OR-02 The medicinal garden: what to grow for a village of 300 in each climate

HEALING after the FALL, research library, OR-02

Researched 10 October 2026 by Claude Opus agent for THRIVING after the FALL, Book Four. Library document, unverified.

What this report does

This report treats the medicinal garden as a system: plants, land, labour, propagation, seed and the locked bed. Doses and evidence come from PH-01 to PH-10, scale from real gardens and programmes. It stops at the harvest basket: drying and storage are in ME-04, the shelf in OR-06 (THRIVING library, ME-04) (THRIVING library, OR-06).

The **tradition's claim**, the **record** and my **inference** are kept apart, and inferences carry [VERIFY]. Grades: A consistent trials, B some trials or strong pharmacology, C plausible traditional use, D weak or contradictory, X harmful or shown not to work.

Controlled plants appear only as where they grow, yield and the owner's decision, with no method.

1. What real medicinal gardens were for

1.1 The Carolingian estate and the St Gall plan

The **tradition's claim** is that monasteries kept medicinal gardens that healed the sick. The **record** is narrower. The Capitulare de villis, issued for Charlemagne's royal estates around 795 to 812, lists in its chapter 70 the plants every estate garden should grow. Counts differ by source: one gives 73 herbaceous plants and 16 fruit trees, others give 89, over 90 or 99, and about 14 names cannot be firmly identified because one name served several plants (Ingelheim n.d.) (THRIVING library, TR-05). Most of the list is food: vegetables, pulses, fruit and pot herbs. The medicinal plants sit among them rather than apart.

The plan of St Gall, drawn at Reichenau around 819 to 830 and never built, shows a herbularius of 16 beds between the infirmary and the physicians' house, each bed labelled with one plant: sage, curled mint, rue, caraway or cumin, iris, lovage, pennyroyal, fennel, bean, savory, costmary, fenugreek, rosemary, mint, lily and rose (THRIVING library, TR-05). A separate kitchen garden held 18 food plants (HAL halshs-00608791, search summary only). I could not find bed dimensions. The plan's scale suggests beds of a few square metres each, but that is my inference from secondary descriptions [VERIFY].

What it got right: one plant per bed, each bed labelled, the garden placed next to the people who use it. What it got wrong: TR-05 judges about a third of the monastery plants plausible as traditional medicine, and two of the sixteen, rue and pennyroyal, are grade X (THRIVING library, TR-05). TR-05's revised 16 beds swap rue for thyme, iris for calendula, pennyroyal for lemon balm, costmary for chamomile and lily for garlic. A 16-bed plan of a few square metres per bed is a teaching garden and a source of fresh herbs for a small community of monks, not a supply for 300 people. The same pattern appears in Vietnam twelve centuries later (section 3.3).

1.2 Padua 1545 and Chelsea 1673: the garden as a school

The **record**: the Venetian Senate founded the garden at Padua by decree on 29 June 1545 as a hortus simplicium, a garden of single medicinal plants, under its first prefect Luigi Squalerno. Its plan is a circle around a square divided into four quarters by paths on the compass points, and it still holds that plan on its first site. It became a UNESCO World Heritage Site in 1997 (Orto Botanico di Padova n.d., search summary only). A wall was added early because valuable plants were being stolen.

The Society of Apothecaries founded the Chelsea Physic Garden in 1673 to teach apprentices to recognise medicinal plants, so that they could spot adulterated or wrong material when they bought it. Apprentices also walked out to nearby heaths to learn plants in the wild (Gresham College n.d., search summary only).

What both got right: the garden's first product is **knowledge**, correct identification. A healer who has handled true comfrey and true wild garlic all year will not confuse them with their poisonous doubles in a hedge. Padua's wall adds that valued plants get stolen and poisonous ones eaten, so the garden needs a boundary.

1.3 The Shaker herb trade

The **record**, all secondary: Shaker communities at New Lebanon, New York, and Harvard, Massachusetts, began selling herbs commercially in the early nineteenth century (Cross 2013, search summary only). By 1827 Watervliet sold 129 herbs and seven extracts. Around 1850 New Lebanon is said to have produced about 100,000 lb of dried herbs a year and several thousand pounds of extracts (Gardening Know How, undated, a secondary gardening site) [VERIFY]. An 1851 New Lebanon catalogue listed 356 medicinal herbs and 181 fluid extracts (Freeman's n.d., catalogue description) [VERIFY].

The **inference**: 100,000 lb is about 45 tonnes, an export trade to pharmacists, much of it probably gathered wild. A village of 300 needs perhaps 40 kg of dried material a year (section 4), so the Shaker lesson is labels and uniform packing, not scale [VERIFY].

1.4 Britain's herb committees, 1941 to 1945

The **record**: the Vegetable Drugs Committee was set up in March 1941, advised by the Medical Research Council's Therapeutic Requirements Committee. More than 70 county herb committees followed, staffed mainly by Women's Institutes, the Scottish Women's Rural Institutes, Scouts and schoolchildren. Wikipedia, flagging the figures as needing citation, gives £1,191 of grants for drying centres and 250 drying centres by the end of the war (Wikipedia County Herb Committee n.d., citing Ayres 2015). The Committee's 1941 pamphlet named six essential plants: belladonna, colchicum, digitalis, henbane, thorn apple and valerian. Kew advised drying foxglove on racks at 90 to 100°F. In 1942 the Clifton and Mayfield Scouts in Derbyshire dried 76 lb of foxglove and the Hathersage Women's Institute 50 lb, mostly nettle (Wikipedia County Herb Committee n.d.). In the First World War, market gardeners in the Vale of Evesham who grew medicinal herbs rose from near bankruptcy to a turnover of £330,000 (Hudson 2017, reporting Ayres). OR-03 records rose hip collection rising from about 200 tons in 1941 to 1,957 tons by 1945 [VERIFY] (THRIVING library, OR-03).

What it got right: collection, drying and grading in every county within a year. What it was not: village medicine. It was **factory feedstock**. Five of the six priority plants are among the most dangerous in Europe and went to manufacturers who could assay them, though children gathered them. OR-03 reaches the same verdict across many cases: plants succeeded as food (rose hips for vitamin C), as factory feedstock, and as dressings (sphagnum moss), and failed when used as home substitutes for drugs (THRIVING library, OR-03).

