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Eco Bee Box™

Summer 2017

Mini Urban Beehive

Understanding Your Colony's Community

A New Simple Comb Packaging Product

The Importance of Knowing the Bee Density in Your Area

Not All Flowers Are Created Equal

Will a Mini Urban Beehive Help Me Be a Better Beekeeper?

Community of Organisms in a Honey Beehive



Eco Bee Box

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The Mini Urban Beehive

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"North Bend" Pollen & Nectar Chart (by Mark Borovatz)

Common Name	Blooming Mo	Nec	Pollen Color	2011 Blooming date	2012 Blooming Date	2013 Blooming Date	2014 Blooming Date	2015 Blooming Date
Quaking Aspen	Feb. / Mar.	No	yellow white	Did not track	Did not track	Did not track	Did not track	Feb. 5th to March 18th
Elm	Feb. / Mar.	No	yellow white	Did not track	Did not track	Did not track	Did not track	Feb. 8th to March 20th
Cedar	Feb. / Mar.	No	yellow white	Did not track	Did not track	Did not track	Did not track	Feb. 9th to March 15th
Crocus	March / Apr.	No	red orange	March 1st to April 2nd	March 9th to April 2nd	March 4th to April 2nd	Feb. 25th to April 1st	Feb. 5th to March 27th
Peach	March / Apr.	Yes	reddish yellow	April 16th to 27th	March 28th to April 13th	April 17th to May 2nd	April 6th to April 18th	March 24th to April 3rd
Daffodil	March / May	Yes	light yellow	March 23rd to May 6th	March 23rd to April 21st	March 23rd to May 3rd	March 16th to April 19th	March 9th to April 13
Vinca Minor	March / June	No	yellow green	April 23 to June 30	March 23rd to June 2nd	April 11th to June 10th	April 8th to June 18th	March 30th to June 9th
Dandelion	March / July	Yes	red orange	April 2 to June 24th	March 25th to May 10th	March 31 to May 13th	March 20th to June 7th	March 16th to June 9th
Grape Hyacinth	April / May	Yes	pale blue	April 13 to 19th	April 9th to April 27th	April 3rd to May 6th	April 8th to May 4th	March 26th to April 25th
Cherry	Apr. / May	Yes	yellow brown	May 1st to 11th	April 2nd to April 21st	April 12th to May 4th	April 7th to May 1st	March 28th to April 13th
Basket of Gold	Apr. / May	No	yellow white	April 18th to May 18th	April 9th to May 8th	April 17th to May 16th	April 6th to May 18th	April 5th to May 5th
Leopard's Bane	April / May	Yes	yellow	Did not grow in 2011	Did not grow in 2012	Planted in 2013	April 21st to May 29th	April 16th to May 16th
Maple	Apr. / May	Yes	Lime	April 19 to May 3rd	April 11 to April 23rd	April 18th to May 3rd	April 10th to April 28th	March 28th to April 15th
Tulip	Apr. / May	No	grey / black	April 22 to May 12th	April 6th to April 21st	April 11th to May 6th	April 8th to April 20th	March 26th to April 18th
Apple	Apr. / May	Yes	yellow white	May 2nd to 18th	April 21st to April 27th	April 25th to May 13th	April 18th to May 5th	April 5th to April 25th
Lilac	Apr. / May	Yes	purple red	May 6th to 31st	April 13th to May 8th	April 29th to May 24th	April 18th to May 23rd	April 5th to May 5th
Bleeding Hearts	Apr. / June	Yes	yellow white	May 4th to June 24th	April 11 to May 14th	April 29th to May 30th	April 16th to May 30th	April 16th to May 30th
White Dutch Clover	Apr. / June	Yes	dark brown	May 24th to June 30th	April 27th to June 18th	May 3rd to June 14th	April 27th to Nov. 5th	March 31st to Sept. 6th
Blue Flax	Apr. / June	Yes	White	May 4th to August 13th	April 23rd to June 18th	May 4th to July 25th	April 22nd to May 24th	April 16th to June 6th
Creeping Thyme	Apr. / June	Yes	yellow white	June 2nd to July 3rd	June 2nd to July 3rd	June 4th to June 16th	May 3rd to June 9th	April 27th to June 8th
Bachelor Buttons	April / Sept.	Yes	light yellow	June 29 to Sept. 16th	May 2nd to Oct 18th	May 11th to Oct. 18th	April 22nd to Nov. 5th	March 31st to July 16th
Dwarf Cranesbill Gerani	May / June	Yes	yellow white	Planted in 2012	May 10th to June 16th	May 24th to June 27th	May 23rd to June 21st	May 5th to June 20th
Red Ladino Clover	May / June	Yes	dark brown	May 24th to June 30th	May 20th to June 6th	May 13th to June 16th	May 15th to June 5th	May 5th to June 10th
Iris	May / June	Yes	light yellow	May 26th to June 30th	May 8th to June 3rd	May 13th to June 10th	May 13th to June 3rd	May 1st to June 3rd
Peony	May / June	Yes	orange	June 2nd to June 30th	May 9th to June 3rd	May 19th to June 14th	May 18th to June 5th	May 6th to June 9th
Painted Daisy	May / June	Yes	yellow	June 2nd to June 24th	May 10th to June 9th	May 17th to June 12th	May 24th to June 11th	May 16th to June 10th
Grapes	May / June	Yes	peach	June 24th to June 30th	May 31st to June 8th	June 1st to June 12th	June 5th to June 11th	June 1st to June 19th
Red Hot Poker	May / June	Yes	yellow	June 22nd to June 30th	May 28th to June 22nd	June 9th to June 20th	Did not bloom	May 20th to June 10th
Yellow Sweet Clover	May / June	Yes	yellow	Did not bloom in 2011	May 19th to June 22nd	May 22nd to June 20th	May 15th to June 11th	May 16th to June 20th
Penstemon	May / June	Yes	yellow white	June 9th to June 28th	May 22nd to June 16th	June 1st to June 25th	May 30th to June 18th	June 11th to June 20th
Pink Pussy Toes	May / June	Yes	light yellow	Planted in 2012	Did not bloom in 2012	May 22nd to June 10th	May 18th to June 8th	May 5th to June 6th
Foxglove	May / July	Yes	Creamy White	May 31st to July 19th	June 23rd to July 28th	June 9th to June 30th	May 30th to Sept. 9th	May 26th to June 20th
Meadow Sage	May / July	Yes	golden	June 14th to July 19th	May 22nd to July 5th	May 18th to June 30th	May 13th to July 3rd	April 25th to July 4th
Lavender	May / July	Yes	light yellow	July 19th to Sept. 1	May 25th to July 26th	June 9th to July 25th	May 30th to July 15th	May 20th to July 19th
Catmint	May / Sept.	Yes	yellow	May 31st to Sept. 24th	May 12th to Sept. 9th	May 17th to July 23rd	June 9th to Sept. 27th	June 18th to Sept. 3rd
Salvia	May / Sept.	Yes	orange brown	June 9th to Sept. 19th	May 10th to Oct. 24th	May 13th to Oct. 3rd	May 8th to Sept. 30th	March 30th to Oct. 14th
Rocky Mountain Bee Pl	May / Sept	Yes	Light green yellow	Did not grow in 2011	May 19th to Oct. 1st	May 13th to Oct. 1st	May 6th to Sept. 27	May 5th to Sept. 6th
California Poppy	May / Frost	No	yellow orange	May 28th to Oct. 26th	May 2nd to Oct 19th	May 6th to Nov. 25th	May 13th to Nov. 5th	April 25th to Nov. 8th
Borage	May / Frost	Yes	Blueish Grey	Did not grow in 2011	June 23rd to Sept. 13th	June 14th Sept. 23rd	May 4th to Nov. 1st	June 3rd to Sep. 3rd
Hosta	June / July	Yes	yellow white	Did not grow in 2011	June 30 to July 14th	Did not bloom this year.	Did not bloom	Did not bloom
Hollyhocks	June / July	Yes	light yellow	July 2nd to July 25th	June 1st to July 9th	June 10th to July 15th	June 9th to Nov. 5th	June 3rd to July 12th
Shasta Daisy	June / July	Yes	yellow	June 29 to July 21st	June 10th to July 5th	June 10th to July 15th	June 18th to June 30th	June 18th to July 11th
Dill (Herb)	June / July	Yes	yellow	June 24th to July 14th	June 8th to July 10th	June 20th to July 10th	Did not plant	Did not plant
Bellflower	June / July	Yes	light yellow	July 9th to 31st	June 22nd to Aug. 27th	June 25th to Sept. 7th	July 15th to Aug. 23rd	Removed
Catnip	June / August	Yes	yellow	June 15th to August 13th	June 20th to August 30th	July 25th to Aug.25th	July 16th to Sept. 30th	July 19th to Sept. 3rd
Melons/ Squash / Pump	June / August	Yes	yellow orange	June 24th to August 26	June 18th to Oct. 7th	July 12 th to Oct. 2nd	June 12th to Sept. 27th	July 19th to Sept. 26th
Tomatoes	June / August	No	yellow	June 20th to August 5th	June 1st to August 30th	June 9th to Sept. 23rd	May 30th to Sept. 23rd	June 11th to Sept. 26th
Coreopsis	June / Sept.	Yes	yellow	June 20th to August 5th	June 2nd to Aug. 27th	June 6th to Sept. 23rd	June 8th to Sept. 27th	June 3rd to Sep. 3rd
Yellow Yarrow	June / Sept.	Yes	yellow	July 3rd to Sept. 17th	June 18th to Aug. 27th	June 10th to Aug. 26th	June 21st to Aug. 25th	June 20th to Aug. 15th
Red Yarrow	June / Sept.	Yes	yellow	July 3rd to Sept. 18th	June 20th to Sept. 14th	June 27th to Sept. 22nd	June 21st to Dec. 1st	June 11th to Oct. 6th
Anise Hyssop	June / Sept.	Yes	yellow white	June 29 to Sept. 28th	July 10th to Sept. 28th	July 24th to Oct. 4th	July 24th to Sept. 20	August 2nd to Oct. 10th
Gayfeather Listris	June / Sept.	Yes	yellow	July 31st to Sept. 14th	June 25th to July 26th	July 2nd to Aug. 1st	July 22nd to Aug. 2nd	Did not bloom
Sweet pea	June / Sept.	Yes	yellow white	Did not grow in 2011	June 25th to Aug. 27th	Replanted in 2013	June 9th to Sept. 9th	May 28th to July 15th
Spearmint	June / Sept.	Yes	light yellow	July 11th to August 5th	June 27th to Aug. 18th	June 25th to Aug. 10th	July 16th to Sept. 29th	July 14th to Sept. 23rd
White Coneflower	June / Oct.	Yes	grey / black	July 21st to Oct. 3rd	June 25th to Sept. 30th	June 29th to Sept. 23rd	June 29th to Sept. 11th	July 11th Sept. 5th

Tree, Plant Flower, Shurb	Blooming	Pollen Color	2011	2012	2013	2014	2015
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The time and resources spent in this labor of love should be obvious to any beekeeper. Understanding nectar and pollen periods for each plant listed is a valuable resource for those building a plant friendly area. The associated plant list may not be ideal for all areas.



