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TEXAS A&M AGRILIFE EXTENSION

Fall Vegetable Gardening Guide

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Most gardeners plant their vegetables in the spring to harvest in late spring to early summer. In most areas of Texas, it is possible to have a fall vegetable garden also, but it will need to be managed somewhat differently than a spring garden.

Locating the garden

If your spring garden was successful, the same location should work well in the fall. When planning a new garden, keep in mind that vegetable crops must have at least 8 hours of direct sun each day and should be planted where the soil drains well.

Preparing the soil

If you're using an established garden area, pull out all plant material—the remains of your spring crop and any weeds that have grown up in the garden. Don't put plant residue from a spring garden into your compost bin because it is likely to be contaminated with insects and disease pathogens.

For a new garden site, remove all the grass. Just tilling it into the soil will not eliminate all the grass sprigs; they will continue to grow and interfere with the garden. Likewise, for a raised garden, remove all turf before building the frame and filling it with soil.

Grass and weeds can be killed with an herbicide that contains glyphosate. Several products are available, including Roundup® and Kleenup®.

After removing the grass, shovel the garden area to a depth of 10 to 12 inches. Rototillers will not penetrate adequately, but they can be used to loosen and mix shoveled areas.

Spread 1 to 2 inches of coarse, washed sand and 2 to 3 inches of organic matter on the garden surface and till it into the soil to improve the soil's physical quality. The soil will need to be improved over time rather than in just a season or two. If you are building a raised bed garden, don't skimp on the soil. Use weed-free loam or sandy loam soil.

Adding fertilizer is the next step. You have two options:

- Apply 1 pound of ammonium sulfate (21-0-0) per 100 square feet (10 feet by 10 feet) before planting. Then sprinkle 1 tablespoon of ammonium sulfate around each plant every 3 weeks and water it in.
- Or, apply 2 to 3 pounds of a slow-release fertilizer (19-5-9, 21-7-14, or 25-5-10) per 100 square feet of garden area. Apply 1 tablespoon of ammonium sulfate (21-0-0) around each plant every 3 weeks and water it in. This second method should produce a more abundant harvest, especially with hybrid tomatoes and peppers.

Do not add too much ammonium sulfate, and do not put it too close to the plants. It can seriously damage them.

Horse or cattle manure may be substituted for commercial fertilizer at a rate of 60 to 80 pounds per

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100 square feet of garden area. Never use poultry manure on a fall garden.

After adding fertilizer, mix the soil thoroughly and prepare beds on which to plant rows of vegetables. These beds should be 30 to 36 inches apart so you can move easily through the garden area when the plants grow larger. Pile and firm the planting beds.

Then water the entire garden with a sprinkler for at least 2 hours. Allow the area to dry for several days, and it will be ready to plant.

Planting

Fall crops generally do better when started from transplants than from seed. Transplants should always be used for growing tomatoes and peppers.

The trick to establishing healthy transplants during late summer is to make sure they have plenty of water. Transplants in peat pots or cell packs with restricted root zones require at least 2 weeks for their root systems to enlarge enough to support active plant

Table 1. Average planting dates for fall vegetables in various growing regions of Texas.