1.5 The monastic infirmary

TR-05 covers the infirmary. Canterbury monks who reached 20 lived on average about 28 more years despite infirmary and garden (Hatcher 1986, via THRIVING library, TR-05). A garden is a comfort, not a defence against epidemic disease.

2. Cuba's green medicine

2.1 The record

Cuba is the clearest modern case of a national health service turned towards medicinal plants at scale, under pressure, after its oil and drug imports collapsed with the Soviet Union. The **record** in outline:

- Juan Tomás Roig's 1945 *Plantas medicinales, aromáticas o venenosas de Cuba* identified 595 species used by the population. A later ethnobotanical study records 657 (González Ramírez and others 2007).
- An experimental station named after Roig opened in the 1970s. CECMED, the drug regulator, was created in 1989 (González Ramírez and others 2007).
- The national programme came in the early 1990s. A ministry resolution in 1992 sanctioned herbal medicine, and the 1992 *Guía Terapéutica de Fitofármacos y Apifármacos* listed 233 formulations (González Ramírez and others 2007) (Webster 2000).
- The *Formulario Nacional de Fitofármacos y Apifármacos* replaced the guide, with a first edition in 2010 and a second in 2013 (EcuRed n.d.).
- By 1998 about 3 million Cubans were said to use green medicine (Webster 2000, a journalist's account, read).

The species in the regulator's 2007 table are almost all common crops and garden plants: onion, garlic (20% tincture), aloe, annatto, calendula (10 and 20% tinctures), chilli, three citrus species, lemongrass (caña santa), lemon-scented eucalyptus, fennel, *Justicia pectoralis* (tilo), *Lippia alba*, chamomile, cajeput, three mints, basil, *Orthosiphon*, passion flower, *Petiveria alliacea*, Caribbean pine, *Piper auritum* (caisimón), both plantains, *Plectranthus amboinicus* (orégano francés), guava, red mangrove, rosemary, sage, *Senna alata*, maize silk and ginger (González Ramírez and others 2007).

2.2 Production

The **record** on production is thin. D'Arcy visited the provincial farm in Pinar del Río in 2003. It covered 200 acres, worked by 45 people with oxen and no tractors, and had grown from 4 crops to 45. Its main crops were oregano (*Plectranthus*), calendula, *Mentha arvensis*, chamomile, aloe, eucalyptus, banana leaves and turmeric, with two growing seasons a year. Output was said to be growing 20 to 25% a year, and every neighbourhood had a green pharmacy (D'Arcy 2006). I found **no published national tonnage** for any year. The term FITOMED appears in the brief, but I found no primary source that defines it [VERIFY].

2.3 What it shows

The **inference**: a country forced onto plants chose the same safe, common plants that PH-01 and PH-07 rank highest, not the exotic or potent ones. OR-03 records the costs: a leg infection worsened under caisimón leaves, and oregano for epilepsy is grade X (THRIVING library, OR-03). Cuba grew plants for comfort, minor complaints and skin, while keeping antibiotics and anticonvulsants for what needed them, at least in policy [VERIFY].

3. Programmes that put gardens in villages

3.1 anamed

anamed (Action for Natural Medicine), the German group behind Hans-Martin Hirt and Bindanda M'Pia's *Natural Medicine in the Tropics*, trains healers, pastors and health workers in East and Central Africa to recognise and grow

a small set of plants, and expects each participant to plant a garden afterwards (ECHO n.d., catalogue description only). One description says the book's third section covers how to grow five especially valuable plants, but does not name them. Course reports from Kenya mention *Artemisia annua*, moringa and roselle (search summary only). I could not obtain the book or its plant list.

anamed's best-known plant is a selected *Artemisia annua* sold as A-3. Hirt promoted the leaf for malaria, gave a child dose and claimed the dried leaf kept for over three years (THRIVING library, IN-09). WHO in 2012 and again in 2019 advised against using *Artemisia* plant material in any form for malaria, and the Munyangi 2019 trial that supported it was retracted (THRIVING library, IN-09). **Grade for A. annua leaf as malaria treatment: X.** ME-04 also records artemisinin falling by about 30% in a year of storage at 40°C, which contradicts the three-year claim (THRIVING library, ME-04).

Moringa is anamed's other flagship. PH-06 grades it as a food (C), with preliminary B evidence for blood glucose, and warns that the root is an abortifacient (THRIVING library, PH-06). One African trial reported about 76 g of leaf powder per tree in the second year after seeding (search summary, source not traced) [VERIFY].

3.2 Hesperian

Where There Is No Doctor (2024 edition) devotes its first chapter to home remedies (Werner and others 2024, read). It praises herbal teas for coughs and fluids for diarrhoea, and gives rules for spotting useless remedies, the first being that the more remedies a disease has, the less likely any works. It names corn silk, garlic for pinworm, aloe for burns and papaya seed for worms.

It also gives an adult dose for a leaf soak of angel's trumpet (*Brugmansia arborea*) for cramps, with a warning that more is very poisonous. PH-04 and PH-10 put *Datura* and *Brugmansia* on the never-use list (THRIVING library, PH-04) (THRIVING library, PH-10). This report sides with PH-04. **No *Brugmansia* or *Datura* is grown in the village garden**, and I do not repeat Hesperian's dose. The village must expect healers to bring this advice from a widely trusted book, which is why it is listed under Red flags. Its corn silk advice for swollen feet in pregnancy also needs a caution: swelling in late pregnancy can be pre-eclampsia, which needs blood pressure checked, not a diuretic [VERIFY].

3.3 Vietnam's model garden of 40 species

Vietnam made the garden part of primary care law. A 2002 Ministry of Health decision (3370/2002/QĐ-BYT) required each commune health station to keep a garden or pots with **at least 40 species** from the ministry's list, and to treat at least 20% of patients with traditional medicine (Ministry of Health Viet Nam 2002, search summary only). Circular 40/2013/TT-BYT lists the plants. One station's garden was about 70 m^2 with nearly 40 species (search summary, untraced). The Làng Giàng station in Lào Cai keeps over 40 species in nine groups, uses the garden to teach residents and gives away seedlings, with over 200 traditional medicine visits a month (Báo Lào Cai 2023, read).

The **inference**, and the most useful finding in this section: 40 species on 70 m^2 is under 2 m^2 per species, which is a **display and nursery**, not a pharmacy supply [VERIFY]. Vietnam's model gives a village what it most needs from a garden, which is plants everyone can recognise and seedlings to take home. Supply presumably came from household plots and the market [VERIFY].

