SUSTAINABLE GARDENING

FOR SCHOOL AND HOME GARDENS

Radish

Raphanus sativus

QUICK FACTS

- **Plant family:** Brassicaceae (Cabbage)
- **Season:** Cool
- **Life cycle:** Annual or biennial
- **Seed to first harvest:** 20-30 days

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History

Radish is a root crop and member of the Brassicaceae family, also known as the cabbage family, which includes other cool-season crops like cabbage, kale, collards, broccoli and cauliflower (Figure 1).

The name radish comes from the Latin word for "root" and a Greek expression that translates into "easily reared." Western Asia (likely China) is considered the country of origin for the wild form, and it was first recorded around 2000 B.C. in Egypt. Radishes were especially popular and highly regarded with the Greeks. The original radish was probably larger and slow-growing, similar to Daikon radish.

By the 16th century the smaller, faster-growing radish was recorded in Europe, likely introduced by the Romans. Radishes were the first crop introduced by Christopher Columbus to the Americas but were already produced in Mexico and Haiti. They were also grown by early English colonists in Massachusetts by 1629 and have remained popular in the U.S. See Figure 2.

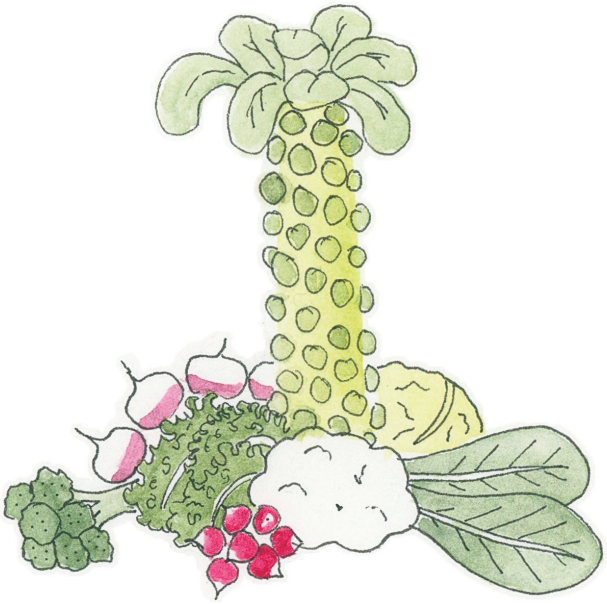

Figure 1. Radish belongs to the Brassicaceae plant family, along with cabbage, kale, collards, broccoli, cauliflower and many more.

