

Our guide to raising honeybees (and making honey)

WE BEGAN THIS ADVENTURE partly in quest of honey to sweeten our One-Block Feast. But we also did it for the love of bees.

You've probably heard the statistic: Bees, traveling from plant to plant and pollinating as they go, are responsible for producing about a third of our country's food supply. Unfortunately for them and for us, they've been dying in huge numbers over the past several years. No one's conclusively figured out what causes Colony Collapse Disorder, as it's been termed.

We figured that by raising bees, we would contribute, in however small a way, to the overall population of bees. We thought it would be easy; we certainly have plenty of plants for them to browse, and relatively benign conditions (good weather, a creek nearby). Life should be great for bees at Sunset.

But having battled ants, bluejays, wasps, buckeye poisoning (the pollen is toxic to bees), and Varroa mites since they arrived in May, we understand just what these hardworking little creatures are up against (for a running diary of our life with bees, see http://oneblockdiet.sunset.com/team_bee/index.html). And it's deepened our appreciation for what marvelous, interesting creatures they are. (See "Amazing Bees," below.)

The stings? Only 2 so far, and it wasn't a big deal. They only sting in self-defense (those 2 stings happened when we were deep in the hive, pulling frames and irritating the bees). Move slowly and gently, and you can hold them in your bare hands (really; see http://oneblockdiet.sunset.com/team_bee).

It's been, and continues to be, an incredible experience. We'll never taste honey again without a sense of gratitude.

"Ask 10 beekeepers a question and you'll get 12 answers, so choose one beekeeper and follow his advice." —Randy Oliver, beekeeper and bee researcher (and our consultant), on how to begin raising bees

WHAT WE RAISED 2 Colonies of Honeybees

Our hives are both filled with European honeybees (*Apis mellifera ligustica*), known for their gentleness and productivity.

WHAT WE USED Materials, Prices, and Sources

Unless otherwise noted, our beekeeping supplies came from Dadant & Sons, based in Illinois (www.dadant.com or 217/847-3324) but with branches throughout the country; we ordered from the one in Chico, CA (deliveries tend to be unexpectedly slow, so factor in extra time for their arrival). We also recommend Mann Lake Ltd. in Minnesota (www.mannlakeltd.com or 800/880-7694) for beekeeping equipment. Prices don't include shipping.

2 Master Pollinator kits (\$299.50 each).

Each kit includes:

1 telescoping outer cover with galvanized metal top and an inner cover The inner cover helps insulate the box. The outer cover provides weather protection. Together, they're designed so the bees can't glue the hive shut with propolis—the sticky substance they exude to bond the various parts of the hive together.

2 painted assembled hive bodies These will be the "brood" boxes, deep boxes that will be the bees' main home and will be filled with brood, honey, and pollen. Each box has 10 frames loaded with Plasticell foundation (a thin sheet of plastic molded into hexagonal cells and coated with beeswax to make it easier for the bees to build honeycomb).

1 painted assembled bottom board We did not use this. See "Country Rubes" Bottom board, below.

1 metal 10-inch hive tool Used to pry frames apart and to scrape off propolis and stray bits of extra comb.

1 bee brush

1 smoker (Smoke calms the bees.)

2 lbs of smoker fuel (we've also used eucalyptus leaves, dead grass, pine needles—anything that will provide long lasting, cool smoke)

1 entrance feeder We've never used this, as it encourages robbing by intruder bees; we made our own feeders—see below.

1 zipper veil suit We chose large, to fit the largest member of Team Bee. It's very large.

1 plastic helmet (not the most comfortable, and one arrived broken) and a veil that zips to the suit.

1 pair leather beekeeping gloves Your choice of S, M, L, XL—most of the women on Team Bee found the small to be the best size.

2 books: *The Hive and the Honey Bee*, edited by Joe M. Graham (1992, Dadant & Sons, Hamilton, IL); and *First Lessons in Beekeeping*, by Keith S. Delaplane (2007, Dadant & Sons, Hamilton, IL)

A year's subscription to the *American Bee Journal*

1 medications brochure

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Not included in the kit:

2 queen excluders, one for each hive. An excluder is a screen whose mesh is sized small enough to prevent the large queen from crawling up into the “honey super” (a box designated for honey collection) and laying eggs. \$11.35 each.

