



Farmington Community
Seed Library

Growing Notebook

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Jubilee Gem Organic Bachelor's Button

Centaurea cyanus

(60 days) Annual. Early frilly 2" periwinkle-blue blooms on semi-dwarf 2' plants. A popular favorite with a long bloom period. 1937 AAS silver medal winner.

Bachelor's Button

~180 seeds/g.

Annual. Named for the centaurs of Greek mythology. Easy to grow, great for cutflowers and beds. Common name may refer to the tight unopened buds' resemblance to buttons or to their popularity as boutonnieres. Also known as **Cornflower** and, formerly, **Hurt-Sickle** because its wiry stems dulled many a sickle during mowing time.

Culture: Start indoors at 60–65° 2 months before setting out, or direct seed in May in a sunny location. Deadhead for persistent blooms, or make a succession planting in mid-late June if you desire late-summer flowering. Will self-sow. Lasts longer than most flowers after frost. Excellent drought resistance. Cut when flowers are just beginning to open—they'll open more in the vase and last 6–10 days. 3'. Cannot ship to Alaska.

Flowers

All flowers are open-pollinated except where noted.

Days in parentheses after a variety indicate days to first bloom.

Kablouna Mix Organic Calendula

Calendula officinalis

(60 days) Annual. Distinct refined form features striking crested mostly yellow blooms with dark contrasting centers. One of the loveliest of the calendulas. Kablouna, our seed room goddess who looks after the good fortune of seed packers, is currently at large. Especially attractive to pollinators.

Calendula

~115 seeds/g.

Annual. Old kitchen garden flower, 18–20" tall, also known as **Pot Marigold**. Beautiful daisy-like flowers feed pollinators, are good for informal bouquets, and are also edible. Blossoms can be snipped from their stems, dried and added to soups, salads and stews. They are also used in homeopathic remedies and herbal tinctures and ointments for their antiseptic and soothing qualities.

Culture: Calendulas bloom over an extremely long period, thriving in cool weather and persisting through autumn's first frosts. Can be direct seeded in May or started indoors in cool place for early blooms. Readily self-sows. Don't crowd, give them full sun. Deadhead to keep blooms coming and the patch attractive, or try succession plantings.

Flowers

All flowers are open-pollinated except where noted.

Days in parentheses after a variety indicate days to first bloom.

Solar Flashback Organic Calendula

Calendula officinalis

(55 days) Annual. A hot release from Frank Morton's calendula program. Morton describes it as "a distinctive new family of flash, selected to highlight contrast between bright light yellows, pinks, and solid red or maroon." Some feature yellow petals, some pinkish-blond, some yellow with light tips, all with contrasting red backs. Take a vacation from calendula orange. 2007 Fedco introduction. OSSI. Independent Breeder. Especially attractive to pollinators.

Calendula

~115 seeds/g.

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Double Take Columbine Organic

Aquilegia vulgaris

A unique double Barlow-style columbine with long-lasting (4-6 weeks) spurless blooms that look like miniature dahlias with layers of pink, magenta, and creamy white. These attention grabbers are especially attractive to pollinators and look gorgeous in bouquets. Plants grow 24-30" tall and start blooming in their second year. Start indoors 6-8 weeks early. Plant out at 12-16" spacing. Especially attractive to pollinators.

Columbine

~600 seeds/g.

Perennial, Zones 3-10. Columbines are an essential part of the cottage garden or border. Their delightful flowers in mixed colors bloom in spring and dance above attractive lobed leaves. Easy to grow, likes moist well-drained soil, sun or partial shade. Need light to germinate; take 3-4 weeks.

Flowers

All flowers are open-pollinated except where noted.

Days in parentheses after a variety indicate days to first bloom.

Common Milkweed

Light

Common milkweed prefers full sunlight. It grows best in an open area where there are six to eight hours of sunlight per day.

Soil

This plant prefers dry to medium average, well-drained soil. It tolerates dry conditions, infertile soil, and rocky conditions.

Water

Common milkweed does not need watering except in the driest conditions. Water deeply, giving the plants between one to two inches of water, then wait until the top inch of soil is dry before watering again. Overwatering common milkweed can result in a lethal fungus.

Temperature and Humidity

Common milkweed tolerates a wide range of temperatures and humidity. But because it's native to eastern parts of the United States, it will not do well in extreme and extended heat or humidity.

Fertilizer

There's no need to fertilize common milkweed plants. Common milkweed tolerates poor soils.

Sensation Blend Cosmos

DAYS TO GERMINATION: 7-10 days at 68-72°F (20-22°C)

SOWING: Transplant – Sow into 50-cell plug flats, or preferred seedling container, 5-7 weeks before last frost, covering seeds lightly. Harden off and transplant outdoors after last frost. Direct seed – Sow after last frost, once soil temperature is above 60°F (16°C), covering seeds lightly. Pinching encourages branching.

LIGHT PREFERENCE: Sun.

PLANT HEIGHT: Varies. Tall varieties may benefit from some wind protection, such as Hortonova, used as horizontal support.

PLANT SPACING: 9-12". Wider spacing creates stronger, thicker stems.

HARDINESS ZONES: Annual.

HARVEST: Petals just opening, but not yet flattened. Deadheading is required to have blooms all summer.

SOIL REQUIREMENTS: Any soil.

Cup Plant

Light

Although cup plants are extremely hardy, six to eight hours of full sun is recommended for optimal growth. If full sun isn't available, the cup plant can thrive in partial sun, too. If you live in a colder zone, consider planting your cup plants in a spot with full sun and little to no wind.

Soil

Because the cup plant has a large native range, it can grow in a variety of soils, but best tolerates medium-to-wet soil, or soil rich in clay. If you want to achieve taller cup plants; plant them in wetter soil; if you want shorter cup plants, drier soil is best.

Water

The cup plant can tolerate heat and drought but prefers regular watering. Be careful not to overwater your cup plants.

Temperature and Humidity

As previously mentioned, the cup plant is extremely hardy and can grow in a variety of climates and locations. Its growing zones range from the cold zone 3 (last frost around May 15th and first frost around September 15th) to the very warm zone 9 (last frost date of March 1st and first frost date of December 15th).

Fertilizer

Thanks to its hardiness, commercial fertilization isn't required for cup plants in gardens, prairies, or naturalized areas. If you want to give your cup plants additional protection, opt for compost or composted manure as a drop dressing on the roots.

In larger crops, fertilizing is recommended as early as possible during the first year of the cup plant's growth to protect the roots. Some studies of larger cup plant crops have shown that fertilizing is not required in the cup plant's second year.

Drama Queen Organic Poppy

Papaver

Annual. Just another example of the hyperbole of those shameless variety-namers? Not this time. It's everything its name suggests, including having its photograph all over the internet. Petals are shaded with deep purple and violet near the center which morphs to vivid raspberry toward the edges, then deeply cut with irregular pointy fringes. Yellow-green centers with prominent creamy-yellow anthers accentuate the 4-5" flower. Either gorgeous or hideous, depending on your point of view, but undeniably dramatic. 3' tall.

Poppy

~1,400 to 4,500 seeds/g.

Annual. Sensuous luxurious flowers, about 2½-3' tall. We offer two heirloom breadseed varieties especially suitable for baking. Poppies make wondrous cutflowers: choose buds that have straightened up but not quite opened. Immediately sear the cut stem with a flame and put in water. Poppies open after several hours—an austere bouquet in the evening can become a riot of colors the next morning.

Culture: Need light to germinate. Sow outside in spring after frost or sow in fall for early blooms the following summer. Thin to 9-12". Like full sun. Will self sow.

Flowers

All flowers are open-pollinated except where noted.

Days in parentheses after a variety indicate days to first bloom.

Ziar Breadseed Organic Poppy

Papaver

In the past we have described Ziar as a “twin” to Elka. Last year in the field, we noticed they have become more identical than fraternal. Poppies readily self-seed and cross with one another. Ziar is now a mix of majority white-lavender blossoms, like Elka, and a few dark pink blossoms, like the original Ziar. It is still ventless with blue seeds. We will begin selecting to bring Ziar back to its distinctly darker petals. Annual. 1996 Fedco introduction. Especially attractive to pollinators.

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Flowers

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Autumn Beauty Mix Organic Sunflower

Helianthus annuus

(70–90 days) This 6–8' multi-branching beauty is always a top seller. Produces a lovely mixture of earthen shades, petal colors ranging from bright yellow to bronze and purples. Most have a characteristic red ring enclosing a black center. Blossoms 4–6" across are perfect as the center of giant flower arrangements. Annual. 35–40 seeds/g. Especially attractive to pollinators.

Sunflower

Annual. Sunflower remains have been found in the Tabasco region of Mexico dating back more than 6000 years. Prized for their seeds by humans and birds, and for cutflowers by market growers, sunflowers also add a lighthearted touch to gardens. Sales soared in the spring of 2020. As our facilitator Ann says, "In hard times sunflowers make people happy."

Culture: Easy to grow. Start indoors 3–4 weeks before last frost at temperatures of 65–75° or direct sow after frost, 3 to a pocket. Thin to best plant, 1' or more apart. Rich friable soil yields tallest plants; drought stunts growth. Will readily self-sow; for some fun leave a few volunteers in strategic locations.

Pollen or pollen-free? Although flower arrangers often eschew sunnies with pollen, Eliza Lindsay of Portland, Ore., speaks for our pollinators: "Sunflowers that produce pollen are my favorite. They feed the bees first and later the birds." She says to grow sunflowers for cutting and to feed your pollinators, too, you must allow some of the flowers to remain uncut to complete their life cycle. Branching varieties are tops for this purpose since taking cuts encourages branching.

She offers tips for handling harvest and post-harvest for varieties with pollen. "The trick to sell them is to harvest prior to pollination. Once pollinated, flowers begin to senesce. Harvest when the petals are fully colored, clearly visible, but unexpanded and wrapped around the flower head. Harvest with long stems set in clean water in a cool dark place. Change water daily and recut stems as necessary. They will fully open in a few days, produce pollen in the vase, but have a long vase life."

All varieties have pollen unless noted otherwise.

Flowers

All flowers are open-pollinated except where noted.

Days in parentheses after a variety indicate days to first bloom.

Evening Sun Organic Sunflower

Helianthus annuus

(60–80 days) Large 3–5" blooms in sunset hues of burgundy, russet-bronze, vivid gold and red, with many bicolor blends. Some say the 6–8' multi-branching plants have even more blooms than popular favorite Autumn Beauty. Especially attractive to pollinators.

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Flowers

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Days in parentheses after a variety indicate days to first bloom.

Benary's Giants Mix Organic Zinnia

Zinnia elegans

(85 days) Yellow, white, rose-pink, coral, lilac and purple. Annual. ~110 seeds/g.

Benary's Giants

(85 days) The most elegant giant dahlia-flowered zinnia. The densely petaled double flowers regularly exceed 4" across, showy yet extremely refined, borne on long stems perfect for cutting. Highlighted by the uniform petal patterns, colors are particularly bright. Holds better than most even under the stress of high heat and rainfall. Absolutely breathtaking in ideal conditions. 3–3½' plants. The zinnia of choice for market growers; on a par with State Fair Mix for home gardeners. Benary's are film-coated with an industrial food-grade non-toxic coloring that does not contain any fungicides or pesticides. ~120 seeds/g.

Zinnia

~110 seeds/g. except where noted.

Annual. Known as **Youth and Old Age** in the 1800s, this showy genus was named for German botany professor Johann Gottfried Zinn (1727–1759). Easy to grow from seed and a favorite for bright color in Maine summers. Zinnia flower essence is used to bring out playfulness and lightheartedness.

Culture: Sow in a sunny spot after last frost, or start indoors for earlier blooms. Germinates 3–5 days at 80–85°, more slowly at cooler temperatures. Grow on at 70° days, 60–65° at night. Temperatures below 60° delay flowering and may induce chlorosis. Space at 9–12".

They need good drainage and like heat. Market grower Jason Kafka says zinnias perform better in tunnels than in the field. With the extra heat they get so big that "they think they are in New Jersey." Cut when flowers are almost fully mature, just before pollen starts to form. Deadhead to continue production.

Flowers

All flowers are open-pollinated except where noted.

Days in parentheses after a variety indicate days to first bloom.

Astro Arugula

When to Plant Arugula

- Arugula seeds will germinate in soil temperatures as low as 40°F (4°C), so sow them outdoors as soon as the soil can be worked in spring. See local frost dates.
- Sow in late summer or early fall for a fall or winter harvest.

How to Plant Arugula

- Sow seeds ¼-inch deep and about 1 inch apart in rows 10 inches apart. Alternatively, broadcast arugula seeds alone or mix with other salad greens.
- Seeds germinate in about a week (or slightly longer in cold soil). Speed up germination by soaking seeds in water for a few hours prior to planting.
- Sow new seeds every 2 to 3 weeks for a continuous harvest later on!

GROWING

- Keep soil evenly moist, especially in warmer weather when bolting may occur. (Bolting is when the plant skips right to producing flowers and seeds without developing much foliage first.)
- Thin seedlings to about 6 inches apart, using the thinnings for salads.
- To reduce heat stress and prevent bolting, provide some shade for warm-season plantings.

HARVESTING

- The leaves taste best when young. Older leaves can be tougher and will have more of a bite!
- Harvest leaves when they are about 2-3 inches long.
- Pull up the whole plants or cut individual leaves as needed.
- The white flowers are also edible.

Esmee Arugula

Eruca sativa, *Diplotaxis* spp.

CULTURE: Arugula prefers a fertile, well-drained soil, with a pH range of 6.0–6.8 in full sun to part shade. Can be grown all season in the field. Most varieties are hardy enough to grow in cool greenhouses and high tunnels during winter from late summer and early fall sowings.

DIRECT SEEDING: Sow 1/8" deep at 5 seeds/inch in rows at least 2" apart from early spring onward.

SUCCESSION PLANTING: For a continual supply, sow about every 2 weeks until 2–3 weeks before the first frost.

DISEASES & PESTS: Flea beetles can be controlled by covering the crop with floating row covers from the day of sowing. Prevent diseases with crop rotation and sanitation.

