Oriental vegetables

Vegetables that are prevalent in Asian cuisines, but less well known in Western diets. Oriental vegetables are very important in Asian countries, but are considered as minor crops in the United States and Europe. However, there has been an increased interest in these crops because of their unusual flavors and textures. In addition, many of these vegetables possess high nutritional values, especially with regard to their protein, vitamin, and mineral contents. Some of the more common oriental vegetables are described in the following text. See also: Asia (content/asia/054800); Food (content/food/265800); Horticultural crops (content/horticultural-crops/323900); Nutrition (content/nutrition/462600)

Chinese cabbage

Chinese cabbage, celery cabbage, napa, or pe-tsai (Brassica campestris, pekinensis group; B. rapa, pekinensis group; B. pekinensis) belongs to the mustard (Cruciferae) family and is a biennial leafy plant, but is grown as an annual. The origin of this crop is obscure; it is thought to have first developed in China and then spread to southeast Asia and later to Korea and Japan. The harvested part is a head that is composed of broad crinkled leaves with a very wide, indistinct, white midrib. The outer leaves are pale green, and the inner leaves of the head are blanched. Chinese cabbage is usually grown in the cool season.

In the north temperate region, if the summers are relatively cool, seeds are planted in July and August; however, if summers are hot, seeding is usually in late August or during September, when the maximum day temperatures have started to decrease. If planted too early during hot weather, plants may bolt (produce seed stalks) before heads can form. The production of Chinese cabbage occurs in the fall, winter, and early spring. There are many varieties of Chinese cabbage adapted for various climates; the hybrids are very popular because they are more uniform and of better quality than the open-pollinated ones.

Seeds may be planted first in a seedling bed for transplanting to the field when plants are at the four- to six-true-leaf stage. Before transplanting to the field, the plants should be hardened by withholding water until they show signs of wilting in the afternoons. In Asia, plants in direct-seeded fields are often bundled and sold in markets as greens. In 45–75 days from
seeding, Chinese cabbage forms a cylindrical compact head. Harvested heads may be stored for several weeks in the refrigerator under high humidity without much loss of quality. It is a good salad vegetable because of the mild flavor and crisp texture. See also: Cabbage (/content/cabbage/101100)

**Bok choy/pak choy**

Most varieties of bok choy (bok choi), pak choy (pak choi), Chinese mustard, or celery mustard (*Brassica campestris*, chinensis group; *B. rapa*, chinensis group; *B. chinensis*) are biennials, but some are annuals that flower during the first year without vernalization. The crop is grown as an annual. The origin of bok choy was probably in northern China; the plant subsequently spread to southeast Asia and to other parts of the world in post-Columbian times. Bok choy does not form a head like most varieties of Chinese cabbage; instead, it forms a celerylike stalk of tall, dark green leaves, with prominent white veins and long white petioles (**Fig. 1**). The base of the petiole may be expanded and spoon-shaped; the blade of the leaf is smooth, and not crinkled like that of Chinese cabbage. When grown in cool regions and in moist soils, some varieties may develop enlarged turniplike roots late in the season. Varieties such as choy sum are grown especially for the seed stalks, with flower buds and a few open yellow flowers. The growing of bok choy is very similar to that for Chinese cabbage; however, bok choy is more tolerant of warmer temperatures.

---

**Fig. 1** Bok choy, also known as pak choy or Chinese mustard (*Brassica rapa* or *Brassica campestris*, chinensis group). (*Photo courtesy of the Agricultural Research Service, U.S. Department of Agriculture*)

---

**Oriental winter radish (daikon)**

The large, long, white radish (*Raphanus sativus*, longipinnatus group) is often called oriental winter radish, daikon, Chinese winter radish, lobok, and lob paak (**Fig. 2**). Radish is a dicotyledonous herbaceous plant grown for its long, enlarged roots. The origin of radish is thought to be in the eastern Mediterranean region. Radish was an important crop in Egypt about 4500 years ago; it spread to China via India about 2500 years ago and then to Japan about AD 700, where it ranks first in
production among the vegetables produced there. Radish roots are generally long and cylindrical; they measure about 5–10 cm (2–4 in.) in diameter and up to 45 cm (18 in.) in length. The turnip-shaped Sakurajima variety can attain diameters as large as 30 cm (12 in.) and can weigh 7–10 kg (15.4–22 lb) each. Rat-tailed radish (R. sativus, caudatus group) is grown for the young slender seed pods, 30 cm (12 in.) in length, which are eaten raw, cooked, or pickled in India.

