



Vegetable Crops

Vegetables represent plants that are unique in their origin, plant type, cultural requirements, and associated concerns. This section of the guide provides additional details on the culture or growing requirements of a selected group of common vegetables.

Asparagus

Asparagus is a hardy perennial that will last for 30 years or more in the garden. Plant asparagus near the side or edge of the garden where it will not interfere with annual tillage. Asparagus is one of the first crops harvested in the spring.

Varieties. California 157 (UC157), Jersey Giant, Jersey Knight, Jersey King, Jersey Supreme, Atlas, and Purple Passion (purple spears).

When to plant. Asparagus can be planted in early spring (mid-March to mid-April) or in the fall (early October to mid-November). Purchase fresh plump crowns from a local garden center or plant seedling transplants.

Spacing. Plant crowns or transplants so buds of the crown are 7–8 inches below ground level. Cover with a few inches of soil initially, and add soil as the season progresses. After the trench is filled and the soil settles, crown buds should be about 6 inches below soil level.



Care. Asparagus produces a large, vigorous root system and is fairly resistant to stress conditions. Well-drained soil and a full sun location are necessary. Soak the area well in very dry weather. Spear production in the spring depends on vigorous growth the previous season. Spears begin to emerge in early April and may be damaged by a few spring freezes. Cut and destroy frozen spears, and the plant will rapidly send up new spears to replace them. Do not harvest the first year. In subsequent years, harvest until the spear size decreases to thinner than a pencil, usually 6–7 weeks in a mature planting. Fertilize in the early spring so that fertilizer can be carried into the root zone with spring rain. Weeds are a particular concern in this perennial plant. Control weeds with mulching, hoeing, or spot chemical treatment because weeds can invade over time. In the fall, you can remove dead ferns after they are completely brown or leave them in place through the winter to catch moisture and prevent soil loss.

Harvesting. Snap spears at the breaking point $\frac{1}{2}$ – $\frac{3}{4}$ inch above the soil level, or cut slightly below the soil level with a sharp knife. When spears are more than 10–13 inches long, they become tough and woody. Heat will cause the tips of the spears to open and become loose—called “feathered tips”—later in the season unless harvested frequently. Asparagus deteriorates rapidly after harvest; store in a cold, moist location and use quickly.

Common concerns

- asparagus beetles



Beans

Beans are a tender, warm-season crop that is popular in Kansas gardens as either a spring crop or a fall crop.

Snap or green beans are grown for their tender immature pods. Some beans can be allowed to fill, and the bean seeds can be harvested for

later use. Some beans are “pole” types that require a large trellis to climb.

Varieties. Contender, Provider, Tendercrop, Strike, Blue Lake, and Dusky are common green bush type beans. Cherokee Wax, Majestic, and Goldcrop are yellow bush type beans. Kentucky Wonder and Pole Blue Lake are large vined, pole beans. Broad, flat ‘Italian or Romano’ beans include Roma, Greencrop, or Bush Romano.

Lima beans are difficult to grow in Kansas because they require a longer period to develop and tend to drop blossoms in hot, dry weather. Choose an early variety such as Baby Bush, Fordhook, Henderson, Thorogreen, or a similar early maturing variety.

Other types of beans grown primarily for their seeds include French horticultural types, cranberry, pinto, great northern, red kidney and similar varieties.

When to plant. Beans are sensitive to cold temperatures. Soil temperatures should be 55–60°F with danger of freezes well past before planting. Fall beans can be planted in early August. You can have a continuous supply by planting at intervals several weeks apart. However, beans planted to bloom in hot, dry weather frequently will be of poor quality.

Spacing. Plant seeds about an inch deep in rows that are 18 inches apart. A

plant every 3–5 inches is desirable, so drop seed about every 2–4 inches. Plant pole beans 6–12 inches apart.

Care. Do not soak bean seed before planting. Moisten the soil to provide moisture for germination, but do not water to form a tight crust. Beans have a shallow root system and require careful cultivation, good weed control, and water in dry periods. Beans are sensitive to soil salts; avoid alkali spots or “salty” locations.

Harvesting. Harvest snap beans when the pod is crisp and before the seeds enlarge significantly. Do not harvest in early morning when dew is on the plants as this may spread bacterial blight. Most newer varieties of beans are developed to set a large number of pods at one time for a more concentrated harvest. Harvest lima beans and horticultural beans when the pods are fully formed and seeds have enlarged to the degree you desire.

Common concerns

- bacterial blight
- bean leaf beetle (black/ yellow spotted beetle)
- poor stands from salt injury or soil crusting

Beet/Swiss Chard

Beets are a popular vegetable and can be grown as a spring or fall crop in Kansas. Tops can be used as a cooked green rich in vitamin A, and roots are a good source of vitamin C. Roots may be canned or pickled and are served diced, sliced, whole, and in strips. Beet juice is the basic ingredient of borscht. Swiss chard is a close relative of the beet and produces foliage rather than an enlarged root. Nutritional value and uses are similar to those for beets.

Varieties. Red round varieties include Detroit Dark red, Early Wonder, Ruby Queen, Little Ball, Red Ace, Asgrow Wonder, and Warrior. Elongated varieties include Cylindra and Long Red Blood. Varieties of Swiss Chard include Burgandy, Ruby, Fordhook, Lucullus, Perpetual and Bright Lights (multicolored).

When to plant. Beets and chard are fairly frost hardy and can be planted in early to mid-April in many areas of Kansas. Irrigate carefully to avoid soil crusting, which prevents good germination. Plant fall beets or chard in early August.



Spacing. The beet “seed” is actually a cluster of seeds in a dried fruit (one variety—Monogem—has a single seed per cluster). Plant the seeds about an inch apart and about ½ inch deep. Hand thinning is usually necessary to provide a uniform stand of beets properly spaced 2–3 inches apart. Poorly thinned stands will have an abundance of tops with few or small roots.

Care. Beets and chard compete poorly with weeds, so frequent shallow cultivations are necessary. Beet plants require a fertile well-watered location. Hand thin the plants when they are 1–2 inches tall to avoid damage to surrounding plants.

Harvest. Select beets of the diameter you prefer. Roots larger than 2–2½ inches in diameter are often tough and woody. Beets for baby beets or whole canning should be harvested smaller. Trim the tops of beets or chard to ½–1 inch above the roots and store in plastic bags in a refrigerator before use. Mulch fall-planted beets to prolong the fresh harvest season, but use them before they freeze.

Cut the outer leaves of chard when they are young and tender or about 8–10 inches long. The inner leaves will continue to grow for additional harvests until hot weather (for spring crop) or a severe freeze (for fall crop) stops the plant growth.

Common concerns

- *Cercospora* leaf spot

Broccoli

Broccoli has increased in popularity considerably in recent years. This vegetable, sometimes known as Italian sprouting broccoli, is a cluster of undeveloped flower buds. Two crops—spring and fall—can be grown in Kansas. Small secondary heads can be harvested for several weeks following the cutting of the large central head.

Varieties. Green Comet, Premium Crop, Emperor, Green Valiant, and Packman are popular green-headed varieties.

When to plant. Set plants in the garden in late March to early April, before the danger of frost has passed. Early planting is essential so that plant heads can develop before the onset of hot weather. Plant fall broccoli plants in early August or direct seed in early July.

Care. Select broccoli plants that are small and stocky. Avoid tall, spindly plants. Weak, tall plants often “bolt” or produce a premature head, which will never enlarge. Broccoli requires a lot of fertilizer to produce a large plant and a large head. Fertilize at planting.



Sprinkle additional fertilizer—side dress—along the row every 2–3 weeks as the crop develops. Provide adequate water as the head starts to develop.

Harvesting. Harvest the head before the flowers start to open or before yellow centers of the flowers start to show. Usually 4–5 inches of the stem is also tender and can be used with the head. Continue to cut small side heads until hot weather causes them to be strongly flavored.

Common concerns

- cabbage worms
- aphids

Brussels Sprouts

Brussels sprouts gets its name from Brussels, Belgium. The plant is a close relative of cabbage, broccoli, and cauliflower, but is slower growing. Best success in Kansas is to grow the “sprouts”—small heads that grow along the stem and resemble small cabbage heads—in the fall season by planting in early July.

Varieties. Jade Cross, Oliver, and Prince Marvel as well as other early maturing varieties.

When to plant. Spring-planted crops should be set in late March. Fall crops, more reliable in Kansas, should be started in early July.

Spacing. Set plants about 2 feet apart in rows at least 3 feet apart. Plant seeds closer and thin to a strong, vigorous plant every 2 feet for a fall crop.

Care. Like cabbage, Brussels sprouts require regular watering and fertilizing. Some gardeners remove the leaves from the side of the plant after the sprouts start to develop, but this is not necessary. Topping or cutting the terminal bud from the plant when the plant is 2–2½ feet tall will speed the development of sprouts.



Harvesting. Snap or cut the sprouts from the stem when they are an inch in diameter. More sprouts will develop on the stem above.

The plant is quite freeze hardy and can be left in the garden until late November or early December many years for continued harvest. Sprouts developing in hot weather will often be loose and of poor quality.