3.4 The Philippines' ten herbs

The Philippines did the opposite, choosing a short list. Under the 1997 Traditional and Alternative Medicine Act, the Department of Health promoted ten herbs: lagundi (*Vitex negundo*), sambong (*Blumea balsamifera*), tsaang gubat (*Ehretia microphylla*), akapulko (*Senna alata*), niyog-niyogan (*Quisqualis indica*), bayabas (guava), yerba buena (*Mentha* sp.), garlic, ampalaya (*Momordica charantia*) and ulasimang bato (*Peperomia pellucida*) (BPI 2025, read).

Lagundi and sambong were developed into registered tablets [VERIFY]. Ten plants is a size every household can learn, and that idea feeds section 9.

3.5 Jamkhed and WHO

The Comprehensive Rural Health Project at Jamkhed in Maharashtra, founded in 1970 by Raj and Mabelle Arole, trained local women as village health workers for villages of about 1,000 people each (Wikipedia CRHP n.d.). I found no record that a medicinal garden was part of the Jamkhed model. Its gains came from village health workers, clean water, nutrition, mothers' care and referral. That absence is itself a finding: one of the most cited village health successes did not need a herb garden [VERIFY].

WHO's 2003 guidelines on good agricultural and collection practices (WHO 2003, catalogue record only) concern quality for medicine makers. I found no WHO document setting a size or plant list for a village garden.

4. How much land: yields per square metre and a year's need

4.1 Measured yields of dried material

Field yields are given per hectare. Divide t/ha by 10 to get kg per 10 m², or multiply by 100 to get g/m². All figures are for dried material.

Plant	Part	Dry yield recorded	g/m²	Source and condition
Chamomile, *Matricaria chamomilla*	flower heads	400-600 lb/acre Hungary, 300-500 lb/acre N Europe	34-67	Montana State WARC n.d., commercial ranges
Calendula, *Calendula officinalis*	flower heads	0.97 t/ha unfertilised, 1.51 t/ha at 80 kg N, older Polish trials up to 2.88, New Zealand and Italy 0.5 or less	50-150	Król 2011, Lublin, 6-8 pickings
Peppermint, *Mentha* x *piperita*	leaf	3.03-5.57 t/ha from two cuts	300-560	SDU repository n.d., Isparta trial, abstract only
Thyme, *Thymus vulgaris*	herb	low in year 1, 1.5-2.5 t/ha from year 2	150-250	FAO EcoCrop n.d., summary only
Marshmallow, *Althaea officinalis*	root	about 1.8 t/ha in year 1, about 9.1 t/ha in year 2	450-900 every 2 years	Kansas State University n.d., summary only
Sweet wormwood, *Artemisia annua*	leaf	2.5 t/ha East Africa average, about 900 g/m² in a New England trial at 8 plants/m²	250-900	IN-09, SARE 2013

Thyme loses a third to a half of its cut weight as stem (Seidler and others 2008, abstract only). Pharmacopoeial thyme allows no more than 10% stem, so usable leaf is about 100 to 150 g/m² [VERIFY]. A Hungarian marshmallow study

reported 4.5 to 6.5 t/ha of second-year dry drug (search summary only) [VERIFY]. Peppermint yields fall sharply in the fourth and fifth years of a plantation (Australian Journal of Experimental Agriculture, EA02024, title and abstract only), so beds must be replanted every three years [VERIFY]. Garden beds without irrigation or fertiliser will fall short of trial figures. **I plan on about half the trial figure**, or on the lowest commercial figure where the source is already a farm average (chamomile, marshmallow) [VERIFY].

4.2 What 300 people use in a year

The doses come from PH-01, which takes them from the EMA monographs. The number of courses is my own estimate for 300 people, about 60 households, and is the weakest number in the table [VERIFY].

Plant	Course (PH-01 dose)	Courses a year, my estimate	Dry need a year	Planning yield g/m²	Bed area
Chamomile	3 g, 3 times a day, 7 days = 63 g	120, plus washes 2 kg	9.5 kg	34 to 45	200-280 m²
Thyme (leaf)	1.5 g, 3 times a day, 7 days = 32 g	200 coughs	6.4 kg	75	85 m²
Peppermint	6 g a day, 7 days = 42 g	100	4.2 kg	150	28 m²
Calendula	1.5 g per dressing, 3 a day, 5 days = 22 g	100 wounds, plus salve 0.8 kg	3 kg	50	60 m²
Marshmallow root	2 g, 3 times a day, 7 days = 42 g	100	4.2 kg	225 a year (450 every 2 years)	20 m² in two halves
Sage	gargle 2.5 g/100 ml, 3 a day, 5 days = 37 g	100	3.7 kg	75 [VERIFY]	50 m²
Lemon balm	2 g, 3 times a day, 7 days = 42 g	50	2.1 kg	150 [VERIFY]	15 m²
Fennel seed	1.5 g, 3 times a day, 5 days = 22 g	50, infant colic excluded	1.1 kg	50 [VERIFY]	20 m²

The total is roughly 480 to 560 m² of beds. Adding a third for paths, a 30 m² nursery and seed bed and a 20 m² fenced plot gives **about 700 m², or roughly 2 to 2.5 m² per person** [VERIFY]. Linseed (10 to 15 g, two or three times a day) and garlic are field and kitchen crops and are left out. Willow bark, yarrow, plantain, elder flower and oak bark come from the hedge and the wild.

4.3 Where this disagrees with PH-01

PH-01's Protocol 1 gives the village 70 m² in four beds: demulcents 20 m², carminatives 20 m², respiratory 15 m² and wound 15 m² (THRIVING library, PH-01). PH-01 marks those areas as its own inference. The table above suggests the true need is **seven to ten times larger**, almost all of it because chamomile and thyme yield so little per square metre. Marshmallow is the exception: 20 m² is about right. Chamomile is the bed most likely to be short. The village can either grow 200 m² of it or accept that chamomile is rationed to infants and the sick while adults use peppermint or lemon balm, which yield three to four times more per square metre [OWNER].