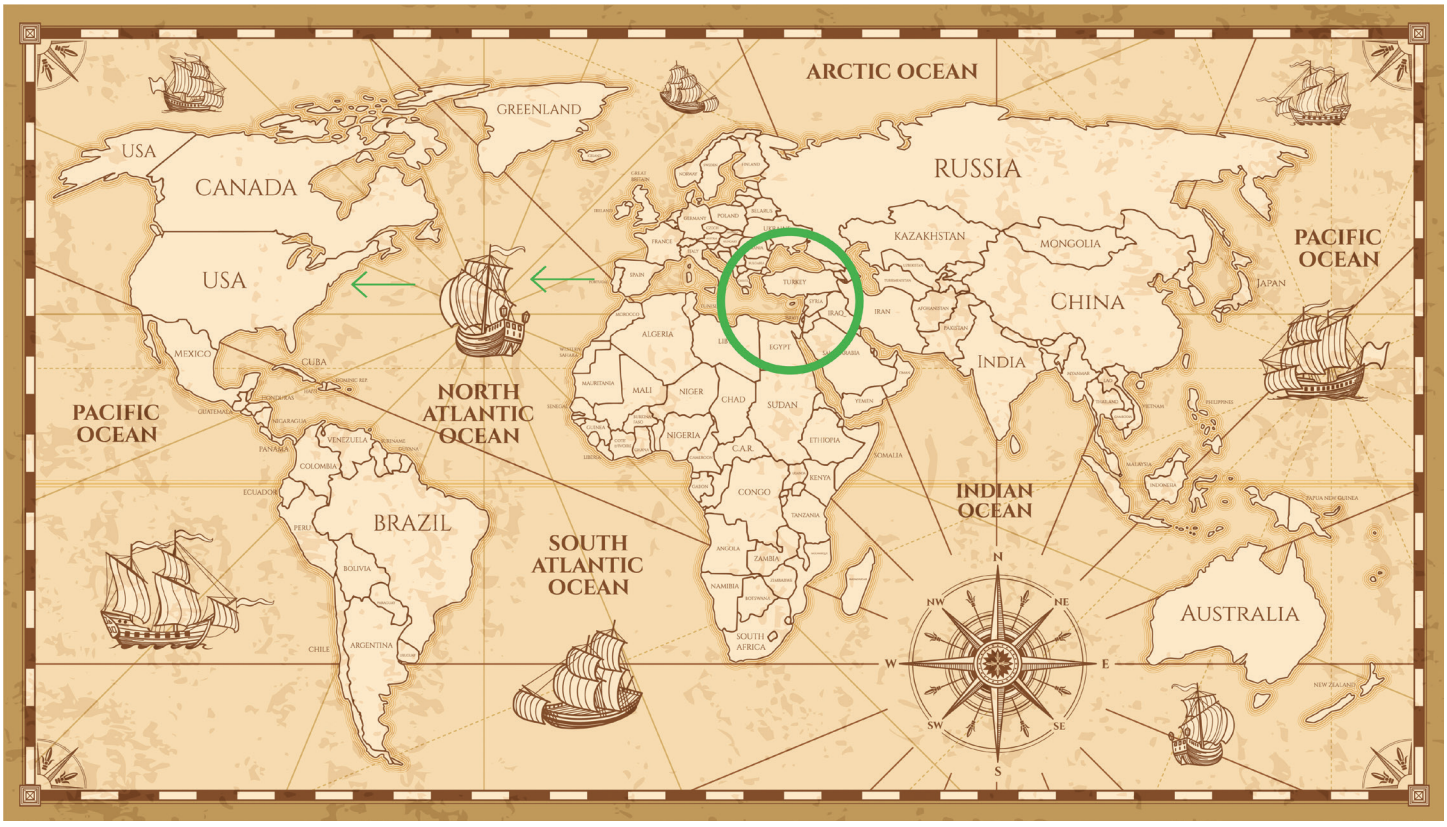

Figure 2. Map showing the origin and migration of radish to the U.S.

The large Daikon radish is most popular pickled in Japan and China (and is a major part of these countries' diets), while the salad radish is more popular in Europe and the U.S.

Growing

Varieties

Radishes are annuals or biennials and are grouped into two main categories: (1) Daikon and (2) salad. Daikon radishes include larger, Asian varieties with long, white cylindrical roots that are great winter storage crops. Salad, or spring, radishes include varieties that are faster-growing with small, round roots and are traditionally red-skinned with white flesh (although available in a variety of colors). Icicle radish is a longer variety of salad radish. French Breakfast and White Icicle radish are great varieties for warmer climates like Louisiana as they are slow to bolt. Radish is primarily grown for its round or cylindrical roots; the green tops are also edible but best cooked rather than consumed raw due to their coarse texture.

Radishes have either open-pollinated (including heirloom) or hybrid varieties. Some radishes are heirloom varieties, such as Black Spanish and French Breakfast, meaning these seeds have been saved for at least 50 years, can be saved each season and replanted, and are open-pollinated. Radish flowers are perfect (having both male and female parts) and are usually cross-pollinated. If saving seed, different varieties should be separated by a distance of 300 feet to one-half of a mile to avoid cross-pollination. Generally, it is not recommended to save seed for future planting

Figure 3. Main types of radish are salad (top) and Daikon (bottom).

with hybrid varieties as they are usually not expressed properly in the next generation.

See the recommended radish varieties for Louisiana in Table 1.

