



BACKYARD TO BELLY

Grow Sheets for Vegetables and Fruits

**UC Marin Master Gardeners
January 2013**



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UC MARIN MASTER GARDENERS

The Marin Master Gardeners are a dedicated, trained group of volunteers with a shared love of gardening and horticulture. Through community service and educational outreach, they provide home gardeners and community organizations with the knowledge and skills to create a healthy environment for Marin County. Since 1986, Marin Master Gardeners have worked as non-paid staff members of the University of California Cooperative Extension (UCCE), answering public inquiries and providing information on all areas of plant health and gardening practices.

We have a free help desk in Novato staffed with volunteer Master Gardeners five days a week located at 1682 Novato Boulevard, Suite 150B, Novato. You can email your gardening questions to us at helpdesk@marinmg.org or call us at 415-473-4204. If you have a pest or disease problem, please bring us a sample in a plastic bag so we can observe and analyze the issue.

You can also find us sharing information with the public on sustainable gardening practices at Marin Farmer's Markets, Educational Seminars, Bay Friendly Garden Walks, School Gardens, and Community Gardens. You'll find our articles and stories in the Marin Independent Journal, PATCH, and other online and in-print publications. We also participate in the annual Farm Day demonstration and the Marin County Fair.

We have a quarterly newsletter, the Leaflet, written for the residents of Marin County that provides seasonal advice, up coming presentations and seminars, and helpful hints on dealing with all sorts of gardening issues from rose blight to rats to watering practices.

Please visit us at our website at www.marinmg.org for more information and to sign up for the Leaflet. You can access the Integrated Pest Management system through our portal and find archived articles and plants guides.

SEASONAL PLANTING GUIDE



What to Plant: February, March and April

- Asparagus
- Beets
- Brassicas including broccoli, brussel sprouts, cabbage
- Alliums including onions, leeks, chives
- Carrots
- Leafy greens including spinach, kale, chard and lettuce
- Herbs (parsley, thyme, oregano, etc...)
- Rhubarb
- Peas
- Strawberries
- Potatoes
- Blueberries

What to Plant in May

- Tomatoes
- Corn
- Eggplant
- Green Beans (and other beans)
- Peppers
- Squash
- Pumpkins
- Melons

What to Plant in August

- Beets, Brassicas, Carrots, and Leafy Greens
- And/ or consider cover crop to work into the soil before planting next February.
- Good cover crops in Marin include fava beans, alfalfa, winter wheat and rye.

Fruit Trees – generally best to plant in early spring

- Apple
- Cherry
- Citrus
- Pear
- Olive
- Apricot

Alliums

What: Allium is the botanical name for a group of bulbous plants that include lovely flowering perennials as well as every cook's staples, onions, garlic, leeks, and shallots. The bulb structure enables the plant to tide over during cold or dry periods safely buried in the earth until favorable conditions return. Most species are found in the northern hemisphere although a few occur in South America and Africa.

When and How to Plant:

Onions – Allium cepa

Cepa Group: Plant in the spring or fall from seed, seedling or sets (small bulb). Onion varieties require different daylight hours to form a bulb. After about six months, tops of dry onions will start to turn yellow and break over. Pull the bulb out of the ground and let them dry for a few days. Store in a dry, cool, dark place.

Leeks – Allium ampeloprasum

Porrum Group: Plant seeds in late summer and thin seedlings to 4-6 inches apart. When plants are almost full grown, push soil up around stems to blanch them white. Harvest next year in early summer before the soil gets hot.

Garlic – Allium sativum

Plant clove (garlic does not set fertile seed) in the late summer. Next summer, cease watering and the foliage will yellow. Break over like onion. Dig up bulbs and sundry them for about three weeks until the skins become papery.

Shallots – Allium cepa

Aggregatum Group: Plant bulb, reproduces only by bulb, in spring. The harvest will be next summer. Dig the bulbs out when tops begin to dry.

Best Cultural Practice: Alliums are susceptible to stem and bulb nematodes. Rotate crops and use only certified seed. These cultural practices are your best defense. Alliums are also susceptible to thrips (use insecticidal soap), maggots (destroy crop), downy mildew (keep soil well drained and allow plants to dry out between watering) and white rot (caused by fungus – destroy crop).

Asparagus, *Asparagus officinalis*

What: Asparagus is a perennial and a member of the *Asparagaceae* family. Native to the Mediterranean, it is a relative of the grasses with a rhizome emerging from an underground crown. Considered a delicacy by the Greeks and the Romans, it grows very well in Marin and according to Bon Appetit Magazine Survey, reigns supreme as our favorite vegetable followed by broccoli and tomatoes.

When to Plant: Plant asparagus crowns from January to March in full sun. For a family of four, you should plant 40 crowns in order to serve five spears to each person for a meal. It takes about three years to achieve full production, which continues for about 6 to 8 weeks and tapers off by June. The plants will produce for as long as 15 years. Choose only varieties resistant to Fusarium wilt and better suited to Marin's warm weather.

How to Plant: In a sunny location, dig a trench two feet deep and twelve inches wide. Into the soil, work in compost (about 30%) lime and steer manure. Back fill the trench halfway and lay out the crowns 12 inches apart, mounding the soil under each allowing the roots to dangle down about two inches. Cover everything with about two inches of soil. As the spears begin to emerge, cover with another two inches of soil until the trench is completely filled in. Irrigate well during the first year and **do not harvest any spears**. Second year, you may harvest spears eight inches high and at least 3/8 of an inch wide – thicker than a pencil. Always cut with a knife at ground level so as not to disturb any underground spears. After the first year, irrigate only during fern season – not harvest season. Ferns are any spear that is smaller than a pencil. The plant needs these to send nitrogen back down to the crown for next year's production. After ferns turn yellow in the fall, cut them off at ground level and fertilize the bed with compost and steer manure. Mulch is good too as it keeps the soil loose for emerging spears.

Best Varieties for Marin: 'UC 157' and 'UC 72' – both developed by UC Davis from the older variety, 'Mary Washington'. 'UC 72' is resistant to both Fusarium wilt as well as Rust – important in Marin which experiences warm weather as well as higher humidity.

Best Cultural Practice: Weed frequently and orient the asparagus beds parallel to prevailing winds in a well drained, sunny area. This helps prevent bent tips that can also be caused by Phytophthora crown and spear rot in which case you need to remove and destroy all crowns. If you get Rust or Fusarium wilt, remove plants as well and destroy. Plant only resistant varieties. Snails and slugs can be picked off and aphids hosed off.

Beans, *Phaseolus vulgaris*

What: Snap Beans (*Phaseolus vulgaris*), also called “green beans” or “string beans”, have been grown as a food crop since ancient times and originated in Central or South America. They are tender annual, warm-season legumes that will fix their own nitrogen once a good root system is established. The structure of these beans can be tall-growing pole-type beans, or half-runners or the low-growing bush-type. Varieties include standard round and flat podded green, yellow wax, and purple-pod types.

When to Plant: When the soil temperature reaches 60°F, it’s safe to plant beans. Seeds planted in cold soils germinate slowly and are susceptible to rotting. Also, seedling growth may be slow in cool temperatures. You need 70 to 80 days of moderate temperatures—nights not below 40°F and daytime temperatures of 70° to 90°F to grow & harvest a good crop of these beans.

