



Everything Texans Ask about **GARDENING**

Joseph Masabni and Patrick Lillard*

ASPARAGUS



General

Q. How should I plant asparagus plants?

A. Prepare a planting bed by digging out unsuitable soil and replacing it with an organic mixture of one-third sand, one-third soil, and one-third sphagnum moss, compost or potting soil. Plant the asparagus 18 to 24 inches apart in a trench with the crowns (buds) 6 inches below the ground level, but with only a thin layer of earth over them. As the growing season progresses, gradually fill in the trench.

Q. When should asparagus plantings be divided?

A. Divide asparagus roots during the winter after the tops have been removed. The tops will freeze in North Texas, but in many areas of South Texas they will have to be cut back to produce a crop next year. During this time the roots can be divided easily into individual plants for replanting.

Q. How long after planting asparagus can I harvest the first spears?

A. If you plant seed, you should wait 3 years before the first harvest. If you start with 1-year-old crowns (the recommended manner) you can harvest to a limited degree the next year. Harvesting early will drastically reduce the yield and quality of homegrown asparagus.

Q. How long can I harvest asparagus in the spring?

A. Most home gardeners harvest asparagus too long. Length of harvest will depend a great deal on your location within the state, but generally the harvest should extend 4 to 6 weeks from the first harvest in early spring. The best method is to harvest completely in early spring, then harvest selectively to allow a few spears to develop into ferns.

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Q. When I finish harvesting asparagus spears, how should I care for them during the rest of the year?

- A. Allow the spears to fully develop into ferns. An occasional selective trimming or pruning can reduce the amount of top growth. Occasional light fertilizing and adequate moisture will help the plant develop sufficient top growth for good spear production.

Q. What causes asparagus spears to be bent and crooked?

- A. Asparagus spears grow extremely fast and are highly sensitive to mechanical injury from cultivation, insect feeding, or windblown soil particles. Spears will grow slowly at the point of injury, but rapidly on the opposite side. This causes them to curve and bend toward the injured side.

Q. Can table salt be used for weed control in my asparagus bed?

- A. Yes, in limited amounts. Asparagus is more salt tolerant than most vegetable plants, so salt may be used around the growing plants for weed control. However, excessive amounts of salt used in any one season, or salt accumulation over the years, can harm asparagus plants and subsequently reduce spear production.

Q. What causes my asparagus spears to get smaller and smaller each year?

- A. This condition occurs in the warmer areas of the state, primarily in South Central and South Texas. Spears are produced primarily from food accumulated in the root system the previous year. If the amount of stored food is decreased by high temperatures (especially in the fall) or poor growing conditions, spears will be smaller the following spring. If these conditions persist over a long period, spears will be smaller and smaller each year.

BEANS



General

Q. Occasionally green beans germinate and come up, but have only two leaves or maybe none at all. What is wrong?

- A. This condition is called *snake head* or *bald head*, and it is generally caused by planting cracked or damaged seed. Occasionally the beans literally pull their heads off when forced to germinate and come through heavy or crusted soil. Planting high-quality seed and keeping the soil relatively moist and friable will help eliminate this problem.

Q. What causes my plants to bloom but not set pods?

- A. Excessive fertility often causes this problem. High temperature combined with low humidity also can cause beans not to set. Planted at the right time and without excessive fertility, most recommended varieties will produce a crop of high-quality beans. Lightly fertilizing after the first harvest will greatly increase subsequent yields and improve the quality of beans harvested later.

Q. Why are some types of beans able to climb and others not?

A. Pole beans have an *indeterminant* or vining growth habit, whereas bush bean varieties are *determinant*. In the vining type, flowers form in the axles of the leaves and stem, so the stem may continue to grow indefinitely. In determinant plants, the main growing point terminates in a flower cluster, preventing stem elongation. Beans that climb do so because of their twining stems. The absence of tendrils or tendril leaves in beans helps distinguish beans from peas. Pole beans cannot climb until they are well along in their growth.

Q. What causes garden beans to become tough, stringy and fibrous?

A. This problem is commonly caused by high temperatures when the pods are forming. Low fertility and inadequate moisture can also contribute to this condition. To produce good-quality, flavorful pods, plant beans when they will mature before the weather becomes too hot.

Q. Can I save seeds from this year's bean crop for next season's garden?

A. Since beans are self-pollinated, they will breed true from one year to the next. However, certain diseases can be seed-borne and may appear in next year's garden if you plant seed from the previous garden.

Q. Can mung beans be grown in Texas gardens?

A. Yes. Seeds of the mung bean are the source of bean sprouts, an ingredient in many popular Chinese dishes. Plant them after all danger of frost in rows 3 feet apart with plants 3 to 4 inches apart in the row. The pods are ready to harvest when they are fully mature and dark brown. The pods will mature over a long time. The seeds should be removed and germinated under clean, moist, dark conditions to produce long, tender, nutritious sprouts.

Q. What is the "yard-long bean" advertised in many seed catalogs?

A. The "yard-long" or asparagus bean is a close relative of the southern pea. It produces pods up to 3 feet long. The plants are vining and need support. The pods are tender when young and frequently used as snap beans. For this use, harvest them when the pods are partially developed and before seed enlargement shows. For shelling, harvest them when the seeds are full size but still immature. They may also be shelled when fully mature.

Q. Can I grow soybeans in my home vegetable garden?

A. Yes. Soybeans are highly nutritious and produce fairly well in many areas of Texas. Certain varieties, commonly called vegetable soybeans, have a milder flavor than those grown in fields. They are normally eaten in the green shell stage. The pods should be thick when fully mature but still green and tender. In most areas of Texas, seed them in May or June in rows 30 to 36 inches apart with plants 2 to 3 inches apart in the row.

Q. What is a broad bean?

A. Broad beans, also called fava, horse bean, and Windsor beans, are not true beans. They are closely related to vetch and will grow in cool weather unsuited for green snap beans. Varieties commonly grown include Broad Windsor and Long Pod. They can be planted very early

in the spring in all areas of Texas. In Central and South Texas, they can be planted in the fall for spring harvest. In most areas they will not produce in the heat of summer. The commonly grown varieties require 85 to 120 days from seeding to harvest.

Diseases

Q. What causes bean foliage to turn yellow on top and have a brown, dusty material on the bottom?

- A. This is bean rust. Rust is associated with cool weather. It is caused by a fungus and is controlled with maneb, maneb plus zinc, sulfur, or chlorothalonil spray. Begin application at the first sign of rust and repeat as necessary.

Q. My bean foliage is distorted with a mottled pattern. The fruit is crooked and hard.

- A. This is bean mosaic, a virus that is seed transmitted. Once it develops within a garden, it can be moved from one plant to another by aphids. Control this disease by using good quality bean seed, controlling aphids, and removing diseased plants.

Q. My beans came up to a good stand and then began to die.

- A. This is seedling disease of beans, caused by the fungus *Rhizoctonia*. Control this disease by planting on a raised bed so the soil does not stay wet around the plants and will warm up faster. The only chemical that can be used to control this disease is captan. Apply it in the seed furrow at planting time. Where this disease has been a problem, crop rotation is essential. The disease is most severe during early spring.

Q. My beans are very stunted. When I removed them from the soil, I found large galls or swellings on the root system.

- A. These galls are caused by root knot nematodes. They restrict the uptake of nutrients from the root system to the foliage, resulting in a yellow and stunted plant. Root knot lives in the soil and can survive on a number of weed and vegetable crops.

Q. After a recent windstorm, my bean plants were blown over and broken at the soil line. What could have caused this?

- A. This is the result of a seedling disease that did not kill plants in the seedling stage but damaged the stems. Controlling the seedling disease complex will prevent this problem. Use treated seed and rotate crops.

Q. My beans appear to be very healthy, but the roots have small galls attached to them.

- A. These are nodules formed by nitrification bacteria. All legumes have the ability to fix atmospheric nitrogen in their root systems. Do not confuse these nodules with knots caused by nematodes. The nitrification nodules appear to be attached to the root system, whereas knots caused by nematodes are enlarged areas of the root itself.

Q. My bean leaves have large brown spots on them. The damage looks more severe near the soil but is beginning to cover the plant.

- A. Although a number of leaf spots occur on beans, one of the most severe in Texas is anthracnose. It is caused by an airborne fungus. It can be controlled with chlorothalonil, maneb, or maneb plus zinc sprays. Begin applications at the first sign of the disease and make two or three more applications every 10 to 14 days.

Q. The foliage on my beans has angular, dead spots. Some of the spots have a yellow halo around them. The severely infected leaves are falling off the plants.

- A. This is bacterial blight of beans. The bacteria that cause it can be controlled with foliar sprays of a copper fungicide such as Kocide® 101 or copper Bordeaux. The bacteria can also be seed transmitted.

Q. As they reach maturity, my bean pods are covered with brown rotten spots. Once the beans are picked, brought inside, and placed in the crisper, these spots develop rapidly into a white fungus.

- A. This is anthracnose of beans, caused by a fungus. Apply fungicide on a regular schedule. Under severe conditions this disease can affect the leaves, stems and pods of the plant, causing severe defoliation and in some cases death. When picking beans to be placed in a crisper and used later, examine them closely. Discard any that are affected by this disease.

Insects

Q. What causes a rusting or browning of green bean leaves in early summer?

- A. Chances are the beans are infested with spider mites, one of the most destructive pests of garden vegetables, especially green beans, tomatoes and eggplant. These minute mites can destroy a planting of beans. Begin applying an approved miticide as soon as the mites are noticed. Insecticides such as malathion, or sulfur, applied early in the season, will usually control spider mites, but the miticide Kelthane® is preferred. Add 1 teaspoon of liquid detergent per gallon of spray mix, direct sprays to the undersides of leaves, and apply every 5 days for four consecutive sprays.

Q. My beans come up every year looking as if they are damaged. The leaves are curled and snarled.

- A. The apexes or shoots of the leaves were damaged when they were very small by a tiny insect called a thrip. The thrip rasps the tissue of the leaf's growing point, causing it to secrete plant juices. The thrip then feeds on these juices. Most plants recover from this damage. Control thrips with malathion applied at 7- to 10-day intervals. Begin spraying when plants first emerge, since most damage occurs then. Use as directed on the label.

Q. Little black weevils are chewing up my dry beans and peas. How did they get into the jars? How do I prevent this problem?

A. These are cowpea curculios. Adults laid eggs in the beans and peas while they were growing in the garden. The new adults are now emerging from the beans. To prevent this problem, temperature treat dry beans before storing. Two methods can be used:

1. Place in a freezer for 48 hours.
2. Place in an oven at 120 degrees F for 30 minutes.

After treatment, bring to room temperature and seal in jars or other containers.

Q. Small black insects with shiny wings are all over the undersides of my bean leaves. Will they hurt my plants? If so, how do I get rid of them?

A. These are aphids. Heavy infestations stunt plants, cause deformed growth, and reduce yield. Control these pests by applying malathion or dimethoate as directed on the label.

BEET



General

Q. What causes beet roots to fail to enlarge and often become woody?

A. For beet roots to enlarge and be of high quality, they must mature under ideal temperatures and have moderate fertility levels and adequate moisture. High temperatures, low moisture, and slow growth brought about by low fertility often cause inferior quality beet roots.

Q. I am canning beets and have some roots with poor color. What caused this?

A. The appeal of your final product will be enhanced by a deep, red color. Of course, zones of darker and lighter color are natural in beets, but a light color is undesirable. Cooler temperatures (50 to 60 degrees F) produce darker beets than warmer temperatures (70 degrees F and warmer). In general, beets grown in fall and winter are darker than those grown in the spring. Small roots also usually have better color than larger roots.

Q. Are beet tops good to eat?

A. Yes, definitely. Many people prefer the tops of beets to the enlarged roots. Beet tops are prepared much like other types of greens, such as collards or turnips, and have a distinctive flavor.

Q. Every time I plant beet seeds, more than one plant comes up from each seed. Is this normal, or am I doing something wrong?

A. Table beet seeds are really clusters of single-seeded fruits grown together into a seed ball or multiple fruit. It is common for several seedlings to come up from each seed planted. Single-seeded fruit of table beets are available, but are not usually used by home gardeners. After your beet plants start coming up, thin them to 1 inch between plants to allow for normal root development.

Q. I always have trouble growing table beets. Could there be something wrong with my soil?

- A. Probably. Beets do poorly in acid soils with a pH of 5.5 or less. Beets are an excellent test crop in many areas of East Texas to determine whether garden soils are acid. If beets fail, chances are the soil is acid and should be limed to adjust the pH.

Diseases

Q. My beet leaves are perforated by small holes. These holes at first are purple and then fall out giving the leaves a shot hole effect.

- A. This shot hole condition is caused by the fungus *Cercospora*. The fungus is airborne and becomes a problem in wet weather, though it doesn't usually cause serious problems with beet development. It can be controlled with the maneb sprays.

Q. My beets are stunted and the roots are covered by small galls.

- A. These are root knot nematodes.

Insects

Q. What is causing all the tiny holes in the leaves of my beets?

- A. This is probably the feeding damage from flea beetles. Unless you plan to use the leaves for greens, treatment is seldom necessary. Carbaryl (Sevin®) controls this pest, but there is no need for treatment unless flea beetles are keeping plants from developing.

BROCCOLI



General

Q. Can broccoli be grown in the spring and the fall?

- A. Generally, yes, depending upon the variety, the area of Texas, and the time planted. Broccoli does best when temperatures remain between 40 and 70 degrees F during the growing period. In most areas of Texas broccoli grows best if planted in late summer so it can mature during cool weather. However, temperatures below 25 degrees F can damage or kill broccoli, so it should be planted early enough to mature before the weather gets too cold.

Q. What causes broccoli heads to become discolored and slightly slimy?

- A. Discoloration occurs under certain environmental conditions, such as high temperatures when the edible portion begins growing. This has been observed on some of the new hybrid varieties. Correct planting times and good cultural care will usually eliminate head discoloration.

Q. What causes broccoli to flower almost immediately, making the heads inedible?

- A. High temperatures at heading time usually cause premature flowering, which reduces the quality and quantity of homegrown broccoli. Broccoli will flower quickly if it is forced to mature at temperatures much above 80 degrees F.

Q. Are broccoli leaves good to eat?

- A. Yes, most people would have a hard time distinguishing between young broccoli leaves and collard greens. Harvest and prepare only young, tender leaves as older, tougher leaves often develop a somewhat bitter taste.

Q. I have harvested the first large heads of broccoli from my garden. The secondary sprouts are now producing heads, but they are not as large as the first heads harvested. Is this normal or should I fertilize?

- A. The center head is always the largest. The secondary sprouts produce heads about the size of a silver dollar. Sidedressing with fertilizer can increase their size. More of these are required to make a meal, but they will be as tasty as the large center head.

Q. My broccoli is magnificent this fall, but some plants rot after I remove the main head. The stem has a hole in it that retains water and causes rotting. What can I do?

- A. The hole in the stem cannot be corrected now. It is caused by a boron deficiency. Next year, apply ½ pound per 1,000 square feet of a boron product such as Twenty Mule Team Borax®. Boron toxicity occurs if too much is added, so use only what is required for your gardening area.

Q. How can I determine when my broccoli is ready to harvest?

- A. Generally, when individual buds of broccoli are match-head size and distinct (loose) in appearance, the head is as large as it is going to get. After growing a certain variety for several seasons, you will soon know the potential size for heads of that variety.

Diseases

Q. My broccoli foliage is developing yellow spots on the upper side with a downy growth underneath.

- A. This is downy mildew. It is caused by an airborne fungus. Some varieties of broccoli are resistant to this. The variety Bravo appears to be especially susceptible. Foliar sprays of maneb plus zinc and chlorothalonil can be used to control this problem. Begin applications at the first sign of the disease and repeat in 10 to 14 days.

Insects

Q. Some of my young broccoli plants are stunted by small, green bugs. What can be used to control these insects?

- A. Aphids, or plant lice, are sometimes a real problem on broccoli and other members of the cabbage family. They are easy to control with insecticides such as malathion. Early control is necessary because aphids reproduce rapidly.

Q. How can I control worms that get in my broccoli heads?

- A. These are probably loopers, imported cabbage worms, or perhaps broccoli head worms. These can be controlled with a product containing *Bacillus thuringiensis*, a biological insecticide.

Bt must be eaten by the worm, so worms will not be killed for 2 or 3 days. *Bt* is a completely safe chemical and can be used to control most types of worms on most garden vegetables. Add 1 to 2 teaspoons of a liquid detergent to each gallon of spray to ensure that the insecticide adheres to the waxy leaf surface.

Also see cabbage.

CABBAGE



General

Q. What causes cabbage heads to be loose and puffy rather than firm and hard?

- A. Some varieties of cabbage produce a looser, less dense head than others, although this condition is generally associated with improper growing conditions. Cabbage grows best when planted in time to head while daytime temperatures are less than 80 degrees F. Excess fertilizer, improper water conditions, and heat can cause loose, puffy heads.

Q. How can I prevent my cabbage heads from splitting when they are ready for harvest?

- A. Cabbage head splitting can be avoided by keeping the soil uniformly moist near harvest time. Splitting can also be prevented by root pruning the plant about the time the heads mature. This can be done by cultivating near the plant or simply twisting the plant to break some of the roots. Splitting is seldom a problem with varieties that mature during cool weather.