5. Labour

The **record** on picking: chamomile picked by hand gives 0.3 to 0.5 kg of dry flowers an hour, at most about 1 kg (Australian figure reported by Montana State WARC n.d.). Montana's own trials recorded about 1.35 lb, or 0.6 kg, of dry flowers an hour. Martin Bauer reports finger picking at 3 to 5 kg of fresh flowers an hour, picking combs at 50 to 150 kg fresh a day, and 25 to 30 working days to hand-harvest a hectare (Martin Bauer n.d.). Fresh chamomile loses 70 to 80% of its weight in drying (THRIVING library, ME-04). Calendula has to be picked every five days through a flowering season of 30 to 40 days, six to eight pickings in all (Król 2011).

The **inference** for the 700 m² garden [VERIFY]:

Task	Hours a year
Chamomile picking, 9.5 kg dry at 0.3-0.6 kg/hour	16-32
Calendula picking, 8 rounds of 60 m²	20-30
Cutting mint, balm, thyme, sage, 2 cuts each	20
Marshmallow root lifting and washing, 10 m²	10-15
Bed preparation, sowing, transplanting	60-80
Weeding and watering, about 0.2 hour per m² a season	140
Seed saving, cuttings, division, records	30
Total	**about 300-350**

That is one keeper about a day a week from spring to autumn, with helpers on picking days. Drying (ME-04) adds more. These hours compete with food in the same months (see The case against).

6. Propagation, seed saving and first-year failures

6.1 How each plant comes back

Plant	Comes back by	Seed notes	Year it first gives a crop
Chamomile	seed, self-sows	tiny seed sown on the surface, needs light, raked in only lightly, sown at 0.32 kg/ha commercially	year 1, 8-10 weeks [VERIFY]
Calendula	seed, self-sows	large seed, easy to save	year 1
Peppermint	runners, cuttings only	**sterile hybrid, sets no true seed**. Seed sold as peppermint is spearmint	year 1 lightly, full from year 2
Spearmint, *Mentha arvensis*	runners or seed	seed varies	year 1
Thyme	cuttings, layering, seed	small seed	light in year 1, full from year 2
Sage	cuttings, seed		light in year 1
Lemon balm	seed, division		year 1
Marshmallow	seed, root division		root in year 2
Fennel	seed, self-sows		seed in year 1 or 2
Artemisia annua	seed only, annual	about 12,000 seeds a gram, surface sown	190-240 days
Aloe vera	offsets		year 2

Plant	Comes back by	Seed notes	Year it first gives a crop
Moringa	seed, cuttings		leaf in months, 76 g a tree in year 2 [VERIFY]
Guava, papaya	seed		papaya fruit in about a year, guava leaf from year 1 [VERIFY]
Ginger, turmeric	rhizome pieces		8-10 months [VERIFY]
Cinchona	seed, cuttings		first bark coppice at 8-10 years (IN-09)

Sources: Wikipedia Peppermint n.d., Montana State WARC n.d., IN-09, PH-06 and PH-07. Rows marked [VERIFY] are my own estimates.

6.2 Seed and stock keeping

Inference from the table: annuals carry the risk of a single failed season. Perennials carry the risk of a single disease or a single winter. The rule for the village [OWNER]: keep two seasons of seed of every annual, in two separate places, dry, cool and labelled. Keep every clonal perennial (peppermint, thyme, sage, aloe) in at least two beds, one of them at a house away from the main garden. I found no data on seed life for chamomile or calendula. Assume one to three years and test germination each spring on 20 seeds on a wet cloth before sowing [VERIFY].

6.3 First-year failures to expect

1. **Perennials give little in year 1.** Thyme, sage and marshmallow produce almost nothing usable in their first season. Plan year 1 on annuals (chamomile, calendula) and on mint.
2. **The wrong mint.** Anything grown from "peppermint seed" is not peppermint. Pennyroyal (*Mentha pulegium*) is also a mint and is grade X (THRIVING library, TR-05). Mints must come from known stock, as runners.
3. **Chamomile sown too deep.** The seed needs light. Covering it is the commonest cause of a bare bed [VERIFY].
4. **Calendula left unpicked.** Heads not picked every five days set seed and the plant stops flowering [VERIFY].
5. **Wrong climate.** Chamomile and calendula struggle in hot humid lowlands. Peppermint fails without water. Aromatics in the wet tropics last one season in store (THRIVING library, ME-04). Marshmallow needs moist soil. *Artemisia annua* in the lowland tropics needs adapted seed (THRIVING library, IN-09). Cinchona needs a tropical highland and eight years.
6. **Old mint beds.** Yields fall in years 4 and 5. Replant from runners every third year [VERIFY].
7. **Weeds that are poison.** Hemlock (*Conium maculatum*) and fool's parsley (*Aethusa cynapium*) come up as weeds among fennel, parsley and carrots [VERIFY]. A bed is weeded by someone who can tell them apart.

7. The poison bed and who holds its key

7.1 Three library positions that disagree

The library disagrees on the narrow-margin plants, and the owner must settle it.

- **ME-07, rule of one plant.** Foxglove (*Digitalis purpurea*, leaf) is the only narrow-margin plant a village healer may prepare. It is grown in one bed kept by one named healer, with a logbook and a locked chest. Belladonna, thorn apple, monkshood, oleander and autumn crocus are dug out near houses (THRIVING library, ME-07).

- **PH-10, never gather.** *Digitalis* is not gathered for any purpose, along with *Aconitum*, *Veratrum*, *Colchicum*, *Convallaria*, *Taxus* and internal *Atropa*, *Hyoscyamus*, *Datura* and *Brugmansia* (THRIVING library, PH-10). PH-10 speaks of gathering wild plants, so it does not strictly forbid a garden bed, but its reasoning, that dose cannot be controlled, applies to both.
- **OR-03, green pharmacy rule.** Grow potent plants only if the district can assay them (THRIVING library, OR-03).

The **inference**: the three can be reconciled by rung. No narrow-margin plant at the household. At the village of 300, foxglove only, and only if the owner accepts ME-07's rule. At the district of 3,000, with assay, the other potent plants as factory feedstock in the British 1941 sense [OWNER] [VERIFY].

7.2 Two kinds of restricted bed

PH-01 already separates a **fenced plot** for plants that are safe at the right dose or only on the skin: comfrey (*Symphytum officinale*, root and leaf, skin only), wormwood (*Artemisia absinthium*, herb), alder buckthorn (*Frangula alnus*, bark aged a year) and horse chestnut (*Aesculus hippocastanum*, seed) (THRIVING library, PH-01). This report adds a **locked bed** for narrow-margin and controlled plants, if the owner allows any.

