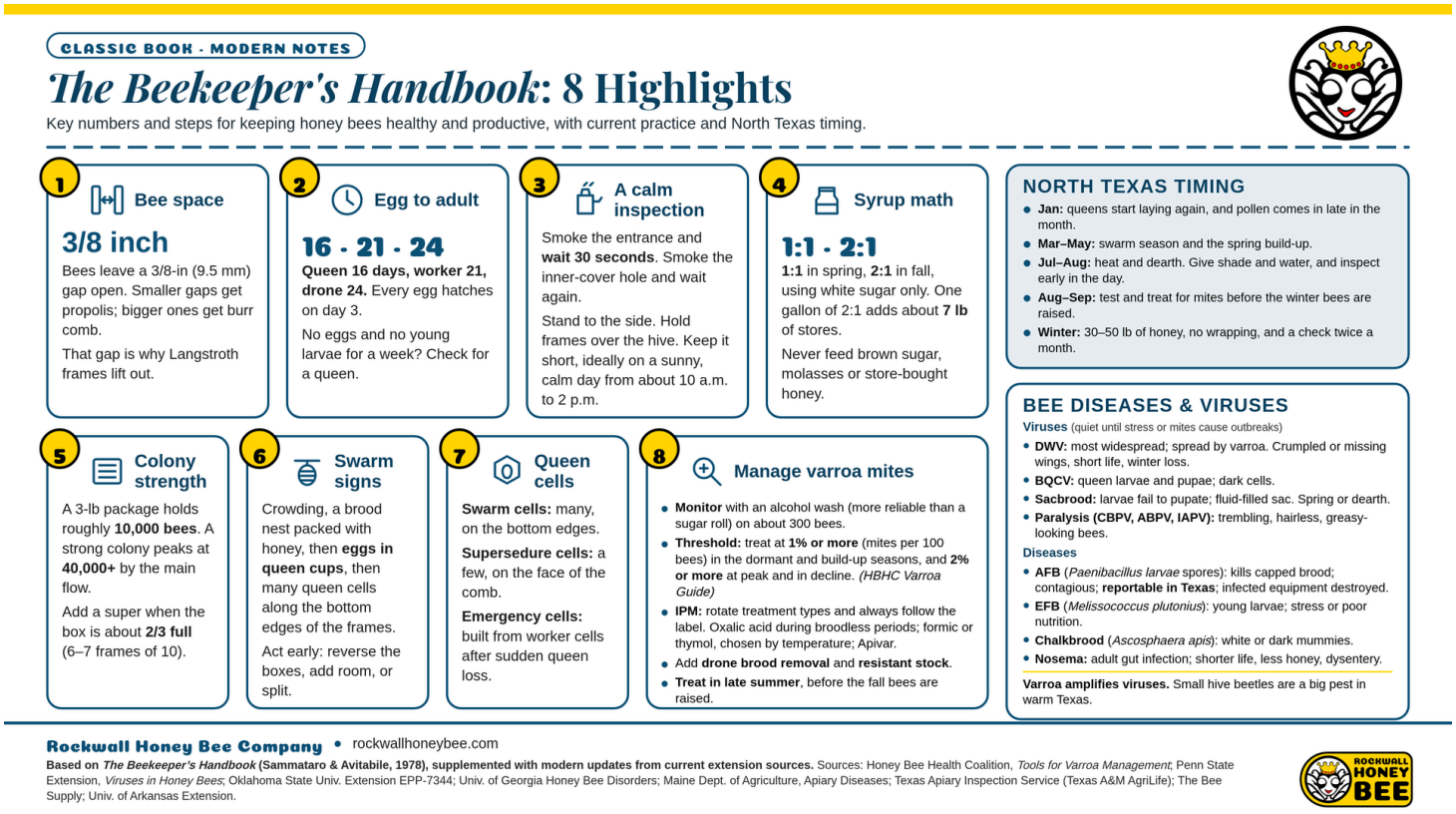
Keeping Honey Bees in North Texas: A Practical Guide, Based on The Beekeeper's Handbook and Updated for Today

By Kirby Jay Carmichael, Rockwall Honey Bee Company

New beekeepers ask me where to start, and experienced beekeepers ask me what a good all-around reference looks like. This guide is my answer. It is built on *The Beekeeper's Handbook* by Diana Sammataro and Alphonse Avitabile (5th edition, Comstock Publishing Associates, an imprint of Cornell University Press, 2021; originally published 1978), a classic that has taught a lot of people the craft, and it is supplemented with modern updates from current extension sources, including Texas A&M AgriLife and the Texas Apiary Inspection Service, the Honey Bee Health Coalition, Penn State Extension, Oklahoma State, and the University of Georgia. Every section ends with links, so you can read the originals.

The graphic below is a one-page summary of the highlights. Save it, print it, and keep it in your bee box.



Eight highlights from the guide, with North Texas timing and a quick reference on bee diseases and viruses.

Start with how the colony works

A honey bee colony is one **queen**, tens of thousands of female **workers**, and, in the warm season, a few hundred **drones**. A strong colony peaks at **40,000 or more bees** by the main flow. A 3-pound package holds roughly 10,000.

The numbers worth memorizing are the development times, counted from the day the egg is laid:

- **Queen:** about 16 days
- **Worker:** 21 days
- **Drone:** 24 days

Every egg hatches into a larva on day 3. That is why finding fresh eggs tells you the queen was alive within the last three days, and why a hive with no eggs and no young larvae for a week deserves a close look for a queen problem.

Workers change jobs as they age. Roughly speaking, they clean cells first, then feed larvae, nurse the brood, build wax, guard the entrance, and finally fly out to forage. A summer worker lives about five to six weeks. The fall bees raised on plenty of pollen live for months, which is why late-summer colony health matters so much, and why I come back to it in the varroa section.

One more number: **bee space is 3/8 inch.** Bees leave a gap that size open. Anything smaller gets sealed with propolis, and anything larger gets filled with burr comb. That gap is the reason Langstroth frames lift out of the box, and it is the reason modern beekeeping works.

Equipment and setting up the yard

The standard hive is the Langstroth: a stand, a bottom board, one or two deep brood boxes, medium or shallow supers for honey, an inner cover, and a telescoping outer cover. Start with ten frames per box on wax or plastic foundation. Paint the outside with exterior latex in a light color. Mark every box with your name and contact information.

Get the **largest smoker** you can, a hive tool, a veil, and a light-colored suit. Add a **varroa monitoring kit** to the starter list: a jar with a mesh lid, a half-cup scoop, and either rubbing alcohol or powdered sugar. I explain why below.

Where you put the hives matters more than most beginners think:

- **Water nearby** and a year-round way to get a truck or cart close.
- **Morning sun**, with entrances facing east-southeast, and **afternoon shade** in a Texas summer.
- **Good drainage.** Do not use a low, wet spot.
- **Space and a windbreak.** Pairs of hives about 6 to 8 inches apart, with 5 to 8 feet between pairs, and not one long straight row, since bees drift toward the ends of rows.
- **Distance from pens, paths, and neighbors.**

I recommend starting with **two to five colonies**, not one. A second hive lets you compare, and it gives you a frame of brood or a spare queen if one colony struggles. Plan on three or four seasons before you feel like you know what you are doing. A local association helps. In our area, the Trinity Valley Beekeepers Association meets on the fourth Tuesday of the month.

What Texas requires. Texas does not require you to register your bees just to keep them, but a TAIS beekeeper registration ($35, valid September 1 through August 31) is required to do legal bee removals. Bringing bees into Texas takes a health certificate and an interstate permit. Selling bees takes a health certificate or an affidavit. Hives must have movable frames, and city and HOA rules still apply. I wrote more about it in my post on registering an apiary with TAIS.

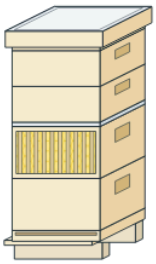
Choosing a hive type

Most of this guide assumes a Langstroth hive, because it is the most common style in North Texas and the easiest one to buy parts for. It is not your only choice, though, and the best hive is the one you will actually keep up with. Below are six styles people ask me about, each with a drawing, how it works, the good and the not-so-good, who it suits, a rough price, and a link to the maker or another good source. Prices come from the makers' own sites in November 2026, change often, and leave out bees, protective gear, and tools.

Thinking about starting? See our Getting Into Bees page.

Hive Types at a Glance

Six styles side by side. Prices are rough, change often, and leave out bees and gear.

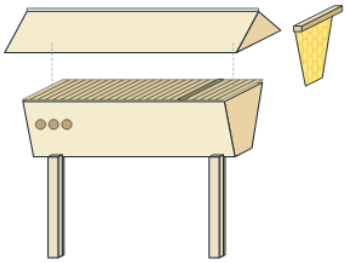


1. Langstroth

About $230 to $410 for an assembled starter kit

The most common hive. Boxes stack, parts are sold everywhere, and honey extracts easily.

Best for: most beginners and honey growers. Full boxes get heavy.