Table 1. Recommended Radish Varieties for Louisiana

Variety Name	Description	Days to Harvest*	Notes
Daikon			
April Cross	Long, white cylindrical roots with white flesh; market standard for Daikon radish; crisp and sweet; hybrid.	60 days	Up to 18" long (begin harvest at 8") with 2-3" diameter; slow bolting; good for winter storage.
Chinese White Winter	Long, white cylindrical roots with white flesh; crisp and pungent; Chinese heirloom variety.	60 days	6-8" long; high-yielding winter storage radish.
Daikon, Miyashige or Minowase	Cylindrical white roots, pale green near leaf; Japanese heirloom variety.	50-65 days	Harvest when 12" long with 2-3" diameter (will grow larger); flavorful raw, cooked, or pickled.
Green Luobo or Green Meat	Green roots and flesh; oblong-shaped with white tips; uniform and fast growing; sweet and spicy; open-pollinated.	50-55 days	6-9" long with 2-3" diameter; good for winter storage and eaten raw, cooked, or pickled.
Summer Cross or Mikura Cross	Uniform, long white roots; Japanese variety; hybrid.	55 days	Up to 16" long with 2-3" diameter.
Salad			
Amethyst	Striking purple round roots with white flesh; medium tops; crisp and mild; open-pollinated.	30 days	Slow to develop woody pith.
Bacchus	Rich purple, round roots; vigorous, early variety; open-pollinated.	24 days	
Black Spanish	Large, black-skinned roots with white flesh; large edible tops; crisp and spicy; heirloom variety.	53-55 days	3-4" or larger in diameter; great for storage.
Champion	Bright red, round roots with large tops; productive; crisp heirloom variety.	28 days	Slow to develop pith; great for cool weather.
Cherriette	Smooth and bright red roots; short tops; crisp and spicy; hybrid.	26 days	Slow to develop pith.
Cherry Belle	Bright red, round roots with crunchy white flesh; sweet tasting; heirloom variety.	24 days	Slow to develop pith.
Easter Egg	Colorful mix of purple, red, and white flesh; round roots; mild tasting; open-pollinated.	24 days	Longer harvesting period due to multiple varieties.
French Breakfast	Bicolored (deep pink and white), oblong roots; mild and crisp; French heirloom variety.	21-26 days	2-3" long; traditionally served raw with butter and salt.
Ping Pong	Bright white, round roots; very productive; crisp and mild hybrid.	30 days	1" diameter.
Red Satin or Red Silk	Uniform, round, bright red roots with white flesh; medium deep green tops; hybrid.	22 days	Slow to develop pith; fast-growing.
Rudi	Classic round, dark red roots with white flesh; crisp, uniform, and reliable; open-pollinated.	25 days	Holds longer in the field than most.

Variety Name	Description	Days to Harvest*	Notes
Scarlet	Bright red, round roots; uniform and high yielding; crisp and mild heirloom variety.	20-28 days	
Shunkyo	Specialty variety from Northern China with smooth, deep pink, cylindrical roots and white flesh; hot and sweet tasting; pink-stemmed tops; crisp; open-pollinated.	32-35 days	5" long; slow bolting.
Sparkler	Bicolored (magenta and white) roots with white flesh; sweet tasting heirloom variety.	24 days	
Watermelon, Red Meat, or Mantanghong	Large, round, white-skinned roots with magenta flesh; large edible tops; sweet tasting heirloom variety.	50-65 days	Great for pickling and storage, 2-4" in diameter.
White Icicle	Bright white, pointed roots; mild flavored heirloom variety.	27-29 days	3-6" long; best harvested small.

*Notes: *From 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, Jordan Seeds, Osborne Seed and Harris Seeds.

Other recommended radish varieties for Louisiana include:
Daikon: Everest or Lo Bok.
Salad: Altaglobe, Cook's Custom Blend, Escala, Fuego, Red Castle.

