

SUSTAINABLE GARDENING

FOR SCHOOL AND HOME GARDENS

Squash, Summer & Winter

Cucurbita pepo, maxima and moschata



QUICK FACTS

- Plant family: Cucurbitaceae (Gourd)
- Season: Warm
- Life cycle: Annual
- Seed to first harvest: Summer: 40-50 days, Winter: 85-120 days

History

Summer and winter squash are members of the Cucurbitaceae family, also known as the gourd family, which includes crops such as cucumber, cantaloupe, watermelon and gourd (Figure 1).

The species *Cucurbita pepo* includes most summer squashes (scallop, yellow crookneck, yellow straightneck and zucchini), winter squashes (acorn, delicata and spaghetti), and field and pie pumpkins and gourds. This is the most diverse species in the Cucurbitaceae family in terms of fruit appearance, size and flesh color. The species *Cucurbita maxima* includes the largest-size squashes and pumpkins, fruits that generally store very well, like the buttercup, Hubbard and kabocha. *Cucurbita moschata* includes squashes and pumpkins that also store well and are very flavorful, such as the winter squashes butternut and calabaza, along with specialty varieties like the Cushaw squash.

The name squash is derived from the Massachusett Native Americans, who named it “askutasquash,” which means “eaten raw or uncooked.” *C. pepo* and *C. moschata* are the earliest varieties, thought to have originated in Mexico and Central America about 9,000 years ago. Squash is essential to the native diet of these peoples, along with corn (maize) and beans. Hence, the traditional Native American or Indigenous peoples’ companion growing

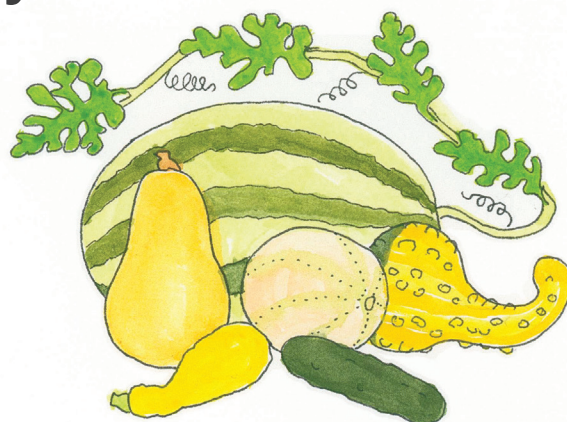


Figure 1. Squash belong to the Cucurbitaceae plant family, along with cucumber, cantaloupe, watermelon, gourd and many more.

method called “Three Sisters” was born. In this growing method, pole beans were trellised on corn stalks while squash covered the ground to prevent weeds. These two species, *C. pepo* and *C. moschata*, were dispersed throughout North America by Indigenous peoples before the discovery of the New World. *C. maxima* is thought to have originated further south near the Andes Mountains in Argentina, Bolivia and Chile and was not spread as early as the other two species (the earliest documentation was in 1591). This species needed plentiful warm weather to grow and did not thrive in Europe. See Figure 2.



Figure 2. Map showing the origin and migration of *C. pepo* and *C. moschata* (green) and *C. maxima* (blue) to the U.S.

Historically, Native Americans planted this crop to cover the ground and prevent weeds beside corn and snap beans. The corn stalks serve as a natural support for snap bean plants. This native companion growing method is called “Three Sisters” (see Figure 3).

Squash remains an important vegetable in Southern cuisine as it grows well in warm climates. The mirliton or chayote squash originated in the Americas and is another member of the Cucurbitaceae family. This is an important crop for traditional diets across Mesoamerica and is very popular in Louisiana. The common name in this region, mirliton, is the Creole-French translation of chayote. Mirliton squash is still used in Creole cooking today. It is commonly stuffed with seafood or meat, and is a popular seasonal dish for the holidays.

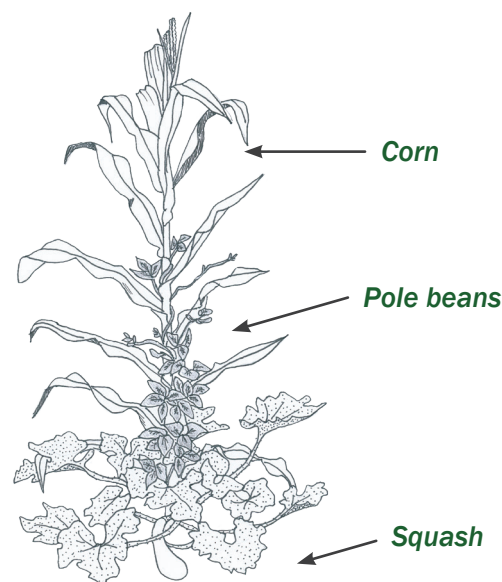


Figure 3. *The traditional Native American companion growing method for squash, pole beans and corn.*

Growing

Varieties

Squash is a warm season, frost-sensitive annual crop with many varieties ranging in color, shape, size and taste. This crop can be divided into two main types: (1) summer squash or (2) winter squash.