Winter radish seeds are planted in mid-August to mid-November in deep loose soil. The roots are ready for harvest at 8–10 weeks after planting, but can remain in the ground during the winter months if the temperature remains above freezing; growth continues to take place. The roots should be harvested before the plant bolts (produces a seed stalk) in the spring. Cultivars such as the Tokinashi (all seasons) can be planted in the spring for harvest in the early summer; if the temperature remains cool, it can be planted later for harvest in the summer and into the fall. Spring crops can be harvested 40–50 days after planting. See also: Radish (/content/radish/571100)

**Edible podded peas**

Edible podded peas, China peas, sugar peas, or snow peas (Pisum sativum, macrocarpon group) belong to the Leguminosae family. Evidence of peas used for food dates back to about 7000 BC in the Near East. The primitive forms of pea are slightly bitter, which prevents them from being eaten by animals, and they have a tough seed coat, which allows for long dormant periods. In the garden pea, the pod swells first as the seeds enlarge; however, in the edible podded pea, the immature seeds bulge the pod, which demarks the developing seeds. Unlike the regular garden peas, which have tough fibery seed pods, the edible podded peas were selected for the tender pods and not for the seeds. A variety called Sugar Snap Peas, which has low-fiber-content pods and enlarged seeds, has become popular again. In Taiwan, the tender shoots of garden peas are harvested and cooked as greens; the shoots have a very delicate flavor.

Peas are a cool-season crop that can be grown at mean temperatures of 13–18°C (55.4–64.4°F). Prior to flowering, pea vines can stand temperatures down to freezing, but the flowers and immature pods are injured by such temperatures. Varieties of edible podded peas have been developed for the tropics and subtropics. Peas are sensitive to acid soils; a pH range of 5.5–7.0 is considered optimal. For early production, a light soil is recommended. A good, airy soil is preferred for optimal nitrogen fixation by the symbiotic *Rhizobium* bacteria found in the nodules of the roots. In cool soils, some nitrogen fertilizer, together
with phosphorus and potassium, is recommended. Seeds are planted late in the fall in mild climates or early in the spring in cold climates. For edible podded pea varieties that are usually climbers, poles or trellises should be put up. From seeding to harvest, 60–110 days are required, depending upon the variety and season. For best quality, the pods are harvested just before the seeds begin to swell. The harvested pods can be put in a refrigerator under high humidity for several days without much loss in quality. See also: Nitrogen fixation (/content/nitrogen-fixation/454100); Pea (/content/pea/492900)

Yard-long bean

Yard-long bean or asparagus bean (Vigna unguiculata, sesquipedalis group) belongs to the Leguminosae family and is a relative of the cowpea (V. unguiculata, unguiculata group). It is an annual climbing plant that reaches a height of 1.8–3.6 m (6–12 ft) and produces pods that are 30–90 cm (12–36 in.) in length. Its primary center of origin was in Ethiopia, and its secondary center of development was in India about 3500 years ago. During the first millennium BC, the cultivation of yard-long beans spread into southeast Asia and China.

Yard-long beans grow best in loam soil, but can be grown in heavy clay soils as well. It is a warm-season crop and cannot stand any freezing temperatures. Seeds are planted in fertile, well-drained soil after all danger of frost has passed. In some regions of the tropics, yard-long beans are often planted with corn. The beans are planted after the corn is well established and tasseling. The growing bean plant can use the corn stalk for support after the ears have been harvested. Pods can be harvested about 50 days from seeding. There are two varieties of yard-long beans: the green-podded type, with pods that are 45–90 cm (18–36 in.) in length, and the white-podded (pale-green) type, with pods that are 30–45 cm (12–18 in.) in length. See also: Bean (/content/bean/075900)

Bean sprouts

The sprouts of mung beans or green grams (Vigna radiata; formerly Phaseolus aureus) [Fig. 3] have been used by the Chinese for their remarkable healing qualities for thousands of years and were described in their earliest medical treatises. Only recently has the Western world recognized the value of sprouted leguminous seeds (mung, soy, and alfalfa sprouts). The unsprouted mung bean seeds contain negligible amounts of vitamin C (ascorbic acid), whereas the sprouted seeds contain 20 mg per 100 g of sprouts, which is as high as tomato juice.