When and How to Plant

While radish varieties do vary in taste and texture, it is a misperception that all radish varieties are hot or spicy. Because this is a cool-season crop, this often-unpleasant taste occurs when a radish has inadequate moisture, experiences warm temperatures that cause bolting or is overmatured. To prevent a hot or spicy radish, plant this crop during the recommended planting dates of the cool season and select shorter harvest varieties when planting a spring crop. Generally, it is best to avoid planting Daikon radish during spring planting dates because the longer harvest time may result in bolting as the warm season approaches. Daikon radishes, along with some slower-growing salad radish varieties, are best planted during fall planting dates and are great winter storage crops.

Radish should be direct-seeded outside during the recommended planting dates (refer to Radish Planting Guide, Table 2). Radish seeds will germinate in soil temperatures of 45 to 90 degrees Fahrenheit, but as a cool-season crop, the optimum growing temperature for best quality crops is 50-65 F. The use of a soil temperature map can help guide planting decisions.

Sow salad radish at a shallow one-eighth-of-an-inch depth. Scatter seeds in a furrow down the row, lightly cover with soil and water in. Seeds should emerge in four to six days, and seedlings should be thinned early to allow 1-inch spacing between plants. For Black Spanish, Watermelon and White Icicle radish, thin to allow 2-4-inch spacing between plants since these are larger varieties. See Table 2.

Sow Daikon radish at a similar shallow depth (one-quarter of an inch) but scatter seeds further apart in a furrow down the row, since they will need to be thinned to 6 inches between seedlings (see Table 2). Cover lightly with soil and water in; seedlings should emerge in four to 11 days.

Table 2. Radish Planting Guide

Direct-seed Outside Dates	Seeds Per Foot	Plant Spacing (inches)	Row Spacing (inches)	Days to Harvest*	Yield Per 10 Ft Row
North LA: Feb.-March; Aug.-Oct. South LA: Jan. 15-March; Sept.-Oct.	Daikon: 2-3 Salad: 12-15	Daikon: 6” Salad: 1”	Daikon: 12” Salad: 6”	20-60	4 lbs.

**Seed to first harvest*
Note: Table adapted from LSU AgCenter, UF Extension Planting Guides and Southeastern U.S. Vegetable Production Handbook.

For a continuous supply of radish, direct-seed outside every 10-14 days. Radish is moderately frost tolerant but will bolt during warm temperatures and longer days. Varieties such as Watermelon and Black Spanish, along with Daikon radish, are best grown as a fall crop.

Where to Plant

Plant radish in loose, well-drained soil in full sun (six hours/day), although they may tolerate partial shade. A soil pH below 6.5 puts radish at a higher risk for clubroot disease. It is recommended to plant radish in box beds or in traditional raised garden rows that are about 4-6 inches tall to ensure good drainage and allow for root formation. In all types of gardens, it is recommended to add a layer of compost, peat moss, rotted hay or other organic matter and mix into the soil to optimize plant health.

Salad radish needs very little space and matures quickly, so consider intercropping (or interplanting) with slow-growing crops, like onions, cucumbers, tomatoes, peppers and squash. Avoid intercropping with other brassicas as they may attract flea beetle pests.

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. For radish, the recommendation is every two to three years to reduce risk of clubroot.

Plant Care

Watering: Radishes require adequate moisture, or they may become hot/spicy, woody or pithy. Generally, they require relatively low irrigation aside from germination and rapid growth stages. Water thoroughly weekly if it doesn’t rain, aiming for 1 inch per week.

Fertilization: As in many cool-season root crops, insufficient boron may cause distorted growth, internal browning, and scabby growths on the surface of radishes. Conduct a soil test for micronutrients if these problems occur and discuss the results with a local county extension agent. If unsure about the nutrient status of your soil, repeat soil testing every three years.

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 1.5 pounds (3 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. For long-growing Daikon radishes, supplemental side-dressing, or reapplication of synthetic or organic fertilizer, is recommended three to four weeks after planting. 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 lightly around each plant, keeping it a few inches away from plant stems, and water into the soil. Additional side-dressing may be applied every three to four weeks. Fish emulsion is a good, quick-release source of nitrogen for side-dressing if using organic fertilizers.

