

Harvest, Preservation & Storage

Guide 12 · Post-Harvest Reference

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Canning · Fermenting · Drying · Freezing · Cellaring

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RELATED GUIDES

This guide is one of seventeen in the Dragoon Mountains Growing Guides Library: - **Guide 1 — Hydroponic Primer & Library Map** · the front door + master multi-crop calendar - **Guide 2 — Peppers in the Dragoons** · soil + hydroponic + variety-specific staking - **Guide 3 — Bato Bucket Hydroponic Systems** · system build, water treatment, operations - **Guide 4 — Hydroponic Nutrients** · Masterblend + DIY + pH + Indoor/LED - **Guide 5 — Grapes in the Dragoons** · Cochise County viticulture - **Guide 6 — Cool-Season Crops** · brassicas + alliums + greens + roots - **Guide 7 — Warm-Season Companions** · tomatoes, cucurbits, beans, corn, sweet potatoes - **Guide 8 — Herbs in the Dragoons** · annual + perennial · soil & hydroponic - **Guide 9 — Backyard Orchard in the Dragoons** · figs, pomegranates, jujubes, stone fruits - **Guide 10 — Pest, Disease & Wildlife** · IPM + Cochise wildlife - **Guide 11 — Foundations: Soil & Seed** · soil-building, composting, seed starting, propagation - **Guide 12 — Harvest, Preservation & Storage** (this guide) · canning, fermenting, drying, root cellaring - **Guide 13 — Water in Cochise County** · sourcing, testing, treatment, rainwater - **Guide 14 — Season Extension Structures** · cold frames, low tunnels, hoop houses, high tunnels - **Guide 15 — Native Food Crops of the Sonoran-Madrean Region** · the indigenous food complex of the Dragoons and the wider sky-island region - **Guide 16 — Companion Plantings & Polycultures** · the design layer — companion matrix, anti-companions, cover crops, 9 Dragoons-specific guild designs - **Guide 17 — Recipes & Kitchen Integration** · what to cook with what came out of the garden this morning · by-crop recipes + seasonal menus This guide is the canonical home for everything that happens between the harvest basket and the dinner plate four months later. Harvest *indicators* — when to pick — stay in the crop guides (Guide 2 for peppers, Guide 5 for grapes, Guide 6 for cool-season crops, Guide 7 for warm-season companions, Guide 9 for orchard fruit). This guide cross-references those tables rather than restating them. Everything downstream of the indicator — handling, canning, pickling, fermentation, drying, freezing, curing, cellaring, and the month-by-month preservation calendar — lives here.

About this guide

A growing library that stops at the harvest basket leaves the reader stranded in the kitchen in October, surrounded by tomatoes that won't keep, peppers that are too many to eat fresh, and onions that will rot in three weeks if they aren't cured properly. This guide closes the loop. Everything you grew is here, in jars and bags and braids, at the back of a cool closet, ready to come out in February.

The Dragoons are a remarkably good place to preserve food. The same low humidity that makes summer evenings comfortable makes drying trivial — the same intense sun that builds sugar in grapes turns half-tomatoes into something between a candy and a cure in three days on a covered porch. The same cool 55-60 °F deep-ground temperature that fails to refrigerate sweet potatoes properly is exactly what onions, apples, garlic, and winter squash want for the long sleep between November and April. Almost every traditional preservation method that evolved in the dry uplands of the American Southwest — the ristra, the chipotle, the raisin tray, the adobe root cellar — was invented for a climate like this one. We are working with the grain of the place.

There is one thing the climate makes *harder*, not easier, and it pulls through every chapter of this guide: **the altitude**. The Dragoons sit at about 4,700 ft. Water boils at roughly 204 °F here instead of the sea-level 212 °F. That single fact changes canning times, pressure-canner pressures, and a number of safety calculations that are not optional. A boiling-water-bath recipe written for sea level is *unsafe* when run unchanged at 4,700 ft — not less effective, unsafe. The food doesn't reach the temperature it needs to reach the pathogens it needs to kill. The first technical chapter (Chapter 4) opens with the altitude adjustment table, and it is repeated wherever a specific time matters. Internalize it.

The guide is in twenty chapters:

1. **About this guide** — mindset, climate advantage, the altitude rule.
2. **Harvest indicators by crop family** — when to pick, cross-referenced to crop guides.
3. **Field-to-kitchen handling** — temperature shock, cleaning, the 30-minute rule.
4. **Canning safety** — water bath, pressure, altitude, equipment.
5. **Pickling** — quick, fermented, refrigerator; brines.
6. **Lacto-fermentation** — kraut, kimchi, hot sauce, garlic; the Dragoons specialty.
7. **Drying — the Dragoons advantage** — sun, oven, dehydrator, smoke, solar.
8. **Freezing** — blanching, packaging, organization, shelf life.
9. **Root cellar / cool storage** — temperature, humidity, the deep-ground rule.
10. **Curing** — onion, garlic, sweet potato, winter squash.
11. **Pepper specialties** — ristras, chipotles, powders, hot sauce.
12. **Tomato preservation** — sauce, paste, sun-dried, canned, salsa.

13. **Brassica preservation** — kraut, kimchi, blanched-frozen, kale powder.
14. **Allium preservation** — drying, cellaring, pickled, black garlic.
15. **Stone-fruit preservation** — drying, brandied, canned, preserves.
16. **Grape preservation** — raisins, juice, jelly, wine pointer.
17. **Herb preservation** — drying, oil cubes, herb butter, pesto.
18. **A starter set of recipes** — twelve recipes most Dragoons growers will use.
19. **The Dragoons preservation calendar** — month by month.
20. **Closing** — pulling a jar from the cellar in February.

The altitude rule. Every canning time in this guide assumes 4,700 ft. Boiling-water-bath times: add 10 minutes to any sea-level recipe for processes longer than 20 minutes (add 5 minutes for processes under 20 minutes is the more cautious USDA reading; this guide uses the +10 minute rule for safety margin). Pressure canning: use **15 psi** at the Dragoons elevation, not the sea-level 10 psi. If a recipe doesn't tell you what altitude it was written for, assume sea level and add the adjustment. **Never can low-acid foods (vegetables, meat, beans, tomatoes without added acid) in a boiling-water bath at any altitude.** Pressure canner only.

LOCAL TIP

The Dragoons preservation toolkit, in order of return on investment. (1) A 23-quart pressure canner (Presto or All American — see §4). (2) An eight-tray Excalibur dehydrator. (3) A vacuum sealer with a roll of bag stock. (4) A digital food scale that reads in grams (essential for fermentation salt ratios). (5) A pH meter or strip set (for canning safety). (6) A second deep freezer in the garage (a 7 cu ft chest freezer is \$250 used). (7) A cool north room or closet you can dedicate to root storage. With those seven things you can preserve essentially everything a quarter-acre garden and a small backyard orchard will produce.

2 · Harvest indicators by crop family

When to pick, by family — cross-referenced to the crop guides

The single most important preservation decision is when you harvest. A pepper picked green and a pepper picked red are different foods, with different preservation paths. A tomato picked at breaker stage and one picked at full ripe color have different canning suitabilities. An apple picked early stores six months; the same apple picked late stores six weeks. This chapter is the short reference; the full indicator tables live in the crop guides.

2.1 Peppers (Guide 2 §9)

Variety class	Pick green?	Pick ripe?	Preservation use
Jalapeño, Serrano	Yes — bright vegetal heat	Yes — red, sweeter, smokier	Fermented hot sauce (red); pickled (green); chipotle (smoked red jalapeño)
Poblano / Anaheim / Hatch	Yes — roasted fresh	Yes — dried red = ancho / California / red Hatch	Roast and freeze green; dry red for chile powder
Cayenne	No	Yes — fully red, thin-walled	Sun-dried, ristra, powder
Habanero / Scotch Bonnet	No	Yes — orange/red/chocolate	Fermented hot sauce, dehydrator powder
Chiltepin	No	Yes — red, pea-sized	Sun-dried whole; the easiest pepper to dry
Rocoto	No	Yes — red/orange	Fresh-frozen halves; the seeds are inedibly hot
Bell	Yes — green bell	Yes — red/yellow/orange, sweeter	Roast and freeze; dehydrator slices

Pick green peppers when firm and fully sized. Pick ripe peppers at full color with shoulder-shine just starting to dull. The reliable Dragoons pepper harvest window is **August through first frost (typically October 25-November 10)**. The chiltepins go latest — pick into late November in protected microclimates.

2.2 Tomatoes (Guide 7 §3)

Tomatoes ripen on a sequence of color stages, and the right stage depends on what you'll do with them.

Stage	Description	Best use
Mature green	Full size, firm, pale green; will ripen indoors	Fried green; green tomato chutney; ripen and process
Breaker	First blush of color at blossom end	Pick for shipping; ripen at 65–70 °F indoors 3–5 days
Pink/turning	Half-colored	Last-minute pick before forecast frost
Light red	Mostly red, still firm	Slicing fresh; not best for sauce
Full red ●	Fully colored, slight give	Sauce, paste, salsa, canning, sun-drying
Soft ripe	Heavy give; “table-ripe”	Eat today; freeze whole today

For canning and sauce, full red is the target. Vine ripening builds sugar and lycopene — both important for preserved flavor. The Dragoons summer monsoon often forces an early harvest of pink tomatoes (avoiding cracking from sudden water) — those will ripen well on a porch table out of direct sun.

2.3 Brassicas (Guide 6 §2)

Crop	Harvest signal	Preservation path
Cabbage (storage)	Tight, heavy head; pre-frost	Kraut, kimchi, cellar at 32–40 °F
Cabbage (napa)	Tight, dense head	Kimchi (canonical use)
Broccoli	Tight head, before yellow flowering	Blanch and freeze; side shoots continue
Cauliflower	Tight curd, white; before separation	Pickled; blanch and freeze
Brussels sprouts	Firm, marble–golf-ball size; after first frost	Blanch and freeze; or fresh through winter on the stalk
Kale	Outer leaves continuously; before bolt	Massaged-fresh; dehydrated chips; powder
Kohlrabi	2–3" diameter (before woody)	Cellar; pickled

Brassicas harvested *after* the first light frost are noticeably sweeter — cold weather pushes the plant to convert starches to sugars as an antifreeze response. Time the cabbage and Brussels harvest for after the first 30 °F night.

2.4 Alliums (Guide 6 §3)

The harvest signal for bulb alliums is **2-3 outer leaves brown and folded; tops not yet flat to ground.**

Crop	Harvest window in Dragoons	Curing required?
Garlic (hard-neck)	Mid-June to mid-July	Yes — 2-3 weeks
Garlic (soft-neck)	Late June to late July	Yes — 2-3 weeks
Shallots	July	Yes — 2-3 weeks
Storage onions	July	Yes — 3-4 weeks
Sweet onions	June-July	Minimal cure — eat first
Leeks	September through February (in ground)	No
Scallions	Cut continuously	No

Lift on a dry afternoon, brush off (don't wash) loose soil, and move directly to the curing area (Chapter 10). The Dragoons July weather — 95 °F dry-shade temperatures, 20 % humidity — is essentially ideal for the cure.

2.5 Roots (Guide 6 §5, Guide 7 §10)

Crop	Harvest signal	Preservation path
Carrots	Shoulders 3/4" diameter; sweetest after frost	Cellar in damp sand; pickled
Beets	1.5-3" diameter (larger turns woody)	Cellar; pickled; canned
Turnips	2-3" diameter	Cellar; fermented
Parsnips	After first frost (essential for flavor)	Cellar through winter
Radish (winter daikon)	2-8" diameter	Cellar; kimchi
Sweet potatoes	Before vines blacken; before frost	Cure (see §10.3); cellar at 55-60 °F
Potatoes (Irish)	Tops die back; skin set	Cellar dark at 38-45 °F

Sweet potatoes are the unusual one — they store almost nothing fresh and almost forever cured. The cure step is non-negotiable (see §10.3 and Guide 7 §10.7).

2.6 Greens (Guide 6 §4, Guide 8)

Most greens — lettuce, spinach, arugula, chard, mustard greens, baby kale — are poor preservation candidates. They are 92–95 % water and lose structure when frozen, canned, or dried. The good preservation paths for greens are narrow:

- **Chard, spinach, mature kale** — blanch and freeze (Chapter 8); good in soups, not for raw use.
- **Kale specifically** — dehydrator chips, or fully dried and ground into kale powder for stocks and smoothies.
- **Herbs** — see Chapter 17.
- **Most other greens** — eat fresh, succession-plant for continuous supply, accept that lettuce is not a preserved vegetable.

The 30-minute rule (Chapter 3) is most important here. Greens cut on a 95 °F afternoon and left on a counter are already deteriorating by dinner.

2.7 Orchard fruit (Guide 9 §11)

The full indicator table is in Guide 9. Summary for preservation purposes:

Crop	Harvest signal	Best preservation
Fig	Soft neck, honey drop	Freeze whole; fig preserves; halve and dry
Pomegranate	“Tink” sound when tapped	Whole at 50 °F; juice frozen in pints; molasses
Jujube	Yellow-green speckled (fresh) or brown wrinkled (dried)	Dry — often on the tree
Peach / nectarine	Background yellow; fragrant; slight give	Can in light syrup; freeze sliced; dry; jam
Apricot	Full orange; slight give	Dry (the Dragoons classic); can; brandied
Plum (European)	Color full; slight stem-end softening	Dry to prune; preserves; brandied
Apple	Brown seeds; clean stem release	Cellar at 32–40 °F; sauce; cider; dried slices
Pear (European)	Background green→yellow; firm at pick	Ripen off-tree; can in light syrup; preserves

2.8 Grapes (Guide 5 §11)

Grapes for fresh eating pick at full color and sugar — taste-test rather than reading a refractometer. Grapes destined for raisins pick at 24+ °Bx for sweetness after drying.

The full Brix/pH/TA table for wine destinations is in Guide 5 §11.

3 · Field-to-kitchen handling

Temperature shock · cleaning · field-heat removal · the 30-minute rule

The first hour after harvest is when more quality is lost than at any other point in the preservation chain. A perfectly grown pepper, mishandled in its first thirty minutes off the plant, is no longer a perfect pepper by the time it reaches the kitchen. This chapter covers the small handful of habits that protect what you grew.

3.1 The 30-minute rule

Everything harvested off a plant in summer or fall is hot when it comes off — leaf temperature on a Dragoons August afternoon runs 90–100 °F. The internal flesh of a pepper or tomato can be even warmer if it has been in direct sun. Cell respiration in just-harvested produce is roughly twice as fast at 90 °F as at 70 °F, and four times as fast as at 50 °F. Sugars degrade, vitamins oxidize, and the produce starts using up its own stored energy.

The rule: get it into shade within 5 minutes; into the kitchen within 30; into a wash bath, refrigerator, or processing within 60. This applies most strictly to greens, herbs, and berries. It applies somewhat less strictly to mature peppers, tomatoes, and roots — but it still applies.

Field-heat removal is the single highest-return habit in preservation. A 90 °F basket of basil chilled in 50 °F water for 5 minutes will keep three days longer than the same basil set on a kitchen counter. A 95 °F lug of jalapeños chilled before processing will produce a noticeably brighter fermented hot sauce than the same lug processed warm. This single step requires no equipment, no money, and no time — just discipline.

3.2 Practical handling — by crop type

Crop type	Field handling	First-stop in kitchen
Leafy greens, herbs	Pick early morning if possible; into shade immediately; loose, single-layer in basket — never heaped	Cold-water dunk (50 °F); spin-dry; into fridge in damp towel
Berries, figs	Single-layer in shallow trays; shade; do not stack	Refrigerate dry — only wash just before use
Tomatoes	Shallow trays; do not stack heavy	Counter (60–70 °F) if processing within 48 h; fridge otherwise

Crop type	Field handling	First-stop in kitchen
Peppers	Loose in basket; OK to stack lightly	Counter or cooler; process within 3–5 days for fresh use
Stone fruit	Single layer in trays; bruise-sensitive	Counter to ripen fully; refrigerate when ripe
Apples, pears	Buckets OK	Cellar or fridge; do not store with onions/garlic (off-gassing)
Roots (carrot, beet, turnip)	Tops still on initially	Trim tops to 1" (greens steal moisture from roots); damp-sand storage
Onions, garlic	Lift gently; do not wash; do not knock dirt off hard	Cure rack (Chapter 10) immediately
Sweet potatoes	Lift carefully (skins are very tender); do not rinse	Cure setup within 24 hours (§10.3)
Winter squash	Cut with 2–3" of stem; do not lift by stem	Cure rack 1–2 weeks in warm dry area

3.3 Cleaning — wash, don't soak

The general rule: rinse to remove visible soil and field debris, and do not soak. Soaking pushes water into the tissue, which shortens storage life. For everything that has a true skin (peppers, tomatoes, apples, roots), a brisk cold rinse is enough. For greens, a 2–3 minute cold-water dunk to bring down the temperature and float off soil is appropriate.