Summer squash are defined as fruits harvested in an immature stage before the rind becomes hard. Summer squash varieties are harvested and consumed fresh in the summer season and are mostly bush-type plants. The skin is tender and easily penetrable, and fruits are harvested young, normally only a few days or less than a week after pollination. Summer squash can be divided into four main types: (1) scallop or patty pan, (2) yellow crookneck, (3) yellow straightneck, and (4) zucchini (see Figure 4).

Scallop or patty pan squash have small, saucer-shaped fruit about 3-7 inches in diameter with scalloped edges. This type of summer squash tends to be very productive, with common skin colors of white, green and yellow. Several

varieties are recommended for Louisiana, including Benning's Green Tint and Early White Bush (both of which are heirlooms) and a miniature variety named Peter Pan.

Yellow crookneck and straightneck squash can be differentiated by either a curved or straight fruit neck, respectively. Most varieties have smooth skin, but some crookneck varieties have bumpy skin. It is important to harvest yellow summer squash when they are tender, as they may quickly develop a tough texture and seeds that are mature and more pronounced (but still edible). Heirloom varieties include Early Summer, Dixie and Early Prolific.

Zucchini squash are generally very productive and produce larger fruit with green skin, although several yellow-skinned varieties, such as Gold Rush and Sebring, are recommended for Louisiana. Heirloom varieties include the Italian Cocolle and Costata Romanesco, along with the Mexican Tatume.



Figure 4. Main types of summer squash (top left to bottom): scallop/patty pan, yellow crookneck, yellow straightneck and zucchini.

Winter squash are physiologically mature fruits with a hard rind that cannot be penetrated with a fingernail, containing visible seeds at harvest. Despite the name, winter squash varieties are also grown and harvested during the summer season, then cured and consumed throughout the winter season. This type has mostly vining habits, but bush-types are available. Winter squash include many types recommended for Louisiana: (1) acorn, (2) buttercup, (3) butternut, (4) calabaza, (5) delicata, (6) Hubbard, (7) kabocha, (8) spaghetti, and (9) specialty (see Figure 5).

Acorn (round, mostly dark green) and **delicata** (cylindrical, yellow or cream with green stripes) squashes are smaller, ribbed fruits. **Butternut squash** are high-quality,

bell-shaped fruits with tan-colored skin and flavorful dark orange flesh. Fewer buttercup, calabaza, and Hubbard squash varieties are recommended for Louisiana. **Buttercup squash** produce smaller, high-quality, green-skinned fruit. **Calabaza squash** produce medium-large, round, ridged fruit in a range of colors; and **Hubbard squash** produce large orange, green or gray oval-shaped fruit. **Kabocha squash**, a Japanese variety, is similar to buttercup squash with globe-shaped, green- or orange-skinned fruit. **Spaghetti squash** is a popular pasta substitute, as the flesh separates easily from the skin and may be cooked and used like spaghetti. It is medium-large and oval-shaped with yellow skin. **Specialty squash**, like the Caribbean heirloom Cushaw Green Striped, is also recommended for Louisiana.



Figure 5. Main types of winter squash (left to right, top to bottom): acorn, delicata, butternut, calabaza, spaghetti, Hubbard, kabocha and specialty.

Squash have either open-pollinated (including heirloom) or hybrid varieties. Seeds from heirloom varieties have been saved for at least 50 years, can be saved each season and replanted, and are open-pollinated. Squash have male and female flowers on the same plant (monoecious) that are only open for a single day and require multiple insect visits to produce a full, well developed fruit. If saving seed, different varieties need to be separated by a distance of 800 feet to one-half of a mile to prevent cross-pollination. Generally, it is not recommended to save seed for future planting with hybrid varieties as they are usually not expressed properly in the next generation.

Pumpkins are also a type of winter squash but are more difficult to grow in Louisiana due to the hot and humid climate, which causes high pest and disease pressure. Normally pumpkins are planted in the early summer

(late June, early July) in order to be harvested and ready for Halloween and the fall season. While they won't be covered in detail in this guide, some recommended pumpkin varieties for Louisiana include: Aladdin, Appalachian, Aspen, Atlantic Giant, Autumn Gold, Baby Bear, Baby Boo, Big Autumn, Big Max, Big Moon, Casper, Charisma, Cinderella, Connecticut Field, Darling, Early Abundance, Frosty, Gold Medal, Gold Rush, Gooligan, Howden, Jack-Be-Little, Jack-O-Lantern, Jumpin Jack, Munchkin, Orange Smoothie, Peek a Boo, Prankster, Prize Winner, Silver Moon, Small Sugar, Sunlight, Sorcerer, Spirit, Spookie, Spooktacular, Trick or Treat and Triple Treat.

It is recommended to select disease-resistant varieties whenever possible. See the recommended summer and winter squash varieties for Louisiana in Table 1.