Bed	Contents if allowed	Fence	Key	Seed control
Fenced plot	comfrey, wormwood, frangula, horse chestnut	1.2 m fence, latched gate, not visible from the path [VERIFY]	garden keeper	cut wormwood before seed
Locked bed	foxglove (ME-07) [OWNER], opium poppy [OWNER]	wall or close fence, locked gate, away from houses, school and food beds	one named healer, second person for each harvest, sealed spare set with the council (OR-06) [OWNER]	remove every flower spike or seed head before seed sets, count them in the logbook [VERIFY]

Foxglove and opium poppy both self-sow freely, so a locked bed that is allowed to seed becomes a hedge full of poison within two years [VERIFY]. OR-06's key rules carry over unchanged: one or two keepers, a second person for the controlled cupboard and a sealed spare set held by the council (THRIVING library, OR-06).

7.3 Controlled plants: where they grow, yield, decision

- **Opium poppy** (*Papaver somniferum*, latex and capsule). It grows in temperate, Mediterranean and highland climates. ME-05 records field yields of 18 to 56 kg of opium a hectare, so a 10 x 10 m plot gives roughly 0.2 to 0.55 kg of opium, enough for perhaps 7 to 20 patient-months of pain control [VERIFY]. Ornamental capsules averaged 362 mg of morphine per 100 g (THRIVING library, ME-05). Whether the village grows it, who holds it and who may use it are for the owner alone [OWNER]. No method is given here.
- **Cannabis** (*Cannabis sativa*, flowering tops). It grows in almost every climate in this report except the boreal fringe [VERIFY]. I found no yield figure I could use. Whether to grow it is for the owner [OWNER].
- **Coca** (*Erythroxylum coca*, leaf). It grows only in the Andean and Amazonian zones that PH-04 covers [VERIFY]. PH-04 leaves its use to the owner (THRIVING library, PH-04) [OWNER].
- **Thorn apple, angel's trumpet, belladonna, henbane.** Not grown. Dug out where found near houses (THRIVING library, ME-07).

8. Harms: children, labels and lookalikes

8.1 Children

The **record**: of 163 Austrian autumn crocus exposures, 113 were in children under 15 (THRIVING library, PH-10). In Croatia, 2010 to 2019, a third of plant exposures involved garden plants, mostly oleander and cherry laurel, and 95.7% were accidental (Croatian Poison Control Centre n.d., abstract only). In Romania, 2017 to 2022, 71 child exposures involved mainly taro, dumb cane and castor oil plant, and 92.9% were accidental (Romanian study, Children 2024, abstract only). The German risk assessment body reported that plants cause about a fifth of exposures in children under six at German poison centres (BfR n.d., abstract only). OR-06 adds that unit-dose packaging cut child deaths from iron tablets from 29 to 1, a reminder that dose packaging matters as much as the plant (Tenenbein 2005, via THRIVING library, OR-06).

Rules that follow are in Protocol 5 [OWNER].

8.2 Mislabelled beds and lookalikes

The **record**: comfrey gathered by mistake turned out to be foxglove in Washington State in 1977 and in Taiwan in 2010, where nine people were poisoned. Wild garlic confused with autumn crocus caused 28 cases and 2 deaths in France between 2020 and 2022 (THRIVING library, PH-01). The **inference**: both errors happen at the border between a garden and the wild, or between two beds. So:

1. One species per bed, with a path between beds. Lookalikes are never planted next to each other: comfrey not beside foxglove, wild garlic not beside lily of the valley or autumn crocus, fennel and parsley not beside any wild umbellifer.
2. A durable label at each end of every bed, a bed map in the ledger, and a pressed voucher of each species in the dispensary book (THRIVING library, ME-04).
3. Wild gathering follows PH-10's rule of three independent confirmations, and one named gatherer. Where a plant is dangerous to gather wild, grow it instead: carrot, parsnip, fennel, lovage, parsley, borage and chives (THRIVING library, PH-10).

8.3 Overharvest of wild stands

ME-04 leaves overharvest to this report, while setting its own limit of 70% of a wild stand (THRIVING library, ME-04). The **inference**: plants with a big wild trade, such as devil's claw, *Pelargonium sidoides*, kinkeliba and slippery elm, belong in the garden (THRIVING library, PH-03) (THRIVING library, PH-06). Where harvest kills the plant (bark, root), take no more than one plant in five from a stand a year and replant [VERIFY] [OWNER].

9. The household's 10 and the village's 40

The **inference** from Vietnam, the Philippines and PH-01's household five: two lists [VERIFY]. **The household 10** grow by the door, about 1 m^2 each, are safe at kitchen doses and have no deadly lookalike in local gardens (listed by zone in section 10). **The village 40** are grown in bulk in the village garden, with one of each for teaching and seedlings for households, as at Làng Giàng.

Zones: T temperate, M Mediterranean, D dry, W wet tropical, B boreal.

Plant	Part	Main use	Grade	Zones	Main lookalike or confusion
Matricaria chamomilla	flower	gut spasm, mouth, washes	C	T M B	scentless mayweed, stinking chamomile (solid, not hollow, receptacle)
Thymus vulgaris	leaf	productive cough	B/C	T M	none of concern [VERIFY]
Mentha x *piperita*	leaf	dyspepsia	B	T M	pennyroyal *M. pulegium* (X)
Mentha arvensis	leaf	dyspepsia	C	W D	pennyroyal
Melissa officinalis	leaf	nerves, gut	C	T M	other mints, catmint [VERIFY]
Salvia officinalis	leaf	mouth and throat	C	T M D	none of concern [VERIFY]
Calendula officinalis	flower	wounds	C	T M B, W highland	*Tagetes* marigolds
Althaea officinalis	root	dry cough, throat	C	T	other mallows, harmless [VERIFY]
Linum usitatissimum	seed	constipation	A/B	T M B	none
Allium sativum	bulb	food, minor	B/C	all	garden none, wild: autumn crocus, lily of the valley
Foeniculum vulgare	seed	wind, colic	C	T M	hemlock, fool's parsley
Plantago lanceolata, *P. major*	leaf	throat, wounds	C/D	all except W	foxglove rosette (young) [VERIFY]
Achillea millefolium	flowering top	gut, wound wash	C/D	T B	hemlock, by silhouette
Sambucus nigra	flower	colds	C	T	dwarf elder *S. ebulus* [VERIFY]
Salix spp.	bark	pain	B	T B	none of concern
Valeriana officinalis	root	sleep	C	T B	none of concern [VERIFY]
Rosa canina, *R. rugosa*	hip	vitamin C food	food	T B	none
Vaccinium macrocarpon, *V. oxycoccos*	fruit	cystitis prevention	A (PH-03)	T B	none of concern