Common concerns

- cabbage worms

Cabbage



Cabbage is a hardy, easy-to-grow vegetable that can be grown in the spring or fall in Kansas. Most varieties are green, but some produce a red head. It can be stored for long periods or made into sauerkraut. Cabbage is intolerant of our summer heat.

Varieties. These include Conquest, Headstart, Cheers, Green Boy Golden Acre, Dynasty(series), and similar early varieties. Green headed varieties with crinkled or savoyed leaves include Savoy King and Vanguard. Red headed varieties include Red Head, Red Acre, Regal Red, and Red Dynasty.

When to plant. Set cabbage plants in late March to early April or in early August for a fall planting. Direct-seeded cabbage can be planted in early July. Cabbage is easily transplanted by choosing stocky, dark green plants with strong root systems.

Spacing. Cabbage plants should be spaced 12–18 inches apart in at least 3- to 4-foot rows. Closer spacing will result in smaller, but more numerous heads.

Care. Fertilize cabbage with a starter fertilizer when setting out plants, and side dress every 2–3 weeks during the growing season. Cultivate carefully to avoid damaging shallow roots. Irrigation is critical when heads are small and enlarging.

Harvest. Cabbage is ready for harvest when the head is fully formed and dense. This can be judged by pressing or squeezing the head to indicate firmness. Waiting too long may result in heads that split, especially after rainfall or irrigation.

Common concerns

- black rot
- blackleg (choose resistant varieties)
- cabbage yellows (choose resistant varieties)
- cabbage worms
- aphids

Carrot

Carrots are a hardy, cool-season crop that grows in the spring or fall in Kansas. Carrots harvested in cooler weather will be tender and sweet. Carrots are an excellent source of vitamin A. The roots grow best in loose or sandy soils. Long slender varieties are not well adapted to growing in our heavier, tighter soils.

Varieties. Short fat varieties include Red Cored Chantenay, Royal Chantenay. Moderate length varieties include Danvers, Scarlet Nantes, Nantes. Miniature or very small carrots (baby carrots) include Little Finger, and Gold Nugget.

When to plant. Plant carrots in mid- to late April before the last freeze, because carrots can tolerate a light freeze. Make sure the soil is well tilled or loosened to an 8- to 9- inch depth before planting. Fall carrots are excellent for growing in Kansas. Plant seeds in late July to early August.

Spacing. Plant seeds ¼–½ inch deep—deeper for fall planting—in moist soil. Rows may be as close as 12 inches apart with plants every 1–2 inches in the row. Carefully sprinkle seeds so that excessive plants do not emerge. Thin carrots to the desired spacing when the plants are small.

Care. Until carrots germinate, avoid heavy watering that could form a crust on the soil surface. Germination may be slow and uneven in early spring. Young carrot plants are weak and spindly. Weeds compete with young plants, so careful weeding is necessary. Water is required as roots are enlarging. Carrots that develop in hard, compacted soils will be misshapen or forked.

Harvesting. Dig or pull the roots when they are the desired diameter. Most carrot varieties require 55–60 days from seeding to mature. Fall-planted carrots can be mulched with straw and harvested as needed until the ground freezes solid in mid- December. After harvesting, cut the tops to within ½ inch of the root top and store in plastic bags in a refrigerator until ready to use. Carrots can be stored for long periods.

Common concerns

- carrot weevil

Cauliflower

This cool-season vegetable is a close relative of cabbage. However, cauliflower takes longer to develop and is not as cold hardy as cabbage

and broccoli. Therefore, cauliflower often is considered more difficult to grow. It is also fairly intolerant of summer heat and drought.

Varieties. Choose early maturing varieties such as Snow Crown, Early Snowball, or Snowball Y. Later maturing varieties, including the self-blanch types, usually take too long for our shortened spring and fall seasons.

When to plant. Set transplants in early to mid-April for a spring crop or in early August for a fall crop. Cauliflower is difficult to direct seed most years in Kansas.

Spacing. Space plants 1½–2 feet apart in rows at least 3 feet apart. The plant is larger than cabbage or broccoli and needs more space.

Care. Use starter fertilizer when setting plants and provide additional fertilizer every 2–3 weeks during the growing season. Provide water during dry periods. When the heads are about the size of a quarter, blanch them by pulling a few leaves over the head to shade them from the hot sun. Secure the leaves with a rubber band, clothespin, or string. Check the development of the head by peeking through the leaves.

Harvesting. Cut heads when they are fully formed but before they are overmature, as indicated by a rough spiny appearance of the curds. This condition—called riciness—indicates that the head will be strong flavored and tough. In cool conditions, a slight purplish color may prevail in the heads and is normal. Some varieties also may produce a few leaves that will protrude through the head. Store cauliflower in a cold, moist location for 2–3 weeks.

Common concerns

- cabbage worms
- aphids

Chinese Cabbage

This relative of cabbage is sometimes known as celery cabbage, Wong Bok, or Bok Choi. It is an old oriental crop that is popular in oriental and stir-fry cooking.

Varieties. The heading types of Chinese cabbage form heads that may be blocky to elongated in shape, depending on the variety. Elongated types include Rocket and Michili. Medium-shaped heads include Jade Pagoda, while blocky short-headed

types include China Pride, Blues, and WR60. Nonheading types include Pak Choi varieties and are harvested for their white leaf stalks with bright-green leaves.

When to plant. Chinese cabbage is difficult to plant in the spring because of a tendency for transplanted crops to bolt or go to seed. Select small, stocky plants and set them in early to mid-April, or direct seed by planting in the garden at the same time. Fall is an excellent season for growing Chinese cabbage in Kansas. Direct seed in early to mid-July, or transplant in early August.

Spacing. Space plants 10–12 inches apart in rows 2–3 feet apart. If you are direct seeding, plant seeds about ½ inch deep.

Care. Like its cabbage family relatives, Chinese cabbage needs a starter fertilizer at transplanting and regular fertilizing every 2–3 weeks during the growing season. Critical periods when water is necessary are during head formation and enlargement.

Harvesting. Heads of Chinese cabbage will be looser than cabbage. Feel through the dense leaves for the head, and cut it when the head has a distinct shape. The tender inner leaves may be used as a salad green. Once seed stalks start to appear, all head development ceases; if bolting occurs, harvest and salvage what you can of the crop.

Common concerns

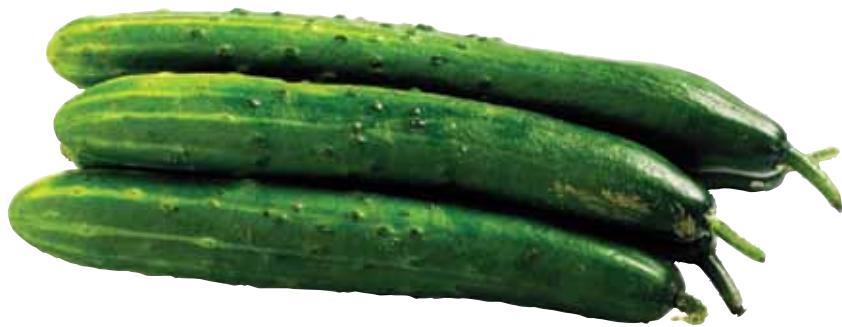
- cabbage worms
- aphids



Cucumber

Cucumbers are warm-season crops that traditionally have required a lot of garden space. With a trellis and newer compact varieties, cucumbers may be grown in small spaces and even in containers.

Varieties. Slicing cucumbers are long and slender, with a dark-green skin. Improved new hybrid varieties include Dasher, Sprint, Raider, Burpee Hy, and Marketmore. Sweet Slice is a long, mild-flavored variety as is Sweet Success. Pickling varieties are short and blocky in shape, with a firm flesh that



makes a crisp pickle. Spartan Dawn, Liberty, Pioneer and SMR-8 are suggested varieties. Burpless—soft mild-flavored types—include Burpless Hy as well as Sweet Slice mentioned before. Dwarf types include Patio Pik, Patio Pickle, and Spacemaster. Another novelty variety, Lemon, produces round, yellow fruit resembling a lemon.

When to plant. Cucumbers require warm conditions with no danger of frost for best results. Soil temperatures should be approaching 60°F, which occurs in early May in most of Kansas. Using black plastic mulch to warm soil is a way of producing cucumbers earlier.

Spacing. Cucumbers are usually spaced 2 feet apart in rows 5–6 feet apart. However, new dwarf types may be grown in 3-foot rows with plants 2 feet apart. Cucumbers may be transplanted by starting seeds in large containers and moving them carefully to the garden area.

Care. Cucumbers are fairly shallow rooted and require caution at initial cultivation. One application of fertilizer along the row when the vines are 6–12 inches long will improve production into the bearing season. Cucumbers can be grown on a fence or cage, but you may have to help the vines get started up the trellis. Avoid areas where strong winds may damage vines, because cucumbers on a trellis are much more subject to injury than are tomatoes. Like other members of the vine crop family—muskmelon, watermelon, pumpkin, squash and gourds—cucumbers have separate male and female flowers on the same plant. Male flowers predominate and usually appear before female flowers start to develop. Many newer cucumber varieties are of the gynecious type or have a larger number of female flowers for higher yields. Bees are required to transfer pollen from male to female flowers for the fruit to develop.