HARVEST: Harvest with a knife when leaves reach desired size, about 3–6". Cut about an inch above the soil to allow for clean regrowth, making sure to cut above the basal plate. Cut again when plants are at desired size, 5–14 days depending on variety. After plants flower, the leaves can still be used, but taste is sharper. Flowers are also edible.

DAYS TO MATURITY: From emergence after direct seeding. Typically germinates within 5–7 days.

Ice-Bred Organic Arugula

Eruca sativa

(44 days) Open-pollinated. The best arugula to be found anywhere. Brett Grohsgal crossed two excellent European heirloom strains in 1989 and has been selecting for cold hardiness and vigor since. He's bred one tough cookie here. Mid-ribs and whole leaves develop a lovely purple hue in winter freezes. Recovers in spring even if plant goes dormant under very cold conditions. Seedlings can stand drought, compete against weeds and don't require high soil fertility. They have been 1–2 days slower to bolt than other arugulas in our spring-sown plots. This is arugula with more bite, vigorous with complex full flavors.

Arugula

About 11,700–15,000 seeds/oz. 1/16 oz packet sows 60 ft; 1 oz sows 960 ft. Also known as **Roquette** or **Rocket**. Musky green and its piquant blossoms will spice up your salad.

Culture: Prefers cool temperatures; direct seed as early as possible in spring. Optimum germination temp 40–55°. Bolts in heat; avoid the heat and grow as a fall crop, or make succession plantings every 1–2 weeks. Use row covers to discourage flea beetles. Let part of a spring crop go to seed and get a self-sown September and October patch that is delicious and has no flea beetle damage! A prime ingredient in tangy mesclun mixes. Frequent watering will reduce its pungency. Suitable for microgreens.

Saving Seed: Saving arugula seed is easy! Let your spring sowing of arugula bolt. The flowers develop into narrow seed pods. Once pods dry on the stems, they can be easily broken open for seed.

Gold Rush Bush Bean

Phaseolus vulgaris

- 54 days
- Bush growth habit
- Package contains approximately 200 Goldrush Wax Bush Bean Seeds.
- Germination: 5 to 8 days at 70 to 85F. Plant seeds 1 to 1 1/2 inches deep leaving 3 inches between plants and 18 to 24 inches between rows.

Beautiful golden pods grow about 5" long in clusters near the main stem, making this plant easy to harvest. The Goldrush Wax bean pods are straight and tender and great for freezing or canning.

Beans are a popular plant for home gardeners, and it's easy to see why—they aren't difficult to grow and they produce large harvests. Bush and pole bean varieties differ in the amount of room needed in the garden. Pole beans can climb upwards to save space when grown up a trellis or other support, while bush beans take up a bit more space in rows on the ground.

PLANTING, GROWING, AND HARVESTING:

Direct sow bush bean seeds in well-drained soil, after the risk of frost is over. Choose a sunny location and plant the seeds in rows. The plants in these rows will help support each other as they grow. If planted in a windy area, bush beans may benefit from added support. Bush bean plants usually grow between 1-2' tall.

To harvest green beans, pick pods when they are young and tender—before seeds inside fully develop. If you want to harvest dry bean seeds, you can allow them to mature and dry on the plant before picking.

Potawatami Pole Beans

Days to maturity: 80

Germination rate: 62% on 01/10/2022 (below standard)

PLANTING / HARVESTING NOTES

Plant in warm soil at least a couple weeks after the last danger of frost has passed. Sow directly in the ground at a depth of one inch, spaced every few inches in rows 12 inches apart (or on either side of a trellis). Thin to one plant every four to six inches. Provide a sturdy trellis as the vines can grow eight to ten feet tall.

SEED KEEPING NOTES

Lima beans are self-pollinating, though it is best to isolate different varieties of *P. lunatus* by at least 150 feet to avoid unwanted cross-pollination from flying insects. For seed saving, harvest the beans when their shells have become dried and crispy on the plants. Lay out the pods in a dry, sunny place to dry down further. Shell the beans and lay out the seeds in a well ventilated place away from direct sunlight for at least another few days to a week before storing for next year.

Provider Organic Bush Green Bean

Phaseolus vulgaris

(50 days) Open-pollinated. For highest early yields—even under adverse conditions—and rich beany taste, nothing provides like Provider. Noted for its concentrated sets of round 5–5½" pods.

"There is no substitute for Provider beans," says Chris Carlin of Hyde Park, Vt. Also excellent for canning and "my choice for freezing and dilly beans," says Elaine Carlson of Cape Porpoise, Maine. Anne Elder of Community Farm of Ann Arbor, Mich., praises its amazing resilience: it and Royal Burgundy re-flower repeatedly after heavy pickings followed by rains. Came in one day ahead of Contender for earliest in our observation plot.

Bush Beans

About 120 seeds/2 oz packet. 2 oz packet sows 25 ft; 1 lb, 200 ft.

Seed sizes vary. Pick frequently for maximum and steady yields, but avoid harvesting or disturbing foliage in wet conditions to prevent spread of fungal diseases. Successive plantings can be made every 2 or 3 weeks until midsummer.

- **All beans are open-pollinated.**
- **Days to maturity are from emergence after direct sowing.**

Culture: Tender, will not survive frost. Inoculate with a legume inoculant, then plant seeds 3–4" apart in rows 24–30" apart after all danger of frost has passed and soil has warmed.

Minimum germination soil temperature 60°; optimal range 70–80°. White-seeded beans are generally more sensitive to cold soil temps than dark-seeded varieties. Legumes have moderate fertility needs and can fix their own nitrogen. Excessive nitrogen may induce some bush varieties to develop vines in moist hot weather.

Saving Seed: Saving bean seed is easy! Leave pods on the plants to dry. Hand shell, or stomp pods on a tarp. To ensure true-to-type seed, separate varieties by 30 feet.

Diseases:

- ANTH: Anthracnose
- BBS: Bacterial Brown Spot
- CBMV: Common Bean Mosaic Virus
- CTV: Curly Top Virus
- DM: Downy Mildew
- HB: Halo Blight
- NY 15: NY 15 Mosaic Virus
- PM: Powdery Mildew
- PMV: Pod Mottle Virus
- R: Rust
- SC: Sclerotinia

White mold, *Sclerotinia sclerotiorum*, affects more than 300 plant species. In beans, low humidity, good air circulation and wider spacing, both between plants and between rows, reduce the likelihood of this soil-borne infection.

Fiesta Organic Broccoli

Brassica oleracea (botrytis group)

(86 days) F-1 hybrid. Party time! Our first organic hybrid broccoli, good for midseason.

Compact plants set uniform bright green tightly domed heads that stand both cold weather and heat with considerable aplomb. We were amazed by its unprecedented production of side shoots. One day in early October 2007 CR harvested ten from one healthy plant, the largest as big as a main head at 6–7", several others nearly as hefty, enough to comprise 3–4 supermarket bunches. White or yellow certified-organic coating. Tested negative for BR and BL.

Broccoli

- **About 100–300 seeds/g. Average varies by cultivar.**
- **Days to maturity are from seedling emergence (subtract 20 days for transplants)**

Culture: Start broccoli indoors March–May for setting out May–July, or direct-seed in May or June for fall crop. Easier as a fall crop because many varieties perform poorly in hot summers. For better stands in dry conditions sow in trenches and keep irrigated. Broccoli dislikes the extreme temperature and moisture fluctuations we have endured in recent seasons. Climate change is making it a challenge to grow even the more heat-tolerant varieties in the summer, while at the same time broadening opportunities in our longer more temperate falls.

Nutrition and disclaimer: Broccoli contains significant levels of sulforaphane, a substance that helps detoxify carcinogens from the body. Some years back, research indicating that broccoli seed sprouts are higher in sulforaphane than the vegetable itself caused a run on open-pollinated broccoli seeds. **The broccoli seed we offer is seed grade, and it is not fit for human consumption as sprouts.** It is not stored in food-safe sanitary conditions before it reaches us. For sprouting seed, please contact your natural foods supplier.

Disease: Head Rot

Cultural controls: use well-domed varieties, harvest heads when tight, cut stalks at an angle.

Material: copper

Brassicas

Days to maturity are from seedling emergence. Subtract 20 days for transplants.

Culture: Start brassicas indoors March–May for setting out May–July, or direct-seed in May, or in June for fall crop. **Minimum germination soil temperature 40°, optimal range 55–85°.** Easier grown for the fall because many varieties perform poorly in hot summers. For better stands in dry conditions, sow in trenches and keep irrigated. Wire hoops and row cover should be used at early stages to keep out flea beetles and swede midge.

Note: because of a rule issued by Oregon, we cannot ship brassica packets larger than ½ oz. (14 grams) into the Willamette Valley, except those that have tested negative for Black Leg and Black Rot. Check descriptions for information.

Fiesta Organic Broccoli

Diseases:

- BL: Blackleg
- BR: Black Rot
- BS: Bacterial Speck
- DM: Downy Mildew
- FW: Fusarium Wilt
- FY: Fusarium Yellowing
- TB: Tipburn
- WR: White Rust

Pest and Disease Remedies for all Brassicas

Major pests: Cabbage Looper, Diamondback Moth, Imported Cabbageworm

Cultural controls: control cabbage-family weeds near crop fields, till under crop debris of early-season brassicas after harvest.

Material controls: Spinosad, Bt.

Pest: Flea Beetle

Cultural controls: floating row covers, mulch with straw, time plantings for fall harvested crops only, crop rotation, perimeter trap cropping.

Material controls: AzaMax, Spinosad, PyGanic.

Pest: Cabbage Root Maggot

Cultural controls: time planting to avoid first hatching, use row covers, control weeds.

Major diseases: Black Rot, Alternaria Leaf Spot, Blackleg, Club Root, Downy Mildew, White Mold

Cultural controls: avoid transplanting plants with yellow leaves or v-shaped lesions, crop rotation, destroy crop debris after harvest, avoid overhead irrigation, control weeds, allow for good air movement.

Material controls: Copper.

Disease: Head Rot

Cultural controls: use well-domed varieties, harvest heads when tight, cut stalks at an angle.

Material control: Copper.

Swede Midge—not as cute as it sounds!

Alert! Heading brassicas in the Northeast are seeing consistent damage from swede midge, a tiny gall midge. Its effects result in a non-heading plant. **Wire hoops and row cover at early stages of heading brassica crops are becoming crucial for success.** Some research also suggests garlic sprays as a possible organic repellent. Consult your Cooperative Extension resources for further information.

Napoli Organic Main Season Carrot

Daucus carota

(55 days) F-1 hybrid. A favored variety for Eliot Coleman's famous candy carrots overwintered in unheated greenhouses. Blunt Nantes type grows 7–8" cylindrical roots with strong medium-sized dark green tops. Crispy, snappy, sweet and juicy with a medium core. "Extra crunchy," rated one of our tasters. Also grows rapidly when sown outdoors in spring and makes a good early bunching carrot. Suitable for fresh market or storage. Good performer in high tunnels. White or yellow certified-organic coating.

Carrots

- **1/8 oz packet sows 35 ft; 1 oz, 280 ft. 1 gram packet has more than 400 seeds and sows about 10 ft.**
- **Carrots average 18,000 seeds/oz with significant variations among varieties.**
- **Days to maturity are from seedling emergence after direct sowing.**

Culture: Very hardy. Early carrots can be sown by late April. For fall crop or winter storage, seed in early summer. **Minimal germination temperature 40°, optimal range 75–85°.** Can take up to 3 weeks to germinate; keep rows from drying out for faster emergence. Thinning is critical: At 3" high thin to 1/2" apart, at 6" thin again to 1-2" apart.

Diseases:

- ALTS: Alternaria Leaf Spot
- PM: Powdery Mildew
- BR: Black Rot
- TLS: Target Leaf Spot
- LR: Licorice Rot
- P: Pythium

ALTS shows up first on the oldest foliage as brown-black spots edged with yellow. Foliage blackens and shrivels as it develops and spreads. Maintaining a good crop rotation is the best preventive.

Yellowstone Carrot

Daucus carota var. sativus

CULTURE: Carrots require well-drained soils, with a pH range of 6.0–6.8. Deep, loose, and fertile sandy loams and peat soils with good moisture-holding capacity grow the straightest and smoothest roots.

PLANTING: Sow from early spring to midsummer, 3/4–1" apart, 1/4– 1/2" deep, in a 2"-wide band (about 30 seeds/ft.), or single rows 16–24" apart. For minimum soil compaction, use raised beds with 2 or 3 rows 16–24" apart, beds 5–6' on center. Sprinkle the soil surface to keep moist. Do not allow soil to crust before the emergence of seedlings, which takes 1–3 weeks, depending on temperature and moisture. If necessary, thin young seedlings to 3/4–2" apart, depending on root size desired. Keep weed-free by tine weeding and shallow hoeing. To prevent greening, cover exposed crowns.

DISEASES: Blights can reduce yield and quality. Alternaria blight shows as brown-black lesions edged with yellow on leaf margins beginning on oldest leaves. Leaflets may shrivel and die. Cercospora blight first appears as small dark spots with yellow margins on the younger leaves and stems. To prevent blights, practice a 3-year crop rotation. Copper fungicides can be employed as a preventive measure or control.

INSECT PESTS: Carrot rust flies and wireworms: Provide fertile growing conditions and avoid ground recently in sod if possible. Exclude adult insects with fabric row covers.

HARVEST: Carrots may be dug any time after they reach the desired size. Generally the best harvest period lasts about 3 weeks (longer in cool, fall weather), after which time the roots may crack or the taste and appearance may decline. Make a few sowings at 3-week intervals for a continuous supply of tender carrots at their prime.

STORAGE: Plant carrots intended for winter storage about 100 days before expected fall frost. Carrots store best at 32°F (0°C) and 98% relative humidity.

Green Finger Cucumber

Soil Nutrients and Requirements

Cucumbers prefer well drained fertile soil high in organic matter with neutral pH. Cucumbers are heavy feeders. Sidedressing is recommended one week after blossoming and again 3 weeks later, especially if there are signs of deficiency. Nitrogen deficiencies cause yellowing, and bronze leaves are a sign of potassium deficiency.

Seeding Depth

½"

Plant Spacing

For slicing cukes 12-24", for pickling cukes 8-12", for greenhouse cukes 20".

Row Spacing

Row spacing: for slicing and greenhouse cukes 5-6', for pickling cukes 3-6'.