Importing Bees to America and their Migration to the Territory of Deseret

European Honey Bees (EHB) were labeled as livestock in 1622 ship logs when imported from England to the colony of Virginia. The Council of the Virginia Company in London wrote a letter dated December 5th 1621 to the Governor and Council in Virginia, "Wee haue by this Shipp and the Discouerie sent you diuers sortes of seedes, and fruit trees, as also Pidgeons, Connies, Peacocks Maistiues, and Beehives, as you shall by the invoice pceiue; the preservation & encrease whereof we respond vnto you..." (Goodwin 1956; Kingsbury 1906:532). The ship "Discovery" captained by Thomas Jones left England November 1621 and arrived in Virginia March 1622 (Langford Ship Information; Brown 1898:469-470). By the early 19th century, EHB had spread as far west as Michigan, Indiana, Illinois, Iowa and Missouri through swarming, a natural division of a colony.

From 1811 – 1870 over 500,000 pioneers traveled one of several overland routes west. Source http://www.octa-trails.org/media/dynamic/les/791_01%20How%20any%20emigrants%20olowed%20the%20trails%20to%20California.pdf. Documentation is scarce regarding what pioneers carried with them on their "manifest destiny" journey west. Several treacherous routes existed. Provisions, weapons, livestock, savings, were hard to come by and sought by vigilantes and local tribes along the routes. Some records exist through diaries, store ledgers, letters, and church records as to items needed for this journey. Questions to ask; how many settlers took honey bees with them; and did any swarm, abscond, or left abandoned following a fatal attack?

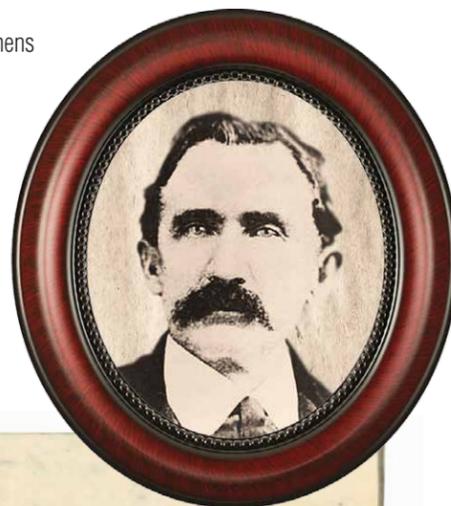
Honey bees were once kept in hollow logs called bee gums. In the 19th century they were replaced by hundreds of new "patented beehives". In 1851 Lorenzo Langstroth filed a patent for large removable framed hive that maintained a standard 3/8" for bee-space. This hive revolutionized the American beekeeping industry for the advent of commercial migratory beekeeping.

Honey bees were in Winter Quarters, Nebraska prior to 1848, as Mormon pioneers carried multiple colonies with them as recorded in Thomas

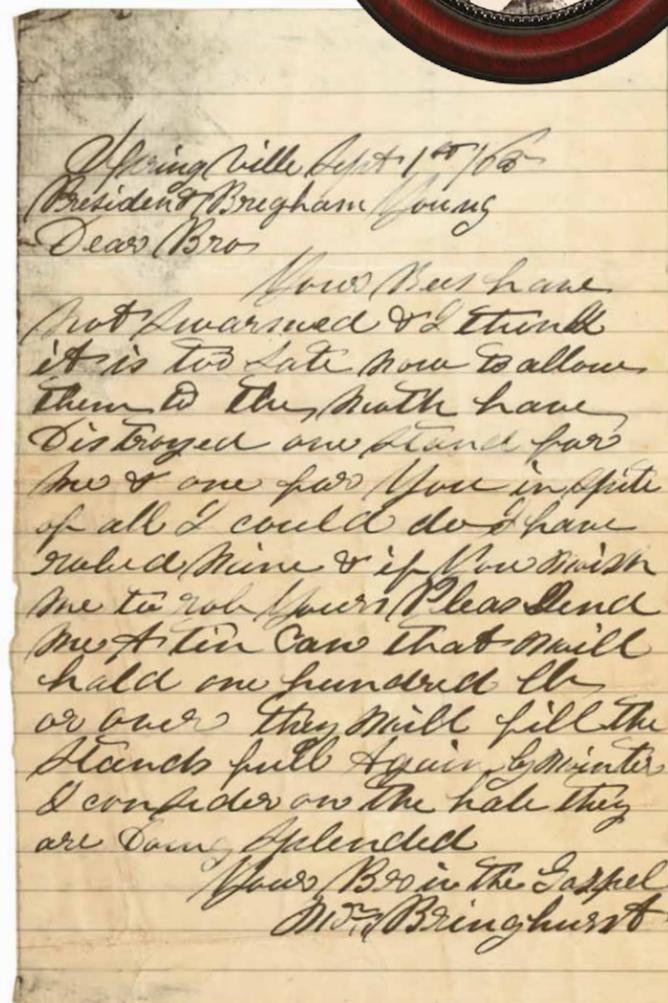
Bullock's published journals dated May 29th 1848 "...587 Souls travelling in 179 Wagons with 28 horses, 7 mules, 586 oxen, 340 cows, 86 loose Cattle, 209 Sheep, 102 pigs 260 Chickens, 33 Dogs 19 Cats, 3 stand of Bees, 6 Ducks, 2 Pigeons, and W.W. Phelps had one crow."

Beekeeping legends suggests the Mitchell family carried bees when they migrated to Utah with Brigham Young in 1848. However, the Mitchell's migrated from Scotland to New Orleans in 1850, and to Utah after 1851.

March 16th, 1859 John L. Stephens imported 85 hives of bees by steamer to San Francisco. The Deseret News recorded Messrs J. Whitbeck and W. D. Roberts imported two swarms from California to Springville, Utah.



William Bringham "Pioneers and Prominent Men of Utah" by Esshom 1913 page 106



William Bringham letter, 1 September 1865; CR 1234/1 Brigham Young Office Files, Special Collections, LDS Archives



BYU Special Collections, Amos Warren, Springville Utah 1880

September 1, 1865 William Bringham wrote Brigham Young a personal letter regarding his colonies and their harvest. May 10th, 1869 the Union and Central Pacific Railroads were connected at Promontory Point, Utah. 18,000lbs of swarms were imported to Utah in 1871 by train car, according to the Salt Lake Herald. Recorded in the Deseret News in 1872, the old species of black bees in Utah were being replaced by the Italian bee. This same year W.D. Roberts exported bees to Idaho and Montana from Utah.

By blindly importing bees into places like Utah's territory, also came the spread of colony foulbrood at alarming rates. Twenty years after the initial outbreak, the Utah territorial legislature approved the "Bee Inspection Act" in 1892. An early regulation intended to provide safety to all beekeepers.

Early in the 20th century Nephi Miller, known as the father of migratory beekeeping, developed a system of transporting active colonies temporarily to California from Utah.

Today it seems every imaginable beekeeping tool has been developed to aid the modern beekeeper. A new beehive system has been developed, aimed at teaching new beekeepers how to raise local queens, performing a colony split, comb honey production just like the pioneers did over a century ago. Introducing the Mini Urban Beehive, or MUB for short. This publication will devote its pages to understanding the reasons behind this 21st century micro hive.



BYU Special Collections "Bro Ed Stung by bee" 1899 Springville Utah



Modern Vintage Mini Urban Beehive Russ Biehn's beehive 2017 Made with 140 year old lumber and naturally aged copper.



History of a Small Beehive: in Nature and in Beekeeping

Understanding the Mini Urban Beehive requires an understanding of both feral and boxed hives. Small colonies appear impractical and time consuming. The purpose of the mini or micro hive differs from the traditional white agricultural grade Langstroth Langstroth hives.

The earliest honey bee (*Apis*) fossil is documented as being associated with the Oligo-Miocene epoch in Eurasia, recorded in "A Review of the Eurasian Fossil Species of the Bee *Apis*1" (A. NEL, 21 NOV 2003). In 2009 an *Apis* fossil was discovered from Steward Valley Nevada paper shale. This fossil was identified from the Miocene epoch dating 14 million years ago. (Engel, M.S., Hinojosa-Diaz, I.A. and Rasnitsyn, A.P. 2009. A honey bee from the Miocene of Nevada and the biogeography of *Apis*)

Since the Miocene epoch, honey bees have sought various sized cavities to house a colony. Smaller cavities fill faster, enabling the successful queen to swarm to establish further colonies. The long-term success of the colony hinges on three factors.. Their ability to:

- 1) Regulate temperature
- 2) Maintain humidity
- 3) Defend the hive



The size of space needed varies on the size of the colony inhabiting it. Smaller colonies can survive if the area can protect them long enough for the colony to multiply and expand its population. A colony develops their inner hive by building and shaping new comb from beeswax (bee fat). This wax is used to form a labyrinth like structure ideal for incubation of young and storage of food. This beehive fortress is uniquely formed with no two being identical.

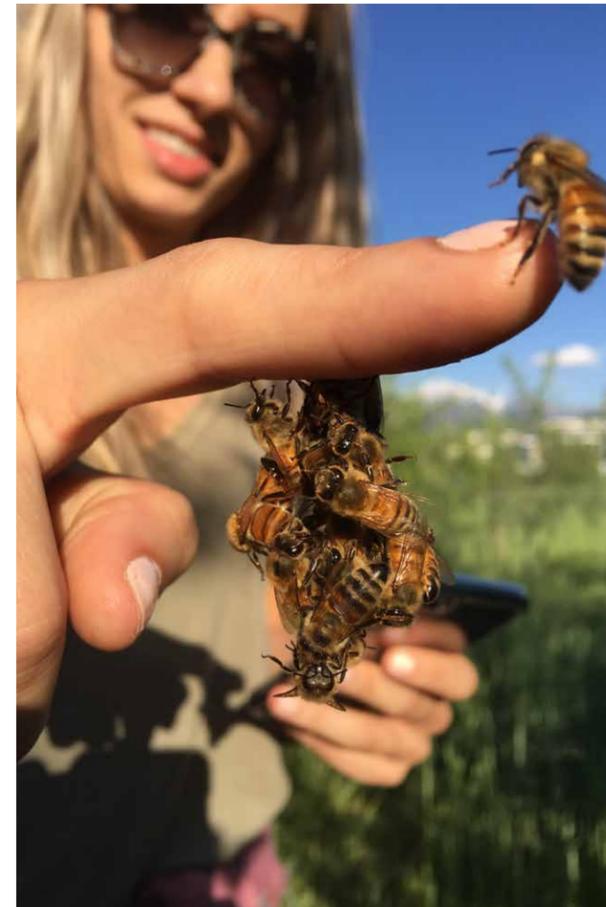
Hives around the globe vary, each with a system of harvesting honey and bee bi-products. The evolution of the hive has varied greatly with many regional styles existing globally. The size of the hive chosen by a

beekeeper is based on what is available and the purpose needed. Most are drawn to the standard ten frame Langstroth deep for its honey potential, extract-ability, and availability. There are other methods that exist and vary from the "norm". Regional issues may warrant a different style. Purpose may dictate a different size. Need can necessitate how the honey is harvested or processed. Level of experience also plays a factor on which hive and what is affordable. Each beekeeper has to determine what is best for them.

Instead of fostering many large colonies for a scientific study, the USDA-ARS has used the Mini Urban Beehives for a variety of reasons: facilitates faster results; smaller controlled test samples; limits researcher maintenance; limits aged comb; ideal for queen breeding; and lower costs.