A few specific exceptions:

- **Cabbage for kraut** — outer leaves discarded, head halved, then quartered; do not rinse the cut surfaces. Whatever microbial population is on the leaf is what will drive the ferment.
- **Garlic and onions for curing** — never wash. Brush off loose dirt and let the cure dry whatever's left. Washing slows the cure and rots the necks.
- **Sweet potatoes** — never wash before curing. Skin is loose and tearing it is a wound that needs to heal during cure.
- **Herbs for drying** — quick cold rinse, very thorough spin-dry, then onto drying screens.

3.4 Tools worth owning

A modest harvest kit pays for itself the first season:

- **Shallow harvest trays** (12 × 18 × 4" plastic flats from feed stores, \$5 each, buy six)
- **A spring-loaded harvest snip** (Felco 12 or similar, \$40 — replaces fingers for everything except tomatoes)
- **A 5-gallon bucket with a kitchen towel inside** (for greens — towel wicks moisture; bucket protects from sun)
- **A salad spinner** (the largest you can fit — herbs and greens)
- **A 16-quart stainless mixing bowl** (the cold-water dunk station)
- **A digital scale** (gram precision for fermentation; ounce precision is not enough)
- **A pH meter or strip set** (for canning and fermentation; see Chapter 4)

4 · Canning safety

Water bath · pressure · altitude · equipment

Home canning is one of the most rewarding preservation methods — shelf-stable, no electricity, jars that look beautiful in a pantry — and one of the few preservation methods that can actually kill someone if done incorrectly. The pathogen in question is *Clostridium botulinum*, the bacterium that produces botulinum toxin in anaerobic, low-acid, room-temperature environments. A sealed jar of improperly canned green beans is exactly that environment. Botulinum toxin is among the most lethal substances known.

This is not theater. People die from home-canned low-acid food every year. The rules in this chapter are not opinions and are not negotiable. They are also not difficult — they are just specific.

WARNING

The single rule that makes home canning safe. Acidic foods (fruit, jam, pickles, tomatoes with added acid, anything with a measured pH ≤ 4.6) can be processed in a boiling-water bath. Low-acid foods (vegetables, meat, beans, soups, tomatoes *without* added acid, pumpkin) **must** be processed in a pressure canner. There is no exception. Boiling water at sea level is 212 °F; at our altitude, it's 204 °F. Neither temperature is high enough to kill *C. botulinum* spores. Only the 240+ °F achieved inside a pressure canner kills the spores. If you can't measure pH and can't pressure-can it, freeze it instead.

4.1 The altitude rule — non-negotiable at 4,700 ft

Standard canning recipes and times are written for sea level. Cochise County and the Dragoon foothills sit at roughly 4,700 ft. This changes two things:

1. **Water boils at about 204 °F instead of 212 °F.** Every 1,000 ft of elevation drops the boiling point by approximately 2 °F. At 4,700 ft, ambient atmospheric pressure is about 12.4 psi instead of 14.7 psi.
2. **Heat penetration into the jar is slower at the lower boiling temperature.** To compensate, water-bath processing times are extended, and pressure canners are run at higher pressures to reach 240 °F inside the canner.

The adjustment table for the Dragons:

Process	Sea-level standard	Dragoons (4,700 ft)
Boiling-water bath ≤ 20 min process	Stated time	Add 5 minutes (this guide uses 10 min for margin)

Process	Sea-level standard	Dragoons (4,700 ft)
Boiling-water bath > 20 min process	Stated time	Add 10 minutes
Pressure canner — dial gauge	10 psi	15 psi (per USDA chart, 3,001–6,000 ft)
Pressure canner — weighted gauge	10 lb	15 lb
Pressure canner — atmospheric ambient	14.7 psi	12.4 psi
Boiling temperature of water	212 °F	204 °F
Internal temp reached in pressure canner at 15 psi	n/a	≈ 252 °F (above 240 °F botulism kill)

Memorize three numbers. At 4,700 ft: water bath, add 10 minutes; pressure dial, 15 psi; pressure weighted, 15 lb. If you write recipes in a kitchen notebook, write the altitude-adjusted time, not the sea-level time. Future-you will not remember which one is in the book.

4.2 Water-bath canning — equipment

Item	Specification	Notes
Pot	Tall stockpot, 21 qt or larger, with rack to hold jars off bottom	An enameled stockpot (\$60) is standard; stainless works equally well
Rack	Wire jar rack with handles	Keeps jars from touching the bottom (boil-bumping cracks them)
Jar tongs	Padded, lockable	Essential — boiling-water jars cannot be lifted with a kitchen towel safely
Wide-mouth funnel	Stainless steel	Keeps rims clean; rims with food on them won't seal
Bubble tool / non-metallic spatula	Plastic	For releasing air pockets in packed jars
Magnetic lid lifter	Optional	Convenient for fishing flat lids out of warm water
Headspace gauge	Optional	A 1/4" or 1/2" gauge that fits the jar mouth

Item	Specification	Notes
Jars	Ball / Kerr / Bernardin, mason-thread	Buy in bulk from feed stores or Ace Hardware in Willcox
Flat lids	New each canning session	The rubber compound is single-use for water-bath sealing
Bands	Reusable	Inspect for rust; discard pitted ones

Suitable for: jam, jelly, fruit preserves, fruit in syrup, tomatoes with added acid, pickles, chutneys, salsa (acidified), pickled peppers, fermented pickles that you want shelf-stable.

4.3 Pressure canning — equipment

A pressure canner is not the same thing as a pressure cooker. A pressure canner is a tall, wide pot designed to hold canning jars upright on a rack, with a regulated venting weight and a calibrated gauge. A pressure cooker (Instant Pot, stove-top pressure pot) is **not safe for canning** — they don't reach the necessary pressures reliably, and the cook-down time is wrong.

Brand / model	Capacity	Type	Notes
Presto 23-quart ●	7 quarts	Dial gauge	Standard household canner; affordable (\$120); replace gasket every 2 years
Presto 16-quart	5 quarts	Dial gauge	Smaller, sufficient for a single grower
All American 921 ●	7 quarts	Weighted gauge (no gasket)	Heavy (\$350) but lifetime tool; preferred long-term
All American 930	14 pints	Weighted gauge (no gasket)	Big-batch household model
Mirro 22-quart	7 quarts	Dial gauge	Acceptable; lighter-weight construction

The All American canners use a machined metal-to-metal seal and a graduated weight on the vent — they have no gasket to dry-rot, no dial to recalibrate, and the safety

margin is wider than dial-gauge canners. They are heavier and more expensive, but they will outlive you.

Dial-gauge canners need to be tested annually for calibration. The University of Arizona Cooperative Extension Cochise County office (Sierra Vista, 520-458-8278) will test a dial gauge for free — bring it in once a year before canning season.

WARNING

Pressure canner safety checks before every use. (1) Vent pipe clear — run a pipe cleaner or stiff wire through to make sure no food residue blocks it. A blocked vent is the failure mode that causes pressure canners to explode. (2) Gasket (Presto) inspected for cracks or stiffness; replace if compromised. (3) Weight or regulator inspected and clean. (4) Safety overpressure plug inspected. A pressure canner that exploded sent shrapnel through a Cochise County kitchen ceiling in 2008. The cause was a blocked vent pipe.

Suitable for: vegetables (beans, carrots, beets, corn), meat, fish, stocks, soups, low-acid tomato products, dried beans cooked and canned, chicken stock, vegetable stock.

4.4 Pots, lids, and the small stuff

Enameled vs stainless. Both work. Stainless lasts longer and tolerates rougher handling. Enameled (the speckled blue or red canning pots from hardware stores) chips with hard use, but each chip exposes bare steel that rusts and discolors food. Both are acceptable. Avoid aluminum for canning — it reacts with acidic foods and discolors over time.

Lids. Ball changed the lid compound around 2019, and there have been intermittent seal failures since. The fix is to (1) use lids from a fresh box for each canning session, (2) wipe rims dry and clean with a vinegar-dampened cloth before putting on the lid, (3) check seals 24 hours after processing (lid should be slightly concave, no flex when pressed). Re-process or refrigerate any jar that didn't seal.

Reusable lids. Tattler and Harvest Guard make two-piece reusable lids with a separate rubber gasket. They work for water-bath and pressure canning, cost about \$1 each, and pay back in 3-4 uses. The trade-off is they require slightly different tightening (snug, not finger-tight) and the gaskets eventually wear out. A grower canning 100+ jars a year should consider them.

LOCAL TIP

Where to get used jars in Cochise County. Estate sales in Sunsites, Pearce, and St. David are the canonical source — a flat of vintage Ball jars goes for

\$5–10 in a good week. Bisbee Antique Mall has them sporadically. The Ace Hardware in Willcox stocks new jars and lids at agricultural pricing. The University of Arizona Cochise County Master Gardener program sometimes runs canning-jar swaps in late summer — call the extension office to ask.

4.5 The basic water-bath process — step by step

1. **Inspect jars.** Check rims with a fingernail for chips. A chip larger than 1/16" will prevent a seal — set the jar aside for refrigerator pickles or a kitchen vase.
2. **Wash everything.** Jars, lids, bands, funnel, tongs. Run jars through a dishwasher cycle on hot, or wash by hand in hot soapy water and rinse.
3. **Heat jars.** Hold jars hot (160–180 °F) — either in the dishwasher with the heat cycle, or in simmering water in the canner. Filling a cold jar with hot food can crack it (thermal shock).
4. **Prepare food.** Per the recipe.
5. **Heat lids.** Modern lids do not need to be simmered — just keep them clean and dry. (Older instructions called for simmering; the current Ball recommendation is to use them straight from the box.)
6. **Fill jars.** Use funnel. Leave the headspace specified in the recipe (usually 1/4" for jam/jelly, 1/2" for pickles, 1" for tomatoes).
7. **Release bubbles.** Run the bubble tool around the inside edge.
8. **Wipe rims.** Clean cloth dampened with vinegar — vinegar cuts any oil residue that would prevent a seal.
9. **Apply lids.** Flat first, then band. Tighten band **finger-tight** — not torqued down. Air has to escape during processing.
10. **Lower into canner.** Water should already be hot. Jars must be covered by at least 1" of water.
11. **Bring to full rolling boil.** Start timing only after full boil resumes.
12. **Process.** For the altitude-adjusted time.
13. **Turn off heat. Wait 5 minutes** before removing jars.
14. **Lift jars onto a towel.** Do not touch the lids. Let cool undisturbed 24 hours.
15. **Check seals.** Lid should be slightly concave; pressing the center should produce no flex or pop. Refrigerate any that didn't seal.

4.6 The basic pressure-canning process

1. **Inspect canner.** Vent pipe clear, gasket clean (Presto), weight clean (All American), gauge calibrated.
2. **Add 2–3" of water to canner.** Not full — pressure canners run with steam, not submersion.
3. **Prepare jars and food as for water bath.** Same hot-jar protocol.
4. **Load jars onto rack.** Don't stack; can double-stack with a second rack if the

canner is designed for it.

5. **Lock lid.** Per the canner's design.
6. **Heat to vent.** Steam will start escaping from the vent. Let it vent steam vigorously for **10 full minutes** — this purges air from the canner. Without this step, the canner reaches pressure but does not reach the corresponding temperature. **This is the most-skipped step and the most-dangerous to skip.**
7. **Put weight on.** Or close the petcock.
8. **Bring to pressure.** Watch the gauge or wait for the weight to rock.
9. **Start timing** only after full pressure is reached at 15 psi.
10. **Maintain 15 psi for the full process time.** Adjust burner heat as needed. Dropping below 15 psi mid-process means restarting the timer.
11. **Turn off heat. Wait for canner to depressurize naturally.** Do not vent forcibly. A natural cooldown takes 30-60 minutes. Forcing it (running cold water on the canner, lifting the weight early) is dangerous and produces siphoning that ruins seals.
12. **Open canner away from face** when pressure has fully released.
13. **Lift jars onto towel.** Cool 24 hours undisturbed.
14. **Check seals.**

4.7 Common canning failures

Symptom	Likely cause	Fix
Seal didn't form	Rim wasn't clean; lid not new; jar not hot enough	Re-process within 24 h with new lid, or refrigerate and eat within 2 weeks
Seal formed, then popped weeks later	Headspace too low; jar too full; weak seal	Do not eat. Botulism is colorless and tasteless. Compost.
Siphoning (food siphoned out of jar)	Forcing canner cool-down; pressure changes too fast; jar over-filled	Wipe lid; let cool; if sealed, fine to use; eat first
Cloudy liquid (in pickles)	Hard water; iodized salt; old vegetables	Cosmetic only if seal holds; use canning/pickling salt next time
Cloudy liquid (in vegetables)	Could be cosmetic; could be early spoilage	Inspect — bulging lid or odor means discard
Bulging lid	Spoilage. Botulism risk.	Compost without opening; do not taste.
Discolored food at jar top	Air contact; oxidation	Refill with brine next time; cosmetic only

Symptom	Likely cause	Fix
Mold on top after opening	Air exposure during storage	Refrigerate after opening; mold means discard

WARNING

The single rule of doubt. If you have any doubt about a canned jar — the lid was puffy, the smell was off, the contents were cloudy in a recipe where they shouldn't be, the brine receded, you found it in the back of a cabinet and can't remember when you canned it, or it just looks wrong — **do not taste it.** Boiling botulism toxin does inactivate it (10 minutes at boil for liquids), but the right move is to throw it out. Compost into a hot pile, double-bag for landfill, or pour the contents down a drain followed by bleach. The jar can be sterilized and reused.

5 · Pickling

Quick pickles · refrigerator pickles · fermented pickles · brine ratios

Pickling is the easiest of the canning-adjacent skills, and it covers more crops than any other single preservation method. Cucumbers, peppers, carrots, beets, onions, garlic, green beans, cauliflower, radishes, watermelon rind, asparagus, and unripe tomatoes all pickle well. There are three families of pickle.

5.1 The three families

Type	Method	Shelf	Acidity source	Heat
Quick (canned vinegar pickle)	Vinegar brine + hot pack + water-bath canning	12+ months pantry	Added vinegar (5 % acetic acid)	Hot
Refrigerator pickle	Vinegar brine + cold pack + refrigerator	2-3 months refrigerated	Added vinegar	Cold or hot
Fermented (lacto-fermented)	Salt brine + wild fermentation	3-6 months in cool cellar; longer refrigerated	Lactic acid from fermentation	Cold

The quick pickle is the workhorse — bread-and-butter cucumbers, dill spears, pickled jalapeños, pickled red onions, dilly beans, pickled cauliflower. The refrigerator pickle is the same thing without the canning step — faster, fresher-tasting, doesn't keep as long. The fermented pickle is its own chapter (Chapter 6).

5.2 The pickling brine — universal ratio

Most quick-pickle recipes are variations on a single brine ratio.

Ingredient	Quantity for 1 quart of pickles (approximate)
White or apple-cider vinegar (5 % acidity)	1 cup
Water	1 cup
Canning/pickling salt	1 tablespoon
Sugar (optional, for sweetness)	1-3 tablespoons (none for dill; 3 Tbsp for bread-and-butter)
Whole spices	varies (see below)

For 7 quarts (a full canner load): 7 cups vinegar, 7 cups water, 7 Tbsp salt, plus spice and sugar to taste.

Salt notes. Use canning/pickling salt, kosher salt, or sea salt — anything without iodine or anticaking agents. Iodized salt produces cloudy brine and off-flavors. Anti-caking agents leave a haze.