How to Plant: Beans prefer a soil pH between 6.0 and 6.5. Snap beans are a low user of nutrients and do not require high amounts of fertilizer because they produce their own nitrogen. Prior to planting, incorporate compost and nitrogen-fixing bacteria into the soil for higher plant yields & healthier plants. For bush beans, sow the seeds 1-inch deep, about 6 inches apart, in rows 18 inches apart. They must have room on either side for maximum production. Plant pole beans 4-6" apart at the base of poles, or a trellis. Plant 6 to 8 seeds around each pole, thinning to 3 plants per pole.

Best Varieties for Marin: There are two basic types of snap beans: green-podded and yellow-podded or wax beans and they come in different shapes: long, short, flat, round, broad. Some folks prefer growing bush beans to pole beans because although they take up more space, they require less work planting, staking, weeding and watering. Bush beans also produce most of the crop all at once, which is great for freezing. ‘Nickel’ was exclusively developed as a baby French/filet bush bean that produces 4-inch long, dark green pods in 53 days. It tolerates hot and cold temperatures better, and displays superior resistance to foliar disease and root rots, compared to other beans in this class. Pole beans are beautiful and bountiful, and you don't have to bend over to reap your harvest. Although they mature later than bush beans, most of the pole bean varieties are really prolific. ‘Blue Lake Pole’ produce stringless pods and can be grown in pots if you tepee them. They mature in 75 days. The ‘Romano’ pole bean is a reliable, stringless flat bean that matures in 65 to 70 days. Pole beans should be picked often for continuous harvest.

Best Cultural Practices: Once planted, keep the soil evenly moist. This is especially important from flower bud formation to pod set. Too much or too little water causes blossom and pod drop. Extremes in soil moisture can also lead to malformed pods in which only the first few seeds develop, leaving the rest of the bean pod shriveled. Water plants early in the morning to allow plants to dry quickly and reduce the opportunity for disease infection. Drip irrigation is recommended to help keep the foliage dry. Pick the beans while they are relatively small for best flavor and to keep the plant producing more beans. At the end of the season you may want to let a few pods mature for saving seeds for planting the next season.

Cutworms, aphids and mites can be a problem. A variety of viruses also attack beans. To control bean diseases, do not handle or work among bean plants when foliage is wet. See UCIPM website for pest management solutions.

Beets, *Beta vulgaris*

What: The garden beet is a member of the *Chenopodiaceae* family. It is an herbaceous biennial grown as an annual during the cooler months of the year. It is a root crop but the leaves (which can reach up to 18 inches) can be eaten, as well, and are very tasty and highly nutritious. Each beet seed is actually a dried fruit containing a cluster of 2-6 seeds. The garden beet is closely related to chard and the sugar beet, an important crop for sugar production. The roots are commonly deep red-purple in color but other varieties reveal yellow, white, orange and red and white striped colors. Garden beet greens, such as 'Bulls Blood', with its intense deep red-maroon color, add beauty to any edible landscape.

When to Plant: Beets are at their best when daytime temperatures are between 60-65 degrees, in the spring and fall months in Marin, but they can survive some frost. They don't like temperatures above 75 degrees and they typically take from 5-10 days to germinate. They will not germinate if soil temperatures are below 40 degrees with the strongest plants emerging when soil temperatures range from 50-75 degrees. Expect to harvest your beets around 50-70 days. Beets are wind pollinated.

How to Plant: Like other root crops, beets are best grown in sandy, loamy or well-amended (with organic matter) soil. They are a good indicator of soil pH with a neutral soil (6.5-7.5) being ideal for their growth. They grow best in nutritious soil in deeply dug, raised beds so be certain to amend your soil well, adding a low nitrogen, organic fertilizer high in phosphorus and potassium. Too much nitrogen will cause excessive green growth and a lack of mature bulbs underground. Beetroots can reach deeply into the soil with its taproot easily reaching 1 foot and its finer root hairs extending several feet down if the soil is well loosened. Beets are almost always direct seeded but can be transplanted successfully. Plant in rows or scatter sow, them in small blocks. Plant 1/2 inch deep and 1-2 inches apart. Thin seedlings when seedlings have two true leaves to 4 inches apart with scissors. Beets must be watered regularly. Harvest the beets at the optimum size (usually 1 1/2 -2 1/2 inches in diameter) as indicated on the seed packet. Some varieties remain tender as they age but most toughen up and become woody.

Best Varieties for Marin: 'Detroit Dark Red', 'Early Wonder', 'Chiogga', 'Golden', 'Bulls Blood'

Best Cultural Practice: Beets need plenty of moisture so mulch to keep them cool in warmer weather and water well. They will store longer in the refrigerator if the greens are cut off leaving about 1 inch of stem, Store the greens separately. Although there is no exact science to companion planting, beets are known to grow well with onions and kohlrabi. Beets are prone to leaf miner. One of the best protections for this pest is to remove infested leaves and cover the plants with a floating row cover.

Blueberries, *Vaccinium*

What: Blueberries, members of the *Ericaceae* family that also includes cranberries, rhododendrons, azalea and huckleberries, are deciduous. Three main types are grown in the United States: the high-bush, the low-bush and the rabbit eye. Blueberries make great hedges with their glossy green foliage, white blossoms in spring turning to berries in May through July and scarlet fall foliage.

When to Plant: Blueberries may be planted from fall through early spring. The blueberry plant begins to bear at about three years and continues for about forty years. Berry production occurs over a period of time and accordingly, berries are classified as early, midseason and late producers. They are to some extent self pollinating but bumblebees and wind help them along. All blueberries will cross-pollinate with each other and having cross-pollinated, the fruit tends to be larger.

How to Plant: To plant a blueberry, dig a hole one foot deep and twice as wide. Keeping the plant high spread the roots in all directions and cover them with a couple of inches of soil. Water thoroughly and mulch. About a month after planting, apply a 10-10-10 fertilizer, about 1 and ½ T per plant. If you prefer organic-based fertilizers, apply 1 pound of fish or blood meal per plant. Blueberries are heavy feeders and like an application of fertilizer in early spring. Continue feeding every two months until berry season is complete. Watering is most important when the berries begin to swell. Apply 1 inch of water per week. For drip systems, this is about 1.25 gallons per week. Regarding pruning, do it if you want production of large berries. Remember the fruit is produced on 1-year old wood. Prune twiggy, spindly older wood, keeping the bush open. You can tell the difference between a fruit bud and a vegetative bud by their fatter, less pointed appearance. Growers recommend limiting the number of canes to 6 to 8 per bush. If you want the bushes to form a hedge, do not limit the number of canes.

Best Varieties for Marin: ‘Bountiful Blue’, ‘South Moon’, ‘Sunshine Blue’, ‘Chandler’, ‘Misty’, ‘Jubilee’, ‘O’Neal’, and ‘Sharp Blue’. These newer varieties require fewer chilling hours than older varieties such as ‘Early Blue’, ‘Blue Ray’ and ‘Berkeley’.

Best Cultural Practice: Blueberries have shallow roots and are heavy acid feeders. Accordingly, they benefit from pine needle mulch to suppress weeds. They prefer good drainage as they are susceptible to root rot.