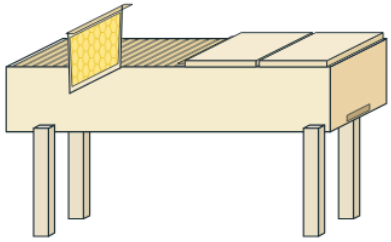


2. Top bar (Kenyan)

About $100 to $750, or build your own

One long box with no frames. Comb hangs from bars. Easy on the back, with more wax than honey.

Best for: hobbyists who want low lifting. Comb is fragile and parts are not standard.

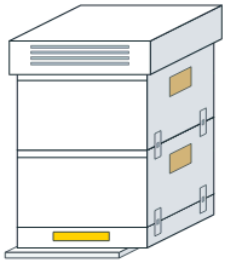


3. Long Langstroth

Price varies; most are built by hand

A horizontal box that uses standard Langstroth frames. You slide frames and never lift boxes.

Best for: beekeepers who cannot lift heavy boxes. Needs good ventilation.

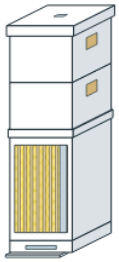


4. Apimaye

$265 to $620 per set, before frames

Insulated plastic boxes with foam in the walls. Arrives assembled and fits Langstroth frames.

Best for: beginners who want a long-lasting, low-maintenance hive and can pay more.

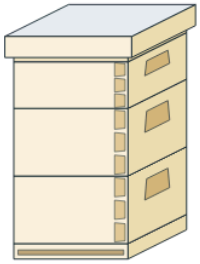


5. Primal hive

$799 list price per complete kit

Tall insulated brood nest with sealed joints and a low entrance. Standard supers on top.

Best for: beekeepers who want to try a new engineered design that still extracts as usual.



6. Premier (Pura)

Deep box about $25 unassembled; Fusion kit with frames $412

A well-built wooden Langstroth with dovetail corners and wide handholds, made in the USA.

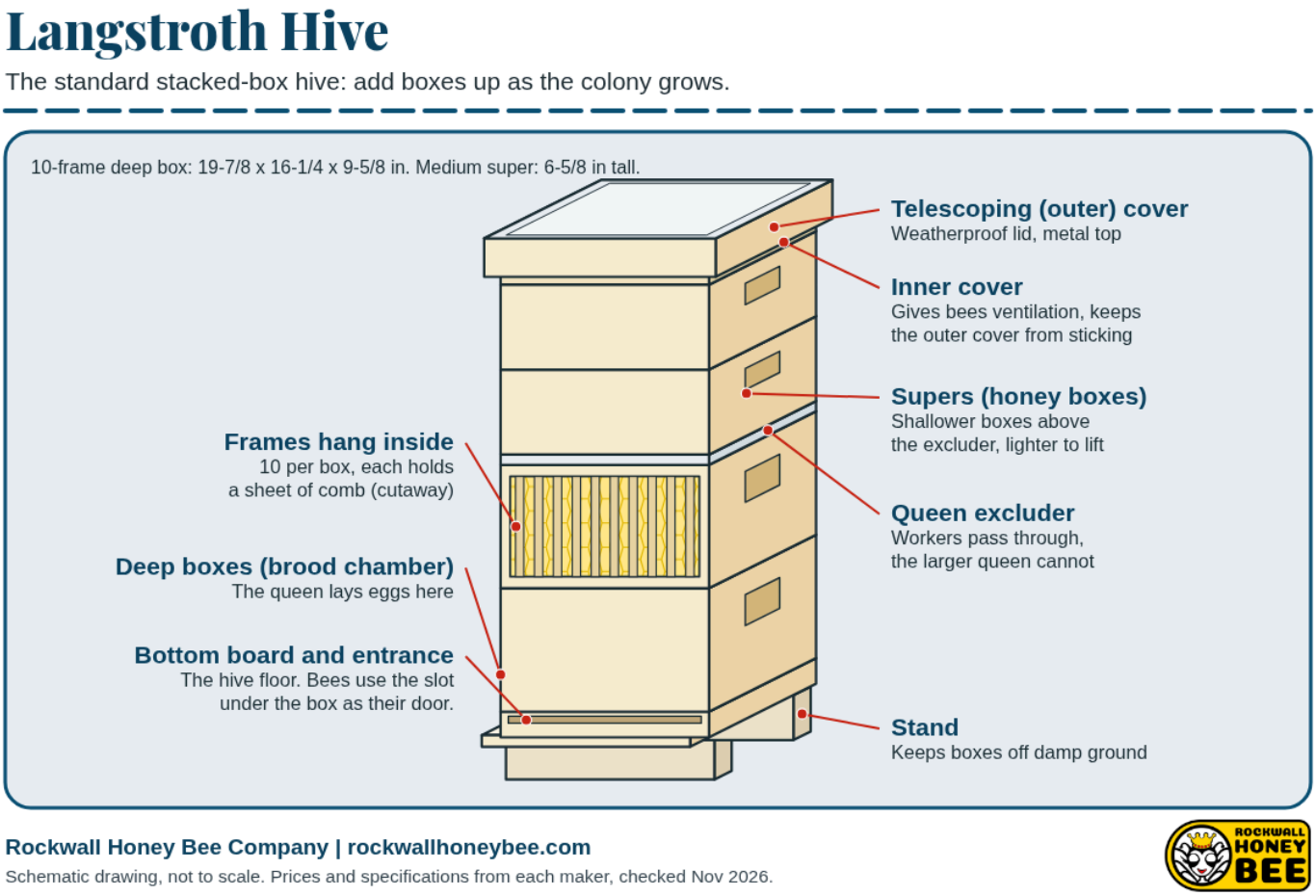
Best for: wood lovers who want standard gear with better joints.

Rockwall Honey Bee Company | rockwallhoneybee.com

Schematic drawing, not to scale. Prices and specifications from each maker, checked Nov 2026.

Hive Types at a Glance: Langstroth, top bar, long Langstroth, Apimaye, Primal, and Premier.

1. Langstroth



The Langstroth hive: stacked boxes of removable frames.

How it works. Removable frames hang inside rectangular boxes that stack. Deep boxes at the bottom hold the brood nest, where the queen lays. Shallower honey supers go on top as the colony grows, and you add or remove boxes with the seasons. This is the hive described in *The Beekeeper's Handbook* and in most of this guide.

Pros. Standard sizes, so boxes, frames, and parts from different makers mostly fit together. Help is easy to find in any club. Honey is uncapped and spun out in an extractor, and the drawn comb goes back on the hive. Splits are simple, and nucs are sold on standard frames.

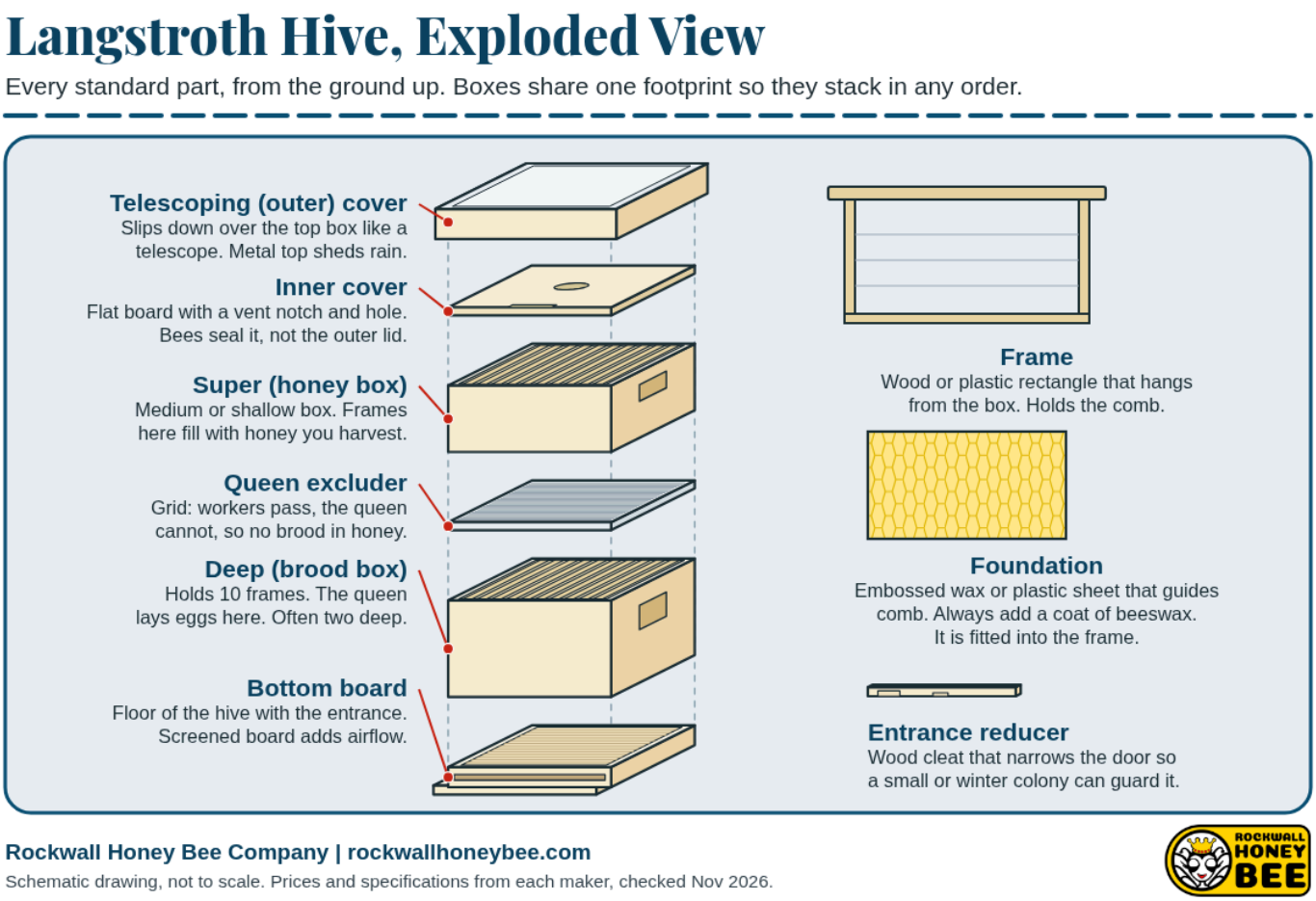
Cons. Boxes get heavy. A full honey super can weigh 40 pounds or more, and an inspection means lifting boxes apart. Wooden boxes need paint and upkeep.