Vinegar notes. Distilled white vinegar is neutral. Apple cider vinegar adds fruity depth — good for fruit pickles, sweet pickles, and pickled onions. Wine vinegars are too expensive for routine use. Whatever vinegar you use must be labeled **5 % acidity** for canning safety — homemade vinegars are unsafe for canning because acidity is unknown.

The pickling salt-to-water ratio matters most for fermented pickles (Chapter 6 — 2 % to 3.5 % salt by weight). For quick vinegar pickles the salt level is mostly flavor; the *vinegar* is what makes them safe. Never reduce vinegar below 1:1 with water in a canned pickle recipe — that compromises safety. Add more vinegar, more sugar, more spice — but not less vinegar.

5.3 Quick pickle procedure (water-bath canned)

1. **Prepare the crop.** Wash. Trim ends. Slice or leave whole. For crisp pickles, cut a thin slice off the blossom end of cucumbers (the enzymes there cause softening).
2. **Salt-soak (optional, for cucumbers).** 4 hours in 1/4 cup salt per 4 lb cucumbers, covered in ice. Improves crispness. Rinse before packing.
3. **Pack jars.** Hot jars from the canner. Pack tight without crushing. Leave 1/2" headspace.
4. **Add aromatics.** Per the jar: 2-3 garlic cloves, 1 tsp dill seed, 1 tsp mustard seed, a small dried chile, a bay leaf, a few peppercorns — whatever the recipe calls for.
5. **Pour hot brine.** Bring brine to a boil first. Pour over the packed vegetables, maintaining 1/2" headspace.
6. **Release bubbles.** Run the bubble tool around the inside.
7. **Wipe rims, apply lids and bands finger-tight.**
8. **Process in boiling-water bath** for the time below (Dragoons-adjusted).

Pickle	Jar size	Boiling-water bath time at 4,700 ft
Cucumber dill spears	Pint or quart	20 min (10 sea-level + 10)
Bread-and-butter slices	Pint	20 min
Dilly beans	Pint	15 min
Pickled jalapeño slices	Half-pint or pint	20 min
Pickled red onion	Pint	15 min

Pickle	Jar size	Boiling-water bath time at 4,700 ft
Pickled beets (cooked first)	Pint	40 min (30 sea-level + 10)
Pickled cauliflower	Pint	20 min
Pickled okra	Pint	20 min
Pickled garlic cloves	Half-pint	20 min
Bread-and-butter zucchini	Pint	20 min

5.4 Crispness — the perpetual pickle question

The most common pickling complaint is soft pickles. Six factors drive crispness:

1. **Variety.** Pickling cucumbers (Boston Pickling, National Pickling, H-19 Little Leaf) hold up better than slicers. Burpless and English cucumbers will not make crisp pickles.
2. **Freshness.** Cucumbers more than 24 h off the vine soften. Pickle the morning of, or refrigerate cut spears in ice water until you're ready.
3. **Salt soak.** A 4-hour ice-salt soak before packing pulls water from the cells and concentrates pectin. Worth doing.
4. **Blossom-end trim.** Cut off 1/8" from the blossom end. Enzymes concentrated there break down pectin during the cure.
5. **Calcium.** Pickle Crisp (calcium chloride, food grade) — 1/8 tsp per pint — firms the texture noticeably. Sold by Ball and at most hardware stores in canning sections. Skip alum (older recipes) — the FDA no longer recommends it.
6. **Tannin.** Traditional addition: a fresh oak leaf, grape leaf, or 1/2 tsp loose black tea per jar. The tannin slows enzymatic softening.

5.5 Specific recipes — the canon

Dill cucumbers (the standard)

For 4 pints: - 2 lb pickling cucumbers (3-4" long) - 8 garlic cloves - 4 large heads fresh dill (or 4 tsp dill seed) - 1 tsp pickling spice (whole) - 2 cups vinegar - 2 cups water - 2 Tbsp pickling salt - 1/8 tsp Pickle Crisp per jar (optional)

Trim blossom ends. Ice-water soak 4 hours. Pack into hot pints with garlic, dill, and pickling spice. Pour boiling brine. Headspace 1/2". Process 20 min in BWB.

Pickled jalapeños (escabeche)

For 4 half-pints: - 1 lb jalapeños, sliced into 1/4" rings (wear gloves) - 1 cup sliced carrot - 1 cup sliced sweet onion - 6 garlic cloves - 2 bay leaves - 1 tsp Mexican oregano - 1 tsp cumin seed - 1 tsp black peppercorns - 1.5 cups vinegar - 1.5 cups water - 2 Tbsp salt - 1 Tbsp sugar

Combine brine. Bring to boil. Add vegetables and simmer 3 minutes. Pack into hot half-pints. Cover with brine. Headspace 1/2". Process 20 min.

Bread-and-butter pickles

For 4 pints: - 2 lb pickling cucumbers, sliced 1/4" thick - 1 lb sweet onion, sliced thin - 1/4 cup pickling salt - Ice - 2 cups apple-cider vinegar - 1.5 cups sugar - 1 Tbsp mustard seed - 1 tsp celery seed - 1/2 tsp turmeric - 1/2 tsp ground cloves

Layer cucumbers and onions with salt and ice in a bowl; weight and chill 4 hours. Drain and rinse. Combine vinegar, sugar, spices; bring to boil. Add vegetables; simmer 3 min. Pack hot. Process 20 min.

Pickled red onions (refrigerator)

For 1 pint, no canning: - 1 large red onion, sliced very thin - 3/4 cup apple-cider vinegar - 1/4 cup water - 1 Tbsp sugar - 1 tsp salt - 1 tsp black peppercorns - 2 bay leaves

Pack onions into pint jar. Bring brine to boil; pour over. Cool 30 min on counter; refrigerate. Ready in 1 hour, peak at 3 days, keeps 2-3 weeks.

Dilly beans

For 4 pints: - 2 lb green beans, trimmed to fit jar - 4 garlic cloves - 4 small dried chiles - 4 heads fresh dill - 2.5 cups vinegar - 2.5 cups water - 1/4 cup salt

Pack beans vertically into hot pints with garlic, chile, and dill. Pour boiling brine. Process 15 min.

Pickled garlic

For 4 half-pints: - 1 lb peeled garlic cloves (about 4 large heads' worth — buy from feed store in bulk) - 1.5 cups white wine vinegar - 1.5 cups water - 2 Tbsp sugar - 1 Tbsp salt - 4 small dried chiles - 4 sprigs fresh thyme or oregano

Pack peeled cloves into hot half-pints. Pour boiling brine. Process 20 min. The cloves will turn blue or green in some batches — this is a harmless reaction between garlic sulfur and trace metals in the vinegar. Edible, but visually unsettling. Use freshly picked garlic and white wine vinegar to minimize.

LOCAL TIP

Cochise County dilly bean season. Tepary beans don't dilly well (too small), but most other bush snap beans hit pickle stage in mid-July through late August. The same week you're pulling garlic out of curing in late July is the week to pickle a 4-pint batch — fresh local garlic and fresh local beans make a noticeably superior dilly bean. Hard-neck garlic specifically tastes better in a dilly bean than soft-neck.

6 · Lacto-fermentation

Salt-only ferments · kraut, kimchi, hot sauce, garlic

If pickling is the workhorse of the preservation kitchen, lacto-fermentation is its high-leverage cousin. The yield from a few cabbages, a few jalapeños, or a few heads of garlic is wildly disproportionate to the effort. No canning, no heat, almost no equipment. Salt and time do the work.

6.1 What's happening — the short version

Lacto-fermentation uses naturally-occurring *Lactobacillus* bacteria (already on the surface of every vegetable) in an anaerobic, salty environment. The bacteria eat sugars and produce lactic acid. The acid drops the pH below 4.0, which inhibits spoilage organisms and pathogens. The result is shelf-stable (with cool storage) and tastes fundamentally different from vinegar pickling — a more complex, more layered acidity, with the fizz and depth that come from active fermentation.

The Dragoons have a small disadvantage and a big advantage for fermentation. The disadvantage is that low humidity dries the surface of an open ferment quickly — covers and water-airlocks matter more here than in Vermont. The advantage is that an ambient indoor temperature of 65–72 °F in a north-facing room is ideal for a slow primary ferment — and the 55–60 °F deep cellaring temperature available year-round is ideal for the secondary cold-storage phase.

6.2 The salt ratio — the most important number

Salt concentration is the variable that distinguishes successful fermentation from spoilage. Too low, and pathogens outcompete the *Lactobacillus*. Too high, and the *Lactobacillus* itself is inhibited and nothing ferments.

Ferment type	Salt by weight	Notes
Sauerkraut, dry-salted	2.0 % of cabbage weight	Lower than this risks spoilage; higher slows fermentation
Kimchi, dry-salted	2.0–2.5 %	Slightly higher because of variable napa moisture
Brine ferment (cucumber, pepper, vegetable)	3.5 % brine	35 g salt per 1 L water
Brine ferment (whole olive, very firm vegetable)	5 % brine	50 g salt per 1 L water
Hot sauce (pepper mash)	2.5 % of pepper weight	Mashes ferment as a slurry

The 2 % rule. For dry-salt ferments (kraut, kimchi), use 2.0 % salt by weight of the prepared vegetable. **By weight, not volume.** A digital gram scale is essential. 1,000 g of shredded cabbage takes 20 g of salt. No exception, no eyeballing, no “a tablespoon or two” — get the gram scale.

6.3 Equipment — the minimum

- **Wide-mouth quart, half-gallon, or gallon jars** with airlocks (Pickle Pipe silicone valves, Easy Fermenter lids, or screw-on glass-and-rubber airlock lids — all \$15-25 for a set)
- **Glass fermentation weights** (small glass disks that sit on top of the food to keep it submerged under brine — essential)
- **A digital gram scale**
- **A 6-quart food-grade plastic bucket or stoneware crock** for larger ferments
- **A pH meter or pH strip set** (4.0-7.0 range)

Crocks (stoneware fermentation vessels with water-moat lids) are beautiful and they work — the German Harsch crock, the Ohio Stoneware crock, the Polish ceramic crocks. They cost \$80-250. They are not necessary. A half-gallon mason jar with an airlock does the job equally well.

6.4 Sauerkraut — the canonical ferment

For one half-gallon jar:

- 1 medium cabbage (about 1 kg / 2.2 lb after coring)
 - 20 g (about 1 Tbsp + 1 tsp) pickling salt
 - Optional: 1 tsp caraway seed, 1 tsp juniper berries, a few thin apple slices
1. **Weigh the prepared cabbage.** Discard outer leaves (set one aside). Core. Quarter. Shred thinly with a chef's knife or mandoline. Weigh the shredded cabbage in a large bowl.
 2. **Calculate salt.** 2.0 % of the cabbage weight. 1,000 g cabbage → 20 g salt.
 3. **Salt and massage.** Sprinkle salt over cabbage. Mix with hands. Let sit 10-15 minutes. Massage and squeeze for another 5-10 minutes. The cabbage will release a noticeable amount of brine.
 4. **Pack jar.** Press the cabbage into the half-gallon jar firmly with a fist or a wooden tamper. The brine should rise above the cabbage. Leave 1.5" headspace.
 5. **Top with whole leaf and weight.** Lay the reserved outer leaf over the surface. Place a glass weight on top to keep everything submerged.
 6. **Apply airlock lid.**
 7. **Ferment at 65-72 °F.** 7 days for a tangy kraut; 14-21 days for full sour; 4-6 weeks for the deepest flavor. The cabbage will fizz, smell sour, and grow cloudy.

White scum on the surface is normal and harmless (kahm yeast); black or pink mold means start over.

8. **Move to cold storage at 50 °F or below.** A cellar, a north pantry, or a refrigerator. Once cold, ferment continues slowly for months. Keeps 6+ months refrigerated.

LOCAL TIP

Dragoons fall cabbage is the kraut cabbage. Cabbage harvested after the first 30 °F night in late October has the highest sugar content of the year — the plant converts starches to sugars as a frost defense. Kraut made from October cabbage ferments more vigorously and tastes sweeter than kraut made from spring or hydroponic cabbage. Schedule the fall cabbage planting (early August transplant) so heads come ready right at first frost.

6.5 Kimchi — the brassica-and-allium ferment

The Dragoons-adapted kimchi recipe uses what the garden produces in October-November: napa cabbage, daikon, garlic, ginger, scallion, and gochugaru (Korean red chile flake — buy at a Tucson Asian market or order online; the Dragoons don't grow this exactly, but home-dried cayenne ground coarsely is a workable substitute).

For one half-gallon jar:

- 1 medium napa cabbage (about 1 kg after coring)
 - 20 g pickling salt for dry-salt (2 %)
 - 1 medium daikon radish, julienned (200 g)
 - 4 scallions, sliced
 - 5 garlic cloves, minced
 - 1" piece ginger, minced
 - 3 Tbsp gochugaru (or substitute)
 - 1 Tbsp fish sauce
 - 1 tsp sugar
1. Cut napa lengthwise into quarters; cut quarters across into 1.5" pieces. Weigh.
 2. Salt cabbage with 2 % salt by weight. Toss to coat. Let sit 1 hour, tossing once. Drain (do not rinse for full-strength kimchi; rinse and squeeze for milder).
 3. Make paste: garlic, ginger, gochugaru, fish sauce, sugar.
 4. Combine drained cabbage, daikon, scallions, and paste. Mix with hands (wear gloves).
 5. Pack into half-gallon jar. Press down. Leave 2" headspace — kimchi expands more than kraut.
 6. Top with glass weight; apply airlock lid.
 7. Ferment at 65–70 °F for 3–5 days. Smell will become sour and pungent.
 8. Move to refrigerator. Develops complexity for 3+ weeks. Keeps 6 months.

6.6 Fermented hot sauce — the Dragoons specialty

The Dragoons grow more peppers than any household can eat fresh. Fermented hot sauce is the highest-yield use for the surplus. The recipe scales — make it in a half-gallon jar; bottle it as a long row of small bottles for gifts.

For one half-gallon jar:

- 1 kg ripe peppers (red jalapeño, fresno, habanero, serrano, ghost — single variety or mix)
 - 25 g pickling salt (2.5 % by weight)
 - 5–10 garlic cloves
 - Optional: 2 carrots; 1 sweet onion; herbs
1. Wear gloves. Stem peppers (leave seeds for full heat; remove for milder). Roughly chop.
 2. Weigh chopped peppers + add-ins. Calculate salt at 2.5 %.
 3. In a food processor or blender, pulse peppers, garlic, and salt to a coarse mash.
 4. Pack into half-gallon jar. Top with weight. Apply airlock.
 5. Ferment at 65–72 °F for **2–6 weeks**. The mash will bubble vigorously the first week. By week 4, fizz subsides and the smell deepens — vinegar notes, fruit, no longer raw-pepper heat. Taste-test at week 2 — go longer for more complexity.
 6. **When ready:** purée in a blender. Strain through fine mesh for smooth, or leave with pulp.
 7. **Add vinegar to adjust** — 1/4 cup of white or apple cider vinegar per quart of mash is typical. Tartness preference varies.
 8. **pH check.** Use a meter or strips. Target pH ≤ 4.0 for shelf-stable bottling. If pH is above 4.0, add more vinegar.
 9. **Bottle in 5 oz hot-sauce bottles.** Refrigerate. Keeps 6+ months refrigerated, or process bottles in BWB 10 min for shelf-stable.

This is the highest-impact preservation a Dragoons pepper grower can do. Three quarts of fermented hot sauce from one summer's surplus is roughly equivalent to a hundred small commercial bottles. The cost is salt, jars, and a few weeks of fermentation. Build the recipe around your own peppers — a Chiltepin-and-Rocoto sauce, a smoked-jalapeño-and-habanero sauce — and it becomes a Dragoons terroir product that you cannot buy anywhere.