Harvesting. Select firm, dark-colored cucumbers developed before the seeds have a hard seed coat and while the skin is tender. Small cucumbers may be harvested for pickles at any stage. Removing large, overgrown fruits will keep vines productive longer.

Common concerns

- cucumber beetles (transmit bacterial wilt)
- powdery mildew

Eggplant

Eggplant is a unique vegetable that is a close relative of pepper and tomato. It requires warm weather to grow well. Eggplant primarily is used in several international dishes, and the crop is not as popular in gardens as many other vegetables. Many newer small-fruited or elongated varieties are now available.

Varieties. Large, dark-purple, oval varieties include Black Beauty, Black Magic, Burpee Hybrid, and White Beauty. Elongated types include Dusky (very early but small), Ichiban, Long Tom, Slim Jim, and Long Purple.

When to plant. Eggplant is usually transplanted about the time peppers are set into the garden—1–2 weeks later than tomatoes or in early to mid-May in most of Kansas. Eggplant is sensitive to cold temperatures and will not grow well in cool conditions.

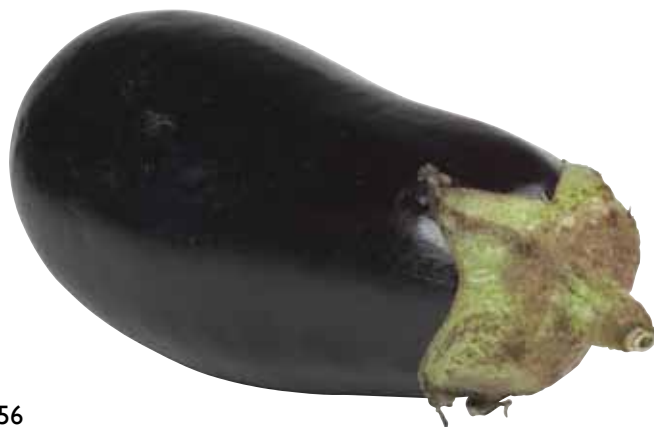
Spacing. Eggplant is usually set 2 feet apart in rows at least 3 feet apart.

Care. Eggplant will thrive in hot dry conditions better than many of its relatives. However, a good soaking in hot weather is beneficial to keep it productive. A strong plant is necessary to support fruit and to protect it from sunburning. Insects are especially damaging to eggplant foliage. Many leaf-feeding insects will nearly defoliate the plants in a short time; regular inspection and insect control measures are usually necessary.

Harvesting. Select firm, fully sized fruit that have a slightly soft touch with a bright and glossy skin. Because the stem that attaches the fruit to the plant is tough and woody, use a pruning shears to cut the fruit loose. Pick off and discard overgrown fruit to keep plants productive.

Common concerns

- flea beetles and other leaf-feeding insects



Endive/Escarole

Endive is a hardy, leafy vegetable similar to lettuce in growth habit and use. Endive has a crinkled leaf, while escarole has a broad, flat leaf. The flavor is stronger than lettuce, but both make an excellent addition to a mixed green salad.

Varieties. Endive varieties include Green Curled and Salad King. Escarole varieties include Broad Leaved Batavian, Florida Deep Heart, and Full Heart Batavian.

When to plant. These leafy green vegetables do not like hot weather and must be planted early in the spring for best results. Starting seedlings indoors and setting out transplants in early April is advisable. Direct seeding in mid-July or setting out transplants in early August is suitable for growing fall crops.

Care. These leafy crops are hardy and can withstand freezes in the fall. Like most leafy greens, they require consistent watering and are fairly shallow rooted. They also require fairly rich or well-fertilized soil.

Harvest. Cut the entire plant at ground level and discard the dark-green outer leaves. The most desirable part of the plant is the bleached light green/yellow leaves near the center. Store leaves in plastic bags in a refrigerator for several weeks.

Common concerns

- aphids

Kale

This relative of the cabbage family is used for its crinkled leaves. It can be cooked or used as garnish as a substitute for parsley. It is an excellent source of vitamins A and C. Kale is one of the most cold-hardy vegetables and can withstand very low temperatures while maintaining its characteristic dark green to purplish color.

Varieties. Common varieties include Dwarf Blue Curled Scotch, Vates, and Dwarf Siberian. Many oriental varieties are available to produce ornamental foliage known as flowering kale.

When to plant. Kale is cold tolerant and can be planted in early to mid-March for a spring crop or in early August for a fall crop.

Spacing. Plant seeds $\frac{1}{4}$ – $\frac{1}{2}$ inch deep and thin seedlings to a plant every 8–12 inches in the row. Rows can be up to 15 inches apart.

Harvesting. Pick older, lower leaves when they are full sized and tender. Cold weather improves the flavor. Kale can be left in the garden and used until a severe freeze damages the crop, usually in early December.

Common concerns

- aphids

Kohlrabi

Kohlrabi is a close relative of cabbage and broccoli. It produces a large, swollen stem resembling a turnip, with leaves protruding like spokes.

Varieties. Grand Duke (green), Early White Vienna (white) and Purple Vienna (purple).

When to plant. Sow seeds in mid-March or late July for a fall crop. The crop will thrive only in cooler periods of the year.

Spacing. Plant seeds 2–3 inches apart and thin to a plant every 4–6 inches for best results. Rows can be 12–15 inches apart.

Harvesting. The flavor is best when the kohlrabi is small—less than 2 inches in diameter. Larger ones often become tough. You can cook the leaves like spinach, and peel and use the swollen stem as you would a turnip eaten fresh or cooked.

Common concerns

- aphids
- cabbage worms



Lettuce and Other Leafy Greens

Lettuce is a cool-weather crop that is fairly cold tolerant. However, the thin, fragile nature of the leaves makes them susceptible to freezes and drought. Lettuce is best grown as a spring or fall crop. There are four distinct types of lettuce.

- Leaf types—Leaves are loosely arranged and colors may range from green to pale red to deep red. Leaf lettuce matures rapidly and is the most reliable type of lettuce to grow in Kansas, especially from seed.
- Romaine or cos—This lettuce forms a loose or soft head with thick stronger flavored leaves. It is an excellent addition to

a mixed salad and takes longer to develop than leaf lettuce.

- **Butterhead**—Tender, rounded leaves that form into a loose or soft head are characteristic of this succulent and delicious lettuce. It takes longer to grow than leaf lettuce and can be started and planted as transplants as well as direct seeded.
- **Head or crisphead**—Head lettuce takes nearly twice as long as leaf lettuce to develop. It is most reliably grown using transplants, and the fall season is the best time to grow head lettuce in Kansas.
- **Other leafy greens**—A wide range of other leafy greens can be grown in addition to lettuce. Mixtures of lettuce and other greens are often sold as mesclun. General culture of most leafy greens is similar to lettuce. Some require long periods of cool weather, making them difficult to grow in many years in Kansas, but many are quick growing and will produce well both as baby salad greens or as larger greens for cooking. Greens crops include cress, red russian kale, mizuna, pak choi (chinese mustard), tatsoi, arugula, komatsuna, orach, and sorrel.

When to plant. Sow lettuce seed in mid-March or set plants in early April. Sow seeds for a fall crop in mid- to late August for leaf or Bibb types, or in late July to early August for head or romaine types. Lettuce grown in hot weather will have a strong, bitter flavor. You may improve the flavor by storing lettuce in a plastic bag in a refrigerator for several days.

Spacing. Sow seeds thinly $\frac{1}{4}$ inch deep, and water consistently until the lettuce emerges. Thin to a plant every 6–8 inches, or set transplants at this spacing. Rows may be as close as 15 inches apart.

Care. Lettuce is shallow rooted, and the root system is fairly spindly. Therefore, it will require careful cultivation so as not to damage roots. Regular watering and fertilizing are necessary. Overwatering in heavy soils can cause root or head rots.

Harvesting. Cut the heads of heading types slightly above ground level and remove damaged, dirty, or excess leaves. Select full-sized leaves of leaf lettuce individually so that the plant will continue to produce. Store lettuce in a plastic bag in a refrigerator

immediately after harvest because it will become limp quickly.

Common concerns

- aphids
- tipburn (brown, dead edges of the leaves)

Muskmelons

Muskmelons, also known as cantaloupe, are a tender, warm-weather vegetable that requires culture similar to that of cucumbers. As the name implies, a strong yet slightly musky odor is characteristic of melons in this group. Muskmelons produce a sprawling vine that takes up a lot of room in a small backyard garden. Most traditional muskmelon varieties produce a pale-yellow melon covered with a netted surface and have orange-colored flesh. Some newer muskmelon varieties have a light-green flesh. Other melons such as honeydew, crenshaw, and casaba—often called winter melons—have cultural practices nearly identical to that of muskmelons.

Varieties. Large sutured or ribbed varieties include Burpee, Supermarket, Pulsar, and Saticoy. Small, solid non-sutured types include Rocky Ford types such as PMR 45 or Four Fifty. Green fleshed muskmelon include Eden Gem, and Galileo. Honeydew types include Earlidew and Moonshine.

