Seed Bank Directory — 2026 Edition

The Complete World

A comprehensive planting manual for every major seed variety across all climate zones and regions of the world — from the Arctic to the Tropics.

50+ Seed Varieties	7 Climate Zones	6 Continents	2026 Edition

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For Canada, USA, Europe, Australia, Asia, Africa & South America

Important Notice

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Accuracy: Every effort has been made to ensure the accuracy of the information in this guide. However, growing conditions vary enormously and no guide can substitute for local knowledge and observation. The publisher assumes no liability for crop failures or plant losses arising from following this guide.

Table of Contents

CHAPTER 1

Understanding Climate Zones & Hardiness

Before planting anything, you must understand your climate.

The USDA Hardiness Zone System

The USDA Plant Hardiness Zone Map divides North America into 13 zones based on average annual minimum winter temperatures, ranging from Zone 1 (below -51°C / -60°F) to Zone 13 (above 21°C / 70°F). Canadian gardeners typically work in Zones 2–8. Hardiness zones tell you about cold tolerance only — they say nothing about heat, humidity, rainfall, or soil.

The Köppen Climate Classification

For a complete global picture, the Köppen-Geiger system divides Earth's climates into five main groups:

Code	Climate Type	Key Characteristics	Major Regions
A	Tropical	Year-round warmth, no true winter	Amazon, Central Africa, SE Asia, Caribbean
B	Arid/Semi-Arid	Low precipitation, high evaporation	Sahara, Arabian Peninsula, Australian Outback
C	Temperate	Mild winters, distinct seasons	W. Europe, Pacific Coast, Mediterranean, SE Australia
D	Continental	Cold winters, warm summers	Canada, Russia, N. USA, N. Europe
E	Polar/Alpine	No true warm season	Arctic, Antarctic, high mountain regions

Growing Season Length by Region

Region	Growing Season	Last Spring Frost	First Fall Frost
N. Canada (Zone 2–3)	90–120 days	Late May–Early June	Early September
S. Canada / N. USA (Zone 4–5)	120–160 days	Mid April–Mid May	Late September–October
Mid USA / Southern UK (Zone 6–7)	160–200 days	Late March–Mid April	October–November
S. USA / Mediterranean (Zone 8–9)	200–270 days	February–March	November–December
Subtropical (Zone 10)	300–330 days	January or no frost	December or no frost
Tropical (Zone 11+)	365 days	No frost	No frost
S. Australia / NZ	180–300 days	August–Sept (SH)	April–May (SH)

SOUTHERN HEMISPHERE NOTE

All season references default to the Northern Hemisphere. Southern Hemisphere gardeners (Australia, NZ, South Africa, S. America) should reverse seasons: plant in our autumn months (March–May) for their spring planting window (September–November).

CHAPTER 2

Soil Science for Gardeners

Soil pH, texture, structure and nutrition — the foundation of all plant growth.

Soil pH and Nutrient Availability

Soil pH affects nutrient availability profoundly. Even if nutrients are present, plants cannot absorb them if pH is outside their preferred range. Most vegetables thrive in a slightly acidic to neutral range of 6.0–7.0.

pH Range	Soil Type	Best Crops	Common Fix
4.5–5.5	Strongly acidic	Blueberries, cranberries	Add lime to raise pH
5.5–6.0	Moderately acidic	Potatoes, strawberries	Add lime gradually
6.0–7.0	Slightly acidic–neutral	Most vegetables and herbs	Ideal range — maintain with compost
7.0–7.5	Slightly alkaline	Brassicas, asparagus, spinach	Add sulphur or acidic compost
7.5+	Alkaline/Chalky	Lavender, limited crops	Raised beds with amended soil

The Three Macronutrients

Nitrogen (N) — promotes leaf and stem growth. Deficiency: pale yellow leaves, stunted growth. Sources: compost, blood meal, fish emulsion.

Phosphorus (P) — promotes root development, flowering, fruit set. Deficiency: purple-tinged leaves, poor root systems. Sources: bone meal, rock phosphate.

Potassium (K) — promotes plant vigour, disease resistance, fruit quality. Deficiency: brown leaf edges, weak stems, poor fruit. Sources: wood ash, greensand, kelp meal.

PRO TIP: THE LIVING SOIL

Healthy soil contains billions of bacteria, fungi, earthworms and other organisms per tablespoon. Every time you dig, you disrupt these communities. The no-dig approach — adding compost on the surface as a mulch — maintains soil structure, reduces weeds, and builds fertility faster than tilling.

CHAPTER 3

Leafy Greens & Salad Crops

Lettuce, kale, spinach, arugula, chard — fast, productive, and nutritious.