Q. What causes my cabbage to send up a flower stalk?

- A. Bolting, or flowering, is directly related to temperature. If the plants become dormant because of extended periods of cold weather, they will often go to seed, or bolt, when growth resumes. This condition can also occur if the temperature becomes too hot. Spring planted cabbage is often seen flowering in gardens throughout Texas during midsummer.

Q. I often have trouble getting my cabbage to form a head. What is wrong?

- A. Cabbage and all members of the cabbage family, such as cauliflower and broccoli, require cool temperatures, adequate moisture, and high fertility to produce good yields of high-quality produce. Any condition that stresses plants during the growing period can result in some degree of crop failure.

Q. What is “Chinese cabbage” and how is it different from regular cabbage?

- A. Chinese cabbage describes several greens that differ considerably. Like cabbage, they are cool-season crops and bolt or go to seed in the long days of late spring and summer. They grow best as a fall or early winter crop in most areas of Texas. Cultural practices are the same as for regular cabbage, although Chinese cabbage matures faster and may be ready in as few as 60 to 65 days after seeding. Chinese cabbage is used fresh in salads or cooked like regular cabbage.

Q. What is Savoy cabbage?

A. Savoy cabbage is a crinkled or crumpled leaf variety. It is cultivated and harvested the same way as common types of cabbage.

Q. I have heard that cabbage plants will produce small secondary heads resembling Brussels sprouts. Is there any truth to this?

A. Small lateral heads may be harvested from early cabbage if the plants are left in the garden after the main head is removed. This is done by cutting carefully just beneath the solid head, leaving the loose, older leaves uninjured. Sprinkle a small amount of fertilizer around each plant and water it in. These small, Brussels sprout-like heads develop from buds located in the axils of older leaves; they should be harvested when of good size and firm. Their flavor, color and texture are excellent. Cabbage grows best under cool conditions and so do the secondary heads.

Q. What are “ornamental” cabbage and kale and are they edible?

A. Certain varieties of cabbage and kale produce decorative, non-heading plants with green or purple leaves and colorful white, cream, pink, red or purple interleaves. These are sold as flowering cabbage and can be used as attractive edging or for low accent plants in flower beds. Ornamental cabbage, like other members of the cole crop family, matures best under cool temperatures. The leaves are edible, but taste tough and strong. The plants are subject to the same insects and diseases as common cabbage.

Q. What causes the dark or black areas on the leaves inside cabbage heads?

A. This is internal tip burn. Although the cause is unknown, tip burn has been related to dry soil, high fertility, and boron or calcium deficiency. To avoid this problem, maintain adequate fertility, especially during formation of the cabbage head, and avoid excessive fertilization near maturity. Applying a small amount of Twenty Mule Team Borax® to the soil can compensate for boron deficiencies, but remember that excessive amounts can be toxic to plants. Don't treat for boron deficiency until this condition is certain.

Diseases

Q. As my cabbage nears maturity, the head develops black, circular spots the size of a penny up to the size of a half dollar.

A. This is Alternaria leaf spot; it can be controlled with maneb sprays.

Q. I harvested a head of cabbage that had black streaks throughout the stem and core area. This extended into the head, causing a foul-smelling decay.

A. This is black rot of cabbage, caused by seed-borne bacteria. The only control for it is to plant resistant cabbage varieties. Cabbage that has been temporarily flooded is susceptible to this infection.

Q. The outer foliage of my cabbage plants develops yellow lesions with downy growth underneath. The foliage is brittle.

- A. This is downy mildew, which can be controlled with maneb, maneb plus zinc, or chlorothalonil sprays. Spray at the first sign of the disease and repeat at 10- to 14-day intervals for two to three applications.

Insects

Q. What are the shield-shaped, brightly colored insects that seem to enjoy my cabbage?

- A. No doubt you are describing harlequin bugs, a type of stinkbug. They can be a real problem if left unchecked. At the first sign of this insect, apply a general purpose insecticide. Always remove harvested or over-mature cabbage, broccoli or cauliflower plants, as they are breeding and nesting places for harlequin bugs that may attack next season's garden.

Q. What are the inch worms that are literally destroying my cabbage?

- A. These are probably cabbage loopers. Loopers, although a severe pest of cabbage, are relatively easy to control with the biological insecticide *Bacillus thuringiensis*. *Bt* can be used with complete safety around the home. It is sold under many trade names such as Biotrol®, Thuricide®, Dipel® and Bt Worm Killer®. Be sure to use 1 to 2 teaspoons of a liquid detergent per gallon of spray to ensure complete wetting of the waxy leaf surface.

Q. Sometimes my cabbage plants seem to be growing slowly and there are white webs and small crawling insects on the roots. What can be done?

- A. You are describing soil aphids. They can cause stunting, poor growth, low quality, and poor yields of infested plants. The occurrence of soil aphids is relatively unpredictable. If you discover them, apply a recommended soil insecticide when the ground is being prepared and before seeding or transplanting next season.

Q. My young cabbage plants are stunted and weak looking and are covered by small, green bugs.

- A. Aphids are the problem. They are relatively easy to control with insecticides such as malathion if treatments begin before aphids become too numerous. Aphids reproduce rapidly and must be controlled early for satisfactory results.

Q. How do I control the velvety green worms that get in my cabbage?

- A. These are probably imported cabbage worms or head worms. Control them with *Bacillus thuringiensis*, adding 1 to 2 teaspoons of a liquid detergent per gallon of spray mix to ensure adequate wetting of the waxy leaf surface. Sevin® is also effective against these pests. Use as directed on the label.

CANTALOUPE



General

Q. Why do my cantaloupes bloom and bloom but seldom set?

- A. Cantaloupes, like other vining crops such as cucumbers, pumpkins, squash and watermelons, require pollination for fruit set. Although cantaloupes have some flowers that contain male and female parts and some that contain only male parts, pollination by bees is still necessary. High temperatures or high fertility can cause cantaloupe to produce only male blooms, which results in poor fruit set. Most problems with fruit set in cantaloupes are caused by a lack of pollinating insects during the blooming period. Nematodes can also cause small plants, a profusion of blooms, and no fruit set.

Q. Can cantaloupes cross-pollinate with other crops such as cucumbers, watermelons, squash or pumpkins?

- A. Crossing between members of the cucurbit family is rare. If crossing occurs, it will not show up in this year's fruit but will be evident if seed from these fruits are planted next year. Many people associate off-flavored or strange-colored fruit with cross-pollination, but these problems are usually caused by environmental conditions or disease.

Q. What is the best way to determine when a cantaloupe is ready for harvest?

- A. Cantaloupe is ready to harvest when the stem easily separates from the fruit. To avoid over-ripening, harvest cantaloupes before they naturally separate from the vine. The best way to check maturity is to place your thumb beside the stem and gently apply pressure to the side. If the stem separates easily, the cantaloupe is ripe.

Q. Some years my cantaloupes are sweet and tasty and other years they have no flavor at all. What is wrong?

- A. Cantaloupe flavor depends upon environmental conditions. Lots of rain or excessive irrigation as the cantaloupes near maturity will adversely affect fruit flavor. Diseases that reduce the vigor of the plant and the leaves' ability to produce sugar will affect fruit flavor. Lack of flavor is not caused by cantaloupes crossing with other vine crops, such as cucumbers. Keep plants healthy and avoiding excessive watering near maturity to improve flavor.

Q. Can you save cantaloupe seed to plant next year?

- A. Yes, but this is not recommended. In any vine crop, cross-pollination can become evident when the seed are planted in next year's garden. If you grow only one variety of cantaloupe and there are no cantaloupes in neighborhood gardens, seed can be saved for next year without producing off-type fruit. If hybrid varieties are used, you should not save seeds.

Q. What is the difference between a honeydew and a cantaloupe?

- A. Honeydew melons are closely related to cantaloupes but ripen later. Most honeydew melons have white or green flesh and mature within 100 to 120 days after planting. Honeydew melons

do not slip from the vine as cantaloupes do and are mature when they become creamy to golden yellow in color and the blossom end softens slightly.

Diseases

Q. The foliage on my cantaloupe is developing yellow spots with a downy growth underneath.

A. This is downy mildew; plant resistant varieties (Top Score, TM Uvalde, Perlita and PMR 45) or apply a fungicide such as maneb, maneb plus zinc, or chlorothalonil.

Q. The foliage of my cantaloupes is covered by brown, dead spots that fall out, giving the foliage a tattered appearance.

A. This disease can be controlled with fungicide applications at 10- to 14-day intervals. Use maneb, maneb plus zinc, or chlorothalonil.

Q. The stems near the crowns of my cantaloupes are splitting, and amber colored ooze is forming around these cuts. Soon after this happens, the plants wilt and die.

A. This is gummy stem blight. It is a soilborne fungal disease that infects and kills young plants. Crop rotation within the garden will help prevent this problem.

Q. After recent rains, my cantaloupes began to rot. Around the base of the decay there was a white fungal mat.

A. This is southern blight. The control for this is mulching between the fruit and the soil. Heavy soils will be more prone to this problem than light, sandy soils. Chemicals do not prevent this. Watering should be light and quick so the soil does not stay wet for long.

Q. The roots of my cantaloupe plants are covered with knots and small swellings.

A. These are root knot nematodes.

Insects

Q. My cantaloupe leaves look wilted and have a sticky substance all over them. What causes this?

A. A wilted appearance and sticky honeydew on melons are characteristics of heavy aphid infestations. Control aphids on cantaloupes with dimethoate, malathion, thiodan or dibrom. Use as directed on the label.

Q. My cantaloupe leaves have little trails or tunnels all over them. Will this harm my plants?

A. These trails are caused by leaf miners. Plants can tolerate very large populations without yield loss. Control them with dimethoate. Use as directed on the label.

Q. My cantaloupe leaves have a web all over them and some of the leaves are turning yellow and dying.

- A. The plants are probably infested with spider mites. Check the undersides of the leaves for small, red mites. Remove and destroy heavily infested plants. Treat light infestations with Kelthane® used as directed on the label.

CARROT



General

Q. I have planted carrots several times with no luck. Why won't they come up?

- A. Do not plant them too deep. Sow the seeds on top of the bed and gently rake them in, covering the seeds only about ¼ inch. Germination improves when soil temperatures are low. Keep your planting area moist. Don't crust or harden the soil on top of the bed with direct sprays of water.

Q. What causes the tops of my carrots to be green rather than orange?

- A. Greening of the top of the carrot is caused by sunlight. Heavy rain can wash away the soil from carrot roots and expose them to the sun. An off-flavor is often associated with this green color. Remove the tops before using the carrots.

Q. Why are my carrots short and stumpy instead of long and slender like those in grocery stores?

- A. The problem is probably variety selection. The Nantes or Chantenay varieties, which are genetically short and thick, are recommended for home gardening. Those sold in grocery stores are the Emperor type and are inherently long and slender. Carrot length can be affected by excessive moisture during growth.

Q. What causes my carrots to be tasteless, woody and often bitter instead of sweet and tender?

- A. These problems are associated with growing and environmental conditions during the maturing period. Carrots grow best and develop the sweetest flavor when temperatures are between 40 and 80 degrees F. The best carrots are planted in fall for early winter harvest. Carrots are cold hardy, but should be planted to mature before temperatures drop below 20 degrees F. In South Texas, plantings can begin in late summer or early fall and continue until about 90 days before temperatures are expected to average 85 degrees F.

Q. Each year my spring-planted carrots send up a seed stalk. What am I doing wrong?

- A. Carrots are biennial, growing from seed to flower-producing plants over 2 years. Carrots and many other biennial crops, such as cabbage, will produce seed stalks the first year if young plants are subjected to cold weather. Carrots that produce seed stalks often lack flavor, are woody, and have poor texture.

Q. What causes my carrots to be pale yellow instead of the typical orange color?

- A. Although there are varietal differences in root color, this problem could be caused by environmental conditions. Carrots that mature when the weather is warm or wet lack good root color. These carrots also have poor flavor and texture. Plant carrots so they mature under relatively cool temperatures that average less than 80 degrees F. Avoid excessive irrigation.

Diseases

Q. The foliage of my carrots is infected with brown lesions that cause the leaves to decay.

- A. This is a leaf blight of carrots caused by two fungi. Control it by spraying with maneb, maneb plus zinc, captan, or chlorothalonil. Begin at the first sign of the disease and repeat at 10- to 14-day intervals. Extended periods of high humidity caused by dews and intermittent rain contribute to the development of leaf blight. Discontinue spraying when weather conditions change. If not controlled, leaf blight can reduce the yield.

Q. When I dug my carrots, I found galls or swelling on the roots.

- A. These are root knot nematodes.

Q. My carrot foliage looks yellow, with multiple sprouting at the crown of the root. There are numerous small roots on the main root.

- A. This is aster yellows, a viral disease carried by leafhoppers. There is no control for it other than a good insect control program coupled with removing any plants that show disease symptoms.

Q. My carrots are rotting at the soil line. The top of the root is covered by a white fungal mat.

- A. This is southern blight of carrots, a soilborne disease. To control it, apply a foliar fungicide, bury organic material deeply so that undecomposed leaf tissue is not in the upper zone of the garden soil, and rotate crops.

Q. My carrots die rapidly during the warm months.

- A. This is cotton root rot, caused by a soilborne fungus. It attacks carrot roots and rapidly kills plants. On close examination of the root system, you will find it to be completely decayed. Cotton root rot requires a hot soil to develop and grow. The only control for this disease is rotation and planting carrots in the fall and winter so they mature before the soil warms up.

Q. Once I harvest my carrots and place them in the crisper, they soon deteriorate into a slimy, foul-smelling mess.

- A. This problem is associated with bacterial soft rot, which enters the carrot at harvest through cuts and breaks. To control this, wash carrots thoroughly, then place them in a crisper and keep them cool. Broken or damaged carrots should be consumed immediately.

Insects

Q. What causes my carrots to be forked or double?

- A. This is caused by damage to the growing tip of a young carrot, which can happen when soil insects and nematodes feed on the growing tip and cause the carrot root to branch.

CAULIFLOWER



General

Q. Can cauliflower be grown in the spring as well as in the fall?

- A. Cauliflower is not easy to grow because it requires constant moisture, a high fertility level, and moderate temperatures. It will not grow well when the average temperature is higher than 75 degrees F or when the temperature drops below 25 degrees F. Poor cauliflower is usually a result of improper planting time, low moisture, or low fertility.

Q. How long does it take cauliflower to go from seed to a harvestable head?

- A. This depends on variety. Some hybrid varieties such as Snowcrown will yield a 6- to 9-inch head about 60 to 70 days after transplanting. Others may require 100 days. Most varieties, if properly grown, will produce harvestable heads 85 to 130 days after the seed is planted.

Q. I read that cauliflower must be blanched to reach its best quality. What is blanching? When and how is it done?

- A. Blanching means protecting the cauliflower heads from sunlight. Unblanched heads will be yellowish green while blanched heads are pure white. When the head begins to enlarge, pull the outer leaves over the head and tie them with a rubber band or soft twine.

Diseases

Q. My cauliflower heads turn dark as they reach maturity.

- A. This is caused by a disease known as downy mildew. Downy mildew can also cause leaf loss. Control it with maneb, maneb plus zinc, or chlorothalonil sprayed regularly.

Insects

Cauliflower is subject to the same insects as cabbage.

COLLARD



General

Q. Are collard greens highly nutritious?

- A. Collard greens are extremely nutritious because they contain lots of Vitamins A and C. The taste is similar to, but richer than, that of cabbage. A light frost near harvest time enhances the flavor of collard greens.

Q. When harvesting collard greens, should you harvest only the older, mature leaves or pull up the entire plant?

- A. Although collard greens can be harvested both ways, you'll have the largest yield if you harvest the leaves from the bottom of the plant first before they become too old. The first harvest generally occurs when the plants are about 60 days old.

Diseases

Q. The foliage on my collard plants developed a yellow area and white, downy growth underneath. This foliage quickly turned yellow and became brittle.

- A. This is downy mildew. It is controlled with maneb or maneb plus zinc. Repeat applications at 14-day intervals.

Q. The stems of my collard plants rot once foliage is removed. The decayed area smells foul.

- A. This is bacterial soft rot, which enters through the broken areas where the leaves were removed. Control it with a spray of Kocide® or copper Bordeaux at harvesting.

Insects

Collards have the same insect problems as cabbage.

CORN



General

Q. Should garden corn be planted in several short rows rather than in one or two long rows?

- A. Yes. Corn is pollinated by windborne pollen. Planting corn in blocks rather than in long rows makes it easier for the plants to pollinate one another during tasseling.

Q. Should the suckers, or side shoots, that emerge near the ground on sweet corn be removed?

- A. This is not necessary, although experienced gardeners feel removing the suckers results in larger, better quality ears. The suckers should be snapped off while they are small.

Q. How long does it take for most sweet corn varieties to produce edible ears?

A. Most varieties mature 65 to 90 days after seeding. Maturity rate will vary greatly from year to year and from season to season depending on temperatures.

Q. Why are ears of corn underdeveloped at the tip end?

A. This is common not only in gardens but also in large commercial plantings. It may be caused by nutrient deficiency, disease damage to foliage, cool temperatures during ear maturation, and low moisture. Corn is cross-pollinated by windblown pollen from the male flowers or tassels at the top of the plant to the female flowers or silks about midway up the stalks. Each kernel develops from an individually pollinated silk. Kernels near the middle and base of the ear develop first, with those at the tip developing last. In unfavorable conditions such as those mentioned above, kernels pollinated first will develop before those pollinated last. This may cause kernels near the tip not to develop properly.