Table 1. Recommended Squash Varieties for Louisiana

Variety Name	Description	Days to Harvest*	Fruit Size	Resistance & Tolerance
Summer Squash				
<i>Scallop or Patty Pan</i>				
Benning's Green Tint	Pale green to white fruit; saucer-shaped with scalloped edges; productive; flavorful; bushy plant; good for edible blossom harvest; heirloom variety.	52-57 days	3-4" diameter	
Early White Bush (White Patty Pan)	White-skinned fruit; very productive; heirloom variety.	47-54 days	6-7" diameter	
Peter Pan	Light green fruit; miniature and early variety; firm, sweet and flavorful; productive, vigorous and bushy plant; hybrid.	50 days	3-5" diameter	
Starship	Shiny deep green skin with white flesh; early variety; vigorous hybrid.	52 days	4" diameter	
Sunburst	Butter-yellow scalloped fruit with bright green blossom end; productive hybrid.	52 days	3" diameter	
<i>Yellow Crookneck</i>				
Early Summer	Bright golden yellow fruit; arched neck; creamy white flesh; very flavorful heirloom variety.	50 days	5-8" long	Squash vine borers.
Dixie	Shiny lemon-yellow fruit with green stem; productive; smooth skin; flavorful and tender flesh; heirloom variety.	41-50 days	6" long	
Gentry	Butter-yellow fruit with green stem; smooth skin; high quality; productive hybrid.	44 days	5-6" long	Heat, stress.
Gold Star	Bright yellow, smooth skin; green stem; uniform, productive hybrid.	50 days	4-6" long	Powdery mildew, cucumber mosaic virus.

Variety Name	Description	Days to Harvest*	Fruit Size	Resistance & Tolerance
Superset	Lemon-yellow fruit and stem; shiny and smooth skin; productive, flavorful, uniform hybrid.	50 days	6-8" long	Cucumber and watermelon mosaic viruses.
Zephyr	Yellow fruit with faint white stripes and light green blossom ends; very flavorful and productive; firm texture; good for edible blossom harvest; hybrid.	54 days	4-6" long	
Yellow Straightneck				
Butterstick	Bright golden yellow fruit; productive; semibush; hybrid.	50-52 days	10" long	
Cosmos	Bright yellow skin; sweet and nutty flavor; vigorous and productive; few spines; hybrid.	60 days	6-8" long	
Early Prolific	Lemon-yellow fruit; slightly club-shaped; high quality and firm texture; very productive and hardy; heirloom variety.	48 days	5-7" long	
Enterprise	Yellow fruit; slender; mild flavor; adaptable; very productive, high quality hybrid.	41 days	7-8" long	
Multipik	Rich yellow fruit and stem; medium bulbing; very productive; long harvest; hybrid.	50 days	6" long	Zucchini yellow and watermelon mosaic viruses.
Superpik	Golden yellow fruit and stem; shiny and sweet flavored fruit; productive; long harvest; hybrid.	50 days	7-8" long	
Zucchini				
Ambassador	Medium dark green fruit with gold flecks; tender white flesh; productive hybrid.	51 days	7-8" long	
Aristocrat	Dark green fruit; smooth and slender; productive hybrid.	53 days	8" long	
Black Beauty	Dark green, glossy fruit with white and creamy flesh; straight, semispineless heirloom variety.	45-55 days	6-8" long	
Cashflow	Medium green fruit; high quality; productive, bushy plant; hybrid.	47 days	8" long	Zucchini yellow mosaic virus.
Cocozelle	Dark and light green striped fruit; green-white firm flesh; flavorful; straight with slight ribbing; uniform; Italian heirloom variety.	55-59 days	6-10" long	
Costata Romanesco	Gray-green, ribbed fruit; best flavor and texture; good for edible blossom harvest; large plants; gourmet Italian heirloom variety.	52-62 days	6-12" long	
Dunja	Straight, glossy, dark green fruit; productive, compact plant; early variety; hybrid.	47-50 days	7-8" long	Powdery mildew, zucchini yellow and watermelon mosaic viruses, papaya ringspot virus.
Eight Ball	Dark green, glossy, round fruit; consistent yield; hybrid.	40-50 days	3" diameter	
Elite	Medium green fruit; very productive; high quality; hybrid.	55 days	8" long	
Gold Rush	Golden yellow fruit; productive hybrid.	50 days	10" long	
Payload	Medium dark green fruit; early variety; productive hybrid.	44 days	8" long	Powdery mildew, zucchini yellow and cucumber mosaic viruses.

Variety Name	Description	Days to Harvest*	Fruit Size	Resistance & Tolerance
Payroll	Medium green, flecked fruit; hybrid.	44 days	7.5-8.5" long	Zucchini yellow, watermelon, and cucumber mosaic viruses, papaya ringspot virus.
Raven	Very dark green fruit; glossy and smooth; concentrated fruit set; productive hybrid.	48-50 days	7-8" long	
Sebring	Golden yellow, straight fruit with green stem; early variety; productive, uniform hybrid.	40 days	8" long	Powdery mildew.
Spineless Beauty	Medium dark green fruit; spineless plant; very productive hybrid.	50 days	8.5" long	
Sure Thing	Medium green fruit with gold flecks; early variety; flavorful; will produce fruit in cool and cloudy conditions; hybrid.	48 days	6-8" long	
Tatume	Round, dark green fruit with yellow flesh; flavorful; productive; Mexican heirloom variety.	55-60 days	5-7" diameter	
Tigress	Medium green flecked fruit; productive hybrid.	50 days	8" long	Zucchini yellow and watermelon mosaic viruses, papaya ringspot virus.

