

Vegetable Family Notes
Pat Patterson, MGJ

BRASSICACEAE has 1,800 species, including the majority of our winter vegetables, quite a few ornamental flowers and a number of weeds. It is also known as the mustard family. Many in this family are biennials, requiring a warm period followed by a cool period and then warm again to flower. The flower is a four-armed cross. Many of its members are peppery or pungent. It is a family from the temperate and cold regions of the world. All this family is hard on the soil with high nutrient requirements. They even reduce the soil biology. Do not grow in the same soil two years running.

- Brassicas (the cabbage alliance) are the largest vegetable group in this family. This group appreciates a fertile, moist soil, high in organic matter with a pH of 6.5 or higher. Brassicas generally have a higher boron requirement than other families since a deficiency may cause a hollow stem. It is generally frost tolerant and even improves in flavor after a frost. The roots are in general shallow and wide-spreading, so cultivating or walking close to the plants damages them. This group should be rotated with some other family since it is quick to build disease and insect infestations. Brassicas are usually high in vitamins A and C and are thus best raw or lightly cooked. However, some people are very sensitive to the oils in these vegetables and cannot tolerate them raw. The major pests are mealy gray aphids, green loopers, cabbage worms and, by far the worst, the root maggot. Overwintering brassicas should have an ample supply of phosphorus and potassium in the fall, but not too much N. About early February, N should be side-dressed alongside the plants. Based on widespread reports from Oregon, younger plants survive severe winters better than older ones. The plants should not be headed up or budding when full winter arrives. All brassicas are biennial and cross-pollinate with pollinate with each other, so seed saving is a challenge.
- Broccoli (*Brassica oleracea*, var. *botrytis* or *italica* -sprouting types) originated in the Eastern Mediterranean and traveled to Europe only in the 17th Century. The best part of broccoli is the flower bud, but the leaves are also edible, although rather strong and tough. The buds should be harvested before they begin to open. Careful cutting on a slant will usually result in second and even third harvests. Sprouting broccoli, an excellent winter crop, has many loose clusters of buds that proliferate well into May most years. These are outstanding marinated for salad or stir fried. Since broccoli is basically flower buds, it will not keep like cabbage and must be used or frozen. Broccoli requires 18 x 18-inch spacing and is otherwise cared for as is cabbage. There is a perennial broccoli available that is a rampant grower and which you might like to try for fun.
- Broccoli Raab (*Brassica rapa*) is also know as Italian turnip. It is a non-heading broccoli whose tops and flower shoots are used in the early spring. It was developed in Europe.
-
- Brussels sprouts (*Brassica oleracea*, var. *gemnifera*) are usually a reliable winter crop. As the name indicates, they were developed near Brussels in Belgium. They will germinate at 50 degrees but 70 is ideal. Grow the transplants over 45 and under 85 degrees. As the miniature cabbages begin to mature, twist the leaves off below them. Harvest the

buds before they begin to open. If you want a lot of sprouts all at once, pinch out the growing tip as soon as the heads have started to form (bottom buds will be 1/2-3/4 inch. Brussels sprouts are prone to flower if the weather turns hot. They appreciate daily averages of 65 degrees or less. Nutrition and flavor are improved by near freezing temperatures at harvest. If grown too vigorously, the sprouts tend to be loose and not keep well. Tight sprouts store very well. Brussels sprouts are slow to mature. Aphids are a major contaminant in this vegetable. One ingenious solution is to encase the plant in a large pantyhose leg as the heads begin to form. Should be fun tucking in all those leaves. Salt water soaks remove most of the aphids and the remaining ones are actually quite edible.