Photograph taken by Mike Halpin in Jackson Hole, Wyoming 2016.



Katelin Clone in Eco Bee Box apiary playing with bees. A group of 20 bees are festooning off of her finger, with one on top her finger looking back at those two big bee eyes.

The first thoughts in developing a "mini hive" began with making a "true" half Nuc. This Nuc also had a unique modification, frames running side-to-side or the shortest distance. This first hive was called the Utah Hive based on its shape and the similarity to the outline of the State of Utah. This evolved into the Mini Urban Beehive or MUB for short.

The MUB evolved into a quarter sized Langstroth hive, 8 1/8" wide and 10" long and is considered a "medium" depth, or 6 5/8". Made of Western Red Cedar, though materials can vary. Inside the beehive are mini sized frames approximately 6" x 6" made with modified medium side bar/ends, with a shortened length. A slight modification with the end bars is a port hole or access hole for bees, or an elastic band support for seeding drawn comb. The upper frame bar is made with a groove so as to attach food grade "thin surplus" beeswax.

This wax is not added to the entire frame, only sized portions are used so the bees have a place to start. Bees prefer drawing their own comb over using plastic foundation. Plastic foundation is primarily used for regulating cell size and extraction. Seeding or using drawn-out comb can be added to the frame with the use of an elastic band to hold it in place. The elastic band follows the recess in the end bars to hold the comb in place. Of course you can't traditionally extract honey from mini frames, but reducing expenses and labor increases overall profits.

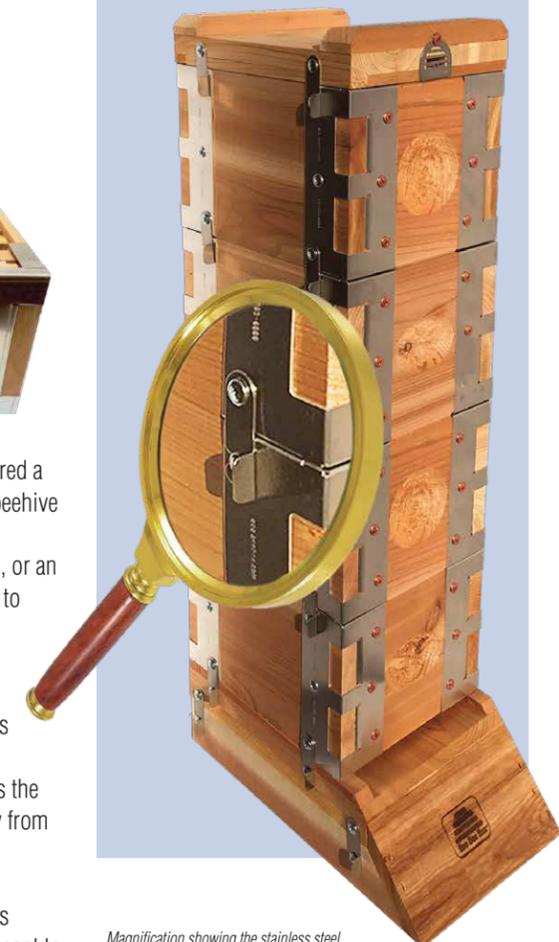
With a secured (locking clip) expansion box, the MUB can grow easily to 4 boxes vertically. This column of mini boxes is identical to a medium 10 frame super/box. The mini frame system is meant to create a Nuc colony.

Development of the Mini Beehive

Honey bee colonies take up residence in almost any hollow cavity, thus locating and removing them alive is an art. The European honey bee swarm is drawn to spaces they can regulate, which in many cases are tight confined areas with limited access points. A majority of the feral colonies in Utah's residences are confined to areas less than a double deep Langstroth hive, with relatively small winter stores. These smaller established colonies, coupled with those who are intimidated by a large colony, initially led to an "ah-ha!" moment - a smaller frame and beehive.

Many challenging questions had to be answered, such as;

- Would a smaller cluster be able to survive winter?
- Can small colonies produce harvestable honey?
- What would the swarm risks be?
- What are the issues with mites and small colonies?
- Is there a correlation between aggression and the size of a colony?
- How would you extract honey, etc...



Magnification showing the stainless steel locking clip in use on a Mini Urban Beehive. This clip swivels on and off, and secures multiple boxes together.



The Mini Urban Beehive (MUB)

Useful on many levels

- Beginning beekeepers
- Gardening and pollination
- Teaching children
- Seniors
- Disabled people
- Veterans
- Starting a colony
- Raising queen
- Education
- Pollinator gardens
- Classrooms
- Farmers markets
- Observation hive
- Local honey
- Removals
- Banking Queens
- Decoration
- Baiting or swarm control
- Comb honey and more

The MUB provides options for beekeepers at any level of experience. A way to learn about honey bees and beekeeping is through hands-on experience. Mini hive beekeeping is an excellent choice for older people, those with disabilities, and children; due to weight and limited numbers of bees. Children equate a smaller hive "for kids". Children are less intimidated by a small hive.

A drawn out frame can hold 200 bees, compared to an unformed frame holding about 1000 feroosting bees. A single mini box holds 5-6 frames. The mini as a mating Nuc gives times for the beekeeper to become acquainted with bees and beekeeping. A MUB can be placed on a small property or even an apartment deck.

Aggression / Temperament

Understanding the life stages of a bee is vital in knowing which bees are nice and which are not, and when temperament can vary. For example, nurse bees are not prone to defense.

Janella Hamilton with CTV News in Saskatoon Canada holding an Eco Bee Box Bee Luminary occupied with bees.



- Understanding the life stages of a bee is vital in knowing which bees are nice and which are not, and when temperament can vary. For example, nurse bees are not prone to defense.
- A nurse bee cares for eggs and feeds larvae, as well as attending to the needs of the queen.
- Attendants groom and feed their queen. As a bee matures, it helps unpack returning foraging bees.
- Next a bee dehydrates nectar. Pollen gets processed and packed into cells and propolis gets distributed.
- Moisture brought by foraging bees is circulated by the fanning wings of younger bees. Water collected by foraging, dehydrating nectar, and body heat, produce humidity for a colony.
- Feroosting uses up reserve bees for building wax comb.
- Wax is produced by the wax gland of house bees. This gland atrophies at the time the bee leaves the hive.
- Defense bees are a later stage in a bee's life cycle.
- The last life stage for a bee is foraging.

Focusing on areas of development prior to the evolution of a guard bee is helpful in limiting aggression. If nectar based feed is supplied to the bees, as well as pollen/protein, bees can focus on building the inner hive instead of field excursions, and defense. Defense bees are bees that also have no other work to do, so by providing needed jobs inside the hive the defense aspect of the hive is hindered. Bees still can protect against intrusions, but are less agitated regarding exterior hive conditions.

When the hive is full of honey stores defense increases. Honey stores is essential for winter, but spring and summer appetites focus on nectar based food. Nectar stimulates growth in a hive, whereas honey consumption correlates to a famine or winter. During the season, wax building is best during nectar flows, so stimulating the hive with nectar based feed will cause growth. Growth + Wax production + Brood production = Bee population.



Weight - A full sized deep (9 5/8") Langstroth hive full of capped honey can weigh between 80-100 pounds. A single deep frame can weigh 6-8lbs each. A 4 Box Mini Urban Beehive full of capped honey weighs between 30-40lbs, with individual capped frames being 1 1/2lbs each.



A 4 box Mini Urban Beehive with bees in January. The current weight is 30lbs, it began winter in December at 34lbs. Empty this hive is 19lbs.

Pollination - Some gardeners want bees primarily for pollination, rather than a honey harvest. A colony comprising over 40,000 bees requires full management with suits and gloves. The lure of a MUB to a hobbyist gardener is less management and less bees. Inspections are vital to learning what is happening in a hive. Problem is once some new beekeepers gets stung, they begin to avoid the hive altogether. Bee stings equals avoidance. A mini colony has time for the beekeeper to learn, as the population is low and defense bees are minimal.



A tree that was cut down with an active feral colony inside it. This tree was about 14" across. This colony was extracted into a mini frames. Carniolan queen was saved.

Area - Urban areas can be over populated by full sized Langstroth hives; which also creates fierce competition for survival. This competition stimulates aggression, as they defend and test nearby colonies. Placing too many large colonies in an area also crowds out native pollinators. Pollinators in your area include: flies, ants, bats, birds, wasps, hornets, native solitary bees, bumble bees, butterflies, and other honey bee colonies nearby.



Learning with bees can be done at many levels, and ages.

Education - Learning is essential with the art of beekeeping. Having a colony requires learning what, why and when to many issues related to bees. Different beehives offer methods that vary considerably; and each can be successful. Equally so is each method of managing bees can result in failure. Failure can occur the very day a colony is hived, or can fail anytime afterwards. Some problems experienced are due to being a novice. Sadly, most colonies are available for sale in spring. Obtaining replacements during the season is very difficult. Envision the season of beekeeping like a marathon. Some fail near the starting line, whereas some end at various points along the way. Each racer that stops has to wait for the next race for the experience to continue. Similarly, beekeeping is a journey with many that fail before the 1st year is over. With the MUB, the journey can continue if access to brood or nurse bees is available. As long as bees remain alive, learning continues. Another reason new beekeepers stop learning is based on their aversion to being stung. Again, less bees equal less threat of aggression. Things a mini hive teaches:

- Locating the queen
- Identifying all types of brood;
- Frame spacing;
- How to feed;
- How to deal with robbing;
- Learning life cycles;
- How to remove;
- When to inspect;
- How to naturally harvest;
- Methods to creating new colonies;
- How to requeen;
- Importance of drones & mating;
- Regional issues related to sun;
- Wintering & candy board feeders;
- How to move a hive;
- When & how to add boxes;
- Using the mini to rescue other colonies;
- Help other beekeepers;
- Hands on experience with bees.



A yard with an Eco Bee Box mini accent on a pole stand. This pole can be greased preventing invasion of other ground crawlers.

Save the Bees / Pollination Garden - The media is always warning about declining bee populations, which results in "save the bee" efforts. A lack of bees to pollinate a garden, or need of local honey for medicinal reasons, are reasons to start beekeeping. A MUB can provide pollination, local honey, and assists in saving bees. A MUB adds an attractive interesting feature to a yard. Uncommon to the rest of the beekeeping world, is a hive that can sit on a pole or be hung on a tree. The pole can be coated with "tanglefoot" (tanglefoot.com), preventing invasion from ground predators. The modern vintage hives also adds a unique ambiance to a yard.

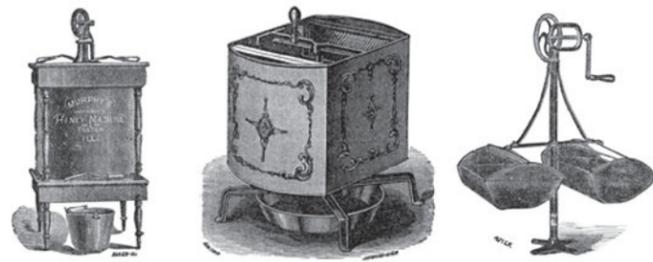


Honey can be cut out of the frame, placed into a baggy, crushed, pop holes and let drain.