Plant	Part	Main use	Grade	Zones	Main lookalike or confusion
Picea spp.	resin	10% salve	B	B T	none
Hamamelis virginiana	bark, leaf	skin	C (PH-03) [VERIFY]	T	none of concern
Echinacea purpurea	root, herb	colds	D (PH-03) [VERIFY]	T	none
Aloe vera	leaf gel	burns	B, latex X	M D W	*Agave*, other aloes
Senna alexandrina	leaf, pod	constipation	A	D M	other *Senna*
Ceratonia siliqua	pod	diarrhoea, with ORS	B	M D	none
Punica granatum	fruit, rind	diarrhoea, worms	C	M D	none
Olea europaea	oil, leaf	food, skin	C	M	none
Nigella sativa	seed	various	C	D M	corncockle seed [VERIFY]
Moringa oleifera	leaf	food	C, root unsafe	W D	none, but the root is an abortifacient
Carica papaya	seed, latex	worms, dead tissue	B	W D	none
Psidium guajava	leaf	diarrhoea, with ORS	B	W D	none
Zingiber officinale	rhizome	nausea	A	W	other gingers
Curcuma longa	rhizome	dyspepsia	A	W	other *Curcuma*
Cymbopogon citratus	leaf	mild, tea	C	W D	none
Senna alata	leaf	tinea versicolor	A	W	other *Senna*
Andrographis paniculata	herb	colds	B, anaphylaxis risk	W	none
Centella asiatica	leaf	skin	C	W	*Hydrocotyle* [VERIFY]
Plectranthus amboinicus	leaf	cough	C, epilepsy X	W	none
Vitex negundo	leaf	cough	C	W	other *Vitex*
Azadirachta indica	leaf, external	skin, insects	C, never oral for children	W D	chinaberry *Melia azedarach*, poisonous fruit
Combretum micranthum	leaf	blood pressure	B	D (Sahel)	other *Combretum* [VERIFY]
Artemisia annua	leaf	not for malaria	X for malaria	T M W	wormwood *A. absinthium*

Sources by row: PH-01 (temperate rows), PH-02 (dry and Mediterranean), PH-03 (North American), PH-05 to PH-07 (tropical), PH-06 (moringa, kinkeliba), PH-09 (spruce, boreal), IN-09 (*Artemisia annua*), Cuba's list (*Plectranthus*, *Justicia*) and BPI 2025 (*Vitex*). Lookalikes marked [VERIFY] are my own.

10. A garden plan for each climate zone

Every plan assumes 300 people and gives beds in m² (net, before paths) [VERIFY]. Planting calendars are given for the Northern Hemisphere temperate case and by season elsewhere. The household 10 is listed under each plan.

10.1 Temperate (central and north-west Europe, eastern North America)

Bed	m²	Plants
Chamomile	200	sown in two batches
Respiratory	135	thyme 85, sage 50
Carminative	63	peppermint 28, lemon balm 15, fennel 20
Wound	60	calendula
Demulcent	20	marshmallow, two halves, lifted in alternate years
Nursery, seed, display	30	one of each of the 40
Fenced plot	20	comfrey, wormwood, frangula
Hedge	boundary	elder, rose, willow, yarrow, plantain

Calendar: March, sow chamomile and calendula, divide mint. April, sow lemon balm and marshmallow, plant thyme and sage cuttings. May to July, pick chamomile every 3 to 5 days in dry weather. June to September, pick calendula every 5 days. June and August, cut mint and balm. July, cut thyme in flower, leaving a woody base. August, sow a second chamomile bed for spring. October, lift marshmallow root from the second-year half, take cuttings. Household 10: chamomile, thyme, peppermint, sage, lemon balm, calendula, garlic, fennel, plantain and one rose.

10.2 Mediterranean

Water is short in summer and winters are mild. The calendar turns round: chamomile and calendula are sown in autumn and picked from late winter to spring [VERIFY]. Thyme, sage and rosemary thrive on dry slopes without water. Peppermint and lemon balm need a shaded bed by the well. Marshmallow is replaced by linseed and mallow leaves.

Beds: chamomile 150, calendula 60, thyme and sage 150, mint and balm 40 (irrigated), fennel 20, *Aloe vera* 20, senna 20, nursery 30, fenced plot 20. Trees: olive, carob, pomegranate (THRIVING library, PH-02). Pull up squill, rue and oleander from house gardens (THRIVING library, PH-02). Household 10: thyme, sage, rosemary, fennel, chamomile, calendula, garlic, aloe, mint by the tap and one pomegranate.

10.3 Dry (Sahel, Middle East, dry Australia, northern Mexico)

Water is the limit and the store is not (THRIVING library, ME-04). Beds are sunken to catch water, shaded at midday, fed with household greywater and mulched [VERIFY]. Most of the medicine grows on trees and shrubs.

Beds: aloe 30, senna 30, *Mentha arvensis* by the water 20, lemongrass 20, black seed 20, sage 20, nursery 30. Trees and shrubs: moringa 20 to 30 as a hedge, guava 5 to 10 and papaya 10 to 20 where water allows, tamarind, baobab, neem, chewing-stick trees, and kinkeliba protected where it grows wild (THRIVING library, PH-06). Calendar: sow at the start of the rains, cut moringa through the rains, harvest seed and pods at the end. Remove colocynth and oleander near houses (THRIVING library, PH-02). Household 10: aloe, moringa, guava or pomegranate, lemongrass, *Mentha arvensis*, black seed, senna, garlic, onion and carob or tamarind.

10.4 Wet tropical

Growth never stops but dried material spoils, so aromatics are grown as a continuous fresh supply rather than a store (THRIVING library, ME-04). Chamomile and calendula fail in the hot lowlands. Peppermint is replaced by *Mentha arvensis*.