6.7 Other Dragoons-relevant ferments

Ferment	Brine/salt	Time at 65-72 °F	Cold storage
Fermented salsa	2.5 % salt dry-mix; or pack into 3.5 % brine	5-10 days	Refrigerated 2 months
Fermented jalapeños (sliced or whole)	3.5 % brine	7-14 days	Refrigerated 6 months
Sour pickles (whole cucumbers)	3.5 % brine; grape leaf per jar	7-14 days	Refrigerated 4 months
Fermented garlic (peeled cloves in brine)	3.5 % brine	4-8 weeks	Refrigerated indefinitely
Fermented carrots (sticks)	3.5 % brine	5-10 days	Refrigerated 4 months
Beet kvass	3.5 % brine; beets quartered	7-14 days	Refrigerated; drink the liquid
Tepache (pineapple peel + piloncillo)	sugar + wild yeast	2-4 days	Drink within 1 week

WARNING

Watch for the signs of failed fermentation. Pink fluffy growth on the surface = discard. Black fuzzy mold = discard. Slimy texture in greens or vegetables that shouldn't be slimy = discard. A vinegary-but-clean smell, white film (kahm yeast), or grayish discoloration on the top = harmless, skim and continue. The general rule: a properly-fermenting jar smells like sauerkraut, kimchi, or sour pickles — appetizing in a sour way. A spoiled jar smells rotten or putrid. The nose tells you most of what you need to know.

7 · Drying — the Dragoons advantage

Sun · oven · dehydrator · smoke · solar · what dries and what doesn't

If pickling and fermenting are the easy methods, drying is the *natural* method here. Cochise County summer humidity is 15-30 % most days outside the brief monsoon afternoons. Surface evaporation is rapid. A tray of sliced apricots set on a covered porch in the morning is half-dry by sundown and fully dry by the next afternoon. New Mexico and Sonoran-Mexican food cultures developed around this fact, and the methods they evolved — the chile ristra, the sun-dried tomato, the air-cured apricot half — work essentially unmodified at the Dragoon foothills' elevation and humidity.

7.1 What dries well, what doesn't

Dries well ●●	Dries acceptably ●	Doesn't dry well
Peppers (all types)	Onions (sliced)	Lettuce
Tomatoes (paste varieties)	Garlic (sliced)	Cabbage
Figs	Apples (slices)	Cucumbers
Apricots	Pears (slices)	Summer squash
Plums (European)	Persimmons	Watermelon
Grapes (Thompson, Flame)	Berries	Most cucurbits
Beans (dry beans)	Stone fruit (peach, nectarine — slice)	Most lettuces
Corn (flint, dent)	Pomegranate arils	Most brassicas (kale is an exception)
Herbs	Mushrooms	Most leafy greens
Chiltepin	Carrots (sliced)	Bell peppers (when fully ripe — slow)
Hot peppers (all)	Squash blossoms	
Beans (for storage)	Kale (chips)	

The general principle: things with high sugar and modest water content dry brilliantly (figs, apricots, peppers, tomatoes). Things that are nearly all water (cucumbers, lettuce, watermelon) lose so much volume that the result isn't useful. Brassicas dry poorly except kale, which has enough mass per leaf to make a chip or a powder.

7.2 The four methods

Method	Best for	Equipment	Time	Notes
Sun drying	Cayenne, chiltepin, halved tomatoes, halved apricots, halved figs	Stainless or food-safe nylon screens; covered porch	1-7 days	The Dragons specialty
Ristra (hanging)	Hatch, Anaheim, cayenne, chiltepin	Twine, large needle, dry porch	3-6 weeks	Traditional, beautiful, slow
Oven drying	Anything; especially good for slow-finish	Sheet pans, oven set to 150-170 °F with door cracked	4-12 hours	Energy-intensive but consistent
Dehydrator	Anything	Excalibur, Cosori, or similar	8-24 hours	The all-weather workhorse
Smoke drying	Jalapeño → chipotle; bacon, jerky	Smoker, hardwood (mesquite, oak)	2-3 days	Hardest skill; best result
Solar dehydrator (DIY)	Same as sun drying, faster	Cardboard or wood box, black foil, screen	6-48 hours	Cheap, effective, build instructions \$7.6

7.3 Sun drying — the simplest method

The Dragons window for traditional sun drying is **mid-May to late June** (pre-monsoon — hot dry days) and **late September through October** (post-monsoon — dry, cool nights). The mid-summer monsoon afternoon humidity will mold a tray of half-dried tomatoes overnight. Work around the monsoon, not through it.

1. **Prepare the food.** Halve tomatoes (cherry whole), apricots, figs. Slice peaches and apples 1/4" thick. Whole small peppers (Chiltepin, cayenne) need no preparation.
2. **Lay single-layer on stainless or food-safe nylon screens.** A standard 18 × 24" screen costs \$15 at restaurant-supply stores or assemble from window-screen kits.
3. **Cover with a second screen or fine cheesecloth** to keep flies and birds off.
4. **Place in afternoon shade** on a porch, ramada, or covered patio. **Not direct sun** — direct sun cooks the surface and case-hardens the inside, trapping moisture.
5. **Turn pieces** once daily.

6. **Bring inside at night** during late September and October — overnight dew or near-dew shortens the dry. Set on a cool tile floor.
7. **Done when leathery, no surface stickiness, internal flesh dry to a fingernail test.** 1–4 days for thin pieces; up to 7 days for thick halved tomatoes or whole figs.
8. **Finish in a 135 °F dehydrator or 150 °F oven for 2–4 hours** for shelf-stable moisture content (< 15 %). This is a safety step worth doing — surface-dry can hide internal moisture.

LOCAL TIP

The Cochise County drying calendar. Mid-May through mid-June: apricots, early peaches, sliced rhubarb, herbs. Late June: garlic scapes for dried scape powder. July (monsoon): work indoors with the dehydrator. August (late monsoon): figs from breba crop. **September–October ●**: peak. Tomatoes, peppers, peaches, plums, late figs, apples, late corn for hominy. November: finish drying anything that needs the dehydrator. The September–October window is the single most important preservation window of the year in the Dragoons.

7.4 Oven drying

If you don't have a dehydrator, the oven works. Set to the lowest temperature (most ovens bottom out at 150–170 °F). Crack the door 2–3" to let moisture escape — a closed oven traps humidity and stalls the dry. Use sheet pans lined with parchment or with a wire rack on top for airflow. Rotate trays once.

Oven drying uses noticeably more energy than a dehydrator and is harder to keep at a steady low temperature. It's the right method when you have a small batch and no dehydrator. For ongoing preservation work, a dedicated dehydrator pays itself back in a season.

7.5 Dehydrator — the workhorse

The Excalibur 9-tray (\$300) and 5-tray (\$200) horizontal-airflow dehydrators are the standard in this category. Vertical-airflow models (Nesco) are cheaper but require tray rotation and are slower. The Cosori Premium (\$150) is a good budget choice with horizontal airflow.

Recommended temperatures by crop:

Crop	Temperature	Time	Done test
Herbs (basil, oregano, parsley, sage, thyme)	95–105 °F	1–4 hours	Crisps and crumbles

Crop	Temperature	Time	Done test
Peppers (whole small)	125 °F	12-24 hours	Brittle
Peppers (sliced thick-walled — poblano, bell)	135 °F	8-14 hours	Brittle, no flex
Tomatoes (halved cherry)	135 °F	8-14 hours	Leathery to brittle
Tomatoes (sliced paste)	135 °F	8-14 hours	Leathery
Apricots, peaches (halved or sliced)	135 °F	10-18 hours	Leathery, slightly tacky
Apples (1/4" slices)	135 °F	8-12 hours	Leathery to crisp
Berries	135 °F	12-18 hours	Brittle (raisin-like)
Onions (sliced thin)	125 °F	8-12 hours	Brittle
Garlic (sliced)	125 °F	6-10 hours	Brittle
Mushrooms (sliced)	125 °F	4-8 hours	Brittle
Kale (whole leaves)	115 °F	4-8 hours	Crisp
Fruit leather	135 °F	6-10 hours	Pliable, not sticky
Jerky	160 °F initial 4 hours, then 145 °F	6-12 hours total	Bends but doesn't break

7.6 Solar dehydrator — the cheap DIY build

A simple solar dehydrator outperforms open sun drying by a factor of 2-3× (faster drying, better protection from insects, no need to bring trays in at night during summer). The basic design — a tilted insulated box with a clear top, a black bottom, screened airflow vents at top and bottom, and food on a rack inside — has been built a thousand ways. The cheapest workable version:

Materials (~\$30): - One large cardboard box (24 × 36 × 18" or larger) — appliance shipping boxes work - Clear shower-curtain plastic or window plastic (Lowe's, \$8) - Black paint or aluminum foil with the black side out - Window screen, 24 × 36" - 2 × 2 lumber for a tilted frame, or just prop the box on a tilted base - Duct tape

Construction: 1. Cut the front of the box at an angle — taller at the back, shorter at the front — so the top tilts toward the sun (about 30° from horizontal). 2. Line the bottom with black foil or black paint. This is the heat absorber. 3. Cut two 2" × 12" vents — one along the bottom-front edge (cool air in) and one along the top-back edge (hot moist air out). 4. Tape window screen over both vents to keep insects out. 5. Build or buy a rack for the food (a small cookie-cooling rack, or stretch a

sheet of screen between two dowels). Position 3" above the bottom. 6. Stretch clear plastic over the slanted top and tape it taut. This is the greenhouse. 7. Set the whole assembly in full sun, oriented south.

Internal temperatures reach 110–140 °F on a typical Dragoons June or September afternoon. Drying time roughly halves vs. open shade. Costs almost nothing. A more durable version uses 1/2" plywood and proper hinges — about \$60 in materials, lasts decades.

LOCAL TIP

The Dragoons solar dehydrator runs from May through October without supplemental heat. The June and September days are best — hot, dry, low humidity, long sun. Avoid running it through the monsoon afternoons in July and August (humidity stalls the dry); a tarp cover during afternoon storms keeps the rain out.

7.7 Smoke drying — the chipotle method

Chipotle is smoke-dried red jalapeño. The technique applies to other peppers (smoked habanero, smoked Anaheim) and is the regional Southwest specialty alongside the ristra. The Dragoon area has abundant mesquite wood for this — the lower foothills and Sulphur Springs Valley are full of mesquite, and most feed stores in Willcox and Bisbee sell or know who sells food-grade mesquite chunks.

Equipment. A smoker (offset, vertical pellet, or barrel) capable of holding 180–225 °F. A water pan to keep the chamber from drying too fast.

Process for chipotle:

1. Harvest jalapeños at full red — not green. Red jalapeños have higher sugar and fatter flesh; they take the smoke better.
2. Wash and dry. Halve or slit each pepper along one side to vent steam.
3. Lay single-layer on smoker racks.
4. Smoke at 180 °F with mesquite, oak, or pecan for **6–10 hours** the first day. Add wood every 2 hours.
5. Continue at 200 °F for another 6–10 hours on day 2 — by this point the pepper is mostly dried, smoke is penetrating the flesh.
6. Finish in a 135 °F dehydrator or on a sun-drying rack until brittle. Total time: 36–60 hours over 2–3 days.

The result is hard, dark-brown to black, intensely smoky, and shelf-stable for a year+ in a sealed jar. Rehydrate in hot water for 20 minutes for cooking, or grind into chipotle powder for direct use.

Chipotle in adobo (the canned product): Rehydrate dried chipotles 30 minutes

in hot water. Drain. Combine 8 chipotles, 1 cup tomato sauce, 1/2 cup apple-cider vinegar, 4 garlic cloves, 1 Tbsp Mexican oregano, 1 tsp salt, 1 tsp sugar, 1 tsp cumin. Simmer 20 minutes. Pack into half-pint jars. Process 25 min in BWB at 4,700 ft. Six months shelf stable.

8 · Freezing

Blanching · packaging · organization · shelf life · burn prevention

Freezing is the easiest preservation method and the one most preservation manuals undersell. For most household-scale growers, the freezer holds more food, more conveniently, than the canner. A second deep-freeze in the garage essentially doubles a household's preservation capacity for \$250 in equipment and \$5-10/month in electricity.

8.1 The freezer toolkit

- **A chest freezer**, 5-9 cu ft, in a cool location (garage in winter is fine; garage in summer at 110 °F is hard on the compressor — an interior closet is better). \$250-400 new.
- **Vacuum sealer**. FoodSaver, Avid Armor, or similar. \$80-200. Reduces freezer burn dramatically; lets you store fish, meat, and pestos for a year+ without surface oxidation. Rolls of bag stock are \$20 for a year's supply.
- **Sheet pans for flat-freezing**. Half-sheet pans (Restaurant Depot, \$15) — flat-freeze berries, peaches, halved tomatoes, blanched broccoli florets in a single layer before bagging. Prevents clumping; lets you grab a handful from a freezer bag without thawing the whole bag.
- **Freezer-grade zipper bags**. Quart and gallon. Not regular sandwich bags — freezer bags are thicker and resist tearing at cold temperatures.
- **A Sharpie and masking tape**. Label every bag with crop, weight, and date. *Especially* the date. Six months from now, you will not remember.

8.2 Why blanch

Blanching is a brief boil (or steam) followed by an immediate ice-water plunge. It does three things: (1) stops the enzymes that continue to deteriorate vegetable quality even at 0 °F, (2) sets color, and (3) reduces surface microbial load. Unblanched vegetables stored frozen lose color and develop off-flavors within 3-4 months. Blanched, they hold 8-12 months.

Fruits do not need blanching — sugars protect them and enzymes that change fruit quality (browning enzymes especially) are usually managed with lemon juice rather than heat.

Greens, beans, and most cruciferous and dense vegetables benefit substantially from blanching. Soft, watery vegetables (cucumber, lettuce, watermelon) do not freeze well at all and blanching does not save them.

8.3 Blanching times by crop

The Dragoons altitude affects boiling here too — but less significantly than for canning. Add 30 seconds to standard blanching times at 4,700 ft.

Crop	Prep	Blanch time (4,700 ft)	Ice bath	Notes
Asparagus	Trim to fit bag	3 min (large), 2 min (small)	5 min	Snap-test for size
Beans (green)	Trim ends	3 min	5 min	Cut to 1" for flat-pack
Beans (lima, fresh shelled)	Shell	3 min	5 min	
Beets	Cook fully (30 min); peel; slice	n/a	n/a	Don't blanch — fully cook
Broccoli	Florets, 1" pieces	3 min	5 min	
Brussels sprouts	Whole, small ones	4 min	5 min	
Carrots	Slice 1/4"	3 min	5 min	Or freeze grated
Cauliflower	Florets	3 min	5 min	Acid in water to keep white
Chard, spinach, kale	Stem removed	2 min	5 min	Squeeze out water before bagging
Corn	Cut off cob	4 min on cob (then strip), or 2 min loose	8 min	The most common freezer crop
Eggplant	1/3" slices	4 min	5 min	Or roast and freeze; better
Okra	Whole	3 min	5 min	Slimes if not blanched
Onion	Diced	n/a	n/a	Freeze raw; brown-bag
Peas	Shelled	2 min	5 min	
Peppers	Sliced or diced	n/a	n/a	Freeze raw
Squash (summer)	Sliced 1/2"	3 min	5 min	Or grate raw and freeze for bread

Crop	Prep	Blanch time (4,700 ft)	Ice bath	Notes
Squash (winter)	Cubed or puréed	Steam 15 min until tender	n/a	Then freeze
Tomatoes (paste)	Whole or halved	n/a	n/a	Freeze raw
Turnips	Cubed	3 min	5 min	
Zucchini	Sliced or grated	2 min sliced; raw OK grated	5 min	

8.4 The flat-freeze trick

Almost every fruit, blanched vegetable, and cooked sauce benefits from flat-freezing before bagging:

1. Line a half-sheet pan with parchment paper.
2. Lay the prepared food in a single layer — berries, halved tomatoes, blanched broccoli florets, peach slices, etc.
3. Freeze on the sheet pan 2-4 hours until solid.
4. Transfer to a freezer bag or vacuum bag.
5. Press out air; seal; label; return to freezer.

The result: pieces stay individually loose in the bag, so you can grab a cup of frozen blueberries without thawing the whole bag, and food doesn't clump into bricks.

8.5 Expected freezer life

At 0 °F (a true deep freezer; not the freezer compartment of a kitchen fridge, which runs warmer):

Crop	Frozen shelf life
Blanched green vegetables	8-12 months
Raw peppers and tomatoes	8-10 months
Fruit, sugared or sliced	8-12 months
Whole fish	6 months
Meat (vacuum-sealed)	12 months
Stocks and soups	6-9 months
Pesto	6 months (oil-protected)
Roasted Hatch chiles (vacuum-sealed)	12 months
Herb-in-oil cubes	6 months

Crop	Frozen shelf life
Bread	3 months
Butter	9 months

Refrigerator-freezer compartments run 10–18 °F, not 0 °F, and shelf life drops to roughly half the deep-freeze numbers.