Winter Squash

Acorn

Carnival (semibush)	Colorful flecks/patches of dark and light green, orange, and yellow fruit; orange flesh, hybrid.	95 days	1-2 lbs.	
Cream of the Crop (bush)	Cream white fruit with golden-cream flesh; productive; stores well; hybrid.	75 days	3 lbs.	
Ebony (vine)	Green-black fruit with yellow flesh; very flavorful; productive; open-pollinated.	100 days	2 lbs.	
Honey Bear (semibush)	Small, dark green fruit with bright orange flesh; flavorful hybrid.	85 days	1-1.25 lbs. 3-4 fruits/plant	Powdery mildew.
Table Ace (semibush)	Black-green fruit with bright orange flesh; smooth and flavorful; stores well; hybrid.	90 days	5-6" fruit	
Table King (vine)	Dark green, glossy fruit with ridges; sweet yellow-orange flesh; early variety; compact plant; heirloom variety.	80 days	2 lbs. 5.5"x4.5" 5-8 fruits/plant	
Table Queen (bush or vine)	Dark green fruit with thick orange flesh; flavorful, vigorous and productive; stores well; heirloom variety.	80-92 days	1.5-2 lbs. 6-7" long	Poor soil conditions.
Taybelle PM (semi-bush)	Dark green fruit with orange flesh; productive, uniform, early variety; hybrid.	80 days	2-3 lbs. 6-8 fruits/plant	Powdery mildew.

Buttercup

Bonbon (vine)	Smooth, deep green fruit; flavorful; uniform, productive hybrid.	95 days	4-5 lbs. 4 fruits/plant	
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Butternut

Early Butternut (vine)	Yellow-tan fruit with deep red-orange flesh; very sweet; stores well; productive, early variety; hybrid.	82-85 days	2-4 lbs. 5-7 fruits/plant	
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Variety Name	Description	Days to Harvest*	Fruit Size	Resistance & Tolerance
Ultra (vine)	Large, tan fruit with dark orange flesh; variable shape; sweet and flavorful; fine texture; hybrid.	90 days	10 lbs. 15" long	
Waltham Butternut (vine)	Smooth, tan fruit; finely textured, dark orange flesh; uniform; flavorful; very productive; stores well; common variety; open-pollinated.	95-105 days	4-6 lbs. 8-9" long	Squash vine borers.
<i>Calabaza</i>				
La Estrella (vine)	Red-orange, green, and brown striped/flecked fruit; round and nearly ribless; flavorful; stores well; hybrid.	70 days	6-10 lbs. 14"x14"	Heat.
<i>Delicata</i>				
Bush Delicata (bush)	Yellow-white fruit with green stripes/flecks; smooth and flavorful orange flesh; very productive; stores well for four months; open-pollinated.	80 days	1.5-2 lbs. 8" long	Powdery mildew.
Delicata (vine)	Cream-colored fruit with dark green vertical stripes and flecks; golden yellow flesh; very sweet and tender even with skin on; uniform; can be used fresh; open-pollinated.	95-100 days	1-2 lbs. 7-9" long 5-7 fruits/plant	
Sweet Dumpling (vine)	Ivory fruit with dark green stripes; teacup-shaped; sweet and tender orange flesh; good for stuffing; open-pollinated.	100 days	1 lb. 4" diameter 8-10 fruits/plant	
<i>Hubbard</i>				
Golden Hubbard (vine)	Orange fruit with tan stripes; golden flesh; sweet and flavorful; productive; good for pies and canning; heirloom variety.	105 days	10 lbs.	
<i>Kabocha</i>				
Sunshine (semibush)	Flattened, globe-shaped fruit; deep scarlet skin with bright orange flesh; sweet and flavorful; stringless texture; productive; good for pies; hybrid.	95 days	3-5 lbs. 3-4 fruits/plant	
Sweet Mama (semivine)	Dark green fruit with yellow flesh; very sweet and flavorful; productive; stores well for four months; hybrid.	85 days	3 lbs.	
<i>Spaghetti</i>				
Pinnacle (semibush)	Small to medium, bright lemon-yellow fruit; uniform; sweet and nutty flavor; very productive; hybrid.	85 days	3 lbs.	
Primavera (semivine)	Small to medium, canary yellow fruit; uniform, productive, hybrid.	90 days	2.5-3 lbs.	
Small Wonder (vine)	Yellow-orange fruit with pale yellow flesh; very flavorful; productive; stores well; early variety; hybrid.	80-90 days	2 lbs.	
Tivoli Spaghetti (bush)	Oval, pale yellow fruit; creamy flesh; sweet and mild flavor; productive; can also be used fresh; hybrid.	98 days	4-5 lbs. 8-10" long	
Vegetable Spaghetti (vine)	Oblong; medium; light yellow fruit and flesh; sweet and nutty flavor; heirloom variety.	88 days	3-5 lbs. 9" long, 4-7 fruits/plant	

Variety Name	Description	Days to Harvest*	Fruit Size	Resistance & Tolerance
<i>Specialty</i>				
Cushaw Green Striped (vine)	Large crookneck fruit with pale green and white stripes; thin skin; very productive; good for pies; heirloom variety from the Caribbean.	90 days	15 lbs.	Squash vine borers, humidity.