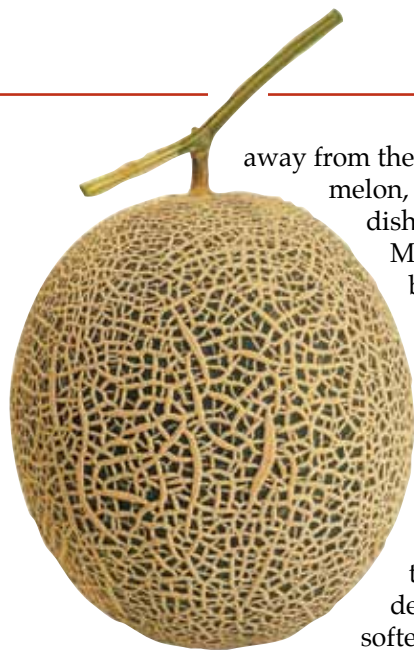
When to plant. Muskmelons are injured by light freezes; all danger of frost should be past before setting plants. Consistent soil temperatures of 58–60°F are necessary to encourage good germination. Early May is a standard planting date over most of Kansas.

Spacing. Muskmelon vines spread 6–8 feet wide, so row spacings of 6 feet are necessary with individual plants spaced every 18 inches to 2 feet in the row.

Care. Muskmelons usually do not require heavily fertilized soil. Normal maintenance fertilizers should produce an adequate crop. Mulching with black plastic warms soil, improves early season growth, and makes weed control easier. Use a starter fertilizer if setting transplants. Dry weather as the melons approach maturity is important to maintain good vine vigor and sweet flavorful fruit. Like cucumbers, muskmelons produce separate male and female flowers and require bees to pollinate them. Male flowers are more abundant and are present 1–2 weeks before female flowers begin to develop. Muskmelons and cucumbers will not cross pollinate.

Harvesting. Melons are ready for harvest when the stem slips easily and cleanly





away from the end of the melon, leaving a clean dish-shaped scar. Melons should be slightly soft and have a pleasant aroma. Honeydew, casaba, and crenshaw melons do not slip from the vine but do develop a slight softening at the flower end opposite the stem. Muskmelon fruit will not ripen off the vine. They can be stored for only 3–4 days when fully ripe.

Common concerns

- cucumber beetles (transmit bacterial wilt)
- aphids
- spider mites

Mustard

Mustard greens are a cool-season crop. They mature quickly and are easy to grow. Although cooking greens is popular in the South, many people recognize their high nutritional value, and they are becoming more popular for use in light cooking and stir frying.

Varieties. Green Wave, Tendergreen, and Southern Giant Curled are common varieties.

When to plant. Mustard is normally direct seeded in early April or can be direct seeded in early August for a fall crop. Fall is a preferred season for growing greens because of the long, cool, harvest season.

Spacing. Seeds should be planted $\frac{1}{2}$ inch deep and plants thinned to a plant every 2–4 inches. Rows may be as close as 15 inches apart, or you can plant mustard in a wide row by scattering seeds in a band 5–6 inches wide.

Care. Mustard requires water during dry periods to keep the tender foliage from becoming limp. Mustard that produces a large plant too early may bolt or produce a seedstalk with bright yellow flowers instead of producing only foliage. Once seedstalk development starts, leaves should be quickly harvested and used.

Harvest. Cut the leaves when they are young and tender. You can cut the entire plant or individual leaves to allow the plant to continue to grow and produce more leaves.

Leaves harvested in hot weather will be strong flavored and tough. Store leaves in a plastic bag in a refrigerator for 2–3 weeks.

Common concerns

- aphids

Okra

Okra is a tall-growing, warm-weather vegetable that is easy to grow in Kansas gardens. Okra is sometimes called gumbo, and the edible part of the plant is the young tender pods that develop following flowering. The plant will continue to bloom and produce pods up the stalk as the season progresses.

Varieties. Clemson Spineless and Dwarf Green are standard varieties. Emerald produces a smooth, non-ribbed pod. Annie Oakley is a new hybrid variety that branches more profusely. Burgundy is a red-podded variety. Cajun Delight is an early maturing variety.

When to plant. Okra requires warm weather, and early to mid-May is a desired planting time. Soil temperatures should be 60°F, and all danger of frost should be past. Okra may be transplanted or direct seeded.

Spacing. Plant seeds an inch deep and thin to one plant every 10–12 inches in the row, with rows no closer than 3 feet apart.

Okra will grow well in a wide variety of soil types and requires only minimal levels of fertilizer. It does fairly well in hot, dry seasons with periodic thorough watering. Later in the season after the plant is tall, you can cut it off about 12 inches from the ground. Use pruners or a saw because okra stalks are very tough. The plant will send up a new stem for pod production into the late summer or fall season.

Harvesting. Cut the pods from the plant when they are no longer than your finger to ensure that they will be tender, not woody. Harvesting every other day might be necessary. Okra pods can be stored in a plastic bag in a refrigerator for a week or so. Pods can easily be frozen for later use.

Common concerns

- few reported



Onions and Onion Relatives

Onions are used primarily as a flavoring agent, although they are rich in vitamins and minerals and low in calories. Onions are grown from sets, plants, or seed. Sets are small onion bulbs that are planted in the spring to produce green onions—scallions—or bulbs later in the season. Most onion sets for sale in garden centers are usually poorly identified by variety. Plants or transplants are sold in bundles or growing in pots or trays and usually are identified by variety. Choose healthy, fresh plants with good green color. Onions can be grown from seed, but seed produces onions latest in the season, and the small, weak onion plant is difficult to weed or cultivate early in the season.

Varieties. Onions can be yellow, white, or red. Yellow varieties include Yellow Globe and Early Globe (pungent flavor but good keepers), or improved mild-flavored types such as Fiesta, Texas 1015 Y, Grano, and Granex. Mildest flavored onions are the Bermuda types—Yellow or White Bermuda—while the largest bulbs are produced by Spanish types—Yellow or White Spanish. Benny's Red and Red Burgundy are popular red varieties.

When to plant. Onions grow well in cool or warm weather. They should be planted early so that as much growth as possible occurs before hot, dry weather. Plant sets in mid-March or plants or seed in early April.

Spacing. Onions may be grown in rows as close as 15 inches, with individual plants spaced 2–4 inches in the row, depending on the size of the bulb. Plant sets 1–1½ inches deep, and plant transplants about the same depth.

Care. Onions have a shallow, inefficient root system and need regular watering and fertilizing for best results. Onions compete poorly with weeds and other crops. Weed control is essential to reduce competition. Watering may be reduced near the harvest period, but regular timely watering until the tops begin to fall over is needed. Large, vigorous plants are essential for large bulbs with high yields.

Harvesting. Onions are ready for harvest when the tops begin to weaken and naturally fall over. This is a signal that the bulbs are as big as they will get. Pull or dig the onions and store in a warm, dry,

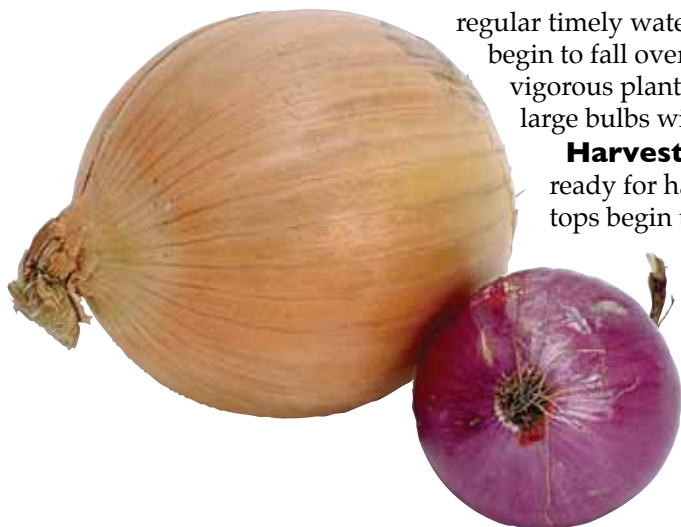
shaded location for 2–4 weeks until the tops and necks are completely dry. After the tops are dry, cut them, trim the roots, and store in a cool dry location. Onions need cool storage, but they should not be stored in a tight plastic bag. An open mesh bag is best for storage. Mild-flavored onions keep for only a month or so. Stronger flavored or more pungent onions keep 3–4 months.

Common concerns

- thrips
- bulb and neck rots
- smut

Onion relatives. Shallots are smaller than onions and are grown by planting a division or clove. They can be dug in midsummer for storage or used as green onions in the spring.

- Garlic is a strong-flavored onion relative that is also grown by planting a division or clove in late summer. After overwintering, the bulbs are ready for harvest in early July when the tops begin to turn yellow.
- Multiplier onions are also divided at the base. They are normally used for green onions in the spring because bulb development is poor and the flavor is strong.
- Chives are grown for the green foliage in the spring, summer, and fall. They are usually grown in clumps.
- Leeks require a long cool season for best results. They are usually planted in early spring and dug in late September to mid-October.