Freezer burn is air contact. Every freezer-burn problem reduces to oxygen reaching the food's surface. Vacuum sealing fixes 95 % of freezer burn. Pressing the air out of zipper bags by hand before sealing fixes another portion. Double-bagging fixes the rest. If you're losing food to freezer burn, the answer is a vacuum sealer, not a colder freezer.

8.6 Power outage and recovery

The Dragoons get occasional summer monsoon power outages — usually 2–8 hours, sometimes overnight. A full chest freezer holds 0 °F for 48 hours unopened; a half-full one holds for about 24. **Keep the freezer closed during outages** — every door opening loses 6+ hours of safe time.

After a long outage, food can be re-frozen if it still has ice crystals or is below 40 °F. Soft, fully-thawed food is judgment call: cooked vegetables, fruit, and bread are usually fine to cook and eat; raw meat and seafood that were fully thawed and over 40 °F should be discarded.

Keep a few gallon jugs of frozen water in the freezer — they extend the safe time during outages and double as cooler ice for camping.

9 · Root cellar / cool storage

Deep-ground temperature · root cellar options · humidity · crops that store

The Dragoons have an underused preservation asset: the deep ground holds at **55-60 °F year-round** at 3 ft below the surface. This is exactly the temperature most root crops, apples, and winter squash want for the long sleep through winter. A buried storage space in Cochise County costs almost nothing in electricity and works for as long as the structure stands. Even the cheapest versions — a buried plastic tote, an unheated north room, a hole dug into a hillside and lined with straw — work better than no cellar at all.

9.1 What stores, and at what temperature

Crop	Ideal temp	Ideal RH	Storage life	Notes
Apples	32-40 °F	90-95 %	2-6 months	Variety-dependent; Pink Lady longest
Pears (Bartlett)	30-32 °F	85-90 %	1-3 months	Then ripen at room temp
Beets	32-40 °F	95 %	4-6 months	In damp sand
Cabbage (storage type)	32-40 °F	90-95 %	4-6 months	Wrap individually
Carrots	32-40 °F	95 %	5-9 months	In damp sand; the workhorse cellar crop
Garlic (hard-neck)	32-40 °F or 55-60 °F (avoid 40-55 °F — sprouts)	60 %	4-6 months	
Garlic (soft-neck)	55-60 °F	60 %	8-12 months	The pantry workhorse
Onions (storage)	32-40 °F	65 %	5-8 months	Low humidity vs roots
Parsnips	32-40 °F	95 %	4-6 months	Or leave in ground
Pomegranate	45-50 °F	80-85 %	2 months	
Potatoes (Irish)	38-45 °F	90 %	4-6 months	Dark — light greens them
Rutabaga	32-40 °F	95 %	4-6 months	

Crop	Ideal temp	Ideal RH	Storage life	Notes
Squash (winter)	50-60 °F	60 %	3-6 months	Cure 1-2 weeks first; do NOT refrigerate
Sweet potato (cured)	55-60 °F	60 %	6-8 months	Below 50 °F = chilling injury
Turnips	32-40 °F	95 %	4-5 months	In damp sand

Note the two temperature zones: **35-40 °F at high humidity** (root crops, apples) and **50-60 °F at lower humidity** (sweet potatoes, winter squash, soft-neck garlic). A good cellar has both — a deeper, cooler corner for the cold-and-damp crops, and an upper or warmer shelf for the cool-and-dry crops.

WARNING

Crops that should NOT be cellared together. Onions and garlic off-gas sulfur compounds that flavor and shorten the life of nearby apples and pears. Ethylene-producing fruit (apples, pears) shortens the life of nearby root vegetables and accelerates sprouting. Sweet potatoes below 50 °F develop chilling injury (internal black spots) that is invisible until you cook them. Plan three zones: cold-damp roots, cool-dry alliums and squash, and a separate spot for apples.

9.2 The four cellaring options for the Dragons

Option	Cost	Effort	Capacity	Best for
Unheated north room or closet	\$0	Minimal	1-3 bushels	Allium, squash, sweet potato, hard-neck garlic at 60 °F
Buried tote ●●	\$20-50	1 day	2-4 bushels	Apples, root crops
Old chest freezer (unplugged, in unheated space)	Free-\$50	1 hour	4-8 bushels	Apples, roots; the underrated option

Option	Cost	Effort	Capacity	Best for
Dedicated root cellar (excavated or earthbag)	\$500-3000	1-4 weeks	20+ bushels	Whole orchard / large garden

9.3 The buried tote — the easiest real cellar

1. Buy a 40-60 gallon plastic tote with a tight lid (Home Depot or Walmart, \$30).
2. Dig a hole roughly the size of the tote in a shaded spot — north of a structure is best, deeper is colder. 3 ft deep is the target; the lid should sit 4-6" above ground.
3. Drill 6-8 small (1/4") drainage holes in the bottom and lower sides.
4. Place 4" of pea gravel in the bottom of the hole.
5. Set the tote into the hole. Backfill around with pea gravel or sandy soil.
6. Line the inside with straw or damp sand depending on the crop.
7. Set crops into the lined tote. Cover with insulating straw, then close lid.
8. Mark with a stake so you can find it after snow.

Internal temperature: 38-48 °F most of the winter; 55-60 °F in summer. Capacity: 100-150 lb of roots, apples, or cabbage.

9.4 The unheated north room — the easiest “cellar”

Many Cochise County houses have a north-facing pantry, mud room, garage interior, or basement corner that runs 55-65 °F year-round with minimal effort. This is the practical Dragoons “cellar” for most households. With these characteristics, it will not match a proper buried cellar for deep-cold crops, but it covers:

- Soft-neck garlic (8-12 months)
- Winter squash (3-6 months)
- Sweet potatoes (6-8 months)
- Onions (3-5 months — slightly short of optimum but workable)

For apples and root vegetables that want 35-40 °F, a dedicated refrigerator works better — see below.

9.5 The old refrigerator — the underrated cellar

A used kitchen refrigerator, run on its lowest temperature setting and parked in an unheated garage, basement, or covered porch, gives you 35 °F at 80-90 % humidity for \$50 (used appliance) and \$5-8/month in electricity. It holds 2-3 bushels of apples and root crops easily. Add a small pan of water to raise the humidity; check the pan monthly. This is the most cost-effective cool-storage solution for most Dragoons households.

A chest freezer (full-size) unplugged in an unheated space works similarly — it doesn't actively cool, but its insulation keeps the contents at the ambient temperature, smoothed over the daily swing. Good for sweet potatoes, garlic, onions, squash; not as good as a running refrigerator for apples and roots.

9.6 Building a proper root cellar — the earthbag method

For a serious household-scale grower, a small dedicated cellar (8 × 8 × 7 ft interior) holds 20+ bushels of stored produce and lasts decades. The cheapest method that works in Cochise County is the earthbag dome or earthbag rectangular cellar:

- **Materials.** 200–400 polypropylene woven sandbags (\$1 each from agricultural-supply stores), barbed wire (one roll), gravel for foundation, decomposed-granite fill (from the site), one wood door, a vent pipe.
- **Site.** North side of a hill or building. Dig down 4 ft and into the slope. Build up the walls with earthbag courses, each tamped firm.
- **Roof.** Heavy timber rafters, plywood, plastic moisture barrier, 18" of earth fill on top, planted with native grass to stabilize.
- **Vent.** Two 4" PVC pipes — one low intake, one high exhaust — drive convective airflow that keeps humidity from stalling.
- **Door.** Solid wood, weatherstripped.
- **Interior.** Wood shelving above gravel floor. Straw on shelves for damp-pack vegetables.

Cost: \$500–1500 in materials, plus labor (weeks of weekends). The result is functionally permanent — 50+ year structure with no operating cost.

Several Cochise County permaculture practitioners have built earthbag cellars. The Borderlands Restoration Network in Patagonia and the Avalon Gardens demonstration site near Tumacácori have examples worth visiting.

9.7 Humidity management

The Dragoons are arid. Most cellaring problems here are *too low* humidity, which causes carrots and beets to shrivel, apples to lose firmness, and garlic to over-dry. Counter-measures:

- **Damp sand or sawdust** packed around root crops. Refresh moisture monthly.
- **Open pans of water** at low points in the cellar.
- **A cool-mist humidifier** in larger cellars (run on a humidistat at 90 %).
- **Plastic bag liners** for individual root crops (carrots in a partially-closed plastic bag inside the cellar).

For alliums and squash, the problem reverses — too high humidity rots them. Storage at 60 % RH or below; ventilation; avoid plastic bagging.

10 · Curing

Onion · garlic · sweet potato · winter squash

Curing is a specific post-harvest process distinct from drying. Where drying removes most of the water from a food (to 15 % or less moisture), curing dries down the *surface* — the necks of an onion, the skin of a sweet potato, the shoulder of a winter squash — so that the surface seals the interior moisture in. Cured produce stays plump, juicy, and storable for months. Uncured produce rots within weeks.

Each of the four major cured crops needs its own protocol.

10.1 Onion and garlic curing (Guide 6 §3.9)

The full protocol is in Guide 6. Summary:

1. **Lift gently.** Use a spading fork to loosen soil; lift by hand. Don't wash. Don't knock dirt off.
2. **Lay in single layers** in a dry, shaded, well-ventilated space — porch, open shed, garage with door cracked.
3. **Conditions:** 60–80 °F, RH below 70 %. Dragoons July weather (95 °F dry-shade, 20 % RH) is essentially ideal.
4. **Duration:** 2–3 weeks for garlic and shallots, 3–4 weeks for onions.
5. **Done test:** necks fully dry and tight; outer skin papery; roots brittle.
6. **Trim and store:** Tops to 1" (or leave whole for braiding soft-necks). Roots flush. Brush off dirt. Cull aggressively — any soft spot, mold patch, or wet neck → eat now, don't store.

Properly cured hard-neck garlic stores 4–6 months at 55–60 °F. Soft-neck stores 8–12 months at the same temperature. The single biggest cause of allium storage failure in Cochise County is under-curing — pulling at 1 week, when 2.5–3 weeks was needed. Don't shortcut this.

10.2 Winter squash curing

Winter squash (butternut, acorn, kabocha, delicata, spaghetti, hubbard, pumpkin, tromboncino mature) needs a brief warm cure to set the skin and convert starches.

1. **Harvest.** When skin is fully colored and a fingernail can't easily pierce it. Cut with 2–3" of stem.
2. **Wash gently.** Brief rinse to remove field dirt; air-dry surface.
3. **Cure.** 80–85 °F at 60–70 % RH for **1–2 weeks**. A sunny windowsill, a covered porch in late September, or a heated greenhouse works.
4. **Wipe with a 10:1 water:bleach solution after cure** — surface sanitizer that prevents storage rot. Wipe dry.
5. **Store.** 50–60 °F at 60 % RH. Single layer, not touching. North-facing pantry or

root cellar shelf.

Cured butternut and Hubbard squash store 4-6 months. Acorn squash store about 2-3 months — they have thinner skin and decline faster. Spaghetti, delicata, and most pumpkins store 2-4 months.

10.3 Sweet potato curing (Guide 7 §10.7)

The hardest curing protocol in the Dragoons because the climate at sweet-potato harvest (early October — 60-75 °F, 20-40 % RH) is exactly opposite to what sweet potatoes need (80 °F, 85 % RH). You have to *build* the curing environment.

The full table of improvised setups is in Guide 7 §10.7. The reliable Dragoons method:

1. **Lift carefully on a dry day.** Skin is very tender; tears are wounds the cure will heal *if* it happens; if not, those wounds become rot.
2. **Brush off loose soil. Do not wash.**
3. **Build a curing chamber.** A 30-gallon plastic tote on a wire rack, with a baking dish of water below the rack and a \$20 reptile heat mat under the dish. Cover loosely with plastic sheet. Target: 80 °F, visible condensation on the inside of the plastic. A thermometer-hygrometer in the tote is essential.
4. **Cure 10 days at 80 °F / 85 % RH.**
5. **After cure.** Skin will be slightly papery and resist scratching with a thumbnail. Wrap individual tubers in newspaper, or place in shallow boxes with no contact between tubers.
6. **Store at 55-60 °F, 60 % RH.** Cool basement, heated garage, interior closet. **Never below 50 °F.** Chilling injury below 50 °F shows as internal black spots — invisible until you cook them.

Properly cured sweet potatoes store 6-8 months. Uncured sweet potatoes from a Dragoons harvest rot in 4-6 weeks.

10.4 The black-garlic special case

Black garlic isn't a normal cure — it's a slow, low-temperature ferment of cured whole garlic heads. The result is a glossy black, soft, sweet, savory garlic with no raw bite — used as a paste in sauces, on bread, with cheese.

Process: 1. Start with fully-cured whole heads of garlic (best with hard-neck; soft-neck works). 2. Place in a rice cooker or food dehydrator set to **140 °F** (60 °C). The rice cooker's "keep warm" setting is usually around this temperature — test with a thermometer first. 3. Wrap loosely in aluminum foil to prevent drying. 4. Hold at 140 °F continuously for **40-60 days**. Yes, 40-60 days. 5. The garlic turns black, soft, and sweet through Maillard browning reactions (not actual fermentation by bacteria — this is enzymatic browning of garlic sugars and amino acids). 6. Cool. Store

refrigerated 6+ months, or vacuum-seal and freeze.

The yield from a year's garlic harvest after a 40-day black-garlic ferment is one of the most distinctive products a Dragoons grower can make. Worth a single batch every winter.

11 · Pepper specialties

Ristra · chipotle · pepper powder · fermented hot sauce

The Dragoons grow more peppers per square foot, with better flavor, than almost any other crop. This chapter is the dedicated pepper-preservation reference — the four high-value techniques every Dragoons pepper grower should learn.

11.1 The ristra

The chile ristra — a string of red peppers hanging from a porch beam — is the iconic Southwest preservation method. Properly made, a ristra is decorative for a year and edible for two. The technique is straightforward but specific.

Best varieties for ristras: Hatch, Anaheim, New Mexico Big Jim, cayenne, chiltepin (small ristra), Pueblo. Generally — long, thin-walled, red-when-ripe peppers. Bell peppers and habaneros don't ristra well (too thick-walled).

Materials: - 50-100 fully red, undamaged peppers with stems intact - Twine or natural cotton string (avoid synthetic) - A heavy darning needle or canvas needle - A wire loop or wooden stick for the top

Process: 1. Harvest peppers with stems and a small section of branch attached (1/2"). Do not pull off the cap. 2. Cull damaged ones — any soft spot will rot in the ristra and spread to the rest. 3. Thread the needle. Tie a wire ring to the top of the string. Push the needle through the base of each pepper stem (not through the pepper flesh). Slide each pepper down the string. 4. Group peppers in clusters of three at the same level along the string. This is traditional and structurally stable. 5. Continue until the desired length (typically 3-5 ft). 6. Hang in a shaded, well-ventilated spot — covered porch, ramada, breezeway. **Not in direct sun** (bleaches color) and **not indoors** (insufficient airflow promotes mold). 7. Cure 3-6 weeks. Peppers will shrink to about 60 % original volume, become leathery, then brittle.

A finished ristra is decorative indefinitely and edible for 1-2 years. Pull individual peppers off as needed for cooking — break or twist; the pepper comes off easily once cured.

LOCAL TIP

The Dragoons ristra calendar. Hatch and Anaheim peppers turn fully red in mid-to-late September. The Dragoons October weather — dry, warm afternoons, cool nights, low humidity — is essentially perfect ristra-curing weather. A ristra strung the third week of September is fully cured by Halloween. A ristra strung in monsoon (July-August) molds. Wait for the dry post-monsoon window.