	Lactuca sativa | Easy | Annual
Days to Germination	4–10 days
Days to Harvest	45–80 days
Sowing Depth	3–6 mm (■–¼ inch)
Spacing	20–30 cm (8–12 inches)
Ideal pH	6.0–7.0
Hardiness Zones	Zones 2–11 (cool season)

Lettuce: World Growing Guide

★ *Canada & Northern USA (Zones 2–5)*

Direct sow as soon as soil can be worked — late March to May. Seed germinates in soil as cold as 2°C (35°F). Start indoors 4–6 weeks before last frost. Succession sow every 2–3 weeks for continuous harvest. Fall crop: sow 6–8 weeks before first fall frost (July–August). Overwinter in cold frames.

★ *UK & Western Europe*

Outdoor season March–October. Sow under cover February–March; transplant April–May. Winter growing possible in cold frames with hardy varieties like "Winter Density" and "Arctic King".

★ *Australia & New Zealand*

Cool regions: plant August–November (spring) and February–April (autumn). Tropical north: dry season only (April–September). In NZ, plant February–June for winter harvests.

★ *Southern USA (Zones 7–10)*

Primary season September–April. Summers too hot. Use shade cloth (30–40%) to extend spring and autumn seasons. In Zone 10 (S. Florida), plant October–February.

★ *India & South Asia*

October–February in northern plains. Year-round in hill stations (Shimla, Ooty, Kodaikanal). Not suitable for tropical lowlands without controlled environment agriculture.

★ *Africa*

South Africa (Cape region): March–August (cool season). East Africa highlands: year-round above 1,500m altitude. North Africa: October–March winter season. West Africa: cool dry season November–February.

	Brassica oleracea var. acephala | Easy | Annual/Biennial
Days to Germination	5–10 days
Days to Harvest	55–75 days
Sowing Depth	6–12 mm (¼–½ inch)
Spacing	45–60 cm (18–24 inches)
Ideal pH	6.0–7.5
Frost Hardiness	Hardy to -15°C (5°F)

Kale is one of the hardiest vegetables known, improving in flavour after frost as cold converts starches to sugars. In Canada, kale survives Zone 3–4 winters with minimal protection. Best varieties: "Lacinato/Dinosaur" (Italian, excellent flavour), "Siberian" (extreme cold hardiness), "Red Russian" (most tender), "Redbor" (purple-red, ornamental). In tropics and subtropics, grow during cool months.

	Spinacia oleracea | Easy | Annual
Days to Germination	7–14 days
Days to Harvest	37–50 days
Sowing Depth	12–18 mm (½–¾ inch)
Spacing	10–15 cm (4–6 inches)
Ideal pH	6.5–7.5
Frost Hardiness	Hardy to -9°C (15°F)

Sow in spring and autumn — spinach bolts rapidly in heat and long days. In Canada, sow April–May and August. In UK, sow March–May and August–October. In India, plant October–February. Choose slow-bolting varieties for best results. New Zealand spinach (Tetragonia) is a heat-tolerant summer alternative.

CHAPTER 4

Root Vegetables

Carrots, beets, radishes, turnips, parsnips and potatoes.

	Daucus carota subsp. sativus | Medium | Annual
Days to Germination	10–21 days
Days to Harvest	70–80 days
Sowing Depth	6 mm (¼ inch)
Spacing	5–8 cm (2–3 inches) after thinning
Ideal pH	6.0–6.8
Soil Requirement	Deep, loose, stone-free

Carrots are direct-sown only — they do not transplant. Loose, deep, stone-free soil is essential. Grow short varieties in heavy or clay soils. In Canada, sow April–July when soil reaches 7°C. In UK, sow March–July, protect with mesh against carrot fly. In Australia/NZ, sow March–August. In India, sow October–February in northern plains.

Common problems: Forked roots (stones or manure in soil), green shoulders (cover with soil), carrot fly (fine mesh barrier), cavity spot (calcium deficiency), cracking (irregular watering — mulch well).

	Solanum tuberosum | Easy | Perennial grown as annual
Days to Germination	14–28 days after planting
Days to Harvest	70–120 days (variety)
Sowing Depth	10–15 cm (4–6 inches)
Spacing	30 cm / 75 cm between rows
Ideal pH	5.0–6.0
Special Need	Earth up / hill regularly

Grown from "seed potatoes" not true botanical seeds. **Chitting** (pre-sprouting in cool light location 4–6 weeks before planting) is standard practice. Canada: plant mid-April (Zone 5–6) to mid-May (Zone 3–4). Short-season varieties: "Yukon Gold", "Norland", "Warba". UK: first earlies late March; maincrop April–May; harvest August–October. Southern hemisphere: plant September–October. India: plains plant October–December.

	Beta vulgaris | Easy | Annual/Biennial
Days to Germination	5–10 days
Days to Harvest	50–70 days
Sowing Depth	2.5 cm (1 inch)
Spacing	10 cm (4 inches) after thinning
Ideal pH	6.5–7.5
Note	Each "seed" contains 2–4 seeds

Direct sow 4–6 weeks before last frost. Thin to strongest seedling at 5 cm tall — thinnings are edible. Both roots and leaves are edible. Sow every 3–4 weeks from spring through mid-summer. In UK, sow April–July. In Canada, sow May–June. In Australia/NZ, sow February–May for winter harvest.