Vegetables	Region I	Region II	Region III	Region IV	Region V
Beans, snap bush	Jul 15	Aug 1	Sep 1	Sep 10	Oct 1
Beans, Lima bush	Jul 15	Jul 25	Aug 20	Sep 1	Sep 15
Beets	Aug 15	Sep 1	Oct 15	Nov 1	Dec 15
Broccoli	Jul 15	Aug 1	Sep 1	Oct 1	Nov 1
Brussels sprouts	Jul 15	Aug 1	Sep 1	Oct 1	Nov 1
Cabbage	Jul 15	Aug 1	Sep 1	Oct 1	Nov 1
Carrots	Jul 15	Aug 15	Nov 10	Nov20	Dec 15
Cauliflower	Jul 15	Aug 1	Sep 1	Oct 1	Nov 1
Chard, Swiss	Aug 1	Aug 15	Oct 1	Oct 20	Dec 15
Collards	Aug 1	Aug 15	Oct 10	Oct 20	Dec 15
Corn, sweet	Jul 1	Aug 10	Aug 20	Sep 10	Sep 20
Cucumber	Jul 15	Aug 1	Sep 1	Sep 10	Oct 1
Eggplant	Jul 1	Jun 15	Jul 1	Jul 10	Aug 1
Garlic (cloves)	Jul	Aug	Oct	Nov	Dec
Kohlrabi	Aug 15	Sep 1	Sep 10	Oct 1	Nov 1
Lettuce, leaf	Sep 1	Sep 15	Oct 10	Nov 1	Dec 1
Mustard	Sep 1	Oct 1	Nov 1	Dec 1	Dec 15
Onion (seed)	Not recommended	Not recommended	Nov 1	Dec 1	Dec 15
Parsley	Sep 15	Oct 1	Oct 10	Nov 1	Dec 1
Peas, southern	Jun 15	Jul 1	Aug 1	Aug 15	Sep 1
Pepper	Jun 1	Jun 15	Jul 1	Jul 15	Aug 1
Potato	Not recommended	Aug 1	Sep 1	Oct 1	Not recommended
Pumpkin	Jun 1	Jul 1	Aug 1	Aug 10	Sep 1
Radish	Sep 1	Oct 1	Nov 25	Dec 1	Dec 15
Spinach	Aug 15	Sep 1	Nov 15	Dec 1	Dec 15
Squash, summer	Aug 1	Aug 15	Sep 10	Oct 1	Oct 10
Squash, winter	Jun 15	Jul 1	Aug 10	Sep 1	Sep 10
Tomato	Jun 1	Jun 15	Jul 1	Jul 10	Aug 1
Turnip	Sep 1	Oct 15	Nov 1	Dec 1	Dec 15

Table 2. Last optimum dates for seeding or transplanting.

Vegetable	Region I	Region II	Region III	Region IV	Region V
Eggplant, peppers, tomato	Jun 25	Jul 10	Jul 25	Aug 10	Sep 1
Broccoli, Brussels sprouts, cabbage, cauliflower	Aug 1	Aug 20	Sep 20	Oct 20	Nov 20

growth. Until that time, they may need to be watered every day or the plants will be stunted or even die.

However, too much water is just as harmful as not enough. Soaking-wet soil will cause root rotting and subsequent stunting or death. So check the soil moisture by feeling the soil before applying water. If the soil balls together, it still has enough water; if not, apply water.

Buy the largest transplants possible. Even though larger transplants cost more, their root systems will spread faster and the plants will produce more fruit sooner.

Or, grow your own larger transplants by planting small ones in potting soil and evenly mixing in slow-release fertilizer pellets such as Osmocote®. Add a water-soluble fertilizer to the irrigation water and place the plants in full sun (with shade after 3 p.m.). Keep the transplants moist, but don't over-water them.

Plant shade-tolerant crops between taller growing vegetables such as tomatoes.

Planting at the proper time is probably the most important factor in successful fall gardening. Table 1 lists average planting dates for each region.

When making planting decisions, compare the temperature extremes in the USDA Hardiness Zone Map at *http://aggie-horticulture.tamu.edu/wildseed/info/hardiness.jpeg* in your area to those of the Texas zones. With these dates in mind, determine which frost-susceptible vegetables to plant, when to plant, and whether to use transplants or seeds.

Table 3. Average minimum temperatures for Texas gardening zones.

Texas gardening zone	USDA Hardiness Zone	Average minimum temperature
Zone I	Zone 6	-10–0°F
Zone II	Zone 7	0–10°F
Zone III	Zone 8	10–20°F
Zone IV	Zone 9A	20–25°F
Zone V	Zone 9B	25–30°F

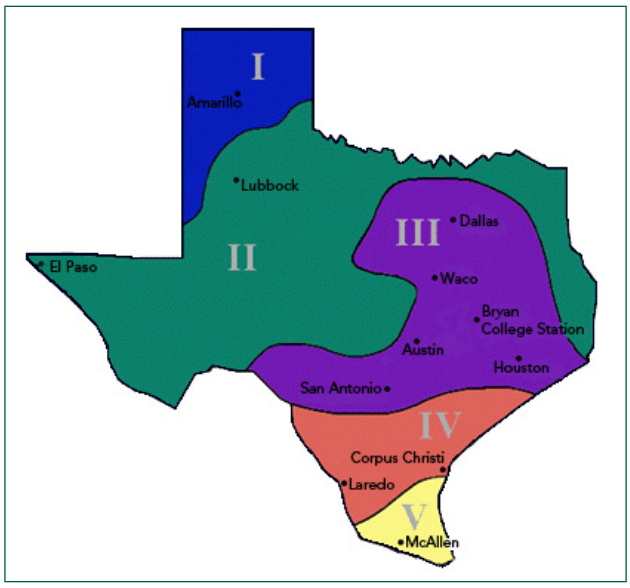


Figure 1. Gardening regions of Texas.