Q. Why is sweet corn sweet and tasty in some years and not in others?

A. The flavor of sweet corn is highly dependent on weather conditions. If it rains within a week of harvest time, sweet corn often has less flavor. Also, if the corn matures when both daytime and nighttime temperatures are high, the sugar level will be low and flavor will be disappointing. The sugar in sweet corn is converted to starch rapidly even under optimum storage conditions, so corn should be cooked soon after harvest.

Q. Is there a best time of day to harvest sweet corn?

A. Experienced sweet corn gardeners recommend harvesting early in the morning. This ensures that the sugar level will be at its highest if the corn is mature but not overripe.

Q. How often should sweet corn be fertilized to produce a high yield and good quality?

A. Lightly fertilize before planting. Fertilize again when the plants are about 4 inches tall and when they are 8 to 10 inches tall. About ¼ pound of complete fertilizer for every 10 feet of garden row is sufficient in most areas of Texas.

Q. This year my sweet corn produced yellow and white kernels on the same cob. What's wrong?

A. You may have a bicolored variety. Some new varieties, primarily those with an extra sweet character, produce white and yellow kernels on the same cob. The bicolored varieties include Sugar Dot and Honey and Cream. These new hybrids are produced by crossing white and yellow inbreds. Cross-pollination also can cause multi-colored kernels on the same cob. Cross-pollination may have occurred if you planted both yellow and white sweet corn in your garden or if a neighbor planted a different sweet corn type.

Q. What is meant by catalog advertisements that refer to "Super Sweet" varieties of sweet corn?

A. Recently developed "Super Sweet" hybrid varieties have a higher sugar content—up to 40 percent more sugar than some of the standard varieties. The super sweet character is lost if the

corn is pollinated by ordinary sweet corn or field corn, so the super sweet hybrids should be planted away from any other type of corn.

Q. What is the difference between roasting ears and sweet con?

- A. To most Texans, roasting ears are field corn harvested at an immature stage. Some people prefer field corn because the ears are larger and the corn is not as chewy. There is no comparison in flavor between sweet corn and roasting ears if the sweet corn is grown under proper conditions, harvested at the right stage of maturity, and handled properly between harvest time and cooking time.

Diseases

Q. My sweet corn produced normally but the tips of the ears became covered with a white mass that grew until it broke open and exposed a black, powdery mass.

- A. This is corn ear smut, a fungus that is carried in the seed. To avoid it, use only high-quality seed from a reputable source. There is no chemical control for this disease.

Q. The foliage on my sweet corn is developing red lesions.

- A. This is rust. There is no chemical control. Some varieties of corn are less susceptible than others. Rust does little damage under normal conditions, but an infection that occurs early and continues to develop can cause losses.

Q. My sweet corn grew for awhile and then had a mosaic appearance. The corn did not develop properly. The ears that formed were poorly filled.

- A. This is maize dwarf mosaic virus, which is common on sweet corn in Texas. It overwinters in johnsongrass around a garden. To control the problem, remove the johnsongrass and follow a good insect control program. Some varieties of corn are more resistant to this disease than others.

Insects

Q. I planted corn in my fall garden and it turned out beautifully, but the worms ate more corn than my family. What can I do to prevent this?

- A. Spray or dust the ear silks with Sevin® to prevent adult insects from entering and laying eggs. Begin dusting or spraying at an early stage and repeat every 2 days. Some gardeners apply a drop of mineral oil on the silks to prevent earworm damage.

Q. Are any sweet corn varieties resistant to earworm?

- A. No. Some varieties seem to be bothered less by corn earworms than others, but none are truly resistant. In general, the higher quality and sweeter corn is more likely to be bothered by earworms. Varieties that have a tight shuck near the silk end seem to be bothered less by earworms than those with loose and open ends.

Q. The centers of my corn plants are stuffed with little green insects. What do I do about them?

- A. Corn leaf aphids infest the swirls of young corn plants. The plants will tolerate large numbers of these aphids. If plants begin to wilt or die, spray them with malathion as directed on the label.

CUCUMBER



General

Q. If I have squash and cucumbers in my garden, do I need to worry about cross-pollination that might cause off-type fruits?

- A. Planting cucumbers along with squash in your garden will not result in off-flavor fruit. Odd-tasting fruit from vine crops such as cucumbers, cantaloupes and squash is not the result of crossing between plants. These crops will not normally cross. If they did, the result would not show up until the seeds from this year's fruit were planted in next year's garden.

Q. What causes my cucumbers to be misshapen and gourd-looking?

- A. Improper pollination, caused by lack of insects, or pollen killed by hot temperatures can cause misshapen fruit. Moisture stress during development can also misshape fruit.

Q. Why do my cucumbers bloom without setting fruit?

- A. This is a pollination problem. Cucumbers have male and female blooms, and fruit will not set unless the pollen is transferred from the male to the female blooms. This is usually done by pollinating insects, primarily honey bees.

Q. How do you tell the difference between the male and female cucumber bloom?

- A. Female blooms have small, immature cucumbers located directly behind the petals. Male blooms do not have immature fruit.

Q. What causes my cucumbers to become bitter tasting?

- A. Any stress on a cucumber plant—high temperature, low moisture, low fertility or foliage disease—can contribute to bitterness. Bitterness is usually noticed with fruit harvested late in the season from unhealthy, poor-yielding plants. Once a plant produces bitter fruit, remove it from the garden because all subsequent fruit will be affected.

Q. How can you tell the difference between a slicing cucumber and a pickling cucumber?

- A. Slicing cucumbers are dark green and 6 to 8 inches long. Pickling cucumbers are lighter and are short and blocky. If you intend to put up pickles, grow pickling types. Pickling cucumbers were developed to go through the brining process and usually produce better pickles. If you intend to use cucumbers mainly in salads, plant slicing types.

Q. Are “burpless” cucumbers really burpless?

A. Yes, at least for some people. Some people have gastric problems that prevent them from enjoying fresh cucumbers. The new burpless types are milder.

Q. Is a gherkin simply a small pickling cucumber?

A. No. Gherkins, also called West Indian or Burr cucumbers, produce small, exceptionally spiny fruit used exclusively for pickles. Gherkins are grown in much the same way as common pickling cucumbers, except that the plants are smaller and require less space.

Diseases

Q. The leaves of my cucumbers develop yellow spots on the upper sides and a downy growth underneath.

A. This is downy mildew, an airborne fungus. It is controlled by planting resistant varieties and applying a foliar fungicide such as maneb, chlorothalonil, maneb plus zinc, or captan. Downy mildew is apt to be a problem during the cool, rainy days of spring and early fall.

Q. The foliage of my cucumbers has brown spots that drop out and leave a tattered effect.

A. This is anthracnose or Alternaria leaf spot. These diseases develop around the crown of the plant and can be controlled with maneb, maneb plus zinc, chlorothalonil, or captan sprays. Repeated applications will be required every 10 to 14 days.

Q. The underside of my cucumber has a spot on it.

A. This is belly rot, caused by the soilborne fungus Rhizoctonia. It can be controlled by caging the cucumber or mulching so the fruit does not contact the soil. Belly rot can also be reduced by growing cucumbers on well-drained soil and not applying large amounts of water during the harvest period. There is no satisfactory chemical control for this problem.

Q. The stems of my cucumber plants are splitting near the crown and a brown ooze forms around these cracks. Soon after that the plants wilt and die.

A. This is gummy stem blight. Spray with a fungicide labeled for this disease at seedling emergence and again at runner formation.

Q. The roots of my cucumber plants are covered by large swellings or galls.

A. These are root knot nematodes.

Q. After a recent rain, the fruit on my cucumber plants became covered with a white, cottony growth.

A. This is Pythium, a soilborne disease. It is encouraged by heavy rains. There is no chemical control for this disease. Plant cucumbers in a well-drained area and use cages or a trellis.

Insects

Cucumbers have the same insect problems as cantaloupe.

EGGPLANT



General

Q. The fruit on my eggplant was delicious during its early production. Now the fruit we harvest is bitter and has brown areas on it.

A. The bitter fruit is caused by plant stress and subsequent slow growth because of hot, dry weather. The brown area is caused by sun scalding. If the scalding is not too severe, it can be removed and the eggplant eaten.

Q. What causes eggplant fruit to become misshapen and odd colored?

A. Poor quality eggplant fruit are usually the result of low moisture and high temperature. Over-mature eggplant will become dull colored and often develop a bronze appearance. For maximum production, remove the eggplant fruit before they are fully mature to allow additional fruit to develop.

Diseases

Q. When one of my eggplants died I found a white fungal mat at the base of the plant. What caused this?

A. This is southern blight, a soilborne disease that can be controlled by crop rotation and by making sure leaf tissue in the upper soil layer decomposes properly.

Q. The fruit of my eggplant develops a rotted area that extends deep into the fruit.

A. This could be caused by several things but is probably Alternaria fruit rot. This is not to be confused with Phomopsis fruit rot, which produces a dish-shaped spot that turns brown and has ring-like structures around it. Alternaria fruit rot is controlled with the normal fungicides used for Phomopsis fruit rot, such as maneb, maneb plus zinc, and captan.

Q. The foliage of my eggplant is turning yellow.

A. This is eggplant yellows or virus of eggplant. It is transmitted by an insect and can cause severe stunting and reduced yields. Destroy infected plants to keep the disease from spreading to healthy plants.

Insects

Q. My eggplants have quit producing. The leaves are turning yellow and falling off.

- A. These are symptoms of spider mites. Check the undersides of the leaves for small, red mites. Control them with malathion or sulfur dust used as directed on the label.

KALE



General

Q. When harvesting kale, should you harvest the whole plant or just the mature leaves?

- A. Kale can be harvested either way. Most gardeners in Texas prefer harvesting the tender, mature leaves and allowing the plant to continue producing.

Q. Is there a difference between kale and collard greens?

- A. Horticulturists do not agree on the answer to this question. Some believe kale is simply a curly leafed form of collard greens with no real distinction. Others think that there is a distinct difference in flavor when cooked. Kale and collards are close kin and have largely identical environmental and cultural requirements, as well as the same problems with diseases and insects.

Diseases and Insects

Kale is subject to the same problems as cabbage.

LETTUCE



General

Q. Is leaf lettuce easier to grow than head lettuce?

- A. Yes. Leaf lettuce generally matures quickly, which makes it ideal for home gardens. Most leaf lettuce varieties mature in 6 to 7 weeks after seeding. Head lettuce varieties often require 10 to 11 weeks.

Q. Does lettuce seed have to be refrigerated before planting?

- A. Although many people believe this, refrigeration is not necessary for germination. Lettuce should be planted in early spring as soon as the ground can be worked. In the fall, plant when the average temperature is below 80 degrees F for maximum germination and growth of young seedlings.

Q. Why did my lettuce taste so bitter and start to grow tall so quickly?

- A. Most home garden lettuce, especially the Bibb variety, goes to seed quickly when days are long and temperatures are high. It quickly develops a bitter flavor in hot weather. Buttercrunch, Saladbowl, Ruby and Romaine tolerate these adversities more than other varieties and remain sweet and tender longer.

Q. What is causing the tips of my lettuce leaves to turn brown and die when the rest of the leaf looks healthy?

- A. Scorch or leaf burn around the margins of lettuce leaves is quite common in Texas gardens. In some cases a disease might be to blame, but this problem is usually the result of root injury that causes moisture stress at the leaf margin. Too much fertilizer, nematode injury, root pruning from close cultivation, or deficiencies of nutrients such as potassium and calcium can cause marginal leaf burn. As the lettuce nears maturity, when it needs lots of water, cells at the edge of the leaf may dry because the leaves use more water than the roots can take up. Give the plants adequate amounts of water and mulch them to help prevent this problem.

Q. Why does my lettuce often flower and never form a head?

- A. It was probably planted at the wrong time of year. Lettuce needs cool weather to produce good-quality heads. Hot weather and long days cause it to form seed heads, or bolt, and may prevent it from forming an edible head.

Insects

Lettuce has the same insect problems as cabbage.

MUSTARD



General

Q. Should you harvest the entire mustard plant or just the mature outer leaves?

- A. Harvest mustard either way. Since mustard greens mature rather quickly and grow best in cool conditions, harvest the entire plant at one time for the highest quality greens.

Q. Why do mustard greens sometimes have a strong, bitter flavor?

- A. Mustard greens should mature under cool temperatures to produce the tastiest leaves. Besides high temperature, dry soil, low fertility, or generally poor growing conditions also can cause an off-flavor.

Diseases

Q. After foggy weather, my mustard developed yellow spots on the upper foliage. These broke open underneath, revealing white spots.

- A. This is white rust, a serious problem on mustard. It is systemic within the plant once it becomes established, and it can cause serious losses. The disease is favored by cool temperatures and intermittent rain or heavy fog. It can be controlled with the maneb sprays applied at the first sign of disease. Affected leaves should be stripped from the plant so they will not serve as a source of secondary infection. Sidedress plants with ammonium sulfate to stimulate new growth. Other plants affected by white rust are turnips, radishes, rutabagas and spinach.

Q. The leaves of my mustard are distorted and have a yellow mosaic pattern.

A. This disease is caused by a virus and is known as turnip mosaic. There is no control other than a good insect control program and removing the diseased plants as soon as they appear to prevent further spread. This virus is transmitted by aphids. Other plants affected by this disease are turnips, rutabagas and radishes.

Q. My mustard has yellow spots on the foliage.

A. Yellow spots usually are the result of a fungus known as downy mildew. This airborne fungus can cause severe loss of foliage during periods of dews, light rain or mild temperatures. It is controlled with a maneb fungicide spray. Repeat at 14-day intervals.

Q. After recent rains, my mustard developed wet, slimy spots on the leaves. Once these spots appear, the leaves rot quickly.

A. The rapid, slimy breakdown of the leaf tissue is most often caused by bacterial soft rot, a soil-borne bacterial disease. There is no control other than rotation, planting good quality seed, and planting in a raised bed.

Insects

Q. My mustard leaves get tiny holes in them, and I can't find anything feeding on the plants. What causes this?

A. This situation is typical of flea beetle infestations. Flea beetles eat small holes in leaves. Gardeners seldom see these insects on the plants because they jump off when disturbed. Light infestations may be tolerated. Control heavy infestations with Sevin®.

Q. What do I do about the green worms feeding on my mustard?

A. Several kinds of larvae feed on mustard. Most can be controlled with Sevin®. If the larvae move with a looping action, you probably have cabbage loopers and should use *Bacillus thuringiensis* to control this pest.

Q. My mustard leaves are beginning to wilt and curl up. The undersides are crawling with tiny green insects. How do I get rid of them?

A. Aphids are a common pest of mustard. They multiply rapidly until they literally cover the undersides of the leaves. Inspect your plants frequently. When large aphid colonies are found, treat with dimethoate or malathion as directed on the label. Infestations are easier to control if heavily infested leaves are removed and destroyed before treatment. Light infestations may be tolerated and washed off of the leaves when they are harvested.

OKRA



General

Q. How often should okra be harvested and how can you tell when it is ready?

A. Okra requires frequent harvesting. For peak quality, it must be harvested before the pods become tough. Okra matures rapidly, especially in hot weather, with only 4 days from flowering to harvest maturity. Okra should be harvested every other day. Pod size will vary with variety, but mature pods are usually 4 to 6 inches long. Test larger pods by cutting through them with a sharp knife. If it is difficult to cut through them, they are tough and unsuitable for serving. Remove old pods from the plant or it will stop producing.

Q. Can okra plants be pruned during late summer or early fall for additional production until the first killing frost?

A. Yes, but it might be best to simply make a mid-summer planting instead of pruning off spring-seeded plants. When pruned, the plants will develop a bush rather than a single stalk, which usually makes harvesting difficult. Pruning should be done 80 to 100 days before the first fall frost is anticipated to give the plants time to produce more pods.

Q. Can seed from this year's okra crop be saved for next year's planting?

A. Yes. Okra is a self-pollinated crop and seed can be saved. Toward the end of the season, allow some of the pods to remain on the plants and harvest them when they become fully mature and almost dry. Allowing okra pods to remain on the plant until fully mature does reduce subsequent production.

Q. Is there anything special about the red-podded varieties of okra?

A. No. This is simply a selection or variety that produces red okra. When cooked, the red color disappears and the pods take on the normal green appearance.

Q. Small drops of liquid are oozing from various areas on the leaves and stems of my okra plants. What causes this?

A. You are describing natural secretions from the okra plant through glands on the leaves and stems. This is a natural process and causes no damage.

Q. What causes my garden okra to fail to grow properly when planted in the early spring?

A. It might have been planted too early. Okra should be planted 3 to 4 weeks after the last spring frost to produce an abundant supply. If planted before soil temperatures warm up and before night temperatures are above 50 degrees F, okra fails to grow properly. Okra is a close relative of cotton and should be planted about the same time cotton is planted.

Q. I transplanted some okra I purchased at a local nursery. It is stunted and not growing. What should I do?

- A. Please, don't waste your garden dollars: Always plant crops such as beans, beets, cantaloupe, carrots, chard, collards, corn, cucumbers, kale, mustard, okra, peas, radishes, spinach, squash, turnips and watermelons from seed. These plants are difficult to transplant and transplanting offers no advantage over seeding directly in the garden.

Diseases

Q. Are there any foliage diseases that affect okra in the garden?

- A. Several foliage problems occur on okra. A common one is Ascochyta, a disease normally found on cotton, a close relative to okra. Losses from this disease are minimal and do not warrant a control program.