Comb Honey - An added cost to selling honey, is the messy time consuming process of extracting. Selling local comb honey on mini hive frames is an alternative. The process is simple, pull a frame of capped honey out of the beehive, then place it in a sealed plastic pouch or comb container and it is ready to sell. Quality control maintained by the bee.



The consumer sees unaltered honey, as it is capped comb. Comb honey provides a high standard honey a consumer can see is unaltered. It is an inexpensive and all-natural process that can be done in the kitchen. Harvesting capped honey in a mini frame equates to clean honey with no bee parts, larvae juice, or bee guts being included in the final process. No unsterilized equipment or threats of imported honey, just local capped honey.



GEARED HONEY EXTRATOR PEABODY'S HONEY EXTRATOR ADAIR'S MEL-EXTRATOR

How to Harvest Honey Without Extraction Equipment

'Extracted honey' is a modern process of removing honey from honeycomb, where the comb is reused repeatedly. Extractible frames and extracting apparatuses began showing up in journals in the late 1800's. Hundreds of hives were developed, each with a novel way to produce comb honey. It was primarily the responsibility of the consumer to separate the wax from the honey. Advancements in extraction and production of liquid honey is a modern art. Deception has crept into the beekeeping industry with illegal importation and blending of honey, mixing with syrups, adding flavors, high pressure filtration, maxing the water content, and so on. No longer can a consumer look at a bottle labeled honey and know it is indeed 100% honey. Comb honey quality control is maintained by the bees. Honeycomb can be manipulated to a degree but once it is capped it has the bees seal of approval.

Each area has micro foraging periods with a variety of blooming plants, the standard system of processing honey blends the seasons harvest, resulting in a hodge-podge of flavors. Comb frames can be dated when inserted and dated when removed, indicating a specific time-frame that honey was produced. Some experienced beekeepers will say that it takes a lot of work to produce wax on empty foundation. Understanding the process of how beeswax (bee fat) is made is important. Bee fat is produced during a nectar flow, which can be induced or natural. In areas where nectar flow is continuous, wax production too is continuous. Areas where summer dearth are experienced, sugar water feeding can be utilized until the wax is formed. For multiple colonies, one colony can be used to produce wax, where others are used to fill the comb. Seasonal honey may come in a variety of flavors and can be quite profitable to sell. An Eco Bee Box 26 Frame Comb box can be used instead of the traditional deep boxes. These frames can be harvested regularly during the season and either cut out and replaced, or sold as is. A medium comb frame can sell between \$15 and \$40 each, with the most popular price being \$20. \$500 can be made per medium super without any processing.

The challenge is turning beekeepers away from the commercially extracted method, to having consumers extract their own comb. A method to remove honey from a mini frame: cut it out; place into a baggy; completely squish; pop toothpick sized holes in the baggy; suspend and let drain into a jar. The separated honey is all natural with no additives and is made at minimal cost. Marketing the honey should include the date and the place it was made. For example: "Produced between May 19th 2017 & June 30th 2017 Alpine, Utah".



Honey can be cut out of the frame, placed into a baggy, crushed, pop holes and let drain.

Profits in honey can be quickly consumed in extraction equipment and processing. Backyard beekeepers with a hand full of hives, can easily capture greater profits in comb honey sales instead of liquid bottled honey. Some consumers do not trust bottled honey and prefer comb honey. Other parts of the world commonly sell comb honey, so immigrants look for what they are used to.



Backyard honey prices are increasing. Natural comb honey is in high demand.



Will the MUB Help Me Be a Better Beekeeper?

Beginning beekeepers need readily available beekeeping hands-on information and skills to raise new colonies. What is essential in this learning bag?

Learning terminology of a beekeeper glossary found at the end of this publication

Which beehive is right for me?

This question does not have a simple answer. Each person and area will have a variety of answers. Some display a simplistic flow chart with limited questions, ending in "this hive is right for you". A specifications sheet for each method / hive would be ideal for those investigating beekeeping. Another list is essential, detailing limitations and expectations of the potential beekeeper. Bees will adapt to the hive they are provided.



Photo taken by Phillip Chandler, his apiary in the UK. From left to right, Phil Chandler's Quadratic hive, a Warre hive, Mini Urban Beehive with English top and in copper, last is a Deep Langstroth hive.

Suggested beginning tools, Hive tool, smoker, bee brush

Understanding how to properly assemble and repair and maintain equipment.

Building Equipment

Use Tightbond III or compatible glue, on joints. Use of screws instead of nails. Use wood sealants for water-proofing as opposed to paint. If broken rabbets occur, use replacement rabbets by Eco Bee Box.

How to effectively "hive" a package or install a Nuc

Many YouTube.com videos exist on this topic. Key is getting the bees into the hive without losing or killing them.

How to care for a colony

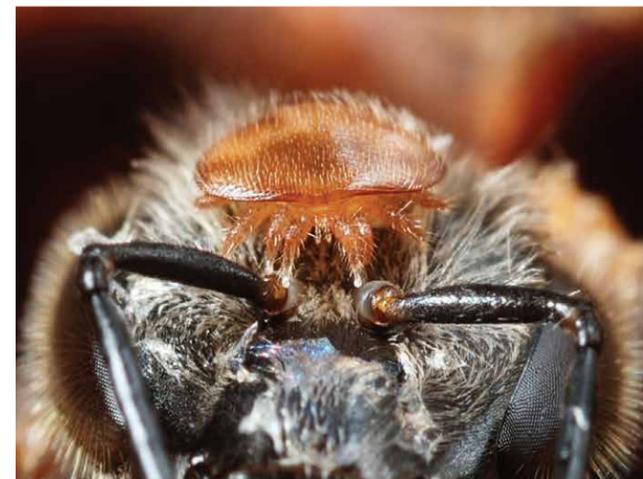
This publication spends a great deal of effort discussing care.

How to inspect a frame for successful traits, or failing signs

Absentee beekeepers rarely look in their hive. Successful beekeeping demands understanding and reading a frame.

Several "do not do" basics

If colder than 40 degrees minimal opening of the hive. Always have hive filled with frames and inspect them regularly to ensure proper development. Inspect between 11am and 5pm as the foraging bees are away. When inspecting, remove an outside frame first, then work towards the other end. If the colony is being attacked by anything, help them. Don't use other beekeepers tools in your hive. Keep observation windows closed or away from direct sunlight. Do not smoke excessively, as bees have an acute sense of smell, if you couldn't breathe in it – probably they can't either. Don't place your hive in direct contact with



A Varroa Mite between the eyes of a honey bee.

Understanding VARROA MITES and Management

Apis.org is an excellent source of information on the varroa mites, with natural and chemical treatments described. Honey Bee Health Coalition also provide information on varroa control that is very helpful. <http://honeybeehealthcoalition.org/varroa/>. Many novice beekeepers become frustrated in their first year because of queen failure, or not knowing what is happening, and why? Many beekeepers fail due to unmanaged infestations. Learning how to manage one colony initially is easier and cheaper than two!



4 box mini is ideal for a beginning beekeeper; for the following reasons:

- Cheaper than one or two large Langstroth hives
- Only one is needed to start with
- The number of bees needed is a fraction of other beginning options
- If starting with a couple frames of eggs and larvae and nurse bees, the colony is docile at first
- A docile colony permits time for the new beekeeper to learn how to inspect with the agitation level at a minimum
- They learn to identify a queen, eggs, royal jelly, larvae, nectar, pollen, bee bread, small cells, large cells, workers, drones, a brood chamber, festooning, clustering, and stages of development
- The association between feeding (nectar based supplemented feed and protein) and hive growth
- Some will see the development of the queen from an egg on
- Will test your area to see how conducive it is for a colony of honey bees.
- Allows others to become familiar with bees in a less threatening way
- Easy to move, lift, and manipulate as it begins with a box less than 5lbs, and increases to four boxes with a filled weight of 40lbs
- Allows practice of performing a split, by adding a McGinty Board (separation board), or separating a few frames in an unused expansion box

The main way beekeepers are taught with the mini system is starting with at least 2 frames of eggs, larvae, and nurse bees. The bees on these frames in 3-5 days will create queen cells. The beekeeper watches patiently and inspects daily. After the cell is capped closed, the pupae incubates for about 8 days. After the incubation, the queen(s) emerge. Mating flights occur next, followed by new eggs appearing. Learning the process of creating a queen is valuable to all beekeepers.

Comb Container for the Mini Frame

When selling your honey, presentation catches consumer's eyes. Packaging is the presentation. Comb honey can be damaged easily. Using a container that limits consumers from squeezing the soft comb is needed. Once packaged, place the package in a freezer to prevent leaking and crystallization, and stops wax moth.



Tips to care for your comb honey

- Store it in a freezer to prevent damage, and crystallizing
- Keep out of sunlight and heat
- Place a sign saying "do not touch"
- Cutting comb honey is less messy while frozen
- Label where it came from with dates when collected
- Label the flavor or forage type

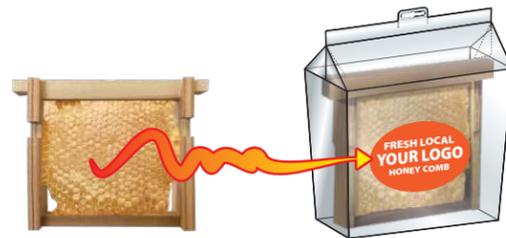
Profits are directly associated with time spent in processing. A container was developed for housing the entire mini frame. This container is food grade PET (polyethyleneterephthalate or polyester). The top is folded similar to a carton and is stapled closed. The package should have your unique labeling and is ready for market. Frames can vary from 1lb to 2lbs. Each state has cottage industry rules to follow when packaging and labeling your produce. Utah's guidelines can be found on-line at: <http://ag.utah.gov/documents/Honey&CottageFoodRule.pdf>

The clear comb packaging container allows full viewing on all sides.

The versatility of this container allows for:

- Temporary transportation of bees
- Viewing and hatching of a queen
- Shared inspection of a diseased frame
- Classroom presentations

This clear container can also hold pollen, seeds, and other small items for sale where inspection aids in sales. Remember, if you are using this container to hold bees, adding thumb tack holes for air is important. Also be sure to keep live confined bees out of direct sunlight.



From the hive to a container, to the market with no processing. This container can hold a mini frame with live bees for classroom presentations.



How to Set-up a beehive in your Eco friendly Yard

Finding an ideal location for your hive is based on what is available mixed with regional issues, and what bees need. Historically bees lived in forests, where protected forage undergrowth and shade were common. An ideal summer location is morning sun (to help warm the bees), mid-day shade (to help cool the hive), evening sun (to prolong foraging activity). Areas with high moisture need more direct sun and ventilation (to dry and keep warm). Areas with excessive heat need less direct sun and perhaps hive ventilation. Bees can effectively cool a hive only when there is close access to water. Daytime lawn sprinklers kill foraging bees.

Visibility of a hive can generate risks of theft and vandalism. Open access to a hive poses risks from rodents and animals intent on raiding this nutrient rich diverse reserve. A mini hive can be mounted on a pole, or hung from a stable branch. A hive off the ground is a great way to avoid ants, rodents and raccoons.

Beehives need to stay dry and out of the wind during the confining winter months. Nearby shrubbery can provide a wind block. Outside temperature during winter should be limited to 10 degrees below freezing.