2 “Country Rubes” bottom boards, one for each hive (these are small boxes on which the hives rest, with an open, screened bottom and a removable plastic board, designed to help manage Varroa mites; see below for information). \$39.95 each.

2 supers (unassembled), one for each hive (supers are smaller boxes that are set on top of the brood boxes; can be used for raising brood but normally are used with a queen excluder to get clean honey), 6⁵/₈ in. size, with frames. \$20.95 each.

20 Plasticell foundations, 5¹/₂ in. size, for the supers. 77 cents each.

2 drone frames, one for each hive (used in Varroa mite control, see below). \$3 each.

3 vented helmets Because we have several people on Team Bee, we needed extra helmets—one per person visiting the hive. These vented helmets are much more comfortable than the plastic helmets from Dadant. One helmet, paired with a round veil—see below—plus a white long-sleeved shirt, light-colored pants, and closed shoes, works fine as a basic beekeeping outfit, with gloves on occasion for heavy or prolonged work, or for days when the bees are grumpy. \$12.95 each, from Mann Lake Ltd.

3 round veils with string tie-ons. \$10.95 each, from Mann Lake Ltd.

Bees

Pre-order as early as in the fall, and certainly no later than early spring, as bees are only available for a short time in the spring (bee-raising begins with warm weather, shortly before the spring nectar flow that provides the bees with food). Order at least 9 months in advance as they sell out early. You can order bees three ways:

1. Packaged bees and caged queen This is the least expensive, but it takes time to build up the colony. One good source is Olivarez Honey Bees, in Chico, CA. \$60 to

\$70 for a 3-lb. package; queen included; contact them for a pickup location near you; www.ohbees.com

2. Nuc (short for “nucleus”) A nuc is an established colony with a laying queen; starting this way helps you get a jump on honey production. Buy from a reputable beekeeper to avoid getting diseased equipment or sick bees. We ordered two nucs from master beekeeper Randy Oliver and drove to his location in Grass Valley, CA, to pick them up. \$90 each nuc; queen included; www.scientificbeekeeping.com

3. Swarms or established colonies Not recommended for beginning beekeepers.

Other Equipment

4 cinderblocks to raise hives off ground (2 per hive), or you can build stands for the hives. We made our stands from scrap 2-by-4s. The stands are rectangles 16¹/₄ inches wide by 20 inches long, with an open top, and 1 foot tall. We painted them with white latex paint.

8 sturdy square plastic food containers 32-oz. size; about \$4 for 4 at a grocery store.

Terro ant bait \$7 for a package of 3; find at any nursery, garden center, or hardware store.

Tanglefoot A goopy, sticky substance that traps ants; used to keep invaders out of a beehive. \$10 for 15 oz. tub at any nursery or garden center.

Apiguard A very smelly gel for Varroa mite control. See “Pest Control” for a description. \$30 for a 10-pack—enough for 10 individual 50 g treatments; Dadant & Sons.

2 feeder tops, one for each hive. These are boards cut to cover the top of the hives. Cut a hole about the size of the feeder jar lid and attach some wooden blocks to hold the jar onto the lid.

4 1-quart-size glass jars and lids (punch several holes in lids with a nail) for feeding. No need to buy anything special; you can use glass jars from your kitchen.

Granulated sugar You’ll need 10 cups—about 4¹/₂ lbs.—dissolved in water to feed each hive per week to start, for at least 3 weeks, or until the bees stop draining the jar. About \$7.50 for a 5-lb. bag at a grocery store.

Powdered confectioners’ sugar You’ll need 1 cup per brood box per hive per week, as

long as you’re dusting for mite control (see below). About \$2 for 2 lbs. (about 7¹/₂ cups) at a grocery store

HOW WE DID IT A Step-by-Step Guide

1. Choose the location

Bees need:

Sun (afternoon shade where it’s hot)

Access to fresh water near the hive We used a plastic plant saucer with stones in the center for the bees to land on (otherwise they drown) and refreshed the water every day. A shallow bubble fountain would work well.

Protection from wind

Privacy Don’t put them near high-traffic areas, play areas, swimming pools, or pet areas. Give them plenty of space.