Parsley

Parsley is an easy-to-grow vegetable that is commonly used as a garnish. However, the nutritional value of parsley is excellent, and it can be used as a salad green in several types of recipes or added to soups, stews, and sauces. It can easily be grown in containers indoors for fresh use during the winter.

Varieties. Curled leaf types include Banquet, Deep Green, Forest Green, Moss Curled, Minicurl, Perfection, and Triple Curled. Italian parsley is not curled; it has a flat leaf. Some varieties can be grown for a large, fleshy root which has a strong parsley flavor.

When to plant. Parsley is a cool-weather crop that can be planted in mid-April, about the same time as beets or carrots, or in early August for a fall crop.

Spacing. Parsley seed is small and needs a fine seedbed because it must be planted $\frac{1}{4}$ inch deep or less. Use fresh seed each year. Plants should be 1–2 inches apart as the plant is fairly small; rows may be 6–12 inches apart. You can also grow parsley in a bed or mass planting in a small area, especially in an herb garden outside the back door where plants are handy for use.

Care. Parsley grows quickly and is best during cool periods. The plant is shallow-rooted and requires regular fertilization and watering for best results.

Harvesting. Clip or break off individual leaves when they are full sized. Wash leaves and store them in a plastic bag in a refrigerator for up to 2 weeks. Parsley can be dried for later use or leaves can be frozen easily. Freeze leaflets on a cookie sheet so they can be separated for later use.

Common concerns

- aphids

Parsnip

Parsnip is a hardy, cool-season crop that is grown for its white, carrotlike root. Roots are most flavorful when dug late in the season, as sugars accumulate in the root.

Varieties. Hollow Crown, Model, and All American are common varieties.

When to plant. Sow seed in early to mid-April as beets or carrots are planted. Using fresh seed is important.

Spacing. Plant seeds $\frac{1}{2}$ inch deep with 2–4 inches between plants. Rows may be 15 inches apart. Seed may be slow to germinate, so be patient for the crop to emerge. Avoid heavy watering that would create a crust and interfere with good germination, or sprinkle some peat moss or sand over the row to prevent crusting.

Care. Parsnips need care similar to that for beets or carrots. Prevent weed competition, and water during stressful periods. Allow the crop to stand until late fall to early winter before digging.

Harvest. Dig the roots in late November to early December before the ground starts to freeze.

Common concerns

- few reported

Peas

Peas are one of the most cold tolerant plants grown in Kansas gardens. They can be planted about as early as soil can be prepared in the spring. Most varieties produce pods and the

seeds need to be shelled. Several newer varieties produce thick, fleshy pods, and the pods as well as seeds can be eaten. In addition, some thin-podded oriental types produce tender pods with only the pods used. Southern peas or cowpeas are an entirely different crop and are grown in much the same way as beans.

Varieties. Standard varieties include Little Marvel, Green Arrow, Maestro, Knight, Sparkle, and Burpeeana. Edible-podded types include Sugar Ann, Sugar Bon, and Sugar Snap. Oriental thin-podded types, often called snow peas, include Dwarf Grey Sugar and Mammoth Sugar.

When to plant. Plant seed in early to mid-March when soil is dry enough to work. Peas will germinate when soil conditions are favorable. Peas are not well adapted for fall gardens because seed usually fails to germinate well in warm soil.

Spacing. Plant seed 2–4 inches apart with rows 12 inches apart. Peas usually do best where 2–3 rows can be planted 4–6 inches apart to allow the weak, spindly vines to support each other.

Care. Peas prefer cool soil and need water during stress periods. They grow best in moderate- to well-fertilized soil. A trellis may be needed to support the flimsy vines; short wire mesh or string trellis works well.

Harvesting. When the pods are swollen so that seeds within are full sized but tender, pick and shell the peas from the pods. Edible-podded types should be picked and used immediately after harvest as they tend to dry out readily. Harvest oriental types when the pods are crisp and tender but before the seeds begin to enlarge significantly. Store peas in a refrigerator in a plastic bag for up to a week. Peas are easily frozen for later use.

Common concerns

- root rots
- mildew



Peppers

Peppers are a close relative of the tomato; but, peppers are more cold sensitive than tomatoes and usually require more fertilization. Peppers are generally classified as sweet

or hot, with the most common sweet peppers being large, blocky bell or mango varieties. Hot peppers vary in shape and size as well as degree of hotness. Peppers can be eaten either when the fruit is full sized but immature or when it changes to its mature color. A variety of colors from green to red, yellow, orange, purple, white, and brown (dull purple) are available.

Varieties. Green to red blocky bell types include Ace, Bell Boy, Jupiter, Lady Bell, Keystone Resistant Giant, and improved California Wonder varieties. Green to yellow varieties include Honeybell, Marengo, and Golden Bell. Gypsy and Canary are light yellow when immature but red when mature. Valencia and Oriole turn bright orange when mature. Purple Bell and Purple Beauty turn purple at maturity. Other sweet peppers include Sweet Cherry, Pimento, Sweet Banana, and Italian frying types. Hot peppers include Jalapeño; Anaheim, used for chiles rellenos; El Paso, and Coronado. Tam Jal is a milder flavored jalapeño. Small, hot types include Serrano, Red Chili, and Super Chili. Small orange Habanero types are among the hottest peppers. Ornamental peppers vary in flavor and hotness and can be enjoyed as ornamental plants.

When to plant. Peppers are usually set as transplants in the garden and should be planted 1–2 weeks after setting tomatoes. Peppers exposed to cold temperatures early in the season will often drop their fruit, resulting in a large, unproductive plant. Mid-May is a safe time to plant peppers in most of central Kansas.

Spacing. Set plants 18 inches to 2 feet apart in rows 15 inches apart. Hot peppers usually produce a larger, more sprawling plant and require more space.

Care. Peppers thrive in well-drained fertile soil. Water is required in dry periods. Even, consistent watering is preferred as peppers can develop blossom end rot, a brown leathery patch at the base of the fruit. Peppers require a slightly more fertile spot than tomatoes, but gardeners should avoid over-fertilization. Harvest fruit when they are the desirable

size, to keep the plants producing more. Poorly shaded fruit may be subject to sunburning in hot summer conditions.

Harvesting. Carefully pick or cut peppers from the plants. Avoid pulling on the fruit as you can easily break the plant. Peppers that have begun to turn color usually will continue after harvest. Hot peppers produce an oil that will penetrate the skin and cause discomfort if you get it in your eyes or other sensitive areas of the body. Use rubber gloves to harvest very hot peppers. Sweet peppers can be chopped and frozen for later use; hot peppers can be frozen or dried. Store peppers for up to a week in a refrigerator.

Common concerns

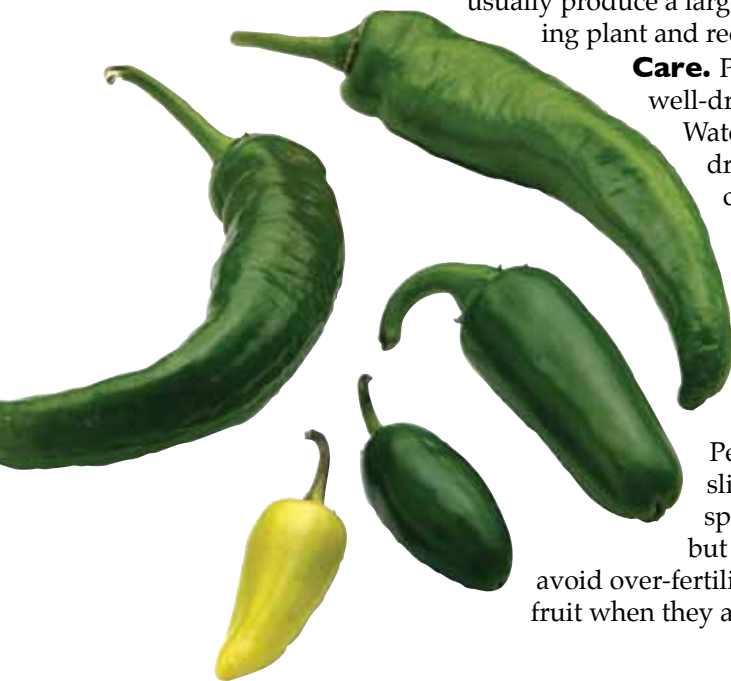
- aphids
- tobacco mosaic virus (distorted, misshapen leaves; transmitted by aphids)

Potatoes

Potatoes, often called Irish potatoes, are one of the most important world food crops and a staple for many large gardens. Potatoes are tubers, or swollen underground stems that form as a storage location for starch. Tubers form best at temperatures of 60–70°F; therefore, early spring planting or fall planting is preferable in Kansas. Potatoes are grown from cut pieces of tubers grown in northern areas the previous season, usually referred to as seed potatoes.

Varieties. Skin color can be white, red, or russet (brown). Common red-skinned varieties include Red Norland, La Rouge, Viking, and Reddale. White-skinned varieties include Superior, Norchip, Crystal, Kennebec, and Irish Cobbler. Russet-skinned varieties include Norgold and Norkotah. Varieties differ in texture as well. The russet varieties are particularly good for baking as they have a mealy, crumbly texture when baked. White or red varieties are usually preferred for boiling or mashing. Consult your local K-State Research and Extension office for additional variety information.