Best for. Most beginners, anyone who wants extracted honey, and anyone who wants to buy equipment and bees locally.

Rough price. About $230 for an assembled deep-and-medium kit with frames, bottom board, and covers (Mann Lake lists $226.99 to $236.99). Dadant lists assembled starter kits at $395.95 to $410.95. Plan on adding boxes later.

More info. Mann Lake 10-frame complete hive kit and Dadant 10-frame complete beehives.

The parts of a Langstroth hive, from the ground up.



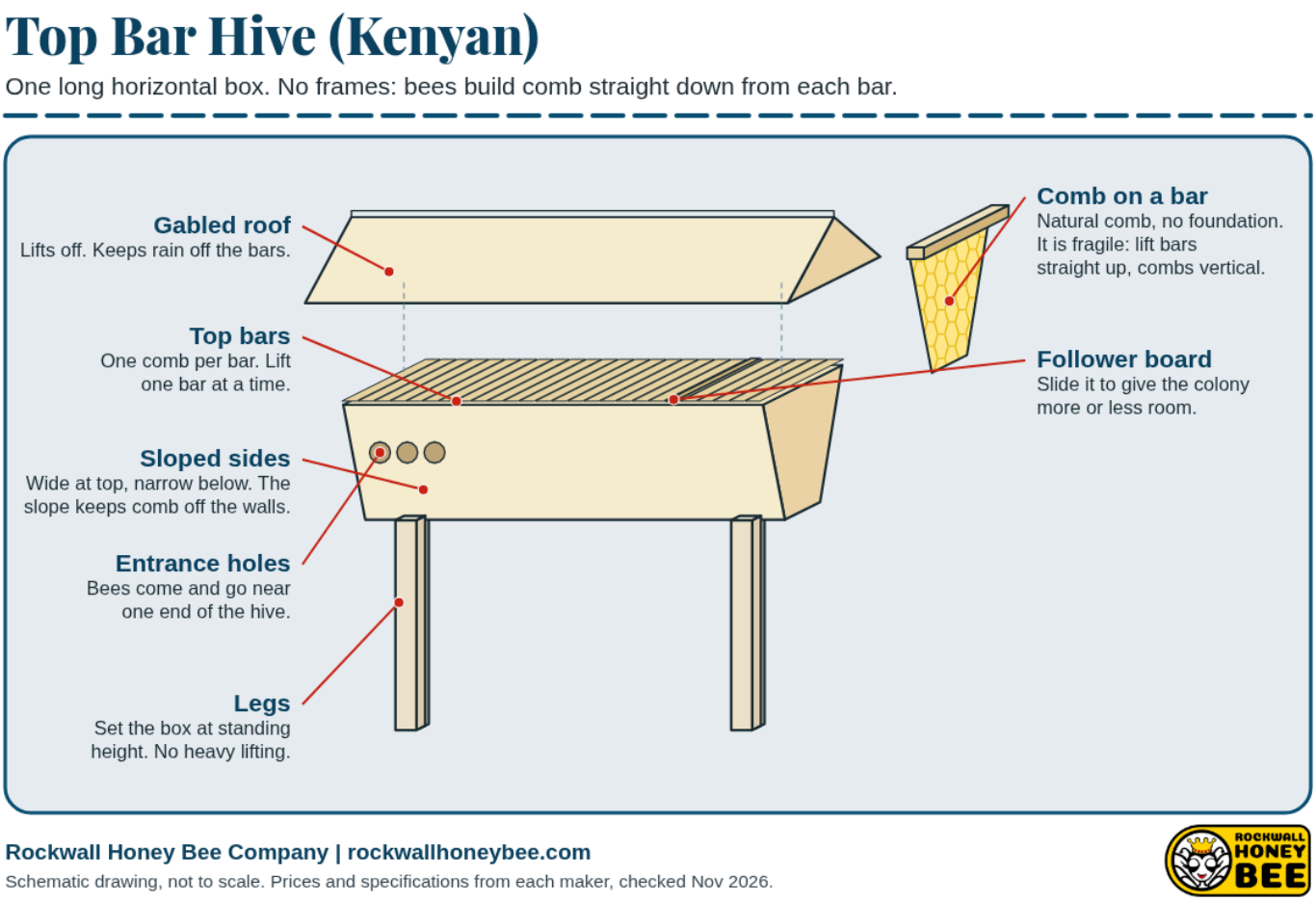
A Langstroth hive taken apart, with every standard part labeled.

- **Bottom board.** The floor of the hive, with the entrance and a landing board. A screened bottom board adds ventilation and lets you count mites that fall through.
- **Entrance reducer.** A wooden cleat that narrows the door. Use a small opening for a new, small, or winter colony so the bees can guard it against robbers and mice, and open it up when the colony is strong and the nectar is flowing.
- **Deep (brood box).** A box about 9-5/8 inches tall that holds ten frames. The queen lays her eggs here, and many beekeepers run two deeps.
- **Queen excluder.** A flat grid. Workers fit through, but the larger queen cannot, so she stays out of the honey supers. Some beekeepers skip it.
- **Super (honey box).** A shallower box, usually a medium about 6-5/8 inches tall, that sits above the excluder and holds the honey you harvest. It is lighter to lift than a deep.
- **Frames.** Wood or plastic rectangles that hang inside each box. The bees build comb on them, and because each frame lifts out on its own, you can inspect the hive one frame at a time.
- **Foundation.** A thin sheet of beeswax or plastic stamped with the six-sided cell pattern. It gives the bees a head start drawing straight comb inside the frame. **My rule: always add a coat of beeswax to your foundation, even if you ordered it prewaxed.** The bees accept it and draw it out better.

- **Inner cover.** A flat board with a center hole and a notch that sits under the outer cover. It gives the bees ventilation and an upper entrance, and it keeps them from gluing the outer cover down with propolis.
- **Telescoping (outer) cover.** The weatherproof lid, usually topped with metal, that slips down over the top box like a telescope and sheds rain.

Dadant also lists the main components of a Langstroth hive on its complete hives page.

2. Top bar (Kenyan top bar)



The Kenyan top bar hive: no frames, one comb hanging from each bar.

How it works. A long, shallow box with sloping sides, shaped like a wide V, sits on legs. There are no frames. A row of wooden bars lies across the top, and the bees build one natural comb hanging straight down from each bar. The sloped sides discourage the bees from attaching comb to the walls, so each comb lifts out cleanly. A follower board slides along the box to give the colony more or less room as it grows.

Pros. Very little lifting: the heaviest thing you handle is one comb. You can set the box at the right height for your back. Inspections are gentle, because you open only a few bars at a time. It is the cheapest style to build yourself, and you get plenty of beeswax and good comb honey.