Weeds: Remove weeds carefully by hand or using hand tools to promote plant health, especially for Daikon radish since this type is slower to mature. Weed pressure may be lowered with crop rotation.

Insect pests and diseases: Since most radishes are very quick to mature, insect pests and diseases pose less of a problem than for other crops. Daikon radishes are more susceptible to insect pests and diseases due to a longer growing time. Refer to Table 3 to aid in diagnosis and management of common radish insect pests and diseases.

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

Symptoms	Diagnosis	Organic and Natural Management
• 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.
• Yellow, V-shaped lesions on leaves. • Wilt and necrosis.	Black rot	• Hot water seed treatment to eradicate bacteria. • Increase plant spacing. • Crop rotation (three years).
• Gray-brown, delicate flies. • Small white eggs laid in soil. • Destroyed root system by white maggots. • Wilted plant; yellowing outer leaves. • Feeding tunnels on the root.	Cabbage root maggot	• Crop rotation. • Use floating row covers after seeding. • Till under fall crop residue to reduce overwintering pupae. • Beneficial insects: soil-dwelling beetles and nematodes. • Organic/natural insecticides targeting root zone.
• Abnormal root growth. • Roots unable to absorb water and nutrients. • Stunted top growth.	Clubroot	• Maintain high nutrient level in soil. • Long brassica rotations (five to seven years). • Improve soil drainage. • Control weeds.
• Seedling rots and suddenly dies (before or after germination). • Cool and wet weather conditions.	Damping off	• Plant fungicide treated seed. • Increase plant spacing.
• 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 and morning irrigation. • Remove crop debris and weeds. • Organic/natural fungicides.
• Small irregular holes in leaves. • Concentrated damage in young plants and seedlings. • Stunted plants, reduced yield.	Flea beetle	• Timely planting. • Perimeter trap cropping. • Super Light Insect Barrier or AgroFabric Pro to protect transplants. • Crop rotation. • Beneficial insects: parasitic nematodes. • Insecticidal oil, spinosad, pyrethrin, Azera.

Note: Table adapted from Alabama A&M and Auburn Universities Extension and UMass 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

It is best to harvest radishes when they are young, rather than overmatured, since they will become hot/spicy, pithy and woody. The root top should be visible above the soil. Daikon varieties will take longer to mature, and fall crops should be harvested before the ground freezes.

Harvest radishes by hand, pulling up on the green tops at their base near the root top. Leave the green tops on (just removing the dead or yellowed leaves) if bunching or consuming within a few days. Remove the green tops for longer storage.

Wash radish and place in plastic bags for storage. Ideal storage temperature of 32 F and high humidity (95%-100%) will keep salad radishes for three to four weeks and Daikon radishes for two to four months.

Radish may be preserved by pickling or fermenting into products like kimchee.

Nutrition

Radishes Are Nutritious and Good for You

High in vitamin C

Important for bones, skin and blood vessels.

High in potassium

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

Good source of dietary fiber

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

Recipes

Basics of cooking with radish: extension.purdue.edu/foodlink/food.php?food=radish
General information on selecting, pairing, preparing, and storing. Also includes a list of recipes.

Video on how to prepare radishes: youtu.be/nV79h8QS18A
Ever wondered about the basics of how to prepare radishes? Chef Allison Kingery shows a couple of options for preparing this vegetable.

Taste Test Ideas

Quick Pickled Radishes

Roasted Radishes

Radishes and Hummus

Other websites with many radish recipes:

Arizona Health Zone — Visit www.azhealthzone.org/recipes and search for radish recipes.

USDA MyPlate Kitchen — Visit www.myplate.gov/myplate-kitchen/recipes and search for radish recipes.

California's Eat Fresh — Visit eatfresh.org/find-a-recipe and search for radish recipes.

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