Cutting and preparing seed. Select firm, solid seed potatoes with a blue tag on the bag (inspected to be free of diseases). Cut the tubers into 1½- to 2-ounce pieces. An average-sized potato is cut into four pieces, while a large potato is cut into six. Store the cut seed in a warm, humid location for 2–3 days to allow the freshly cut surface to “heal.” This prevents the seed piece from rotting when planted. Always purchase new potato seed. Do not use your own tubers for seed as reductions in yield and vigor will result.





When to plant. Mid-March—St. Patrick’s Day—is a traditional time to plant spring potatoes in Kansas, while early to mid-July is the time to plant for a fall harvest.

Spacing. Plant seed 12 inches apart in rows 3 feet apart. Plant the seed less than 2 inches deep in the spring, or 4–5 inches deep for a fall planting.

Care. Potatoes develop along the main stem of the plant, above the seed piece. To encourage large yields and to prevent sunburning, potatoes should be hilled or ridged, pulling loose soil along the row as the crop is growing. This ridge or hill eventually should be 8–12 inches tall. Potatoes like a fertile well-drained location with loose, friable soil. Potatoes need regular, consistent watering, especially during development when the plants are 6–12 inches tall. Irregular watering lowers yields and may result in rough knobs on the tubers. Mulches can be useful in holding moisture near the plant.

Harvest. Early or new potatoes can be harvested as the plants are growing by gently removing some plants in the row. Begin digging potatoes when the vines are about half dead. Remove excess vines and carefully dig the tubers. Allow them to surface dry out of the sun for a day or more to toughen the skin and prevent sunburning. Then move potatoes into a cold, dark location for storage. Ideal storage temperature is below 40°F.

Common concerns

- scab (use certified seed)
- Colorado potato beetles
- early blight
- leafhoppers

Pumpkin

Pumpkin is a warm-season crop used primarily for Halloween decoration; it also is used for pies, breads, cookies, soup, and

roasted seeds. Immature flowers can be stir fried and small pumpkins used as summer squash.

Varieties. Pumpkins produce large, sprawling vines that take up a lot of space in the garden. Some pumpkin varieties are bush or semivining types that take less space but still spread.

- Small. Small Sugar Pie and Spookie are 8–10 lb size, while Baby Pam is smaller. Jack Be Little and Munchkin are miniature pumpkins.
- Medium. Spirit (compact vine), Cinderella (compact vine), and Youngs Beauty.
- Large. Connecticut Field, Howden, Jackpot (semivining), and Ghost Rider are jack-o-lantern types. Big Autumn and Autumn Gold colors quickly and completely.
- Huge. Big Max, Atlantic Giant, and Big Moon are specimen types.

When to plant. Pumpkins can be safely planted after all danger of frost is past in early to mid-May. However, most growers prefer to plant in early to mid-June to ensure that pumpkins do not mature too early. June-planted pumpkins are ready for harvest in early October.

Spacing. Pumpkin vines need 50–60 square feet per hill—1–2 plants—and standard vining types should be planted about 4–5 feet apart in 12-foot rows. Small or semivining types can be planted 3–4 feet apart in 6-foot rows. Plant seed about an inch deep.

Care. Provide shallow cultivation to keep weeds from developing in areas where vines will spread, because weeds will be difficult to remove later. Water thoroughly as the fruit start to develop. Only female flowers develop into fruit; male flowers outnumber female flowers and appear first. Bees transfer pollen from male to female flowers, requiring care in application of pesticides that may kill bee populations.

Harvest. Pumpkins are ready for harvest when the skin is tough and hard and the stem no longer “leaks” when cut from the vine. Cut the stem with a sharp knife or pruning shears to leave a “handle” attached to each



fruit. Store pumpkins in a warm, dry location for 2–3 weeks to further dry and cure the fruit. Storage temperatures of 50–60°F in a dry location out of direct sunlight will maintain pumpkins' bright color.

Common concerns

- powdery mildew
- squash bugs

Crossing Squash and Pumpkins.

Pumpkins, squash, and gourds are closely related crops that are members of the Cucurbit or vine crop family. There are four species of the genus *Cucurbita* used as vegetables, and crossing can occur within species only. Cross pollination, however, will only influence the crop if you save your own seed for next year's crop. The term "pumpkin" is used for anything that is round and orange, while the term "squash" is used for an edible fruit of some other shape or color. The term "gourd" is used for various shapes and sizes of fruit used for decoration.

The four species are listed below with some common varieties for each species. Only varieties within species will cross with each other.

- *Cucurbita pepo*, true pumpkins. Most jack-o-lantern pumpkins, zucchini, yellow summer squash, scallop or patty pan squash, acorn squash, most small, yellow-flowered gourds.
- *Cucurbita maxima*, true squash. Large pumpkins (Big Max, Atlantic Giant), Hubbard squash, buttercup squash, delicious squash, Turk's Turban squash.
- *Cucurbita moschata*. Dickinson field (pie pumpkins), Kentucky field, butternut squash.
- *Cucurbita mixta*. Green-striped cushaw, sweetpotato squash, Japanese pie pumpkins.

Radishes

Radishes, a cool-weather vegetable, are among the first vegetables that can be used from the garden. Radishes need a sunny location and can be grown in early spring and as a fall crop. As the weather gets hot, however, the flavor of radishes becomes strong and hot.

Varieties. Round red varieties include Cherry Belle, Scarlet Globe, Red Prince, Red Boy, and Comet. White radishes include Icicle and Round White. Multicolored (white to pink to red) varieties include Easter Egg. White and multicolored varieties generally require longer to mature.

When to plant. Plant radishes in mid- to late March for a spring crop or early



September for a fall crop. Make successive plantings so that you will have a continuous supply over a longer period of time. A special type of radish such as the large winter radish or oriental radish might require as long to mature as beets or carrots and requires the same culture.

Spacing. Radishes can be grown in narrow 15-inch rows, and in bed or wide-row plantings. Each radish needs 1–2 inches to enlarge its root, so thin thickly planted seedlings to this spacing. Plant seeds ¼–½ inch deep.

Care. Radishes require loose, well-drained soil and need regular frequent watering for a good crop. Excessive nitrogen fertilizer can encourage lush tops with poor-sized radishes. Control weeds while they are small, and be careful not to damage the shallow root system of this spring crop.

Harvesting. In loose soil, radishes can easily be pulled, especially if the soil is moist. For elongated radishes in heavy soil, a spading fork may be necessary. Store excess radishes by removing the tops and placing in plastic bags in a refrigerator. Radishes will remain good for a week or more.

Common concerns

- flea beetles
- root maggots

Rhubarb

Rhubarb is a perennial crop grown for its red stalk that has an acid flavor. Rhubarb often is mixed with fruits. It is among the first vegetables ready for use in spring. Because your planting may last a number of years, locate plants in full sun at the edge or end of the garden area to avoid damaging them with annual tillage.

Varieties. The most common red-stalked variety is Canada Red; others are McDonald, Ruby, Valentine, Cherry Red, and Strawberry Red.

When to plant. Rhubarb is best established in early spring—March to April—by planting a plump, healthy "crown" consisting of a portion of the woody root system with some buds in a shallow trench. Dig an old plant and divide the root into 4–8 pieces for

replanting, or purchase rhubarb roots from a garden center.

Spacing. Plant rhubarb about 2 feet apart in rows at least 3 feet apart. The crowns should be planted in a well-drained location with a slightly raised bed to encourage good drainage away from the center of the plant. The roots should be planted 1–2 inches deep.

Care. Fertilize rhubarb plantings in the spring so that spring rainfall will carry fertilizer into the root system, encouraging early summer growth. Rhubarb survives by producing vigorous leaves that produce food reserves stored in the root system, especially in the fall season. Rhubarb thrives in cool locations and is fairly hardy in severe winters. Always provide good drainage; never allow water to stand over the row.

Harvesting. Rhubarb must be established for a season before it can be harvested. Pull leaves as soon as they are large enough to use in the spring, and continue the harvest as long as the leaf stalks are large and thick—up to 7–8 weeks in the spring. After late May to early June, it is time to stop harvesting and allow the plant to produce summer growth for continued bearing the following season. In some seasons, rhubarb will produce seed stalks. These should be cut and discarded immediately as rhubarb that produces seed also produces less foliage, resulting in less vigorous crop the next year. Rhubarb dries out quickly. Trim the large leaves and place the leafstalks in plastic bags in a refrigerator to store for a week or more. Excess rhubarb can be frozen easily for later use.

Common concerns

- crown rot
- curculio

Salsify

Salsify is commonly known as oyster plant because the flavor of the cooked roots is similar to that of oysters. The thick, fleshy root of the plant, resembling a thin, white carrot, is dug in the fall or allowed to stay in the soil for digging throughout the winter.

Varieties. Mammoth Sandwich Island.