Cons. Sizes are not standardized, so parts from different makers may not fit. You harvest by cutting comb out, so the bees rebuild comb each time, and you cannot add supers, so the surplus is usually smaller than from a Langstroth. New

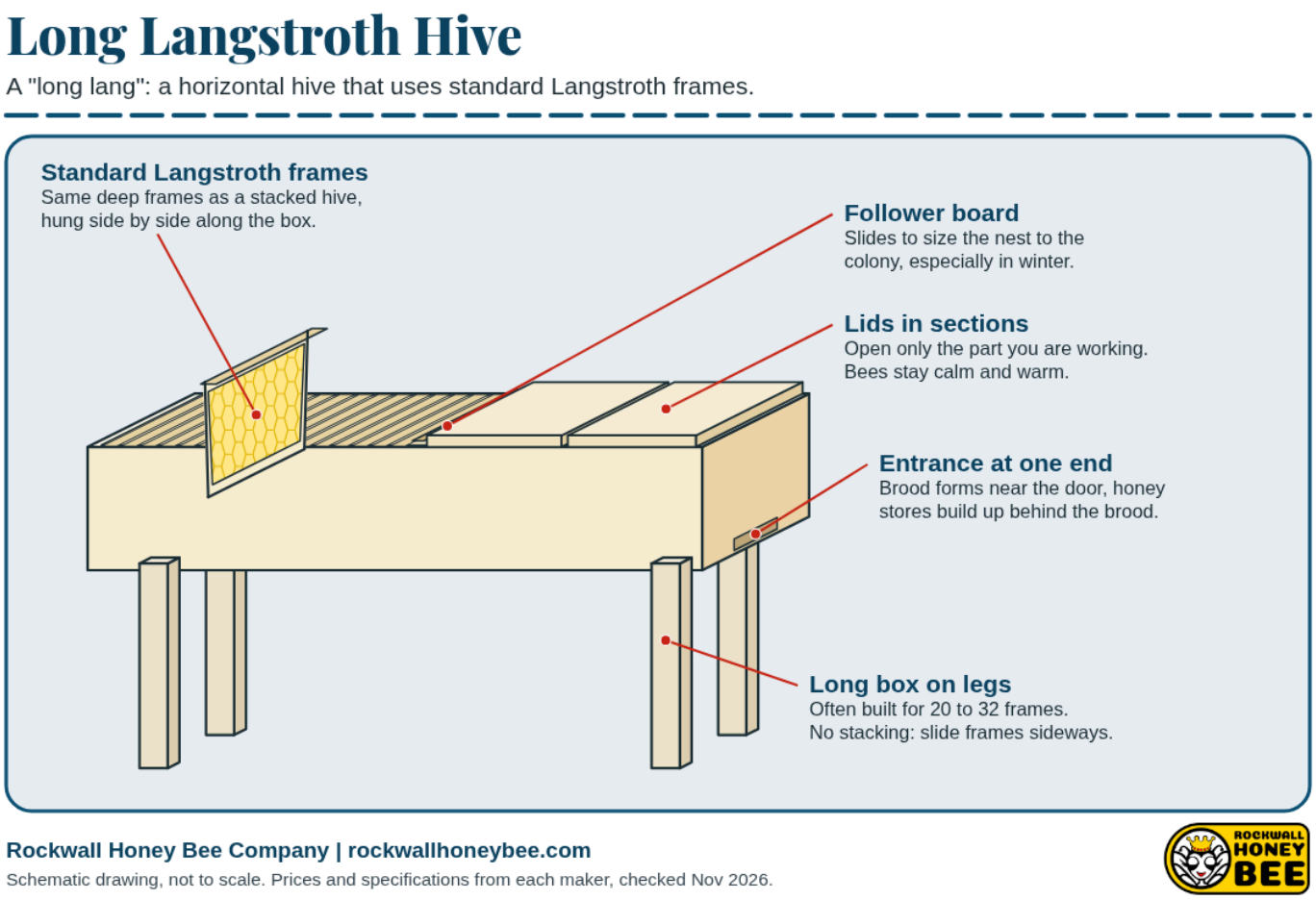
comb is fragile and hard to repair if it breaks. A standard nuc will not drop in, because nucs are sold on Langstroth frames.

Best for. Hobbyists with one or two colonies who want to avoid lifting, who like comb honey and wax, and who do not mind a steeper early learning curve.

Rough price. Roughly $85 to $750. Unassembled pine kits start around $100, a Mann Lake kit was listed near $315, and a fully assembled cedar hive with viewing windows is about $750 (BeeGuide, 2026). Building your own can cost $50 to $150 in lumber and hardware.

More info. BeeBuilt, BeeGuide's top bar hive guide, and the Food and Agriculture Organization of the United Nations' How to make a Kenyan topbar hive.

3. Long Langstroth ("long lang")



The long Langstroth: a horizontal hive that uses standard Langstroth frames.

How it works. A long lang is a horizontal hive: one long box, usually about four feet, that holds 32 standard Langstroth deep frames side by side, about the volume of three deep boxes. The entrance is at one end, the bees put the brood nest near it, and honey stores build up behind. The lids open in sections, so you only open the part you are working.

Pros. No boxes to lift. You slide out one frame at a time, which is easy on your back and quiet for the bees. The queen has lots of room, which can mean less crowding and less swarm pressure. Because it uses standard frames, you can use a regular extractor, move frames to or from a stacked Langstroth hive, and buy nucs.

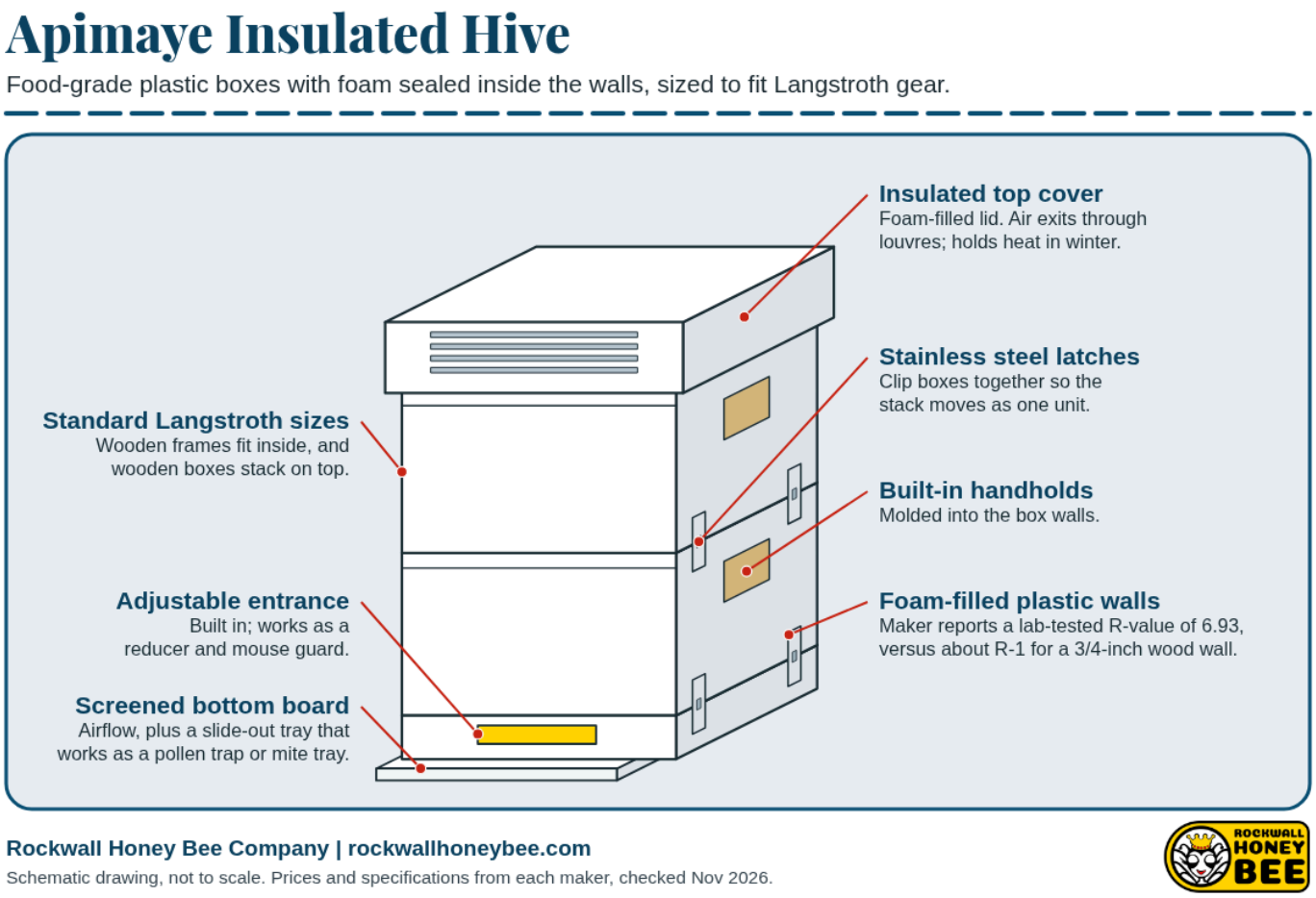
Cons. Hard to find ready-made, so most are built by hand. The long box is heavy and awkward to move. Air can move poorly down a long box, and keepers report condensation and wood warping. In winter the cluster can end up separated from its honey. Plan on good ventilation and a follower board.

Best for. Beekeepers who cannot or do not want to lift boxes, who stay at one site, and who are comfortable building or ordering custom equipment.

Rough price. It varies widely because most are built by the beekeeper or ordered from small shops, so I will not quote a range.

More info. The Long Langstroth Hive (Center for Rural Affairs case study) and A Turn in Approach: The Long Lang Hive (American Bee Journal).