When to Sow

Cucumbers can be direct seeded or transplanted one week after all danger of frost has passed. Start transplants 3-4 weeks before planting date. Plants with one or two true leaves transplant best. Optimal soil temperature for germination is 85°F. Soil temperatures below 50°F slow growth and impair water uptake by roots. Cucumbers prefer an air temperature of at least 70°F during the day, 60°F at night. Plastic mulch and row covers are commonly used for field cucumbers to increase soil and air temperature and ward off insects. Make sure to remove row covers when plants begin to flower to ensure pollination.

Other Considerations

- Greenhouse cucumbers should be kept pruned to one central leader and trellised with a wire that can slide laterally to create space as vines grow. Greenhouse cucumbers are parthenocarpic, able to produce fruit without pollination. Seedless cucumbers are attained by excluding insects from the greenhouse. If insects are present, they will pollinate flowers and fruits will produce seed.
- Cucumbers can be misshapen from low fertility or poor pollination

Harvest

Once plants begin to bear, it is important to harvest every day or two. Plants carrying overripe fruit will slow production.

Storage

Cucumbers store well for up to 7-10 days at 50-55°F with 95% relative humidity and can become injured at temperatures lower than 50°F. Thin skinned cucumbers are best stored wrapped in plastic.

Green Finger Cucumber

Pest Info

- Striped or Spotted Cucumber Beetles usually emerge from overwintering in debris at the edges of fields in early June. Protect young plants with floating row covers. Established plants can usually withstand a beetle infestation; it is the spread of bacterial wilt by their feeding that is of the most concern. Practice crop rotation and removal of crop debris to discourage overwintering populations.
- Squash Vine Borer- Monitor plants in late June to early July. Adults are orange moths with black spots that can be seen flying around in the daytime. They lay eggs at the base of stems, which the larvae chew through, causing wilting. Larvae can be dug out and killed. Destroying crop residues will help with next year's population.
- Aphids can be washed off plants with a hard stream of water. They have several natural predators that control populations including parasites (aphids appear grey or bloated), lady beetle larvae and lacewings.

Disease Info

- Bacterial wilt (*Erwinia tracheiphila*) is spread by cucumber beetles and will quickly kill young plants. Control of cucumber beetles is critical in preventing spread of this disease.
- Angular Leaf Spot, caused by the bacteria *Pseudomonas syringae pv. lachrymans*, can be responsible for decreased yields due to loss of photosynthesis when leaves become ragged, but does not kill the plant and does not necessarily affect fruit.
- Gummy stem blight (*Didymella bryoniae*) is common on greenhouse cucumbers and can be prevented by strict sanitation measures to remove and destroy all plant residue, as well as measures to reduce wetness on leaves.
- Cucumber mosaic virus causes leaves to become mottled and distorted and fruit stunted and misshapen. Use of row cover (to exclude aphids, which can carry the disease) and controlling weeds (also potential hosts) can be effective in preventing CMV, as well as selecting varieties with disease resistance and/or tolerance.
- Scab – Avoid wetting foliage and give plants plenty of space for circulation.
- Cucumbers are also subject to the fungal diseases of powdery mildew and downy mildew that affect all cucurbit crops, for which the best prevention is the selection of resistant varieties

Marketmore 76 Organic Slicing Cucumber

Cucumis sativus

(63 days) Open-pollinated. Dr. Henry Munger's classic cucumber for the ages, long the leading slicing variety in the Northeast, still sells nearly 5,000 packets per year for us though it is offered by just about every seed purveyor on the planet. Dark green 8–8½" fruits show good uniformity. Vines vigorous throughout the season. Tolerant to CMV, DM, PM, resistant to scab.

Cucumbers

- **About 30 seeds/g; about 900 seeds/oz; variations noted.**
- **Days to maturity are from emergence after direct seeding. From transplant, subtract 20 days.**

Culture: May be started indoors for early production, or direct-seeded when soil has warmed. **Minimum germination soil temperature 65°, optimal range 65–95°.** Very tender, will not survive frost. Direct seed 3" apart thinning to 1' apart in rows 4–6' apart or 6 per mound in hills 4' apart thinning to 3 best plants. For transplants: once seedlings have 1–2 true leaves, about 3 weeks old, plant 1' apart in rows 4–6' apart. Cucumbers require good fertility and regular rain or irrigation for abundant yields. Without adequate water, fruits will be misshapen and bitter. Pick cukes frequently for best production, or else the plants shut down. Make sure to remove blimps to the compost pile.

Combat striped cucumber beetles by handpicking early AM when the dew makes them sluggish, or use floating row covers, removing when cukes flower. Cucumber beetles are the vector for BW.

Using compost in conjunction with row covers (rather than either alone) increased cucumber yields at the University of Michigan.

Parthenocarpic varieties can set fruit without being pollinated, an advantage in cold cloudy summers. Gynoecious varieties produce almost exclusively female flowers for uniformity and high yields.

Saving Seed: Saving cucumber seed is easy! Take that big yellow cuke that got away and save it for seed. Scoop out the guts of overripe fruit and ferment it in an uncovered container for a few days. A moldy gross cap to the slurry means the seeds are ready to rinse and dry. To ensure true-to-type seed, grow only one open-pollinated variety per season.

Marketmore 76 Organic Slicing Cucumber

Diseases:

- ALS: Alternaria Leaf Spot
- ANTH: Anthracnose
- BW: Bacterial Wilt
- CMV: Cucumber Mosaic Virus
- CVYV: Cucumber Vein Yellow Virus
- DM: Downy Mildew
- PM: Powdery Mildew
- PRSV: Papaya Ring Spot Virus
- R: Rust
- WMV: Watermelon Mosaic Virus
- ZYMV: Zucchini Yellows Mosaic Virus

Pest: Striped Cucumber Beetle

Cultural controls: use tolerant or resistant varieties, rotate crops, till under crop debris soon after harvest, use floating row covers until flowers appear, use plastic mulch, perimeter trap cropping (Black Zucchini and Blue Hubbard make particularly good trap crops), use yellow sticky strips, hand-pick early morning when beetles are very sluggish.

Materials: Surround, Pyrethrum (PyGanic).

Mizuna Asian Greens

Light

Mizuna grows best in sunny spots that receive three to four hours of direct sunlight a day. However, this plant thrives in cool weather, making spring and fall crops abundant. It is slow to bolt, but hot temperatures and long sunny days may accelerate the bolting process.

Soil

Mizuna likes well-drained soil amended with rich organic matter. Since Mizuna is a leafy crop, it also thrives in soil with plenty of nitrogen. This green will grow in a soil pH from 6.0 to 7.5, but something in the 6.5 to 7.0 range is best.

Water

Keep your garden soil evenly moist for best growing results. If the soil is too wet, mizuna roots may rot. If it is too dry, the plants may fail to thrive.

Temperature and Humidity

Like most greens, mizuna favors the cool weather of spring and fall. Hot temperatures will eventually cause the green to bolt.

Fertilizer

Chemical fertilizers should never be used on greens meant for consumption. Mizuna should get enough nutrients from soil heavily composted with organic materials. If an extra boost is needed, try spraying a dilute fish emulsion solution on the plants midseason, and be sure to wash the leaves thoroughly before eating them.

Mizuna Varieties

Most seed packets are simply labeled "mizuna," however, sourcing specialty seeds will allow you to grow varieties with the traits you like and will help guarantee the success of next year's crop. Here are some gardener favorites:

- Komatsuma: This plant has slender leaves and is very drought- and frost-tolerant.
- Kyona: A green with frilly leaves on pencil-thin stalks; it's great when eaten fresh.
- Kyoto: Featuring deeply serrated leaves, this variety has a pleasant bite.
- Red Komatsuna: This variety is not as robust as the other green types, but it's very flavorful.
- Vitamin Green: This vitamin-rich green has smooth, dark green leaves and is slow to bolt.

Red Planet Salad Blend

Soil Nutrients and Requirements

Choose cool, well drained, loose soil with pH 6.2-6.8. Lettuce is sensitive to low pH. Use 50-75lbs Nitrogen/acre, ~150 Phosphorus and Potassium/acre. Sidedress with N 3-4 weeks after planting. With transplanting, use 2lbs/50 gallons starter fertilizer, 4-8oz per plant

Seeding Depth

1/8", seeds require minimum amount of light for germination.

Plant Spacing

Babyleaf – continuous band. Full size – 8-12"

Row Spacing

Babyleaf – 3/4" between bands, 16 rows/36" bed. Full size – 12-18" or 3 rows/36" bed, 5' centers.

When to Sow

Lettuce can be seeded in the spring as soon as the soil can be worked. Days to maturity are from direct seeding in spring conditions, subtract 10-14 days if transplanting, subtract 7-10 days if planting in summer conditions, add 20 days if planting late summer-fall. In certain areas, lettuce can be grown throughout the summer by choosing varieties which are heat tolerant; however, many lettuce varieties have difficulty germinating in soils above 75°F. Start transplants 3-4 weeks before setting out. Sow seeds 4 per inch in flats or small-cell plug trays, barely covering with fine soil. If sowing into flats, transplant 2 weeks later into plug trays, pots, or into another flat at 1-2" apart.

Harvest

Cut lettuce holds best when harvested in the morning and cooled rapidly. For salad mix or baby leaf production, harvest individual leaves when they reach desired size, or cut evenly across the bed making sure to stay above the growing tip. For a continuous harvest, sow lettuce every 3 weeks.

Storage

Store just above freezing temperatures with 98% humidity.

Pest Info

- Tarnished Plant Bugs cause brown scarring on stems. Romaine is especially susceptible.
- Cabbage looper and cutworms can be controlled by *Bacillus thuringiensis* (such as Dipel DF, see Supplies) and/or spinosad (such as Entrust™), preferentially in rotation with one another to prevent selection of resistant individuals (check with your certifier before applying).
- Leafminers burrow underneath the skin and leave weaving, translucent trails. They are usually controlled by natural enemies.
- Slugs and Snails can be baited by beer traps. Practice clean cultivation and avoid mulch.

Red Planet Salad Blend

Disease Info

Many lettuce diseases are best prevented by production practices that maximize airflow around heads to stimulate rapid drying. Many varieties have been bred to have disease resistance.

RESISTANCE KEY:

DM: Downy Mildew (race specified, if known), TB: Tip Burn, WM: White Mold, BHR: Bacterial Head Rot, BR: Bottom Rot, HS: Heat Stress, LMV: Lettuce Mosaic Virus, APH: Aphids,

- Drop (*Sclerotinia sclerotiorum*, also called white mold). Grow on raised beds, rotate crops with grass.
- Bottom rot (*Rhizoctonia solani*). Select plants with upright growth habit. Take care not to set seedlings too deep.
- Lettuce mosaic virus (LMV) is highly seed-borne. Choose a reputable seed source. *MTO-10, MTO-30: 10,000 or 30,000 seeds were tested for the presence of Lettuce Mosaic Virus, none was found. A disease-free test does not guarantee a seed lot to be disease-free, only that no pathogen was detected in sample.*
- Damping-off (caused by a number of soil-borne fungi) Avoid overwatering when plants are young.
- Downy mildew (*Bremia lactucae*)

Ultimate Salad Bowl

Contains Arugula, Ruby Red Chard, Tres Fine Endive, Mizuna, Tatsoi, Red Mustard, Red Russian Kale, Red Oakleaf Lettuce, Buttercrunch Bibb Lettuce, Green Salad Bowl Lettuce, Parris Island Lettuce, Red Salad Bowl Lettuce, and Royal Oakleaf Lettuce.

Growing Instructions

Direct sow from 4 weeks before last spring frost until 2 weeks before first fall frost at 3-week intervals. Thin by harvesting (and eating!) half of the young plants, leaving half to mature further for additional harvests. Harvest promptly to avoid stressing plants through overcrowding. For salad cuttings, cut when 3" high, about 3 weeks after seeding. Harvest the leaves only, leaving growing tip to regrow. Repeat 2 times. To create a decorative border for your garden, we recommend mixing USB seeds with sand in a 1:1 ratio and drizzling the mix along a shallow trough around your garden.

All Star Kale Mix

Growing Instructions:

Direct sow kale about a month before last frost. Alternatively, sow under protection 8 weeks earlier, then transplant about a month before last frost. For a young, tender fall crop, sow 3-4 months before first fall frost. Avoid planting at edge of garden, as slugs love kale and will creep in for nightly dining. Harvest a handful of individual outer leaves from each plant; mature plants will be ready for another harvest in a few days.

Days to Germination 3-10 days

Days to Maturity 60 days

Planting Depth ½"

Spacing in Row 12-18"

Spacing Between Rows 18"

Height at Maturity 24"

Sun Preference Full to Partial Sun

Curly Roja Kale

Soil Nutrients and Requirements

Kale and Collards thrive in well drained fertile soil high in organic matter, with pH 6.0- 7.5. They can tolerate slightly alkaline soil. A general guideline is 2-3 lbs of 8-16-16 fertilizer over 100 sq ft of garden area two weeks before planting. If boron is not present in your soils, consider adding 1 Tbs per 100 sq ft.

Seeding Depth

1/4-1/2".

Plant Spacing

Babyleaf- Direct seeding: ~60seeds/ft in 2-4" bands; Full Size- 12-18"

Row Spacing

18-30" for full size

When to Sow

Days to maturity are from direct seeding, subtract 2 weeks if transplanting. Direct sow as soon as soil can be worked or start transplants 4 weeks before planting date. Plant baby leaf every 4-5 weeks for a continual harvest. Sow fall plantings two months before first expected frost for full size and up until frost for baby leaf.

Harvest

Harvest full size leaves when desired. Kale flavor sweetens after light frosts. Kale and collards are both very cold hardy, overwintering in most climates to some degree.

Storage

Cool leaves in cold water at harvest and store in plastic in fridge. In late fall, cut the heart of the plant and store just above freezing in a plastic bag for a few weeks.

Pest Info

Kale and collards do not usually suffer too much from pest damage, but they are subject to the same insect pests as cabbage, cauliflower, and broccoli.