Season	Frost-susceptible crops (will be killed or injured by temperatures below 32°F)	Frost-tolerant crops (can withstand temperatures below 32°F)
Early-season vegetables: 30 to 60 days to harvest	Bush bean, summer squash	Beet, leaf lettuce, mustard, radish, spinach, turnip, turnip green
Mid-season vegetables: 60 to 80 days to harvest	Cucumber, sweet corn, lima bean, okra, pepper, cherry tomato	Broccoli, carrots, Chinese cabbage, green onion, kohlrabi, parsley
Late-season vegetables: 80+ days to harvest	Cantaloupe, eggplant, Irish potato, pumpkin, sweet potato, tomato, watermelon, winter squash	Brussels sprouts, bulb onion, cabbage, cauliflower, garlic

Fall vegetable crops are categorized as long-term and short-term crops. The duration of these crops depends on the date of the first killing frost and the cold tolerance of the vegetables.

Group the plants according to their frost tolerance. Plant long-term, frost-tolerant vegetables together. Frost-tolerant vegetables include beet, broccoli, Brussels sprouts, cabbage, carrot, cauliflower, chard, collard, garlic, kale, lettuce, mustard, onion, parsley, spinach and turnip.

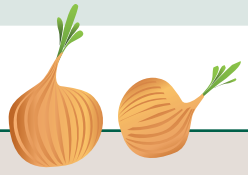
Also, plant short-term, frost-susceptible vegetables together so that they can be removed after being killed by frost. Frost-susceptible vegetables include bean, cantaloupe, corn, cucumber, eggplant, okra, pea, peppers, Irish potato, sweet potato, squash, tomato, and watermelon.

Search for these Texas varieties

Although many varieties of garden vegetables are available, only three or four varieties of any one vegetable are well suited or adapted to a particular area of Texas. Choose the varieties that are proven to do well in your area of the state.

The varieties listed below are recommended for Texas gardens. Your county Extension agent may have lists of other varieties that should do well for you.

Asparagus	Jersey Giant, Jersey Knight
Beans	*Snap:* Blue Lake, Derby, Roma II, Topcrop *Pinto:* Arapaho, Dwarf Horticultural *Lima:* Henderson Bush, Jackson Wonder, King of the Garden
Beets	Detroit Dark Red, Ruby Queen
Broccoli	Green Magic, Packman, Premium Crop
Cabbage	Bravo, Market Prize, Rio Verde
Carrots	Imperator 58, Nantes Half Long, Red Core Chantenay
Cauliflower	Snow Crown, Snowball Y Improved
Chinese cabbage	Jade Pagoda, Michihili
Cucumbers	*Slicers:* Dasher II, Poinsett 76, Sweet Slice, Sweet Success *Pickling:* Calypso, Carolina, County Fair 87
Eggplant	Black Beauty, Black Magic, California White, Early Long Purple
Oriental eggplant	Ichiban, Millionaire, Pingtong Long
Garlic	California Early, California White, Elephant Garlic
Greens	*Collards:* Blue Max, Georgia Southern *Swiss Chard:* Bright Lights, Lucullus, Ruby
Kale	Dwarf Blue Curled Vates, Green Curled, Nero di Toscano
Lettuce	*Crisphead* or *Iceberg:* Mission *Looseleaf:* Red Sails, Salad Bowl *Butterhead* or *Bibb:* Buttercrunch, Esmeralda, Summer Bibb *Romaine:* Paris Island, Winter Density
Melons	*Cantaloupe:* Caravelle, Minnesota Midget, Mission, Primo *Honeydew:* Sweet Delight, TAM Dew
Mustard	Tendergreen, Southern Giant Curl
Okra	Cajun Delight, Clemson Spineless, Emerald, Lee
Onions	*Bulb:* Candy (Long Day), Early Grano 502 (Short Day), Granex (Short Day), Texas 1015 Y (Short Day) *Green:* Evergreen Long White, White Spear