Beds: ginger 30, turmeric 30, lemongrass 20, *Senna alata* 20, *Andrographis* 15, *Centella* 10, *Plectranthus amboinicus* 10, *Justicia pectoralis* 10, *Vitex negundo* 10, *Mentha arvensis* 20, tulsi 10, nursery 30. Trees: guava 5 to 10, papaya 10 to 20, moringa on the drier ground, bael and tamarind (THRIVING library, PH-05) (THRIVING library, PH-07). Remove *Gloriosa*, *Abrus*, yellow oleander, *Cerbera* and *Strychnos* from house gardens (THRIVING library, PH-07). Calendar: plant rhizomes at the start of the rains, lift them 8 to 10 months later, take cuttings of the herbs in every season. *Artemisia annua* only from adapted seed, and not for malaria (THRIVING library, IN-09). Household 10: guava, papaya, ginger, turmeric, lemongrass, *Mentha arvensis*, aloe, *Senna alata*, *Plectranthus* and garlic.

10.5 Boreal and subarctic

The season is short and the dryer is the limit (THRIVING library, ME-04). Annual chamomile and calendula can be grown in the frost-free months, thyme is marginal, and most of the medicine is perennial, wild or food [VERIFY].

Beds: chamomile 150, calendula 60, yarrow 20, valerian 20, linseed 30, nursery 20. Shrubs and trees: rose hips (rugosa or dog rose) as a hedge, willow, spruce for resin, and cranberry or lingonberry on wet ground. Sphagnum is gathered, not grown (THRIVING library, PH-09). Labrador tea and chaga are not used (THRIVING library, PH-09). Angelica is grown only from known garden seed because water hemlock grows in the same wetlands [VERIFY]. Calendar: start calendula and chamomile indoors in April, plant out after the last frost, pick through June to August, cut yarrow in July, lift valerian in September, gather rose hips after the first frost. Household 10: chamomile, calendula, yarrow, plantain, rose, willow, spruce salve, cranberry or lingonberry, garlic or chives, and linseed.

Evidence grades

Claim	Grade	Basis
A village garden of common plants supports self-care of minor illness	C	Cuba, Vietnam and the Philippines show use, not outcomes
Garden plants substitute for drugs in serious disease	X	OR-03, Cuba's own cases
PH-01's 70 m^2 meets the need of 300	D	yields in section 4 [VERIFY]
About 700 m^2, or 2 to 2.5 m^2 a person, is needed	C	trial yields halved, use estimated [VERIFY]
Peppermint cannot be raised true from seed	A	botany, sterile hybrid
Artemisia annua leaf treats malaria	X	WHO 2012 and 2019, retracted trial (IN-09)
Senna for constipation, ginger for nausea, turmeric for dyspepsia	A	PH-02, PH-07
Thyme for cough, guava leaf and carob with ORS, papaya seed for worms	B	PH-01, PH-02, PH-05
Garden-grown foxglove can be dosed safely in a village	D	ME-07 against PH-10 and OR-03

Claim	Grade	Basis
Separating, labelling and fencing beds prevents confusion	C	inference from PH-01 cases
A garden improves village health outcomes on its own	D	Jamkhed succeeded without one

Means ledger

Rung	What the garden needs or gives
Hands and knowledge	Recognising 40 plants and their lookalikes, the rule of three, the household 10, picking rates of about 0.5 kg dry chamomile an hour
Hearth	Infusions, cold macerates, poultices, a shaded dry corner (drying in ME-04)
Garden and still	700 m² of beds, nursery, seed store, fence, a small still for oils and spirit for tinctures [VERIFY]
Village dispensary of 300	One keeper about a day a week, ledger, vouchers, locked bed if allowed [OWNER], OR-06 shelf
District infirmary of 3,000	Seed bank, assay of potent plants, cinchona or *Artemisia* plots where they grow, training of keepers [VERIFY]
Hospital before the Fall	Standardised extracts, digoxin, artemisinin combination therapy, morphine, assayed quinine

Harm test

1. **Delay.** A garden remedy taken instead of rehydration, antibiotics or antimalarials can kill. Cuba's leg infection under caisimón and grade X oregano for epilepsy are the warnings (THRIVING library, OR-03).
2. **Misidentification.** Comfrey and foxglove, wild garlic and autumn crocus, fennel and hemlock. Prevented by separate labelled beds and known stock.
3. **Children.** Toxic ornamentals near houses, self-sown foxglove and poppy.
4. **Labour taken from food.** About 300 to 350 hours a year in the growing season.
5. **Contamination.** Beds by roads or on polluted ground (ME-04: at least 50 m from roads).
6. **False confidence from a long list.** Hesperian's first rule applies to the garden too: forty plants for one complaint means none of them works well.

Red flags

- Any seed sold or traded as "peppermint".
- A *Brugmansia* or *Datura* dose from a trusted book.
- *Artemisia annua* tea offered for fever in a malarial area.
- Foxglove or poppy seedlings outside the locked bed.
- Unlabelled jars, or a bed with two species in it.
- A healer who gathers "comfrey" or "wild garlic" from the hedge in spring.
- Moringa root, neem oil by mouth for a child, aloe latex, pennyroyal or rue.
- A garden bigger than the village can weed, so beds go wild.

The case against

A garden of 700 m² and 300 hours a year buys mild relief for coughs, colic, sore throats, small wounds and indigestion. Those illnesses mostly get better on their own. The things that kill a village of 300 are diarrhoea, pneumonia, childbirth, infected wounds and malaria. Against them the garden contributes little that ORS, clean water, soap, food and, where available, antibiotics would not do better. Jamkhed improved health without a garden. Britain at war did not ask villages to treat themselves, and Cuba kept its doctors. The best use of the land may be food: rose hips, garlic, carob, guava and moringa are medicine mostly because they are food. The garden is worth having as a school for identification, a supply of comfort and a guard against poisoning by error. It is not worth having as a pharmacy, and the owner should not let it be described as one [OWNER].

10-line summary

1. Real medicinal gardens, from St Gall to Vietnam's commune stations, were schools and nurseries, not supplies.
2. Britain 1941 to 1945 gathered potent plants as factory feedstock, not village medicine.
3. Cuba chose common, safe crops, grew them on labour-heavy farms and published no tonnage.
4. Measured yields mean a village of 300 needs about 700 m² of beds, not 70 m² [VERIFY].
5. Chamomile and thyme take most of the land. Mint and balm yield three or four times more.
6. One keeper a day a week and helpers on picking days: about 300 to 350 hours a year [VERIFY].
7. Peppermint has no true seed. Perennials give little in year 1. Keep two seasons of seed in two places.
8. Two restricted beds: a fenced plot, and a locked bed only if the owner allows foxglove or poppy [OWNER].
9. Children, labels and lookalikes cause most garden harm. Separate, label and voucher every bed.
10. Each household grows ten safe plants by the door, the village grows forty.