- Insect pests, including cabbage looper, imported cabbage worm, and diamondback moth are largely of the Lepidoptera order and can thus be controlled by *Bacillus thuringiensis* (such as Dipel DF) and/or spinosad, preferentially in rotation with one another to prevent build-up of resistant individuals.
- Flea beetles chew small holes in the leaves and are most detrimental when plants are young; use row cover (make sure edges are sealed) or application of Pyganic™, neem or capsaicin products to control populations.

Disease Info

In general, kale and collards do not suffer much from disease. They can be affected by Black Rot, caused by the bacterium *Xanthomonas campestris* and Club root, caused by the soil borne fungus *Plasmodiophora Brassica*. Prevention includes resistant varieties, crop rotation, removal or tillage of plant debris, eliminating cruciferous weeds, and handling plants in dry conditions.

Rainbow Lacinato Organic Curly Kale

Brassica oleracea (acephala group)

(61 days) Open-pollinated. Who but Frank Morton would think to cross Lacinato with Redbor? The result? A spectacular kale that combines some of the best features of both. Curly edges, red veins, purple leaves, blue-green leaves, what a banquet of diverse shapes and colors. Dinosaur lends deepened background color to Redbor's productivity, super cold-hardiness and reluctance to bolt. A heavenly combination. **Tested negative for BR and BL. OSSI. Cold-hardy. Independent Breeder**

Kale

- **Days to maturity are from emergence after direct sowing. For transplants, subtract 20 days.**
- **About 175–280 seeds/g and 4,200–9,800 seeds/oz.**

Scientists say kale descends from wild cabbage, a plant found primarily on the lime cliffs of coastal Europe. Originating in Greece, kale was enjoyed for thousands of years throughout Europe where it was the most common green vegetable until the Middle Ages when cabbage became more popular.

One cup provides more Vitamin C than a glass of orange juice, more calcium than a cup of milk, more potassium than a banana and, per calorie, more iron than beef. Kale may be used in textured salads, steamed or braised as a side dish, mixed in omelettes, lasagna and stews, and made into chips.

Culture: Start indoors March–May for setting out May–July, or direct-seed in May. **Minimum germination soil temperature 40°, optimal range 45–85°.** To enjoy it at its best and to avoid the worst of the flea beetle season, direct seed in July or August for late-season maturity. Use wire hoops and row cover to keep flea beetles out at early stages. Important crop in colder climates owing to its natural resistance to frost, kale is sweeter after exposure to cold. Excellent for microgreens.

Diseases:

- BL=Blackleg
- BR=Black Rot

Brassicas

Days to maturity are from seedling emergence. Subtract 20 days for transplants.

Culture: Start brassicas indoors March–May for setting out May–July, or direct-seed in May, or in June for fall crop. **Minimum germination soil temperature 40°, optimal range 55–85°.** Easier grown for the fall because many varieties perform poorly in hot summers. For better stands in dry conditions, sow in trenches and keep irrigated. Wire hoops and row cover should be used at early stages to keep out flea beetles and swede midge.

Rainbow Lacinato Organic Curly Kale

Diseases:

- BL: Blackleg
- BR: Black Rot
- BS: Bacterial Speck
- DM: Downy Mildew
- FW: Fusarium Wilt
- FY: Fusarium Yellowing
- TB: Tipburn
- WR: White Rust

Pest and Disease Remedies for all Brassicas

Major pests: Cabbage Looper, Diamondback Moth, Imported Cabbageworm

Cultural controls: control cabbage-family weeds near crop fields, till under crop debris of early-season brassicas after harvest.

Material controls: Spinosad, Bt.

Pest: Flea Beetle

Cultural controls: floating row covers, mulch with straw, time plantings for fall harvested crops only, crop rotation, perimeter trap cropping.

Material controls: AzaMax, Spinosad, PyGanic.

Pest: Cabbage Root Maggot

Cultural controls: time planting to avoid first hatching, use row covers, control weeds.

Major diseases: Black Rot, Alternaria Leaf Spot, Blackleg, Club Root, Downy Mildew, White Mold

Cultural controls: avoid transplanting plants with yellow leaves or v-shaped lesions, crop rotation, destroy crop debris after harvest, avoid overhead irrigation, control weeds, allow for good air movement.

Material controls: Copper.

Disease: Head Rot

Cultural controls: use well-domed varieties, harvest heads when tight, cut stalks at an angle.

Material control: Copper.

Swede Midge—not as cute as it sounds!

Alert! Heading brassicas in the Northeast are seeing consistent damage from swede midge, a tiny gall midge. Its effects result in a non-heading plant. **Wire hoops and row cover at early stages of heading brassica crops are becoming crucial for success.** Some research also suggests garlic sprays as a possible organic repellent. Consult your Cooperative Extension resources for further information.

Red Russian Kale

Brassica oleracea

CULTURE: Kale prefers a fertile, well-drained soil high in organic matter with a pH range of 6.0–7.5. Consistent moisture will produce the highest-quality leaves. For baby-leaf production, see the Baby Leaf Brassica Greens culture.

DAYS TO MATURITY: From direct seeding; subtract about 14 days for days to maturity from transplant.

DIRECT SEEDING: Plant from early spring to approximately 3 months before expected fall frost. For bunching: Sow 3–4 seeds every 12–18", ½" deep, in rows 18–36" apart. Thin to 1 plant per group.

EARLY SPRING CROP: Use varieties suited to warm-season production. Sow 2 seeds per cell in 50- to 72-cell plug flats, 3–4 seeds/in. in 20-row flats; or, in outdoor beds ¼" deep. Seedlings should be ready to transplant in 4–6 weeks. If possible, keep soil temperature over 75°F (24°C) until germination, then reduce air temperature to about 60°F (16°C). Transplant outdoors 12–18" apart in rows 18–36" apart. Kale prefers cooler growing temperatures, between 55–75°F (13–24°C), optimum being 60–70°F (16–21°C), but will produce good crops under warmer, summer conditions.

FALL CROP: Start seedlings as above in May and transplant to the garden in June–July. To ensure mature heads, seed the crop early in areas where heavy freezes occur early in fall.

WINTER CROP: Successful kale crops can be grown where winters are mild and temperatures rarely fall below 32°F (0°C). Transplants can be set out from September to February in these regions.

DISEASES: Adhere strictly to a preventive program including: (1) long crop rotations with non-brassica crops, (2) clean starting mixes and outdoor seedbeds, and (3) strict sanitation practices. Johnny's Selected Seeds only sells seed lots of kale that have tested negative for black rot (*Xanthomonas campestris* pv. *campestris*) and black leg (*Phoma lingam*).

INSECT PESTS: Kale is not as afflicted with pests as are other brassica crops such as cabbage. Apply row covers at the time of planting to exclude pests from the crop. Control cabbage worms and loopers with *Bacillus thuringiensis* (Bt).

HARVEST: Beginning about 2 months after planting, harvest by clipping individual leaves. Kale is very hardy, and the eating quality will improve into the late fall with light frost. Late-summer sown or planted collards can be wintered in cold frames or hoophouses, or in the open in mild regions, to extend the season. Protecting with row covers can extend the harvest period.

Green Star Lettuce

Lactuca sativa

CULTURE: Lettuce is a hardy, cool-weather crop and can be planted with your earliest worked soil. It grows best at 60–65°F (16–18°C) and germinates best below 70°F (21°C), so careful variety selection is key for success in hotter weather. Sow every 2–3 weeks for a continuous supply of either full heads or salad mix.

PELLETED SEED: Pelleted seed requires a little extra attention when it comes to watering, as it performs best with consistent, moderate soil moisture throughout the germination period. An initial watering will split or dissolve the pellet, but if the soil is allowed to dry out before the germination period is over, the seed may receive insufficient moisture for optimal germination.

PELLET STORAGE: Pelleting offers many advantages, but the pelleting process also shortens the shelf life of the seed. We recommend using pelleted seed within one year of purchase. If you need to store pelleted seeds until planting, protect them from heat and humidity in a cool, dark, dry place. If you prefer to store your seed in the refrigerator, be sure to place the seed in an air-tight container to protect it from fluctuations in humidity.

THERMAL DORMANCY: Lettuce seed can enter thermal dormancy when exposed to high temperatures. Optimum germination results at soil temperatures of 60–68°F (15.5–20°C). The priming process in pelleted lettuce seeds broadens the temperature range in which the seeds will germinate, overcoming some of their thermal dormancy.

TRANSPLANTING for HEAD LETTUCE: 3–4 weeks before field planting, sow in 128-cell trays barely covered with vermiculite or fine soil. If necessary, utilize shade and frequent misting to keep trays cooled below 75°F (25°C) during germination. Young plants properly hardened at least 3–5 days before planting can survive temperatures as low as 20°F (–6°C). Transplant iceberg, romaine, and butterhead lettuce 10–12" apart in rows 15–18" apart, other types 8–10" apart in rows 12–18", and mini heads as close as 6" in a grid.

DIRECT SEEDING for BABY LEAF: Seeds can germinate well in soils as low as 40°F (4°C) but often poorly above 75°F (24°C). Sow 4–6 seeds/inch in rows at least 2" apart. Cover lightly to 1/8" and firm gently. Dry soil must be watered to ensure coolness and moisture for uniform germination.

HARVEST: Head Lettuce: Cut at base, keeping wrapper leaves for handling loss. Consider cutting alternating plants to extend harvest window, allowing remaining plants to continue to grow. Pack heads in layers facing cut ends away. Wash off sap and cool immediately to prevent staining and dehydration. Baby Leaf: Harvest about 1" above the growing point when leaves reach desired harvestable length, about 3–4" long. Remove harvest debris to improve regrowth quality.

STORAGE: Keep cold at 35–40°F (1–4°C) with high humidity but free of standing water. Head Lettuce: Keep 14–20 days, less for delicate types like butterhead and oakleaf, and longer for lettuce grown slowly in cooler temperatures. For one-cut types, extend season in cold weather by holding cut heads in cooler up to two weeks to process into salad mix.

Lettuce Blend Organic Lettuce Mix

Lactuca sativa

Light up your salad patch with contrasting colors and leaf forms! At least a half-dozen different lettuces, all suitable for cut-and-come-again culture.

Mixes

Exact components will vary according to availability; click here for current list of varieties in each mix (posted in mid-January).

Lettuce

- **All lettuce is open-pollinated.**
- **700–1100 seeds/1g pkt.**
- **1 gram packet sows 25 ft; 2 grams, 50 ft; 1 oz, 500–700 ft.**
- **Days to maturity are from emergence after direct sowing; for transplants, subtract 20 days.**

Culture: Direct seed outdoors as soon as ground can be worked and repeat every 2 weeks for continuous supply. Or start indoors in March and at regular intervals thereafter for early transplanted successions. **Optimal germination temperature range 40–70° though many varieties won't germinate in soil temps above 75° and most shut down above 80°.** Thin sowings frequently and ruthlessly to a final distance of 1' for full heads. Heavy nitrogen feeders. Hardy. All save icebergs tolerate heavy frost. Fall and overwintered harvests are becoming standard practice. For summer harvest, select varieties carefully: bolting, bottom rot and tipburn are problems if a variety can't take the heat! Using shade cloth can keep lettuce tender and sweet longer into summer. Sesquiterpene lactones produced in the latex render lettuce bitter when it bolts.

Saving Seed: Saving lettuce seed is easy! Leave spring-planted lettuce heads to bolt. Flowers will become white tufted seeds. Once dry on stalk, rub seeds off the plant into a paper bag. To ensure true-to-type seed, separate lettuce varieties by 10 feet.

Diseases:

- BOR: Bottom Rot
- DM: Downy Mildew
- LMV: Lettuce Mosaic Virus
- PM: Powdery Mildew
- SC: Sclerotinia
- TB: Tipburn
- X: Xanthomonas

Lettuce Blend Organic Lettuce Mix

Pest: Aster Leafhopper (vector for Aster Yellows disease)

Cultural controls: control perennial broadleaf weeds near lettuce plantings, plow lettuce fields immediately after harvest.

Pest: Slug

Cultural controls: avoid mulch or nearby grassy areas.

Material: Sluggo

Disease: Bottom Rot

Cultural controls: rotate with grass-family green manures, plant in well-drained soil or on raised beds, more upright varieties escape infection.

Major Diseases: Downy Mildew, Grey Mold, White Mold

Cultural controls: rotation, reduce duration of leaf wetness, plant parallel to prevailing winds, use wide spacing, control weeds, use well-drained fields in spring and fall.

Material controls: MilStop

Winter Density Romaine Lettuce

Lactuca sativa

CULTURE: Lettuce is a hardy, cool-weather crop and can be planted with your earliest worked soil. It grows best at 60–65°F (16–18°C) and germinates best below 70°F (21°C), so careful variety selection is key for success in hotter weather. Sow every 2–3 weeks for a continuous supply of either full heads or salad mix.

THERMAL DORMANCY: Lettuce seed can enter thermal dormancy when exposed to high temperatures. Optimum germination results at soil temperatures of 60–68°F (16–20°C). The priming process in pelleted lettuce seeds broadens the temperature range in which the seeds will germinate, overcoming some of their thermal dormancy.

TRANSPLANTING for HEAD LETTUCE: 3–4 weeks before field planting, sow in 128-cell trays barely covered with vermiculite or fine soil. If necessary, utilize shade and frequent misting to keep trays cooled below 75°F (25°C) during germination. Young plants properly hardened at least 3–5 days before planting can survive temperatures as low as 20°F (–6°C). Transplant iceberg, romaine, and butterhead lettuce 10–12" apart in rows 15–18" apart, other types 8–10" apart in rows 12–18", and mini heads as close as 6" in a grid.

DIRECT SEEDING for BABY LEAF: Seeds can germinate well in soils as low as 40°F (4°C) but often poorly above 75°F (24°C). Sow 4–6 seeds/inch in rows at least 2" apart. Cover lightly to 1/8" and firm gently. Dry soil must be watered to ensure coolness and moisture for uniform germination.

HARVEST: Head Lettuce: Cut at base, keeping wrapper leaves for handling loss. Consider cutting alternating plants to extend harvest window, allowing remaining plants to continue to grow. Pack heads in layers facing cut ends away. Wash off sap and cool immediately to prevent staining and dehydration. Baby Leaf: Harvest about 1" above the growing point when leaves reach desired harvestable length, about 3–4" long. Remove harvest debris to improve regrowth quality.