Pepper	*Bell:* Big Bertha, Camelot, Jupiter *Hot:* Hot Jalapeño, TAM Hidalgo Serrano *Sweet jalapeño-shaped:* TAM Mild Jalapeño
Potatoes	*Irish:* Red: Norland, Purple Viking, Red LaSoda *Irish:* White: Kennebec *Sweet:* Beauregard, Centennial, Jewel
Pumpkin	*Large:* Big Max, Connecticut Field *Medium:* Bumpkin, Howden, Jack O'Lantern *Small:* Jack-Be-Little, Lady Godiva, Munchkin
Radish	Champion, White Icicle
Southern peas	*Purple hull:* Texas Pink Eye *Cream:* Texas Cream 8, Zipper Cream *Black eye:* California #5 *Crowder:* Mississippi Silver
Spinach	Bloomsdale, Early Hybrid, Melody
Squash	*Summer:* Burpee's Butterstick, Dixie, Multipik *Zucchini:* Black Magic, Eight Ball Tigress, Gold Rush *Winter:* Butternut types, Cushaw, Royal (Acorn)
Sweet corn	Kandy Korn (se), Silver Queen (white, su), Summer Sweet (sh2), Sweet G-90 (bicolor, su)
Tomatillo	*Tomatillo:* De Milpa (Purple), Goldie (Yellow), Toma Verde
Tomatoes	Medium 4–11 oz: Amelia, Better Bush, Celebrity Small <3 oz: Cherry Grande, Gold Nugget, Juliet Paste: Roma, Viva Italia
Turnips	Tokyo Cross, White Lady
Watermelon	*Standard:* Jamboree, Petite Sweet, Supersweet *Seedless:* Gem Dandy, Summersweet 5244, Tri X-313

Fall is for herbs

Herbs are plants that are used as flavoring in foods. The common herbs used in cooking are referred to as culinary herbs. Mild or savory herbs impart a delicate flavor to food, while the stronger or pungent herbs add zest. Herbs are also planted for their ornamental value.

Planting and propagation

Select a sunny, well-drained location. At planting, apply a slow-release fertilizer at the rate of 2 pounds per 100 square feet.

Herbs can be annuals (live only one season) or perennials (grow back from their root systems each year). Annual herbs can be planted in an annual flower garden or vegetable garden. Plant perennial herbs at the side of the garden where they won't interfere with next year's soil preparation.

Some herbs can be established by planting the seed directly in the garden or by starting seed indoors for later transplanting to the garden. You can obtain seed from a local garden center or seed catalog, or save the seeds produced by the herb plants for next year's crop.

To save your own seeds, harvest the entire seed head after it has dried on the plant. Then allow the seeds to dry in a protected location that is cool and dry. After the seeds are thoroughly dry, separate them from the seed heads and discard the trash.

Store the seeds in sealed, labeled jars in a dark, cool, dry location. Some herb seeds such as dill, anise, caraway, or coriander can be used for flavorings.

Perennial herbs can be propagated by cuttings or by division. Herbs such as sage and thyme can be propagated by cuttings. Chives can be propagated by dividing the roots or crowns.

Divide the plants every 3 to 4 years in the early spring. Dig them up and cut them into several sections. Or, cut 4- to 6-inch sections of the stem and place the cuttings in moist sand in a shady area. In 4 to 8 weeks, roots should form on these cuttings.

Care for the herb garden is the same as for a vegetable or flower garden.

Watering

Water as necessary during dry periods. Generally, herbs need about 1 inch of water per week, either from rainfall or from irrigation. Mulch will help conserve soil moisture as well as reduce weed growth. Because mints prefer moist soil, they must be watered more often.

Harvesting

The leaves of many herbs, such as parsley and chives, can be harvested for fresh seasonings. Gradually remove a few leaves from the plants as you need them. Don't remove all the foliage at one time. With proper care, these plants will produce over a long period.

To harvest rosemary and thyme, clip the tops when the plants are in full bloom. The leaves and flowers are usually harvested together.

Basil, mint, sage, and sweet marjoram are harvested just before the plant starts to bloom. Parsley leaves can be cut and dried anytime.

Drying

After harvest, hang the herbs in loosely tied bundles in a well-ventilated room. You can also spread the branches on a screen, cheesecloth, or hardware cloth. Spread the leaves on flat trays. Cover the herbs with a cloth that will keep dust off but allow moisture to pass through.

Many of the herbs we grow today are from the Mediterranean region, so hot, dry summer weather suits them perfectly. Herbs need good drainage (they do best in a raised bed) and the right exposure. Most require full sun. Mints and a few other herbs grow well in shade or partial shade.

The herbs below grow well in Texas.

Basil: This is one of the easiest herbs to grow, even from seed. However, basil is tender, so expect to lose it at the first sign of frost.