Broccoli, *Brassica oleracea*

What: Broccoli belongs to the *Cruciferae* family, a remarkably varied plant species all descended from wild or sea cabbage native to the Mediterranean seaboard. This group of plants includes cabbage, kale, kohlrabi, bok choy, cauliflower, brussel sprouts, rocket (also known as arugula), mustard, horseradish, cress, collards, rutabaga, turnip and broccoli, one of the oldest cultivars. Cultivated by the Romans who named it *brachium* (meaning arm), broccoli's edible structure is an entirely active flower. The pungency and odor found in Brassicas comes from an essential oil, a potassium salt and glucose compound, probably not surprising for a plant native to a coastal region.

When to Plant: Most Brassicas taste best when grown in cool weather. There are newer varieties cultivated to tolerate warmer weather but generally speaking, the optimum soil temperature is from 55 to 75 degrees.

How to Plant: Direct seed in July; ¼ inch deep and 4 to 6 inches apart in rows 18 inches apart. When planting, calcium and magnesium are good soil additives. Harvest will follow in late October/ November before the flower head blooms. After the central head is cut, an impressive production of side stalks will follow, providing a continued harvest. Pollination in Brassicas is an interesting process. Within each brassica flower, the male and female parts are very close. Some brassica species contain recognition compounds called glycoproteins. Unique to each plant, these compounds allow the brassica plant to recognize itself causing abortion of the plant's own pollen. This is called *self-incompatibility*. This means for pollination to occur, the pollen from one brassica plant must travel to the stigma of another brassica plant, thus ensuring the genes are well mixed among the brassica population. Bees are perhaps the best pollinators for brassicas although other insects help fertilize too. Brassicas are particularly beautiful in an edible landscape, especially the lime green seashell, 'Romanesco', which can be beautifully inter-planted with Swiss chard, marigolds, artichokes and dahlias. Remember, plants in the Brassica family vary greatly in height and while broccolis generally stay around two feet, cabbages like the 'Sarth' and the 'Black Florentine' can be as tall as 6 feet. It is fun to fill in around these with chrysanthemums and feathery fennel. Brussel sprout towers look striking set off with asters.

Best Varieties for Marin: 'Thompson', an open pollinated variety grows well as do hybrids 'Apollo' and 'Veronica'.

Best Cultural Practice: Rotate cruciferous crops out every two years and use mulch which helps control weeds and creates a barrier for brassicas like cabbage, and maintain adequate soil moisture not allowing soil to dry out.

Carrots, *Daucus carota*

What: Members of the *Apiaceae* or parsley family, carrots are a cool weather crop best grown in Marin in the fall to spring with other root crops. Members of this family all have ferny foliage and flat topped, umbrella-like flower clusters. Other vegetables in this family include parsnip, celery and fennel. First grown over two thousand years ago in Asia near Afghanistan, the first carrot was probably purple. You may notice that the top of a carrot exposed to sun may sport some of this ancestral purple color. The yellow carrot, a mutation, was most likely first grown in the ninth century in Iran. Carrot cultivation spread from the Middle East to Europe by the fourteenth century. The first orange varieties were cultivated in Holland in the seventeenth century. North American settlers brought the orange carrot to the western part of the world.

When to Plant: The best time to plant carrot seed in Marin is from August to October. You can also plant it from February to March. Carrots grow best at a mean temperature of 65 degrees. Have you ever wondered where carrot seeds come from? Flower initiation in some plants begins only in the second year of growth after winter chill. This process is called vernalization: the promotion of flowering due to exposure to low temperatures or chilling.

How to Plant: Pick a sunny spot where the seeds will receive sun all day. Root crops prefer sandy soil that drains well. They can be raised in a container, raised bed, row-bed or border garden. When planting any root crop, remember this old French proverb, *Un binage vaut deux arrosages*; one tilling of the soil is worth two waterings. Work and amend the soil with compost to 12 inches deep until friable; cloddy soil will not grow straight carrots and often produces forked carrots. Next, apply compost and mix it into the soil. If you add fertilizer, avoid excess nitrogen as carrots like a pH range of 5.5 to 7.0. When carrots get hairy, that is a sure sign of excess nitrogen. Rake ground level and irrigate until moist 12 inches deep. Plant the seeds about ¼ inch deep with 4 seeds per inch. Cover the seeds with fine soil and water lightly once or twice a day until the seeds sprout. This may take as long as 21 days at soil temperature of 55 to 80 degrees. Once sprouts appear, you can cut back on the watering. Excess water may cause splitting. Thin the seedlings to 3 inches apart. Carrot seed tapes avoid a lot of backbreaking thinning; just apply a bit of flour and water on to a strip of newspaper and drop a small seed every three inches. Carrots are ready to harvest when they are large enough to eat anywhere from 60 to 90 days depending on the variety. Carrots left in the ground too long get woody.

Best Varieties for Marin: The most successful carrot for Marin's conditions are the blunt end, smaller Nantes, Chantenay and Danvers variety carrots. Recent successes include 'Royal Chantenay', 'Thumbelina Baby Ball', and 'Nelson'. A new Nantes carrot that may prove successful is 'Yaya'. If you want to have some fun, try 'Purple Sun', wine-red to its core although like other purple vegetables, the color fades a bit when cooked.

Best Cultural Practice: Water evenly from planting to sprouting. Work the soil well before planting.

Corn, *Zea mays*

What: While sometimes eaten as a vegetable and sometimes as a grain, corn is classified by botanists as a fruit as are tomatoes, peppers, cucumbers, zucchini and other squashes. Corn is a member of the *Poaceae* family, developed by the Mayans from its wild cousin, Teosinte grass (*Zea Mexicana*).

When to Plant: Corn, a warm season crop, germinates best when soil temperatures reach at least 60 degrees.

How to Plant: Before planting, amend the soil with a blended all natural fertilizer (5-5-5) and direct seed covering with about 1 inch of soil. Because corn is wind pollinated, planting four short rows of plants (each about eight feet long) works well. Seeds can be planted every four inches and after three to four leaves appear, thin to eight inches. When the plants are 12 inches tall, side dress with fertilizer or water with fish emulsion and seaweed product (4-1-1). Each stalk has been bred to produce two ears, maybe three with optimal conditions. It is unnecessary to remove suckers and if you plant more than one variety, you need to isolate the varieties from each other to ensure maintaining the desirable characteristics; remember it is wind pollinated! A distance of 400 yards is recommended between varieties. Corn is ready to pick when the silk browns, the husk is still green and the kernels are full sized to the tip of the ear. Experience teaches it is best to feel along the ear to ascertain ripeness, as sometimes the tip may not develop fully. Pull the ear down and twist and snap from the stalk. Picking in the cool of the morning is best and store as quickly as possible in the refrigerator to maintain sweetness.

Best Varieties for Marin: ‘Jubilee’, ‘Silver Queen’, ‘Golden Bantam’, ‘How Sweet it Is’, ‘Kandy Korn’, ‘Early Xtra Sweet’, ‘Super Sweet Jubilee’, and ‘Triplesweet’ (the newest hybrid). These varieties minimize chances of worms, mosaic virus, aphids, rust, fungi, and cutworms.