STORAGE: Keep cold at 35–40°F (1–4°C) with high humidity but free of standing water. Head Lettuce: Keep 14–20 days, less for delicate types like butterhead and oakleaf, and longer for lettuce grown slowly in cooler temperatures. For one-cut types, extend season in cold weather by holding cut heads in cooler up to two weeks to process into salad mix.

New York Early Organic Yellow Storage Onion

Allium cepa

(98 days) Open-pollinated. Superior strain of Early Yellow Globe selected for storage until early spring. Very firm mild yellow onions may be eaten raw in salads or sandwiches. They average 2½–3" across and store longer than Early Yellow Globe. "My fave, sweet & tender," evaluated one of our tasters. The strain we list is rated as the best in an independent evaluation. This is our top-selling onion. New York Early was maintained by commercial onion growers in Orange County, NY. Adapted from 38° latitude to southern Quebec.

Onions

- **Days to maturity are from date of transplanting.**
- **About 200–250 seeds/g, 5,700–7,000 seeds/oz.**

Culture: Set seedlings out 1–2" deep and 6–8" apart in shallow trenches, 1–2' between rows. Onions survive light frosts. After half the onion tops fall, push over the remainder and harvest within a week. Field-cure in the sun about 10 days until dry, covering with a tarp in wet weather. In the event of extreme heat or prolonged damp conditions, we recommend sheltered curing in a well-ventilated barn or greenhouse. Curing is essential for long storage. Store cured onions in mesh sacks in a cool dry well-ventilated place, periodically removing sprouting or rotting bulbs. In spring, put your remaining onions in the fridge to extend storage until your new crop is ready.

Onions are triggered to form bulbs in response to day length. Day length differs depending on latitude, so different onion varieties were developed to have different day-length needs. In the north, the earlier onions are set out, the more chance they have to make top growth while the days are lengthening. High fertility and steady water is crucial for large onions. Side dressing is recommended. After summer solstice they begin bulbing.

All the varieties we list are suitable for northern growers. If you live farther south, note our latitude specifications at the end of each description.

Long-day: Must be north of 36° latitude, though some long-day types perform best north of 40°. These onions need 14–16 hours of sun a day to trigger bulb formation. May not perform well in continually hot soil temps.

Intermediate-day: Also called day-neutral onions, generally need 12–15 hours of daylight to bulb. Some can do well in parts of the upper southern U.S. all the way up through Maine. Others are best for mid-latitudes only (35–40°). All intermediate-day onions in our catalog have performed well repeatedly in our Maine trials.

(Short-day: Suited for the South, below latitude 36°, bulbing when the day length measures between 10–12 hours. We don't offer seed for short-day varieties.)

Onion seed is short-lived. Retest 1-year-old seed before using. Discard anything older.

New York Early Organic Yellow Storage Onion

Alliums

Culture: Start allium seeds indoors in February or March. Minimum germination soil temperature 45°; optimal range 60–70 °. We discourage using bottom heat because alliums germinate poorly in soil temps above 70°. Transplant in spring soon after the ground can be worked.

Alliums are heavy feeders and want generous amounts of organic matter, fertilizer and water. Late transplanting and poor fertility can result in small onions or failure to form bulbs. Alliums are notoriously intolerant of weeds. Slugs love to munch them, and in areas above 40° latitude, root maggots may be a problem.

About allium seed: Allium seed is short-lived. We do not hold over hybrid onion seed because of precipitous decreases in germination. Test 1-year-old seed before using. Discard anything older.

Diseases:

DM Downy Mildew

PR Pink Root

ALERT: Leek Moth is emerging as a serious pest potentially affecting all Alliums in the Northeast. Consult your local Cooperative Extension for more info.

Burpeeana Early Pea

How to Sow and Plant

- Because peas are members of the legume family of plants, they can benefit from an application of a soil inoculant designed for beans and peas, prior to planting. The inoculant will enable the plants to take nitrogen from the air to use as fertilizer, which can increase crop yield and quality.
- For optimum flavor, grow in cool weather.
- Coat untreated seed with an inoculant.
- Sow in average soil in full sun in early spring for first crop, in late summer for fall crop.
- Support shorter peas on small stakes or a pea fence. Taller peas can be supported with a tower or trellis netting. Set supports for vining varieties prior to planting.
- Sow 2 inches apart in double rows spaced 6 inches apart with 24 inches between each set of rows.
- Cover with 1 inch of fine soil, and sow 1 inch deep.
- Thin gradually to stand 4-6 inches apart starting when seedlings are about 1-2 inches high.

How to Grow

- Protect spring plantings with floating row covers to keep flea beetles away.
- Keep weeds under control during the growing season. Weeds compete with plants for water, space and nutrients, so control them by either cultivating often or use a mulch to prevent their seeds from germinating. Avoid disturbing the soil around the plants when weeding.
- Keep plants well watered during dry periods to promote rapid, uninterrupted growth. They do not perform well in overly wet conditions. Seeds can rot in wet soil before germination occurs when planted in early spring.
- Monitor for pests and diseases. Check with your local Cooperative Extension Service for pest controls recommended for your area.

Green Arrow Organic Shell Pea

Pisum sativum

(65 days) Open-pollinated. The pea preferred by commercial growers, always on target for heavy yields. Sets the standard for midseason varieties. Long pods with up to 10 peas per pod (more typically 7–8) on vines up to 3'. Seems to withstand miserable and extreme weather better than other varieties. Easy-to-pick because pods tend to set in pairs at the top.

Peas

- **2 oz packet sows 25 ft; 1 lb, 200 ft. Avg 160 seeds/2 oz pkt.**
- **All peas are open-pollinated.**
- **Days to maturity are from direct seeding.**

Culture: Sow as early as ground can be worked for best yields. **Minimum soil temperature for pea seed germination: 40°. Optimal range 50–75°.** Peas are legumes with moderate fertility requirements. Avoid excess nitrogen: they can fix their own. Use a legume inoculant at planting. They prefer cool, moist weather and dislike dry heat.

All peas produce more when staked; varieties over 2½' must be supported. Use either Trellis Netting or chicken wire. Install support at planting time to avoid disturbing seedlings. Plant 8–10 seeds/ft on each side of supports in double rows. Set supports for rows 3' apart (5' if very tall varieties).

Young plants are very hardy but frost stops production at the blossom or pod stage. If you love peas as much as we do, try for a second crop in the fall. Timing is crucial, as peas ripen slowly in the cool of September, and frost will halt production. We recommend planting the first two weeks of July for a fall crop in central Maine. Warmer areas try later July. If the summer is hot, cool the soil with a hay mulch in advance of planting, or shade peas with tall crops to hold in soil moisture.

Peas are 25% sucrose by weight and lose nearly half their sugars within 6 hours at room temperature. That's why they taste best grazed right off the vine. Keep cool and shell as soon as possible after picking for freezing.

Not well adapted to southern climates where the spring heats up too quickly. Pam Dawling in Virginia has great success with Sugar Ann but cannot grow the tall longer-season Sugarsnap in her climate. Smooth-seeded peas germinate better in colder soils than wrinkle-seeded peas, but are not as sweet. Dawling suggests that forsythia flowering signals time to sow snap and snow peas.

Saving Seed: Saving pea seed is easy! Leave pods of spring-planted peas on the vine to dry. Hand shell, or stomp pods on a tarp. To ensure true-to-type seed, separate pea varieties by 30 feet.

Green Arrow Organic Shell Pea

Diseases:

- CTV: Curly Top Virus
- PM: Powdery Mildew
- DM: Downy Mildew
- PPR: Pythium Root rot
- F: Fusarium
- PSV: Pea Streak Virus
- PEMV: Pea Enation Mosaic Virus
- W: Common Wilt race 1

Powdery mildew looks like someone sprinkled talcum powder over the vines. It spreads rapidly when picking occurs in hot dry weather. Pick in early morning while the dew is still on the foliage to slow its spread and ensure best flavor. Fusarium causes vines to dry out, yellow, then brown and die. As a preventive, always sow peas on well-drained soil. Fusarium-infested soils are said to be pea sick. Do not save seed from plants afflicted with fusarium, which can be seed-borne. Rotate out of legumes for at least 4 years. Brassicas, especially mustards, are good disease-suppressant successions.

Off-types in peas continue to be a problem across the industry. Over the past several years we have eliminated some old favorites that got beyond the bounds of what is acceptable and added several more reliable varieties. We'll keep working at it!

Oregon Sugar Pod Snow Pea

START SEEDS OUTDOORS

In early spring, as soon as soil can be worked, plant peas in full sun in well-worked, fertile soil. Sow seeds 1 inch deep and 2 to 3 inches apart. Sow seeds in wide rows or bands 3 inches across, spacing the wide rows 2 feet apart. Provide supports for these 2 1/2 foot vines at planting time. Protect from marauding birds with netting or floating row covers if necessary. If first sowing doesn't germinate evenly, replant right away as new seedlings catch up quickly. Sow again for a fall crop about 2 1/2 months before first expected fall frost.

GROWING NOTES

Use netting or wire trellis or short tree branches stuck into the ground to support these heavy bearing vines for easy picking. Turn a sprinkling of bone meal and wood ashes into the soil before planting. Keep pea vines well weeded and watered, and mulch to conserve moisture.

HARVEST AND USE

Pick peas frequently when pods are fully formed but still flat with tiny immature peas. Snow peas are delicious in stir-fries with ginger, soy sauce and garlic, but cook very quickly, just until they turn a deeper green color. Or enjoy the juicy pods as you pick them fresh from the vines.

SS141 Snap Pea

- Plant peas during the mild weather of early spring, once soil temperatures reach 45° F.
- Space young pea plants 5 inches apart in an area with an abundance of sunshine and fertile, well-drained soil.
- Improve your native soil by mixing in several inches of aged compost or other rich organic matter.
- Before planting, stake a tomato cage or trellis in the ground to make harvesting pods easier.
- Lay down a 2-inch layer of straw or dried grass clippings to help retain soil moisture and prevent weeds.
- Ensure your pea plants grow to be strong and vigorous by feeding them regularly with a continuous-release plant food.
- For snap-style peas, harvest when pods begin to flatten.

Peas thrive in cool, damp weather, making them an ideal candidate for early spring planting. In mild climates, you can also plant for a fall harvest, but spring plantings generally yield more. Get peas in the ground as soon as possible in early spring, once the soil temperature reaches at least 45 degrees. Space plants 5 inches apart.

Young pea plants can take a light frost, so tuck plants into the garden before the last average frost date for your region. However, be prepared to protect flowering plants from a late frost; it will hurt flowers and sometimes causes tiny developing pods to be deformed.

Green peas don't need a trellis, but pods will be easier to pick when vines are held upright. If you're using a trellis, insert it prior to planting. Use netting, stakes, and string, a wood frame trellis covered with chicken wire, metal fencing, or a collection of twiggy branches stuck into the ground among the plants. Peas attach by tendrils, tiny stems that curl and encircle supports. Tendrils quickly wrap around slender supports to hoist vines skyward.

Withhold water slightly during the early growing phase to encourage deeper rooting (peas tend to be shallowly rooted). Watering is critical from the appearance of the first flower until harvest. Peas need consistent moisture to develop full, flavorful pods.

Sugar Ann Snap Pea

Pisum sativum

CULTURE: Peas are a cool-weather crop. Midsummer pickings are not as prolific as earlier harvests. For best yields ensure adequate fertility and a pH of 6.5–6.8. Adjust pH with ground limestone or wood ashes, ideally in the fall prior to spring planting. Inoculate peas to encourage formation of nitrogen-producing nodules on the plant roots. This enriches the soil, results in larger plants, and increases yield.

DAYS TO MATURITY: From direct seeding.

DIRECT SEEDING: In early spring as soon as the soil can be worked, sow 1 1/2–2" apart in rows 18–36" apart, 1/2–1" deep. Do not thin. Varieties under 3' tall can be sown without support in rows 12–18" apart. For taller varieties, use crop supports such as a trellis net or chicken wire to keep vines upright, easy to pick and off the ground where they are less likely to rot if rainy weather coincides with harvest. Suspend the bottom of the trellis or chicken wire just above the young plants. The best time to install a trellis is at planting time. Normal row spacing is 4–6' for trellised peas. Harvest when peas enlarge in the pods.

FALL CROP: Variety selection is key: Choose powdery mildew-resistant varieties and early maturing varieties that will still flower in diminishing daylight. Sow about 2 months before frost. Keep seeds well-watered to encourage good germination.

AVG. DIRECT SEEDING RATE: 1 lb. per 80', 13 lb./1,000', 272 lb./acre at 25 seeds/ft., in rows 24" apart.

DISEASE: A common disease is pea root rot (*Fusarium* sp. or *Aphanomyces euteiches*) which causes yellowing and die-back of foliage from the ground up. The best control is to ensure well-drained soil and to rotate crops out of legumes for at least three years. Powdery mildew causes white, powdery mold on the leaves, stems, and pods in hot weather. Choose resistant varieties.

California Wonder Sweet Pepper

Planting: Peppers are best started indoors, eight to ten weeks or more before the last frost date for your area. Pepper seeds can be a difficult seed to germinate, and seedlings grow slowly. Space plants 18" inches apart in rows 24" inches apart or more. Water plants thoroughly after transplanting.

Watering: Keep the soil evenly moist; especially when the fruits are developing, peppers need about an inch of water a week.

Fertilizer: As the peppers develop, switch over to a fertilizer higher in Phosphorous and Potassium. Gardeners often make the mistake of providing too much nitrogen. The result is a great looking bushy, green plant, but few fruit.

Days to Maturity: Most peppers take 60 to 80 days to mature.

Harvesting: Bell peppers are usually picked green and immature but when they are full-sized and firm. However, if they are allowed to ripen on the plant they will be sweeter and higher in vitamin content. Other peppers are usually harvested at full maturity. Be careful when breaking the peppers from the plants, as the branches are often brittle. Hand clippers can be used to cut peppers from the plant to avoid excessive stem breakage. The number of peppers per plant varies with the variety. Bell pepper plants may produce 6 to 8 or more fruit per plant. Storing: Store sweet peppers for up to two weeks in a spot that ranges from 50 to 55°F. Hot peppers are good to eat fresh, dry or pickle. Harvest peppers for drying when they start to turn red. Simply pull the plants from the ground and hang them upside down in a cool, dry place.