CHAPTER 5

Brassicas: The Cabbage Family

Broccoli, cabbage, cauliflower, Brussels sprouts — nutritious, globally important.

	Brassica oleracea var. italica | Medium | Annual
Days to Germination	5–10 days
Days to Harvest	60–100 days from transplant
Sowing Depth	Start 6–8 weeks before LF
Spacing	45–60 cm (18–24 inches)
Ideal pH	6.0–7.0
Nutrition	Heavy feeder — high nitrogen

Heavy feeding cool-season crop sensitive to heat. Canada: start indoors February–March, transplant 2–4 weeks before last frost. Fall crop: start June–July, transplant outdoors. UK: spring heading types (over-wintered), summer types sown February–March, calabrese sown April–June, purple sprouting broccoli sown May–June for spring harvest the following year.

CROP ROTATION MANDATORY

Never grow brassicas (broccoli, cabbage, cauliflower, Brussels sprouts, kale, radish, turnip) in the same ground more than once every 3–4 years. Club root is a devastating, persistent soil pathogen with no chemical cure. Prevention through rotation is the only reliable strategy.

Cabbage (Brassica oleracea var. capitata)

One of the world's most universally grown vegetables — a staple from Korea (kimchi) to Germany (sauerkraut) to Eastern Europe, Scandinavia, Russia, and across Africa. Growing requirements similar to broccoli but more heat and cold tolerant. In Canada, grow spring and autumn crops. In tropics, grow during cool highland seasons. Chinese cabbage (napa) is faster-maturing and particularly well-suited to Asian growing conditions.

Brussels Sprouts

The longest season of all brassicas — 120–180 days from transplant. Start indoors in Canada and UK April–May for autumn/winter harvest. In Canada, brussels sprouts are challenging except in Zone 6+ with reliable long summers. In UK, they are a traditional Christmas table staple. Requires a hard frost to convert starches to sugars — do not harvest until after first frost.

CHAPTER 6

Tomatoes & the Nightshade Family

Tomatoes, peppers, aubergines — warmth-loving crops that reward careful growing.

	Solanum lycopersicum | Medium | Annual (tender perennial)
Days to Germination	6–14 days at 21–27°C
Days to Harvest	60–85 days from transplant
Sowing Depth	Start 6–8 weeks before LF
Spacing	60–90 cm (24–36 inches)
Ideal pH	6.0–6.8
Min. Soil Temp	16°C (60°F) to plant out

Determinate vs. Indeterminate: Determinate (bush) varieties stop growing at a set height and ripen all fruit in a defined period — ideal for short seasons and canning. Indeterminate (cordon/vining) types grow and produce continuously until frost — higher yield, require staking and side-shoot removal.

★ *Canada (Zones 3–6)*

Start seeds indoors under grow lights 6–8 weeks before last frost (typically February–April). Do not transplant until night temperatures exceed 10°C consistently. Zone 3–4 best varieties: "Sub Arctic Plenty" (55 days), "Polar Beauty" (55 days), "Glacier" (55 days). Zone 5–6 broader selection: "Brandywine", "Cherokee Purple", "Sungold", "San Marzano". Use black plastic mulch and Wall-O-Waters for earlier planting.

★ *UK & Northern Europe*

Almost all UK tomatoes require greenhouse or polytunnel protection. Start late February–March under lights. Outdoor growing possible in southern England in warm summers with south-facing wall shelter. Best outdoor UK: "Gardeners Delight", "Tumbling Tom". Best greenhouse: "Alicante", "Moneymaker", "Black Cherry".

★ *Southern USA (Zones 7–10)*

Two seasons: spring (transplant Feb–April) and fall (start seeds late June–July, transplant Aug–Sept). Summer heat prevents fruit set — flowers drop above 35°C day or 21°C night.

★ *Australia & New Zealand*

Plant September–November (spring) in cool/temperate regions. Queensland and tropical north: plant March–May (autumn). Use heat-tolerant varieties in hot humid climates: "Grosse Lisse", "Tommy Toe",

"Apollo".

★ *India & South Asia*

October–January in northern plains; June–August in hills. Use disease-resistant varieties: "Pusa Ruby", "Arka Vikas". East Africa highlands: year-round above 1,500m altitude — "Money Maker" and "Kilele F1" are widely grown.

TOMATO PROBLEMS REFERENCE

Blossom end rot: calcium/irregular watering — mulch and maintain consistent moisture. Blight: use resistant varieties, avoid overhead watering. Blossom drop: temperature extremes. Cracking: irregular watering — mulch. Hornworms: hand-pick or use Bacillus thuringiensis spray. Whitefly: yellow sticky traps, insecticidal soap.