Best Cultural Practice: Water 1 to 1.5 inches of water per week especially during the pollination process, which can take up to 5 days. If you don’t, kernels may be improperly formed or not form at all (known as blanking). Weed control can be accomplished with mulch (straw works) and companion planting with beans and squashes. Do not over fertilize corn as it can cause the stalks to fall over (known as lodging).

Eggplant, *Solanum melongena*

What: *Solanum melongena*, also known as the aubergine, or eggplant, is a member of the plant family Solanaceae. As a member of the nightshade family, it is closely related to the tomato and potato. It is thought to have been domesticated in India from the species *S. incanum*. *S. melongena* is a delicate, tropical perennial often cultivated as an annual in temperate climates. The standard eggplant produces egg-shaped, glossy, purple-black fruit 7 to 10 inches long when fully mature. The long, slender Japanese eggplant has a thinner skin and more delicate flavor. Both standard and miniature eggplants can be grown successfully in containers, but standard varieties yield a better crop.

When to Plant: Probably the most important thing to note about growing eggplant is that they cannot tolerate cold. Warm to hot weather throughout the season is necessary for good production. Seeds germinate quickly at 70 to 90 °F. and should be grown for 8 to 9 weeks before setting them out. Cold temperatures will stop plant and root growth, reducing plant vigor and yields. Using hot caps or row covers protects plants from cold conditions. Most cultivars require a frost-free period of between 100 to 140 days to mature. Eggplants prefer a daytime temperature of between 75 and 85 degrees F and a nighttime temperature at or above 65 degrees F. Be sure to set the plants out in a warm but sheltered spot.

How to Plant: Plant and handle eggplant in the same way as tomatoes; although eggplant is slightly more sensitive to cold than tomatoes. They require steady moisture and well-drained, fertile soil, so make sure you mulch the soil around them. They develop fungal diseases in very humid areas, so if you are using them in your landscape be sure to allow for plenty of air circulation.

Eggplants are heavy feeders, prepare planting beds with aged compost and side dress with organic fertilizer or compost tea every 2 or 3 weeks until the fruit has set. Do not choose a fertilizer high in Nitrogen as this will promote foliate growth to the detriment of the fruit set. Eggplants and other members of the tomato family should be rotated around the garden to prevent disease proliferation.

Best Varieties for Marin: Choose type according to use – Japanese types are good for stir-fry, too tender for Eggplant Parmesan. ‘Little Prince’ is a proven producer for Marin. Two Japanese eggplants, ‘Millionaire’, a very early maturing (55 days), productive plant and ‘Lavender Touch’ (matures in 63 days), a pastel lavender & white plant also do well in Marin. If you live near the coast or in the cooler microclimates in southern Marin, ‘Nadia’ was developed for cool climates and is resistant to verticillium wilt. It has excellent yield, and is disease resistant. ‘Dusky’ and ‘Early Bird’ are also early maturing eggplants that can be grown in your microclimates.

Best Cultural Practices: Eggplants are subject to the same challenges as tomatoes. Pick disease resistant varieties. Eggplant should be pruned to three main branches. Benefits of pruning include increased fruit quality and decreased susceptibility to disease. Prune early so a leaf canopy develops before fruiting to prevent sunburn of the fruit. Prune suckers periodically throughout the growing season. Test for maturity by pressing with the thumb. If the flesh springs back, the fruit is green; if it does not and an indentation remains, the fruit is mature. Harvest when the fruit is about halfway between these stages. Mature fruit should not be left on the plant because they will reduce overall productivity. Use a knife or pruning shears to cut the fruit from the plants.

Kale, *Brassica oleracea*

What: Kale, a member of the cabbage family, is a hardy cool season vegetable, which is harvested for its nutritious foliage. In the same group as collard greens, the two are extremely similar genetically. Until the end of the Middle Ages, Kale was one of the most common green vegetables in all of Europe. It's so easy to grow and it survives most winters without protection. In fact, mild frosts actually sweeten the flavor. Kale has become so popular in recent years as the "new beef" or "queen of the greens". It is very low in calories and high in fiber, iron, Vitamins K, A and C, antioxidants and calcium. It can be eaten raw in a salad or cooked in soups and stir-fries. When it is baked or dehydrated, it takes on the consistency of a potato chip, which can be seasoned with salt and other spices. Many kales are grown for their ornamental leaves, which can be brilliant white, pink, red, lavender, blue and violet in the interior of the rosette. These ornamental types add color to a winter garden even in areas that receive minimal winter sun.

When to Plant: Grow kale from transplants or sow directly in place. Start seeds in midsummer for fall and winter harvests and as early as January for a spring crop. The optimal soil germination temperature is 55 to 75 degrees. Refer to individual seed packet varieties for determining days to germination.

How to Plant: Kale is grown best in full sunshine in cool, moist, fertile soil but can tolerate some shade. Kale tastes best when it grows fast, so enrich the soil with compost before planting and add some fish emulsion a month later. Sow seeds ¼- ½ inch deep and approximately 12-18 inches apart, depending on the variety. Mulch the soil with compost, straw or other appropriate materials. You can begin to harvest outer leaves as soon as they are large enough to toss in a salad. Kale is another "cut and come again" plant so you can either continually harvest the outer leaves or harvest the plant all at once.

Best Varieties for Marin: All varieties of kale will do well in our climate and seeds are readily available. 'Red Winter', an improved 'Red Russian', is sweet and very tender. Its red veins and wavy margins resemble oak leaves and are very dramatic in the garden. 'Toscano', a lacinato type, is also known as dino kale. Its dark green leaves don't curl but are heavily savoyed and the variety tolerates heat and cold very well. 'Siberian', 'Dwarf Blue Curled Scotch', and 'Winterbor' are some other favorites.

Best Cultural Practice: Relatively hardy, Kale does not have many diseases or pest problems. Rotating crops alleviates many plant diseases. Kale should avoid following cabbage family crops. Watch for flea beetles and aphids and protect young plants from cutworms with a collar made from paper cups with the bottoms removed.

Melons, *Cucumis melo*

What: Melons are members of the *Cucurbitaceae* Family. Most of the melons eaten in the United States are closely related members of the single genus *Cucumis*, which includes cucumbers. This annual is likely native to Asia, India and/or Egypt. Melons including musk, cantaloupe, honeydew, Crenshaw and casaba (all *Cucumis melo*) are eaten as fruit whereas some varieties of melons grown in Asia are in fact eaten as vegetables. The flesh of all melons, except watermelons, is derived from the ripening ovary wall. Watermelons, *Citrullus lanatus*, are native to Africa and their flesh is placental tissue, which explains the distribution of seeds throughout the flesh.

When to Plant: Melons are most sensitive to cold, germinating only when soil temperatures reach 60 to 65 degrees and ripening best when air temperature is between 75 and 95 degrees. In Marin, with luck, you can grow cantaloupes and watermelons and will increase your chance of success by picking early maturing varieties with small fruit.

Melons are large seeded plants and therefore best grown direct seeded in late May to early June. Fruit development requires about 90 days and, like other members of the cucurbit family, development of male flowers occurs first followed by female blooms. Pollination is by honeybees.