Pests & Diseases: Several insects enjoy your pepper plants. Spider mites and aphids are the most common, with an occasional borer. In many areas, it is infrequent. For the infrequent problem, try an organic insecticide or dust. While many viruses and diseases can affect Peppers, it is somewhat infrequent. Fungal infections can be treated with fungicides. Apply treatment as soon as you see it.

Shishito Pepper

Growing Instructions:

Small, mild Japanese pepper with thin walls that blister and char easily when pan-fried, roasted or grilled, taking on rich flavor that is delicious with coarse salt and lemon juice. Typically harvested green, but eventually turns orange and red with sweeter flavor. Planting tips: peppers are long season, heat-loving annuals which require transplanting to reach full maturity in most areas. Start transplants 6-8 weeks before planting date, after the danger of frost. Optimal soil temperature for germination is 75-85 degrees Fahrenheit.

Baby Pam Pie Pumpkin

Growing Tips

Planting

Plant pumpkins ½" - 1" deep. For a general rule of thumb plant seed the depth of three times the thickness of the seed. Plant spacing varies depending on fruit size. If planting a large pumpkin give plant approximately 72 sq. ft. of space. Medium sized pumpkins require 30 sq. ft. of space. Pie pumpkins require 24 - 30 sq. ft. of space. Miniature pumpkins require 10 - 24 sq. ft. of space. See the Pumpkin Planting / Harvest Timing chart on page 111 of the catalog for additional information.

Management

Scout fields every 7 days to ensure crop health. Look for insect, weed, and disease pressure. The first three weeks focus on weeds and insect pressure. Then focus on disease pressure. For weed, insect, and disease identification and treatments consult the Midwest Vegetable Production Guide: Midwest Vegetable Production Guide for Commercial Growers 2020 or your local extension. Place pollinators in field to ensure maximum fruit set.

Harvest

Harvest when fruit has developed deep color. Handles will appear dry. Cut handles with shears to protect handles from being broken off.

Storage

Clean fruit of dirt and wash in 5% chlorine solution. Let air dry and cure for 10 - 12 days. Make sure air is able to circulate around fruit. It is important to keep fruit dry.

Plant Spacing

Each variety or type of pumpkin has an optimum plant spacing for its best performance. If plants are too close, stress and competition can decrease fruit size and possibly even reduce the number of female flowers. Under extreme stress, tight spacing may eliminate the crop entirely.

Optimum spacing for maximum yield, especially for jack-o-lantern pumpkins, will not necessarily be the best spacing for large fruit size. For large fruit, we would suggest reducing plant density to the next recommended plant population.

- Accurate plant spacing will be an equal opportunity environment for every plant.
- Suggested populations are for final plant stands.
- To achieve ideal plant populations it is necessary to either over-plant and hand thin or to plant according to recommendations and hand plant later to fill skips.
- Seed corn maggots, wire worms, mice and birds, floods or lack of rain are all common problems that effect accurate stand establishment.

Rat-tail Organic Radishes - Leaf & Pod

Raphanus sativus var. caudatus

(50 days) Open-pollinated. Grown for its tangy seed pods, not its roots. William Woys Weaver called it “the Don Juan of radishes” because it so readily crosses with all others. Introduced from Japan in 1866-67 by James J.H. Gregory. Attracts butterflies and other pollinators, worth growing even if you don’t want to consume its pungent pods. Because they often grow as long as rat’s tails and almost as fibrous, garden writer Barbara Damrosch advises harvesting the pods at “skinny bean size like a French filet bean” for maximum tenderness. The immature purplish-green pods are a delicacy in India and Asia, adding a mustardy zing to salads, stir-fries and other dishes. When exposed to vinegar the purple pods turn a brilliant green that will bleed into a pickling brine and enhance the color of cucumber pickles. Mustard and radish plants will grow to 5' and branch out as they set seed, so give them plenty of room. Stake or trellis them for ease of picking; tomato cages work well. Your objective is not a small root, but a generous supply of pods. Especially attractive to pollinators.

Radishes

- Days to maturity are from date of seeding
- Disease: FY: Fusarium Yellows

Schwarzer Runder Radish

Soil Nutrients and Requirements

Remove stones from loose, well drained soil with pH 5.8–6.8. Go easy on nitrogen, as excessive amounts can lead to big tops and little roots.

Planting depth: 1/4–1/2"

Plant spacing: for garden radishes 1", for daikon 4–6". Thin if necessary to ensure even sizing.

Row Spacing: For garden radishes 8–12", for daikon 12–16".

When to Sow

Radishes can be direct seeded as soon as soil can be worked and are best adapted to the cooler temperatures and shorter day-length of spring and fall. Optimal soil temperature for germination is 65–85°F. Seedlings emerge within a few days. Plant every 10 days for a continual supply. Winter radishes should be planted to mature around fall frost date.

Harvest

Harvest radishes on time as they do not hold well in the field, especially in warm weather when roots tend to become pithy and pungent.

Storage

Topped radishes will keep good quality for 3–4 weeks if store at near freezing temperatures with high humidity in semi-permeable containers.

Pest Info

- Flea beetles can present a problem, particularly for young plants, by chewing small holes in the leaves. Healthy plants usually outgrow the damage to produce a fine crop. Where undamaged leaves are desired or flea beetles are especially problematic, use floating row cover (see Supplies) from time of planting until two weeks after leaves emerge.
- Floating row cover also helps prevent the cabbage root maggot, which feeds on the plant roots.

Disease Info

- Like other crucifers, radishes can be subject to fungal diseases in wet seasons, such as Alternaria Leaf Spot and White Mold (sclerotinia).
- Clubroot is a soil borne disease which stunts the roots of the plants so that they are not able to develop normally. Rotate crops and add lime to raise soil pH to 7.2.

Watermelon Radish

START SEEDS DIRECTLY OUTDOORS

Plant watermelon radishes at midsummer for fall harvest only. They size up and get sweeter as temperatures drop at the end of the growing season. Sow seeds in well-worked, fertile soil in full sun. Space seeds 1 inch apart, in rows 6 inches apart. Cover 1/2 inch deep. Keep soil evenly moist and well weeded. If the first sowing comes up unevenly, replant right away.

GROWING NOTES

Thin seedlings early to stand 3 inches apart; Watermelon radishes get big, up to three or even four inches in diameter and need room to size up. These Asian-style radishes grow more slowly than spring radishes, so be sure they have consistent moisture for best quality and flavor. Protect with a barrier of floating row cover if marauding birds or insect pests are a problem.

HARVEST AND USE

For best quality, harvest watermelon radishes promptly when sized up 2 to 4 inches in diameter. Note: Interior flesh becomes rosy red when roots are fully mature. Their flavor will be milder and sweeter harvested in cool fall weather. These roots will keep their eating quality for weeks in your refrigerator. For a beautiful and colorful salad, make a plate of very thinly sliced watermelon radishes sprinkled with oil and rice wine vinegar or fresh lemon juice and chopped scallions.

Butterflay Spinach

Soil Nutrients and Requirements

Like all leafy greens, spinach thrives in fertile and moist soil. Spinach is sensitive to soil pH, preferring a range of 6.5–7. Magnesium deficiency manifests in yellowing leaves similar to nitrogen deficiency. Because spinach will carry excess nitrates if over fertilized, try correcting Magnesium first.

Seeding Depth

1/8–1/4"

Plant Spacing

For babyleaf ~40seeds/ft" in 2–4" bands, for bunching 2"

Row Spacing

For babyleaf space bands 1–2" apart, for bunching 12–18"

When to Sow

Direct seed as soon as soil can be worked in the spring, and again in the late summer–early fall. Greenhouse spinach is sown in early fall to give just enough time to germinate and produce a modest amount of leaf, but not grow so fast as to require a lot of upkeep. Seed germinates best when soil temperatures are 32–60°F and achieves the best quality when air temperatures are 55–60°F. Sow every 7 days for a continual harvest.

Harvest

Harvest individual leaves or cut baby leaves 1" above the ground. Harvest the entire plant for bunched spinach by cutting the whole plant right below its crown.

Storage

Store washed spinach at low temperatures and high humidity for 10–14 days.

Pest Info

- Aphids can be washed off plants with a hard stream of water. They have several natural predators that control populations including parasites (aphids appear grey or bloated), lady beetle larvae and lacewings.
- Leafminers are generally controlled by natural predators. Deep plowing in the spring can help, as well as controlling alternate hosts such as lambsquarter, chickweed, nightshade and plantain.

Disease Info

- Spinach is susceptible to downy mildew (*Peronospora farinosa* f. sp. *spinaciae*) and fusarium wilt (*Fusarium oxysporum* f. sp. *spinaciae*).
- Fusarium wilt is primarily soil borne, but can be spread over long distances by infected seed. Use only disease-free seed. Once introduced to the soil, fusarium wilt is difficult to eradicate. Crop rotations help eliminate inoculum, and the addition of lime at 2 tons per acre also reduces disease severity by increasing pH to alkaline levels that do not favor disease development.
- Downy mildew is not as persistent and its pressure can be reduced by three-year rotations with non-host crops.
- White rust can be a problem for spinach growers, primarily in southern climes; resistant varieties are now available.
- Cucumber mosaic virus, transmitted by aphids, causes stunting and underdevelopment in plants. Larvae of the Canada leafminer burrow into leaves causing blisters, making leaves unmarketable. Control insect pressure by using row cover and controlling weed hosts.

Butterflay Spinach

Propagation

SEED:

Seed Depth: 1/4–1/2"

Space Between Plants: 8–12"

Space Between Rows: 12–18"

Germination Soil Temperature: 45–70°F

Days for Germination: 7–14

Sow Indoors: 3 to 4 weeks before average last frost.

Sow Outdoors: Beginning in the early spring, when temperatures are consistently 45 to 50°F.

Climate

Prefers a mild climate and cool weather. Spinach is quite hardy and can withstand temperatures as cold as 20°F but prefers temperatures between 40–75°F. If you live in a cooler climate zone and are planting very early in the spring or overwintering your crops, cover with straw to keep plants protected in case of extreme cold snaps. If planted too late, your plants may come to maturity when it's too warm, and they'll likely bolt quickly and become bitter.

Light

NATURAL: Full sun. Partial shade in warmer weather.

ARTIFICIAL: Fluorescent bulbs are a good choice for spinach plants as they don't care for too much heat.

Growing Media

SOIL: Will grow in most soil types but prefers a slightly sandy substrate. A pH of 6.0 to 7.5 will keep plants healthy and nourished.

SOILLESS: Seeds will germinate in most soilless mixes and prefers those that are higher in nitrogen.

HYDROPONICS: Will thrive in hydroponic systems in media such as coco coir or perlite.

AEROPONICS: Will thrive in an aeroponic system.

Care

WATER: Requires low to moderate amounts of water but likes soil that is evenly moist. The highest amounts of water will be required when plants are still in their younger stages. This can be lessened as the plant matures.

NUTRIENTS: Requires moderate levels of nutrients. A balanced fertilizer of nitrogen, phosphorous, and potassium is preferred. Choose mixes that have higher amounts of nitrogen and potassium and lower levels of phosphorus for preparing the beds prior to planting.

FOLIAR: Apply compost tea or fish emulsion when plants have first been transplanted, about a month following, and just prior to harvest.

Renegade Spinach

Growing Instructions

Smooth, round leaves are perfectly cupped for bulky baby greens. Long stems make for easy harvest. Resistant to Downy Mildew (races 1-7) and CMV. Planting tips: Direct seed as soon as soil can be worked in spring; seed again in the late summer through early fall. Provide ample fertility and moisture. Baby leaf: sow 40 seeds/ft in 2-4' bands with $\frac{3}{4}$ ' between bands. Full-size: see planting chart for instructions. Sow every 7 days for a continual harvest.

Yellow Crookneck Summer Squash

Cucurbita pepo

CULTURE: Fertile, well-drained soil with a pH of 5.8–6.8 is best. Plastic mulch and fabric row covers (AG-19 grade) can aid plant establishment and exclude insect pests during the seedling stage. Row covers should be removed when plants begin to flower. Poor fruit development may indicate insufficient pollination. For highest quality fruit, succession plantings every 2–3 weeks may be needed.

PLANT SPACING: Space plants 18–24" apart in rows 6' apart. Wider spacing may allow for easier harvesting.

DISEASES: Common cucurbit diseases include powdery mildew, downy mildew, bacterial wilt, and phytophthora. Avoid problems with adequate soil drainage, good air flow, insect pest control, and crop rotation. If necessary, check with your local Cooperative Extension Service agent for specific control options.

INSECT PESTS: Cucumber beetles, squash bugs, and vine borers are all common pests for cucurbits. Protect young plants with floating row cover. Squash bug eggs found on the undersides of leaves may be crushed by hand. For vine borers, cut out of vines and hill soil over the wound. Keep field borders mowed and remove plant refuse in the fall; spring plow to bury pupae. Pyrethrin sprays may offer some control.

HARVEST FRUIT: For some varieties, it is common for the first fruits to be malformed, wither, or blacken, which indicates poor pollination and is usually remedied as more male flowers appear. Harvest regularly, 2–3 times a week, once plants begin to produce. Cut or gently twist off fruits when they have reached the desired size. For summer squash, 4–6". Handle with care to avoid scratching fruits.

HARVEST BLOSSOMS: Harvest male blossoms (with thin stems) or female blossoms (with thick stems and an immature fruit at the base of the flower) in mid to late morning when fully open. Clip flowers 1–2" below flower base. If a squash fruit crop is also desired from the same planting, only harvest male flowers, leaving a few to pollinate the female flowers.

STORAGE: Keep fruit at 40–50°F (5–10°C), 95% relative humidity for up to 2 weeks. Use as soon as possible for best quality.

DAYS TO MATURITY: From direct seeding; subtract about 14 days if transplanting.