A mini hive can be easily moved in winter to a dark cold storage room, or given a beehive blanket. Ideally the bees will be lathargic but will maintain a warm cluster. Moisture in the winter is deadly. Adding a moisture blanket absorbs excess moisture inside the hive. A main cause of excessive moisture in winter is through consumption of liquid honey and unprocessed nectar. Beekeepers that feed late in the season risk moisture issues in winter. Ideally, honey that has crystallized produces insignificant moisture. Adding a candy-board offers low moisture crystallized sugar and controls moisture levels. Dry hardened sugar absorbs moisture. Recipe for winter candy: 12 cups sugar, 3/4 cup water, teaspoon of Complete by Complete Bee. Mix and pack in drawn frames or in a vertical candy board.

The mini hive with a galvanized telescoping top cover and water resistant Beehive Blanket.

Method #1 - Existing drawn frames of eggs, larvae, and nurse bees (no queen)

In the MUB system, typically two frames are the minimum amount required for a successful start. As the season progresses, more than two frames are better. One box with a top and bottom board is the initial set up. Place the frames containing the eggs, larvae with nurse bees tightly to the rear of the box. Four remaining frames require wax (thin surplus) inserted. Inserting wax is done by tearing small finger sized pieces, and inserting them in the groove. Slightly dipping the wax edge in melted beeswax, or melting the edge with a candle flame works well. When using formed comb, cut 2 inch sections and suspend with an elastic band through the frame notches. Bees will remove the elastic when the comb is secured.



A mini frame with a beeswax starter strip in place.



A drawn frame with new queen cells.

Note: Candles are made with petroleum and must not be ingested. Beeswax is produced by honeybees and can be consumed. Do not use petroleum wax for starting comb frames.

During the initial 3-5 days, nurse bees identify young larva suitable for a future queen.



Looking into a queen cell with larva visible on white royal jelly. This cell is a day away from being capped and incubating.



A queen surrounded with her attendants. The queen is longer than the other bees.

The initial development of a bee is as follows

- Queen lays either a drone (unfertilized) egg in a large cell, or a worker bee (fertilized) egg in a small cell.
- Remain as an egg for 3 days
- Once eggs hatch larvae is fed royal jelly for 2-3 days, worker bees are fed bee bread
- Queen larvae is continuously fed royal jelly until capped

Understanding the growth cycle of a queen allows you to estimate when stages occur. During inspections, "finding your queen" is not usually required. Looking for single eggs in a cell shows the queen was there within 3 days.

If all goes well your new queen will have emerged in 16 days (egg to emerging). It takes a few more days for her exoskeleton to harden enough to allow her leave the hive to mate. Virgin queens leave the hive to mate on day 22-25 from when it was an egg. The virgin queen will mate over a series of days and should be laying eggs by day 28.

Feed bees during the queen development stage is best, as there are few foraging bees in this two mini frame nuc. Mix 2:1 cane sugar solution (fill your jar 1/2 full with canesugar, then top it up with water. Add about a teaspoon of Complete by Complete Bee. Blend until dissolved. Place in a front entrance feeder, or in a sealed baggy above the frames (poke a few holes with a toothpick in the top middle of the baggy). Adding a 2 inch portion of Power Patties gives the colony protein which aids in royal jelly secretion and stored bee bread.



Note: Brown sugar has molasses which bees have difficulty digesting. Refrain from feeding with sugars that have color.

Method #2 - Starting a new colony with temporary queen and nurse bees

Finding the queen is a challenge for any beekeeper. This method requires a queen and existing colony, and empty single MUB.

When choosing a colony to rear a queen from, identify traits you want to replicate:

- over-wintered or is winter hardy
- ideal temperament
- large brood pattern
- hygienic behaviors and mite resistance
- regional issues the colony has overcome
- limits consuming stores
- low swarming tendencies and coloring or race

Locate the ideal queen and place or chase her onto the MUB mini frame. Once she is on the frame, brush or shake the frame of bees she was with into the mini. Add a feeder and a 2 inch portion of protein patties. Finally, leave alone for 4 days. The colony this queen came from will know she is missing in an hour. Within 3-5 days, the original colony will produce emergency queen cells. In the meantime the queen is actively laying eggs in the new MUB. After 4 days return the borrowed queen to the original hive. The queenless colony will immediately accept her. If the queen cells are on natural comb, they can be cut and placed into the MUB, otherwise puncture them so they will be recycled. In the MUB, the young bees sense a lack of queen pheromones and go to work generating queen cells.

Another option is to leave the queen in the MUB and let the larger colony requeen. This process in the large colony aids in varroa control, as it breaks the brood cycle.

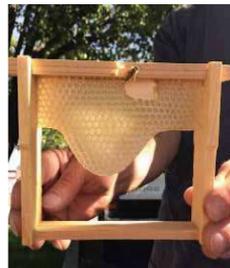
Case notes: In March 2015 an over-wintered colony was inspected for making a spring split. Temperament and resources were adequate. On Thursday March 12, 2015, a Carniolan queen, with one frame of nurse bees was taken from a long-box and transferred into a MUB. A frame with honey, bee bread, with drawn comb was added. This queen remained in the MUB for 4 days, then was returned to the original colony. The MUB had young day old larvae in pools of royal jelly. On Friday March 27 this MUB was taken to Cheyenne, WY from Salt Lake City. The first day the class inspected the MUB and had photos taken. The next day the MUB was taken from the hotel room back to the conference. Following the class the hive was inspected, which showed 9 uncapped queen cells. The MUB was returned to Salt Lake where the queens were separated and placed into separate MUB hives to finish incubation and to mate.



A beautiful dark queen with black thorax and long abdomen.



Starting a frame with elastics and a portion of drawn wax. The notches in the side bars allow for the suspension of the comb.



A drawn frame with new queen cells.



A single frame can produce many queen cells. First queen out will kill the rest.

Method #3 - Purchasing a colony with introduced mated queen

A standard practice for starting and distributing bee colonies is a package of bees. Bees are removed from their colony, shook into a screened package, weighed, given a can of liquid feed, and a caged foreign queen that is suspended inside the crate. This package remains caged for 3-4 days, until the worker bees acclimate to the new queen's pheromones, then it is hived.

A 2lb or 3lb package of honey bees can be added to a MUB (or 26 frame standard medium comb box). It is hived, fed for 2-3 weeks, then is split. Splitting can be adding a McGinty (vertical separation board), or separating each box with a new lid and bottom board. The box with the original queen will need a second box, the colony then go through a process of producing an emergency queen cell.

McGinty separation boards are bottom boards without the raised cleat underneath. These separation boards hold a feeder and allow bees to come and go. They can be used where they alternate from front to back, which would prevent less drift of bees migrating to other entrances. Locking clips secure the MUB together, including the McGinty separation board to the hive.

Method #4 - Using empty frames with existing colony

This application can be done with a Langstroth, Top-bar, or Warré hive. Two mini frames (with starter wax strips or drawn comb with elastic bands) can be wired or zip-tied into a frame. Then this frame is placed inside a hive near the colony's brood. Inspect periodically for appropriate aged larvae (newly hatched larvae in pools of royal jelly). Once drawn out and filled with young larvae, remove the mini and place into the MUB with the attending nurse bees. You can add more bees from the hive when doing this separation. If you take the queen, the old colony will re-queen. In 3-5 days new queen cells will appear in the hive that does not have the queen.

Method #5 - Swarm capture

Capturing a swarm or baiting, is an exhilarating way to start a hive. Swarms can vary from a softball size, to the size of a torso. A softball sized swarm is about a pound of bees. Small swarms may have a virgin queen, or a mated queen. Three ways to start a MUB with a swarm:



Shaking a package into a hive, or hiving a package.



A beehive with a vertical separation board, called a McGinty board that also acts as an landing board entrance.



A 26 Frame Comb Box with a swarm of bees. This medium box will be 100% drawn and laid in a week.



Adding emergency brood to a queenless top-bar hive.

1) Find a Swarm – A swarm is a colony that has left their hive in search for another. Local areas have swarm lists you can be added to. Giving your name to the nearby fire department, and police dispatch, if they receive a call. Bee clubs all have swarm lists. Posting in the classifieds during the first couple months of spring is effective. After the initial capture, add a feeder with 1:1 sugar syrup and a protein patty. The bees are coming with resources, but these entice them to stay. They also need a nearby source for water 15' or more away. It is hard for bees to locate sources of food and water within 15' of the hive.



A 4 foot swarm caught in Utah, in the shape of the Grim Reaper. Sickie, hoodie to mid thigh.



A hand coated with sugar water, and lots of crawling bees.



Typically a swarm is quite calm. This branch was removed and was carried down the ladder from the roof intact.



A night-time swarm capture with a Mini Urban Beehive.

2) Apiary Maintenance – Responsible beekeeping dictates that each apiary will have some form of external swarm control plan. The probability of a colony swarming is natural and expected; this is what healthy hives do to reproduce a colony. You can use a baited MUB hive placed about 15-20 feet away to help with swarm control. Adding melted dark comb, and/or a drop of lemon grass oil, and/or a mist of Swarm Commander, will increase the attractiveness of the MUB.

3) Intentional Baiting For those areas with beekeepers that don't practice "apiary maintenance" and for feral colonies, intentional baiting can secure a colony. Blindly setting a bait hive may not bring in a colony. Research your area to identify where feral colonies are, or areas with too many colonies. Use a baited hive with melted dark comb, and/or a drop of lemon grass oil, and/or a mist of Swarm Commander. Areas with lots of colonies and a nearby water source is an ideal location.

Note: Never bait a swarm trap with honey. Honey creates a robbing frenzy, or looting. Honey bees abscond when robbing exists.

Method #6 - Cut-outs or retrieving a feral colony

A cut-out can be very challenging, only do it if you have a good knowledge of construction. The key for a successful extraction is obtaining comb with eggs and larvae, and as many bees as you can get. A bee vac is very useful for removals in awkward locations. Begin removing comb from the outer edges first, working your way to the brood chamber. The outer edges and top of the hive are usually honey. Place honey in a bucket and take home to crush and strain for personal use. Take empty comb and brood comb, and place into a mini frame with elastic bands, using the slots on the side bars. Keep comb right side up when transferring to mini frame. Transfer the brood with the bees intact on the comb, or quickly add them once secured. Eggs and larvae can dry out. If transferring without bees, cover with a warm wet cloth, and avoid air flow. If the queen died during the removal, the bees will generate new queens from the young brood collected.

Note: When removing a feral colony with comb, disease inspection is vital.

Method # 7 - Isolation with use of follower-board and honey-wall methods

Follower boards and honey walls are used to separate brood chambers, for the purpose of creating a Nuc. Follower boards are a top-bar accessory, but have been adapted for mini hives and Langstroth horizontal hives. A McGinty board was created for a vertical hive. Honey walls are areas filled with capped honey and is a barrier for the queen. A queen may wander from the brood, but needs attendants to feed her and nurse bees to maintain her brood. A queen will not lay multiple brood chambers in a hive, so once the honey wall is in place she will only lay in the allotted area. Multiple queens can be kept in a long box or top-bar hive, if follower boards or honey walls are used to separate the queens. Using this equipment will allow you to have multiple active queens in one mini hive, or any hive.



A photo taken by Tari Sorensen in South Dakota. This frame is a beautiful rainbow with a capped honey wall on the top, brood in the middle separated with bee bread close-by in orange.



Capturing / hiving a swarm into a 26 Frame Comb Box.