Many varieties and flavors of basil are available. The most common is sweet green basil. More-unusual varieties are cinnamon, Cuban, globe, holy, lemon, licorice, purple ruffled, Japanese sawtooth, and Thai. Not all are used in cooking.

Basil is the herb to use in all tomato dishes. It can be chopped fine and mixed with butter. Add fresh chopped leaves to vinegar, crushed garlic, and olive oil to make an excellent dressing for sliced tomatoes. It is also used in eggplant, pork, roast chicken, scrambled eggs, and squash dishes.

Chamomile makes wonderful herbal tea. There are two varieties: English and German chamomile. The dried blossoms of either can be used to make tea. The tea can also be used as a hair rinse.

To make tea, pour boiling water over about 1 tablespoon of chamomile leaves for each cup desired and let it steep for about 10 to 15 minutes. Filter it through a tea strainer, and add lemon and honey to mask the bitter taste.

Chamomile is an easy plant to grow from seed. Roman chamomile is a low-growing ground cover.

Catnip: Many cats like to roll all over catnip and any surrounding plants, so it may be best to grow this herb in a hanging basket. Although it is sometimes used to make a hot tea, catnip is of interest mainly to cats.

Comfrey is a vigorous herb with large, "donkey-ear" leaves that look like green sandpaper. A tea can be made from the leaves or roots.

Lemon balm is a member of the mint family and can be very vigorous. It's best to grow lemon balm in a confined bed area or in containers. It can be started from seeds, cuttings or roots. Once established, it will spread and self-sow, so give it plenty of room.

The leaves have a strong lemon odor; they can be used to make tea or flavor regular teas. Lemon balm is also added to fish dishes.

Marjoram and **oregano** are similar, but the flavor of marjoram is sweeter and more delicate. They're both easy to grow and can be used year round.

Varieties of marjoram include creeping golden marjoram, pot marjoram, sweet marjoram, and winter marjoram. They are best grown from transplants or root cuttings.

The most common types of oregano in Texas are *Origanum vulgare,* the low-spreading plant used in Italian or Greek foods, and *Lippia graveolens* or *Lippia palmeri,* the bushy shrub known as Mexican oregano.

Marjoram and oregano can be used in the same foods—meats, pizza, soups, stews, stuffing, and spaghetti sauce. The leaves are best used dried.

Mints: There are many mints. The easiest to grow is spearmint; peppermint is more difficult. Most mints are tough, hardy plants. Other mints include apple mint, pineapple mint, and orange mint, which is so vigorous that it soon becomes a weed.

All mints appreciate moisture and do best where they get afternoon shade. A good place to plant spearmint is at the base of a downspout. Mints can be grown from cuttings, roots, or transplants. Mint plants cross-pollinate easily, so hybrids abound. Spearmint and peppermint are used as culinary herbs and to make teas.

Rosemary: There are many forms of rosemary, ranging from a low-growing groundcover to a bush that grows up to 4 feet tall. Rosemary is a hardy plant that thrives in hot, dry climates.

A strong herb, it often used in meat dishes, especially chicken. Use a branch of rosemary as a basting brush for barbecued chicken, or place a few leaves on top of roasts or baked chicken.

Chives: The smallest member of the onion family, chives are easily grown from seeds or transplants. Use this herb any way you would use onions. It can be use it as garnish or added to baked potatoes, cottage cheese, omelets, and sauces.

Coriander is also known as cilantro or Chinese parsley. It is easily grown from seed and can sometimes be found growing wild. To have a steady supply of young leaves, sow seeds every few weeks.

Coriander is used in Mexican dishes. The leaves have a strong, "clean" flavor. Use only young leaves; the older ones are too strong.

The seeds have a flavor similar to orange and are used in pastries, sausage, and cooked fruit. They are also an important ingredient in pickling spice and curry powder.

Dill is one of the easiest herbs to grow from seed. It will easily become a weed if the seed heads are allowed to dry on the plant. The large green caterpillars that eat dill will turn into swallowtail butterflies, so plant enough for you and them.

Dill is used in pickling. It can also be added to fish, cottage, cheese, cream cheese, salad dressings, and most vegetables. The dried seed can be added to bread dough for a caraway-like flavor.

Parsley is probably the most used and least eaten herb in the world because it is used mostly as a garnish. Parsley is a biennial, producing leaves the first year and flowers the next. There are two forms: the flat-leaved or Italian parsley, and the curly or French parsley. Many hybrids of each are available as seeds or transplants.

The seeds germinate slowly, but parsley is worth the wait. It is loaded with vitamins and minerals. It can be battered and deep-fried, or browned with butter and garlic to make a basting sauce for grilled meats.