11.2 Chipotle — smoke-dried red jalapeño

The chipotle technique is covered in §7.7. Key Dragoons-specific notes:

- Mesquite is the canonical wood for chipotle, and the Dragoon foothills, Sulphur Springs Valley, and lower Cochise County are full of mesquite. Local feed stores (Willcox, Bisbee) sometimes sell food-grade chunks; otherwise harvest dead, dry mesquite wood from a property where you have permission, season it for 6 months to dry fully, and split into chunks.
- Jalapeños must be fully red at harvest, not green. Green jalapeños won't chipotle properly — too little sugar, too thin flesh.
- The full smoke-and-dry cycle takes 36–60 hours over 2–3 days. Plan around weather — a forecast of dry days helps; a thunderstorm during a smoke session is a serious inconvenience.
- A finished chipotle is hard, dark, and intensely smoky. Stored whole in jars, it keeps 1+ years. Ground into powder, it loses aroma faster — store as whole pods and grind as needed.

11.3 Pepper powder

Dried peppers ground into powder are the most concentrated, shelf-stable, kitchen-ready form of a pepper crop. The technique:

1. Fully dry the peppers (sun, dehydrator, or ristra-cured to brittle).
2. Stem and remove seeds (optional — leave seeds for more heat).
3. Wear a dust mask and eye protection.
4. Grind in batches in a clean coffee grinder dedicated to peppers (a \$20 Krups blade grinder works fine; don't share with coffee — your morning will not appreciate it).
5. Sieve through a fine mesh if you want fine powder; leave coarse for flakes.
6. Store in sealed jars in a dark cupboard. Use within 12 months for full flavor; powder loses aroma after 18–24 months.

Single-variety powders:

Variety	Heat	Flavor	Best use
Ancho (dried poblano)	Mild	Sweet, raisin, deep	Mole, chile sauces, rubs
Pasilla (dried chilaca)	Mild	Tobacco, berry	Mole, rich dark sauces
Guajillo (dried mirasol)	Mild	Tangy, bright	Red enchilada sauce, marinades
Cayenne	Hot	Sharp, clean heat	All-purpose hot powder
Chiltepin	Very hot	Bright, vegetal	Salsa, soup, hot oil
Aji panca	Mild	Berry, smoke	Peruvian dishes
Chipotle (smoked jalapeño)	Medium	Smoke, sweet	Adobo, chile sauces, BBQ

Variety	Heat	Flavor	Best use
Smoked paprika (dried sweet pepper)	Mild	Sweet smoke	Spanish-style dishes
Korean (gochugaru)	Medium	Sweet, fruity	Kimchi, Korean cooking

A blended **Dragoons house chile powder** worth building: 3 parts ancho, 1 part chipotle, 1 part cayenne, 1 part guajillo, a pinch of chiltepin, plus 1 tsp Mexican oregano per cup and 1 tsp cumin. Use as the seasoning base for chili, mole, enchilada sauce, rubs.

11.4 Hot sauce — beyond fermented

Fermented hot sauce is in Chapter 6. Two other useful hot-sauce styles for Dragoons growers:

Vinegar-cooked hot sauce (the Louisiana-style approach): - 1 lb red peppers (chopped) - 1 cup white vinegar - 1 tsp salt - 4 garlic cloves

Simmer 20 minutes. Purée. Strain. Bottle. Refrigerator-stable 6 months; shelf-stable if processed 10 min in BWB (at 4,700 ft).

Fruit hot sauce (mango-habanero, peach-ghost): - 1 lb ripe peppers - 1 cup chopped ripe fruit (mango, peach, pineapple — Dragoons peach works beautifully) - 1/2 cup white wine vinegar - 2 Tbsp sugar - 1 tsp salt - 1 lime, juiced - 2 garlic cloves

Simmer 15 minutes. Purée. Strain. Bottle. Refrigerator-stable 4 months.

12 · Tomato preservation

Sauce · paste · sun-dried · frozen · salsa · ketchup

The Dragoons tomato crop runs from late July through first frost in late October–early November. A typical 6-plant household block produces 100–200 lb of fruit over the season — far more than fresh eating can absorb. Tomato preservation is the single largest preservation undertaking of the year for most growers.

12.1 The yield calculation

Different preservation methods produce wildly different yield-by-weight numbers. Plan the right method for the volume you want.

Preserved product	Yield from 10 lb fresh tomatoes
Canned whole tomatoes	8–9 lb (5–6 quart jars)
Crushed tomatoes (canned)	7–8 lb (4–5 quart jars)
Tomato sauce (thick)	4–5 lb (8–10 pint jars)
Tomato paste	1–1.5 lb (~3 half-pint jars)
Salsa (tomato-based)	6–8 lb (4–5 pint jars)
Sun-dried	0.5–0.75 lb (one quart jar of dried halves)
Frozen whole	8–9 lb (2 gallon freezer bags)
Frozen sauce	4–5 lb
Ketchup	1.5–2 lb (~3 pint jars)

Paste and sun-dried are the most concentrated; raw frozen tomatoes are the easiest. Most growers want a mix of all of them.

12.2 Frozen whole — the simplest tomato preservation

The lowest-effort tomato preservation method, and one of the most useful:

1. Wash tomatoes. Cut out cores. Don't peel.
2. Flat-freeze on a sheet pan, single-layer.
3. When frozen solid (a few hours), transfer to gallon freezer bags. Press out air.
4. Store at 0 °F for up to 12 months.

To use: hold a frozen tomato under warm running water for 10 seconds. The skin slips off in a single piece. The tomato thaws to a slightly soft, easily-chopped form perfect for soups, sauces, and stews. Quality of the finished sauce is roughly equivalent to canned whole tomatoes — significantly better than the supermarket equivalent.

Frozen whole is the gateway tomato preservation. No canning, no peeling, no equipment beyond a freezer bag. A new grower doing tomato preservation for the first time should start here. Move to canning and paste-making in year two or when freezer space becomes the constraint.

12.3 Canning tomatoes — and the acid problem

Tomatoes sit at the borderline of high-acid and low-acid foods (pH 4.0–4.9 depending on variety and ripeness). USDA guidance since the 1990s has been to **add acid to all home-canned tomato products** to ensure pH stays below 4.6:

- 1 Tbsp bottled lemon juice per pint, or 2 Tbsp per quart, **or**
- 1/4 tsp citric acid (food-grade) per pint, or 1/2 tsp per quart

This is non-negotiable for water-bath canning. Without added acid, tomatoes must be pressure-canned as low-acid food. Heirloom tomatoes (Brandywine, Cherokee Purple) are typically lower-acid than commercial varieties — they especially need acidification.

12.4 Canned whole tomatoes

For 7 quarts:

- 23 lb ripe Roma, San Marzano, or paste tomatoes
 - 7 Tbsp bottled lemon juice (or 1 3/4 tsp citric acid)
 - 7 tsp canning salt (optional, for flavor)
 - Hot water to cover
1. Peel: dip tomatoes in boiling water 30 seconds, then ice water. Skins slip off.
 2. Core. Quarter or halve large tomatoes.
 3. Pack into hot quart jars, pressing gently to release juice but not crushing. Leave 1/2" headspace.
 4. Add 1 Tbsp lemon juice and 1 tsp salt per quart.
 5. Pour boiling water to cover, maintaining 1/2" headspace.
 6. Process in BWB for **55 minutes at 4,700 ft** (45 minutes sea-level + 10).

12.5 Tomato sauce (canned)

For 7 pints:

- 24 lb ripe paste tomatoes
- 1 Tbsp salt
- 14 Tbsp lemon juice (1 Tbsp per pint)
- Optional: 4 cloves garlic, herbs

1. Wash. Core. Quarter.
2. Cook in a heavy stainless pot, stirring frequently, for 1.5–3 hours, until reduced by about half and thick enough to mound on a spoon.
3. Mill through a food mill (Squeezeo strainer is the upgrade if you do this every year) to remove skins and seeds.
4. Return to pot. Simmer to desired thickness.
5. Add 1 Tbsp lemon juice per pint jar.
6. Pack into hot pints. Headspace 1/2".
7. Process **45 min in BWB at 4,700 ft** (35 sea-level + 10).

12.6 Tomato paste

The most labor-intensive but highest-concentration tomato preservation. Worth it for the flavor.

For 4–5 half-pints:

- 15 lb ripe paste tomatoes
 - 1 large onion, chopped
 - 1 red bell pepper
 - 4 garlic cloves
 - 2 bay leaves
 - Salt
 - 2 Tbsp olive oil
 - Lemon juice (1 Tbsp per half-pint)
1. Quarter tomatoes. Cook with onion, pepper, garlic, bay leaves until very soft (about 1 hour).
 2. Mill through food mill.
 3. Return purée to pot. Add olive oil. Simmer over low heat for **4–6 hours**, stirring often, until reduced to roughly 1/5 original volume and very thick. Alternative: pour purée onto sheet pans and dry in a 175 °F oven, scraping and stirring every 30 minutes — faster but watch carefully.
 4. Pack into hot half-pints. Add 1 Tbsp lemon juice per jar. Headspace 1/2".
 5. Process **45 min in BWB at 4,700 ft**.

Alternative: freeze tomato paste in 1-tablespoon dollops on parchment, then transfer dollops to a freezer bag. A frozen tablespoon of paste drops directly into a hot pan — easier than opening a jar for one spoonful.

12.7 Sun-dried tomatoes

The Dragoons-specialty method. Paste varieties (San Marzano, Roma, Amish Paste) are the best candidates because of their lower water content.

1. Halve tomatoes lengthwise. Squeeze gently to remove some seeds and juice (optional — leaves more concentrated flesh).
2. Lay cut-side up on stainless screens.
3. Sprinkle lightly with salt.
4. Set on covered porch in afternoon shade for 3–5 days, turning once daily.
5. Finish in 135 °F dehydrator 4–8 hours, or oven at 175 °F, until leathery and slightly tacky (not brittle — that's overdried).
6. Pack in olive oil with a few sprigs of oregano and a clove of garlic per jar, **or** vacuum-seal dry and freeze.

The oil-packed version keeps **refrigerated only** (4 weeks at most) — garlic-in-oil at room temperature is a botulism risk. The dry-vacuum-sealed-and-frozen version keeps 12 months and is the safer storage path.

WARNING

Garlic in oil at room temperature is the most common home-canning botulism vector. Anaerobic, low-acid, nutrient-rich, room temperature. If you're packing sun-dried tomatoes (or any dried herb mix) in oil with garlic, **refrigerate** the jar and use within 2–4 weeks, or **freeze**. Never leave a jar of garlic in oil at room temperature. Never can garlic-in-oil at home — there is no validated home process for this.

12.8 Salsa (canned)

For 6–7 pints (the canonical Dragoons salsa):

- 6 lb ripe paste tomatoes, cored
 - 2 cups chopped onion
 - 2 cups chopped peppers (jalapeño, serrano, or mix)
 - 4 garlic cloves, minced
 - 1 cup chopped cilantro
 - 1 cup bottled lime juice **or** white vinegar (5 % acidity)
 - 2 tsp salt
 - 1 Tbsp ground cumin
 - 1 Tbsp Mexican oregano
 - 1 tsp black pepper
1. Peel and chop tomatoes (or pulse coarsely in food processor).
 2. Combine all ingredients in heavy pot. Bring to simmer 10 minutes.
 3. Pack hot into pints. Headspace 1/2".
 4. Process **25 min in BWB at 4,700 ft** (15 sea-level + 10).

The acid (lime juice or vinegar) is what makes this safe — do not reduce. The pro-

portion of low-acid ingredients (peppers, onion, garlic) to acid is what the recipe is calibrated for. Adjusting ratios significantly is unsafe; use a tested recipe like this one and vary only spices.

12.9 Ketchup

For 7 pints:

- 24 lb ripe tomatoes
- 3 cups chopped onion
- 1 cup cider vinegar
- 1.5 cups brown sugar
- 1 Tbsp salt
- 1 Tbsp mustard seed
- 1 Tbsp celery seed
- 1 Tbsp whole allspice
- 1 cinnamon stick
- 1 tsp cayenne (or to taste)

1. Cook tomatoes and onion until soft. Mill.
2. Return to pot. Add vinegar, sugar, salt.
3. Tie spices in cheesecloth bag; add to pot.
4. Simmer 1.5–2 hours until thick (about 1/3 original volume).
5. Remove spice bag. Pack into hot pints. Headspace 1/4".
6. Process **15 min in BWB at 4,700 ft** (5 sea-level + 10).

13 · Brassica preservation

Kraut · kimchi · blanched-frozen · kale chips · kale powder

Brassicas don't dry well, don't can well, and don't store fresh for long. Their two best preservation paths are fermentation (kraut, kimchi) and blanched-freezing. A third minor path — kale dried and ground into powder — is worth knowing.

13.1 Brassicas — methods and matches

Brassica	Best preservation	Second best
Cabbage (green)	Sauerkraut	Blanched-frozen (for
Cabbage (red)	Sauerkraut (purple kraut)	Pickled (sweet-sour)
Cabbage (napa)	Kimchi	Quick-pickle
Broccoli	Blanched-frozen florets	Pickled florets
Cauliflower	Blanched-frozen	Pickled (giardiniera)
Brussels sprouts	Blanched-frozen	Roasted-then-frozen
Kale	Blanched-frozen (cooking); dried chips (snack); powder (cooking)	
Kohlrabi	Pickled	Cellared
Collards	Blanched-frozen	
Bok choy	Stir-fry-then-freeze	Kimchi
Mustard greens	Blanched-frozen	Sichuan-style ferment

13.2 Sauerkraut (Chapter 6 §6.4 — full recipe there)

A single 5-lb storage cabbage from a fall Dragoons crop yields about 1 half-gallon jar of finished kraut, which keeps 6+ months in a cool cellar. A 25-lb harvest (5 heads) is enough kraut for an entire household for a year.

13.3 Kimchi (Chapter 6 §6.5 — full recipe there)

Napa cabbage is the workhorse. Daikon radish is the second-largest ingredient. A typical Dragoons grower with 4 napa heads and 4 daikons produces 2 half-gallon jars of kimchi — about 6 months' supply for a household that eats kimchi regularly.

13.4 Blanched-frozen broccoli and cauliflower

The standard method, more or less identical for both:

1. Cut into 1" florets. Soak in salt water 10 minutes (1 Tbsp salt per quart of water) — this drives out cabbage worms hiding inside.
2. Drain and rinse.

3. Blanch in vigorously boiling water for **3 minutes** (Dragoons-adjusted from 2:30 sea-level).
4. Plunge into ice water 5 minutes.
5. Drain fully — spin in a salad spinner.
6. Flat-freeze on a sheet pan, single-layer, until solid.
7. Transfer to freezer bags. Press out air.
8. Store at 0 °F up to 12 months.

To use: drop frozen florets directly into hot pans for stir-fry, into soup, or onto a sheet pan with olive oil for roasting (extends roasting time by ~5 minutes vs. fresh).

13.5 Blanched-frozen kale, chard, spinach

These three behave almost identically.

1. Wash thoroughly — these greens hide grit.
2. Remove tough stems (kale and chard). Roughly chop.
3. Blanch in boiling water 2 minutes.
4. Plunge into ice water 5 minutes.
5. **Squeeze out water firmly.** A clean kitchen towel works — gather the greens into the towel and wring. Greens should be slightly damp, not dripping.
6. Pack into 1/2-cup portions in muffin tins (a useful single-serving size), or directly into freezer bags pressed flat.
7. Freeze.

A Dragoons fall block of 8-12 kale plants produces enough frozen blanched kale to last a household through summer of the next year.

13.6 Kale chips

Better as a snack than a preservation method, but they keep 1-2 months in a sealed jar in a cool pantry — long enough to be useful.

1. Wash and dry kale (Lacinato is best; curly works).
2. Tear leaves from stems into 2" pieces.
3. Toss with 1 Tbsp olive oil and 1/2 tsp salt per medium bunch.
4. Lay single-layer on dehydrator trays at **115 °F for 4-6 hours**, or on parchment-lined sheet pans in a 250 °F oven for 20-25 minutes.
5. Cool fully. Pack in dry jars. Use within 2 months for best texture.

13.7 Kale powder

A dark-green, mild-flavored, nutrient-dense addition to stocks, smoothies, soups, and pesto. The most concentrated form of kale preservation.

1. Stem kale; tear leaves.

2. Dehydrate at 110 °F for 6–10 hours until brittle.
3. Grind in a high-speed blender or coffee grinder to a fine powder.
4. Sift if desired.
5. Store in sealed jar. Keeps 12 months.