How to Plant: Melons thrive in well-fertilized soil with a pH around 6.5 and full sun exposure and even moisture. Plant the seeds one inch deep and about 6 inches apart. The vining varieties sprawl along the ground but do make good candidates for trellising, growing in large containers, which help retain heat and for planting along stone walls which also retain heat. If trellised, fruit will need a sling support. If you want to plant melons in a flowerbed, select a bush variety. It is important to remember that excess water or nitrogen shuts down the roots, stops photosynthesis and destroys the sugar in melon fruit. Almost half of the sugar content is developed in the last week of ripening. The melon is ripe when the fruit separates from the vine referred to as slip stage. The fruit will taste best 1 to 2 days after harvest with storage at 70 degrees. Watermelons are ripe when the ground spot turns golden. If you have trellised, the tendril nearest the watermelon will have dried up and the skin of the watermelon will have dulled. The thump test is highly unreliable.

Best Varieties for Marin: Cantaloupe/ Muskmelon: ‘Lil’ Loupe’ and ‘Minnesota Midget’.
Watermelon: Sugar Baby, and Green Flesh melon: Honey Ace

Best Cultural Practice: Water evenly but never let the soil get soggy especially from flowering to fruit swell. Once plants have expanded, reduce the water to enhance ripening and flavor. Use maximum heat enhancement techniques. Fertilize with fish emulsion once about 6 weeks after planting. Selection of disease resistant varieties is important as melons are subject to the same diseases as cucumbers; powdery mildew, downy mildew, mosaic virus, verticillium wilt and blossom end rot and poor fruit set. Attract bees to your garden with companion plantings and give melons plenty of space to grow.

Peas, *Pisum sativum*

What: Pea probably originated in southwestern Asia and thereafter spread to the temperate zones of Europe. There are several types of peas: garden peas, snap peas and sugar peas (snow peas). The pods on the latter two are edible when the peas are still immature and small; the garden pea varieties are those that need shelling before eating. All are delicious, especially when fresh from the garden.

When to Plant: Peas are cool-season, frost hardy plants, making them an ideal part of the Marin winter vegetable garden. The seeds are easy to grow because they will germinate at soil temperatures between 40° to 70 °F. Most peas will tolerate mild frosts. The best time to plant peas in Marin is between January and April, although you can plant them in late October or early November if the weather is mild & they have time to germinate. Warm weather shortens the harvest season. Temperatures above 80.6°F shorten the growing period and adversely affect pollination. A hot spell is more damaging to peas than a light frost.

How to Plant: Direct seeding is the preferred method. Peas do not like to be transplanted. Sow directly into fertile, loosened soil with a pH of 5.5 to 6.8. If your garden has a heavy clay soil, mix in organic matter. Also, remember that peas have the ability to "fix" nitrogen in the soil, and can actually leave the soil richer than it was prior to planting. Legume inoculants are available from seed suppliers for seed treatment, and is recommended. Yields can increase 50-100% by inoculating with *Rhizobium* bacteria. Do not use fertilizer unless your soil is very poor or low in organic matter. Too much nitrogen encourages foliage growth and not pods. Seed at depths no more than 2 – 3 times the seed diameter. Plant extra seeds and then thin to the recommended spacing within the row. Seed every 2 weeks to extend the growing and eating (Yum!) season.

Peas generally need something to climb on so add a trellis or other support when you plant your seeds. There are also pea varieties that are short and don't require a climbing structure.

Best Varieties for Marin: 'Oregon Sugar Pod II', 'Cascadia', 'Sugar Snap' or 'Super Sugar Snap' have a long season and are disease resistant, particularly to mildew.

Best Cultural Practices: Peas need constant soil moisture to develop well. Peas are shallow rooted and will generally do better with light, frequent irrigation. It is important to avoid overwatering because that will promote root rot diseases, especially in heavier soils.

Many adult insects, as well as larvae, find parts of the pea plants as delicious as we do. Cabbage maggots or cutworms, both grayish grubs, aphids and thrips are all potential pea pests. Check the UCIPM for remedies. Peas are especially prone to fungal diseases; peas should be planted in a different spot each year, if possible, to minimize their potential exposure to these soil diseases. Aphids spread mosaic virus and pea enation virus. Choose disease resistant varieties.

Pick your peas according to what type you have planted – garden peas should be picked when the pods swell and the peas inside feel firm. Snap peas should be picked earlier – when the pods have started to swell, but the peas inside are smaller. If you wait too long the pods will get stringy and unpleasant to eat. Snow peas should be picked even earlier – when you can barely discern the peas inside.

Peppers, *Capsicum annuum*

What: Peppers, members of the *Solanaceae* family, are found in the warmest parts of the world. A perennial, ranging in taste from the hottest habaneros to the sweetest bells, the “hot” agent comes from capsaicinoids primarily found in the tissue like membrane surrounding the seed.

When to Plant: Peppers need daytime temperatures of 65 degrees to 85 degrees and do not like nighttime temperatures below 65 degrees. Soil temperatures below 50 degrees will cause root dieback. Accordingly, in Marin, the best planting date is after June 1st. Peppers grow very slowly and harvest is usually 60 to 80 days out. Blooms after the end of August usually do not mature. When temperatures approach 100 degrees, pollination, fruit set and yield are reduced.

How to Plant: Just like tomatoes, peppers like soil with a pH range from 6.5 to 7.0 but they require more sun and nitrogen than tomatoes. Before planting, amend the soil with a nitrogen rich manure and side dress with fish emulsion or cow manure at fruit set. For good plant development, do not plant from seed unless you have a greenhouse or hotbed with exposure to sunlight. Be forewarned, it takes seven to ten weeks from sowing to produce transplants. Rather, you may choose to plant purchased seedlings four to six inches tall with healthy green leaves. Do not select seedlings with flowers or fruit on them. If you do, those plants are not as likely to develop good root systems after transplanting. As with tomatoes, do not handle the stems when transplanting. Hold only the leaves and space the plants 12 to 24 inches apart depending on variety. Pinching off the tip of the pepper plant at planting encourages more side branches and fruit.

Peppers like soil kept evenly moist and water is important from fruit set through full fruit development. In the edible landscape, peppers are very attractive plants. To avoid breaking branches, harvest peppers by clipping the stem. Most peppers turn from green to red or yellow when fully ripe. Interestingly, red peppers have twice as much vitamin C as green or yellow peppers.

Best Varieties for Marin: Varieties that have performed well in Marin include ‘Hungarian Wax Banana’ (3 inches long), ‘Cherry’ (a hybrid that’s red, small, round, spicy and showy), ‘Pimento’ (red, medium and heart shaped) and ‘Jalapeno’ (can be picked green or red, slim and pointed). ‘Ascent’ is an attractive edible ornamental pepper with lush foliage and tiny red peppers (hot).

Best Cultural Practices: Peppers are subject to the same challenges as tomatoes including verticillium wilt, mosaic virus, and blossom end rot. Pick disease resistant varieties and keep the soil evenly moist to avoid problems.

Potatoes, *Solanum tuberosum*

What: It is a modified stem (tuber).
It is a cool season perennial grown as an annual.

When to Plant: Native to the Andes region of South America, you can plant potatoes in Marin as early as February and as late as May. Tuber production occurs underground until soil temperatures reach 80 degrees. Plant only certified seed potatoes to avoid disease.