Q. My okra did not grow properly last year. When I removed it at the end of the season, the roots were damaged by galls and swellings.

- A. The damage was a result of root knot nematodes.

Insects

Q. What causes okra pods to be crooked and bent rather than straight?

- A. This could be caused by insects feeding on the pods. Certain sucking insects, such as stinkbugs and leaf-footed bugs, inject chemicals into the pods that cause growth to stop or slow down in that area. The other side continues growing normally, which results in a curved or bent pod. The pods can still be eaten. No control is necessary unless the bugs are still feeding on the plants. Use Sevin® for control.

Q. I have long, funny looking insects running around my okra stalks. Do they hurt the plant?

- A. These insects are sharpshooters. They suck juice from the plants, causing buds to shed. Control them with Sevin® as directed on the label.

Q. I have ants all over my okra. Do they hurt the plants?

- A. Ants do not hurt your okra plants. Ants visit okra plants to get honeydew produced by sharpshooters, aphids, or other sucking insects. Get rid of the sucking insects and the ants will leave.

ONION

General

Q. How deep should my onion transplants be set?

- A. Onion plants should be placed approximately 1 inch deep or at least deep enough to support the plant and keep it from falling over.

Q. Is it necessary to remove the garden soil from around my onion bulbs in the spring to make large bulbs?

- A. Absolutely not. Bulbing of onions is controlled by variety, temperature, and day length. The onion will bulb when the required conditions are met. Removing soil around the base of the plant will not increase bulbing, although it appears to because the bulbs are visible. In fact, it may do harm, especially to white varieties of onions. Removing the soil from around white onions results in sun burning, which turns the tops of the bulbs green.

Q. What varieties of green onions grow well in Texas?

- A. The term green onion describes an immature onion. Even the large bulb onions such as Grano or Granex can be harvested mature and used as green onions. Some gardeners who seed these varieties of onions directly in their garden selectively thin them as they grow and use the thinnings as green onions. Evergreen Bunching and Beltsville Bunching varieties do not form bulbs but produce clusters of four to eight slender, white onion stalks. The shallot, a multiplier-type onion with a distinct flavor, is also used as a green onion.

Q. What is the difference between a set and a transplant?

- A. Although many gardeners in Texas use these terms interchangeably, there is a difference. An onion set is a small bulb, ½ to 1 inch in diameter. When planted, it grows a larger bulb. An onion transplant is a plant 8 to 10 weeks old that has not yet produced a bulb. If planted at the right time it will produce a large bulb.

Q. What is a bunching onion?

- A. Several types of onions are used as green bunching onions. Evergreen White Bunching and Japanese Bunching are varieties of this type. They may be planted from seed, sets or transplants. Bunching onions are generally classed as multipliers because they propagate themselves. They are cold resistant and can be grown during winter in all Texas areas. They will not bulb and are harvested as needed. Both the roots and tops are used.

Q. What is a shallot?

- A. A shallot is a member of the onion family that lives for many years. It is grown for its mild, garlic-flavored roots, made up of segments called cloves. The plants will grow to be about 18 inches tall and often bear white or violet flowers in early summer.

Q. Some years my onion plants make nice size bulbs and other years they don't. Why?

- A. There is no simple answer to this commonly asked question. First of all, obtain varieties that will bulb in your particular area of the state. Always buy plants about the size of a lead pencil. Larger plants will not produce earlier or produce larger bulbs. Generally, a large onion plant will produce a seed stalk after planting instead of forming a large bulb. Always set the plants in your garden at the right time for your area.

Q. Should I break over the tops of my onion plants to get a larger bulb?

- A. Breaking over the tops of onion plants will not increase bulb size but can actually prevent bulb enlargement. Onion bulbs increase in size as sugars manufactured in the top are translocated to the bulb. If the tops are broken, this process stops and the bulbs get no larger.

Q. What is the difference between green onions and leeks?

- A. A leek has a much milder flavor than an onion. The term scallion describes leeks and green onions.

Q. What varieties of onions should I plant to produce the large, sweet bulbs Texas is famous for?

- A. Plant the varieties Grano, Granex or, if you prefer, the red onion Burgundy. These Bermuda onions are considered short-day onions. Planted at the right time for your area of Texas and given proper moisture and fertility, they should produce large, sweet bulbs like those you find in the spring at grocery stores.

Q. What causes my bulb onions to send up flower stalks?

- A. Flowering of onions can be caused by several things, usually temperature fluctuation. An onion is classed as a biennial, which means it usually takes 2 years to go from seed to seed. However, this condition is triggered by temperatures. If an onion plant is exposed to alternating cold and warm temperatures, it begins a cycle of going dormant, resuming growth, going dormant, and then resuming growth again. This makes the plants flower or bolt prematurely. Flowering can be controlled by planting the right variety at the right time. Use only transplants no larger in diameter than a pencil.

Q. Should I remove the flower stalks from my onion plants?

- A. No. Once onion plants have bolted, there is nothing you can do to eliminate this problem. The bulbs will be edible but probably smaller. Use them as soon as possible because you will not be able to store them.

Q. After harvesting, what is the best way for me to store my onions?

- A. Onions should be stored in a cool, dry place. Texas-grown onions, being mild and sweet, will not store as long as northern, more pungent varieties. Texas onions usually can be stored only 2 to 3 months. Allow your onions to fully mature in the garden before harvesting. They are mature when the top of the onion plant falls. Then pull and dry the onions in the garden for several days. Some gardeners prefer to pull the onions up partially, which allows them to dry while still in the ground. After drying, remove the roots and the top, leaving about $\frac{3}{4}$ to 1 inch of the neck to seal and prevent the entrance of decay organisms.

Diseases

Q. The foliage on my onion plants has purple spots that kill the leaves.

- A. The purple spot is caused by a fungus, and the disease is purple blotch. The fungus is airborne and infects onions during extended periods of dews and intermittent rain. The loss of foliage

from purple blotch can result in small bulbs and secondary rots that prevent the bulbs from storing properly. Purple blotch is controlled with fungicides, with maneb materials being the most effective. They should be applied at 10- to 14-day intervals as long as weather conditions favor disease development.

Q. The tips of my onion leaves turn brown and leaves gradually die back down to the bulb.

A. This is a foliage disease known as tip dieback of onions. The suspected cause is the fungus *Alternaria*. It is commonly associated with plants that are not growing properly. Pink root can also weaken the plant, which continues dying back. The maneb fungicides have some effect on this. The total cultural picture should be considered when tip dieback becomes a problem.

Q. My onion plants are stunted and not growing properly. When I remove them from the soil, I find that the root system is deteriorating and has a purple to pink appearance.

A. This is pink root of onions. It is a soilborne fungus that is most often found in sandy, cool, wet soils. There is no control for the disease other than rotation. When buying onion transplants, look at them closely for pink roots on the young plants. If the plants have pink root, do not purchase them. Buy only those plants that are certified to be free of pink root. Also use varieties resistant to pink root such as Grano and Granex.

Q. Why do my onions always rot when I try to store them?

A. In most cases, onions decay in storage because of neck rot. This is caused by a soilborne fungus. When harvesting onions, wait until the tops begin to dry and fall over. Once this has happened, lift the plants and allow them to dry. After drying, clip the tops and dry the cut area for 1 to 2 days. This will eliminate a possible site for infection. Then place the onions in a well-ventilated area and in a container that allows air to move freely around the onions. If onions are to be stored, it's important to have a good fungicide program during the growing season to prevent diseases such as tip blight and purple blotch from entering the bulbs.

Insects

Q. My onion leaves look silver and some are dying. What causes this?

A. Thrips could be feeding on the leaves. Examine the plants for small, yellowish or blackish insects. If they are present, treat with malathion as the label directs.



PEA

General

Q. Can southern peas be grown in Texas in the fall as well as in the spring?

A. Generally, yes. However, the best quality and set of southern peas occurs when they mature during relatively warm temperatures, so spring planting is better. Planting in midsummer for

fall harvest also results in more problems with insects and diseases during the early stages of growth.

Q. What causes my southern peas to grow extremely large vines but fail to set any pods?

- A. Although failure to set pods can be caused by a number of things, the most common problem is over fertilization. Southern peas, if over fertilized, grow large plants but fail to set many, if any, pods. Thrip, an extremely small insect that attacks the blooms of southern peas, can also cause poor pod set.

Q. Can I save seed from this year's blackeye pea crop for next year's garden?

- A. Yes. Peas are self-pollinated and seed may be saved for planting in next year's garden. However, this is not recommended because several types of seedborne diseases may show up in seeds saved for later plantings.

Q. Why are my pea plants always yellow when they first come up, then turn green after plants get larger?

- A. Yellow plants early in the season are usually caused by cool or wet soils. As the temperature warms and the soil dries, the plants will usually turn green.

Diseases

Q. My peas are developing powdery, reddish lesions on the undersides of the leaves.

- A. This is rust, and it can be controlled with foliar sprays or dusts of sulfur or maneb. Begin applications at the first sign of disease and repeat them at 7-day intervals. Rust on peas or beans is more of a problem in the fall than in the spring.

Q. The foliage of my peas developed an olive green substance on the lower sides of leaves.

- A. This is Cercospora leaf spot. It can be controlled with foliar sprays of maneb. Begin at the first sign of the disease and continue at 7- to 14-day intervals as long as weather conditions favor disease development.

Q. My pea plants died rapidly, one plant after another down the row.

- A. This is most likely Fusarium wilt. It is a soilborne disease and can best be controlled by rotation.

Q. My southern pea plants were smaller and yielded less last year. I found galls and swellings on the roots.

- A. These are root knot nematodes. The pea variety Mississippi Silver resists nematodes and should be used where they are a problem.

Insects

Q. My southern peas come up every year looking damaged. The leaves are curled and snarled. What is wrong?

- A. The apexes or shoots of the leaves were damaged when they were small by a tiny insect called a thrip. The thrip rasps the tissue of the leaf's growing point, causing it to bleed or secrete plant juices. The thrip then feeds on these juices. Host plants recover from this damage. Thrips can be controlled with malathion applied at 7- to 10-day intervals. Spraying should begin when plants have just emerged, since most damage occurs then.

Also see beans.

PEPPER



General

Q. Why do my pepper plants often bloom but fail to set fruit?

- A. Peppers, like tomatoes, are sensitive to temperature. Most peppers will drop their blooms when daytime temperatures get much above 90 degrees F and night temperatures are above 75 degrees F. They will also drop their blooms in the early spring if temperatures remain cool for extended periods. Hot peppers, such as jalapenos, withstand hot weather fairly well and can often produce fruit through the summer in most areas of Texas. Optimum temperatures are 70 to 80 degrees F for bell peppers and 70 to 85 degrees F for hot varieties.

Q. If I remove the first few blooms on a pepper plant, will my overall production increase?

- A. Maybe. Occasionally, if a bell pepper plant sets the first bloom, the plant will be stunted as that fruit matures. This is likely to happen if the plant is growing under marginal conditions such as low fertility or perhaps low moisture. With the first bloom removed, the plant will grow larger before setting fruit, which often does result in higher total yield. However, if the plant is growing under satisfactory conditions, removing the first bloom should not affect yield.

Q. If you plant hot peppers beside sweet peppers, will the sweet pepper plant will produce hot fruit?

- A. Absolutely not. Pepper flowers are self-pollinated, although they occasionally cross-pollinate. However, the result of this crossing will appear only if seed is saved from this year's crop and planted next year. It will not change the characteristics of fruit from this year's crop.

Q. Can I cut back my spring-planted pepper plants in late summer or early fall for increased production later?

- A. Yes, although this is not recommended. In the northern parts of the state, spring-planted pepper plants can often be carried through to the first killing frost without pruning. However, in the central and southern parts of Texas, judiciously pruning the pepper plants and applying additional fertilizer as a sidedress application can prolong pepper production until the first

killing frost. Plants should not be pruned severely in southern parts of the state because it can result in burn, stunting or death of the plants.

Q. Is there any difference in taste or nutritive value between green peppers and those that mature and turn red?

- A. Peppers that are allowed to mature and ripen entirely, from green to yellow to red, have a higher vitamin content, especially Vitamin A. There is little difference in taste, although the texture is quite different.

Q. How can you tell when jalapeno peppers are mature?

- A. Jalapeno peppers are edible and flavorful at all stages of their growth. However, a connoisseur of jalapeno peppers can distinguish a definite flavor difference between a fully mature jalapeno and one harvested early. A fully mature jalapeno pepper, regardless of size, usually has small cracks around the shoulders of the fruit. Often a darkened area on the fruit indicates maturity and the initial stages of a color change in the fruit.

Q. Can I save seed from this year's pepper crop for planting in my next garden?

- A. Yes. Peppers are self-pollinated and will breed true if seed is saved for planting later. Although an occasional cross-pollination will occur, this is generally not a problem. Do not save seed from hybrid pepper plants, as these will not breed true and plants will have different characteristics than the desired hybrid.

Diseases

Q. The foliage on my pepper plants developed spots or lesions and the leaves have dropped off.

- A. This could be a combination of three foliage diseases: *Alternaria* leaf spot, *Cercospora* leaf spot, and bacterial leaf spot. In most cases, two or more of these occur simultaneously. They can be controlled with foliar sprays using a combination of maneb and Kocide® or any other copper fungicide. Begin at the first sign of the disease and continue at 1- to 2-week intervals during the critical disease periods.

Q. The foliage and fruit of my pepper plants are distorted and small. The leaves have a mosaic pattern.

- A. This could be one of five viruses that attack peppers in Texas. The best control is to buy healthy plants and to follow approved cultural practices and a good insecticide program. The viruses are transmitted by aphids. For this reason, it is important to control insects. Also remove infected plants.

Q. My plants wilted and died soon after recent rainfall. The inner stems of the plants were dark.

- A. This is Phytophthora stem rot, a soilborne fungus that attacks peppers. It is particularly severe in areas where water stands around the plant. Plant on a raised bed for optimal drainage.

Q. After a summer rain, my pepper plants died rapidly. I found a white growth at the base of the plants. Intermingled with this growth were small, round, bead-like structures the size of a pinhead.

- A. This is southern blight, caused by a soilborne fungus. Crop rotation and deep burial of organic material will help control it. Do not allow leaves to collect around the base of the plant because the fungus will feed on them and later develop on the peppers.

Insects

Q. There are small wiggly trails all over the leaves of my pepper plants. What are these?

- A. These trails are caused by leaf miners. Heavy infestations can defoliate plants and reduce yields. Control this pest with bifenthrin, or petroleum oil. Two or three applications may be necessary. Use as directed on the label.

POTATO



General

Q. I used potatoes purchased at the grocery store as seed for planting and they rotted without sprouting. Why?

- A. Many potatoes sold for fresh market consumption have been treated with chemicals to prevent sprouting in storage. These chemicals will also prevent sprouting after planting. Another possibility is that the potatoes you purchased were from this year's crop and had not been stored properly to break the rest period. Potatoes have a rest period that must be broken before the seed will sprout. Cool temperatures or extremely warm temperatures can break the rest period and allow potatoes to sprout. Next time, plant certified seed that has been properly stored to induce sprouting.

Q. Can I save the small potatoes from my spring crop for planting in the fall in my garden?

- A. Yes. This is commonly done because good seed potatoes are scarce in the fall in Texas. Sometimes the potatoes saved from the spring garden fail to sprout when planted in the fall because of a natural dormancy in newly harvested potatoes. There is considerable controversy about how to handle these potatoes in order to break the dormancy and enable them to sprout when planted. One recommendation is to place the potatoes in a cool storage area, preferably in the range of 50 degrees F, until about 3 to 4 weeks before the anticipated fall planting date. At that time, remove the small potatoes and maintain them at normal environmental conditions until planting. Keep the humidity high during this time by covering the potatoes with moist burlap bags or some similar material so they will begin to sprout. The small potatoes should be planted whole and not cut to prevent rotting.

Q. What size pieces should seed potatoes be cut into?

- A. Each seed piece should contain at least 2 to 3 “eyes.” Research has shown that the best size seed piece weighs approximately 2 ounces. If seed potatoes are expensive or scarce, the pieces can be smaller, although each piece must contain at least one eye.

Q. Sometimes my potatoes or the potatoes I see at supermarkets have a green color. Are these potatoes poisonous?

- A. Potatoes with a green color contain a substance known as solanine. Solanine, if consumed in extremely large quantities, can cause severe illness or death. This greening of potatoes is caused by exposure to light during the growing period or excessive exposure to artificial lights at grocery stores or supermarkets. In the garden, this is most common after heavy rains that uncover potatoes near the surface, exposing them to sunlight.

Q. How do I know when my potatoes are ready for harvesting?

- A. Potatoes are generally mature when the plant starts to turn yellow. Potatoes require 75 to 140 days from planting to maturity, depending on the variety and the season in which they are grown. Immature potatoes will often skin and bruise easily. When digging potatoes, if the skin is not set and is easily removed, delay the harvest. Dig spring-planted potatoes before the soil becomes hot. Avoid harvesting the potatoes when the soil is wet to avoid potato diseases.

Q. I have some seed potatoes left from my spring garden. Would it be all right to eat them?

- A. No. Potato tubers purchased for seed purposes definitely should not be eaten. Frequently, such tubers have been chemically treated. Like all treated seeds, seed potatoes should not be fed to people or animals.