When to plant. Plant salsify about the same time as you would parsnips, beets, or carrots in the spring. Because it normally requires all season to develop, fall plantings are rare.

Spacing. Plant seeds $\frac{1}{2}$ – $\frac{3}{4}$ inch deep and allow 2–3 inches between

each plant after thinning. Rows may be as close as 15 inches.

Care. Salsify grows slowly in the early season, and careful, shallow cultivation to keep it well weeded is important. Once the plant is established, it is drought hardy and not susceptible to common garden disease or insects.

Harvesting. The flavor of salsify does not develop until several freezes have occurred in the fall. The long, thin roots usually require digging to remove them. You can dig salsify during the winter as long as the ground is not frozen, or it can be left in the ground for digging the next spring before plant regrowth. Store salsify in a plastic bag in a refrigerator after trimming off the tops.

Common concerns

- few reported

Spinach

Spinach is a hardy, cool-season crop that is increasing in popularity as a salad green. It is easy to grow and well adapted in small garden areas. It will grow in spring or fall seasons, but hot days in late spring cause spinach plants to bolt or produce a seed stalk.

Varieties. Spinach varieties vary as to the degree of “crinkle” in the leaves—called savoy. An old, standard, heavily savoyed variety is Long Standing Bloomsdale. Melody, Space, and Avon are hybrid, semi-savoyed types that produce well. Tyee is a type with smoother leaves. Smoother leaf types are easier to wash and clean if you have sandy soil that may get into the cracks and crevices of the leaves. A plant referred to as “New Zealand spinach” is not related to spinach and is often called “hot weather spinach” because it grows best during the warm days of late spring. It is not planted until later in the season and is harvested for the young, tender leaves that develop through late spring to early summer.



When to plant. Spinach can be planted very early as it is cold hardy. Mid- to late March is a common planting time. Fall spinach can be planted in mid-August to early September. Fall-planted spinach will usually overwinter if lightly mulched and vigorously re-grow in the spring. However, it will often 'bolt' (produce a seedstalk) early so spring-planted spinach should still be planted to grow longer into the spring season.

Spacing. Plant seeds about an inch apart in rows as close as 5–6 inches, or you can scatter seed uniformly about an inch apart in a wide row or bed planting. Because spinach germinates and grows early in the season, weed control is easier in this crop than in many planted this way.

Care. Spinach needs a fertile, well-drained location. Because production occurs early in the season, watering during stressful weather is not normally a concern. Additional nitrogen may be required to keep the spinach dark green and growing vigorously.

Harvest. Clip spinach leaves as soon as they are big enough to use. If you clip individual leaves, the plant will continue to develop and produce more leaves. If you want to harvest mature plants, cut the plant at the soil level. This will be necessary as hot weather approaches. Fall-planted spinach will often overwinter; clip individual leaves for fall harvest but allow the plants to remain. Cover the planting with mulch in mid- to late November and uncover early in the spring. You will usually get an additional early spring crop of spinach; however, this overwintered crop produces seed stalks early in the season. Store spinach in a plastic bag in a refrigerator for about a week.

Common concerns

- few reported

Squash

Two main types of squash are grown in Kansas gardens. Summer squash are used in their young or immature stage and grow on compact, nonsprawling vines, while winter squash are used at their mature stage



and grow on trailing vines. The general culture and care are similar for both types.

Varieties. Summer Squash—Summer Crookneck, Prolific Straightneck, zucchini (several hybrid varieties vary, depending on color and shape), Eldorado (yellow zucchini), Goldrush, Sunburst (yellow scallop).

Winter Squash—Royal Acorn, Ebony Acorn, and Table Queen, Butternut (several hybrid varieties), Improved Green Hubbard, Pink Banana, Striped Cushaw, Spaghetti Squash.

When to plant. Squash are warm-season crops that are damaged by freezes. Plant after all danger of frost has passed; early May is a traditional planting time. A planting of summer squash for a fall harvest can be made in early August. Fall plantings of winter squash should be made in mid- to late May.

Spacing. Summer squash can be planted 2 feet apart in rows at least 3 feet apart. Winter squash need more room for their sprawling vines, with 3–4 feet between plants in rows at least 6 feet apart.

Care. Weeds compete with squash plants, making shallow cultivation essential, especially early in the season. Squash benefit from the soil-warming and weed-control properties of black plastic mulch. Once full vine spread is achieved, little additional care is necessary. When plants are established, squash are fairly tolerant of drier soil conditions. Squash, like other relatives such as cucumber, muskmelon, and watermelon, have separate male and female flowers on the same plant. Bees are required to transfer pollen from flower to flower. Male flowers usually appear first, and there are more male than female flowers.

Harvesting. Summer squash are harvested at an immature stage—before the skin and seeds have toughened. Usually harvesting when they are 6–10 inches long is preferable. Squash develop quickly, and regular harvesting is important. Winter squash are harvested at maturity—after the rind or skin is tough. Check the development by trying to penetrate the skin with your fingernail. Immediately af-



ter harvesting, allow winter squash to further dry by storing them at 70–80°F in a dry location for 2–3 weeks before moving them to storage areas such as a basement where temperatures are 50–60°F. This “curing” process allows squash rind to toughen. Winter squash can be stored for 4–8 months. Summer squash should be stored in a refrigerator for only a short time because they are prone to drying out.

Common concerns

- squash bugs
- powdery mildew

Sweet Corn

Ears of sweet corn are a popular addition to summer meals. The flavor and quality of freshly picked sweet corn is outstanding. Sweet corn does not adapt well to small garden areas because closely spaced plants will produce only 1–2 ears. Space is a major consideration if you want to grow sweet corn.

Varieties. New hybrid varieties of sweet corn are available. The colors range from yellow to white to bicolor, yellow and white kernels together on the same ear. Early varieties that require 65–75 days to mature produce smaller stalks and ears, while later varieties requiring 75 days or longer produce larger plants and larger ears. New varieties are available with resistance to several common diseases such as maize dwarf mosaic, smut, and bacterial wilt.

Sweet corn differs from field corn by a single genetic factor called the “sugary” or Su gene. Several new varieties that have higher levels of sugar controlled by additional genes have been developed. Varieties with the shrunken-2 or Sh-2 gene are extremely sweet and produce a more watery, crisper kernel but must be isolated from other corn varieties that may pollinate at the same time. A newer class of varieties carrying the SE or sugary extender gene are moderately sweeter, tender, and do not require isolation.

Common yellow varieties include Gold Cup, Merit, Miracle, Bodacious, Incredible, Jubilee, Sweetie, Sugar Loaf, Sweet Time, and Kandy Korn. White varieties include Quick Silver, Sugar Snow, Snow Belle, and Silver Queen. Bicolor varieties include Carnival, Calico Belle, Candy Store, Ambrosia, and Honey and Cream.

When to plant. Sweet corn is a warm-season crop and should be planted in mid- to late April. New sweeter varieties have a smaller, more shriveled seed and will rot in cold soil; do not plant these types until early May. Successive plantings of corn are important to spread the harvest over a longer period.

Make additional plantings when the previous planting is $\frac{1}{2}$ – $\frac{3}{4}$ inch tall.

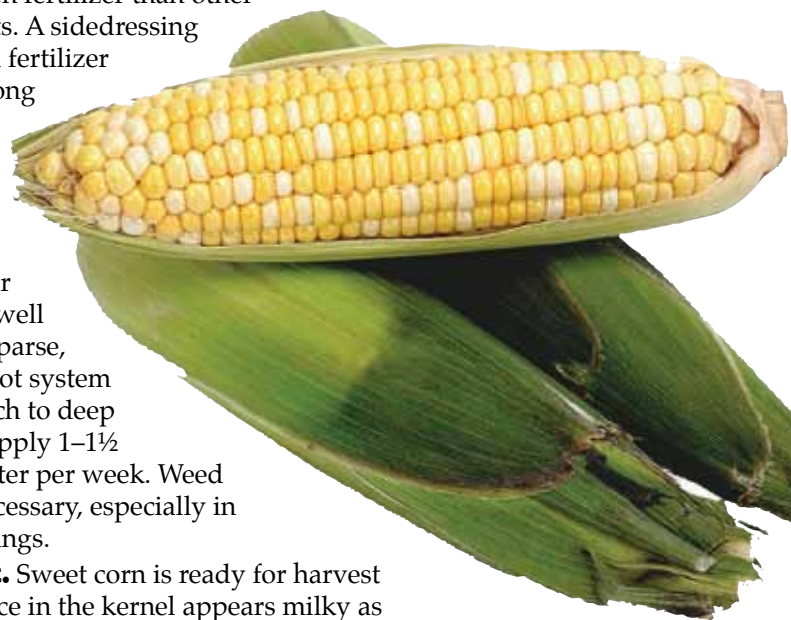
Spacing. Plants should be 8–12 inches apart in rows at least 3 feet apart. Do not crowd plantings, as weak, spindly, unproductive plants will result. Plant the kernels an inch deep. If many seeds fail to germinate, do not attempt to replace missing plants; replant the entire planting.