How to Plant: Plant certified potato seed 3” deep and 6” to 12” apart. When the plant is 6” high, cover with another 3” of soil. This is called hilling and can be done once again after 6” more of plant growth. Hilling increases production and prevents greening. Green potatoes cannot be eaten as they contain a high level of toxic alkaloid solanine. Water just enough to keep the soil from cracking and to avoid rot – about one to two inches per week.

Potatoes mature in 90 to 120 days. Dig up a test potato and if it is a good size, cut off the plant at ground level and discard the leaves and all tiny green fruit as they are toxic and can spread disease. Leaving the crop in the ground for another couple of weeks without watering, hardens off the skin.

Best Varieties for Marin: ‘Buffalo’, ‘Bison’, ‘Carola’, ‘Carlotta’, ‘White Rose’, ‘Kennebec’, ‘Chieftain’, ‘Nargold’, ‘Russet’, ‘Red Lasoda’ and ‘Yukon Gold’.

Best Cultural Practice: Plant only certified potato seed and practice a 4-year crop rotation.

Pumpkins, *Curbita pepo*

What: Pumpkins are actually winter squashes, meaning that they are harvested when the rind is hard which keeps them from spoiling through the winter months. They are thought to have originated in North America. Pumpkins range in size from miniature to mammoth and range in color from the ghostly white 'Lumina' to the deep red-orange 'Rouge vif D'Etampes.'

When to Plant: Pumpkins are a very tender vegetable and the seeds do not germinate in cold soil. Plant after the soil has thoroughly warmed from April through June. Keep in mind that pumpkins require a long growing season -- from 75 to 100 frost-free days and may not do well near the coast or in some cooler areas of southern Marin.

How to Plant: Full sun, good air circulation, and rich, well draining soil are all key to growing your own pumpkins. They need eight hours of sun per day. Pumpkins need ample space. Air circulation is important to help fend off powdery mildew, which can be a huge problem for pumpkins in late summer. The soil should be enriched with compost. Cover the seeds with soil. When several true leaves have appeared, thin each direct-seeded circle to the healthiest two or three plants. Use mulch to keep weeds down; do not over cultivate or the shallow roots may be damaged.

Best Varieties for Marin: One thing to keep in mind is that pumpkins can take up a huge amount of space. However, 'Buskin' is a compact vine for a large container or garden. 'Jack O'Lantern' is great for carving, while 'Spirit', a semi bush type, is a multipurpose pumpkin that can be used for both cooking & carving. 'Jack be Little' and 'Wee B Little' are just 3 inches across and can be grown on a trellis. The best varieties for cooking are 'Small Sugar' and 'New England Pie.'

Best Cultural Practices: Pumpkins require regular irrigation and fertilizing for good growth and production. Pumpkin vines grow quickly, and pull nutrients from the soil like mad. The best way to ensure that your pumpkin vines get plenty of nutrients is to start with compost-enriched soil. You can also add a granulated organic fertilizer to the soil at planting time, and alfalfa meal will provide your plants with a nice amount of potassium -- great for overall plant health. After initial planting, feed the plants every month with fish emulsion or kelp meal.

Be sure to water regularly -- pumpkin plants need about an inch of water per week. Don't just assume your plants need water if you see the leaves wilting in the heat of summer -- check your soil before adding extra water. If the soil is still moist, don't give them extra water or you'll risk drowning them. Pumpkin leaves often wilt during very hot days, but recover once the hottest part of the day is past. *In order to prevent wilt diseases, keep leaves dry when watering. Use drip irrigation if possible.*

Pumpkins can be harvested whenever they are a deep, solid color (orange for most varieties) and the rind is hard. If vines remain healthy, harvest in late September or early October. If vines die prematurely from disease or other causes, harvest the mature fruit and store them in a moderately warm, dry place until Halloween. Cut pumpkins from the vines carefully, using pruning shears or a sharp knife and leave 3 to 4 inches of stem attached.

Rhubarb, *Rheum rhabarbarum*

What: Rhubarb is a member of the *Polygonaceae* family, as are sorrel and buckwheat. The name rhubarb comes from the Greeks who called this plant the vegetable of “barbarians beyond the Rha” (the Volga River). Native to that southeast part of Russia, rhubarb stalk is usually used as a fruit substitute in early spring even though its edible stalk classifies it as a vegetable. The leaves of rhubarb are deadly poisonous and all green matter should be stripped away before preparing the stalk to eat. Oxalic acid is in the leaf, stalk and roots of rhubarb. The higher concentration of oxalic acid in the rhubarb leaf and roots makes these parts very poisonous. Concentration in the stem is not as high and allows us to eat the stem just as we eat spinach, which also contains lower amounts of oxalic acid. Rhubarb is a hardy perennial that thrives best in cool temperatures.

When to Plant: Plant crown transplants in early spring (March) when rhizomes are available either as bare root or in containers. Plants grow vigorously into early summer and then go dormant until the rains come again next winter. The plant’s large glossy green leaves with red veins and stalks make it a perfect and architecturally striking candidate for a sunny exposure border. The stalks average about 24 inches in height with leaves as wide as 18 inches and attractively pair with a spread of low vegetables. Productive for many years, its roots go deep. Crowns may be divided and re-planted every 5 years or so when the crown begins to work itself up out of the ground. Do not harvest stalks the first year and select harvest (leave at least 50% of the stalks) in subsequent years because the crowns require nitrogen to produce more stalks next year. If rhubarb begins to flower, remove the stalk or production will slow. Conversely, in the edible landscape, when left to bloom, the cream-colored flower stalk is very decorative.

How to Plant: Dig a hole 2 feet wide by 2 feet deep and fill in with rich manure and compost. Pack down the organic material to within 12 inches of the top of the hole. Lightly pack in another 12 inches of organic material with pH ranging from 5.0 to 6.8. Plant the rhizomes with “eyes” facing upwards, burying the root 2 to 3 inches deep. Keep the area free of weeds, moist and mulch with leaf mold.

Best Varieties for Marin: The red variety ‘Crimson Red’ grows well in the cool coastal regions of Marin as does the variety ‘Victoria’ which sports green stalks with red shading. To harvest, stalks should be twisted not cut due to rot back. To cook rhubarb, strip away all green matter from the stalk and cut into 1½-inch sections. Cook for 10 to 15 minutes in a non-reactive saucepan in a 50/50 mixture of sugar and orange juice. You may also add orange peel and cinnamon stick to this delicious compote. Sometimes called the pie plant, rhubarb is also tasty cooked in a pie dish sugared, spiced and covered with a crumbled topping and baked for 45 minutes at 350 degrees. Rhubarb can also be pulverized and fermented with sweetener to make an interesting wine.

Best Cultural Practice: Rhubarb is subject to little disease but does require winter chill and a sunny location with afternoon shade provided in warmer areas. Plants may perish where winters are mild. Give rhubarb plenty of space.

Summer Squash, *Cucurbita pepo*

What: Summer squash belong to the family, often called “cucurbits,” that are harvested when immature (while the rind is still tender and edible). The name "summer squash" refers to the short storage life of these squashes. Summer squash grows on non-vining bushes. They bear two kinds of flowers, male and female, both on the same plant. In order for fruit set to occur, pollen from the male flower must be transferred to the female flower. . Many varieties have different fruit shapes and colors. The three main types include the yellow straight neck or crooked neck; the white, saucer shaped, scallop or patty pan; and the oblong, green, grey or gold zucchini.