	Capsicum annuum / chinense | Medium | Annual
Days to Germination	10–21 days at 27–30°C
Days to Harvest	70–90 days from transplant
Sowing Depth	Start 8–10 weeks before LF
Spacing	Min. soil temp 18°C
Ideal pH	6.0–6.8
Heat Requirement	Higher than tomatoes

Peppers need more heat and a longer season than tomatoes. Use heat mats for germination. In Canada: focus on 70–80 day varieties for sweet peppers and jalapeños. In UK: almost exclusively greenhouse/polytunnel crop. In tropical regions: year-round staple — grow during dry seasons for concentrated flavour and reduced disease pressure.

CHAPTER 7

Legumes: Beans & Peas

Nitrogen-fixing, protein-rich, globally adaptable food crops.

	Phaseolus vulgaris / coccineus | Easy | Annual
Days to Germination	7–14 days
Days to Harvest	50–70 days
Sowing Depth	4–5 cm (1.5–2 inches)
Spacing	15 cm (6 inches) in-row
Ideal pH	6.0–7.0
Note	Direct sow only after all frost risk

Beans fix atmospheric nitrogen — do not fertilize with high nitrogen. Direct sow only when soil reaches 15°C (60°F). In Canada, sow late May–June; succession sow every 2–3 weeks. Best short-season varieties: "Provider", "Contender", "Masai". In UK, sow May–July outdoors. In tropics, use yard-long beans or cowpeas which are better heat-adapted than common beans. Harvest daily for continued production.

	Pisum sativum | Easy | Annual
Days to Germination	7–14 days
Days to Harvest	55–80 days
Sowing Depth	2.5–5 cm (1–2 inches)
Spacing	5–8 cm (2–3 inches)
Ideal pH	6.0–7.5
Frost Tolerance	Hardy to -4°C once established

Cool-season crop tolerating frost. Sow in soil as cold as 4°C. Canada: sow as soon as soil is workable March–May. UK: sow February–June outdoors. Australia: sow March–July in temperate regions. Provide trellis support. Sugar snap peas are the most versatile — eat pod and all at any stage.

CHAPTER 8

Cucurbits: Squash, Cucumber, Melon & Pumpkin

Space-hungry, warmth-loving crops that produce abundantly in the right conditions.

	Cucumis sativus | Easy | Annual
Days to Germination	5–10 days at 24°C
Days to Harvest	50–70 days
Sowing Depth	Start 3–4 weeks before LF
Spacing	30–45 cm on trellis
Ideal pH	6.0–6.8
Key Tip	Harvest frequently for continued production

Train vertically on a trellis for space efficiency and better airflow. In Canada, start indoors 3–4 weeks before last frost — do not over-start as root-bound transplants fare poorly. In UK, outdoor cucumbers are challenging — greenhouse types more reliable. In tropical regions, grow during the dry season to reduce fungal disease. Powdery mildew is the main disease challenge — choose resistant varieties.

	Cucurbita maxima / moschata / pepo | Medium | Annual
Days to Germination	7–14 days
Days to Harvest	90–120 days (winter squash)
Sowing Depth	Start 3–4 weeks before LF
Spacing	1.5–2.5 m (5–8 feet)
Ideal pH	6.0–6.8
Special Need	Rich soil, plenty of space

Pumpkins need 90–120 days and substantial space. In Canada Zone 3, use compact varieties: "Delicata", "Sweet Dumpling" (85 days). In tropics, pumpkins and squash are year-round staple crops across Southeast Asia and Sub-Saharan Africa.

CHAPTER 9

Alliums: Onion, Garlic, Leek & Shallot

The flavour foundations of world cuisine.

Day-Length Critical: Onion bulb development is triggered by day length. Long-day varieties (14–16 hours) for northern latitudes (Canada, UK, Scandinavia). Short-day varieties (10–12 hours) for southern latitudes (S. USA, India, tropics). Using the wrong type produces scallions (never bulbs) or immediate bolting. This is the most common onion failure.

	Allium cepa | Medium | Annual/Biennial
Days to Germination	7–14 days
Days to Harvest	100–120 days (seed); 60–80 (sets)
Sowing Depth	Start 10–12 weeks before LF
Spacing	10 cm (4 inches)
Ideal pH	6.0–7.0
Day Length	CRITICAL — choose correct type

Canada and N. USA: long-day varieties. Start seeds indoors January–February. Plant sets March–May. UK: traditional autumn planting of over-wintering sets (Sept–Oct) for July harvest; spring sets planted March–April.

Garlic (Allium sativum)

Planted as cloves in autumn. Canada and UK: plant October–November for July–August harvest. Hardneck types for cold climates; softneck for warmer climates and longer storage. In southern hemisphere: plant March–April for December harvest. Not well-suited to true tropical lowlands.