Gardener's Sweetheart Organic Small-Fruited Tomato

Tomatoes

- **Days to maturity are from date of transplanting**
- **9,000 seeds per oz, 0.1 gram pkt ~30 seeds, 0.2 gram pkt ~60 seeds, 0.5 gram pkt ~150 seeds.**

Culture: Usually started indoors Feb–April. Minimum germination soil temperature 60°, optimal range 75–90°. Transplant after frost danger has passed. Avoid using fresh manure as it causes lush foliage with few ripe fruits. Instead use generous amounts of well-rotted cow or horse manure or compost to boost plant vigor, and crushed eggshells or gypsum at the bottom of each hole for calcium. Heavy phosphorus needs. Responds well to foliar sprays.

- **Determinate (Det.)** bush varieties may be staked, should not be pruned.
- **Indeterminate (Ind.)** climbing varieties are customarily staked and pruned. Tomato experts Carolyn Male and Kokopelli's Dominique Guillet both oppose pruning, arguing more abundant foliage provides more photosynthesis.

Organically and sustainably grown seed was rinsed with a sodium hypochlorite solution to reduce risk of seed-borne disease. This treatment poses no health risks.

Saving Seed: Saving tomato seed is easy! Remove stem-end and crush the fully ripe fruit into a container. Ferment uncovered for a few days until the slurry forms a moldy cap. Rinse in a fine strainer and dry seeds on a coffee filter. To ensure true-to-type seed, grow open-pollinated varieties and separate by 50 feet.

Diseases:

- ASC: Alternaria Stem Canker
- EB: Early Blight
- F: Fusarium
- GLS: Grey Leaf Spot
- LB: Late Blight
- N: Nematodes
- SEPT: Septoria Leaf Spot
- TSWV: Tomato Spotted Wilt Virus
- TMV: Tobacco Mosaic Virus
- V: Verticillium

Gardener's Sweetheart Organic Small-Fruited Tomato

Lycopersicon esculentum

(62 days) Open-pollinated. Indeterminate. These Sweethearts, borne on trusses, each with 6–8 bright red miniature heart-shaped fruits with a nipple on the end, came from a chance cross in master-seed-saver Will Bonsall's greenhouse. We used to think that a tough-skinned tomato couldn't harbor a deep rich flavor inside. Because they will keep seemingly forever on the vine, the trick is to wait to harvest until they are deep red—they'll keep getting sweeter and reach full flavor. Only then are they truly satisfying. This mating of juicy, flavorful but crack-prone Gardener's Delight with determinate paste tomato Royal Chico (good solids, dry pulpy flesh, tough skin and indifferent flavor) combines most of Delight's richness with some of Chico's toughness. Firm, hard fruits average 15–16g and don't fall apart or crack under any circumstances. Bring them inside, they will likely keep for weeks. Ideal in shish kabob, they probably would make a superb tomato sauce if one has the patience.

Open-pollinated Cherry, Grape & Salad Tomatoes

300–750 seeds/g unless otherwise noted.

Preventing Late Blight

Dry conditions spare us some years, but late blight is here to stay, especially for field-grown crops. Cool temperatures, moist conditions, still air and lack of sunshine favor sporulation; spores can occur and advance in any condition of high humidity. LB might spread quickly... or not; wind-borne spores can travel hundreds of miles on storm fronts, but also can be baked into submission by the hot sun. Once LB lesions develop on your plants take immediate action to halt the disease in hopes of salvaging a crop. Our recommendations:

- Where possible, use resistant varieties.
- Try to find tolerant cultivars—use anecdotal evidence and experiment.
- Grow your own tomato plants or buy locally grown seedlings. Avoid big-box seedlings. Know your farmer!
- Do not use saved potatoes as seed stock. Purchase only new certified disease-free seed potatoes. Click here for more potato-related late blight info.
- Plant in areas with full sun and few wind blocks. Avoid shade and moist environments. Facilitate air movement. Maintain high soil fertility.
- If you choose to spray, have a plan and materials on hand, so you can make quick and timely application(s) when conditions indicate. Order supplies from Organic Growers Supply
- Most market growers and many home gardeners now grow at least a portion of their tomatoes in high tunnels, which greatly reduces vulnerability though still requires vigilance.

Information Sources

- See vegetablemndonline.ppath.cornell.edu/ for excellent photos and info.
- University of Maine Cooperative Extension: Potato IPM bi-weekly tells where LB infections have been confirmed in Maine or the eastern United States, umaine.edu/potatoes, 1-888-USE-UMCE.
- Or use the forecast model uspest.org/risk/tom_pot_map to assess potential for spore germination and lesion formation in your area.

Pink Brandywine Organic Slicing Tomato

Lycopersicon esculentum

(82 days) Open-pollinated. Indeterminate with potato-leaf foliage. Pink Brandywine is the heirloom that launched a movement, leading many gardeners to be flavor-positive preservation-aware seed-savers. As Brandywine's popularity exploded, so did its production as commercial bulk seed. But like all heirlooms, our favorite old-fashioned OPs with their hand-selected hand-me-down genetics need special care. Fedco Seeds has partnered with Daniel and Corinne at Blackbird Rise of Palermo, Maine, to keep building the Brandywine legacy. Through multiple summers, they've grown hundreds of plants from our classic Sudduth/Quisenberry strain, selecting for that perfect Brandywine color, flavor, bountiful size and shape that says "homegrown comfort." The result is this extra-select strain of large oblate pink meaty beefsteaks, trending away from small-fruited, less-vigorous and late-ripening traits. Of course, that precious balanced deep flavor with perfect hints of tart still rings true! Oblate meaty beefsteak fruits average right around a pound, ripening unevenly throughout the season, often preferring cool early fall to peak heat of August.

Open-pollinated Slicers

250–650 seeds/g unless otherwise noted.

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Pink Brandywine Organic Slicing Tomato

Tomatoes

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- **9,000 seeds per oz, 0.1 gram pkt ~30 seeds, 0.2 gram pkt ~60 seeds, 0.5 gram pkt ~150 seeds.**

Culture: Usually started indoors Feb–April. **Minimum germination soil temperature 60°, optimal range 75–90°.** Transplant after frost danger has passed. Avoid using fresh manure as it causes lush foliage with few ripe fruits. Instead use generous amounts of well-rotted cow or horse manure or compost to boost plant vigor, and crushed eggshells or gypsum at the bottom of each hole for calcium. Heavy phosphorus needs. Responds well to foliar sprays.

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- **Indeterminate (Ind.)** climbing varieties are customarily staked and pruned. Tomato experts Carolyn Male and Kokopelli's Dominique Guillet both oppose pruning, arguing more abundant foliage provides more photosynthesis.

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Saving Seed: Saving tomato seed is easy! Remove stem-end and crush the fully ripe fruit into a container. Ferment uncovered for a few days until the slurry forms a moldy cap. Rinse in a fine strainer and dry seeds on a coffee filter. To ensure true-to-type seed, grow open-pollinated varieties and separate by 50 feet.

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- TMV: Tobacco Mosaic Virus
- V: Verticillium

Pruden's Purple Tomato

Solanum lycopersicum

DETERMINATE (Bush):Varieties do not need pruning and may be grown with or without support; fruit ripens within a concentrated time period.

INDETERMINATE (Climbing):Varieties should be staked, trellised, or caged, and pruned for best results; fruit ripens over an extended period.

CULTURE:Medium-rich soil with pH 6.0–6.8 preferred. Fertilize accurately since excess nitrogen causes rampant growth, rot, and delayed ripening. For short determinates, succession-plant every 4–6 weeks. Tomatoes typically germinate in 5–7 days.

TRANSPLANTING:Don't start too early—leggy, root-bound, or flowering transplants can cause stunting and reduce early production. About 5–6 weeks before transplanting, sow 1/4" deep in 20-row flats with 20 seeds/row, or in 200-cell trays with 1 seed/cell; lightly cover. Keep mix at 75–85°F (24–29°C) with moderate moisture. At first true leaf, pot-up to 50-cell trays or 4" pots, depending on expected transplant timing. Grow at constant 60–70°F (16–21°C) temp and use complete fertilizer until hardened-off. Supplemental lights and lower night temps control stretching. For earliest crop, plant under row cover around last frost date. Avoid exposing unprotected plants to consecutive nightly temperatures below 45°F (7°C). In rows 4–6' apart, space determinates 12–24" and indeterminates 24–36". Plant deeply to encourage adventitious rooting. Water seedlings with a high-phosphate fertilizer solution at planting to help boost early yields.

TRELLISING:Basket-weave by pounding 5–6' stakes every 2–3 plants, using heavier t-posts intermittently and at ends of beds. For tall indeterminates, consider short extensions or pruning once they outgrow a manageable size for easy harvest.

PRUNING:Indeterminates likely benefit by removing all suckers under the first strong branch directly below the first flower cluster. The lower bottom suckers often miss trellis supports, set fruit closer to soil, take energy from upper parts, and encourage spread of disease from soil. If needed later in season, consider thinning out leaves to increase airflow or topping plants to help finish ripening last fruits.

DISEASES & INSECT PESTS:Learn your common pests and options for control, including resistant cultivars and pesticides. Avoid wet leaves and handling when wet or using tobacco products. Manage plant debris and crop rotations.

HARVEST:Fruits ripen gradually from the blossom end to shoulders and from the base of clusters to the tips. Harvest softer fruit unstacked into shallow, padded trays. Use fully ripe fruit only for local retail or home-use. To deliver sound fruit, pick less ripe the further the distance and the longer the time between field and customer. Any fruit breaking color will still ripen post-harvest. Calyx can be removed or kept to prove freshness. If staking larger fruit with calyx on, consider trimming below shoulders when harvesting.

Moon & Stars Watermelon

Germination

8-10 days

Planting

Watermelons are tender annuals that require warm temperatures to germinate and fruit. Sow seeds directly into garden soil when all danger of frost is past. Plant ½" deep, 3 seeds per hill. Space hills 12-18" apart with 6' row centers. Thin to one strong seedling in every hill. Plants may be started indoors for transplanting. Sandy, well-drained soils are best.

Harvesting

95-100 days. Fruit is ripe when the nearest tendril is brown and dry; when the spot that touches the ground turns from white to yellow; when the blossom end is soft; and the fruit sounds hollow when tapped. Cut the fruit from the vine with a sharp knife or pruners.

Description

Moon and Stars watermelon sports dark green skin speckled with yellow spots of varying sizes. The vine is compact, making it ideal for small gardens. The flesh of the fruit is commonly red, yellow, or orange. The rind is thick and good for pickling, and the flesh has a sweet flavor. The fruit can grow up to 40 pounds under ideal conditions, though 10-15 pounds is more commonplace.

Modena Organic Zucchini

Cucurbita pepo

(45 days) F-1 hybrid. Glossy dark green Modena was another star of our 2019 trial of more than 20 modern zukes versus standard Raven. Slightly earlier than Raven, it quickly puts the sleek zuke-production pedal to the metal like a Ferrari Modena 360. The very open upright plant habit ensures easy unscratched harvest and no squash dragging in the dirt. Mild nutty flavor and fine-grained texture add to Modena's refinement. Resistant to PRSV, CMV, ZYMV.

Zucchini

130–240 seeds/oz. 1/8 oz packet sows 4–6 hills; 1 oz, 40 hills. The term zucchini, which means 'little squash' in Italian, was not in common parlance until the late '30s. Squash expert Amy Goldman, author of *The Compleat Squash*, traces the first true zucchini to 1901 in Milan, but vegetable marrows and cocozelles, now called zucchini, are considerably older.

Cucurbita pepo

One of the oldest domesticated species. Pepo derives from the Greek pepon, meaning 'ripened by the sun.' They have hard 5-sided ribbed stems, and fruits are usually ribbed. They also include summer squashes and small gourds, as well as some pumpkins.

Summer Squash

- About 200–320 seeds/oz for yellow, patty pan and Lebanese summer squashes; 1/2 oz packet sows 5–8 hills; 1 oz, 40–60 hills. About 130–240 seeds/oz for zucchini.
- Days to maturity are from direct seeding; subtract 20 days for transplants.

Culture: Tender, will not survive frost. Minimum germination temperature 60°, optimal temperature range 70–90°. Sow in hills 4' apart, 5 seeds/hill. Thin to 2–3 best plants. Or start indoors, 25 days before transplanting. Immediately install wire hoops and row cover to keep out cucumber beetles. Floating row covers, especially when used in low tunnels, provide extra heat and can hasten maturity by 1 to 2 weeks. Make succession plantings to ensure harvest through the entire frost-free season, insurance against powdery mildew and other diseases of tiring old plants. For best flavor pick summer squash when they are small. Don't leave oversized squash on the vines. It shuts down production.

Squash blossoms are a delicacy. Harvest male blossoms when fully open for salads or stuffing. Male blossoms typically precede females by about a week. Females have a bulge at the base of the blossom, an early stage of the fruit forming.

In early summer, a combination of cool, cloudy weather and declining bee populations may result in poor pollination causing low yields. Mites and colony collapse disorder have wiped out a high percentage of wild and domesticated honeybee colonies in the last 20 years, creating a real crisis for cucurbit growers.

Modena Organic Zucchini

Pests & Diseases: To combat squash bugs without using pyrethrum or neem: Protect young plants with row covers. Striped cucumber beetles and squash bugs overwinter in squash residues so burn or haul these away at season's end rather than cold composting them. By hand-picking them in June and July, I reduced an endemic problem and almost completely eliminated squash bug damage.

- CMV: Cucumber Mosaic Virus
- PM: Powdery Mildew
- PRSV: Papaya Ringspot Virus
- WMV: Watermelon Mosaic Virus
- ZYMV: Zucchini Yellows Mosaic Virus

Pest: Striped Cucumber Beetle

Cultural controls: use tolerant or resistant varieties, rotate crops, till under crop debris soon after harvest, use floating row covers until flowers appear, use plastic mulch, perimeter trap cropping (Black Zucchini and Blue Hubbard make particularly good trap crops), use yellow sticky strips, hand-pick early morning when beetles are very sluggish.

- Materials: Surround, Pyrethrum (PyGanic).

Pest: Squash Bug

Cultural controls: rotation, till in cucurbit debris before winter and plant a cover crop, boards on soil surface near squash will attract bugs overnight which can be killed, avoid mulching. Squash bugs lay their brown-brick red egg clusters on the underside of the foliage, often next to the central vein—destroy egg clusters on undersides of leaves.

- Materials: Pyrethrum on young nymphs, AzaMax.