Q. After harvesting, how should I handle my potatoes to get the longest storage time possible?

- A. Dig potatoes when the soil is dry, being careful not to skin or bruise the tubers. Do not wash the potatoes. Place them in crates or some suitable container and store them in a dark area for about 10 days at a temperature of 60 to 65 degrees F with relatively high humidity. After this curing period, keep the potatoes at 38 to 45 degrees F and about 85 percent humidity. Make sure there is good air circulation.

Q. Can potatoes be left in the ground for storage?

- A. Generally, no. Cool, humid conditions (38 to 45 degrees F and 85 percent relative humidity) are best for storing Irish potatoes. Leaving the potatoes in the ground with a heavy mulch to keep the soil cool will work temporarily if the soil is not saturated and is free of wireworms and grubs. The potatoes would not stay dry enough in the soil to prevent second growth or sprouting. Several weeks at high temperatures can break the rest period in homegrown potatoes, after which sprouts will develop on the tuber. All things considered, it is better to dig the potatoes and put them in a cool, damp area.

Q. Why do home-stored potatoes have a different flavor in the winter than in the summer?

- A. Irish potatoes stored at temperatures below 55 degrees F will taste sweeter and be stringier than those stored at warmer temperatures. At temperatures less than 55 degrees F, enzymes within the tuber convert starch into sugars, causing the sweet taste and stringy consistency. Potatoes to be eaten should never be stored in the refrigerator. Sugars within the potatoes can be converted back into starch by storing the potatoes at temperatures above 65 degrees F for a week or two before use. Some gardeners store potatoes in large lots in cooler temperatures to keep them from sprouting and keep a small quantity inside the house for immediate consumption.

Q. My potato plants produced small tomatoes this year. I planted them next to my tomatoes. Could they have crossed, or have my potatoes mutated?

- A. The potato and tomato belong to the same botanical family and have similar growth characteristics. The potato flower looks very much like the tomato flower and is pollinated and fertilized in the same way as the tomato flower. The fruit on the potato plant is actually its fruiting structure. The fruit will mature if the plant is left long enough. Your potato and tomato plants have not cross-fertilized.

Diseases

Q. The stems of my Irish potato plants are decayed. The plants weaken but do not die.

- A. This is Rhizoctonia. It is a soilborne fungus that causes decay in stems and seed pieces. Approved seed-piece fungicides, especially captan and maneb, are the best control. Follow the label instructions closely to get maximum control.

Q. After a rainfall, the plants in one area of my garden began to die rapidly. The stems were rotted. A dark discoloration is moving up the stem to the top of the plant, and the stem has a foul odor.

- A. This is black leg of potatoes, one of the major bacterial potato diseases. To avoid this, plant only in well-drained areas. Seed piece treatment will also help prevent the entry of bacteria and other organisms.

Q. When I dug my potatoes, they were covered by small, raised bumps.

- A. These are root knot nematodes. They are a serious problem on potatoes. Rotate crops where nematodes have become a major problem.

Q. After I dug my potatoes, I found that they were rough and had deep scars.

- A. This is potato scab, caused by a soilborne organism. To control this, maintain an acid soil around your potato plants. Also maintain a uniform moisture level from the time the potato is formed until it is harvested. Seed-piece treatments using captan or maneb are somewhat effective in preventing this problem.

Q. The lower foliage on my potato plants is beginning to turn yellow and is covered with brown spots.

A. This is early blight of potatoes, which is similar to blight on tomatoes. Spray with maneb as soon as spots are observed and repeat two or three times at 7- to 14-day intervals.

Q. The foliage of my potato plants is distorted, rolled, and is not as thrifty as it should be.

A. Several viruses attack potatoes. The best prevention is to plant only certified seed pieces.

Insects

Q. When I dug my potatoes, I noticed small holes chewed in them. How do I prevent this?

A. Several soil insects such as wireworms and white grubs cause this type of damage. Treat for soil pests before planting. Permethrin, imidacloprid, or bifenthrin are effective. Use as directed on the label.

Q. The leaves of my potatoes are disappearing fast. All I see on the plant is some pinkish worms.

A. These pinkish larvae are immature Colorado potato beetles. They can defoliate plants and should be controlled with Sevin®, thiodan or methoxychlor. Use as directed on the label. In small plots, control by hand picking the larvae and destroying them.

PUMPKIN



General

Q. What causes my pumpkin to produce very few fruit?

A. Poor fruit set on pumpkin is commonly caused by having the plants too close together. This causes plants to produce too many leaves, which discourages pollinating insects. Like other members of the cucurbit family, pumpkins require bees for pollination. They produce both male and female flowers and pollinating insects must transfer the pollen from the male to the female flowers for fruit set to occur. Also, wet, cloudy conditions that slow insect activity will greatly reduce fruit set.

Q. Will pumpkins cross with squash, watermelons or cucumbers, resulting in off-type fruit?

A. Varieties of the true pumpkin cross readily with each other, but this crossing will not be apparent unless seed are saved from this year's fruit and planted next year. Pumpkins will not cross with varieties of true squash. All varieties of "summer squash" are in reality true pumpkins and will cross readily with each other and with other pumpkins. If you grow both summer squash and pumpkins in your garden, you should not save seed for planting in next year's garden.

Q. Will it help to remove the tips of my pumpkin vines late in the season to encourage fruit size?

- A. The tips of vining pumpkins may be removed about 45 days before the anticipated first fall frost to discourage plants from further spreading. This practice generally encourages larger fruit and will not harm production because any additional fruit that might set after that time will not ripen before the first killing frost of the fall.

Diseases

Q. When I raise pumpkins in the fall, the foliage becomes covered with a white, powdery, dusty material. What can I do to prevent this?

- A. This is powdery mildew. It is an airborne fungus that grows on the outside cell layers of the leaves. It can be controlled with sprays of benomyl if applied early and on a regular schedule. There are no varieties resistant to this disease, and if the disease is not controlled, it can kill the plant.

Insects

Pumpkins have the same insect problems as squash.

RADISH



General

Q. What causes my radishes not to bulb?

- A. Radishes will fail to bulb for several reasons. Probably, they are not properly thinned and are growing too close together. Radishes should be planted two to three seeds per inch and thinned when they are about 1 to 2 inches tall to space them 1 inch apart. Radishes will also not bulb properly when forced to mature during temperatures higher than about 80 degrees F.

Q. Sometimes my radishes have a hot, bitter flavor. What is the problem?

- A. Off-flavor is caused by planting at the wrong time or by poor cultural practices such as low fertility or low moisture, which result in slow growth. For highest quality, radishes should grow quickly. You can stimulate fast growth by applying adequate fertilizer and moisture. Radishes also taste hot if they are too old.

Q. What causes roots of radishes to crack?

- A. This is usually caused by harvesting the radishes too late. Cracking is caused by fluctuations in moisture, which cause the root to swell rapidly and crack, especially near maturity.

Q. Are the leaves of radish plants edible?

- A. Radish leaves are not poisonous and can be consumed, although they have a strong, bitter flavor. There may be some dishes or some methods of preparing radish leaves that would make them more palatable, but for the most part they lack a desirable flavor.

Q. What are winter radishes and how do they differ from regular garden radishes?

- A. Winter radish varieties produce large roots, which may be round or elongated and white, red or black. They require a long season for full growth. The roots may be eaten raw with vinegar or cooked like turnips. The flavor of winter radishes is usually pungent, and the texture is more fibrous and less crisp than in common garden radishes.

Diseases

Q. My radishes have a black, crusty growth around the globe.

- A. This is scab, a soilborne disease. It can be controlled by rotating radishes within the garden to avoid planting in infected soil.

Insects

Radishes have the same insect problems as mustard.

SPINACH



General

Q. Each year my spring-planted spinach sends up flower stalks about the time I think it is ready for harvest. What causes this and what can be done about it?

- A. Spring-planted spinach hurries into its flowering phase, which stops production of edible foliage. Flowering is affected by length of day, temperature, and variety. Bolt-resistant varieties, often called long standing, should be used in the spring. Plant as soon as possible in the early spring and no later than 6 to 8 weeks before daytime temperatures are expected to average more than 75 degrees F. Bolting is usually not a problem in fall plantings, which should be about 4 to 6 weeks before the average first frost date.

Q. How do I keep my spinach growing vigorously instead of slowing down?

- A. Spinach responds to liberal applications of nitrogen fertilizer, which stimulates the growth of leaves. Sidedressing with ammonium sulfate at the rate of 2 to 3 tablespoons per 10 feet of row will hasten growth and improve spinach yields. Apply when the plants are about 2 inches tall and again after the first harvest.

Q. Should spinach be harvested by removing the outer, older leaves or by pulling the entire plant?

- A. This depends on whether it is a spring- or fall-planted crop. In the spring, spinach will go to seed quickly, so the best harvesting method is to pull the entire plant. When planted in early fall for winter harvesting, harvest the outer leaves and allow the plant to continue to grow and produce more foliage.

Q. I've heard that spinach is extremely high in minerals and vitamins but also contains high levels of something that can cause problems. Is there any truth to this?

- A. Spinach contains high concentrations of oxalic acid, which can interfere with the utilization of calcium or magnesium in the diet. The same is true for rhubarb and Swiss chard.

Q. Can New Zealand spinach be grown successfully in Texas?

- A. Yes. New Zealand spinach is a low-growing, ground cover plant that spreads 3 to 5 feet. New Zealand spinach should be started indoors in peat pots and transplanted after danger of frost in the spring. Young, tender stems and leaves can be harvested through the summer in most areas.

Q. What is Malabar spinach?

- A. Malabar spinach, sometimes called summer spinach, is an attractive, glossy-leaved vine that grows rapidly in warm weather and produces edible leaves and shoots in 70 to 80 days. Since it grows a vigorous vine, it should be trained against a fence or wall. Young leaves and growing tips can be harvested throughout the summer. Seed may be saved from the plant in the fall for replanting in the next garden. The leaves are used fresh in salads or cooked as greens.

Diseases

Q. The foliage on my spinach plants developed white, ruptured areas underneath the leaf and a faint yellow color on the upper side of the leaf.

- A. This is white rust, a fungus that causes severe loss of foliage. It is favored by cool, moist weather and can be controlled with foliar sprays of maneb fungicide. The varieties Hybrid 7 and Dixie Market resist white rust.

Q. The foliage on my spinach plants has developed a bluish-gray material underneath the leaf. The leaves dried quickly.

- A. This is blue mold of spinach, caused by a fungus. It is controlled with foliar fungicide sprays. The Bloomsdale varieties are very susceptible and should not be grown in Texas.

Q. White spots develop quickly on the upper sides of my spinach leaves, then form holes. The leaves look ragged.

- A. This is either *Cercospora* leaf spot or Anthracnose. A good fungicide program, using maneb, will control these fungi.

Q. My fall-planted spinach died soon after coming up.

- A. An excessively high soil temperature is probably killing the plants. Plant spinach when the soil temperature is no higher than 75 degrees F during the daytime. Soil temperature can be determined by placing a soil thermometer in the upper inch of the soil and reading it at noon. Also, once plants become established, keep the soil around them moist with light, periodic sprinklings.

Insects

Q. Small clear, green, or sometimes dark insects are a real problem on my spinach every year. How should I control them?

- A. Any small, clear-bodied insects are probably aphids, often called plant lice. They are difficult to control in spinach because they get under the curled or crinkled leaves. Insecticides should be applied with large quantities of water to the undersides of the leaves. Using a general purpose insecticide such as malathion and beginning sprays early in the season generally results in good control. Aphids may also be washed off with a vigorous stream of water, but avoid damaging the plants.

SQUASH



General

Q. Each year my squash blooms profusely but seldom produces any squash to eat. What is wrong?

- A. Squash plants produce male and female blooms. For fruit to set, pollen must be transferred from the male to the female bloom. Pollinating insects, mostly bees, carry out this important job. When treating the garden for insects and diseases, spray or dust during the late afternoon to avoid killing bees. Nematode infestations can also cause this problem. Check roots for galls.

Q. Most of the time my yellow squash is tough or has seed in the middle. What is wrong?

- A. Squash matures rapidly, requiring only 5 to 7 days from flowering to maturity in hot weather. The key to high quality is timely harvest—every other day in hot weather. Good yellow summer squash should be 1 ½ to 2 inches in diameter at the base and a pale yellow color. Dark yellow or yellow-orange squash with a firm rind is over mature. Remove it from the plant and discard it. If over mature fruits are not removed, the plant will stop yielding.

Q. I have a vegetable growing on my back fence that produces a pale green fruit 3 feet long and 3 to 6 inches in diameter. The plant is vining. What is this and is it edible?

- A. People are amazed by the size of this vegetable, which is sometimes called Hercules Club squash. It is actually a gourd, but it is edible if harvested when small. Cook it as you would squash.

Q. Will squash cross with other vine crops in my garden such as watermelons and cucumbers?

- A. No. Squash will cross-pollinate with other types of squash, for example yellow squash with green squash, but they will not cross-pollinate with cucumbers, watermelons or cantaloupes. Cross-pollination with other squash will not cause off-flavored or off-colored fruit from this year's garden, but if seed are saved for planting next year, the result will be a combination. If

yellow squash crosses with a zucchini squash and you plant the seed, the new plant will have the characteristics of both.

Q. Can seed be saved from this year's squash crop for planting in next year's garden?

- A. Yes, but this is not recommended. Because squash has male and female blooms and needs bees for pollination, seed saved from this year's crop probably will not breed true when planted next year. This is especially true if you are growing more than one type of squash. If you are only growing one type of squash and there are no other types of squash in the area, then seed can be saved with a fairly high degree of genetic purity. If you are growing hybrid squash, such as the variety Dixie, do not save seeds as they will not breed true.

Diseases

Q. My squash leaves are covered with a white, powdery substance. The plants die rapidly.

- A. This is powdery mildew. It is a fungal disease that attacks and kills squash. Some varieties tolerate this disease better than others. Powdery mildew is more of a problem in the fall than in the spring. Benlate is the most effective fungicide for controlling powdery mildew. Mildew occurs most often on old foliage of declining plants. Succession plantings of squash will provide vigorous, productive plants and allow removal of older, more susceptible plants.

Q. My fruit blooms and sets young fruit, yet quickly becomes covered with a black, whiskery fungal growth.

- A. This is Chaonephora fruit rot, a soilborne disease that rots the young fruit. It is particularly damaging during extended wet periods. It can be controlled with a combination of treatments: use foliar sprays of chlorothalonil, plant in raised beds, and plant open foliage varieties. This allows air movement to dry the soil and the foliage. Avoid planting squash on heavy, poorly drained soils. Apply fungicides during wet periods.

Q. As my fruit begins to develop, it is covered with a white fungus.

- A. This is Pythium, commonly called wet rot. It is controlled by growing plants in a raised bed, planting in a well-drained area, or improving air circulation around the plants. Some varieties produce their fruit in the upper part of the plant so the fruit does not come in contact with the wet soil.

Q. Each year my yellow squash plants do a peculiar thing. In early to midsummer the plants, which once produced yellow fruit, start producing green or yellow and green fruit. This is accompanied by a twisting or mottling of the leaves. What could be causing this?

- A. Your plants have been affected by a virus disease, most often squash mosaic virus or cucumber mosaic virus. The virus is transmitted to your plants by insects that have fed on other virus-infected squash plants or some wild plant. Once the plant gets this disease nothing can be

done, and the plant will eventually die. Best preventive measures include insect control and planting varieties that will mature early in the year. This disease is more severe on late-planted squash or summer-planted squash than it is on the early spring-planted crop. The green squash (which should be yellow) is still good to eat if harvested at the proper stage of maturity. There will be little change in taste.

Insects

Q. Each year my squash plants wilt and die about the time they start producing. Some have a yellowish or greenish sawdust-like material all over the vines. What is wrong?

A. More than likely, your problem is squash vine borers. If so, the white, grub-like larvae can be found within the stem of the plant by cutting it open. The larvae hatch from eggs laid by a bright colored, wasp-like moth on the foliage or stems. The eggs hatch and the larvae travel down the plant to the stem and literally “core it out.” To prevent this problem, begin applying Sevin® to the bases of the plants about the time the plants start to bloom. Once the grubs are inside the stems, they are almost impossible to control. During the fall growing season, begin treatment shortly after plant emergence.

Q. How do I keep squash bugs from destroying my plants?

A. Squash bugs are very difficult to control, especially if control measures don't begin until after the insects have reached the mature stage. Apply insecticides such as Sevin® or thiodan early in the season while the insects are small. Applications, whether sprays or dusts, must thoroughly cover the plants so insects come in contact with the insecticide. Apply the insecticide to the base of the plant, underneath the foliage, and underneath the stems. Also remove and destroy egg masses on the bottoms of leaves.

Also see cantaloupe.

SWEETPOTATO



General

Q. When should you bed out sweetpotato roots for slip production?

A. To produce slips, sweetpotato roots should be laid on their sides in hotbeds about a month before the nighttime temperatures stay above 60 degrees F. Cover the sweetpotato roots with 2 inches of moist sand and keep the hotbed between 75 and 80 degrees F. When the sprouts develop, remove them with a twisting tug. Additional transplants (slips) will form from the bedded sweetpotatoes if left in place.

Q. I want to grow a few rows of sweetpotatoes in my garden. How do I get seed or plants?

A. Sweetpotatoes are started from transplants or vine cuttings rather than from seeds. Transplants, also called slips, usually grow from bedded roots. A vine cutting is a 10- to 12-inch

section cut from a vine growing in the field. Home gardeners can produce a limited number of slips or sections of vine by placing a sweetpotato, bud side up, in a jar of water and placing the jar in a sunny location. Vines produced can be cut into sections and planted.