- Cabbage (*Brassica oleracea*, var. *capitata*) has been cultivated at least 2,000 years. The cabbage started as a loosehead in the Middle East, but moved to Europe and Asia thousands of years ago. It developed its firm head only in the 16th century. When starting, try to keep the temperature at 60 degrees or less to avoid legginess. For fall and winter harvest, plant 2-3 months before the first frost. It can be intensively planted at 12 x 12 inches for small-head types to 18 x 18 inches for large types. Ornamental cabbages look like giant roses. When the head is firm as a softball, you can harvest. Cut the head carefully, leaving the bottom leaves and extra bonus heads will grow. If the cabbage is ready for harvest, but you are not, twist it enough to crack the roots and it will store in the garden without splitting for quite a while. It can be stored in a root cellar environment for months if harvested with the roots attached. The Savoy types (especially Chieftain Savoy and January King) are most winter hardy. Red cabbages seem to be more insect and disease resistant in our area. They are also very winter hardy. Over watering and high pH may increase clubroot. Cabbage is a heavy user of P, K and S. Sometimes this whole family requires extra boron.
- Cauliflower (*Brassica oleracea*, var. *botrytis*) was used in the Eastern Mediterranean area about 2000 years ago and entered Europe around the 14th century. As with broccoli the flower buds are eaten. Culture is as for broccoli, except that cauliflower is much more sensitive to environmental stress. It must have fast, unchecked growth to head properly. If it is not the self-blanching type, be sure to tie the leaves loosely over the head. You can use a broad rubber or pantyhose. Cauliflower is best grown as a fall crop. It also makes a good over-wintering crop most years. There are many improved varieties now available and a self-blanching one would be highly recommended. It is also a crop best grown yourself from seed, though be sure the transplant is not allowed to suffer any stress which expresses itself as "ricey" curds. Purplish or greenish coloration of the curds is harmless. Uniform moisture is needed to prevent "buttoning". There are also violet, golden or green colors of cauliflower. I especially like the golden form, though it is not as winter hardy.
- Collards (*Brassica oleracea*, var. *acephala*) have been a food crop for 4,000 years and have been cultivated in its present form for 2000 years. Collards are genetically almost identical to kale. They tend to be quite large and require a minimum spacing of 18x18 inches. They definitely need frost for best flavor and thrive here. They are nutritionally very rich. Collards love warm weather and seem to be little bothered by root maggots. A really good variety is Blue Max. Champion is also quite good. There

does not seem to be a lot of breeding being done in this vegetable. From collards one can have greens through the winter and plenty of flower sprouts for stir-fry through the spring. Occasionally collard seed may revert to the kale form. There are heading and loose leaf types.

- Kale (*Brassica oleracea*, var. *acephala*) tends to bolt if hot and cool weather alternate. It is probably the original *oleracea* from which the others developed. It is mild and tender when very young or after frosts. It makes a reliable winter salad base, rarely freezing out. It is also low in oxalic acid. Kale has few insect problems besides an occasional slug or an aphid attack if it is under stress. Kale can also be exceptionally beautiful with brightly colored (ornamental type) and deeply curled leaves. It is best raw or very slightly cooked and should be harvested just before use. Heat over 75 degrees can make its growing leaves tough and harsh. These are best fed to birds and other animals and the new leaves then eaten. Try some *Gai Lohm* (Chinese Kale in the *alboglabra* group, not *acephala*) if you can find it. Kale is cultured as cabbage. In rich soil, high in organic matter 18x 18 inch spacing will result in tree-like plants. When kale bolts in the spring, the flower buds are great stir-fried. There are now many kale cultivars available with exceptional curling and/or color. The cultivation of kale is lost in pre-history, but it probably originated in Central or Northern Europe. Some claim a Mediterranean origin for it. Konserv, Winterbor, & Westland Winter seem to have superior flavor for raw use. Don't overlook the Russian Red and Dinosaur (Tuscan) kale (*B. lacinatus*) for winter use particularly. Tuscan was the only survivor of some past winters. Kale is now the new wonder vegetable and snack food, as in kale chips.
- Kohlrabi (*Brassica oleracea*, *Gongylodes* group) is a great replacement for the insect-prone turnips if you get the right variety. It should be harvested before it gets woody and Kongo, Winner and Grand Duke give good leeway in harvest time. The giant forms such as Gigante are fun to grow as they can provide a 15 lb. tender bulb. The young leaves are also good. This European plant is genetically very close to turnips. It does best if growth is steady and uninterrupted, but the seed should not be sown if temperatures are below 40 degrees or the plant may just flower. Small transplants usually do best and two can be grown in one hole if the fertility and tilth are good. Kohlrabi will be most tender when the days do not exceed the upper 60's. It stores very well in a root cellar environment. An 8 x 8 inch (except for Gigante) spacing usually works out well. It requires full sun. The Vienna types are definitely inferior to the newer forms.
- Turnips (*Brassica rapa*) are probably the best trap crop available for root maggots. Without careful timing and/or screening, they are next to impossible to grow in the summer garden organically. Some years even persistent pesticides have trouble keeping them completely clean. Turnips prefer cool weather and should be used young. Turnip greens are relatively easy to grow and are more nutritious than the bottoms. Turnips can make an excellent late fall/green manure crop that can be harvested in the spring. The vegetable originated in Asia, but was used in northern Europe in Roman times. They were used primarily for livestock until the 17th century. They need 3-5 inch spacing to form roots. They are best planted from

March to June 7 for the early crop. A new white turnip like a radish is Oasis. It can be planted at 1-2" spacings and is crisp and sweet. The earliest Jack-o-Lanterns were made of turnips. To protect turnips, never plant in the same area each year and cover with a row cover such as Reemay™ at planting and leave on until harvest.