A medium kale bunch yields about 2 Tbsp of finished powder.

14 · Allium preservation

Drying garlic · cellaring onions · pickled · black garlic

The full allium curing protocol is in Guide 6 §3.9 and §10.1 of this guide. This chapter covers the *preservation* methods beyond the cure — the dried, pickled, fermented, and transformed forms.

14.1 Dried garlic

Why dry garlic when properly cured heads store 8-12 months? Two reasons: (1) a portion of the crop with damaged outer skins or split heads won't store, and (2) garlic powder, granulated garlic, and dehydrated minced garlic are kitchen-ready forms that are faster than peeling fresh cloves.

1. Peel cloves.
2. Slice 1/8" thick, or roughly chop.
3. Dehydrate at 125 °F for 6-10 hours until brittle.
4. **Optional grind:** in a clean grinder (the smell will not leave the grinder for weeks — keep a dedicated one), pulse to granulated, then to powder.
5. Sift; store in sealed jars. Keeps 12+ months.

LOCAL TIP

Sliced dehydrated garlic for cooking is more useful than powder for many applications. A handful of brittle garlic slices rehydrates in any sauce or soup in 5 minutes and tastes more like fresh garlic than powder does. Powder is good for rubs and dry mixes; sliced is the everyday kitchen workhorse.

14.2 Cellared onions and garlic

Conditions table in §9.1. The single most important rule: **separate from apples, pears, and stone fruit**. The sulfur compounds emitted by onions and garlic taint nearby fruit; the ethylene emitted by fruit shortens storage life of nearby alliums. Two zones, not one.

14.3 Pickled garlic (Chapter 5)

The full recipe is in §5.5. Notable: pickled garlic cloves are one of the most useful pantry items the Dragoons garlic crop produces. A jar of pickled garlic on the counter is faster than peeling fresh cloves for most cooking — and the resulting flavor is its own thing, not a substitute for fresh.

14.4 Garlic confit (refrigerator only)

A French preservation method that produces a soft, sweet, mellow garlic for spreading or cooking.

1. Peel 2 cups of garlic cloves.
2. Place in a small saucepan. Cover with olive oil (about 1 cup).
3. Cook at the lowest possible heat — 200 °F oven, or low-low stovetop simmer — for 1 hour. Cloves should be soft and golden, not brown.
4. Cool. Transfer cloves and oil to a glass jar.
5. **Refrigerate. Use within 1 week.**

WARNING

Garlic confit is a botulism vector if stored at room temperature. Anaerobic, low-acid, room-temperature garlic in oil is the classic textbook example of a botulism-favorable environment. Refrigerated, the cold suppresses *C. botulinum* — but only for about a week. After a week, freeze the confit (oil and cloves together, in small portions) or discard. **Never can garlic confit.** There is no safe home process.

14.5 Fermented garlic (honey or brine)

The salt-brine version is in Chapter 6 (3.5 % brine, 4–8 weeks). A second traditional method ferments peeled cloves directly in raw honey:

1. Fill a half-pint jar 2/3 full of peeled garlic cloves.
2. Cover with raw honey. Stir gently to release air bubbles.
3. Loose lid (not sealed — fermentation gases need to escape).
4. Let stand at room temperature 4–6 weeks, turning the jar daily for the first week to coat all cloves.
5. The honey thins as garlic releases moisture and natural sugars convert. Slight bubbling is normal.
6. After 4 weeks: cloves are mellow, honey is thinner and garlic-infused. Store refrigerated indefinitely.

The honey takes on a powerful garlic-and-fermented character; the cloves become soft, sweet, mellow. Used as a sore-throat remedy, marinade ingredient, glaze, or salad dressing base. The acidity (raw honey at pH ~3.9–4.1, dropping further as ferment proceeds) is sufficient to keep this safe at room temperature — but in this guide we recommend refrigerating after the initial ferment for additional margin.

14.6 Black garlic (Chapter 10 §10.4)

Full protocol in §10.4. The 40–60 day low-temperature transformation produces one of the most distinctive preserved Dragoons garlic products. Worth a single batch every winter from each year's cured crop.

15 · Stone-fruit preservation

Drying · brandied · canned halves · preserves

Stone fruit — apricot, peach, nectarine, plum — is the orchard's high season, late June through late August. The total tonnage from a small backyard orchard (3–6 trees) can run 200–400 lb in a good year. Preservation is the difference between a glut and a year's supply.

The full harvest-indicator table for stone fruit is in Guide 9 §11. This chapter covers what to do with the basket once you bring it inside.

15.1 The four main paths

Method	Yield from 10 lb fresh	Best variety	Shelf	Notes
Dried	1.5–2 lb	Apricot, plum (Stanley)	1+ years	The Dragoons specialty
Frozen sliced	8–9 lb	Peach, nectarine	8–12 months	Easiest
Canned in syrup	9 lb	All	12+ months	Pantry-ready
Preserves / jam	4–5 lb (depends on sugar)	Apricot, peach, plum	12+ months	Highest sugar
Brandied	7–8 lb (in liquid)	Apricot, peach, plum	1+ year	Adult-only Dragoons specialty

15.2 Drying apricots — the Dragoons stone-fruit specialty

If the desert Southwest has a canonical preserved fruit it's the air-dried apricot. The technique:

1. Halve apricots; remove pits.
2. Optional: dip in a lemon-water bath (1 cup lemon juice in 1 gallon water) for 1 minute to prevent browning.
3. Lay cut-side up on stainless screens.
4. Sun-dry on covered porch in afternoon shade 2–4 days, turning once.
5. Finish in 135 °F dehydrator for 4–6 hours.
6. Done when leathery, slightly tacky, no surface moisture. Internal flesh should be firm but pliable.
7. Pack in glass jars or vacuum-seal. Store in cool pantry. Keeps 1+ year.

The Dragoons-grown Royal Blenheim and Goldcot apricots produce the best-tasting

dried fruit — they have higher sugar and lower water than commercial varieties. A 10 lb harvest produces about 2 lb of finished dried apricots — a generous winter supply.

15.3 Dried plums (prunes)

European-type plums (Stanley, French Improved, Brooks) dry beautifully into traditional prunes. Japanese plums (Methley, Santa Rosa) don't dry well — too wet, too low in sugar.

1. Halve plums; remove pits. Optionally leave whole and slit one side.
2. Cut-side up on screens.
3. Sun-dry 3–5 days, or dehydrator at 135 °F for 16–24 hours.
4. Done when leathery, dark, slightly sticky.
5. Pack and store as for apricots.

15.4 Frozen sliced peaches

The easiest stone-fruit preservation:

1. Peel peaches (dip in boiling water 30 seconds for skin removal).
2. Halve, pit, slice.
3. Toss with 1/4 cup sugar per 4 cups slices and 1 Tbsp lemon juice (sugar protects color and texture).
4. Flat-freeze on sheet pans.
5. Transfer to freezer bags or vacuum-seal.
6. Stores 8–12 months at 0 °F.

To use: thaw in the refrigerator for cobbler, smoothies, ice cream, jam. Direct-from-freezer for smoothies and ice cream toppings.

15.5 Canned peach (or apricot) halves in light syrup

For 7 quarts:

- 17 lb fresh peaches (or apricots)
 - 2 quarts light syrup (2 cups sugar in 6 cups water, dissolved by simmering)
 - Bottled lemon juice (1 Tbsp per quart for color; optional)
1. Peel peaches (skip for apricots — skins are tender).
 2. Halve and pit. Optionally slice further.
 3. Pack into hot quarts, cut-side down. Headspace 1/2".
 4. Pour hot syrup over fruit to 1/2" headspace.
 5. Process **35 minutes in BWB at 4,700 ft** for quarts (25 sea-level + 10).

15.6 Brandied fruit (apricots, peaches, plums)

The traditional adult-table-of-Cochise-County preserve. Slow-developing — finished fruit is best after 3–6 months in the jar.

For 1 quart:

- 1.5 lb whole apricots (or halved peaches, or whole plums)
- 1 cup sugar
- 1 quart brandy (the cheapest decent brandy works — this isn't for sipping)
- 1 cinnamon stick
- 1 vanilla bean
- 2 strips orange peel

1. Pack fruit into hot quart jar.
2. Layer in sugar, cinnamon, vanilla, orange peel.
3. Pour brandy over fruit to cover, leaving 1/2" headspace.
4. Cap tightly. **Do not water-bath process.** The brandy preserves it.
5. Store in cool, dark cupboard.
6. Turn the jar gently every few days the first month to dissolve sugar.
7. Ready at 3 months; better at 6; excellent at a year.

Brandied fruit is served as a dessert on ice cream, with cheese, or as a holiday gift. The brandy itself, infused with fruit, is an after-dinner sipper.

15.7 Apricot preserves / jam

For 6 half-pints:

- 4 lb apricots, pitted and chopped
 - 4 cups sugar
 - 1/4 cup lemon juice
 - 1 box pectin (or set with the apricots' natural pectin — apricots have enough)
1. Combine apricots, lemon juice, and sugar. Let sit 1 hour to draw juice.
 2. Cook over medium heat 30–45 minutes until thickened to a sheet test (a chilled spoon dipped and lifted holds a sheeting jam that doesn't drop quickly).
 3. Pack into hot half-pints. Headspace 1/4".
 4. Process **15 min in BWB at 4,700 ft** (5 sea-level + 10).

16 · Grape preservation

Raisins · juice · jelly · wine pointer

A grape vineyard is typically grown for wine, and winemaking is its own craft — not covered in this guide. The full vineyard-to-wine handoff is in Guide 5 §12. This chapter covers the non-wine preservation paths: raisins, juice, and jelly. The vineyard table-grape harvest and the backyard cluster from a single Concord, Thompson, or Flame vine all benefit from these techniques.

16.1 Raisins — the easiest grape preservation

The Dragoons September sun and low humidity make raisin-making trivial. The full technique:

1. Pick clusters at full color and 24+ °Bx. Single-variety raisins from Thompson Seedless, Flame Seedless, or Black Corinth are the canonical choices; Sultana works; wine grapes make small intense raisins (Zante currant style).
2. Lay clusters on stainless or food-safe nylon screens in a single layer.
3. Sun-dry on south-facing racks in full afternoon sun (this is one of the few sun-drying applications that works in direct sun rather than shade — raisins want the maximum heat-and-light-driven dry).
4. Turn clusters once daily.
5. Cover with cheesecloth or fine screen to keep birds and bees off.
6. **10-14 days** to finish for most varieties. Done when raisins are wrinkled, no surface moisture, slightly tacky inside.
7. Pack in sealed jars or vacuum-seal. Store cool. Keeps 1+ year.

Yield: 1 lb fresh grapes → about 0.25 lb raisins. A vine producing 20 lb of fruit makes about 5 lb of raisins.

16.2 Grape juice

For 7 quarts:

- 24 lb ripe grapes
 - 2 cups sugar (or to taste — Concord and Thompson make excellent juice without added sugar)
1. Wash grapes; remove stems.
 2. Crush coarsely (a potato masher or a clean foot in a bucket).
 3. Bring to a simmer for 10 minutes; do not boil hard.
 4. Strain through cheesecloth or a jelly bag overnight in the refrigerator.
 5. Combine strained juice with sugar; bring to 190 °F (do not boil).
 6. Hot-fill into hot quart jars. Headspace 1/4".
 7. Process **30 minutes in BWB at 4,700 ft** (20 sea-level + 10).

Frozen: pack juice into containers leaving 1" headspace for expansion. Keeps 12 months.

16.3 Grape jelly

For 6 half-pints:

- 6 lb grapes
 - 1 box powdered pectin
 - 4 cups sugar
 - 1/2 cup water
1. Crush grapes; simmer with water 10 minutes.
 2. Strain through jelly bag overnight (don't squeeze — that clouds the jelly).
 3. Measure juice — should be about 4 cups.
 4. Combine juice and pectin in a heavy pot. Bring to rolling boil.
 5. Add sugar all at once. Return to full rolling boil 1 minute.
 6. Skim foam.
 7. Pack into hot half-pints. Headspace 1/4".
 8. Process **15 min in BWB at 4,700 ft** (5 sea-level + 10).

16.4 Wine — pointer

Wine-making at the home scale, from Dragoons grapes, is a deep craft of its own. Guide 5 §12 covers the vineyard-to-crushpad handoff. From there:

- The standard small-scale reference is *From Vines to Wines* by Jeff Cox.
- The second is *The Wine Maker's Answer Book* by Alison Crowe.
- The Sonoita and Willcox AVA neighbors (Callaghan, Sonoita Vineyards, Dos Cabezas, Los Milics, Rune) are within a 30-60 minute drive and welcome growers during crush. The Arizona Wine Growers Association runs an annual meeting and harvest visits.

The Dragoons grape harvest is in September; the wine is in barrel by November; first racking is January; the bottle is the following August at the earliest. A one-year cycle is short for wine.

17 · Herb preservation

Drying · oil cubes · herb butter · pesto

Herbs are the easiest of all crops to preserve in the Dragoons. The low humidity and high airflow that make air-drying work for everything else work brilliantly for herbs — most of them dry to brittleness in 2–3 days hanging in a covered porch.

17.1 What works for which herb

Herb	Drying	Freezing (in oil/butter)	Pesto	Vinegar/salt
Basil	Poor (loses flavor)	●● Excellent	●● Excellent	Vinegar good
Cilantro	Poor (loses flavor)	● Acceptable	Acceptable	Salt good
Parsley	● Acceptable	● Acceptable	● Acceptable	
Oregano	●● Excellent	● Acceptable		
Thyme	●● Excellent	● Acceptable		
Sage	●● Excellent	●● Excellent		
Rosemary	●● Excellent	● Acceptable		
Mint	●● Excellent	● Acceptable		
Dill	● Acceptable (seed esp.)	● Acceptable		Vinegar good
Chive	Poor	●● Excellent		
Tarragon	● Acceptable	●● Excellent (vinegar especially)		Vinegar excellent
Lemon balm	●● Excellent	● Acceptable		
Bay laurel	●● Excellent			

The pattern: woody, low-moisture herbs (oregano, thyme, sage, rosemary, mint, bay) dry beautifully. High-moisture leafy herbs (basil, cilantro, chive, tarragon) lose too much aroma when dried — freeze them in oil or butter instead.

17.2 Air-drying herbs

The Dragoons way.

1. Harvest on a dry afternoon, after dew has burned off but before peak heat. Cut stems 8–12" long.
2. Rinse quickly only if necessary; thorough spin-dry.
3. Bundle 8–12 stems together with twine.
4. Hang upside down in a covered porch, shed, or ramada — out of direct sun, with airflow.
5. **2–7 days** to fully brittle. The dry test: the leaves crumble easily off the stem; stems are stiff and break with a snap.

6. Strip leaves from stems. Store whole leaves in sealed jars in a dark cupboard.
7. Crush just before use — the volatile oils last longer in whole-leaf form than in pre-ground.

LOCAL TIP

The Dragoons porch is essentially a free herb dehydrator from May through October. A modest oregano bed produces enough dried herb for a year in two or three hanging cycles. Schedule the major drying push for July (between monsoon storms) or late September — both have the right humidity and the herbs are at peak essential-oil content.

17.3 Freezing basil and other tender herbs in oil

Basil, chive, cilantro, tarragon, and (occasionally) parsley lose too much flavor when dried. Freeze them in oil instead.

1. Wash and dry herbs thoroughly.
2. Roughly chop.
3. Pack into ice-cube trays — about 1 Tbsp herb per cube.
4. Fill each cube with olive oil to cover.
5. Freeze. Pop out cubes once frozen; bag in freezer bags.
6. Drop a cube directly into a hot pan when needed — the oil melts, releasing the herb.

Keeps 6–9 months. The oil-covered method preserves color and flavor far better than freezing herbs dry.

17.4 Herb butter

1. Soften 1 cup unsalted butter at room temperature.
2. Combine with 1/2 cup finely-chopped fresh herbs (parsley, chive, tarragon, basil, dill — single herb or mix), 1 tsp salt, 1 tsp lemon zest, 1 minced garlic clove.
3. Roll into a log in plastic wrap, or pipe into ice-cube molds.
4. Freeze. Slice off rounds as needed.
5. Keeps 6–9 months.

Particularly good with the spring chive harvest and the late-summer dill flowering.