Placing a frame with eggs and young larvae into a queenless broodless top-bar hive.



Setting 4 Mini Boxes, or a 26 Frame Comb Box on an Existing Hive

A MUB is a 1/4 size of a standard Langstroth hive. Four MUB boxes with prepared frames can be placed on a traditional hive, above or below the brood chamber. As an expansion to the brood, these boxes will be drawn and filled with brood. Once each of the boxes are filled, remove them leaving the queen in the original hive. The four mini boxes can then be individual nucs, or one stack. This same process can be achieved using the 26 Frame Comb Box as an expansion to the brood chamber. Once filled, individual frames can be removed for use in other hives or the entire box.

Method # 9 – Using MUB for Banking Queens

Banking queens is where queens are caged and kept until future use. The MUB can store 4 queens easily in a mini frame by using an elastic band. Nurse bees are required in a queen bank. A brood frame, or portion of comb with brood should be added. If a queen escapes her cage, the risk of all the caged queens being killed is high. Banking is not a long-term storage.

Case notes: Debby Yaber Anderson wrote: "I went to a presentation at our local farm store in 2014. I have never owned bees. I have never even really been around honey bees. And, while I somewhat have a ridiculous reaction to yellow jacket [sic] beestings, I really wanted honey!! I went to a presentation for the Langstroth type of hive. I was also interested because Oregon had been having troubles with declining bee populations and my own small garden plot seemed to suffer. After the presentation, I started reading up on bees and I had also been browsing on websites and joined Oregon Beekeepers Facebook page. I think that is where I saw this beautiful mini hive box advertised.

In March, I called Al and ordered my beautiful mini 4 box hive and bees. I anxiously waited. I worried if they were ever going to come! I read and explored. I joined Eco Bee Box Facebook page.

Between March and July 3, when I received my bees. I had ordered my bee jacket. I prepared a toolbox with rubber-bands, baby powder, nitrile gloves, screwdriver, hive tool and brush (both of which I won at the bee presentation) all at the ready! I purchased a smoker and had a spray bottle to fill with sugar water. I had also ordered a Boardman feeder. And, of course my Complete! I was ready for my babies! I had also ordered a box holder that we bolted into a short steel post and mounted in a cement block. I got most of my stuff ready by following the hints given on the Eco Bee Box Facebook page! This page has been quite helpful to me! July 3rd I received my girls. It was interesting bringing them home. While they were closed up and buzzing in the box, my husband was about to crawl out of his skin as we drove the 5 miles back to our home to put them in a dark cool place until I could set them in their new home. I started with 3 frames. And, as predicted I had my queen in approximately 21 days. She was rather elusive, but I knew she was there because I saw eggs and larvae! I have only seen her a couple of times...And, my bees were multiplying like crazy!

As far as support from other beekeepers, I haven't found anyone who would share their information; it's like a private club or something. If anything, I have shared MY own experience with people who ask. And, I have shared the mini experience. I think this is the perfect way to get started and to succeed! It is a manageable size. When I started, a few people told me that I would fail, as I did not start with a queen. One person, in particular, who has kept bees for 20 years, said raising your own queen was the most ridiculous thing ever and said that I bought into a stupid scheme. Well, I feel pretty excited about my bee-growth and I have been sharing my pictures. She hasn't said a word!

I have been somewhat nervous the whole time, mainly the fear of failing. I was afraid the barn swallows captured my queen on her mating journey, but I had eggs and larvae and brood. Then, there was the fear the yellow jackets would overtake them, which actually prevented me from opening my hive, I have not been opening it very much for fear of robbing! Now I am nervous for the winter. I am trying to give my bees a good start; they are currently on 2:1 sugar to water. They drink about a quart every other day now. They are closing up spaces with Propolis. I have harvested only a small amount of honey, and I was excited for what I had, but, I think I will be able to say I was successful when they are alive in the spring! I am excited for the next season and am contemplating the addition of another set of boxes!

What to Look For During a Hive Inspection

Determining health and strength of your colony, comes primarily from visual inspections, and learning hive sounds and smells.

A partial list of items to identify:

- Eggs (tiny, white and look like small grains of rice)
- Progression of larvae and royal jelly pools
- Identify worker cells vs. drone cells
- Partially capped cells verses perforated cells
- Healthy brood patterns
- Cells size (smaller size for worker bees, larger size for drones)
- Color progression of aging drawn comb
- Propolis polished cells
- Bridge comb (connects areas for bee transport)
- Burr comb (areas with too much free space)
- Uncapped queen cell with bed of royal jelly and larva
- Queen cell (emergency on face, swarm cell on bottom)
- Worker bees, drones and the queen
- Bee bread, nectar, capped honey
- Propolis varies in color with many uses
- Sample uncapped and capped honey
- Look for bees with no wings, sign of Varroa issues
- Pollen on legs of returning bees, and bee bread in cells
- Investigate for varroa mites on bottom board, in capped cells, and on bees

Sounds of the colony are clues to what is going on. Agitated bees have a loud buzz, calm bees have a low hum. The duration of the agitated buzz is also telling as well as the time it takes for the bees to calm back down. A toot, bugle, or chirp sound is made by a virgin queen in preparation for queen battles.

A healthy bee hive has a pleasant scent blended of wax, pollen, honey, and bee sweat. A sick colony with decaying larvae has a distinct stench of rotting larvae. This stench can be identified prior to opening a hive, and is associated with foulbrood. Foulbrood can be a result of stress (European Foulbrood), or bacteria (American Foulbrood). Treatments depend of the type of foulbrood. If you suspect a foulbrood disease, call your local bee inspector for a hive inspection. More on this will be discussed later in this publication.



An inspection by a new beekeeper Chauvoni Cooke.



Observation hives are an asset in the class room. Children learn about the bees and are fascinated by the bees





Configurations of the Mini Urban Beehive

Many configurations exist on how to use the versatile mini system.

A single box setup is ideal for tiny swarms, queen rearing, mating, bumble bees, initial walk-away splits, queen sabbaticals, banking, bearding, fall splits, 1lb package, and so forth. This will hold about 1000 – 2000 bees on new open frames.

A double box setup is ideal for growing a nuc, baiting, small swarms, larger walk-away splits, dividing a swarm with a new queen, 1lb package, and so forth. This will hold about 2000 – 3000 bees.

A triple box setup is for mid-size swarms, expanding colony, may have surplus honey, will hold a 2lb package. This will hold about 3000 – 4000 bees.

A quad box, or four box set-up, is for a swarm the size of a basketball. Can store a 3lb package, but will need management within two-four weeks. More than a four-box vertical set-up is not recommended, as it is harder to manage.

You can create four walk-away splits by placing four mini hives on a traditional 10 frame Langstroth bee hive (the footprint is identical). Place this set-up between two brood boxes with drawn comb in the frames and after the queen has laid eggs in the cells, you can remove the mini boxes for your splits.

A four-box mini beehive holds 20 – 24 frames.

Eco Bee Box has created a modified standard medium comb box that holds 26 – 28 mini frames. Use this box as a brood box to create more colonies quickly. Each set of 2 or more frames, can be separated to start a Nuc.

Utilizing the vertical McGinty follower board. This modification allows for two applications: 1) isolating a section of the hive from itself, forcing the colony to re-queen itself; 2) with a screened McGinty board multiple colonies together for winter so they can share heat. Multiple separations can be used at one time in a single MUB.

Use of the McGinty follower board is also a way to take a defensive colony and “tame it” so-to-speak. By separating the hive with follower boards, the colony goes into a survival mode and is forced to utilize its troops to a common goal of raising a queen. Once queen cells, or a mated queen appear, remove them and join the equipment back together. Resources are also depleted, giving room for stores to be placed.



Expert Guide to Starting A Mini Bee Hive

Basic configurations for a MUB

The recommended first year set-up of a 4 Box Mini Urban Beehive is broken down as follows:

4 Box Mini Urban Beehive \$185.00
(Includes top, bottom with landing board, 4 boxes, 20 frames, top entrance reducer, 10 stainless steel locking clips, 16 medium brackets, instructions for set up, 1 sheet of food grade beeswax for priming the frames, and comes fully assembled.)

Other initial suggested items include:

Entrance Feeder \$10.00
4oz bottle of Complete or
Optima by Complete Bee \$14.00
1lb package of Power Pattie by Complete Bee \$4.50
2 frames of nurse bees, eggs, and larvae(need minimum of 2) . . . \$40.00
MUB Publication (this publication). \$25.00
Becks Bees Wax (for water-proofing exterior) \$6.00
Beekeeping Veil (just for face protection) \$25.00

Additional Items to Consider for the MUB

Winter Blanket \$35.00
Post Stand Bracket \$40.00
Branch Hanger \$25.00
Bee Brush \$8.00
Hive Tool \$15.00
English Garden Top Cover \$50
McGinty Board (vertical separation board) \$15.00
Gloves (vinyl arm length) \$10.00
Swarm Commander (for baiting a colony & initial retention) . . . \$35.00

Other Options for Starting the MUB

1 Box Mini Urban Beehive (instead of the 4 box kit) \$80.00
2 Box Mini Urban Beehive (instead of the 4 box kit) \$120.00
3 Box Mini Urban Beehive (instead of the 4 box kit) \$180.00
1 Box Mini Modern Vintage Urban Beehive \$195.00
2 Box Mini Modern Vintage Urban Beehive \$295.00

Be a Good Neighbor and Understand your Bees

An urban neighborhood comprises many people, a majority with fears of insects that “buzz”. A beehive can pose a large threat almost equal to a nuclear power plant. Keeping honey bees is a constant learning experience, and sometimes your “learning” will spill over the fence to include your neighbors.

Was asked to requeen an aggressive colony in a nice urban neighborhood. This colony did not know an inspection was in the works, nor was it disturbed prior. As the gate was opened to the rear of the yard, defense bees out in force defending their area. The colony filled 4 deeps and was loaded with queen cells and excessive brood. Thinking they were angry due to being cramped, they were split into 4 colonies. The inspection a week later showed each colony had queen cells, but still very angry. Too angry for a residential area. It was decided to move them to a safer place, and have them tested for Africanized DNA. After the move, there were so many bees agitated, it was hard to see either hand feet in front of the protective veil. DNA results showed a very low percentage Africanized DNA. The queen cells in each

colony were then destroyed and new mated queens introduced, one of which was later entombed in her cage. Due to the drones from these angry colonies, no natural queen rearing was done that season in this apiary.