- Rutabaga (*Brassica napus*, var. *napobrassica*) is also called Swedish turnip. It seems to be less prone to attack by root maggots and is a good fall crop. Rutabagas are more nutritious than turnips and the tops may also be eaten, although they are somewhat strong. "Swedes" store very well. Unfortunately many people have difficulty in acquiring a taste for them. Seed these in April, early June and July 20-August 1 (overwintering) for three main crops. Their main use has been as a livestock feed.
- Mustard (*Brassica juncea*) also comes in many varieties, but all are characterized by a peppery taste. Mustard is generally not a good summer crop as it gets too peppery and also tends to bolt. Very young leaves are best, used in moderation. The term mustard gas refers to a chemical found in these plants which can really bring tears to your eyes and dyspepsia to your tummy. Mustard does well on 8x8-inch spacing unless you are growing the giant variety. It really should be kept picked as the larger leaves are rarely palatable. For fall crops, seed July through August. Harvest is about 50 days from seed. Garden cress (*Lepidium sativum*) has the mustard or watercress flavor and is a very easy early spring crop. The weeds in this family are also good salad greens, especially before the garden really comes into production. One I use a lot is bittercress (*Cardamine oligosperma*).

Asian Brassicas have been cultivated for about 3000 years in eastern Asia. All are cultivated much like cabbage.

- Chinese cabbage (*Brassica pekinensis*) comes in many forms. It can be very difficult to grow here since all the pests, especially root maggots, adore it. The root maggot fly is usually active from mid-April to late September and the plants must be protected at that time. Chinese cabbage is also very prone to bolt in long days and is best grown as a fall crop. Space them at 15 x 15 inches. As the name implies this is originally an Asian plant. The optimum temperature for the first half of growth is 68 degrees, for heading 59. If it is too hot or if it remains under 55 degrees for a long period, the plants will bolt. This plant is best grown under a cloche or row cover to exclude the pests and not where cabbage family plants were grown the previous year.
- Bok (pak) choy (*Brassica chinensis*) is sometimes called Chinese mustard, but the term is misleading. This is a very sweet succulent plant. It looks a little like Swiss chard but is very mild with stout stems. It is well suited to stir fries and salads. It is moderately winter hardy. Bok choy is planted on 12 x 12 -inch spacing and the outer leaves are harvested as needed. Most years it will provide nutritious and tasty greens until well into spring. There is enormous variety in the seed strains of this plant, so if you find one you like, it is probably best to stay with that packager. Tatsoi is like a miniature Pak Choi.
- Mizuna (Kyona) is an excellent mild Asian frilled mustard which we especially enjoy early and late in the year. It is very easy to grow and highly productive.

- Radishes (*Raphanus sativus*) started in China and spread to Japan, through Central Asia and finally to Northern Europe. All the early varieties were elongated. Round ones first showed up about 200 years ago. Both the ancient Greeks and Egyptians valued them very highly. Originally they were a cooked vegetable and are still so used in many cultures. They need to be grown outside the root maggot season or protected. 4 sq. ft. can easily produce 144 radishes at a time, so succession sowing at 2 week intervals is obviously desirable. Radish tops can be used in soups. It is a quick crop and a natural for succession. The young radish pods are excellent in salads and stir fries. I now tend to use them more than I do the roots. One radish can produce a quart of pods easily. Radishes can be harvested in as little as 25 days. If they do not grow quickly, they will be pithy or hot. Water stress will ruin them. The large winter radishes make a fine vegetable, but require a deep, well-drained soil. Radishes can be scatter-sowed, spaced at 1x 1 inch or seed tape sowed. Radishes come in all kinds of colors and shapes and are especially rewarding for children to grow. Winter radishes should never be seeded before midsummer or they will be hot and woody and buggy. Wild radish is common here so saving seed from your own is very tricky. Radishes are commonly grown as a marker crop for the slower germinating carrots. Root maggots are most fond of turnips and radishes and these are sometimes used as a trap crop.
- Horseradish (*Armoracia rusticana*) is grown as a condiment and a little goes a long way. Once established it readily becomes weedy and should never be rototilled as each root part will become a new plant. To grow prime roots offer it 12+ inches of loose well-drained soil high in organic matter. Manure is an excellent additive. Horseradish responds very well to high levels of fertility. In good soil its side roots will easily forage laterally 18 inches or more and choke out any plant with which it comes in contact. Even comfrey can lose this battle. Harvest after the tops die down. Use root cuttings 1/2-3/4 inch in diameter for "seed stock". Horseradish is native to Eastern Europe.