Fig. 3 Mung bean sprouts (Vigna radiata).
**Jicama or yam bean**

Jicama (*Pachyrhizus erosus*), also called the yam bean, is indigenous to Mexico and Central America. It belongs to the pea (Leguminosae) family. The name jicama was derived from the Aztec word *xicama* by the Spaniards who first found the crop growing in Mexico. The crop is grown for its enlarged turnip-shaped root, which is eaten raw or cooked; it has a crisp texture and is sweetish in taste. It is an important ingredient in Chinese cookery. Jicama is an herbaceous vine growing to lengths of more than 3 m (10 ft). Under short-day conditions, it produces small white to deep violet flowers shaped typically like those of the common bean or pea. It is a tropical plant and requires a long, warm, frost-free season for the formation of the enlarged root. In the tropics, it is grown from sea level to about 1600 m (5250 ft) in elevation.

The seeds are planted in rich, sandy or loose soil. For best-quality roots and high yields, the flower buds are pruned off so that seed pods are not allowed to develop. The roots are harvested when they are about 10 cm (4 in.) in diameter; larger roots, and plants left in the ground too long, tend to become fibery and of poor quality. The roots can be stored in a refrigerator or cool place under relatively high humidity for several weeks. The plants, including the enlarged roots, contain rotenone, a natural insecticide, so no pesticide is needed to grow the crop.

**Chinese winter melon**

Chinese winter melon, wax gourd, winter gourd, white gourd, ash gourd, Chinese preserving melon, ash pumpkin, or tung kwa (*Benincasa hispida*; *B. cerifera*) is a viny annual cucurbit, probably of Indian or Chinese origin. It is monoecious (having male and female flowers separate on the same plant). The plant has been cultivated for more than 2000 years and is reported to grow wild in Java. The immature fruits of this species have bristlelike hairs on the surface. The mature fruits are watermelon-shaped; some varieties are somewhat spherical, reaching 38–46 cm (15.2–18.4 in.) in length, 30–38 cm (12–15.2 in.) in diameter, and 7–14 kg (15.4–30.8 lb) in weight. With increasing maturity, most varieties develop a white waxy bloom on the fruit surface that thickens with time, even after harvest. The flesh of mature fruits is used in making Chinese soups. It can be eaten raw or made into sweet preserves similar to citron or watermelon rind preserves. For special occasions, the skin is scraped off the fruit, the pulp and seeds are removed, the fruit cavity is stuffed with previously cooked meat and vegetables, and the entire fruit is steamed for a couple of hours before serving. The fruit is said to have medicinal qualities. A variety of this species is grown especially for the immature fruits, which are 10–15 cm (4–6 in.) in length and 5–7.5 cm (2–3 in.) in diameter. These, called mo kwa by the Chinese, are used like summer squash.

The crop is planted like winter squash or melons, and the vines are allowed to creep on the ground. The seeds are planted in hills and in rich, loamy soil. In southeast Asia, the vines and fruit are sometimes supported on trellises. Chinese winter melon fruits, when mature, store for more than 6 months or longer, especially if stored in a cool, dry place, such as a cellar. The temperature during storage should not fall below 7.5°C (45.5°F) or go above 18°C (64.4°F). The ideal storage temperature is 10–15°C (50–59°F). If kept at warmer temperatures, the storage time is reduced.