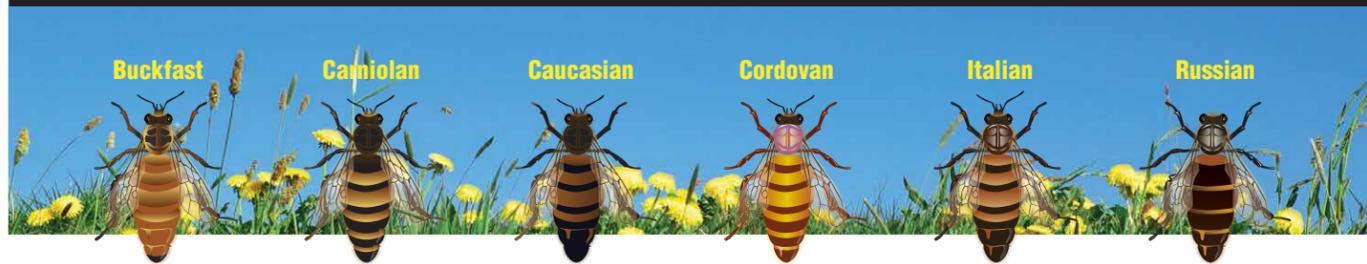
Another situation occurred when a new beekeeper hived a 3lb package on their apartment deck. This deck was 8' off the ground, and next to the main walkway into the complex. The colony was hived, then the tenant went biking all day. Many in the apartment complex were concerned by the excessive amount of bees flying, so they called the police. The police determined it was a health risk, so they were removed. A month later the tenant noticed his bees were gone! He contacted the authorities, and learned they were confiscated. Instead of the full-sized colony, a MUB was given to replace the large hive. This new beekeeper reared a new queen. This colony existed for 2 seasons, then were given away.

Using a sugar water solution in a mist bottle, instead of smoking bees, is a good practice for simple inspections. This promotes grooming, which aids in reducing varroa

mite counts. Inspecting bees, or harvesting – will agitate your colony, posing a threat to neighbors. Some inspections can be performed at dusk, which limits the patrolling bees to the remaining daylight. Full inspections can be done between 11am-5pm as foraging bees and guard bees are limited. Full sized colonies require protective clothing, so consider the risks on your neighbors. Educating your neighbors about honey bees is a good idea. The MUB is less intimidating to neighbors, and stimulate curiosity. Take every opportunity to inform people and help mitigate fears.

Different types of honey bees have diverse traits, from aggressive to calm. The temperament of each colony can also vary. It's important to understand what sets off your colony, and how your bees react to changes in the weather, hive inspections, and even people walking near the hive. Your previously calm, gentle honey bees can turn ferocious during a nectar dearth, for example. An important aspect of keeping bees is understanding their needs.

Types of Honey Bees: Africanized bees are a combination and appearance of any of these bees.



Africanized – an excellent honey producer; aggressive nature, defends against invasive threats like Varroa mites; lives in hot and tropical climates effectively; very defensive; swarms excessively and overtakes existing colonies; not a good bee for urban beekeeping or with nearby livestock; has difficulty in cooler climates.

Buckfast – good honey producer; good for northern climates; resists Tracheal Mites and Chalkbrood; gentle bee ideal for urban settings; low swarm risks; queens create large colonies; slows brood production in fall and during drought; fills brood nest with honey for winter; slow spring build up.

Carniolan – good honey producer; tolerates cold and moist days better than other bees so it can forage earlier in the day; builds up fast in spring; stops brood production during times of drought and fall so sometimes looks queenless; uses less stores during drought and winter due to ability to lower population; not as much propolis, burr and brace comb as other bees so inspections are less of a mess; highly successful breeding with other types of bees for generating hybrids; swarms faster than Italian bees due to needing more space.

Caucasian – good honey producer; can forage earlier during the day; low swarm tendency; good queen layer; slows brood production during drought and in fall so sometimes looks queenless or not queen right; good propolis producer; good comb builder.

Cordovan – a beautiful golden bee; excellent fat producing young bees; mild bees; like Italians these consume lots of resources in fall and winter; once season starts they don't slow until fall.

Feral – may be acclimated to area; usually from colonies that have absconded or swarmed from packages; swarm lists enable beekeepers to capture them for minimal expense; if queen is unmarked it is unknown how long she may have lived; may have disease or mites; temperament unknown; natural selection on breeding; variety from colony to colony exists due to how long feral, what stock it came from originally; can be prolific at swarming; may have come from a boxed hive, feral hive, may be old, may be recent; should be well inspected in a holding yard prior to bringing into an apiary. Italian – a very popular bee due to their mild temperament; fast build up; fast comb builder; does not produce much propolis; great honey producer; does not slow down brood production during drought; goes into winter with large colony; consumes lots of resources during drought and winter; poor flight orientation causing bee drift between other colonies.

Russian – resistant to Varroa Mites and Tracheal Mites; similar qualities to the Carniolan bee; good honey producer; tolerates cold and moist days better than other bees so it can forage earlier in the day; builds up fast in spring; stops brood production during times of drought and fall so sometimes looks queenless; uses less stores during drought and winter due to ability to lower population; not as much propolis, burr and brace comb as other bees so inspections are less of a mess; highly successful breeding with other types of bees for generating hybrids; swarms faster than Italian bees due to needing more space.

Each breed has pros and cons to it, so it's helpful to talk with other local beekeepers to see what bees work for your area. Generally, most people begin with Italian bees due to their docile behavior.



Speaking of Forage... What Grows in Your Area?

Each area of the country has different plant species which create seasonal varietal honey blends (think of Basswood or Orange Blossom Honey, for example). The flavor and color of honey vary widely depending on the nectar source. Honey flavors can be mild and “fruity” to intensely bold or pungent, while color can range from water white to almost black.

Learning what forage is available in your area and knowing when those plants or trees bloom is essential to a beekeeper. Forage can include fruit bearing plants and trees, to non-fruiting ornamental trees, shrubs, and plants.

In many regions, there may be heat tolerant forage available. Farms may give access to crops like alfalfa or buckwheat. Not all flowers and plants benefit a honey bee. A vital step in beekeeping is knowing the plants in your area that produce nectar or pollen. Farms may be a “food desert” for honey bees because the crops are non-nectar and

non-pollen producing plants, or have a low nutritional value. Autumn will produce many late blooming hardy plants and over-ripe fruits. Many beekeepers just “wing it” and open the mystery box in fall to see what kind of honey they get. Fall extractions are a practice of blending the season's honey to create a single honey type. For most beekeepers, this is a common practice. Commercial beekeeping can produce single honey types, due to the isolated areas hives are placed.

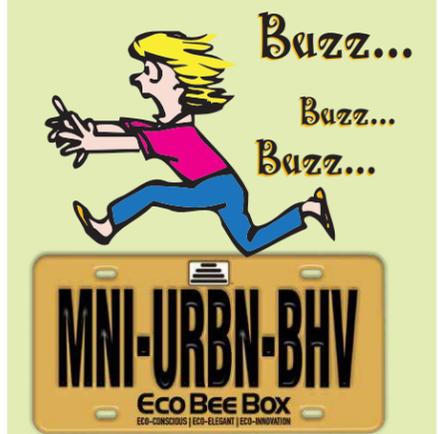
Using the MUB allows the beekeeper to have micro harvests during the season. If your area is dominated by Linden trees, you could pull frames of honey from just that blossom, and then later in the summer harvest honey that came from a later blooming crop. Most flowers only bloom for 2-4 weeks so if one variety is poor on your list, other varieties will continue as the season progresses. Micro seasonal harvesting generates higher returns for honey as well as capped honey. Due to the small size of the mini frame, this unique way of harvesting is ideal for backyard beekeepers.

Licensing

Many areas require a license to keep bees, which may include a fee or certification, or both. Requirements may be imposed restricting the number of colonies based on area of land, or allowable limits the community imposes with bylaws and ordinances. A city may not have regulations, which then may be imposed by the county or state. Beekeepers usually find out about regulations when an inspector comes to visit, “oh, I didn't know”.

In law, the onus is on the individual to know the law. Most issues arise with improperly stored equipment excessive numbers of colonies and bees visiting nearby water sources outside of the yard boundaries. The public uses the card, “I am allergic”, which may or may not be true. Most people cannot tell the difference between a buzzing fly, wasp, hornet, solitary bee, or honey bee. If it buzzes, it is a threat. The result is restrictions on beekeepers, with every other buzzing creature being ignored. A yard over-run with car parts, farm equipment, “stuff”, can be an incubation area for diseased colonies and a breeding ground for aggressive territorial wasps and hornets.

For those who decide to maintain numerous full-sized colonies on a residential urban property, neighbors will complain and it will become a bitter situation. This is again a great reason for the MINI URBAN BEEHIVE, as the populations are small, yet provides pollination and honey.



Not All Flowers Are Created Equal

Not all nectars, honey or pollen are equal in nutritional value for the honey bees. When a beekeeper witnesses pollen being carried in on the bee's hind legs, it may seem like the protein needs of the colony are being met. However, some plants have less value to a honey bee than others. Blueberries, for example lack nutrition, but as honey is incredible. Brazilian Pepper has high nutritional value for the bee, but the "pepper and sweet" honey flavor seems a stark contrast.

A beekeeper with many colonies was granted permission to place his colonies in the middle of a huge alfalfa field. The farmer permitted the crop to bloom, which should result in a wonderful tasting and abundant honey harvest. Sadly, almost all of these colonies perished. There was an abundance of blooms, no competing apiaries nearby, so what gives? The answer, alfalfa does not produce pollen. Foraged pollen is processed into bee bread in the hive, and the bees primary source of protein. Without protein, the colony will struggle producing royal jelly, essential for feeding young brood and their queen. The result is - brood fails and the queen is starved. There might be plenty of nectar available to make honey in this scenario, but failure of the colony in this pollen deficient mono-crop was the result.

Each region has a variety of plants all season long, but if there is a lack of pollen or nectar, the colony can and will struggle. Spend time observing what plants are in your area. Plant in preparation for a dearth period, as this can fill the gap in available bee forage.

Annuals live one season but grow fast, perennials grow multiple seasons but are slow growers initially. Not all plants produce nectar and pollen. A series of charts produced by Ever Sweet Apiaries identifies many plants and the amount they produce in pollen and nectar, with associated colors. An essential easy to understand guide for planting. What is lacking is the nutritional value, which can be compensated by planting a variety.

Mark Borovatz from Utah spent countless hours with his colonies and plants, by identifying:

- When a planted flower bloomed
- When his bees visited each plant
- Whether it had nectar or pollen
- The color of pollen produced

The time and resources spent in this labor of love, is remarkable and beneficial to many beekeepers. Ideal plants for bees may vary depending on location, as a plant in one area may not grow in all regions, or be considered invasive by the USDA in other locations. The associated plant list is suggested, and may not be ideal for all areas. This is illustrated on the inside back cover of this publication.

A few suggested sites for great information on planting for your area:
Master Plant List for US by Rusty Burlew - <https://honeybee suite.com/wp-content/uploads/2015/09/Master-Plant-List-by-Scientific-Name- Revised.pdf>

Master Plant List for Canada by Rusty Burlew - <https://honeybeesuite.com/wp-content/uploads/2015/02/Master-Plant-List-by-Scientific-Name-Canada.pdf>

Plant list by State by Rusty Burlew - <https://honeybeesuite.com/wp-content/uploads/2015/09/Plant-list-by-Individual-States-Revised.pdf>

If you know of additional plants, ideal for honey bees in your area, send this information by email to: Albert@ecobeebox.com or postal mail to Eco Bee Box c/o Albert Chubak, 5033 South 300 West, Murray, Utah, 84107. Information on bee forage plants for the provinces of Canada is wanted.