CHAPTER 10

Culinary & Medicinal Herbs

From basil to lavender — herbs are among the most rewarding plants for any gardener worldwide.

Herb	Type	Zones	Days to Harvest	Key Notes
Basil	Annual	All (warm)	30–60 days	Loves heat. Pinch flowers. Cannot tolerate cold.
Cilantro	Annual	All (cool)	21–28 days	Bolts in heat. Succession sow every 2 weeks.
Dill	Annual	All zones	40–60 days	Direct sow only. Reseeds freely.
Parsley	Biennial	Zones 2–11	70–90 days	Slow to germinate. Soak seed 24h before sowing.
Oregano	Perennial	Zones 4–11	90 days (yr 1)	Harvest just before flowering for strongest flavour.
Thyme	Perennial	Zones 4–9	90 days (yr 1)	Drought tolerant once established.
Rosemary	Perennial	Zones 6–11	Second season	Slow from seed. Not hardy below Zone 6.
Sage	Perennial	Zones 4–8	75 days (yr 1)	Well-drained soil. Very drought tolerant.
Lavender	Perennial	Zones 5–9	Second season	Alkaline soil preferred. Excellent bee plant.
Chamomile	Ann/Per	Zones 3–9	60–65 days	German (annual) vs Roman (perennial). Self-seeds.
Mint	Perennial	Zones 3–8	90 days (yr 1)	Invasive — grow in containers or with root barriers.
Echinacea	Perennial	Zones 3–9	Second year	Native to N. American prairies. Medicinal.
Lemongrass	Trop. Per	Zones 9–11	Second season	Annual in Zones 6–8 or overwinter indoors.

TROPICAL HERBS NOTE

Many European herbs struggle in tropical heat and humidity. Instead, grow heat-adapted herbs: lemongrass, Thai basil, turmeric, ginger, kaffir lime, galangal, pandan. In India, Tulsi (Holy Basil, Ocimum tenuiflorum) is among the most important medicinal herbs — extremely easy to grow year-round throughout the subcontinent.

CHAPTER 11

Fruit Trees: Temperate Varieties

Apple, pear, peach, cherry, plum — long-term investments rewarding decades of harvests.

Most temperate fruit trees require a certain number of "chill hours" — hours below 7°C (45°F) during winter dormancy — to flower and fruit properly. Using incorrect chill-hour varieties is a leading cause of failure in warmer climates.

Fruit Tree	Zones	Chill Hours	Years to Fruit	Self-Fertile?	Notes
Apple	Zones 3–8	500–1,000 hrs	3–5 yrs (grafted)	No (most)	Needs 2 compatible varieties
Peach	Zones 4–9	600–900 hrs	2–4 years	Yes (most)	"Reliance", "Contender" for cold climates
Pear	Zones 3–8	600–900 hrs	4–6 years	No (most)	Asian pears: self-fertile, warmer zones
Sweet Cherry	Zones 5–7	800–1,200 hrs	4–7 years	No (most)	"Stella", "Lapins" are self-fertile
Sour Cherry	Zones 4–8	400–700 hrs	3–5 years	Yes	"Montmorency" is standard. Hardy.
European Plum	Zones 4–8	700–1,000 hrs	3–6 years	Varies	"Stanley", "Damson" self-fertile
Apricot	Zones 5–8	300–900 hrs	3–5 years	Yes (most)	Late frost during bloom is main challenge

Planting Guidance

Plant bare-root trees when dormant (late autumn to early spring). Dig a hole wider than deep — do not plant in frost pockets. The bud union (swollen point near base) must sit above soil level. Stake for 2 years to prevent wind-rock. Mulch with compost 5–8 cm deep, keeping mulch away from trunk.

CHAPTER 12

Fruit Trees: Tropical & Subtropical

Avocado, mango, papaya, citrus, banana, fig — the world's most exotic fruits.

Avocado (Persea americana)

For the complete avocado growing guide, see the blog section of Seed Bank Directory. Growing summary: subtropical to tropical (Zones 9–12); 5–13 years from seed, 3–4 from grafted tree; requires excellent drainage; frost-tender. Can be grown as a houseplant in all zones but is unlikely to fruit indoors without supplemental light and pollination assistance.

Mango (Mangifera indica)

Requires warm temperatures, a distinct dry season to trigger flowering, and full sun. Southeast Asian polyembryonic varieties produce seedlings true-to-type from seed. Monoembryonic types (Florida/Caribbean) produce variable seedlings. From seed: 5–8 years to fruit. From graft: 2–4 years. Grows across South and Southeast Asia, tropical Africa, the Caribbean, and Central and South America.

Papaya (Carica papaya)

One of the fastest tropical fruits — flowers within 6–12 months of planting. Plant at start of rainy season in tropical regions; spring in subtropical areas. Requires full sun and excellent drainage. Plant several seeds to ensure pollination (separate male/female plants unless using hermaphrodite varieties).

