the plant, but suck the juice from within the stems or leaves. Therefore, the material that is used to kill them must be dusted or sprayed on the insect and not just on the plant, as is the case with chewing insects. Plant lice of various kinds are the most common sucking insect. These insects attack greens of all types, English peas, and vine crops. To control plant lice spray the plants with  $1\frac{1}{2}$  teaspoonfuls of nicotine sulphate mixed with one gallon of water. If the weather is cool when the lice attack occurs, mix  $1\frac{1}{2}$  teaspoonfuls of household ammonia or one cubic inch of laundry soap with the nicotine sulphate solution to increase its killing qualities. Where

dust is to be used in combating lice, ready-mixed rotenone and sulphur is effective. The mixture should contain .75% rotenone. Where vine crops are to be treated a Lethane dust mixture without sulphur should be applied, as sulphur may burn the foliage of such crops as cucumbers, cantaloupes, and watermelons. Prepared dust mixtures are available in most seed stores and drug stores.

Some insects are more easily controlled by certain insecticide materials. The striped cucumber beetle and blister beetle are best controlled by using cryolite dust. This material may be applied more easily if mixed with talc, mixing two pounds of cryolite with one pound of talc. It can be applied without mixing if talc is not available.

Tomatoes, cabbage, and other "stemmy" plants are frequently cut down overnight by cutworms. To control these pests, mix together five pounds of coarse wheat bran, three pounds of white arsenic or Paris Green,  $\frac{1}{2}$  pint of cheap molasses and enough water to make the mixture sticky. Several days before the plants are set out, scatter the mixture late in the evening over the area to be planted. By applying the poison mixture before the plants are set out, most of the cutworms will be destroyed before any damage can be done to the young plants. If damage occurs after the plants have been set out, apply the mixture along the row close to the plants. (See C-197, Garden Insects, for further insect information.)

## **PLANT DISEASES IN GARDENS**

Plant diseases in gardens are usually prevented rather than cured. Outstanding among practical disease control measures is the growing of disease resistant varieties. In old gardens, wilt and foliage diseases take a heavy toll of tomatoes, beans, and vine crops. Varieties of tomatoes which have been developed for disease resistance are Rutgers, Marglobe and Pritchard. Where other varieties are to be grown, it is important to plant in an area where tomatoes have not been planted for several years.

Rotation with non-susceptible crops is helpful in reducing disease. Vine crops should not follow vine crops on the same land. Root crops such as beets and carrots may follow vine crops. Leafy crops such as lettuce, mustard and cabbage along with corn or other vegetables can be so arranged in the planting that the same vegetables do not go back in the same part of the garden more often than once in three or four years.

Seed treatment for controlling such diseases as scab on Irish potatoes, black rot and stem rot on sweet potatoes, and other seed borne diseases is an effective way of exercising disease prevention in a practical way.

Good soil hygiene is best exercised by removing diseased plants as they appear in the planting. Again as each vegetable reaches maturity the plants should be removed and the soil plowed to eliminate as much diseased plant growth from the soil as is possible. (For detailed information on vegetable diseases, obtain Bulletin B-132, Plant Diseases in Texas and Their Control.)

### REFERENCES ON GARDENING

The following publications are available free of cost either from your County Extension Agent or by writing the A & M College Extension Service, College Station, Texas, giving the number and title of materials wanted:

- |         |   |
|---------|---|
| C-175   | GROW A GARDEN AND PRODUCE FOOD<br>FOR FREEDOM |
| C-59    | FALL GARDENS                                  |
| C-110   | HOTBEDS FOR HOME GARDENS                      |
| C-121   | FRAME GARDEN SUGGESTIONS                      |
| C-134   | SOILS AND HOW TO TREAT THEM                   |
| C-143   | IMPROVE YOUR GARDEN SOIL                      |
| C-197   | SAVE VICTORY GARDENS FROM INSECT<br>PESTS     |
| B-132   | PLANT DISEASES IN TEXAS AND THEIR<br>CONTROL  |
| B-92    | SUBIRRIGATION FOR GARDENS                     |
| FHH-349 | BARNYARD MANURE                               |
| C-193   | City Gardens                                  |
| C-194   | Farm Gardens                                  |
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