Sage doubles as a durable landscape plant. It is very drought resistant and can be killed by overwatering. Although sage is best started from transplants or cuttings, it can be started from seed.

Varieties of sage include blue, clary, garden, golden, pineapple, and tri-color. All can be used in cooking.

Sage leaves should always be dried before use. It can be used in black-eyed peas, chicken, egg and cheese dishes, pork, and poultry stuffing. When dried, leaves will keep their flavor for years.

Thyme is a good ornamental in beds and rock gardens. There are more than 400 species of thyme, including common, English, golden, lemon, mother-of-thyme, silver, and woolly.

Thyme is used in soups and fish, meat, poultry, and vegetable dishes. Add a pinch of thyme to a tablespoon of honey and mix with drained cooked carrots and onions. Thyme is a key herb in making Cajun gumbo.

Along with sage, rosemary, marjoram, and oregano, thyme should be considered a basic of every herb garden.

Caring for vegetable plants

Watering

Many people consider watering one of the most enjoyable jobs in the garden. However, many gardening problems—including diseases, bitter fruit, poor fertility, poor quality, sunscald, and poor yield—can be related to improper watering.

Do not water lightly several times a week, which causes poor root development. Instead, water thoroughly, soaking the soil to a depth of 6 inches, and only when the plants need it. An inch or two of water applied once a week is usually enough for most vegetable gardens in Texas.

Determine when to water by examining the soil, not the plants. If the soil surface appears dry, scratch it to a depth of 1 inch to see if the soil is moist. If so, do not water. If the soil is dry at a depth of 1 inch, it's time to water.

Light, sandy soils drain quickly and must be watered more often than heavy clay soils, so check sandy soil more often.

One of the best ways to water a garden is with a drip irrigation system. Drip irrigation controls the application of water by releasing it slowly over a long period. When the rate of drip irrigation is adjusted correctly, there will be no puddles, runoff, or saturated soil.

When buying a drip irrigation system, look for one that can be adapted to your garden's size and shape. The hose will need to be placed along each row to irrigate the plants' root zones.

Before laying out the drip irrigation hose, firm the soil in the rows to help the water move laterally in the soil as well as downward. For the pre-plant irrigation, you may need to sprinkle the entire garden to settle the soil enough for drip irrigation water to move laterally, especially in sandy soils.

Protecting plants from insects and diseases

Expect insect and disease problems. When they appear, the first step is to identify the cause correctly. For help in identifying insect damage and disease symptoms, refer to publications in Extension's Easy Gardening series (*http://agrilifebookstore.org*).

To produce a good yield, protect the plants much as possible. Many pesticides can help protect vegetables from insects and diseases. Before buying, read the product label carefully to make sure it is the right one for your intended use. Always follow the label directions carefully.

Other techniques do not use pesticides; they protect the plants before they are damaged. One method is to protect the plants with covers that keep insects away. Insects damage plants by feeding on them, and some insects—including aphids, whiteflies, thrips, and leaf-feeding beetles—also transmit diseases. Although it is impossible to keep insects away from plants entirely, plant covers can help.

Covers can be of clear plastic or a translucent, fabric-like material known as row cover or spunweb. Covers can be used on row crops but are easiest to use on plants that are caged, such as tomatoes and peppers. Install the cages around young transplants and cover them to the ground with the plant covers. Anchor the covers securely in the soil.

Because heat can build up under plastic covering, ventilate it during the day if temperatures are in the high 70s or more. Ventilate the cages by opening the top and raising the plastic 4 to 6 inches off the ground at the bottom. The cover will still protect the plants because most insects do not enter from the top.

On cold nights, close the covers. Remove plastic covering entirely when the foliage begins to touch the edges and bunch against the sides of plastic. For tomatoes, this will usually be about the time the plant has marble-sized fruit.

Plants covered with spunweb never need to be uncovered. Spunweb will not overheat plants because the temperature inside the material is about 15°F cooler than the outside temperature. Used in the fall, spunweb also gives plants some shading from the hot sun.

However, spunweb does not provide as much cold protection as plastic, so each cage will have to be artificially heated (such as with Christmas lights) if temperatures fall below freezing.

Cover can also protect the plants from wind. Winds as low as 15 mph can significantly slow plant growth, delay harvest, and decrease yields.

You may wonder if plants will set fruit when covered with plastic or spunweb, since no bees or other insects are able to enter. It's not a problem for tomatoes, peppers, and eggplants, which are 85 percent self-pollinated; that is, they don't need insect pollination to set fruit.