17.5 Pesto — the basil canonical recipe

For 2 cups:

- 4 cups packed fresh basil leaves
- 1 cup grated Parmesan or Pecorino
- 1/2 cup pine nuts (or walnut, almond, sunflower seed)

- 4 garlic cloves
- 1 cup good olive oil
- 1 tsp salt
- 1 squeeze lemon juice

1. Pulse basil, garlic, and nuts in a food processor.
2. Add cheese; pulse.
3. With motor running, stream in olive oil.
4. Salt and lemon to taste.

To freeze: Skip the cheese (freezes poorly). Make the basil-garlic-nut-oil paste; freeze in ice-cube trays. Add fresh cheese when serving.

Keeps 6 months in oil cubes; 1 week refrigerated; 1 month vacuum-sealed in the fridge.

18 · A starter set of recipes

Twelve preserves a Dragoons grower will reach for, with the recipes spelled out

The recipes that follow are the ones most Dragoons growers actually make. Each cross-references the relevant earlier chapter for technique. Process times are 4,700 ft-adjusted.

18.1 Dilly beans (full recipe §5.5)

The summer green-bean preservation. 4 pints from 2 lb beans. Process 15 min BWB. Excellent gift-pickle.

18.2 Pepper jelly

The Dragoons summer's most popular jelly, especially good with cheese.

For 6 half-pints:

- 2 cups finely chopped sweet bell pepper (red and green mix is prettiest)
- 1 cup finely chopped jalapeño or serrano
- 1.5 cups cider vinegar
- 5 cups sugar
- 1 pouch liquid pectin
- A few drops red food coloring (optional)

1. Combine peppers, vinegar, and sugar in a heavy pot.
2. Bring to a rolling boil. Add pectin. Return to rolling boil 1 minute.
3. Skim foam. Pack into hot half-pints. Headspace 1/4".
4. Process 15 min BWB.

18.3 Salsa (canned) (full recipe §12.8)

The household pantry mainstay. 6-7 pints from 6 lb tomatoes + peppers. Process 25 min BWB. Plan to do 30+ jars per season.

18.4 Sauerkraut (full recipe §6.4)

One half-gallon jar per medium cabbage. 2.0 % salt. 14-21 days. Cellar 6+ months.

18.5 Fig preserves

The August fig glut, in a jar.

For 5-6 half-pints:

- 3 lb ripe figs, stemmed and quartered
- 3 cups sugar
- 1 lemon (zest + juice)

- 1/2 vanilla bean (optional)
 - 1 cinnamon stick (optional)
1. Combine figs and sugar; let sit overnight refrigerated. Figs will release juice.
 2. Add lemon zest and juice, vanilla, cinnamon. Bring to gentle simmer for 45–60 min until syrup thickens and figs look glossy.
 3. Pack into hot half-pints. Headspace 1/4".
 4. Process 15 min BWB.

18.6 Pomegranate molasses

A concentrated pomegranate syrup — used in Middle Eastern and Persian cooking. Best preservation method for pomegranate juice.

For about 1 pint:

- 4 cups pomegranate juice (from about 4 lb of fresh pomegranates, halved and pressed; or store-bought 100 % juice)
 - 1/2 cup sugar
 - 2 Tbsp lemon juice
1. Combine in heavy non-reactive pot.
 2. Simmer over low heat, uncovered, **for 1-2 hours** until reduced to about 1 cup of thick, dark syrup that coats a spoon.
 3. Cool. Bottle.
 4. Refrigerator-stable indefinitely. Process 15 min BWB for shelf-stable storage at room temperature.

18.7 Pickled jalapeños (full recipe §5.5)

4 half-pints from 1 lb jalapeños. Process 20 min BWB. Use within 12 months.

18.8 Garlic confit (full recipe §14.4)

Refrigerator-only. One week shelf life or freeze. **Never can.**

18.9 Tomato sauce (full recipe §12.5)

7 pints from 24 lb tomatoes. Process 45 min BWB. The annual sauce stockpile.

18.10 Pickled cauliflower (giardiniera-style)

For 4 pints:

- 1 medium cauliflower, broken into florets
- 1 cup sliced carrot
- 1 sliced red bell pepper
- 1 small onion, sliced

- 4 garlic cloves
- 2 cups white wine vinegar
- 2 cups water
- 2 Tbsp salt
- 1 Tbsp sugar
- 1 tsp mustard seed
- 1 tsp celery seed
- 1 tsp fennel seed
- 4 small dried chiles

1. Pack vegetables into hot pints with garlic, spices, and chile.
2. Pour hot brine. Headspace 1/2".
3. Process 20 min BWB.

18.11 Apricot preserves (full recipe \$15.7)

6 half-pints from 4 lb apricots. Process 15 min BWB.

18.12 Hot sauce (fermented) (full recipe \$6.6)

One half-gallon ferment yields about 2 quarts finished sauce or 25 small bottles. The signature Dragoons preserve.

19 · The Dragoons preservation calendar

What's coming in · what to preserve · month by month

The calendar that follows assumes a typical mixed-crop Dragoons garden and small orchard at 4,500–5,000 ft. Adjust by 1–2 weeks for sites significantly higher or lower.

Month	Coming out of the garden / orchard	What to preserve, in priority order
January	Cellared apples, garlic, onions; overwintered kale; cold-frame greens	Quiet month — eat from the cellar. Inventory canning jars. Plan seed orders. Black garlic in the rice cooker starts now (out by mid-March).
February	Cellared root crops still going; overwintered chard; first preserved-lemons (citrus harvest)	Lemon and orange marmalade from the citrus pots. Buy new canning lids in bulk. Refresh sand in root-cellar bins.
March	Asparagus first cuts (year 3+); overwintered greens flushing; chive	Asparagus into the freezer for stir-fries. Pesto if basil overwintered indoors. Frozen-rhubarb prep.
April	Asparagus full season; rhubarb; spring herbs; salad greens	Rhubarb compote and rhubarb-strawberry jam if strawberries are in. Spring herb-butter. Cold-storage onions running low — finish the soft-necks first.
May	Strawberries; spring lettuce; rhubarb peak; herbs flourishing; first peas	Strawberry jam (peak strawberry week). Spring pea-and-mint pesto. Herbs starting major harvest — first oregano and thyme bundles in the porch. Apricot pre-bloom (no fruit yet). Last of the cellared onions and garlic getting used up. Apricot drying setup gets cleaned and inspected for June.

Month	Coming out of the garden / orchard	What to preserve, in priority order
June	Apricots ripening; first peaches; cherries (rarely); cucumbers starting; squash blossoms; spring brassicas going to seed; new garlic harvest mid-to-late June	● Apricots into the sun-drying rack. Sour cherries (if you have them) into preserves. Peach jam in late June. Garlic harvest and cure begin. First cucumber pickles. Herb drying in full swing.
July	Garlic harvest finishing; onion harvest beginning; peaches peak; tomatoes starting; cucumbers; summer squash; basil; blackberries; mid-summer brassica winding down	● Peach canning and drying month. Plan 30–50 quarts of canned peaches and apricots. Cucumber pickles in earnest — dill spears and bread-and-butter. Onion cure beginning. Garlic still on the cure rack. Pesto. Basil in oil cubes. Late blackberry jam.
August	Tomatoes peak; peppers (green) starting; figs (breba crop); summer squash glut; corn; eggplant; melon; first chiles ripening red	● Tomato month. Sauce, paste, canned whole, salsa, frozen whole. Start the pepper preservation: green jalapeños pickled. First fig preserves. Corn frozen. Eggplant roasted-and-frozen. Squash pickled if you can't eat it.
September	Tomatoes still heavy; peppers turning red (jalapeño, serrano); figs (main crop); first grapes; first apples; cool-season transplants going in; chiles (Hatch, Anaheim, cayenne) ripening red	● The biggest preservation month. Red pepper preservation in earnest: hot sauce ferments started; ristras strung; chipotle smoking begins. Salsa canning. Grape harvest — raisins in the sun, juice canned, jelly made. Apple processing begins (sauce, dried slices, cider).

Month	Coming out of the garden / orchard	What to preserve, in priority order
October	Late tomatoes (pre-frost); pepper end-of-season harvest; pomegranates; figs winding down; apples peak; pumpkin and winter squash; sweet potato harvest; fall brassicas heading up	● Final big month. Last salsa batches. Sweet-potato curing begins. Winter squash curing. Apples cellared. Pomegranates picked and juiced. Final tomato push before frost. Ristra cure continues. Hot-sauce ferments mature. Cabbages in for kraut and kimchi. Last sun-drying window of the year.
November	First frost mid-month; last brassicas; cellared crops; cured sweet potatoes; cured squash; pomegranate; jujube; late apples (Pink Lady, Granny Smith)	Sauerkraut and kimchi ferments active. Last apple cider. Late apple canning. Pumpkin purée canned (only via pressure canner — not BWB). Hot-sauce finished and bottled. Black garlic batches start. Cellar inventory complete. Pickled garlic.
December	Cold-frame greens; cellared everything; preserved jars from August–October now eaten	Quiet month — eat from the cellar and the canned-jar pantry. Make herb-vinegar gifts. Black garlic continuing. Plan next year's preservation calendar based on what ran out and what didn't get eaten.

The two peak preservation weeks. Week 1 of August (tomato glut + first peppers + last figs) and Week 2 of September (everything red + grapes + first apples + late tomatoes) account for roughly 60 % of a Dragoons grower's annual preservation work. Block those weeks on the calendar. Don't schedule travel. Stock canning lids and jars by July 1.

20 · Closing

The jar in February

A jar of last August's salsa, opened on the third week of February when the snow's not yet melted off Cochise Stronghold and the daytime sun is still weak — that jar is the entire point of this guide. Eaten with tortilla chips on the kitchen counter, it tastes like a Tuesday afternoon six months ago, when the tomatoes were stacked in the kitchen overflowing every counter and the kids were running through the sprinkler in the side yard. Preservation is, in the end, time travel. You harvest in August and you eat in February. You ferment in October and you taste it through the next September. You cure garlic in July and you season every winter stew with it. The growing season is a few months long; the eating season, with a well-stocked pantry and cellar, is the whole year.

The Dragoons make this easier than most places. The same dry afternoons that ripen the tomatoes dry the apricots on a rack. The same intense October sun that makes the late peppers turn brilliant red also cures a ristra hanging from the porch. The same cool, deep ground that fails to make a sweet-potato cure work (we have to build that one) is exactly the right temperature for the onions and garlic and apples and squash. The climate is on our side — for once, the desert Southwest's hardest features (the low humidity, the intense sun, the wide diurnal swing) are the very features the traditional methods of preservation were designed for.

There is a kind of patience in this kind of agriculture that becomes its own reward. The first year you make sauerkraut, you stand over the half-gallon jar wondering if it's working. By year five, you have a working cellar of half-gallon jars of kraut, and a cycle, and you reach for them without thinking. The first year you smoke chipotles, the smoker temperature is wrong and the peppers come out either raw or scorched. By year five, your chipotles are gift-quality and the Dragoons-grown mesquite-smoked jalapeños you bring to a friend's table are something they remember a long time. The first ristra you tie up rots — you didn't dry the peppers enough first. By year five, you have a half-dozen ristras curing on the porch every October, and one of them lives on the dining room wall through the year.

And the jar in February, eaten on a Tuesday at the kitchen counter, is just one of three hundred such moments, all of which add up to a household fed from its own land and a year that stays warmer in memory than its weather actually was.

Sources & references

Reference material consulted, suggested for further reading

Local resources

- **UA Cooperative Extension — Cochise County office (Sierra Vista)** — pressure-canner gauge testing (free, annual), home canning workshops, food preservation publications. Phone 520-458-8278. The single most important Dragoons resource for safe canning.
- **UA Master Food Preservers Program** — a network of trained volunteers who answer canning questions; the Cochise County branch runs seasonal classes in Sierra Vista and Willcox.
- **Native Seeds/SEARCH (Tucson)** — heritage Sonoran-Desert preservation traditions; reference for traditional chile, bean, and corn preservation methods.
- **Borderlands Restoration Network (Patagonia)** — earthbag cellar examples, traditional Sonoran food preservation knowledge.
- **Willcox Ace Hardware / Sulphur Springs Valley feed stores** — canning jars, lids, pressure canners, dehydrators, fermentation supplies at agricultural pricing. Bulk-jar discounts in spring.
- **Local estate sales (Sunsites, Pearce, St. David)** — vintage canning jars at \$5-10 per flat.
- **Sulphur Springs Valley mesquite** — wild mesquite for chipotle smoking; ask permission, harvest dead wood, season 6 months.

Books

- **The Ball Blue Book of Preserving** (current edition) — the canonical home-canning reference. Every recipe is USDA-tested. Buy the current edition; recommendations have changed since the 1980s editions.
- **The USDA Complete Guide to Home Canning** (free PDF from the National Center for Home Food Preservation, nchfp.uga.edu) — the safety authority. Free, current, and the source for the altitude tables in this guide.
- **The Joy of Pickling** by Linda Ziedrich — comprehensive pickle reference, including fermented pickles and unusual vegetables.
- **The Art of Fermentation** by Sandor Katz — the definitive home-fermentation guide; covers everything from kraut to miso to tepache.
- **Wild Fermentation** by Sandor Katz — the shorter, friendlier introduction. The right starting book.
- **Preserving Food Without Freezing or Canning** by the Gardeners and Farmers of Centre Terre Vivante — root cellar, oil, salt, vinegar, alcohol, drying. The traditional-methods reference.
- **The Complete Book of Pickling** by Jennifer MacKenzie — recipes, technique, the canonical “third book” after Ball and Joy of Pickling.

- **Mes Confitures** by Christine Ferber — the high-end jam reference; relevant for the apricot/peach/fig work that's the orchard's stone-fruit yield.
- **Salt: A World History** by Mark Kurlansky — context. The Dragoons preservation tradition is salt, sun, and time; this book is the long story of those three.
- **Growing Food in a Hotter, Drier Land** by Gary Paul Nabhan — the Sonoran-Desert food-tradition reference. Native preservation methods (chile drying, mesquite flour, agave-based ferments) that predate Anglo settlement here.

Online resources

- **National Center for Home Food Preservation** (nchfp.uga.edu) — the USDA-maintained authority on canning, freezing, drying, fermenting. All recipes here are scientifically tested. The first stop for any safety question.
- **UA Cooperative Extension publications** (extension.arizona.edu) — Cochise County food preservation bulletins; altitude-adjusted canning sheets; pressure-canner safety.
- **University of California ANR Food Preservation** (anrcatalog.ucanr.edu) — extensive food preservation publications relevant to the desert Southwest.
- **Ball Mason** (freshpreserving.com) — recipes (current, tested), product information, troubleshooting for jars and lids.
- **The Fermentation Association** (fermentationassociation.org) — recipes and science of lacto-fermentation.
- **NMSU Chile Pepper Institute** (cpi.nmsu.edu) — the canonical reference for pepper preservation, ristra construction, chipotle technique.

Equipment sources

- **Pleasant Hill Grain** (pleasanthillgrain.com) — All American pressure canners, grain mills, dehydrators; reliable shipping to Cochise County.
- **Excalibur Dehydrators** (excaliburdehydrator.com) — direct from manufacturer.
- **Cultures for Health** (culturesforhealth.com) — fermentation lids, weights, starter cultures (though most ferments in this guide need no starter).
- **FoodSaver** (foodsaver.com) — vacuum sealers, bag stock.
- **Ohio Stoneware / Harsch crocks** — fermentation crocks if you want the heirloom-quality vessel.

The Dragoons preservation tradition is older than the guides that document it. The Apache who harvested wild Chiltepin from the canyons knew how to dry chiles before any European arrived. The Sonoran ranching tradition that brought beans, chiles, and squash through long dry winters depended on the same low-humidity, intense-sun, cool-deep-ground climate this guide describes. The mesquite that smokes our chipotles is the same mesquite that has grown in the Sulphur Springs Valley for ten thousand years. A jar of sauerkraut on a Cochise County kitchen counter in February is part of a continuity that predates the kitchen, the county, and the jar — and the act of opening it is a small participation in a way of feeding ourselves that has worked here for as long as anyone has been here.

Plant the garden. Harvest carefully. Preserve well. Eat in February.