Citrus (Lemon, Orange, Lime, Grapefruit)

Climate range from Zone 8 (Meyer lemon with protection) to Zone 11. In cooler climates (UK, Canada), grow in containers — outdoors in summer, indoors before frost. Plants from seed take 5–15 years to fruit; grafted trees begin earlier.

Fig (Ficus carica)

More cold-hardy than most tropicals — some varieties to Zone 6 with protection. "Brown Turkey" and "Chicago Hardy" are the most cold-tolerant. In the UK, grow against south-facing walls with root-restricting pits. In Canada, grow in large containers brought indoors for winter.

CHAPTER 13

Berry Bushes & Fruiting Shrubs

Blueberries, raspberries, strawberries, elderberries — highly productive garden plants.

Berry	Zones	Soil pH	Years to Full Production	Key Notes
Blueberry	Zones 3–7	4.5–5.5 (acidic)	3–4 years	Must acidify soil. Needs 2+ varieties. Bird netting essential.
Raspberry	Zones 3–9	5.5–6.5	2 years	Summer or autumn bearing. Cut back canes after fruiting.
Blackberry	Zones 5–9	5.5–7.0	2 years	Thorned or thornless. More vigorous than raspberries.
Strawberry	Zones 3–10	5.5–6.5	Year 1	June-bearing, everbearing, or day-neutral types. Replace every 3–4 yrs
Elderberry	Zones 3–8	5.5–6.5	2–3 years	Vigorous, disease-resistant. Berries must be cooked before eating.
Gooseberry	Zones 3–6	6.0–6.5	2–3 years	Underused, extremely productive. Tolerates shade.
Haskap/Honeyberry	Zones 2–6	6.0–7.0	2–3 years	Extremely cold-hardy. First fruit of the year in northern gardens.

CHAPTER 14

Fruiting Vines: Grape, Kiwi & Hops

Long-lived, productive vines that transform any garden support structure.

Grape (Vitis vinifera and hybrids)

European wine grapes suited to Zones 5–9. Cold-hardy Canadian hybrid varieties for Zones 3–5: "Marquette", "Frontenac", "La Crescent", "Louise Swenson". Canadian wine regions: Okanagan (BC), Niagara Peninsula and Prince Edward County (Ontario). Plant dormant canes in early spring. Prune annually when dormant. Guyot system is most common for production; overhead pergola for home gardens. Growing from seed produces variable results — use cuttings or grafted vines.

Hardy Kiwi (Actinidia arguta)

Produces small smooth-skinned fruit hardy to Zone 3. Vigorous, long-lived (decades), and very productive. Requires male and female plants (1:6–8 ratio). Canada: genuinely viable long-term food garden plant. Fuzzy kiwi (supermarket type) requires Zones 7–9 minimum.

Hops (Humulus lupulus)

Herbaceous perennial dying back in winter (hardy to Zone 4). Vines reach 5–7 metres in one season. Only female plants produce hop cones. Plant from rhizomes, not seed. Canada: grown Zone 4+. UK: traditional hop gardens in Kent are a cultural landscape. Harvest late summer when cones are papery and fragrant.

CHAPTER 15

Flowers & Companion Plants

Sunflowers, marigolds, nasturtiums, cosmos — edible, ornamental, and essential.

The "Three Sisters" intercropping system — corn, beans, and squash grown together — is a 10,000-year-old Indigenous North American agricultural technology validated by modern science. Corn provides trellis for beans; beans fix nitrogen for all three; squash mulches the ground preventing weeds and retaining moisture.

Flower	Type	Zones	Companion Benefits	Notes
Marigold (Tagetes)	Annual	All zones	Repels nematodes, aphids; attracts pollinators	Universally adaptable. Sacred in India. Easy seed saving.
Nasturtium	Annual	All zones	Trap crop for aphids; edible flowers and leaves	Thrives in poor soil. Self-seeds in mild climates.
Sunflower	Annual	All (warm)	Attracts pollinators; edible seeds	Major commercial crop in Ukraine, Russia, Argentina.
Cosmos	Annual	All (warm)	Attracts beneficial wasps; pollinators	Very easy, fast, self-seeds. Direct sow after frost.
Borage	Annual	All zones	Repels hornworm; edible flowers; attracts bees	Self-seeds prolifically. Blue star flowers.
Calendula	Annual	All (cool)	Attracts beneficials; edible; medicinal	Hardy, tolerates frost. Grow spring and autumn.
Echinacea	Perennial	Zones 3–9	Attracts native bees; medicinal	Native to North American prairies.
Milkweed	Perennial	Zones 3–9	Essential for monarch butterfly	Critical for conservation. Multiple species available.
Lupine	Ann/Per	Zones 3–7	Nitrogen fixer; attracts pollinators	Hardy. Beautiful spike flowers.