To ensure adequate pollination for other vegetables, shake the covered cages vigorously every day after bloom begins, or thump the bloom clusters daily with your finger. You can also artificially set early blooms by spraying bloom clusters with a plant hormone spray such as Blossom-Set®. The resulting fruit will have fewer seeds.

Spunweb will protect seedlings from birds and other pests, and cole crops (such as broccoli and cabbage) from leaf-eating caterpillars. You can also use spunweb to "vine ripen" fruit.

Nematodes are a common garden problem. They can severely damage all crops except corn, garlic, onions, and nematode-resistant tomatoes. The symptoms of nematode damage above ground are like those of many other root diseases or of environmental problems such as inadequate water or nutrient deficiency: The plants look wilted or stunted, have chlorotic or pale green leaves, and yield less produce.

Garden problem guide

Symptom	Possible causes	Possible cures
Dying young plants	Fertilizer burn	Mix the fertilizer thoroughly with the soil; don't apply too much fertilizer.
	Disease (damping off)	Use treated seed, or drench transplants with a fungicide.
Stunted plants, pale to yellow leaves	Low soil fertility	Test the soil for nutrients needed.
	Poor soil drainage	Add organic matter or plant in raised beds.
	Shallow or compacted soil	Work the soil deeper.
	Insects or diseases	Identify the cause and use appropriate control measures.
	Nematodes	Plant Elbon rye in the fall; solarize the soil; plant marigolds in summer.
Stunted plants, purplish color	Low temperature	Plant at the recommended time.
	Lack of phosphorus	Add phosphorus fertilizer.
Holes in leaves	Insects	Identify the insect and use appropriate control measures.
Spots, molds, darkened areas on leaves and stems	Disease	Identify the cause; spray or dust at the recommended rate and time.
	Chemical burn	Use recommended chemicals at the recommended rate and time.
	Fertilizer burn	Keep fertilizer off plants.
Wilting plants	Dry soil	Irrigate if possible.
	Excess soil moisture	Avoid overwatering.
	Disease	Use resistant varieties if possible.
Weak, spindly plants	Too much shade	Move the garden to a sunny area.
	Plants too crowded	Seed at the recommended rate; thin the plants.
Failure to set fruit	Improper temperatures	Plant at the recommended time.
	Too much nitrogen	Avoid excessive fertilization.
	Insects	Identify the insect and use appropriate control measures.
Tomato leaf curl	Heavy pruning in hot weather	Do not prune; use cages.
	Varietal problem	Use a different variety.
Dry brown to black rot on blossom end of tomato	Low soil calcium	Add gypsum.
	Extremely dry soil	Irrigate and mulch.
	Too much water	Plant on raised beds or reduce irrigation.
Misshapen tomatoes (catfacing)	Cool weather during blooming	Plant at the recommended time.
	Stink bug damage	Apply insecticides.
Abnormal leaves and growth	2,4-D weed killer	Do not use a sprayer that previously contained 2,4-D; do not allow the spray to drift to the garden.
	Virus disease	Remove the infected plants to prevent spreading; control the insects that transmit the virus.

The most characteristic symptoms of nematode damage are underground. Infected roots will swell and form knots or galls. Fast-growing annuals will have large, fleshy galls; woody perennials will have small, hard galls. Infected tubers, corms, or other edible roots will have small swellings or pimpling on the surface.

There are several ways to combat nematodes. For a spring garden, plant cereal rye (Elbon) in the fall.

For fall gardens, solarize or pasteurize the soil in July by tilling it well and watering until it is very moist; then cover the soil with clear plastic. Seal the edges and leave the plastic in place for at least a month. Do not use black plastic because the soil will not heat up enough to destroy the nematodes. Solarization also helps control fungi and weeds.

In areas heavily infested with nematodes, plant marigolds in the garden area in August. Marigold roots release a substance that is toxic to nematodes. Plant marigolds 12 inches apart and allow them to grow until the fall planting of cole crops (such as broccoli, cabbage, cauliflower, kale, mustard, and turnips) begins in October. Then remove the tops of the marigolds and till their roots into the soil.

Many gardeners avoid planting marigolds because they attract spider mites to the garden. However, the spider mites will be virtually eliminated when the garden is tilled in August for planting with marigolds. Because mite populations decline as the weather cools in the fall, they will not have time to increase to damaging numbers when the fall garden crops are growing.