2. Prepare the location Hives need to be kept off the ground to protect them from dampness and critters. After clearing the brush and leveling the ground, we put our hives on cinder blocks at first, but when ants invaded, we put them on hive stands (see above), each leg set in a water-filled plastic container.

3. Install the bees Spring, when the weather is kind to bees and flowers are beginning to bloom, furnishing a food supply, is the time to put your bees in their hives. Once you’ve chosen how to buy them (see “What We Used: Materials, Prices, and Sources,” above), the best bet is to rely on your source for installation instructions.

Here’s what happened when we picked up our bees from Randy Oliver at his property in Grass Valley: He gave us an introductory class in beekeeping, showing us how to use the hive tool and the smoker, handle bees (we scooped them up with our bare hands!), pry apart frames, and check for eggs, brood, and queen (all vital signs of a colony’s health). We brought two brood boxes with us, and Randy loaded 5 frames of his gentle hybrid bees and a queen into each box and sealed the opening with our beekeeping gloves. We used a ratchet strap to secure the boxes in the back of the truck.

Back at Sunset, we positioned the brood boxes in their designated locations

and removed the gloves from the entrances.

4. Feed the bees Young colonies have a lot of work to do—storing pollen and nectar, sealing all the cracks and seams in their new home, and taking care of the queen and new brood. To make their adjustment easier, we provided a “nectar” to feed the bees. Here’s how: Dissolve equal parts sugar and water and use to fill quart jars. Top with feeder lids (regular jar lids with small holes in them) and, using the feeder top, invert them over the hole. They should not drip; the bees will drink what they need. Our nucs drank about $\frac{3}{4}$ of a quart jar per day in the beginning. Over the next 3 weeks or so, it tapered off to the point where we realized sugar water was no longer necessary; the bees were finding their nutrition in flowers. Plus, sugar water makes for insipid honey and so shouldn’t be continued if not needed.

5. Every week, open and inspect the hives for eggs and to check on the queen. Much of beekeeping is simple observation and response. Inspect the hive about once a week in the beginning to make sure the queen is healthy and laying eggs (if she isn’t, consult an expert—your local beekeeping guild is a good source). Opening the hives and thoroughly checking them requires smoking to keep the bees calm. Every time the hive is opened and the colony smoked, it stresses the bees and takes them about a day to recover; weekly checks are best.

6. Check regularly for mites Varroa mites are the pest most typically found in beehives. Left unchecked, they can cripple and eventually kill the hive (see below for hints about mite control).

7. Expand the hive when necessary Start with one deep brood box. Let the bees build up brood cells in the first brood box.

When the first brood box is well filled (7 to 8 frames of bees and brood), add a second brood box. Let the bees build up brood cells in the second brood box. When the second brood box is well filled (7 to 8 frames of bees), add a queen excluder and, finally, the honey “super”.

Pest Control

Bees are like flying balls of delicate spun sugar filled with honey. Everything wants to eat them. Here are two of the worst pests we battled, and how we attempted to control them.

Ants Argentine ants are a problem throughout most of the San Francisco Bay Area, and they can kill a hive by robbing honey and eating the brood. To keep ants out of the hives, immerse each leg of the hive stands in water (you could also use oil instead, although that will kill bees too, if they fall in). Some people also apply a thin stripe of Tanglefoot (a goopy, sticky substance to trap the ants) on the legs of the stands, but we found that the ants could cross it if any dust blew into the sticky stuff.

We couldn’t spray to kill the ants, since that would also kill the bees. We tried Terro ant bait, a less toxic control. These are little containers filled with boric acid mixed with a sweet substance ants like. They take the boric acid back to their colony, feed it to their queen and brood (yes, ants have a social caste system similar to bees) and they all get a terminal bellyache. The ants seem to like it, but their ranks are still strong, so we’re not sure it’s working.

Varroa mites The most damaging pests a beekeeper has to deal with are Varroa mites. Virtually unknown in this country until the middle of the 20th century, these pests threaten the survival of a hive once they become established. They suck the blood of adult bees and lay their eggs in brood cells, where their larvae feed off bee babies, infecting them with viruses and weakening and even killing them. To save their bees, beekeepers use a variety of methods.