4. Apimaye



The Apimaye: insulated plastic boxes in Langstroth sizes.

I call this one the Cadillac of bee hives.

How it works. Apimaye makes insulated hives of food-grade plastic with foam sealed inside the walls. The boxes come in standard Langstroth sizes, so wooden frames fit inside. Boxes clip together with stainless steel latches, and each set includes an insulated top cover with vents, a screened bottom board with a slide-out tray, an adjustable entrance, top feeders, and a queen excluder. Hives arrive assembled, with no painting. The maker reports an independently lab-tested R-value of 6.93 for its walls, compared with about R-1 for a three-quarter-inch wood wall.

Pros. Insulation can help the bees through cold snaps and Texas heat. The maker says colonies use less stored honey to stay warm in winter and spend less energy cooling the hive in summer. Everything arrives assembled and ready, the boxes will not rot or warp, and there is a limited lifetime warranty. Your wooden frames fit, and wooden boxes stack on top of Apimaye boxes.

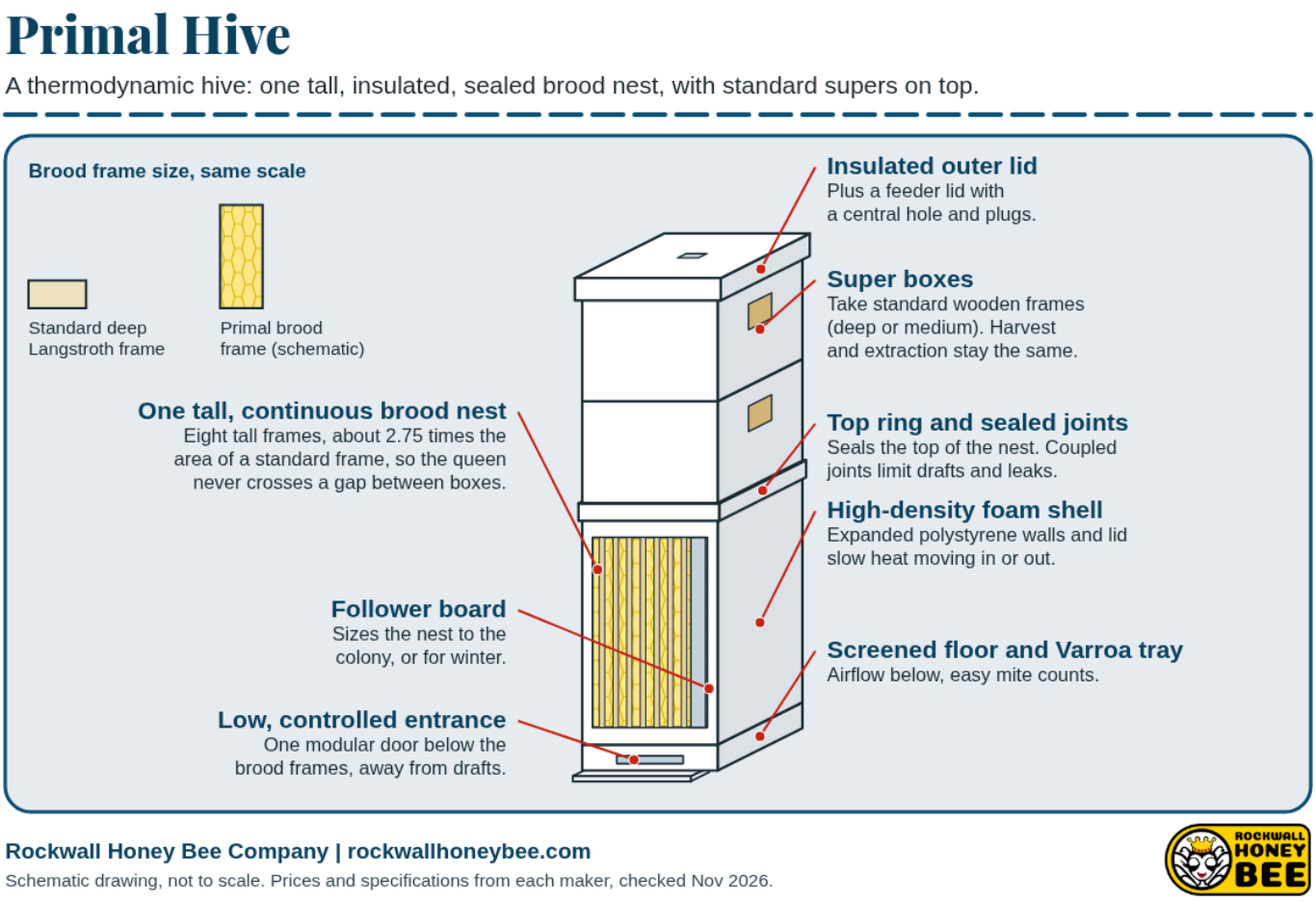
Cons. Cost: it is a lot more up front than a standard wooden hive. Not everyone likes plastic. Apimaye boxes sit securely on top of wooden boxes, but they will not latch to them.

Best for. Beginners who want a complete, low-maintenance hive and have the budget, and beekeepers who want extra insulation.

Rough price. Apimaye's Ergo 10-frame sets run from $265 (one deep box) to $620 (two deeps and two mediums), before frames. The set Apimaye recommends for a first colony, the Double Brood Box, is $395 without frames and about $485 to $515 with frames.

More info. Apimaye USA 10-frame hive sets and Apimaye hive FAQ.

5. Primal hive



The Primal hive: one tall, insulated brood nest with standard supers on top.

This is the newer style I most want to promote. Primal Bee began with two lifelong friends, an engineer and a certified Master Beekeeper, who lost their colonies three years in a row and decided to rebuild the hive around how bees actually handle heat and cold. The hive is patented (U.S. Patent No. 11,375,697, with patents also granted in the European

Union, Australia, and Canada), and the makers say it has been field-tested for more than ten years in climates from Alaska to the Negev desert.

How it works. Three things work together. First, a thick shell of high-density expanded polystyrene (EPS) slows heat moving in or out. Second, one tall, continuous brood nest: eight tall frames, each about 2.75 times the area of a standard Langstroth frame, give the queen about 32 square feet of connected comb with no gaps between stacked brood boxes. Third, sealed joints and one low, controlled entrance cut drafts and uncontrolled air exchange. Honey supers on top take standard wooden frames, deep or medium, so your extractor and harvest routine do not change. The screened bottom board has a slide-out tray for mite counts.

Pros.

- The idea is that steadier temperatures inside the hive leave the colony more energy for raising brood and storing honey, instead of spending it on heating and cooling.
- One continuous brood nest, with fewer, larger brood frames to inspect.
- A complete system in one order: nest, frames, supers, screened bottom board, mite tray, entrance reducers, feeder lid, outer lid, and a safety strap.
- Standard supers and standard extraction, so harvest day looks the same.
- The maker offers usage guides and live weekly office hours for new beekeepers, and says the kit works for a first-time beekeeper.

What does the evidence say? Primal reports a 2017 Swiss field comparison of two groups of ten hives, Primal and standard Dadant, managed the same way. The Primal hives averaged about 76,000 emerging bees against about 43,000, and lower varroa mite infestation was observed. That is the maker's own reporting, not independent peer review, and Primal says plainly that forage, weather, genetics, queen quality, mites, and management still decide how any colony does. I appreciate that honesty. It is exactly why I want North Texas beekeepers to try this hive and compare notes, since our summers and winters are the kind of swings that insulation is meant to buffer.