Harvesting fall produce

To get the best results from your garden, harvest produce properly and at the right time. Below are some tips to help you.

Beans, snap: For maximum tenderness, harvest beans before maturity when the pods are not completely full. Wash and refrigerate them immediately.

Beets: Pull early beets when they are about 2 inches in diameter. Larger beets are woody, especially in warm, dry weather. Remove all but about 1 to 1½ inches of the tops. Wash and refrigerate them immediately.

Broccoli: Harvest broccoli heads when they are firm, compact, and 4 to 8 inches in diameter. Determine the maximum size by watching the floret development. Broccoli heads are composed of many individual flowers called florets. The head is as large as it will be when the individual groups of florets begin to loosen, emerge from the surface of the head, and are not tightly clustered. Cut the stalk below the head, leaving 8 to 10 inches of stem and attached leaves. Chill the heads immediately.

Brussels sprouts: Harvesting usually begins 3 to 3½ months after transplanting. Early sprouts should be picked several times, taking the lowest on the plant each time; otherwise, they will open and become yellow. The first harvest should occur before the lower leaves begin to turn yellow; otherwise, the sprouts will toughen and lose their delicate flavor.

When picking Brussels sprouts, break off the leaf below the sprout and then remove the sprout by breaking it from the stalk. As the lower leaves and sprouts are removed, the plant continues to push out new leaves at the top, and new buds, or sprouts, are formed. Remove all lower sprouts, even those that do not make solid little heads.

Cabbage: Cabbage is mature and as large as it will get when the head becomes solid and the sides or top cannot be pressed in with the thumb. Mature heads often split open.

To delay the harvest of mature cabbage yet prevent this splitting, twist the entire plant slightly to break several roots. The breakage will reduce the uptake of water from the soil and delay splitting.

Cauliflower: Harvest cauliflower heads when they are firm, compact, and 4 to 8 inches in diameter. Like broccoli, the heads are as large as they will get when the individual groups of florets begin to loosen and emerge from the head. To harvest cauliflower, cut the stalk just below the head.

The yellowish color of the cauliflower surface is caused by exposure to sunlight. To prevent discoloration, when the small bud head appears in the center of the plant, draw the lower leaves of the plant loosely over the bud in a tent-like fashion. Tie the leaves together with a string or rubber band.

The leaves of cauliflower, broccoli, and Brussels sprouts also can be harvested and eaten as greens.

Carrot: There are many varieties of carrots with different potential sizes and lengths. Most mature fully within 60 to 85 days but can be harvested earlier.

The crown size can indicate maturity. The crown, where the foliage attaches to the root, is usually at least ¾ inch in diameter when the carrot is mature. Another test for maturity is to pull the largest carrot

and examine the bottom or growing tip. If the tip is orange, the carrot is mature. If the tip is white, the carrot is still growing.

There is no need to harvest the carrot crop all at once. Carrots can be left in the ground for several weeks after they mature. In fact, the best place in Texas to store carrots is in cool garden soil.

Cucumber: Harvest cucumbers when they are bright, firm, and green but before they get too large. About 1 to 2 inches in diameter is right, with the smaller size best for pickling.

Discard all nubbins (small, undeveloped cucumbers), and poorly shaped or light-colored fruits. If possible, do not store cucumbers in the refrigerator for more than 2 days. It is best to pickle cucumbers the same day they are picked.

Greens: Harvest greens while the leaves are young and tender and before they start turning yellow or brown. Slight bronze tints are normal on mustard greens. Avoid wilted or flaccid leaves. Wash and chill them immediately.

Peppers: Harvest peppers when they are 4 to 5 inches long and have full, well-formed lobes. Immature peppers are pale, soft, pliable, and thin fleshed. Wash and chill the peppers immediately.

Spinach: Harvest spinach when six or more crisp, dark green leaves have formed. Wash them gently and chill immediately. Cut the leaves from the plant to encourage re-sprouting.

Squash: Harvest yellow crookneck squash when it is 4 to 6 inches long; harvest yellow straight-neck squash when it is 6 to 9 inches long; and harvest white scallop squash when it is 3 to 4 inches in diameter. A glossy color indicates tenderness.

Wash, dry, and store squash in a warm area of the refrigerator. Like cucumbers, squash are susceptible to chilling injury and should not be stored for more than 2 days.

Tomato: Harvest tomatoes at the pink stage, and ripen them in a warm area of the house. Harvesting at this time will not affect flavor, and it may prevent damage by insects and birds.

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