Notes: *From direct seed to harvest.
 Table varieties selected from recommendations from LSU AgCenter, UF Extension, Texas A&M Extension and Southeastern U.S. Vegetable Crop Handbook.
 Variety descriptions compiled from High Mowing Organic Seeds, Johnny’s Selected Seeds, Reimer Seeds, Southern Exposure Seed Exchange, Sow True Seed, All America Selections, Hoss Tools, Jordan Seeds, Osborne Seed, Vermont Bean Seed Company, Seedway, Renee’s Garden and Syngenta.

Other recommended squash varieties for Louisiana include:
 Summer: Cheetah, Cougar, Declaration II, Destiny, Dividend, El Dorado, Embassy, Gold Bar, Golden Finger, Goldie, Independence II, Justice III, Liberator. III, Medallion, Patriot II, Patty Green, Precious II, Prelude II, President, Revenue, Scallopini, Senator, Seneca Prolific, Solstice, St. Patrick, Sun Bar, Sundance.
 Winter: Royal.

When and How to Plant

Squash should be direct-seeded outside during the recommended planting dates based on summer or winter type (refer to Squash Planting Guide, Table 2). As warm-season crops, squash seeds germinate best in soil temperatures between 70 to 95 degrees Fahrenheit (optimum of 85-95 F; minimum of 60 F). There should be no danger of frost. The use of a soil temperature map can help guide planting decisions. For fall plantings, be sure to plant selected varieties with enough time to mature before the first frost date for the region (mid-November for north Louisiana, late November for south Louisiana, or mid-December for

New Orleans).

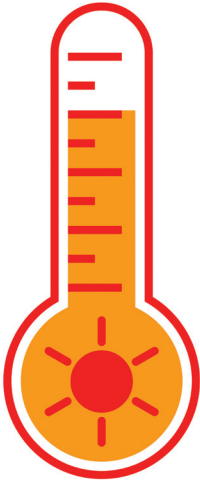
Refer to Table 2 for the recommended spacing based on summer or winter squash and growth type (bush, semibush or vining) when planting seeds outside. Sow seeds 1 inch deep, cover with soil and water in. Seeds should emerge in about five to seven days.

Alternatively, bush varieties of summer and winter squash may be planted in 12-inch hills of three to four plants following the same spacing recommendations. Sow five to six seeds in a small circle, then thin to three seedlings once a few true leaves develop. Here is a video showing how to plant seeds using the hill method.

Table 2. Squash Planting Guide

Squash Type	Plant Outside Dates	Seed Spacing (feet)	Row Spacing (feet)	Days to Harvest*
Summer squash	<u>North LA</u> : March 15-Aug. <u>South LA</u> : March-Sept. 15	1-2	3-4	40-50 days
Winter squash	<u>North LA</u> : March 15-June 10** <u>South LA</u> : March-June 10	Bush: 2-3 Semibush: 2-4 Vining: 4-5	Bush: 5-6 Semibush: 6-8 Vining: 8-10	85-120 days

*Seed to first harvest.
 **For Halloween pumpkins, plant June 15-July 19.
 Note: Table adapted from LSU AgCenter and UF Extension Planting Guides, and Southeastern U.S. Vegetable Production Handbook.



Where to Plant

Squash is a warm-season crop and well-draining, loose soil and full sun (six hours/day) are recommended. Squash plants prefer a soil pH between 6.0 and 6.8 but will tolerate a pH as low as 5.5 or as high as 7.7.

It is recommended to plant squash in box beds or in traditional raised garden rows that are about 12 inches tall to ensure good drainage and prevent disease. In all types of gardens, it is recommended to add a 2-3-inch layer of compost, peat, rotted hay or other organic matter and mix into the soil to optimize plant health.

This is especially important for squash plants, which thrive in soils high in organic matter and nitrogen. Fish emulsion fertilizer may be used if leaves are yellowing.

Plastic mulch — or a plastic fabric/film — is recommended to increase soil temperature, yield, fruit size and quality while controlling weeds and conserving moisture. Mulching will also help to deter common squash pests like cucumber beetles.

Floating fabric row covers are also recommended for this crop to improve growth and deter pests during the seedling stage. Row covers should be removed when plants enter the flowering stage of growth to optimize pollination. Do not use row covers if cucurbits were previously planted in the same area, as squash vine borers overwinter in the soil and may be trapped under the covers.