Open questions

- Real dry yields from small, unirrigated village beds, rather than commercial trials.
- How many courses of each remedy 300 people use in a year.
- Seed life of chamomile, calendula and fennel in farm storage.
- The anamed plant list and Hirt's growing instructions.
- Cuban national production figures, and what FITOMED was.
- St Gall bed sizes and how monastic gardens were really cropped.
- The full Circular 40/2013 plant list and Vietnamese yields per station.
- How the owner resolves foxglove between ME-07, PH-10 and OR-03 [OWNER].

Sources to read in full

- Ayres 2015, *Britain's Green Allies*, for 1941 to 1945 tonnages.
- Horn and Born 1979, *The Plan of St. Gall*, University of California Press, for bed sizes.
- Hirt and M'Pia, *Natural Medicine in the Tropics*, anamed.
- Roig 1945, *Plantas medicinales, aromáticas o venenosas de Cuba*.
- Cuba's *Formulario Nacional de Fitofármacos y Apifármacos*, 2010 and 2013.
- Vietnam Circular 40/2013/TT-BYT and Decision 3370/2002/QĐ-BYT.
- WHO 2003, *Guidelines on good agricultural and collection practices*.
- Arole and Arole, *Jamkhed*, on what the project chose not to do.

At the bedside after the Fall

A child of three has coughed for four days, has no fast breathing and is drinking. The keeper takes thyme from the jar picked last July and makes an infusion at PH-01's strength for the child's age, with honey if the child is over one

year [VERIFY]. She counts breaths first and tells the mother what fast breathing looks like, because pneumonia is not a thyme illness. A man has burnt his forearm at the forge. Cool water first, then aloe gel in the south or honey and a calendula dressing in the north, changed daily and watched for spreading redness. A baby has watery diarrhoea. ORS first, always. Guava leaf or carob only as an addition, and only for an older child (THRIVING library, PH-02) (THRIVING library, PH-05). A woman brings "wild garlic" from the wood in April. The keeper checks the leaves against the voucher, smells for garlic and sends anything doubtful to the compost, not the pot.

Protocols

Protocol 1. Laying out the village garden (temperate, 300 people)

- ☐ Site: full sun, at least 50 m from a road, not on old dump or smithy ground, near water, visible from the dispensary.
- ☐ Area: about 530 m² of beds, 170 m² of paths, total about 700 m² [VERIFY].
- ☐ Beds 1.2 m wide, paths 0.5 m, one species per bed, labels at both ends.
- ☐ Order of planting: year 1 chamomile 200 m², calendula 60, mint 28, balm 15, fennel 20. Year 2 thyme 85, sage 50, marshmallow 20.
- ☐ Nursery 30 m² with one plant of every species of the village 40, labelled, for teaching.
- ☐ Fenced plot 20 m² at the far end. Locked bed only if the owner decides [OWNER].
- ☐ Bed map and voucher sheets in the dispensary ledger before the first harvest.

Protocol 2. Harvest handover to the dryer

- ☐ Pick in dry weather after the dew has gone, before noon heat.
- ☐ Chamomile every 3 to 5 days in flower. Calendula every 5 days for 6 to 8 rounds.
- ☐ Mint and balm at first flower, two cuts a season. Thyme in flower, leave the woody base.
- ☐ Marshmallow root in autumn of year 2, washed the same day.
- ☐ Weigh fresh, label bed and date, hand to the dryer within 2 hours. Drying temperatures and endpoints are in ME-04 (35 to 45°C, 30 to 35°C for aromatics).
- ☐ Record fresh weight in the ledger. Expect flowers to lose 70 to 80% in drying.

Protocol 3. Seed and stock

- ☐ Save seed of every annual from at least 10 healthy plants.
- ☐ Store two seasons' seed in two places, dry, cool, labelled with species and year.
- ☐ Test 20 seeds on a wet cloth each spring. Below half germinating, sow double or use new seed [VERIFY].
- ☐ Peppermint, thyme, sage, aloe: keep each in two beds in two places. Replant mint every third year from runners.

Protocol 4. The restricted beds and the key

- ☐ Fenced plot: 1.2 m fence, latched gate, keeper only.
- ☐ Locked bed, only if the owner allows [OWNER]: locked gate, one named healer, a second person at every harvest, sealed spare key with the council (OR-06).
- ☐ No flower or seed head left to ripen unless counted for seed. Logbook entry for every plant lifted, cut or destroyed.
- ☐ Walk the hedge and house gardens each spring for self-sown foxglove, poppy, autumn crocus, thorn apple, oleander and castor oil plant. Remove near houses and the school.

Protocol 5. Children and the garden

- ☐ Teach the rule: nothing from a garden goes in the mouth unless an adult hands it over.
- ☐ Children work in the garden only with an adult and never in the restricted beds.
- ☐ No oleander, castor oil plant, cherry laurel, yew, autumn crocus or foxglove near a house or the school [OWNER].
- ☐ If a child has eaten an unknown plant: keep the plant, note the time, fetch the healer and watch the child for at least 6 hours [VERIFY]. Do not make the child vomit (ipecac is grade X, PH-05).

Numbers to carry

- About 700 m² of garden for 300 people, about 2 to 2.5 m² a person [VERIFY].
- Chamomile 34 to 67 g/m² dry. Calendula 50 to 150. Thyme 150 to 250 cut, 100 to 150 as leaf. Peppermint 300 to 560. Marshmallow root 450 to 900 every 2 years.
- Picking chamomile: 0.3 to 0.6 kg dry an hour.
- Calendula: pick every 5 days, 6 to 8 times.
- Garden labour: about 300 to 350 hours a year [VERIFY].
- Peppermint: no true seed. Replant every 3 years.
- *Artemisia annua*: 12,000 seeds a gram, 190 to 240 days to harvest, grade X for malaria.
- Vietnam: at least 40 species per commune station. The Philippines: 10 herbs.
- Cuba 1992: 233 formulations. Roig 1945: 595 species.
- Britain 1941 to 1945: over 70 county committees, about 250 drying centres.
- Opium poppy: 0.2 to 0.55 kg of opium per 100 m² (ME-05) [OWNER].
- Austria: 113 of 163 autumn crocus exposures were children.

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