1. A 24-hour count of a natural mite fall will give you a good idea of a hive’s infestation. Coat the bottom of your “Country Rube” plastic bottom board with petroleum jelly (so the mites can’t walk away), slide it into the lower part of the bottom board, wait 24 hours, and then pull it out and count the mites. Anything more than a couple of mites per brood box indicates you’ve got a problem.

2. The powdered sugar method lets you both count the mites and control them. Simply sift powdered (confectioners’) sugar, 1 cup per brood box, over the tops of the frames and brush it into the hive. The powdered sugar makes the mites lose their grip on the bees and fall off; the bees groom the sugar off their bodies, dislodging more mites. Again, use the plastic bottom board coated with petroleum jelly to capture the fallen mites. If you have a strong hive, you should not see more than a few mites 10 minutes after dusting. If there are more, you have a problem.

3. Drone frames will also help trap Varroa mites. These frames are designed to encourage bees to make drone comb, which is larger than worker comb (meaning each cell in the comb is larger). Since Varroa mites prefer drone brood 10 to 1, the drone comb makes a great mite trap. Just before the drones hatch (about 21 days after the eggs were laid), destroy the drone comb (you can freeze it and return it to the hive, or simply cut it out), and replace the drone frame for the next cycle. (Since our queens have already mated and have a lifetime’s supply of sperm inside of them, our drones are obsolete.)

The big gun in mite control is Apiguard, a gel infused with Thymol, made from the oils of thyme plant and bee balm. It works well, but it makes the honey stored during the treatment unusable (it evidently won’t hurt you, but it tastes like mouthwash).

For more information on mite control, see the sources listed below.

STILL TO COME Honey Collection!

Two months after bringing home our bees, we harvested a small amount of honey when we pulled the drone frame. There was a band of comb full of pure honey along the bottom of the frame. After freezing the comb to kill the drones (and the mites), we carefully cut away the clean comb and suspended it in a fine mesh sieve over a bowl for 24 hours, ending up with about $\frac{1}{2}$ cup of honey.

Because the bees had built the comb while the Apiguard was in the hive, the comb tasted like Thymol in places, but the

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honey had only a slight off taste, and just a few of us (those of us who had gotten it on our hands while applying it) could taste it.

We expect to harvest two frames of honey soon, and will update this guide with the details—and the tasting notes.

Helpful Info

General websites

www.scientificbeekeeping.com/

www.sanmateobee.org

www.sfbee.org/

www.beesource.com/

www.beginningbeekeeping.com/

Websites about Varroa mites and how to control them

www.ent.uga.edu/bees/Disorders/Varroa_mites.htm

www.countryrubes.com/information/informationandpictures.html

www.scientificbeekeeping.com

www.dadant.com/

[Apiguard-Howtouse_003.htm](#)

Books and Publications

The Hive and the Honey Bee, edited by Joe M. Graham (1992, Dadant & Sons, Hamilton, IL)

First Lessons in Beekeeping, by Keith S. Delaplane (2007, Dadant & Sons, Hamilton, IL)

American Bee Journal, \$24.95/per year (monthly publication); 51 S. 2nd St. Hamilton, IL 62341, 217/847-3324

Amazing Bees

Worker bees—all females—work hard their whole lives. (Not so the males, known as drones. They lounge about stealing honey until it's time for them to fly out and look for a queen to mate with.) But from the moment a working girl pulls herself from her six-sided cell, she begins contributing to the health of the hive by cleaning her cell in preparation for the next baby bee.

As they age, worker bees have a specific job (although tasks sometimes overlap). At 10 to 17 days old they are house bees, cleaning the hive (bees are very clean), tending the brood (baby bees), taking care of the queen, and taking the

groceries (nectar and pollen are the only things European honeybees eat) from the foraging bees and storing it in the wax combs. After about 17 days, house bees become foragers, and can fly up to 10 miles away to find suitable blooming plants, but prefer to stay closer to home. Foragers will also help the house bees build comb, ventilate the hive, and guard it from honey-hungry animals.

In the summer, the worker bees work so hard they just wear out after about 35 days. The queen, no slacker herself, may lay up to 1,500 eggs a day, in order to provide a constant supply of new workers. In the winter, bees live longer—140 days or more—keeping the hive and queen warm, dry, and safe until spring when the season begins again.