When to Plant: Cucurbits are warm-season crops and should be planted when soil and air temperatures are above 60 degrees F. Summer squash thrives in coastal & southern Marin’s cooler climates as well as the warmer microclimates of the county. In Marin, plant seeds from May to July.

How to Plant: Choose an area that receives full sunlight (at least 4 to 6 hours a day), where squash will not be shaded by trees, fences, or walls. Try to plant away from areas that will be watered by lawn sprinklers. Soil containing plenty of well rotted compost or manure is ideal, although good crops may be grown in average soils that have been fertilized adequately. Squash can be seeded directly or transplanted into the garden. For direct seeding, plant more seeds than necessary so as to make up for any losses. Keep moist during the germination period. When the plants are about 3 inches high, thin plants. For transplants, use young plants with 4 to 6 true leaves, wider than tall, stocky, succulent, and slightly hardened to outdoor conditions. Mark where you want each plant and make the hole deep enough to bury the stem as far as the first leaf. Place the plant deep into the hole. Press the soil firmly around the plant and water thoroughly to remove any air pockets. If transplanting in the summer, shade the plants in the middle of the day for the first week or use floating row cover. When direct seeding, the beds should be irrigated until completely wet. After the seedlings emerge, water when moisture is being depleted from the soil. Apply water to 1-foot depth to insure deeper rooting. Avoid wetting the foliage or fruit with overhead watering. If plants are stressed for water when they start to set fruit, the squash may be deformed.

Best Varieties for Marin: ‘Trombetta’ is an Italian climbing variety. It produces firm-textured, light-green, 12- to 15-inch fruit with excellent flavor and huge yield, ‘Cube of Butter’ (yellow), ‘Superpik’ (yellow) and ‘Black Beauty’ (Zucchini) are also good choices as they are disease resistant and are available as bush or vine.

Best Cultural Practices: Under good growing conditions, fruits are ready for first harvest 50 to 65 days after seeds are planted. Zucchini types should be harvested when immature, about 6 to 8 inches long and 1-1/2 to 2 inches in diameter; patty-pan types, when 3 to 4 inches in diameter; yellow crookneck, when 4 to 7 inches in diameter. Pick disease resistant varieties & keep soil moist to avoid deformed fruit. Both male and female flowers develop on the same plant. Pollen must be transferred to the female flowers from the male flowers for fruit to develop and this is mostly done by honeybees. If you have to use an insecticide, use it in the evening so that you do not kill the pollinating bees.

Strawberries, *Fragaria*

What: A member of the rose family, the tiny yellow or black dots on the red berry's surface are called achenes and are the actual fruit. The ripened receptacle we call the strawberry is the base of the flower. Within each of the achenes is the true seed. Native to almost everywhere temperate around the globe, California has a native strawberry, (*Fragaria chiloensis*) so named because it is also native to Chile where it was first discovered. Much selection and breeding of strawberries has been done.

When to Plant: In Marin's mild climate, strawberries can be planted in the spring and in the fall. Selection of a cultivar is important because of varying degrees of sweetness, harvest time and disease resistance. Strawberries sold in nurseries today are either June-bearers, ever-bearers or day-neutrals. June-bearers form buds in the autumn with fruit following the next spring (June). This strawberry is a good choice if you want a lot of berries at once. It is not a good choice for areas subject to late frosts when bud formation occurs. So called ever-bearers produce two crops, one in June and one in the fall. Most of the ever-bearers form their flower buds during the long days of summer. About thirty years ago, a newer type of strawberry was developed: the day-neutral strawberry. Not sensitive to day-length, they bear continuously where temperatures range between 35 degrees F and 85 degrees F although most of the fruit is still produced in spring and fall. Because day-neutrals are smaller plants and produce fewer runners, more weeding is required. Ever-bearers are often considered synonymous with day-neutrals.

How to Plant: To plant your strawberries, select a sunny site in which you have not grown other plants susceptible to verticillium wilt. This includes tomatoes, potatoes and other berries. To reduce stress on new transplants, plant on a cool, foggy morning. Twenty-five to 50 plants will provide plenty of berries for a family of four. Dig a hole about 6" deep and amend with fish emulsion. Set the plant with the roots pointing downward and fanned out, deep enough so the midpoint of the crown is even with the surface of the soil. Firm the soil around the plant and water deeply. Three planting methodologies (cultural systems) are used to maximize fruit production, "matted row", "spaced row" and "hill system". The matted row works best for June bearers because the plants should be mowed down to 3 inches after fruit production. Set the plants 18" to 24" apart in rows 3-4 feet apart and allow runners to fill in to 18" wide, clipping as needed. With spaced rows, plant as with matted rows but clip runners leaving only 6 to 8 per plant. Plants will be larger and berries more visible. For day-neutrals, select the hill system (which isn't really a "hill") and clip all runners setting the plants 12 to 15 inches apart in rows set the same distance apart.

Best Varieties for Marin: Marin county nurseries typically carry a variety of cultivars, including 'Sequoia' and 'Chandler' (June-bearers) and 'Seascape', 'Albion' and 'Tristar' (day-neutrals) and ever-bearers: 'Eversweet', 'Ozark Beauty' and 'Quinalt'.

Best Cultural Practices: Best cultural practices remain the best defense against disease, including well drained soil, weeding and mulching with pine needles or straw. A change in location and new plants every four years will be beneficial and maintain production. Strawberries like regular water, full sun and can be planted in containers or in borders and look lovely mixed with geraniums and primroses.

Swiss Chard, *Beta vulgaris*

What: Swiss chard is an ancestor of beets, grown for its succulent stalks and flavorful leaves, but no storage root. It is a biennial (meaning that it will overwinter and go to seed the following spring) grown as an annual. It thrives in the cool season with milder conditions but will survive some light frost and can tolerate some summer heat if given afternoon shade. The foliage is a nutritional powerhouse and is a stunning color in the landscape varying from deep green to deep red with stems which can be red, yellow, orange, purple and pink.

When to Plant: Plant chard in full sun although if grown during the warmer months it will need some p.m. shade or grow it under some taller plants (corn, tomatoes, sunflowers) that will filter out the intense sun. Sow in place in the early spring to a depth of 1/2 inch and 2 inches apart. Thin to 10-12 inches apart and eat the thinnings! Ideal soil temperature for sowing is 50-85 degrees with the optimum being 85 degrees. You can sow indoors 1-2 weeks before the last frost and transplant out after the plant has two sets of true leaves. The ideal soil temperature for growing outdoors is anything above 50 degrees with the optimum being 60-65 degrees. Seeds can be sown in the fall, as well, but will tend to produce shorter plants.

How to Plant: Chard prefers a soil pH range of 6-7. Before planting work in several inches of organic matter, keep the area well weeded and water regularly. Apply fish emulsion or an organic fertilizer at planting and again 6 weeks later. If you're continually harvesting, fertilize again one month later. Mulch heavily to keep the soil cool and moist. The entire plant can be harvested when young or the more preferred method is to pick off several outer leaves at a time leaving at least 5 leaves for the plant to keep producing. Cut the leaves about an inch above the soil. Referred to as a "cut and come again" plant, the frequent picking helps to stimulate the production of new leaves. Be sure to sow succession plantings if you plan to harvest the entire plant. Chard is so versatile in the kitchen. It can be harvested as baby greens for salads and the more mature leaves can be used in sautés, soups, pastas, and frittatas or in any recipe that calls for spinach. Excess chard is easy to blanch and freeze.