**Balsam pear**

Balsam pear, alligator pear, bitter gourd, bitter melon, bitter cucumber, or fu kwa (*Momordica charantia*) is a monoecious annual herbaceous vine of southeast Asian origin; it is now widespread throughout the tropics of the world. The fruits are heart-shaped to cylindrical, tapered at the blossom end, and characterized by longitudinal rounded ridges; the entire surface of the fruit is rugose. The mature fruit size varies from 12.5 to 25 cm (5 to 10 in.) in length and from 5 to 7.5 cm (2 to 3 in.) in diameter. The fruit is extremely bitter; some of the bitterness is removed before cooking by peeling and steeping in salt water. Immature fruits are less bitter than mature ones.
The seeds of balsam pear are sown in rich loam soil. As a vegetable, the fruits are harvested just prior to attainment of full size and while the seeds are still immature. The harvested fruits can be stored in a refrigerator for about a week. As with immature cucurbit fruits, prolonged storage in the refrigerator should be avoided because physiological breakdown, called chilling injury, occurs at temperatures below 10°C (50°F), with subsequent rotting by decay organisms. The mature fruits, with seeds removed, are parboiled in salt water, and some of the bitterness is removed by draining and pressing or squeezing of the pulp, which is then added as an ingredient to other foods being cooked. The red aril of mature fruits is sometimes used as a condiment, and the red pigment is used as food coloring. The tender shoots and immature leaves are used as greens.

**Chinese okra**

Chinese okra or angled loofa (also spelled loofah or luffa; *Luffa acutangula*) is called zit kwa by the Chinese; it is a close relative of *L. aegyptiaca* (*L. cylindrica*; known also as sponge gourd or dishcloth gourd). Chinese okra is a monoecious annual climbing vine grown for the immature fruits, which are harvested when the fibers have not yet developed and when the fruits are 10–15 cm (4–6 in.) in length. The origin of *Luffa* is thought to be in India because wild forms of this genus have been found there. The club-shaped fruits of Chinese okra are oblong and pointed at the blossom end (Fig. 4); when mature, they are 30–38 cm (12–15.2 in.) in length and 7.5–9 cm (3–3.6 in.) in diameter at the thickest part. The 10 prominent sharp longitudinal ridges that extend from the peduncle to the blossom end characterize the fruit.

![Chinese okra](image)

Fig. 4 Chinese okra (*Luffa acutangula*). The length of the fruit can reach 30–38 cm (12–15 in.). *(Photo by Forest and Kim Starr)*

The seeds, which are poisonous, are planted in rich loam soil. The crop is trellised or staked to allow the vines to climb for better quality and increased yields. The thoroughly mature fruits of Chinese okra can be made into vegetable sponges by retting until the outer walls are rotted, and then the skin, seeds, and pulp are washed away from the network of fibers. The fibers can be whitened with a dilute solution of bleach, followed by rinsing and drying.


**Water spinach**

Water spinach, water convolvulus, swamp cabbage, kang kong, or shui ung tsoi (*Ipomoea aquatica*) is a perennial semiaquatic tropical plant grown for its long, tender shoots. It is a relative of the sweet potato (*I. batatas*), but does not produce an enlarged root. Possibly of East Indian origin, it is now widespread throughout the tropics and semitropics, where it has become a very popular green vegetable. There are two types of water spinach: a narrow, pointed leaf type adapted for dryland culture and a broadleaf type adapted for aquatic culture. In the dryland culture, the crop is seeded in beds and grown with abundant water. Irrigation is practiced in regions of low rainfall. It grows very quickly, requiring only about 2 months under ideal conditions from seeding to first harvest. For aquatic culture, the crop is propagated by stem cuttings that are 30–40 cm (12–16 in.) in length. The cuttings are planted in puddled soil, similar to rice paddies, to a depth of 15–20 cm (6–8 in.).

The first harvest for crops grown in water can be made as soon as the new shoots are more than 40 cm (16 in.) in length. About 25–30 cm (10–12 in.) of the shoot is cut, and 8–10 shoots are bundled for marketing. New shoots continue to develop, so harvests can be made every 7–10 days. For crops grown on dry soil, shorter shoots of 20 cm (8 in.) are harvested because the stem sections further from the growing point are not as tender. Water spinach in Asian cooking is used like common spinach. It can be stored in a refrigerator under high humidity for a few days without much loss of quality. In southeast Asia, the parts not used for food are harvested and fed to livestock.

*Masatoshi Yamaguchi*

---

**Additional Reading**


[Guide to Asian Specialty Vegetables](http://sfp.ucdavis.edu/crops/Asian_Vegetables/AsianVeg/)