Q. What causes sweetpotato roots to be long and stringy?

- A. This condition is caused by too much fertilizer. Luxurious growing conditions cause vigorous vine growth and result in poorly developed, stringy roots. Maturity and variety also affect the texture of sweetpotatoes.

Q. How do you know when sweetpotatoes are mature and ready for harvesting?

- A. Sweetpotatoes can be harvested at any stage of maturity. They require 100 to 140 days from planting to maturity, depending on variety. Harvest sweetpotatoes before the first killing frost because cool conditions can physiologically damage roots.

Q. How should sweetpotatoes be handled after harvesting for long-term storage?

- A. Handle them gently because the tender skins bruise easily. Any damage to the roots can cause considerable decay during storage. After harvesting, dry the sweetpotatoes for 2 to 3 hours. Then spread them out in baskets lined with newspaper. Place them in a dry area where the temperature will remain 80 to 85 degrees F for 10 days to 2 weeks. After this curing period, place them where the temperatures will range from 55 to 60 degrees F and where humidity is about 85 percent. Sweetpotatoes treated this way will store for several months. Remove any roots that show signs of deterioration or decay.

Q. Is there a difference between sweetpotatoes and yams?

- A. Yes and no. In the southern United States, some sweetpotatoes are advertised as yams, for example, Louisiana Yams. However, these are all sweetpotatoes with the scientific name *Ipomoea batatas*. The true yam, which is native to tropical regions, is an unrelated plant with the scientific name *Dioscorea batatas*. The true yam is also called a Chinese Yam or Chinese Potato. True yams are not grown as food crops in the U.S.

Diseases

Q. When I harvested my sweetpotatoes, they were rough and the surface was cracked.

- A. This can be caused by two things. One is fluctuating moisture levels within the soil; the other is root knot nematodes. If nematodes are suspected, check the part of the root closest to the plant for small necrotic lesions in the sweetpotato. If nematodes are found, use the resistant variety Jewel in future plantings.

Q. After I dug my sweetpotatoes, I found as much as half of each sweetpotato covered with a black, necrotic scab that decays rapidly.

- A. This is sweetpotato scurf, caused by a soilborne fungus. It is controlled by growing sweetpotatoes in acid soil. Also be sure to use disease-free slips and rotate crops to help prevent the disease.

Insects

Q. How do I control sweetpotato weevils?

- A. No chemicals are currently cleared for control of sweetpotato weevils. The best ways to control them are to plant certified weevil-free sweetpotato slips, rotate crops, and remove all crop residue and weeds that might serve as winter hosts for the sweetpotato weevil.

TOMATO



General

Q. When should I start my seed indoors to produce tomato transplants for my garden?

- A. Depending upon temperature and how the plants are grown, it takes from 6 to 8 weeks to produce a healthy, 6-inch-tall transplant for setting out in your garden. The plants should be grown in a warm area and receive 6 to 8 hours of sunlight daily or tall, poor quality, leggy plants will result.

Q. How do you select good transplants at nurseries or garden centers?

- A. First, select the right variety of tomatoes, peppers, eggplant or broccoli. Also, look for plants that have a healthy, dark green color and do not have any spots or holes in the leaves. The ideal tomato, pepper or eggplant transplant should be just about as wide as it is tall. Avoid tall, spindly plants.

Q. How often should my tomatoes be fertilized?

- A. It is necessary to fertilize the garden before planting tomatoes. Fertilize again when the fruit first sets. From that point on, fertilize (sidedress) every week to 10 days. Plants grown on sandy soils should be fertilized more often than those grown on heavy, clay soils. A general sidedress fertilizer recommendation is 1 to 2 tablespoons of a complete fertilizer scattered around the plant and worked into the soil. If using a fertilizer high in nitrogen, such as ammonium sulfate, reduce the rate to 1 tablespoon per plant.

Q. Should tomato plants be staked, caged, or left unsupported?

- A. Tomatoes grown in Texas must be supported. Plants with foliage and fruit supported off the ground will produce more than unsupported plants. Whether you cage or stake them is a personal preference. Caging involves less work. Once the cage is placed over the plant, no pruning or tying is necessary. The fruit are simply harvested as they ripen. Caging produces more foliage, which gives fruit more protection from bird damage and fruit rot. In many areas of Texas, staking and pruning plants results in sunburn when the developing fruit is exposed to

excessive sunlight. Caged tomato vines produce more, smaller tomatoes, whereas staked and tied plants produce fewer, larger tomatoes.

Q. My tomato plants are dark green, vigorous and healthy. However, flowers are not forming any fruit. What is the problem?

- A. Poor fruit set could have a number of causes, including too much nitrogen fertilizer, nighttime temperatures warmer than 70 degrees F, temperatures below 50 degrees F, irregular watering, insects such as thrips, or planting the wrong variety. Combinations of these can cause a complete failure to set fruit.

Q. Are there really low-acid tomato varieties?

- A. Some varieties (for example, some yellow-fruited types) are slightly less acidic than others, but the difference is so slight that taste and processing methods are the same. Research conducted by the USDA indicates that all varieties available to the home gardener are safe for water bath processing as long as good quality fruit are used. Flavor differences between varieties are not caused by acid content but by the sugar to acid ratio.

Q. Spring Giant and Bigset tomato varieties are recommended because they are determinate and fast maturing. What does determinate mean, and can you tell if a tomato is determinate by looking at it?

- A. Determinate means the plant is small. Spring Giant and Bigset seldom are more than 5 to 6 feet tall. A determinate vine is distinguished by a repeating pattern of two leaves followed by a flower or fruiting cluster. An indeterminate vine has a repeating pattern of three or four leaves, then a cluster.

Q. Can I save tomato seeds for next season's plantings, and if so how?

- A. You can save tomato seed if the variety is not a hybrid. Hybrid tomatoes such as Bigset and Spring Giant do not come true from seed and the plants and fruit may or may not resemble the parent. Chances are the fruit will be poorer quality. However, with true-breeding varieties, such as Homestead, it is easy to save seed. To save seed from tomatoes or any other home vegetable crop, leave the fruit on the plant until it is mature, then pull it, squeeze juice with seed into a glass, and let this ferment for several days, adding water if needed. Seeds will settle to the bottom. Remove the seeds and rinse them two or three times to remove debris. Then blot them and place them in the sun to dry. Store the seeds in a cool, dry place.

Q. How large should a tomato cage be?

- A. The diameter of the cage should be at least 18 to 20 inches. Smaller cages often restrict plant growth and reduce yields. A cage 2 ½ feet high is sufficient for the recommended varieties. However, if vining types such as Better Boy, Homestead or Terrific are planted, 5-foot-high cages are preferred. Regardless of variety, the 2 ½-foot cage is sufficient for most fall garden tomatoes.

Q. How do you stake tomatoes?

A. First, prune the plant to either one or two main stalks. (Tomatoes grown without support develop a bush shape and can't be staked.) Remove the small suckers that develop between the axil of the leaf and the stem to develop a vine structure rather than a bush. Drive a wooden stake (1 inch in diameter and 6 feet long) into the ground beside the plant. Do not damage the root system when inserting the stake. Loosely attach the stalk of the plant to the stake with twist ties, soft string, strips of cloth, or panty hose. For sufficient support, attach the plant to the stake at 12- to 14-inch intervals. Continue suckering to prevent the plant from developing more than one or two central stems. If a double stalk plant is desired, leave the sucker produced above the first flower cluster because it will be the most vigorous.

Q. What causes a tomato to crack? Is there anything I can do to prevent it?

A. Cracking is a physiological disorder caused by soil moisture fluctuations. If the plant's water supply is reduced or cut off when the tomato reaches the mature green stage, the tomato will begin to ripen. A cellophane-like wrapper around the outer surface of the tomato becomes thicker and more rigid to protect the tomato during and after harvest. If the water supply is restored after ripening begins, the plant will resume the translocation of nutrients and moisture into the fruit. This will cause the fruit to enlarge, which splits the wrapper around the fruit and results in cracking. The single best control for cracking is a constant and regular water supply. Apply a layer of organic mulch around the base of the plant to prevent soil moisture from fluctuating. Water plants thoroughly every week, especially when the fruits are maturing. Some varieties are resistant to cracking, but their yield and quality are less than other varieties.

Q. What causes the leaves of my tomatoes to turn brown along the edges?

A. Leaf burn or scorch generally indicates root injury, quite often caused by large amounts of fertilizer applied too near the roots. This injury often causes leaf tips and margins to brown and die back. Other possible causes are root injury caused by nematodes, insects or cultivation. Overwatering or underwatering, along with diseases, might also cause leaf tip burn.

Q. About the time my tomatoes ripen and turn red, I lose at least half my crop to bird damage. How can I prevent this?

A. One control method that works quite well is to cut old nylon stockings into pieces 10 to 12 inches long. Tie a knot in one end of the stocking and slip the open end over the entire cluster of tomatoes. Secure the end above the tomato cluster with a rubber band or twist tie. Birds will not be able to peck through the nylon. Slip the stocking off the cluster to harvest the ripe fruit, and replace it to protect later ripening fruit. Also, birds damage fully mature fruit more readily than breaker fruit, so harvest at the breaker stage. Scarecrows, aluminum strips, tin foil plates, and noisemakers will discourage birds until they become accustomed to them.

Q. What causes the black spots on the bottoms of my tomatoes?

A. This is blossom end rot, caused by improper moisture. Maintain uniform soil moisture as the fruit nears maturity. Remove affected fruit.

Q. What causes tomato leaves to curl?

A. The exact cause of tomato leaf roll isn't known. It appears about the time of fruit setting. The leaflets of the older leaves on the lower half of the tomato plant roll upward. This gives the leaflets a cupped appearance and sometimes the margins even touch or overlap. The overall growth of the plant does not seem to be greatly affected and yields are normal. This condition seems most common on staked and pruned plants. It occurs when excessive rainfall or overwatering keeps the soil too wet for too long. It is also related to intensive sunlight, which causes carbohydrates to accumulate in the leaves. Some varieties of tomatoes, such as Saladette and Monte Grande, are characteristically curled.

Q. What causes some of my early tomato fruit from the spring garden to be oddly shaped and of poor quality?

A. This condition is usually caused by low temperatures during bloom and pollination. Fruits that set at temperatures of 55 degrees F or cooler are often oddly shaped and of poor quality. The blooms from which these tomatoes develop are also abnormal and grow into abnormal fruit.

Q. Do products that are supposed to aid in setting tomatoes really work? If so, how should they be used?

A. These hormonal products are designed to substitute for natural pollination. They do not work well in Texas. These products work better when tomatoes are failing to set because temperatures are too cool. Most of the fruit set problems in Texas are caused by temperatures that are too warm. Tomatoes that set after these products are used will be puffy and seedless.

Q. What is the plant advertised as a tree tomato?

A. The tree tomato is a member of the nightshade family, like the regular tomato, but it is a different species. The tree tomato has the scientific name *Cyphomandra betacea*. Like the true tomato, it is a native of Peru. It is grown in market gardens there and in several other subtropical countries such as Brazil and New Zealand. The tree tomato is woody, grows 8 to 10 feet tall, bears fruit 2 years after seeding, and may continue to bear for 5 or 6 years. It is not winter hardy except in southern Texas and would need to be taken inside for the winter. Fruits of the tree tomato are oval, about 2 inches long, and change from greenish purple to reddish purple when fully ripe. The fruits are low in acid and the flavor is moderately agreeable. Some varieties of the tree tomato produce bright red fruits. The fruits can be used in stew or preserves after the tough skin and hard seeds are removed.

Q. Should you allow tomatoes to become fully ripe and red on the vine before harvesting?

A. Generally, yields will be increased by harvesting the fruit at the first blush of pink instead of leaving them on the plant to ripen fully. A tomato picked at the first sign of color and ripened at room temperature will be just as tasty as one left to fully mature on the vine. Picking tomatoes before they turn red reduces damage from birds.

Q. If tomatoes are picked green or before they are fully mature, how should they be handled to ensure proper ripening and full flavor?

- A. Never refrigerate tomatoes picked before fully ripened. Lay them in a single layer and keep them at room temperature as they develop full color. When they are fully ripe, place them in the refrigerator where they will store for several weeks. Tomatoes handled in this way will be of high quality and have full flavor.

Q. What is a husk tomato?

- A. Husk tomato is also called Ground Cherry, Poha Berry, or Strawberry Tomato. It is grown the same way as regular tomatoes and produces a fruit the size of a cherry tomato. The fruits are produced inside a paper-like husk that, when ripe, turns brown. The fruit then drops from the plant. If left in the husk, the fruit will keep for several weeks. Like tomatoes, they are sensitive to cold weather and should be set out from plants after all danger of frost in the spring. Space the plants 1 ½ feet apart in rows at least 3 feet apart. When ripe, the small fruit can be used in pies or jams or dried in sugar and used like raisins.

Q. I have the best tomato crop I have ever had, but the large tomatoes are falling off the vines. Even the ones that stay on the vine are jarred off easily. What is the problem?

- A. Cool fall temperatures cause the abscission zone—the area where the tomato is attached to the plant—to weaken. The heavy fruit then falls. Gather fallen tomatoes as soon as possible, wipe them clean, and store them in a warm place to ripen. These aborted tomatoes will rot if left on the ground.

Q. I have large translucent areas on my tomato fruit. What's going on?

- A. This is an environmental problem. The translucent areas are sun scalds. Heat from direct, intense sunlight destroys the color pigment of the tomato. This damage does not make the tomato inedible.

Q. Can I propagate tomatoes for the fall garden from existing vines?

- A. If necessary, use suckers or layering (cover with soil until roots appear) of the existing vines. Do this several weeks before the recommend transplanting date for fall tomatoes, and use early tomato varieties.

Q. Can spring-planted tomatoes be cut back in late summer or early fall to renew growth and continue production until the first killing frost?

- A. This can be done in some areas of Texas, especially in the central and southern parts. However, the plants must be healthy and have no insect problems. Trying to carry an unhealthy plant through the summer into the fall usually means disaster. If the plants are cut back, avoid removing too much of the foliage since hot weather can burn the plants to death. After pruning, apply additional fertilizer and water to renew growth and increase tomato production well into the fall.

Q. How do you tell whether a green tomato harvested early to prevent freeze damage will ever turn red and ripen?

- A. This can be done easily with a sharp kitchen knife. Harvest a tomato typical of most of the green tomatoes on your plants. Look at size, but pay particular attention to fruit color. Slice through the center of the tomato. Closely examine the seed within the fruit. If the seeds are covered with a clear gel that causes them to move away from the knife, then that fruit will eventually turn red and ripen. If the seeds are cut by the knife, those fruit will never ripen properly. Compare the color and size of the tested fruit when harvesting tomatoes on your plants to determine which ones will eventually ripen and turn red.

Q. Is a tomato a fruit or a vegetable?

- A. The tomato was legally declared a vegetable by the Supreme Court of the United States. A vegetable is an herbaceous (non-woody) plant or plant part that can be eaten without processing and is usually consumed with the main meal.

Diseases

Q. The foliage on my tomatoes is infected by irregularly shaped spots that cause leaves to turn yellow and drop off. This occurs in all seasons and on the top as well as the bottom leaves.

- A. Several types of leaf spots will attack tomatoes. Septoria leaf spot is seen quite often in Texas. It can be controlled with a combination of maneb and benomyl. Begin the spray program early in the life of the plant. Apply maneb every 7 to 10 days, adding benomyl every second spray (14 to 20 days) if humidity is high or rain and dew cause wet foliage.

Q. The leaves on my tomato plants are distorted. Why?

- A. This is called tobacco mosaic virus. If the virus is severe, remove the plants to prevent its spread to other plants. Working around the infected plants can spread the virus to healthy plants nearby. Many viruses are transmitted by insects, so carry out a good insect control program on tomatoes.

Q. My tomato plants are stunted and have pale yellow foliage. The roots have knots or swellings.

- A. These are root knot nematodes. Varieties such as Bigset, Bonus, Better Boy and Small Fry resist this problem. It is best to use only nematode-resistant varieties. Nematode resistance is indicated by the letter N after the name (Example: Bigset VFN).

Q. My tomatoes were healthy during the spring and early summer, but after a recent rain they wilted and died very rapidly. I found a white fungal growth at the base of the plant.

- A. This is southern blight. It is a soilborne fungus that lives on organic material in the soil. Terachlor, used as a preplant treatment, will reduce this problem, as will burying undecomposed organic material deeply in the soil and rotating crops. Control foliage diseases on tomato

plants, because the fallen leaves around the base of the plant will feed the fungus and cause it to build up in this area and damage plants later. Crop rotation will also reduce southern blight.

Q. My tomato plants wilted rapidly. When I cut the stem open, I found a brown ring around the inside.

- A. This is Fusarium wilt. It is a soilborne fungus that attacks tomatoes and other crops. It is controlled only through the use of resistant varieties. Most commercial tomato varieties are resistant to Fusarium wilt. This resistance is denoted by the letter F after the name—Example: Bigset VFN.

Q. What do the letters “VFN” associated with particular tomato varieties indicate?

- A. VFN indicates the tomato variety is resistant to three types of diseases—Verticillium wilt, Fusarium wilt, and nematodes. Many of the new hybrid varieties are VFN types. Home gardeners should always plant disease-resistant varieties if possible.

Q. The lower foliage on my tomatoes is beginning to turn yellow and drop. The leaves have circular, dark brown to black spots.