Each season rotate plant families — avoid planting crops from the same plant family in the same area of the garden — to reduce disease and pests. A longer crop rotation is recommended for Cucurbitaceae crops to reduce pest pressure and risk of disease.

Plant Care

Watering: Squash plants should be watered enough to avoid plant wilt, as this may cause blossom drop. If the weather is dry, watering once or twice a week should be adequate, being especially sure that water demands are met during the fruit development stage. Adjust the watering schedule based on soil type: Water more frequently for sandy soils and less often for clay soils. Deep watering is important to strengthen the root system. Avoid wetting the plant foliage. Summer squash require more irrigation than winter squash.

Fertilization: Do not over-fertilize squash with nitrogen. Excessive nitrogen may cause vining crops like squash to remain in a juvenile state and delay flowering and fruiting. Uneven watering may result in blossom-end rot of summer squash, a disorder resulting from calcium deficiency. Inconsistent watering causes calcium to be poorly dissolved in the soil and unavailable for uptake. If blossom-end rot persists with even watering, conduct a soil test and discuss results with a local county extension agent.

Organic fertilizers, such as compost, fish emulsion, composted poultry litter or manure, worm castings, and blood or bone meal, originate from living organisms. They are safer and far more

environmentally sustainable than traditional synthetic fertilizers. They naturally release nutrients more slowly and over a longer period of time. When applying organic fertilizer, it is important to use in unison with compost, cover crops and crop rotation, which all work together to build soil health. Learn how to convert inorganic fertilizer recommendations to organic fertilizers [here](#).

Alternatively, a synthetic fertilizer may be used at a rate of about 1 pound (2 cups) of 13-13-13 for every 25 feet of row or 75 square feet. Broadcast, or sprinkle evenly, over the soil before planting and then mix in about 3 to 6 inches deep using a rake. Supplemental side-dressing, or reapplication of synthetic or organic fertilizer, is recommended when plants begin to run (change to a vining habit). Side-dressing is the addition of fertilizer to the soil around already established plants when the plant begins to fruit or vine, primarily to provide nitrogen. If using synthetic fertilizer, sprinkle 2 tablespoons around each plant, keeping it about 6 inches away from the plant stem, and water into the soil. Additional side-dressing may be applied every three to four weeks. Because of their slow, steady release of nitrogen, crops fertilized with organic fertilizer do not usually need to be side-dressed. Fish emulsion provides a quick-release, organic form of nitrogen, if needed.

Weeds: Plastic mulch will control most of the weeds; hand pull weeds close to the plant, especially in the planting holes. If using tools to weed, avoid hoeing deeper than 1 inch so as not to damage shallow roots.

Insect pests and diseases: Aphids are common insect pests for squash plants and can transmit harmful viruses. Other common squash insect pests include cucumber beetles, spider mites, squash bugs and squash vine borers. Squash are susceptible to aphid-vectored viruses (e.g., cucumber, watermelon and zucchini yellow mosaic viruses and papaya ringspot virus), fungal diseases (e.g., anthracnose, downy and powdery mildew), and physiological disorders (e.g., blossom-end rot). Some squash varieties are resistant to specific diseases and these should be selected and planted — especially if the garden has been afflicted by one or more diseases in previous growing seasons. Generally recommended tools for prevention are using reflective mulches, avoiding overhead irrigation, improving air circulation and crop rotation. See Table 3 to aid in diagnosis and management of some common squash insect pests and diseases.

Table 3. Organic and Natural Management for Common Squash Insect Pests and Diseases

Symptoms	Diagnosis	Organic and Natural Management
- Wet, humid conditions. - Sunken spots on fruit with pink spores.	Anthracnose	- Plant resistant varieties. - Crop rotation (three years). - Avoid working in fields when plants are wet. - Mulch; avoid overhead irrigation. - Regular harvest; remove diseased fruit. - Organic/natural fungicides.
- Curled and yellowed leaves. - Stunted crops. - Sticky honeydew on leaves.	Aphids	- Timely planting and harvest - Reduce water stress. - Weed control. - Use water jet to dislodge. - Reflective mulches; insect barrier fabric. - Beneficial insects: lady bugs, lacewings, predatory stink bugs, syrphid flies. - Insecticidal soap, neem oil, pyrethrin, Azera.
- Tip of fruit rots and shrinks. - Premature fruit ripening. - Calcium deficiency. - Drought stress, root damage. - Over-irrigation, humidity.	Blossom-end rot	- Plant resistant varieties. - Keep soil pH at 6.0 to 6.5. - Fertilize (abundant calcium) and mulch. - Adequate, consistent irrigation, avoiding wet/dry extremes. - If soil is calcium deficient, drench around plants with calcium solution; remove fruit.
- Cream-colored larvae, 3/8-inch long. - Adult yellow beetles with black spots/stripes, 1/4-inch long. - Feeding damage on foliage, especially young leaves. - Damaged winter squash skins. - Stunted plants or death.	Cucumber beetle	- Crop rotation. - Trap cropping (Hubbard squash). - Dip/spray seedlings with kaolin clay (can also combine with insecticidal soap or neem oil). - Floating row covers. - Beneficial insects: parasitic wasp. - Remove crop debris. - Insecticides: pyrethrin, neem, sabadilla.
- Transmitted by aphids. - Yellow-green mottling or mosaic pattern on leaves. - Distorted, deformed leaves. - Stunted young leaves. - Low yield; small, deformed, discolored fruit.	Cucumber, watermelon, and zucchini yellow mosaic viruses and papaya ringspot virus	- Plant resistant varieties. - Control aphids and weeds. - Remove and destroy infected plants and crop debris.
- Damp, cool conditions. - Small, yellowing, angular patches on leaves. - Damping off.	Downy mildew	- Crop rotation (two-plus years). - Plant resistant varieties. - Reduce leaf moisture by improving air circulation, morning irrigation. - Remove crop debris and weeds. Organic/natural fungicides.