CHAPTER 16

Sprouts, Microgreens & Wheatgrass

The fastest food you can grow — harvest in days. Grown indoors anywhere in the world.

Sprouts and microgreens can be grown anywhere in the world at any time of year — no outdoor space, no weather concerns. They are among the most nutritionally dense foods available — some microgreens contain 4–40 times the nutrient density of their mature counterparts.

Sprouting

Requires only seeds, a jar, and water. Rinse twice daily. Keep in indirect light. Harvest in 2–7 days. Best sprouting seeds: alfalfa (3–5 days), broccoli (4–6 days, high sulforaphane), radish (3–4 days, spicy), mung bean (4–5 days), lentil (3–4 days), chickpea (3–4 days). Food safety note: rinse thoroughly and keep clean — immunocompromised individuals should cook sprouts before eating.

Microgreens

Microgreen	Days to Harvest	Flavour	Nutrition Highlights
Sunflower	10–14 days	Nutty, crisp	High protein, vitamin E
Pea shoot	12–18 days	Sweet, delicate	Vitamins A, C, K
Radish	6–10 days	Spicy, peppery	Vitamin C, folate
Broccoli	8–12 days	Mild brassica	High sulforaphane (anti-cancer research)
Beet	10–14 days	Earthy, sweet	Betalains, iron
Basil	14–21 days	Intense basil	Antioxidants, vitamin K
Wheatgrass	7–10 days	Grassy, intense	Chlorophyll, iron, B vitamins

CHAPTER 17

Cover Crops & Soil Builders

Clover, buckwheat, vetch, rye — plants that feed the soil, not the gardener.

Cover Crop	Season	Key Benefits	Zones	Termination
Red Clover	Spring/Summer	N-fixation (150 kg N/ha), pollinator forage	Zones 3–9	Turn in before flowering
White Clover	Year-round	Living mulch, nitrogen, low-growing	Zones 3–9	Mow or turn in
Buckwheat	Summer	Fast, weed-suppressing, phosphorus release	Zones 3–10	Incorporate before seed set (35 days)
Hairy Vetch	Autumn/Winter	Winter-hardy nitrogen fixer, 100–200 kg N/ha	Zones 4–9	Terminate in spring before planting
Winter Rye	Autumn/Winter	Winter-hardy, breaks compaction, suppresses weeds	Zones 3–8	Roll/crimp at heading stage
Phacelia	Spring/Autumn	Exceptional pollinator forage	Zones 4–9	Turn in before or at flowering
Mustard	Spring/Autumn	Biofumigation — suppresses soil pathogens	Zones 3–9	Chop and incorporate at flowering

CHAPTER 18

Grain & Staple Crops

Corn, wheat, quinoa, amaranth — growing the foundations of human civilization.

Corn / Maize (Zea mays)

Wind-pollinated — must be planted in blocks (minimum 4×4 rows) not single rows. Requires warm soil (above 16°C / 60°F) and high nitrogen. In Canada: grow short-season varieties (65–75 days) from Zone 3 onward. In tropical regions: staple food crop grown year-round at appropriate altitudes worldwide.

Wheat (Triticum aestivum)

World's most important grain crop. Winter wheat sown in autumn, harvested following summer — higher yields. Spring wheat sown early spring, harvested late summer. Harvest when heads turn golden and grain is hard. Store at less than 12% moisture content for years.

Quinoa (Chenopodium quinoa)

Native to the Andes — highly nutritious pseudo-grain. Increasingly viable in temperate climates including UK, Netherlands, and Canada. Tolerates frost, poor soils, and drought. Sow after last frost. Rinse seeds thoroughly before eating to remove bitter saponin coating.

Amaranth (Amaranthus spp.)

Grown for grain and edible leaves. Staple crop of Central American, Indian, and African agriculture. Extremely heat and drought tolerant — excellent for warm, dry climates. High in protein, lysine, and iron — nutritionally superior to most cereal grains.

CHAPTER 19

Regional Planting Calendars

Month-by-month guides for Canada, UK, Australia, and India.

Canada — Zone 5 (Southern Ontario / S. BC Interior)

Month	Start Indoors	Plant Outdoors	Harvest
January	Onion, leek, celeriac	—	Stored crops only
February	Tomato, pepper, eggplant, broccoli	—	Stored crops
March	Herbs, lettuce, kale	Peas, spinach (cold frame)	Overwintered greens
April	Cucumbers, squash, melons	Lettuce, radish, beets, carrots, kale	Early spinach
May	—	Beans (end), corn, transplant tomatoes/peppers after LF	Lettuce, radish, peas
June	—	All warm crops; succession sow beets, carrots, beans	Lettuce, radish, peas, herbs
July	Broccoli, kale (fall)	Succession sow lettuce, beans, beets, carrots	Beans, cucumber, zucchini, berries
August	—	Fall crops: spinach, lettuce, kale, arugula, radish	Tomatoes, peppers, corn, squash
September	—	Last fast sowings (radish, spinach)	Main harvest season — all crops
October	—	Plant garlic for next year	Squash, pumpkins, root vegetables
November	—	Mulch garlic, protect perennials	Root vegetables (mulched in ground)
December	—	—	Stored crops, root cellar