- A. This is Alternaria leaf spot or early blight. It is a common problem on tomatoes and causes defoliation, usually during very rainy periods. Plant tomatoes in a raised bed to improve water drainage. Space plants far enough apart so air can move through the foliage and dry it. Follow a spray program using maneb, captan or daconil beginning when the fruit is set and continuing at 1- to 2-week intervals until harvest.

Insects

Q. My tomatoes have small yellow specks on the surface. Those yellow specks form a tough spot that must be cut off before eating the tomatoes. What’s wrong?

- A. The yellow speckling is caused by sucking insects such as stinkbugs or leaf footed bugs. Control these sucking insects early in the season.

Q. There are some small holes near the stem ends of our tomatoes. When we cut them open, there is a small worm inside. What is it and what can we do?

- A. You have been invaded by the tomato pinworm. They usually do not damage all fruit and can be controlled only by a preventive insecticide spray every 7 to 10 days. When the damage is evident, it is too late to do anything about it.

Q. What causes my tomato leaves to turn yellowish and fall off?

- A. Many conditions may cause these symptoms, including spider mites, diseases, and nutrient deficiencies. Examine the undersides of the leaves for small red to greenish mites. If mites are found, treat with Kelthane®, malathion or sulfur dust. Make two to three applications at 5-day intervals for best results.

TURNIP



General

Q. What causes turnips to fail to make large roots

A. Like radishes and other bulbing crops, crowded turnips will not enlarge. Turnips also require a moderately fertile soil and adequate moisture to grow large, fleshy roots. For good size bulbs, space turnips 2 to 3 inches apart. Plant in the spring as soon as the ground can be worked. For a fall crop, plant when daytime temperatures average below 80 degrees F. In many areas of Texas, planting can begin in early fall and continue until about 5 to 6 weeks before maximum daytime temperatures average 80 degrees F.

Q. Are some turnip varieties grown just for the tops and not for their enlarged roots?

A. Yes. The varieties Crawford and Shogoin are grown primarily for their tops and usually do not make large, high-quality roots.

Q. What causes my turnip greens to have a bitter and pungent flavor?

A. Conditions that stress the plant or cause it to grow slowly often cause the leaves to have a bitter off-flavor. This can happen when turnip leaves mature in hot weather and growing conditions are unfavorable.

Q. My plants appear to be stunted and have small, round galls on the roots.

A. The problem is root knot nematodes. They are controlled by crop rotation and summer fallowing.

Q. My turnip roots are black in the center.

A. This is most often the result of boron deficiency. To determine the exact problem, send a soil sample to the Soil Testing Laboratory at Texas A&M University or to the laboratory supporting your area.

Refer to mustard for other diseases associated with turnips.

Insects

Q. How do you control aphids or plant lice on turnips?

A. Aphids can be controlled easily with an insecticide such as malathion. Begin applications the first time you observe the insects and repeat periodically.

WATERMELON



General

Q. Do watermelons readily cross with other vine crops, resulting in off-flavor and poor-quality fruit?

- A. Watermelon varieties do cross with each other and with the wild citron, but crossing will not be apparent unless seeds are saved to plant another year. Watermelons will not cross with cantaloupes, cucumbers, pumpkins, squash or Cushaw. Off-flavor or oddly shaped fruit is generally caused by growing conditions and not cross-pollination.

Q. What determines the sweet flavor of watermelons?

- A. There are differences in sugar content from one variety of watermelon to another. The sweeter varieties include Crimson Sweet, Dixilee, and the old variety Black Diamond (if harvested at the proper stage of maturity). Excessive moisture, caused by late irrigations or rainfall near maturity of the watermelon, results in poor flavor.

Q. How can you tell when a watermelon is ripe?

- A. Determining ripeness in watermelons is difficult. The area touching the soil, or the belly of the fruit, turns from a light grass green color to a cream color as the fruit ripens. Thumping is used to check ripeness, but the results will vary. Generally, a solid sound indicates ripeness, while a sharp echoing sound indicates a greener fruit. The dark green fruits such as Black Diamond will develop a duller color as they mature. The tendrils that connect the fruit to the vine will dry as the melons mature. If the tendril closest to the fruit is dry and brown, the fruit is probably mature.

Q. What causes watermelon plants to fail to set fruit?

- A. Poor fruit set in watermelons is usually caused by poor pollination. The watermelon plant produces male and female blooms and needs bees to transfer the pollen from the male to female bloom. So poor fruit set occurs if there are no bees for pollination or if cool, wet weather slows bee activity during bloom.

Q. What causes the end of the watermelon fruit to turn black and rot?

- A. Watermelon are affected by blossom end rot just as tomatoes are. In general, this condition occurs during dry periods when the plant's roots can't get enough water to replace that lost by the plant. The result is desiccation and blackening of the blossom end of the fruit. You can prevent blossom end rot by giving plants adequate moisture, especially as the fruit is maturing.

Q. Are there really seedless varieties of watermelons?

- A. Yes, several hybrid varieties of watermelons produce seedless or nearly seedless fruit. One is Tri-X 313. Since the seeds of this variety are relatively weak, start them indoors in a warm area. When setting the plants out in the garden, also plant a few seeds of a standard variety because they provide pollen for fruit set. Transplant before the first true leaves form.

Diseases

Q. As my watermelons begin to set fruit, the leaves around the crown of the plant develop necrotic lesions and die rapidly.

- A. A number of foliage diseases can cause this condition. The most common one is downy mildew. Alternaria and anthracnose cause similar lesions. Control these diseases with Bravo® or

maneb fungicide. Begin applications at the first sign of the disease and continue at 7- to 14-day intervals as long as weather conditions favor disease development.

Q. As my watermelon plants began to grow, the stem near the crown cracks and oozes an amber colored liquid. Soon after this the plants die.

A. This is gummy stem blight. It is a soilborne fungus that attacks watermelons and other vine crops such as cantaloupes and cucumbers. Spray with a fungicide labeled for this disease. Also rotate crops to decrease this problem.

Q. My watermelon plants grew vigorously. There was a slight twisting at the stem end, and the leaves were distorted. Fruit was either not formed or was distorted on these plants.

A. This is watermelon mosaic. It is transmitted by aphids and can be partially prevented by spraying the plants regularly to control aphids. Once the plant becomes infected with the virus, there is no control. Early planting will decrease this problem.

Q. My watermelons were growing and doing well but suddenly began to wilt and died soon after. I found the stems have a tan ring on the inside.

A. This is Fusarium wilt of watermelon, a soilborne disease. Planting resistant varieties such as Charleston Gray and Jubilee will reduce this problem. There are other wilt-resistant varieties, but consult seed catalogs before planting varieties other than the two mentioned. There is no chemical control for this disease.

Insects

Watermelons have the same insect problems as cantaloupe.

MINOR CROPS

BRUSSELS SPROUTS



Q. When do I plant Brussels sprouts for maximum production?

A. Brussels sprouts are sensitive to temperature and generally produce best when daytime temperatures average about 65 degrees F or less. Consequently, in most areas of Texas Brussels sprouts grow best when planted in mid to late summer for late fall or early winter harvesting.

Q. Should you pinch or cut the tops out of Brussels sprout plants to make them produce more?

A. This is up to you. Pinching or removing the growing point of the plant will hasten the development of the sprouts, resulting in earlier harvest, but it reduces the yield by about one-third. If you expect temperatures to drop much below 20 degrees F, which might kill the plants, pinching out the tops in early fall will probably increase harvestable yield.

Q. Why do my Brussels sprouts fail to make firm, good-sized sprouts?

A. They were probably planted at the wrong time of the year. Brussels sprouts grow best when they mature in relatively cool weather. For firm, good-quality sprouts, plant about 120 days before the first expected hard, killing frost in the fall.

Q. Can the leaves of Brussels sprouts be eaten?

A. Yes. They are prepared much like collards. Harvest only the young, tender leaves as mature leaves often have an off-flavor.

CELERY



Q. Can celery be grown successfully in Texas gardens?

A. Yes, under the proper growing conditions. Celery does best in cool weather when nighttime temperatures are about 50 degrees F and average daytime temperatures are 60 to 70 degrees F. Since celery requires these conditions for as long as 5 to 6 months, the optimum planting time is mid to late summer, with harvesting in early winter. Prolonged periods of cold during early growth or excessively high temperatures near maturity will start the formation of a seed stalk. In the northern parts of Texas, set out celery transplants early to avoid damage from low temperatures. In southern Texas, seed or transplant in late fall for harvest during midwinter.

Q. Will freezing weather kill or damage celery?

A. Yes. Young celery plants can be damaged by near freezing temperatures. Plants at or near maturity can withstand frost or freezes, although temperatures much below 30 degrees F can kill or damage them.

Q. What causes the stout and often bitter flavor of celery?

A. Improper environmental conditions, primarily high temperatures at maturity and stress conditions such as drought or low fertility, can cause off-flavored celery. For best quality, celery must be grown under suitable environmental conditions and have constant moisture.

Q. What is meant by blanching celery?

A. Blanched celery lacks green color. Blanched celery is less popular and the self-blanching varieties are difficult to locate. Most gardeners prefer green celery because it is more nutritious. Green varieties can be blanched if light is blocked from the plant. You can do this by placing strong paper or boards all around the plants or by loosely wrapping individual plants with paper 2 to 3 weeks before harvesting.

Q. The foliage on my celery plants is marked by reddish-brown lesions.

A. This is leaf blight, caused by several fungi. *Cercospora* seems to be the primary fungus involved. It can be controlled with foliar sprays of maneb or captan. Begin applications at the first sign of the disease and continue at 10- to 14-day intervals.

Q. I plant celery seed, but they won't grow. Then when it is too late in the season, many of the seeds come up. How can I get the seed to grow at the right time?

A. Soil temperatures must be between 60 and 70 degrees F during the daytime and 60 degrees F or lower at night. Adequate and constant moisture also is necessary for seed germination.

CELERIAC

Q. What is celeriac?

A. Celeriac, also called turnip rooted celery or knob celery, is grown for its globular root, which has a celery-like flavor. It is usually about 4 inches in diameter at maturity.

Q. Can celeriac be grown in Texas?

A. If you can grow celery in your garden, you can grow celeriac. It requires approximately 200 days from seeding to maturity, although the root is edible at any earlier stage.

Q. How do you use celeriac?

A. Leaves can be harvested from celeriac at any time. Pull up the roots to use when desired, usually when they are about the size of a baseball. The root must be peeled before use. Celeriac is usually eaten cooked rather than raw.

CHIVES

Q. What are chives?

A. Chives are a hardy relative of the onion. They produce numerous thin, hollow leaves 6 to 10 inches long. In late spring or early summer they have lavender blossoms. They are classed as perennials, but are not evergreen perennials.

Q. When planting chives do I use seeds or plants?

A. Either. If you plant clumps or plants you can start harvesting within 2 months. Plants started from seed need about 90 days before first harvest.

Q. Do chives require any special care for maximum production?

A. You must harvest the leaves constantly to keep the plants healthy and vigorous. Every third year, dig and divide the clumps and plant them in another part of the garden. They are easy to grow in gardens and do exceptionally well in containers.

DANDELION

Q. Is there any secret to growing dandelion in Texas gardens?

- A. Treat dandelion as you would lettuce. Plant in midsummer for a fall crop. Dandelion is a perennial and can become a problem in gardens if allowed to grow unchecked.

Q. How is dandelion harvested and used?

- A. Dandelion has an extremely high iron and Vitamin A content. The young, tender leaves are used fresh from the garden in salads or often served with hot bacon drippings, vinegar and crumpled bacon crisps.

DILL

Q. Are there any particular problems with growing dill in Texas?

- A. Dill should be seeded in the spring. Plant in full sun and in well-drained soil. The plants will grow extremely large in some areas and should be supported. Dill is relatively free of problems. An occasional dill worm may appear, but can be controlled easily with *Bacillus* insecticides.

Q. When do you harvest dill and how is it used?

- A. Harvest the leaves as soon as the flowers begin to open. Harvest seeds when they are brown and flat, which indicates ripeness. The leaves are often used in tartar sauce or butter sauce, and in pickled beets, potato salad, and tossed green salads. The seeds are used in cheese, breads and rolls. They are also widely used in pickles, sauerkraut and beef dishes.

ENDIVE

Q. What is endive?

- A. Endive, also called curly endive, looks like lettuce. Endive has slender leaves with wavy edges, while escarole, which also looks like lettuce, has broad, flat leaves. Both form a flat rosette of leaves up to 18 inches across when mature. Their flavor is somewhat sharper than lettuce.

Q. How do you grow endive and escarole?

- A. Endive and escarole are grown in the same way as lettuce, but will do best when grown for fall or winter harvest in most areas of Texas. Both will withstand considerable cold, but in areas where temperatures fall below 25 degrees F they should be planted early enough to mature before then. In the southern parts of the state, plant in early fall for harvesting throughout the winter and early spring.

GARLIC

Q. After harvest, my garlic often deteriorates before I can use it. How can I prevent this?

- A. Dry garlic thoroughly after it is harvested and hang it up in a well-ventilated area to prevent rot. Do not expose it to extremely high or low temperatures after harvest. Store garlic at room temperature, about 75 degrees F.

HORSERADISH

Q. How is horseradish planted and grown?

- A. Horseradish will do well in all areas of Texas and is grown from root cuttings. Plant the root cuttings with the small end down and the large end 2 to 3 inches below the soil surface. Plant in the spring and harvest the horseradish in late fall.

Q. How long does it take horseradish to mature

- A. Horseradish is planted in the spring for harvesting in late fall. Connoisseurs of horseradish recommend digging the plants each fall so they won't get out of control and take over the garden. Most agree this improves the quality of the horseradish.

JERUSALEM ARTICHOKE

Q. Does Jerusalem artichoke do well in Texas?

- A. Definitely. The Jerusalem artichoke is a hardy, tuber-bearing member of the sunflower family that grows extremely well in all areas of Texas. Plant whole or cut pieces of the tubers, much like potatoes. They should be planted in rows 3 feet apart with the final spacing 15 to 18 inches apart in the row. Unharvested tubers left in the soil to overwinter will grow new plants in the spring. If left unchecked, Jerusalem artichokes may become undesirable weeds and take over the garden.

Q. When are Jerusalem artichokes ready to be harvested?

- A. Jerusalem artichokes planted in the spring are generally ready during the fall. Harvest them after heavy frost in the fall or before new growth begins in the early spring. The tubers are crisper and sweeter if left in the soil until early spring.

Q. Is it true that Jerusalem artichokes are a good source of inulin?

- A. Yes, the carbohydrate inulin is found in Jerusalem artichoke tubers. Inulin has several health benefits.

KOHLRABI

Q. What is kohlrabi and how is it grown?

- A. Kohlrabi is a member of the cabbage family grown for the swollen, turnip-shaped portion of the stem that rests on the ground. This edible portion can be white, purple or green with a creamy white interior. Kohlrabi is eaten raw in salads or can be cooked like a turnip.

Q. Does kohlrabi require any special cultural conditions to grow in Texas?

- A. Kohlrabi can be grown anywhere that turnips can be produced. It does best in cool weather with abundant moisture to prevent the edible portion from becoming tough and woody. Kohlrabi requires 50 to 65 days from seed to maturity and should be harvested when slightly larger than a golf ball.

LEEKS



Q. How are leeks different from onions and garlic?

- A. The leek is a member of the onion family, but is milder than either onions or garlic and does not form bulbs or produce cloves. Instead, it develops an edible round stem that is 6 to 10 inches long and as much as 2 inches in diameter. The leek has leaves very similar to garlic. They are flat rather than round and hollow like onion leaves.

Q. How and when should leeks be planted and how do you know when they are ready for harvesting?

- A. Leeks may be grown from seeds or transplants, much the same as onions. They require about 120 days from seed to maturity. In North Texas they should be set out as transplants in early spring to be ready to harvest by midsummer. In Central and South Texas they do best when seeded or transplanted in late summer or early fall for harvesting during early winter. Leeks mature best when the average temperature is below 75 degrees F. Both the leaves and stems of leeks may be eaten. Begin harvesting leaves when they reach sufficient size. Harvesting too many of the leaves early may affect the growth of the stalk.

PARSLEY



Q. When should parsley be planted?

- A. Parsley requires 70 to 90 days from seed to a harvestable plant. Plant in the late fall for winter harvest or in late winter for spring and early summer harvest.

Q. Can a single planting of parsley be harvested for more than 1 year?

- A. Yes. Parsley is a biennial, which means it grows a plant the first year and sends up a seed stalk or flowers the second year. When a flower stalk begins growing, remove it and continue harvesting the mature leaves. If protected from excessively hot or cold temperatures, parsley can be harvested well into the second year. If temperatures remain above 90 degrees F for a long time, parsley will not grow well and may die. Parsley is cold hardy and can overwinter in most areas of Texas. If planted too early in the spring, cold temperatures may cause it to send up a flower stalk during its first season of growth.

PARSNIP

Q. What are parsnips?

A. Parsnips are commonly grown in Europe and in many northern areas of the U.S., but are not a popular garden vegetable in Texas. They are grown for their delicate tasting, carrot-like roots, which can grow up to 15 inches long and 3 to 4 inches across at the top. The plants are biennials but are grown as annuals and should be harvested before the second year's leaves start to grow.

Q. Can they be grown in Texas?

A. Yes. Plant parsnips in late summer or early fall in Texas so they will mature during cold weather. The roots take 100 to 120 days from seed to maturity and must be subjected to near freezing temperatures to change the starch to sugar and give the parsnip its flavor. Parsnip roots may be left in the ground all winter or dug out in late fall and stored in the refrigerator. Gardeners who have had experience with parsnips say the flavor is enhanced if the roots are left in the ground throughout the winter.