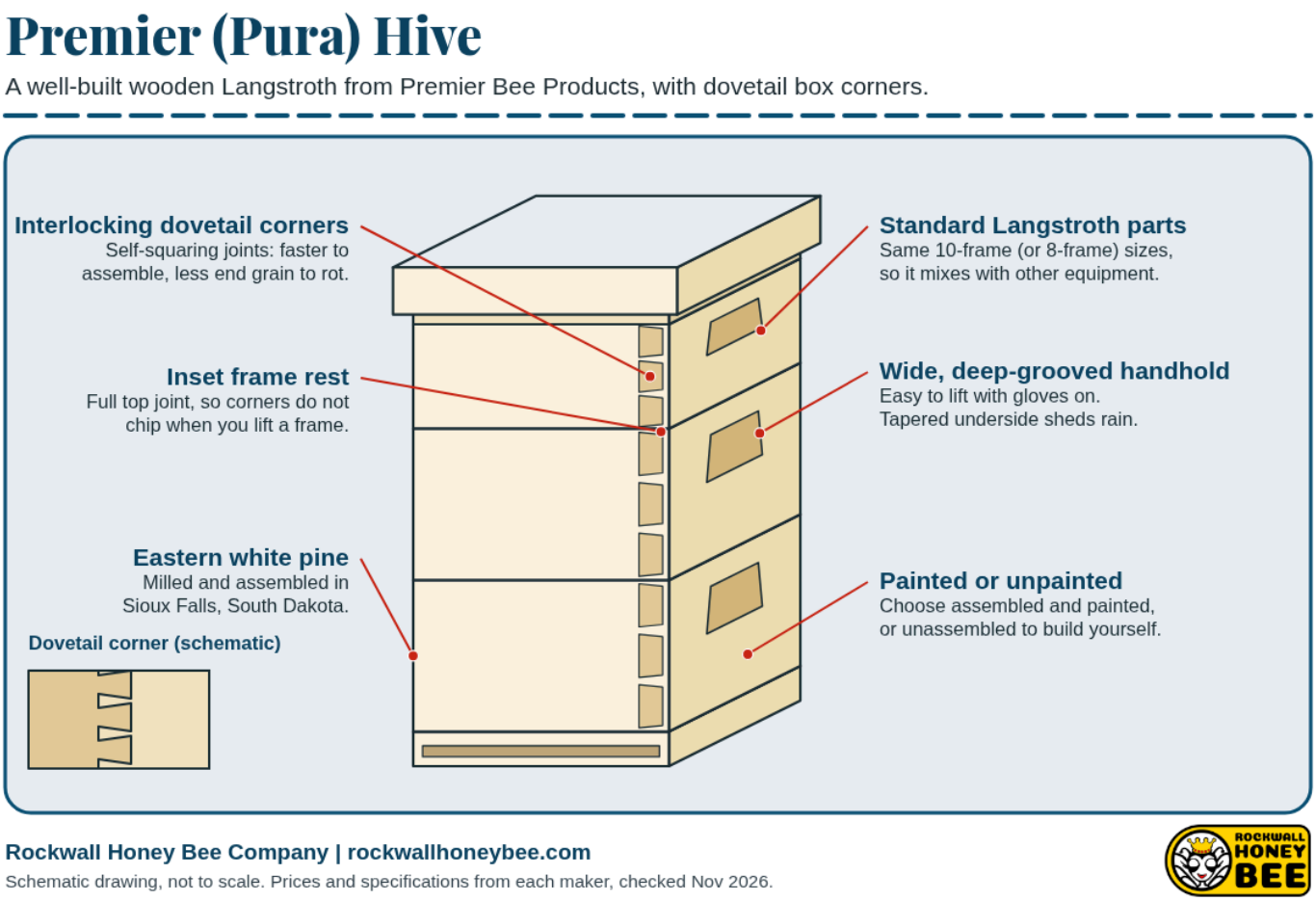
Cons. It is new, so fewer local beekeepers have run one. The brood frames are Primal's own, so a nuc on standard frames will not drop straight in. Foundation is not included for the brood frames, so plan on wax starter strips or buying foundation. With supers on, the hive stands about 58 inches tall. If you paint the foam, use water-based latex or acrylic paint. The warranty is one year.

Best for. Beekeepers who want to try something new while keeping standard supers and extraction gear, and new beekeepers who like buying one complete system. You still need to monitor varroa mites and manage the colony like any other hive.

Rough price. $799 list price per complete kit, with three medium or two deep supers (volume discounts for more hives, and sale pricing comes and goes). Bees, brood foundation, and protective gear are extra. Size is 15.7 x 23.4 x 58.2 inches, and it weighs about 43 pounds.

More info. Primal Bee, the Starter Kit page, the evidence and field reports, and the patent.

6. Premier (Pura) hive



The Premier (Pura) hive: a Langstroth with dovetail corners.

How it works. Premier Bee Products, in Sioux Falls, South Dakota, makes the Pura line, a modern take on the wooden Langstroth. The boxes are standard 10-frame or 8-frame sizes in eastern white pine, with better details: interlocking half-blind dovetail corners that square themselves, an inset frame rest that makes a full top joint, an extra-wide, deep-grooved handhold, and waterproof glue. Assembled boxes are also nailed with hot-dipped galvanized nails and come unpainted or painted. Premier also sells a Fusion Hive kit that pairs Pura boxes with Apimaye's insulated top cover, screened bottom board, and feeder.

Pros. Standard Langstroth parts, with sturdier corners. The maker says the dovetails assemble up to three times faster than finger joints and expose 25 percent less end grain, which cuts the chance of rot. The wide handhold is easy to grip with gloves. You can buy it assembled or build it yourself to save money.

Cons. It is still a Langstroth: boxes are heavy, wood needs paint and upkeep, and you still do the lifting. Unassembled boxes take your time and glue. It is a better-built version of a familiar design, not a new way of keeping bees.

Best for. Beekeepers who like the Langstroth system and want better-built wooden boxes, or who are building several hives.

Rough price. A Pura deep box starts around $25 unassembled ($24.95 mill-run grade, $29.95 select grade). The Fusion Hive kit (two deeps, two mediums, 40 frames, plus the Apimaye cover, bottom board, and feeder) is $412.

More info. Introducing Pura, the deep assembled hive body, and the Fusion Hive kit.

Flow Hive

The Flow Hive is a Langstroth-style hive whose honey super holds Flow Frames: partly formed plastic comb that the bees finish, fill, and cap. When the honey is capped, you insert the Flow Key and turn it. The cells split, and the honey runs down a trough and a tube into your jar while the bees stay in the hive. The brood box underneath works like any other Langstroth brood box. In the United States, the Flow Hive 2 costs $799 to $959, depending on whether you choose the 6-frame or 7-frame size and add the hive stand. The maker markets it to beginners and experienced beekeepers alike, but I think it suits experienced beekeepers better. The tap harvest replaces the extractor, not the beekeeping: you still need regular hive inspections, mite monitoring, feeding, swarm control, and general colony management. The maker says the same, that you will still need to look after your bees. It is also a pricier setup than a standard hive. For more, see the maker's Flow Hive 2 page and How Flow Works.

Other styles you may run across (no drawings). The **Warré hive** is a vertical top bar hive made of small stacked boxes, with new boxes added at the bottom. The **National** (British) hive is the standard in the United Kingdom and works like a Langstroth with smaller frames. The **Dadant** hive uses a larger, deeper box and is popular with commercial beekeepers. The **Layens** hive is a deep horizontal hive with large frames, popular in parts of Europe. Horizontal hives come in several variants, including the long Langstroth above and the Layens. **Log hives** are hollow logs, a traditional style. **Observation hives** have glass sides so you can watch the bees, and they are for teaching rather than for long-term production. **Skeps** are woven straw baskets from history, with comb fixed inside so it cannot be inspected. They do not meet Texas's movable-frame rule, and they are not allowed for honey production in many places today. A good overview with pictures is Wikipedia's Beehive and Skep pages.

Whichever hive you choose, the hive is only the box. Monitoring varroa mites, feeding when stores are low, and inspecting regularly matter more than the style. Thinking about starting? See our Getting Into Bees page.

Getting bees: packages, nucs, and swarms

- **Packages.** A package is 3 pounds of bees and a caged, mated queen. Order in **December or January**, and in North Texas expect delivery around **March or April**. Install in the late afternoon, hang the queen cage between frames, leave the candy plug in so the bees release her slowly, and feed 1:1 syrup. Check that she has been released after about a week, and look for eggs and brood in about two weeks.
- **Nucs.** A nuc is four or five frames with a laying queen, brood of all ages, and stores. For most beginners it is the easiest start. Look over the frames, ask about mite treatment history, and ask whether the seller has had a TAIS inspection.
- **Swarms and cutouts.** Swarms are free and usually gentle, but their health is unknown, so hive them on foundation and check for mites after a few weeks. Texas has Africanized honey bees, and most feral colonies here carry some African genes. If a swarm or cutout is defensive, requeen it with a **mated queen from a reputable breeder**. (TAIS on Africanized bees; AgriLife on bees in and around buildings.)

Working a hive without wrecking it

Keep inspections **short**, 15 minutes or less. Choose a warm, sunny, calm day, ideally between about 10 a.m. and 2 p.m., when the foragers are out. Stay out of the hive in wind, cold, rain, and in the evening.

Smoker safety. Use natural fuel such as burlap, pine needles, or cardboard, and top it with green grass for cooler smoke. Hold the smoker by the bellows, never puff it at a face, keep it away from dry grass, and douse the fuel completely when you are done. Never put a lit smoker in a vehicle or building.

Step by step.

1. Approach from the side, never from in front of the entrance.
2. Smoke the entrance and **wait 30 seconds**. Lift the outer cover, smoke the hole in the inner cover, and wait another 30 seconds.
3. Lean the inner cover against the hive, and set the supers on the upturned outer cover.
4. Lift the outermost frame first, and hold frames over the hive so a falling queen lands in the box.
5. Put frames back in the same order and orientation. Don't split the brood nest without a reason.
6. Scrape burr comb, smoke bees off the rims before you set boxes down, and close up gently.

Ask five questions every visit. Is the queen laying? What does the brood pattern look like? Are there enough stores? Is there any sign of pests or disease? Is there enough room? Write the answers down. Notes in a notebook, on the hive, or in a phone app all work, and your records also help the national colony-loss survey, which usually opens around April.