United Kingdom — Temperate Maritime (Zone 8)

Month	Under Glass	Outdoors	Harvest
January	Onion, leek from seed; chit potatoes	—	Parsnips, leeks, kale, sprouts
February	Tomato, pepper, aubergine, celeriac	Broad beans (mild areas)	Kale, PSB, leeks
March	Herbs, lettuce, calabrese	Peas, spinach, lettuce (cold frame), 1st early potatoes	Purple sprouting broccoli
April	Courgette, cucumber, squash, French beans	Carrots, beets, parsnips, onion sets	Asparagus (est. beds)
May	—	All half-hardy plants; maincrop potatoes, salads, beans	Salads, radish, peas
June	—	Succession: lettuce, chard, beans, courgette	Peas, broad beans, strawberries
July	—	Brassicas for autumn; succession lettuce	Beans, courgette, cucumbers, berries

Month	Under Glass	Outdoors	Harvest
August	—	Autumn lettuce, Oriental greens, spinach, turnips	Outdoor tomatoes (S. UK), apples, plums
September	—	Winter salads under cover, garlic planting	Main harvest — all crops
October	Winter lettuce (cold frame)	Garlic, overwintering onion sets	Squash, pumpkins, late apples
November	—	—	Leeks, kale, parsnips, Brussels sprouts
December	—	—	Sprouts, kale, parsnips, leeks, stored

Australia — Cool Temperate (Victoria, Tasmania) — SOUTHERN HEMISPHERE

Note: All months are Southern Hemisphere months. Seasons are reversed from the Northern Hemisphere.

Month	Sow Indoors	Sow/Plant Outdoors	Harvest
Jan–Feb (Summer)	—	Leek, onion, brassicas (for autumn)	Tomatoes, beans, zucchini, capsicum, stone fruit
Mar–Apr (Autumn)	Tomatoes, capsicum (heated propagator)	Brassicas, peas, broad beans, garlic, lettuce	Late tomatoes, start of autumn crops
May–Jul (Winter)	Tomatoes, peppers (heated propagator, early)	Brassicas, peas, broad beans, silverbeet	Winter brassicas, root veg, leeks
Aug–Sep (Spring)	Warm season crops (tomatoes, capsicum, cucumber)	Lettuce, peas, radish, spring onions	Brassicas, leeks, broad beans
Oct–Nov (Spring)	—	Tomatoes, zucchini, cucumber, corn, beans (after last frost)	Lettuce, peas, strawberries
Dec (Summer)	—	Succession warm crops	Early tomatoes, zucchini, beans, berries

CHAPTER 20

Seed Saving & Long-Term Storage

How to save seeds from your best plants and store them for years or decades.

Only open-pollinated (OP) and heirloom seeds can be saved to produce true-to-type offspring. F1 hybrid seeds do not breed true. Seed saving connects gardeners to a 10,000-year tradition of human agriculture.

Difficulty	Crops	Key Challenge	Isolation Distance
Easy	Lettuce, tomato, pea, bean, pepper	Minimal crossing — self-pollinating	3–6 metres (most self-pollinators)
Moderate	Squash, cucumber, melon, corn	Cross-pollination between varieties	400–800 metres (cross-pollinators)
Advanced	Brassicas, onion, beet, carrot, parsnip	Biennial or complex pollination	400–1,600 metres

Optimal Storage Conditions

Seeds store longest when cool, dark, and dry. The sum of temperature (°F) + relative humidity (%) should be less than 100 for long-term storage. Ideal: 4°C (40°F), below 40% humidity. Store in sealed glass jars with silica gel desiccant packets in a refrigerator.

Crop	Seed Viability	Notes
Onion, parsnip, parsley	1–2 years	Replace annually for best germination rates
Pepper, corn, okra	2–3 years	Decline significantly after 2–3 years
Carrot, pea, bean	3–4 years	Good viability with proper storage
Tomato, cucumber, squash	4–6 years	Excellent long-term viability
Lettuce, radish, beet	4–6 years	Test germination before planting old stock
Brassicas	4–5 years	Test germination after 3 years

SEED BANKS OF THE WORLD

The Svalbard Global Seed Vault (Norway) stores over 1.3 million seed samples from nearly every country as backup against catastrophic loss. Other critical facilities: the Vavilov Institute (Russia), National Seed Laboratory (UK), USDA National Plant Germplasm System (USA). The global seed banking network is humanity's greatest insurance policy against agricultural collapse.

— Good growing to you. —

Disclaimer & Seed Import Regulations

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