Q. How are parsnips used?

A. Parsnips can be parboiled or steamed in their skins, then peeled and sliced lengthwise. One popular way of preparing parsnips is to pan glaze them with butter and a touch of brown sugar and nutmeg. They taste much like candied sweet potatoes. Another method is to puree boiled parsnips, blend in butter and cream, and top with breadcrumbs.

PEA (ENGLISH OR SUGARPOD)

Q. The last time I grew English peas, the foliage became covered with a white, powdery material.

A. This was powdery mildew, a serious problem on English and sugarpod peas. Sulfur is the only material approved for the control of this disease. Repeated applications will be required to control the mildew.

Q. What are sugar snap peas?

A. Sugar snaps are a variety of edible, podded English peas that do well in most areas of Texas, especially in the spring.

Q. Why won't my peas yield?

A. Soil alkalinity, planting too late, hot weather, or planting the wrong variety are all possible causes.

RHUBARB

Q. Can rhubarb be successfully grown in Texas?

- A. Unfortunately, rhubarb will not do well in Texas. Rhubarb, a cold-resistant perennial, thrives where maximum daytime temperatures average no more than 90 degrees F. In most areas of Texas it will produce only thin leaf stalks that lack color.

SWISS CHARD

Q. When should Swiss chard be planted in my garden?

- A. Since Swiss chard is a close relative of beets, plant it the same time you do beets. Generally, seeds should be planted 2 to 3 weeks before the average last killing frost date in the spring. In all but the northern parts of Texas, seed can be sown for harvesting through the winter and most of the following year. Swiss chard is unusual in that often a single planting can be harvested for well over a year or perhaps into the second year if the flower stalks are removed as they develop.

Q. How should Swiss chard be harvested?

- A. Swiss chard is grown for its tender, vitamin-enriched leaves. The plants grow 1 to 2 feet tall and the crinkled leaves have prominent central ribs. When harvesting, cut the leaves at the base of the plant with a sharp knife. The undisturbed inner leaves should continue to grow and be ready for picking in a few days. Pick and discard any old leaves. If they remain on the plant, they will decrease production.

Q. How is Swiss chard used?

- A. Both the leaves and the central leaf ribs are consumed. These ribs can be cut from the rest of the leaves and cooked and served like asparagus. The remainder of the leaf is eaten as greens. The stalks can be cut into 2- to 3-inch lengths and simmered in boiling, salted water until tender. They are generally served with butter and a touch of wine and vinegar. The leaves should be chopped coarsely and cooked quickly in just the water that clings to them. They are often prepared with butter and salt. A popular recipe for Swiss chard involves serving the cooked greens in hot bacon and wine/vinegar dressing sprinkled with shredded hard-boiled eggs.

HERBS

Anise is a slow-growing annual that flowers about 3 months after planting. It grows to a height of about 2 feet and produces yellowish-white flowers in umbrella-like clusters. It will grow best in a deep, fertile soil in a sunny, warm location. It should be planted 6 to 10 inches apart in rows 2 to 3 feet apart. This herb is grown for its seeds, which are ready for harvest about a month after bloom. The licorice-flavored seed is widely used in breads and cookies.

Basil is an annual that grows about 2 feet tall and has leafy, light green foliage. It produces tiny white flowers often tinged in lavender. This is an easy herb to grow. Plant it in the spring after

the last frost or sow it indoors and transplant it into the garden. It grows best in full sun. Prune or pinch off the stem tips for a bushier, more compact plant. Do not over fertilize as this may reduce the desired flavor. This herb is grown for its leaves, which are best harvested before or during blooming. The leaves may be preserved by freezing.

Borage is an attractive annual that may grow to be 3 feet tall. Its leaves are gray-green and it produces bright blue star-shaped flowers. Seed it in the garden because it is difficult to transplant. It grows best in full sun but does fairly well in partial shade. This herb is grown for its leaves, which should be harvested before the plant flowers.

Caraway is a biennial that produces seeds the second year. The first year it grows 12 to 15 inches tall and produces bright green, carrot-like leaves. It will die back in the winter but comes back in the spring and grows to a height of about 2 feet. At bloom, it produces clusters of greenish-white flowers. Harvest the seeds about 1 month after flowering. After flowering, the plant dies. In Texas, this herb should be seeded in early fall, allowed to freeze and go dormant, and then produce seed the following summer. It is difficult to grow in South Texas and along the coast.

Chervil is an annual that does well in flowering borders and makes attractive potted plants. It grows to a height of 2 feet and produces green fern-like leaves resembling parsley. It produces tiny white flowers in umbrella-like clusters. This herb prefers partial shade and a slightly moist soil at all times. Plant it in early spring and thin the plants to 3 to 4 inches apart. The leaves for which this herb is grown should be picked before the buds break and flower.

Coriander is a fast-growing annual that reaches a height of about 2 ½ feet. It is easy to grow and should be seeded in place. The plants should be thinned to 7 to 10 inches apart. It prefers sun but will do fairly well in partial shade. This herb is grown for both its seed and leaves. The leaves can be harvested when the plants are 4 to 6 inches tall. Gather the seeds as they ripen. Coriander is widely used in many Mexican dishes and is commonly known as cilantro. It is used extensively in the manufacture of sausage.

Common fennel or **sweet fennel** is a perennial that won't survive winters in North Texas. It is most often grown as an annual and can reach a height of 3 to 8 feet. It should be seeded in place, in full sun, on rows 3 feet apart with plants 10 to 12 inches apart. All the parts of this plant may be used. Harvest the stems before the flowers bloom and the leaves when flowers start to bloom. Seeds turn brown when ripe and can be dried for later use.

Marjoram produces an attractive, bushy plant 1 to 2 feet tall. It can be used in borders or as a container plant. It produces small leaves that are light green on top and gray underneath. Except in extreme South Texas, it should be grown as an annual although it is actually a perennial. Start seed indoors and set transplants out after the last killing frost. This herb is grown for its leaves, which should be harvested just before the plant blooms for full flavor.

Mints of many different kinds are grown in Texas, including spearmint, peppermint and orange mint. All are hardy perennials and are among the easiest and most popular garden mints. They may be started from seed, but cuttings are recommended. Mints prefer sun but will withstand

shade. Though they are perennials, mint beds should be renewed every 3 to 4 years. Mints are harvested for their stems and leaves and the more frequent the harvest the better the plant grows. Remove stalks before they go to seed.

Oregano is a hardy perennial and does well in containers. It produces a leafy, shrub-like plant 2 to 2 ½ feet tall. It has broad leaves and pale pink flowers in loose clusters or short spikes. Plant oregano in full sun and well-drained soil. Space plants at least 10 to 12 inches apart. Cutting back the flowers will stimulate foliage growth. Although this plant is a perennial, it should be dug and replanted when the plants become woody, usually in 3 to 4 years. Oregano is grown for its leaves, which can be used at any stage of growth.

Rosemary is a hardy evergreen shrub in most areas of Texas, but it will die if the temperature drops below about 10 degrees F. It normally grows 4 to 6 feet tall and produces gray-green foliage and pale blue flowers. It grows best in dry, sunny areas.

Sage is a shrub-like perennial that grows 1 to 2 feet tall. This herb will do best if started indoors and transplanted to the garden or flower bed. Place in a well-drained, sunny area. Space plants at least 2 to 2 ½ feet apart because of their bush-like growth. The plants eventually become woody and should be replaced with new plants every 3 to 4 years. This herb, grown for its leaves, should be harvested before bloom. Sage is difficult to grow in South Texas and in coastal areas.

Savory, commonly grown in Texas, includes summer savory and winter savory. Summer savory is an annual that may grow to 1 ½ feet high. It has erect, branching stems and gray-green leaves. Winter savory is a shrub-like perennial that grows to about 1 foot tall. Both plants should be placed in sunny, dry areas. Both herbs are grown for their leaves, which should be gathered before blooming begins.

Sesame, an annual, grows 3 feet high and produces attractive green leaves and pale orchid flowers from midsummer to early fall. It should be planted in sunny areas and spaced 8 to 10 inches apart. Sesame is grown for its seeds, which ripen about a month after flowers bloom.

Tarragon is an attractive plant that grows about 2 feet tall. It produces fine, dark green leaves with small, whitish-green flowers in tight clusters. It is a perennial grown from cuttings or divisions and does well in partial shade. In northern Texas, the roots should be covered with mulch. New plantings should be made every 3 to 4 years. The leaves for which this herb is grown are most flavorful when picked before the plant blooms or just as blooming occurs.

Thyme is a perennial, shrub-like plant about 1 foot tall. It produces purple flowers and gray-green leaves. Thyme grows best in dry soil with abundant sunlight. Space plants 12 inches apart. Constant harvesting prevents the plants from becoming woody, although they should be renewed every 3 to 4 years. Harvest by clipping the tops when the plants are in full bloom.

NON-CROP

Q. I have been scattering ashes from the fireplace around fruit trees and in my garden, but am worried that I may have used too much. How much should I use?

A. Wood ash contains very small amounts of mineral elements and is very alkaline. Soils in many areas of Texas are alkaline and do not need to become more alkaline. Applying small amounts of wood ash is not harmful to acid soils, but avoid excess.

Q. Why shouldn't we save seed from hybrid tomatoes, peppers, eggplant, etc.?

A. The definition of a hybrid is "the offspring of plants of different genotypes, varieties, species or genera." Hybrid seeds you purchase are the result of a controlled cross-breeding process. The process produce plants with certain desirable characteristics such as disease resistance, nematode resistance, large fruit, early ripeness, etc. Seed produced by the fruit of a hybrid plant may or may not possess the same characteristics as the hybrid. Purchasing new seed or plants each year ensures that plants will have those desirable characteristics.

Q. I have heard many people talk about washing frost off plant leaves to protect them. Is this a good technique?

A. Frozen plant cells shatter when warm faucet water strikes them. The best way to prevent cell damage after a light freeze is to slowly thaw these cells. Cover plants with a sheet or blanket to shield them from the sun's warming rays, which would do the same harm as faucet water. Remember, survival is possible only after a light frost or freeze; after a hard cold spell this technique will not save plants.

Q. How important is variety selection with regard to canning and freezing vegetables such as tomatoes, cucumbers and beans?

A. The most important thing when preserving garden vegetables is to use top quality produce. Select high-yielding, disease-resistant varieties recommended for your area. Preserve only good produce for later consumption.

Q. What is a good way to keep seed left over from this year's garden?

A. Leave seed in the original packets or labeled envelopes and place it in an airtight container such as a wide-mouthed jar. For long-term storage, securely wrap 2 tablespoons of powdered milk in tissue paper and place it in the bottom of the jar. The powdered milk acts as a desiccant and lengthens the storage life of garden seed. Keep the jar in the refrigerator until the next gardening season.

Q. Are dead grass clippings from dethatching the lawn good for mulching my garden?

A. Yes, but be sure they are dead. Otherwise, you'll be sprigging your garden with grass. Clippings make an excellent mulching material. Since this grass is in small, chopped pieces, it will break down easily. Remember that when you use any organic mulch you must apply nitrates in

the form of extra fertilizer or manure to feed the fungi responsible for decomposition. Otherwise, they will rob it from your soil and growing vegetables.

Q. I have heard that some leaves poison the soil. I have an abundance of pecan leaves and would like to use them for compost. Are pecan leaves harmful?

- A. Pecan leaves should not damage a garden. In fact, these leaves are recommended as mulch because they are fibrous and decompose slowly. Pecan leaves contain tannic acid, which may be the reason some people have the idea they are damaging. When tannic acid reacts with alkaline soil, a neutral organic salt, called calcium tannate, is formed. But this compound is not detrimental. Mix other types of organic matter or leaves with pecan leaves rather than making a compost of pure pecan leaves.

Q. Can I use sawdust as a mulch? I know extra nitrogen must be added, but should I expect any other problems?

- A. Yes, extra nitrogen in small, constant doses is required. If you use pure sawdust, it can cake and form an impenetrable barrier to water. Water slowly and check the depth of penetration after watering.

Q. Our garden failed last year. We think our soil must be worn out and want to haul in some more. What type should be used?

- A. First of all, your soil is not worn out. Some farms have been cropped continuously for many years. The addition of organic matter (crop residue, grass clippings, leaves) and proper fertilization keeps any soil healthy. Also make sure you don't work your soil when it's too wet because that will damage the soil's structure.

Q. My fall-planted okra and tomatoes are beautiful and full of fruit. However, one end of my okra row and a few of my tomato plants are small and sickly. Is this a lack of water?

- A. It may be lack of water, but it's more likely that you have nematodes. Check for swellings on the roots of slow-growing, nonproductive plants. If you do have nematodes, remove the existing crop and practice crop rotation.

Q. Is it true that organically grown vegetables are better and more nutritious?

- A. Research has not shown that organically fertilized vegetables are more nutritious than those grown with chemical fertilizers. Both kinds of fertilizer supply the same plant nutrients, which must be in an ionic form before they can be absorbed by the roots. When plants are given equal amounts of organic or chemical fertilizers, the nutritional composition of the produce will be exactly the same. The wonderful flavor we enjoy from garden vegetables results from freshness and a timely harvest.

Q. How long can I expect garden seeds left from this fall and stored in a sealed jar to keep?

- A. The life span of seeds varies from a few weeks to several hundred years, depending on the kind of vegetable and how they are stored. Most vegetable seeds will last 3 to 15 years if properly

stored in a cool, dry place. Seeds of some vegetables live longer than seeds of other vegetables. The following groupings can be made:

Group A Short-lived	Group B Medium-lived	Group C Long-lived
Onions	Beans	Cucumbers
Corn	Carrots	Turnips
Okra	Peas	Watermelon
Parsnips	Tomatoes	Eggplant

Q. I would like to grow my own mushrooms at home. Is this feasible or practical in Texas?

- A. The production requirements for mushrooms are so exacting and require such controlled conditions that home production would probably be very disappointing. You may find mushroom-growing kits for sale at some nurseries or garden centers and through seed catalogs. These kits will introduce you to mushroom production, but they provide too few mushrooms to be useful for most families.

Q. What insects will marigolds repel from my garden?

- A. Marigolds do not repel insects or prevent insect damage. They probably get this reputation because they are not a host for root knot nematodes, one of the most serious pests in gardening. However, marigolds are one of the preferred hosts for spider mites. Planting marigolds in the garden will not control nematodes but will invite spider mite problems. This is an invitation to disaster because spider mites are difficult to control and can become almost as serious a problem as nematodes.

Q. Are the varieties of mushrooms that come up periodically in my yard edible?

- A. Several species of wild mushrooms in Texas are edible, and some are of excellent quality. However, many others are highly poisonous, so you should never eat wild mushrooms. To be safe, eat only mushrooms purchased at a store.

Q. When is compost ready to be used?

- A. Most materials need several months to become properly composted. If kept moist, a good compost mixture started in early spring should be ready to use as a mulch or turned into the soil by early fall. However, this depends on how the compost pile is handled, whether it is located in the sun or shade, and how often it is turned. A properly prepared compost pile should reach an internal temperature of 160 degrees F within a matter of weeks. Under these conditions, the organic material will be usable in 2 or 3 months.

Q. What is meant by biennial, and which vegetables are classed as biennials?

- A. Biennial vegetables normally require 2 years from seed to flowering. Biennial vegetables include beets, Brussels sprouts, cabbage, carrots, cauliflower, celery, chard, collard, endive,

kale, kohlrabi, leeks, onion, parsley, parsnip, rutabaga, salsify and turnip. Remember that if young biennial plants are subjected to cold weather early during their growth, they may produce seed the first season.

Q. What are the best temperature and humidity conditions for storing surplus vegetables from my home garden?

- A. Vegetables need different temperatures and humidity during storage. The root crops and cabbage need a cold temperature, 32 to 35 degrees F, plus high humidity and moderate ventilation. Root crops can be stored in a cold place in polyethylene bags or in boxes with a few holes for ventilation. Potatoes need a moderately cool temperature of 40 to 45 degrees F and a moist atmosphere, while onions need a cold temperature of 32 to 35 degrees F, dry humidity, and plenty of air movement. Pumpkins and squash need a moderately cool temperature of 50 to 55 degrees F and a moderately dry atmosphere. Consult other garden publications for ideal storage conditions for individual vegetables.

Q. Should the rows in my vegetable garden run east and west or north and south, or does it make a difference?

- A. The slope of the land determines which way the rows run in your garden. Wherever the garden soil is not level, rows should run across the slope to reduce soil washing and erosion. Otherwise, the direction of garden rows is not important.

Q. What are the advantages of adding organic matter to my garden soil?

- A. Organic matter worked into the garden soil will improve soil texture, make the soil easier to work, increase the water-holding capacity of sandy soils, supply plant nutrients, improve conditions for beneficial organisms such as earthworms, slow nutrient leaching, and increase water movement and drainage through the soil.

Q. What is organic gardening?

- A. Organic gardening is the production of vegetables without synthetic fertilizers or pesticides. Rather than adding synthetic fertilizer, soils are enriched with lots of organic matter in the form of animal manure, crop residue, and compost. Supplementary mineral elements are those from natural deposits. Diseases, insects, nematodes and weeds are controlled by planting resistant varieties and using other biological or cultural control practices, or with naturally occurring pesticides obtained from plants.

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