Feeding your bees

- **Syrup.** Use **1:1** (equal parts sugar and water by volume) in spring and **2:1** in fall. One gallon of 2:1 adds about **7 pounds** of stores. Use white cane or beet sugar only. Brown sugar, raw sugar, and molasses can cause dysentery. Never boil or scorch syrup.
- **Feeders.** A jar or pail over the inner-cover hole inside an empty box, or a top feeder, works well. Entrance feeders invite robbing, and a cold cluster cannot reach them.
- **Winter.** When daytime highs stay below about 50 degrees Fahrenheit, stop liquid feed and switch to **fondant or sugar bricks** placed right over the cluster. In North Texas I switch to 2:1 syrup in late October, while bees can still cure it.
- **Honey.** The best food is your own capped, disease-free honey. Never feed store-bought honey, because it can carry foulbrood spores.
- **Pollen.** Bees need protein. Use commercial pollen substitutes made for bees, or patties, and start around early January in North Texas to support spring buildup.

I have more detail in these posts on sugar syrup math, when to stop the syrup, and sugar bricks.

The North Texas calendar

Most beekeeping books are calendared for colder places. Our spring starts earlier, our summer brings a heat-and-dearth period, we often get a fall flow, and our winters are mild enough for bees to fly. Treat the windows below as a starting point, and adjust them against your own yard records.

- **January.** Queens start laying again in early to mid-January. Pollen comes in late in the month. Start pollen patties if the bees will take them, and check stores.
- **February to March.** Spring buildup begins. Do your first mite check. Replace failing queens and old comb. Add room before bees get crowded.
- **March to May. Swarm season** and the spring buildup. Add a super when a box is about two-thirds full. Packages and nucs arrive.
- **April to June.** The main honey flow, roughly. Supers go on and come off.
- **July to August.** Heat and dearth. Give shade and water, inspect early in the day, and keep an eye out for robbing. This is also when you **test for mites** and, if you are at threshold, treat.
- **September to October.** A fall flow is possible. Confirm queens, combine weak colonies, and heft the hives for stores. Aim for about **30 to 50 pounds** of honey going into winter.
- **November to January.** Check twice a month: lids secure, no water on the bottom board, wind blocks in place, and a quick peek under the lid. Pull frames only around noon on sunny days. Add sugar bricks or fondant right above the cluster if the second box is light. Do not wrap hives in North Texas. Let them breathe, and close the screened bottom.
- **Late December to early January.** The broodless window is a good time for **oxalic acid**.

Sources: Winter Hive Checks from The Bee Supply, Cold Comfort from the University of Arkansas Extension, and AgriLife's hive maintenance guide.

Swarms and queen cells

Swarming is how a colony reproduces. The old queen leaves with about half the bees on a warm, calm day, usually between 9 a.m. and 3 p.m. The warning signs come in a rough order: a population surge, drone brood, a brood nest packed with honey, queen cups along the bottom edges of the frames, eggs in those cups, and then many queen cells at different ages.

You can stay ahead of it by adding room early, reversing boxes if the brood nest has moved to the top, and splitting the colony. A typical split uses about four frames of brood, four of foundation, and two of honey, with a queen, eggs, or cells, and a reduced entrance.

Learn to read the cells:

- **Swarm cells:** many, along the bottom edges, with larvae of mixed ages.
- **Supersedure cells:** a few, on the face of the comb, all the same age, in a colony with a failing queen.

- **Emergency cells:** built from worker cells after a sudden queen loss.

Clipping a queen's wing does **not** stop a colony from swarming. If you mark your queens, use the international colors, which follow the last digit of the year: **white** for years ending in 1 or 6, **yellow** for 2 or 7, **red** for 3 or 8, **green** for 4 or 9, and **blue** for 5 or 0. **2026 is white and 2027 is yellow.** (UF/IFAS queen management guide.)

Varroa: the first thing to manage

If you remember one section of this guide, make it this one. *Varroa destructor* is the top threat to colony health in North America. It feeds on adult bees and brood, weakens them, and **spreads and amplifies viruses**. The Honey Bee Health Coalition's Tools for Varroa Management guide lays out the approach I use.



A reddish-brown varroa mite feeding on a developing honey bee pupa. Photo: Scott Bauer, USDA Agricultural Research Service, image K8541-13. Public domain.

1. Monitor. Do an **alcohol wash** on about 300 bees, which is a half-cup scoop. The alcohol wash is **more reliable than a powdered-sugar roll**, so use the sugar roll only when you cannot use alcohol, and skip it in high humidity or during a strong flow. Test monthly through the season, test again after any treatment, and test more often in fall.

2. Use a threshold. The Honey Bee Health Coalition says to treat at **1 mite per 100 bees (1%) or more** during the dormant and population-increase seasons, and at **2 mites per 100 bees (2%) or more** at peak population and in

population decrease (fall). With a 300-bee sample, divide the mites you count by 3. Don't treat on a calendar, and don't wait for obvious damage.

3. Practice integrated pest management (IPM). Use more than one tool, and **rotate the types** of treatment so mites don't become resistant. **Always follow the label**, because the label is the law, and the label covers temperature, timing, and whether honey supers can be on.

- **Oxalic acid** works best during **broodless periods**, when the mites are exposed. In North Texas that is often late December to early January, or right after a split or requeening.
- **Formic acid and thymol products** are chosen by **temperature**. Each label has a range, so check the forecast before you open the package.
- **Apiguard** is a slow-release thymol gel made from thyme oil, one of the gentler, naturally derived options. Set one tray on the top bars, add a second tray two weeks later, and leave it in for four to six weeks total. It works best when daytime highs run about 60°F to 105°F, and honey supers come off while it's in. In North Texas that usually means late summer or early fall, after the main flow. See the Apiguard label and directions.
- **Amitraz strips such as Apivar** are a longer treatment that stays in the hive for several weeks, per the label.

4. Add the non-chemical tools. Drone brood removal works because mites prefer to reproduce in drone cells. Screened bottom boards, brood breaks, and **mite-resistant stock** such as varroa-sensitive hygiene (VSH) and Russian bees all help.

5. Time it right. Treat in **late summer, before the fall bees are raised.** Those are the bees that must carry the colony through the winter, and mites and viruses hit them hardest. In North Texas that means testing in August and acting at threshold in August and September, and doing a final check before winter.

I wrote about each of these in more depth: Know Your Enemy: Varroa Mites, How to Use the HBHC Varroa Management Guide, and IPM for Honey Bee Health.

Honey bee viruses

In the United States, the two most common honey bee viruses are **deformed wing virus (DWV)** and **black queen cell virus (BQCV)**. Viruses are normally present at low, symptomless levels. Outbreaks happen when stress, poor nutrition, pesticides, or mites push them up. There is **no treatment for a virus**. The remedy is a healthy colony, good nutrition, and varroa control.

- **Deformed wing virus (DWV).** The most widespread honey bee virus, and spread heavily by varroa. Signs include crumpled, stunted, or missing wings, a shorter life, a spotty brood pattern, and winter colony loss. If you see bees with deformed wings, mites and the virus have probably both reached damaging levels.
- **Black queen cell virus (BQCV).** Very common across North America. It mainly affects developing queen larvae and pupae, turning queen cells dark brown and killing the brood.
- **Sacbrood virus (SBV).** A larval virus. The larvae fail to pupate properly and end up in a fluid-filled, sac-like skin. If you gently pull one out with tweezers, it comes out as an intact sac. It often shows up in spring or during

food shortages.

- **Paralysis viruses (CBPV, ABPV, and IAPV).** These are chronic bee paralysis virus, acute bee paralysis virus, and Israeli acute paralysis virus. Infected adults may tremble, lose their body hair, look dark or greasy, and struggle to fly.