Symptoms	Diagnosis	Organic and Natural Management
- Small, round white spots with fungal growth on older leaves with dark mottled underside. - Leaves covered with talclike powder; leaf yellows and dies. - Hot, dry weather.	Powdery mildew	- Plant resistant varieties. - Good soil health and air circulation. - Increase plant spacing. - Eliminate weeds. - Organic/natural fungicides containing sulfur.
- Spiderlike pests; very small. - Feeding on underside of leaves causes yellow spots and tiny webs. - Begins around garden perimeter, grassy areas.	Spider mites	- Timely plant and harvest. - Adequate irrigation. - Beneficial insects: predatory mites. - Restrict mowing grass close to crops. - Paraffinic and neem oil, sulfur dust, Chenopodium terpene extract, Soluble Silica, Aramite, Biomite.
- Bugs are gray-brown, 1/2-3/4-inch long with flat back. - Bugs found on underside of leaves, under plastic mulch or debris. - Crop damage, wilt, death.	Squash bug	- Plant resistant varieties. - Row cover. - Trap cropping (Hubbard squash). - Handpick and destroy bugs. - Remove or till crop debris. - Beneficial insects: Tachinid fly. - Insecticides: pyrethrin or sabadilla.
- White larvae, 1-inch long, outside and inside stem near the soil. - Vine wilt and death.	Squash vine borer	- Mix charcoal into soil just before planting. - Apply rotenone around plant base. - Floating row cover if previously rotated. - Pheromone baited sticky traps. - Slice open stems of infested plants and destroy vine borers.
- Plants wilt and die. - Brown streaks inside root and lower stem when split lengthwise. - Bacterial wilt is transmitted by the cucumber beetle.	Wilt (Fusarium, bacterial)	- Long crop rotation. - Control cucumber beetles. - Remove infected crop debris. Control weeds.

Note: Adapted from LSU AgCenter, Texas A&M AgriLife Extension, UMass Extension, Alabama A&M and Auburn Universities Extension, and University of Minnesota Extension. The Louisiana Pesticide Law regulates the use of pesticides in schools to protect children and staff from harmful exposure to chemicals and is enforced by LDAF. The recommended alternative to routine pesticide use is integrated pest management (IPM), which combines pest control, disease management techniques and organic/natural alternatives, many of which are found in this table.

Harvest and Storage

Summer squash fruit should be harvested when the fruit is young and tender. Most varieties should be harvested when fruit is glossy and between 4-8 inches long. It is recommended to clip the fruit with shears, leaving a small 1-inch stem attached (avoid twisting/breaking the stems). Use gloves when harvesting summer squash as most plants have small spines. Consistent harvesting and removal of overmatured fruit is essential for optimal production length; aim to harvest two to three times per week. The fruit is bruised easily and should be handled with care post-harvest. Summer squash should be stored between 41-50 F (95% humidity) for one to two weeks.

Summer squash blossoms may also be harvested in the morning when fully open. Clip flowers 1-2 inches below the base. Harvest only male flowers (identified by thin stems) if fruiting is desired, but make sure to leave some for pollination of female flowers. Harvesting female flowers (identified by thick stems with immature fruit at the base) comes at the expense of fruit production. See Figure 6 for a comparison of male and female squash flowers. Squash blossoms are considered a delicacy and are commonly prepared stuffed and fried. They are very popular in the Mediterranean area and in Mexican cuisine, as well as farm-to-table restaurants in the U.S.