Best Cultural Practices: Chard is generally quite pest and disease free and rarely sees damage other than snails, slugs or cutworms. Trap slugs in beer-baited traps, use an iron phosphate based control product or surround your plant with crushed eggshells. Birds can devour young seedlings and leaf miners are common during the warmer months. Fungal diseases are more common in warm, rainy weather. Keep plants properly spaced to promote good air circulation and promptly remove any affected leaves.

Best Varieties for Marin: Most of the varieties of Swiss chard will thrive in our area. Some of the favorites are 'Fordhook Giant', 'Five Color Silverbeet', 'Bright Lights', 'Rhubarb' and 'Oriole Orange'. A perpetual variety called 'Perpetual Spinach' has thinner stems and smaller, smoother leaves. It will produce for several months and tastes more like Spinach. This variety works well in small gardens and containers.

Tomatoes, *Lycopersicon esculentum*

What: Tomatoes, a member of the *Solanum* family, are a tender perennial grown as a warm weather annual. Indigenous to the Andes, tomatoes were domesticated in Mexico and brought to Europe by the Spanish. Tomato plants are amongst the 8% of flowering plants fertilized not by honeybees but rather bumblebees. Because bumblebees are attracted to blue flowers, many a tomato lover incorporates plants such as borage in their edible landscape. Varieties of tomatoes are numerous and plants are categorized by vine habit as Indeterminate, Large Determinate and Determinate and ranked from large to compact. Leaf size and canopy vary by variety as do tolerance and resistance to disease. If you are incorporating a tomato plant in a bed of ornamentals or planting in a container, it is best to know the size of the vine – so do your homework before selecting a variety.

When to Plant: Tomatoes can be direct seeded or begun indoors and transplanted when the danger of frost has passed. February is a good date to seed start inside and in Marin County, May 1st is a good date to plant outside in the afternoon to minimize water loss. Fruit set occurs when nighttime temperatures are above 55 degrees and daytime temperatures do not exceed 90 degrees.

How to Plant: If you elected to start your seedlings indoors, harden them off, acclimatizing the seedlings to the number of hours of outdoor light and temperatures. Dig a hole two feet deep and amend the soil with calcium and fish emulsion. Tomatoes grow best in neutral soil with a pH of 6.5 to 7.0. You can add agricultural limestone (one pound for every 100 square feet). An 8-inch seedling can be planted 2 inches deeper than its growing pot. Pinch off the lower leaves, handling the seedling by its leaves or root ball only. Set the plant horizontally in the hole with just a few sets of leaves showing above ground and plant a sturdy stake near the seedling. Carefully fill in the hole, water and fertilize with 5-10-5 working it in two inches deep. Keep the soil moist around the seedling for the next three to four weeks. Water established plants deeply when the soil dries out to about two inches – usually twice a week.

Best Varieties for Marin: Ask Master Gardeners at the Tomato Market held every April at both Pini Hardware in Novato and Bon Air Shopping Center in Greenbrae. Last year, varieties for sale included: 'Big Beef', 'Black And Brown Boar', 'Blondekopfchen', 'Bloody Butcher', 'Bush Early Girl', 'Cabernet', 'Carmello', 'Celebrity', 'Cherokee Purple', 'Chianti Rose', 'Chocolate Cherry', 'Early Girl', 'Fantastic', 'Green Zebra', 'Haley's Purple Comet', 'Indigo Rose', 'Isis Candy', 'Japanese Black Trifele', 'Jubilee', 'Legend', 'Michael Pollan', 'New Big Dwarf', 'Oaxacan Jewel', 'Riesentraube', 'San Marzano', 'Siletz', 'Stupice', 'Sun Gold', 'Sun Sugar' And 'Sweet 100'.

Best Cultural Practices: Tomatoes are subject to verticillium wilt, mosaic virus and blossom end rot. Pick disease resistant varieties.

Table 3.2 Companion Planting Chart for Home & Market Gardening.

Source: ATTRA (Appropriate Technology Transfer for Rural Areas) *Companion Planting: Basic Concepts & Resources*.

Companion Planting Chart for Home & Market Gardening		
Crop	Compatible Companions	Incompatible
Asparagus	tomato, parsley, basil	
Beans	most vegetables & herbs	onion, garlic, gladiolus
Beans, Bush	Irish potato, cucumber, corn, strawberry, celery, summer savory	onion family
Beans, Pole	corn, summer savory, radish	onion, beets, kohlrabi, sunflower
Beets	cabbage & onion families, lettuce	pole beans
Cabbage Family	aromatic herbs, celery, beets, onion family, chamomile, spinach, chard	dill, strawberry, pole beans, tomato
Carrots	English pea, lettuce, rosemary, onion family, sage, tomato	dill
Celery	onion & cabbage families, tomato, bush beans, nasturtium	
Corn	Irish potato, beans, English pea, pumpkin, cucumber, squash	tomato
Cucumber	beans, corn, English pea, sunflowers, radish	Irish potato, aromatic herbs
Eggplant	beans, marigold	
Lettuce	carrot, radish, strawberry, cucumber	
Onion Family	beets, carrot, lettuce, cabbage family, summer savory	beans, English pea
Parsley	tomato, asparagus	
Pea, English	carrots, radish, turnip, cucumber, corn, beans	onion family, gladiolus, Irish potato
Potato, Irish	beans, corn, cabbage family, marigolds, horseradish	pumpkin, squash, tomato, cucumber, sunflower
Pumpkins	corn, marigold	Irish potato
Radish	English pea, nasturtium, lettuce, cucumber	hyssop
Spinach	strawberry, fava bean	
Squash	nasturtium, corn, marigold	Irish potato
Tomato	basil, onion family, nasturtium, marigold, asparagus, carrot, parsley, cucumber	corn, Irish potato, fennel, cabbage family
Turnip	English pea	Irish potato

- *Beneficial habitats.* Beneficial habitats—sometimes called refugia—are another type of companion plant interaction that has drawn considerable attention in recent years. The benefit is derived when companion plants provide a desirable environment for beneficial insects and other arthropods—especially those predatory and parasitic species which help to keep

pest populations in check. Predators include ladybird beetles, lacewings, hover flies, mantids, robber flies, and non-insects such as spiders and predatory mites. Parasites include a wide range of fly and wasp species including tachinid flies, and *Trichogramma* and Ichneumonid wasps.

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<http://vric.ucdavis.edu/>

Gardening Information

<http://ucanr.org/findinformation.cfm?findinfosub=6>

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<http://www.ipm.ucdavis.edu/PMG/menu.homegarden.html>

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http://www.ipm.ucdavis.edu/PMG/weeds_common.html

Mulch

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Online Order Catalog for UC Publications

<http://anrcatalog.ucdavis.edu>

California Master Gardener Handbook

Home Vegetable Gardening, Publication # 21444

Pests of the Garden & Small Farm, Publication # 3332

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