Care. Sweet corn requires wind to transfer pollen from the tassel (male) to the ear (female). Plant corn in small blocks or several short rows rather than a single row to encourage better pollination. Sweet corn pollinates poorly in 100-degree weather, and ears with missing kernels or gaps may result. Sweet corn may be cross pollinated by other types of corn such as field corn that pollinates at the same time. If there is a danger of cross pollination, a space of 40–50 feet may be needed as cross pollination can affect flavor. Sweet corn is a member of the grass family and needs considerably more nitrogen fertilizer than other garden plants. A sidedressing of additional fertilizer sprinkled along the row every several weeks is important. Sweet corn needs regular watering as well because its sparse, inefficient root system does not reach to deep soil water. Apply 1–1½ inches of water per week. Weed control is necessary, especially in young plantings.

Harvest. Sweet corn is ready for harvest when the juice in the kernel appears milky as you puncture a kernel with your finger. The ear should be well filled to the tip. This ideal harvest stage lasts for only a few days in hot weather, and regular checking for maturity is important. The silks of mature ears are generally completely dry and brown. Twist and pull the ear from the plant by bending the ear down sharply. Use corn immediately or store it in a cold place immediately after harvest. Pick corn early in the morning when it is cool outside. Store corn for only a few days in a refrigerator before using. Corn is easily frozen for later use.

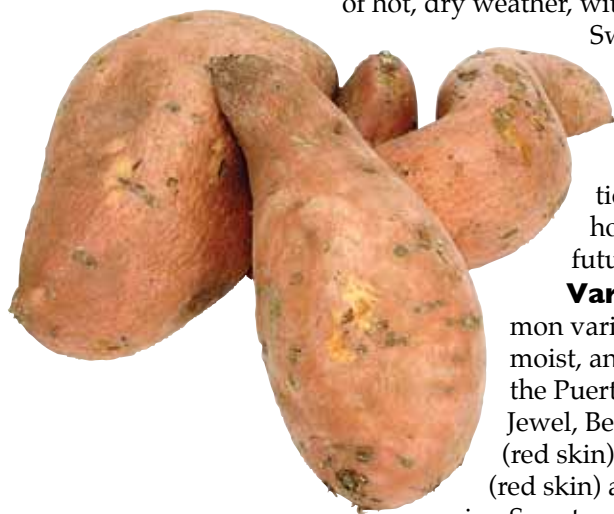
Common concerns

- corn earworm
- smut



Sweet potato

Sweet potatoes are a warm-season crop that is often overlooked as an easy-to-grow, productive garden vegetable. They are tolerant of hot, dry weather, with few pest concerns.



Sweet potatoes do sprawl more than Irish potatoes and need plenty of room. Sweet potatoes are nutritious and easy to store in household conditions for future use.

Varieties. Most common varieties are dark orange, moist, and sweet and fall into the Puerto Rican type varieties. Jewel, Beauregard, Georgia Jet (red skin), Centennial, and Travis (red skin) are common varieties. Sweet potatoes are grown from plants, usually called “slips,” that can be purchased in bundles from your local garden center. You can also grow your own by placing a sweet potato root in a container filled with moist sand and allowing it to sprout in a warm location for about six weeks before setting plants in the garden.

When to plant. Sweet potatoes can be injured by any degree of cold weather. Wait until mid- to late May before attempting to plant. Sweet potatoes need to be planted on a ridge or mound of loose soil about 8–12 inches high to provide a bearing area for the fleshy roots to develop later in the season.

Spacing. Plant about 12 inches apart in rows at least 3 feet apart. Vines may spread to 6–8 feet wide.

Care. Avoid planting sweet potatoes in excessively rich soils or highly fertilized soils. The plants grow best in moderately fertile soil. Sweet potatoes are adapted to grow well in drier weather, but a thorough, deep watering in early August during dry periods will improve yields. Hoe as needed early in the season to prevent weeds from developing; later in the season, the dense vine growth will suppress weeds.

Harvesting. Sweet potatoes continue to develop throughout the season and do not deteriorate in quality if they get too large. It usually takes until mid-September to mid-October for the fleshy roots to enlarge to a harvest stage. Dig before freezing weather occurs. Cut or chop the vines a few days before digging to make digging easier. After digging, break the roots from the vine and allow them to air dry for a few hours before picking them

up. Gently place roots in baskets or boxes to avoid injury to the tender skin. Sweet potatoes must be “cured” in a warm, humid location for 1–2 weeks to improve keeping quality and flavor. Place the baskets in an 80–90°F environment with high humidity for 7–10 days. Then lower the temperature to around 55°F for long-term storage. Never allow temperatures to drop below 50°F as poor keeping quality, flavors, and dark colors will result. If sweet potatoes are washed before storing, make sure they are handled carefully and dried before curing.

Common concerns

- few reported

Tomatoes

Tomatoes are the most popular vegetable grown in Kansas gardens. They are easy to grow, productive in small garden areas, and used in a wide variety of ways. Tomatoes require a location that is fairly fertile, well-drained, and sunny, getting at least a half day of sun or more. Smaller vine tomatoes can be grown in containers.

Varieties. Most modern tomato varieties are hybrids with disease resistance. Certain varieties produce well in our variable climate. Fl91, Jet Star, Mt. Spring, Mt. Fresh, Celebrity, Scarlet Red, Red Defender, Security28, Fabulous, and Fl 47 are adapted varieties as well as several other hybrids. Whopper and Beefmaster are large “beefsteak” types. For canning, choose the productive and firm-fruited LaRoma, Campbells, or Heinz varieties. Small fruited or cherry varieties include Mt. Belle, Red Cherry, Small Fry, Sweet 100, and Cherry Grande. Patio, Pixie, and Tiny Tim are dwarf varieties well suited to container growing.

When to plant. Plant tomatoes after all danger of frost is past. Early



May is the common spring planting time. For a later harvest, tomatoes can be planted as late as early June.

Spacing. Most garden tomatoes should be spaced at least 18 inches to 2 feet apart in rows 3–5 feet apart. Dwarf varieties can be spaced closer.

Care. Tomatoes are usually grown from transplants. Choose a strong healthy transplant that has a dark green color and balance between the size of the plant and the container. Set the plant slightly deeper than the container and firm soil well around the root system. Water with a starter solution immediately after planting. Tomatoes respond to mulching because they require stable soil moisture. Black plastic mulch encourages early growth, while organic mulches are excellent for summer when applied 2–3 weeks after planting. Weeds compete with tomatoes for nutrients, water, and light. Use shallow cultivation near the plants to scrape away small weeds. A sidedressing of fertilizer when the first fruit on the plant are about the size of a walnut usually will improve yields and lengthen the harvest period. Cold nights early in the growth period or hot, dry, windy weather may cause blossom damage or blossom drop. Irregular shaped fruit called “catfaced” fruit may develop from early cold periods. Avoid excessive fertilization as it may increase catfacing and blossom drop as well as fruit deformities.

Harvesting. Tomatoes will ripen on or off the plant when the fruit are full sized and starting to show a slight tinge of color. Harvest early to reduce the chances of cracking, fruit rots, and other damage. Early harvest encourages additional production. Store ripening fruit at 55°F for maximum storage life or place them in a warmer location for quicker ripening. Red pigments do not form in temperatures of 95°F or above; therefore, deeper red color will result from ripening off the vine in summer heat. At the end of the season, harvest all full-sized fruit and store them in a cool basement for ripening to enjoy fresh tomatoes 1–2 months after the last freeze.

Common concerns

- leaf blight diseases
- mites
- aphids
- blossom end rot
- fruit worms or hornworms

Turnip and Rutabaga

Turnip is a cool-season vegetable that can be grown as a spring or fall crop in Kansas. Turnips are easy to grow and can be used for the

root, top, or both. Rutabagas are a relative of turnips that require considerably more time to develop. Rutabagas are best grown as a fall crop in Kansas.

Varieties.

Purple Top White Globe, Tokyo, and Just Right (white) are common varieties grown for the root and top. Seven Top and Shogoin are varieties best grown for tops or greens. American Purple Top, Laurentian, and Red Chief are rutabaga varieties.

When to plant.

Plant spring turnips in mid- to late March to allow roots to develop before intense summer heat. Plant fall turnips in late July to early August. Rutabagas should be planted in mid-July.

Spacing. Plant seed about ½ inch deep and about 2–4 inches apart in rows at least 15 inches apart. Use a slightly deeper planting for fall crops. You can also plant turnips in a bed or wide row planting by scattering seed to produce a plant every 2–4 inches in each direction. Rutabagas may need 5–6 inches between plants. It is common to scatter seed for fall turnips over a section of the garden.

Care. Turnips need regular watering during their early development to ensure emergence and rapid growth. Weeds compete with small plants and must be removed early, using care to avoid damaging young, tender, turnip plants.

Harvesting. When roots are 2–4 inches in diameter, pull and trim the tops. Store turnip roots in plastic bags in a refrigerator for 2–3 weeks. Harvest the tops when they are young and tender. Overmature tops or roots will be strong flavored, and roots may be tough. Rutabagas will be slightly larger—about 3–5 inches in diameter at harvest because the plant is larger. The roots have a yellow interior.

Common concerns

- flea beetles
- aphids