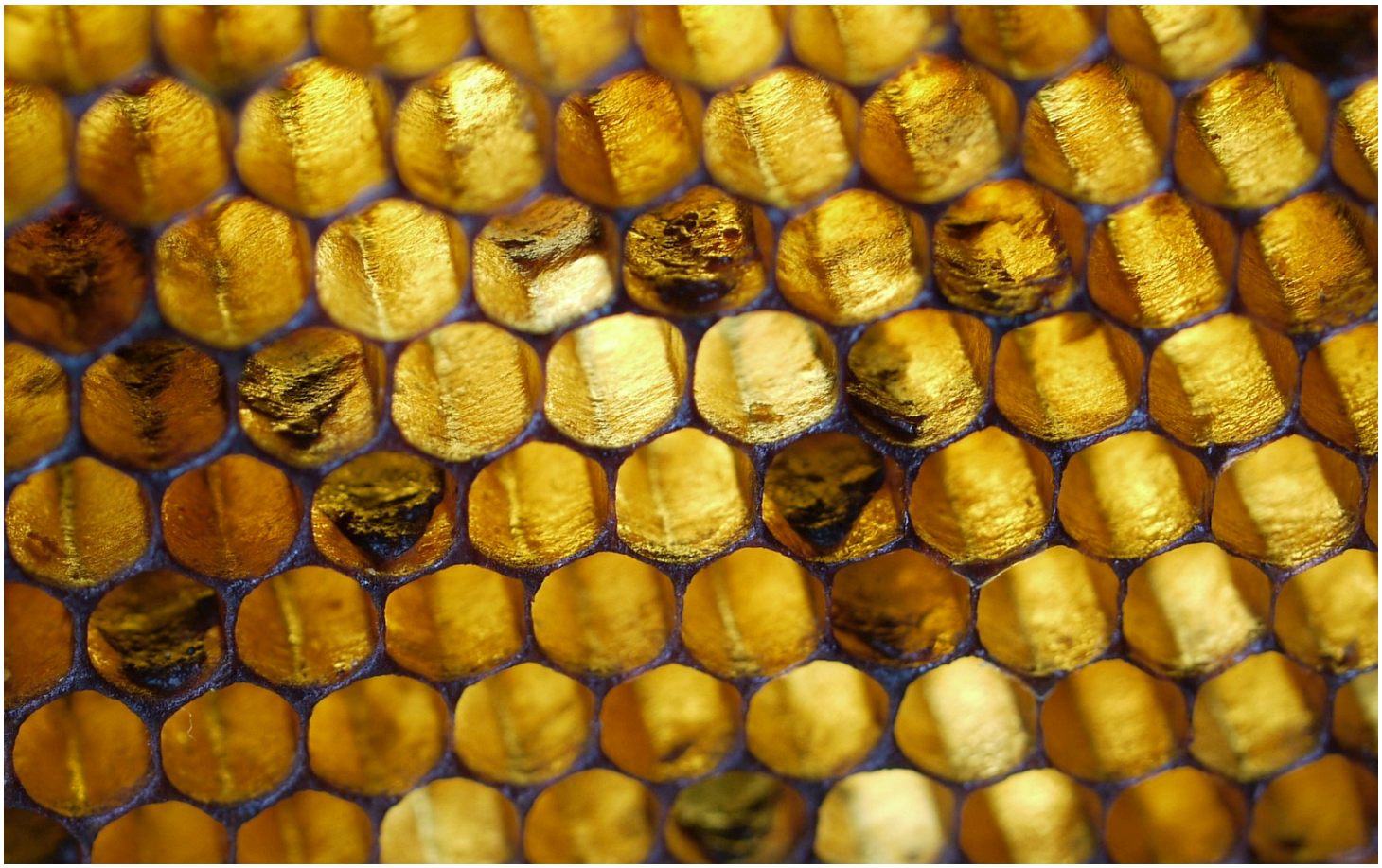
A honey bee with deformed wing virus and a varroa mite. Photo: Stefan de Konink, Wikimedia Commons, CC0 (public domain dedication).

For more detail on symptoms and how viruses spread, see Penn State Extension's Viruses in Honey Bees.

Brood and adult diseases

- **American foulbrood (AFB).** Caused by spores of the bacterium *Paenibacillus larvae*. It **kills capped brood** and it is highly contagious. Look for spotty brood, sunken, greasy, or punctured cappings, and brown larvae that stretch out about an inch on a matchstick (the rope test). The spores last for decades. **American foulbrood is reportable in Texas.** If you suspect it, call TAIS at 979-321-5827 or email tais@ag.tamu.edu. Confirmed colonies and infected equipment are destroyed, and antibiotics only mask the disease.

- **European foulbrood (EFB).** Caused by *Melissococcus plutonius*. It affects **young, uncapped larvae**, which look twisted, melted, and cream to brown. It is often linked to colony stress or poor nutrition, and it shows up most in early spring.
- **Chalkbrood.** A fungus, *Ascosphaera apis*, that turns dead larvae into hard **white or dark mummies**, often found on the bottom board or at the entrance. Help colonies with sun, ventilation, strong bee numbers, and requeening.
- **Nosema.** A gut infection in adult bees caused by a microsporidian fungus. It **shortens life, lowers honey production, and can cause dysentery**. Strong colonies, clean comb, good nutrition, and replacing old comb are the best defense.



American foulbrood: hard, dark scales stuck to the bottoms of the cells. Photo: Dalibor Titera (Beedol.cz), Wikimedia Commons, CC BY-SA 4.0. Resized for the web.



The rope test for American foulbrood. Photo: Virginia Williams, USDA Agricultural Research Service, image D827-1. Public domain.



European foulbrood: discolored, melted larvae beside healthy pearly-white larvae. Photo: Dalibor Titera (Beedol.cz), Wikimedia Commons, CC BY-SA 4.0. Resized for the web.

Medicines for foulbrood are legal only with a **veterinarian's feed directive or prescription**, and they are never used as prevention. Never upgrade a suspicion to a diagnosis. Use a test kit, ask TAIS, or get lab confirmation. My post on identifying brood diseases has more photos and the Texas reporting steps.

Pests, pesticides, and other threats

- **Small hive beetles** are a big pest in warm places like Texas. The larvae damage comb, honey, and pollen. Keep colonies strong, put hives in sun, use traps, and don't leave empty supers on hives over winter.
- **Wax moths** attack stored comb and weak colonies. Freeze drawn comb at **20°F for 4½ hours or 5°F for 2 hours**, then thaw before you bag it. Store it clean and dry, with airflow and light. If you use a fumigant, use **paradichlorobenzene (such as ParaMoth) only, never naphthalene mothballs**. A gentler option is **Certan (B402)**, a biological spray made from *Bacillus thuringiensis* subspecies *aizawai*. This natural soil bacterium kills young wax moth larvae and is harmless to honey bees and people. Mix 1 part Certan to 19 parts water and use it the same day. Spray both sides of each extracted frame, about 1 ounce per deep, ⅔ ounce per medium or ½ ounce

per shallow, and let the frames dry before storing. It works only as a preventive, so apply it in fall before the comb gets infested. One treatment lasts into the next season. Some beekeepers use **XenTari**, a garden caterpillar product with the same *Bacillus thuringiensis aizawai* bacterium, but its label doesn't cover beehive comb. Certan is the one labeled for it. See the Certan (B402) product page.

- **Skunks, mice, and ants.** Raise hives on stands, use metal mouse guards (or half-inch hardware cloth) in fall, and set stand legs in oil cups or on barriers for ants.
- **Pesticides.** Signs of poisoning are a sudden loss of foragers, piles of dead bees, and trembling bees. Don't spray blooming plants or when bees are flying, spray in the evening, tell applicators where your hives are, and read the EPA bee-hazard language on the label.
- **Reportable in Texas:** American foulbrood, Tropilaelaps mites, and the yellow-legged hornet.

Sources: TAIS on small hive beetle, TAIS on wax moths, and EPA pollinator protection.

Honey, wax, and safety

- **Harvest** when frames are at least 90 percent capped, or when a refractometer reads about 18.6 percent moisture or lower. Honey ferments above about 17 to 18.6 percent moisture. Extract warm, strain, and return wet supers to the bees at dusk.
- **Crystallized honey is not spoiled.** Honey crystallizes fastest at about 57°F. To liquefy it, use a warm-water bath, never heat it above about **113°F (45°C)**, and never use a microwave or an open flame. Store honey at room temperature, not in the refrigerator. (Southern Cross University and NC State Beekeepers.)
- **Never give honey to a child under 12 months.** It can carry spores that cause infant botulism. (CDC.)
- **Beeswax** ignites easily. Melt it in a double boiler or an electric or solar melter, never over an open flame.
- **Stings.** Scrape the stinger out and don't pinch it. If you've ever had a reaction beyond local swelling, ask an allergist about an **epinephrine auto-injector** and venom immunotherapy. For a severe reaction, use the epinephrine and **call 911**. (ACAAI on insect sting allergies.)
- **Heat.** A bee suit in July is no joke. Work early, drink water, and use a buddy. Full sun adds up to 15°F to the heat index. (NWS heat index.)

Want to learn more?

Questions? Email me at kirby@rockwallhoneybee.com, visit rockwallhoneybee.com, or come to a Trinity Valley Beekeepers Association meeting on the 4th Tuesday of the month.

If you'd like to see how we care for colonies across North Texas, check out our Client Showcase at rockwallhoneybee.com: an interactive map of 200+ projects with 3,000+ photos of removal work, commercial beekeeping, urban apiary work, and in-hive bee images.

More reading on the disease and virus sections:

- Penn State Extension, Viruses in Honey Bees
- Oklahoma State University Extension, Honeybee Diseases and Their Recognition (EPP-7344)
- University of Georgia Bee Program, Honey Bee Disorders
- Maine Department of Agriculture, Conservation and Forestry, Apiary Diseases fact sheet
- Mann Lake, The Most Common Honey Bee Diseases
- Honey Bee Health Coalition, Tools for Varroa Management

Sources: D. Sammataro and A. Avitabile, The Beekeeper's Handbook, 5th edition (Comstock Publishing Associates, an imprint of Cornell University Press, 2021; originally published 1978), summarized, supplemented with modern updates from the extension and agency sources linked throughout. Photographs are credited in their captions.

Q: What do bees say on a hot summer day?
A: Swarm, isn't it?

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