Pest: Squash Vine Borer

Cultural controls: butternut squash is resistant, maximas & pepos susceptible; rotation, plow in squash vine debris soon after harvest, use floating row covers, watch for wilting plant parts and destroy borer within.

Disease: Powdery Mildew

Controls: Use small plots to slow spread, plant indeterminate (viney) varieties, control weed competition.

- Materials: sulfur and whole milk, mineral or other oils in combination with potassium bicarbonate.

Disease: Bacterial Wilt

Cultural control: Striped Cucumber Beetle is vector—control it; choose resistant varieties.

Hot Biscuits Organic Amaranth

Amaranthus cruentus

(65-75 days) Flaunts glorious 2' chestnut-bronze to copper-colored well-branched seedheads atop its majestic 4' stalks at maturity. Pinch back to facilitate branching. Wonderful decorative complement to the red amaranths, used as a garden backdrop or to give harvest arrangements a bright earthy autumnal color. Easy to grow. Also an underused food plant both for its seeds and its young leaves, though the seeds may require too long to mature in our climate. Replaces Copperhead, which was starting to exhibit red off-types.

Amaranth

Annual. A dual-purpose crop, both nutritious and decorative. From the Greek amarantos for 'unfading.' Used as an ornamental, especially in harvest arrangements. Amaranth was an extremely important food of the Aztecs. ~1,250 seeds/g.

Flowers

All flowers are open-pollinated except where noted.

Days in parentheses after a variety indicate days to first bloom.

Genovese Organic Basil

Ocimum basilicum

(70 days) Open-pollinated. The choice of many connoisseurs for making pesto. Also called Perfumed Basil. Leaves are slightly smaller and finer than Sweet Basil with more aroma and potency.

Basil

~600 seeds/g. Indispensable culinary herb, in cultivation for more than 3,000 years. By far our most popular herb.

Culture: Direct seed when soil warms in late spring or transplant after danger of frost in well-drained moderately rich soil. Young seedlings will damp off if heavily watered during cool cloudy weather. Water sparingly at first. Use row covers to enhance early season vigor and speed maturity. Thin to 8–12", top mature plants to induce branching and increase total yield. Harvest before plants blossom. Annual, absolutely intolerant of frost, damaged by temperatures in the mid-30s.

Diseases: Where so indicated our varieties have been sampled and found to be fusarium-free. While not a guarantee that the entire lot is fusarium-free, a negative test improves the odds. No samples were taken for varieties not so indicated.

Herbs

About medicinal herbs: Archeological evidence dates the medicinal use of herbs back 60,000 years to the Neanderthals. 85% of the world's population employ herbs as medicines, and 40% of pharmaceuticals in the U.S. contain plant-derived materials. Fewer than 10% of higher plant species have been investigated for their medicinal components. Interest in traditional herbal remedies continues to grow.

Statements about medicinal use of plants have not been evaluated by the FDA, and should not be used for the diagnosis, treatment, cure or prevention of any ailment. Before using or ingesting any medicinal plant, consult a healthcare practitioner familiar with botanical medicine.

Takinagawa Burdock and Resina Calendula, as well as oats, mammoth red clover and alfalfa in the Farm Seed section, also have medicinal uses. Medicinal herbs such as black cohosh, licorice, and many more are available as plants, and shipped in the spring with orders from our Trees division.

Culture: Some herbs are customarily grown from divisions because they cannot come true from seed, such as scented thymes and flavored mints. Some require fall sowing of fresh seed, such as sweet cicely and angelica.

Using herbs: Drying herbs at home is not difficult. Whole leaves retain their flavor at least a year. To substitute fresh herbs for dried in cooking, use triple the dried quantity called for in a recipe.

Rutgers Obsession DMR Basil

SOWING: Direct seed (recommended): Plant seeds 1/4" deep, 2-3 seeds per inch, in rows 18" apart. Firm the soil over the seeds. Thinning is not necessary, but a final spacing of 4-8" apart produces healthy, full plants. Note: Holy Basil requires some light for germination, so sow more shallowly than other basil. Transplant: Sow indoors 6 weeks prior to setting out. Plant 1/4" deep and keep at 70°F (21°C) for best germination. Transplant to the field when seedlings have 3-4 sets of leaves, spacing at 4-8" apart in rows 18" apart.

SOIL REQUIREMENTS: Moderately rich, moist soil. Basil is not drought tolerant and can be damaged by heat stress. Regular moisture throughout the growing season helps to ensure a good crop.

PLANT HEIGHT: Varies. See the product description for exact heights.

PLANT SPACING: 4-8".

HARDINESS ZONES: Annual.

HARVEST: Begin light harvesting after plants have become established. It is best done in the early morning when the temperature is cooler and the leaves are less likely to wilt. A full harvest should be completed just before the plants start to flower. Cut the entire plant 4-6" above the ground to promote a second growth. Leaves are easily bruised when picking, so handle carefully. Do not store at a temperature less than 50°F (10°C).

PELLETED SEED: If using pelleted seed, we recommend consistent soil moisture during the germination period. Pelleted seed must be kept cool and dry prior to planting, and should be used within one year of purchase.

Leisure Organic Cilantro

Coriandrum sativum

(55 days) Open-pollinated. Kick back! Leisure's excellent bolt resistance allows harvest at your leisure.

Cilantro

About 60 seeds/g.

Used for its fresh green foliage, its edible flowers that attract beneficial insects, and its dried seeds—coriander. Essential flavoring in Indian, Chinese, Southeast Asian, Persian, North African and Latin American cooking. Accentuates soups, salsas and bean dishes like no other herb.

Culture: Annual grows to 2' with whitish blooms. Make succession plantings in average well-drained soil and keep watered for lushest leaf production. Thin early. In warm locations will stand longest as a fall crop. Self-sows.

Herbs

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Culture: Some herbs are customarily grown from divisions because they cannot come true from seed, such as scented thymes and flavored mints. Some require fall sowing of fresh seed, such as sweet cicely and angelica.

Using herbs: Drying herbs at home is not difficult. Whole leaves retain their flavor at least a year. To substitute fresh herbs for dried in cooking, use triple the dried quantity called for in a recipe.

Santo Cilantro

Santo Cilantro Plant Care

Sow seeds at one to two per an inch at a depth of ½”and twelve to eighteen inches, center on center. Plant in well drained moist soil with access to full sun or light shade. For a maximum harvest, pinch the young plant back an inch to encourage a fuller plant. In hot weather Santo Cilantro bolts quickly, keep a close eye on it.

Growing Santo Cilantro Plants

In thirty days after planting, leaves will begin to appear, and they can be harvested once tender. After 45 days seeds can be harvested. This cilantro is a wonderful self sower. Plant twelve to eighteen inches apart to ensure it has enough room. The summer season is optimal for this cilantro, sow seeds in late spring. For warmer climates growing can be done in the fall.

Grow in your herb garden, window box, or in containers. If indoor planting is desired, choose a pot that is eighteen inches wide and ten to twelve inches deep. Place in a space where it can receive the most sun. Use a rich well-drained, organic soil. Transplant every four to five weeks.

Watering Santo Cilantro Plants

Water until the plant drains, wait until soil is dry to water again.

Feeding Santo Cilantro Plants

Apply a water-soluble, garden balanced fertilizer once the plant reaches two inches in height. This will help produce a healthy yield.

Bouquet Dill Organic

Anethum graveolens

(55 days) Bouquet is usually grown for dill weed production because its leaves are sweeter and more refined than those of Mammoth. Foliage should be harvested early, before seed stalks mature. Especially attractive to pollinators.

Dill

~500 seeds/g.

Name derived from the Norse dilla, meaning 'to lull,' as the plant is said to have soothing properties. Best known in this country for pickling, but essential for Russian, Polish and Hungarian cuisine. Annual, sometimes classed as biennial, grows to 4–5'. Self sows. Upright plant branches out from single stalk; the feathery leaves known as dill weed. Likes well-drained moderately rich soil.

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Using herbs: Drying herbs at home is not difficult. Whole leaves retain their flavor at least a year. To substitute fresh herbs for dried in cooking, use triple the dried quantity called for in a recipe.

Greensleeves Dill

Anethum graveolens

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Lemon Balm

Planting and Spacing

Lemon balm grows from 2 to 3 feet high and should be spaced 18 to 24 inches apart. Lemon balm prefers full sunlight but will tolerate light shade. Plants grown with some shade tend to produce larger and more succulent leaves.

Water

Lemon balm is a hardy perennial herb that grows best when it is not water stressed. Keep the soil moist, but not wet, or the plants will get root rot. Supply water through drip or overhead irrigation and mulch around the plants to conserve soil water.

Fertilizer

Lemon balm responds to general allpurpose fertilizer. Feed in the spring to encourage new growth and again after harvest to encourage additional leaf growth. Over-fertilization causes excessive growth and poor flavor development.

Mulching

Mulching helps conserve soil moisture, control weeds, and aids in plant survival over the winter. Organic mulches include grass clippings, bark, leaves, compost, or shredded newspapers.

Problems

Weeds

Weed control is very important because the presence of weeds in the dried product will reduce the quality of the herb. Lemon balm, like mint spreads rapidly (becomes weedy) and can take over an herb bed. Growing plants in containers helps control this problem. If planted in the soil, harvest the leaves regularly, remove the flowers before they set seed, and dig around the plant edges to reduce root spreading.

Insects and Diseases

Lemon balm is generally not bothered by insects or diseases because of its high natural oils concentration. Powdery mildew and root rots can be a problem if plants are over-watered. There have been reports of aphid and mite problems affecting plant growth.

Harvesting and Curing

Frequent harvest encourages branching and will keeps lemon balm bushy and compact. Harvest about one-third of the foliage at monthly intervals to encourage healthy growth. Harvest before the plant starts to bloom, being careful not to bruise the leaves. After harvesting, tie the stems in a bundle and hang them indoors out of direct sunlight or in a shady place to dry. Dried leaves retain their green color, but are not as fragrant as when used fresh. Carefully strip the dried leaves from the stems and store in airtight containers.

Zaatar Oregano Organic

Origanum syriacum

An oregano that carries a bit of zing, and is a necessary ingredient in the condiment za'atar. Mix with sumac, toasted sesame seeds, salt and sometimes a few other herbs to make the sprightly topping so essential to Middle Eastern cuisine. Bushy tender perennial, hardy to Zone 10, grown as an annual in colder climes. For most aromatic flavor, harvest before its small white flowers appear. Start seeds indoors or sow directly in the ground just prior to the last spring frost. ~4,650 seeds/g.

Oregano

The oregano genus has more than 50 species. The ancient Greeks gave it its name, meaning 'joy of the mountains.' These fragrant plants grow on steep rocky alkaline hills, filling Mediterranean mountainsides with their joyful cheer and intense scent. Not only has oregano flavored foods for thousands of years, but it also has medicinal uses, from relieving rheumatism and asthma to decongesting stuffy head colds.

Culture: Start indoors in spring for best results. Likes sun and light well-drained alkaline soil. Will lose potency if soil is overfed. Harvest when it is beginning to flower.

Herbs

About medicinal herbs: Archeological evidence dates the medicinal use of herbs back 60,000 years to the Neanderthals. 85% of the world's population employ herbs as medicines, and 40% of pharmaceuticals in the U.S. contain plant-derived materials. Fewer than 10% of higher plant species have been investigated for their medicinal components. Interest in traditional herbal remedies continues to grow.

Statements about medicinal use of plants have not been evaluated by the FDA, and should not be used for the diagnosis, treatment, cure or prevention of any ailment. Before using or ingesting any medicinal plant, consult a healthcare practitioner familiar with botanical medicine.

Takinagawa Burdock and Resina Calendula, as well as oats, mammoth red clover and alfalfa in the Farm Seed section, also have medicinal uses. Medicinal herbs such as black cohosh, licorice, and many more are available as plants, and shipped in the spring with orders from our Trees division.

Culture: Some herbs are customarily grown from divisions because they cannot come true from seed, such as scented thymes and flavored mints. Some require fall sowing of fresh seed, such as sweet cicely and angelica.

Using herbs: Drying herbs at home is not difficult. Whole leaves retain their flavor at least a year. To substitute fresh herbs for dried in cooking, use triple the dried quantity called for in a recipe.

Gigante D'Italia Parsley

SOWING

Indoor Mar-Apr

Outdoor Apr-May, Aug-Sept

TIMING

Germination 25-30 days

Harvesting 70-90 days

SPACING

When sowing 1-3 cm; Depth 0,5 cm

When thinning 10-20 cm

GROWING

Sunlight Full sun to partial shade

Soil Well-drained, moist and loamy soil

Watering Regular watering, allow to dry out

Feeding Heavy feeder

CARING

Expert tip Parsley seeds do not germinate easily. Soak parsley seeds in warm water for one day prior to planting them and maintain the soil temperature at minimum 20 °C for best results.

Don't give up just because they are slow to germinate!

SUPPORTING

Pollinators

Attracts bees and butterflies.

Pests

Repels asparagus beetles.

Moss Curled Parsley

Sowing: Most gardeners sow parsley seed indoors to give the plants a head start; soak the seeds overnight, then plant them 1/4" deep and keep them at 65–70 degrees F. Because parsley has a notorious habit of slow germination, don't expect to see sprouts for 3–5 weeks. Keep the soil evenly moist. Transplant the seedlings when the average outdoor soil temperature reaches 60 degrees F, spacing them 6" apart in full sun or partial shade. Parsley also grows well as a container plant.

Growing: Parsley has shallow roots, and should not be allowed to dry out for long. Mulch to help conserve moisture and control weeds.

Harvesting: Harvest the leaves as needed, taking the large outer leaves first and removing at least 10" of stem with the leaves to keep the plant healthy. The whole plant can be harvested at once, cutting it off just above ground level; more leaves will grow. Use immediately or freeze to preserve freshness.

Seed Saving: Though most varieties of parsley can survive below zero temperatures when mulched well, another method of overwintering is to dig up the entire plant, cut down the stems to 1", and plant it in sand; keep it in a 32–40 degrees F location until spring replanting. Watch the developing seed heads carefully, since they tend to shatter easily; pick each one as it becomes dry and mature. Additional drying time may be needed. Clean the seed by rubbing the heads through a screen or shaking them. Store the seed in a cool, dry place for up to 4 years.