For winter squash, harvest fruit when they are full-sized and the skin is richly colored and hardened (should not be easily dented by a fingernail). Often the stems have begun to dry, and the plant itself has begun to wilt and brown. For some winter squash varieties like Acorn, the bottom of the fruit touching the ground changes color from yellow to cream or gold to orange. It

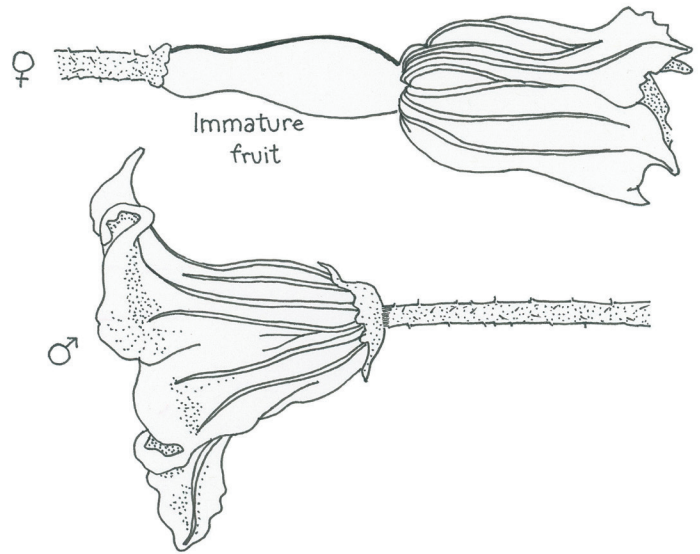


Figure 6. Female (top) and male (bottom) squash flowers may be harvested at the blossom stage.

is recommended to clip the fruit using shears, leaving at least a 2-inch stem attached (avoid twisting/breaking the stems). Here is a helpful video on when and how to harvest winter squash. Use care in handling fruit to prevent wounds that may lead to decay and rot in storage. Use clean and sterilized containers for curing and storage. After harvesting, most winter squash require a curing process in a warm area (80-85 F with 75%-80% humidity) for 10 days. After curing, fruits will keep for several months (depending on variety) if stored at around 50-55 F (50%-70% humidity). Take care not to store below 50 F as this may damage the fruit.

Preserve squash by freezing or drying.

Nutrition

Squash Are Nutritious and Good for You

Rich in vitamin A

Important for eye health, a strong immune system and cell growth.

High in potassium

Essential for body function, especially the heart, kidney, nerves, bones and muscles.

Contains vitamin C

Important for bones, skin and blood vessels.

Excellent source of dietary fiber

Important for bowel health, lowering cholesterol, controlling blood sugar and maintaining a healthy weight.

Recipes

Basics of cooking with squash:

Summer Squash: extension.purdue.edu/foodlink/food.php?food=summer%20squash

Winter Squash: extension.purdue.edu/foodlink/food.php?food=winter%20squash

General information on selecting, pairing, preparing and storing. Also includes a list of recipes.

Video on how to prepare squash:

Summer Squash: youtu.be/k7EqDmPxWQ0

Acorn Squash: youtu.be/MmVfOhV_jeg

Butternut Squash: youtu.be/9Tgyn75ybsE

Ever wondered about the basics of how to prepare zucchini, summer squash, acorn squash and butternut squash? Chef Allison Kingery shows a couple of options for preparing these vegetables.

Recipes including squash:

<https://seedstosuccess.com/homerecipes/#summer-squash>

This recipe bank is full of nutritious and delicious recipes that feature local Louisiana foods. Louisiana Harvest of the Month recipes are culturally relevant, designed with few ingredients and easy to prepare.

Taste Test Ideas



Grilled Summer Squash



Baked Stuffed Winter Squash



Zoodles (Zucchini Noodles)

Other websites with many squash recipes:

**Oregon State University's
Food Hero**

Visit www.myplate.gov/myplate-kitchen/recipes and search for squash recipes. Recipes include squash salsa, squash soup, apple stuffed squash and more.

USDA MyPlate Kitchen

Visit eatfresh.org/find-a-recipe and search for squash recipes. Recipes include corn and squash sauté, veggie scramble, Three Sister succotash and more.

California's Eat Fresh

Summer Squash: Visit here and search for summer squash recipes:

eatfresh.org/search?search_api_views_fulltext=summer%20squash

Recipes include corn and squash sauté, mushroom stuffed squash, veggie scramble and more.

Winter Squash: Visit here and search for winter squash recipes: [eatfresh.org/](https://eatfresh.org/search?search_api_views_fulltext=winter%20squash)

[search?search_api_views_fulltext=winter%20squash](https://eatfresh.org/search?search_api_views_fulltext=winter%20squash)

Recipes include winter vegetables in coconut sauce, Three Sisters succotash and more.

Produce for Better Health Foundation

Summer Squash: fruitsandveggies.org/fruits-and-veggies/summer-squash-nutrition-selection-storage/?view=recipes

Recipes include squash nut sweetbread, roasted squash and eggplant casserole with chicken and more.

Zucchini: fruitsandveggies.org/fruits-and-veggies/summer-squash/?view=recipes

Recipes include rainbow chips, corn and zucchini pan omelet, skillet zucchini creole and more.

Acorn Squash: fruitsandveggies.org/fruits-and-veggies/acorn-squash/?view=recipes

Recipes include squash with pecans and cranberries, puree of acorn squash and more.

Butternut Squash: fruitsandveggies.org/fruits-and-veggies/butternut-squash/?view=recipes

Recipes include butternut squash mac and cheese, roasted pear and butternut squash soup and more.

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