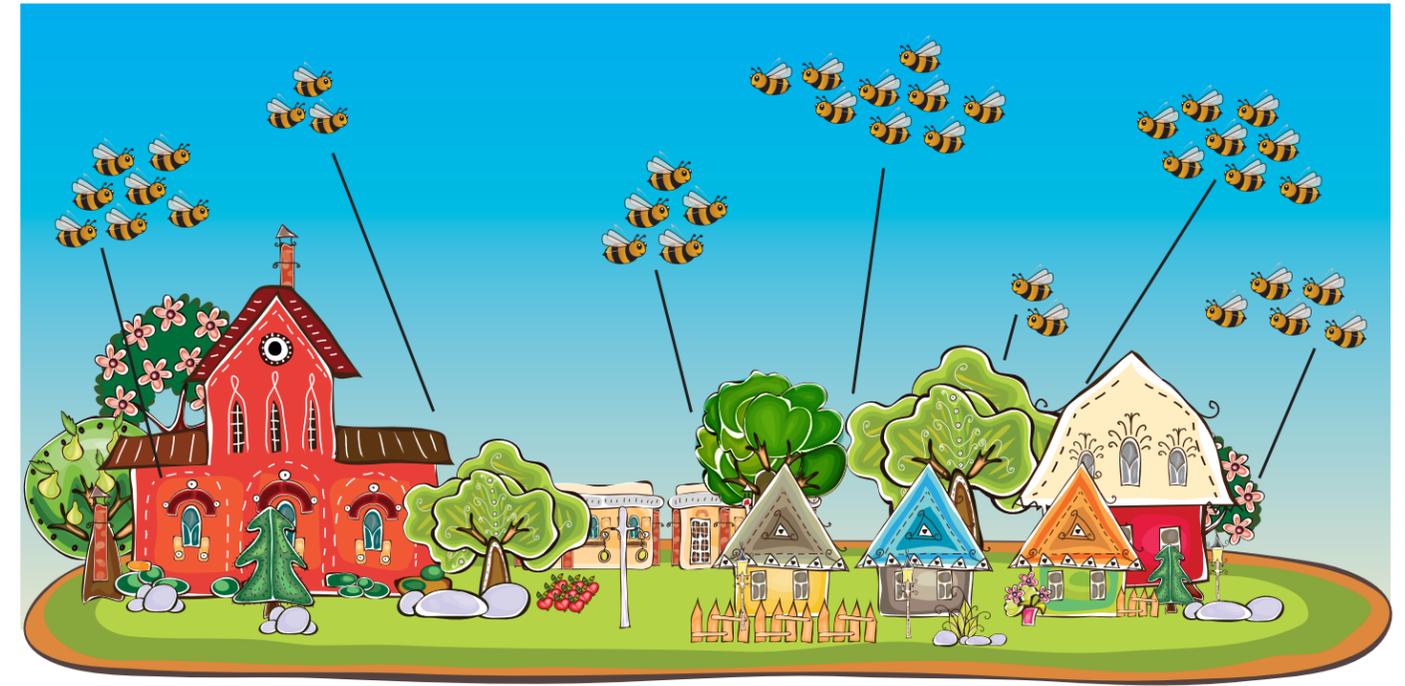


Propolis is Nature's Best Kept Secret

Most beekeepers think of propolis as an annoying by-product that the colony produces, but it plays a vital role in colony health. Propolis is a sticky reddish brown product bees produce and use to seal off cracks and holes in the hive, and used to disinfect the hive. On hot summer days, beekeepers quickly become familiar with how that gooey mess adheres to everything it touches. Propolis can be hard like dried glue, or similar to a sticky paste.

It is made up of about 190 different ingredients gathered by the honey bees while foraging and is used for a variety of reasons. The main purposes of propolis is to act as glue, a disinfectant, or as a sealant. Beekeepers are most familiar with its use as glue, as the bees will use it to seal their lid and end of the frames. It is also used to encapsulate threats such as wax moth cocoons. As a disinfectant, it is used by young bees as a polish in sterilizing cells prior to reuse. All small cracks and holes are filled, to control moisture and exterior threats, also limiting spaces other insects can inhabit. As winter approaches, honey bees propolize openings and seal air vents.

If forage is limited in your area, propolis ingredients maybe scarce. A "food desert", or plant monoculture limits essential resources for propolis production. With supplies lacking, the risk is the hive won't be as sterilized as it needs to be for optimum health. We don't have complete understanding of what other benefits propolis may be adding to the hive; but we do know that the honey bees have been cultivating propolis for millions of years, and have a natural instinct to replicate it's recipe. It's up to us to place our hives in locations with diverse plant and tree habitats to help honey bees thrive.



The Importance of Knowing the Bee Density in Your Area

Did you know that honey bees can fly 2-3 miles away? Because of that foraging range, coupled with available forage, it's important to know how many colonies are utilizing the same area.

If you understand the density of the area's surrounding bee population you'll be equipped to understand:

- The risks for robbing
- Threats of disease
- Spread of Varroa Mite or Small Hive Beetle
- Drone populations for mating or potential for drone congregation areas
- The type of bees your virgin queen may mate with
- Available forage
- Treatments others may be using and when.

Robbing Threats – Each season beekeepers race to place colonies in locations suited primarily for them, accessible and safe. Few consider how their colony's placement will negatively affect other nearby beekeepers. Bees test other local colonies, in search for resources. If a colony feeding frenzy. Beekeepers regularly see this mistakenly think their colony is strong, when it is being decimated. A lady took time to make several small hives and populated them during the summer on her

property. Each colony was equipped with sugar syrup, protein, eggs, larvae and nurse bees. Each one of her colonies generated a virgin queen, but by the time they were ready to mate, a large apiary a few blocks away became a threat. The 40-full-sized hives in the middle of Utah's desert summer were unfed and searching everywhere for forage. Those small mini colonies had food resources which caused an almost immediate robbing frenzy from the larger colonies. In this case, the small honey bee colonies should have been moved to a safer location for mating and build-up, and then possibly returned to that location if the forage in the vicinity was adequate to support that many hives.

Invasive Pests Threats – Understanding the health of a colony requires experience, which takes time to develop. Sadly, many hives become pest incubators instead of raising bees. Understanding mite threats and populations in your hive are a must for all beekeepers. Many natural and chemical solutions exist for regulating mite populations. Options include: chemical or essential oil treatments; drone culling; performing splits / swarming; caging or natural requeening process; using Russian honey bees or hygienic developed honey bees. The MUB if started with multiple frames of brood and nurse bees, goes

through a queen development cycle which equals being broodless. This cycle prevents limits mite incubation. In addition, foraging bees are limited as feed and protein are supplied, also limiting introduction of mites into the colony.

Disease threats - Another risk is unattended or uncared for hives. A few years back, a family wanted to become beekeepers. They had previously abandoned commercial colonies on their property. Prior to reuse, an inspection was performed on the four pallets of hive equipment. Bees were still active, but were they robbing or returning with forage? Plastic frames showed American Foulbrood (AFB) scales, with all the honey robbed and the wax eaten by wax moth. The only thing that remained was the foulbrood scale. Other frames showed perforated cells. One hive in this deplorable situation actually had a thriving colony with no signs of American Foulbrood! Samples were taken and tested, which showed antibiotic resistant American Foulbrood. These abandoned hives were spreading disease, and few knew they were there.

Why do Honey Bees Need Water... I Thought they Drank Nectar?

Honey bees collect water from a variety of sources while foraging. Water is vital for a colony's health, as each hive is a temperature / moisture regulated incubator for producing bees. Eggs and larvae need to be kept moist or they will fail. The brood needs to be kept within a very narrow temperature range of 93°-95° degrees F or 33°-35° C to develop properly; if the temperature exceeds 95° degrees, it will kill the developing brood. Honey bees regulate this brood chamber environment with body heat and water. A colony can overheat due to insufficient access to water and ventilation. In performing removals, bees choose a location based on access to a very close water source. They can forage a huge area, but if a colony is over-heating they cannot go far for water. Honey bees will gather and use anywhere from a quart to a gallon of water a day per hive to help maintain the temperature in the hive (think of it as their swamp cooling system). Humidity in the hive is also generated by dehydrating nectar, as well as produced through body heat. Honey bees fan their wings to help equalize temperature and humidity throughout the hive. On very hot days, you'll frequently find your honey bees "bearding" on the front of the hive in an effort to cool the hive, through absentee bodies – less bees equals less heat. If a brood frame is removed from a hive, and this temperature and humidity is uncontrolled for too long, the brood can fail. Inspections should be limited on hot days, and should be performed quickly.



A big using its proboscis to suck up a water drop.

Dr. Hueng noted in his article in the Bee Culture Journal that honey bees seek sources for "salt" water as well. Salt water can be found in chlorinated pools, hot tubs, near livestock with salt blocks, as well as less appealing locations like urinals. It's important to provide a water source for your bees. This can be a chicken feeder, birdbath filled with fist sized stones, or a sponge in water (essential to provide safe landing areas or they will drown). A pond, stream or other natural body of water is suitable. Bees will locate a water source initially in spring and be loyal to it all season. To minimize the impact on surrounding homes and complaints, provide a constant external source of water for your apiary.

A New Method for Solving the Laying Worker Dilemma

A new method for solving a Laying Worker problem in a hive. When a colony goes queenless, and no viable brood is left leaving desperate worker bees to lay unfertilized eggs. These eggs become poor quality drones, consuming resources in the hive, facilitating a complete collapse. During an inspection it is easy to spot a laying worker situation with multiple eggs haphazardly deposited into a cell. A fertilized queen places her egg bottom center. Laying worker(s) are impossible to find as they resemble any worker bee.

A desperate beekeeper will try anything to rid this condition and ultimately places other nearby colonies at risk.

Methods include:

- Introducing a fertilized queen
- Introduce a frame of young brood
- Shake out the bees 15' from the original spot
- Adding the colony to another colony by paper separation or placing away from brood frames

Challenges exist with all these methods, and still can result in an active laying worker threat in the hive.

Chubak Laying Worker Method is as follows:

During the day while colony is active, place the laying worker colony at least 25 feet away in the same position to the sun as it was. Place a Mini Urban Beehive (MUB) or Nuc with a frame of brood and nurse bees in the old location, facing the exact same direction. Do not disturb the laying worker hive, let them go about their activities as they would have. All the field bees will return to where the original hive was. Leave for two days; repeat if there are still lots of foraging bees. Once the new hive is built up with field bees, at night move the laying worker hive over 2 miles away or kill the remaining colony.

Problem solved. Field bees saved and helping a new young colony. Laying workers left untouched and removed from being a threat. The new colony will prepare a new queen from available larva, or a mated queen can be introduced.



A honey bee and a wasp fighting. Bees don't eat insects, wasps do.

The Beehive and the Local Food Chain

A honey bee's hive is a delicious nutrient rich "grocery store" for the local food chain. Insects and other critters seek out sugars, proteins and fats in their relentless quest for survival. A bee colony/hive can provide abundant food resources if under defended or abandoned, to all the crawling life nearby. This "water-hole" of food can cause frenzied looting if your colony is not strong or they have too much space to defend without enough guard bees. Stronger honey bee colonies will overwhelm weaker hives and rob the honey, and result in your colony's failure.

A symbiotic relationship exists between the wasp and honey bee. Honey bees generally transport their dead a short distance from the hive, but when there is an excessive number of dead bees, the housekeeping bees will just push hive debris out of their entrance. This can cause a food frenzy with the protein loving wasps, and when the dead are all removed by the scavenging insects the hive becomes the next focus. It's a common issue in the autumn to find weak hives being robbed by yellow jackets and wasps, and those predators are ruthless and will decimate your hive. If you suspect you have a weak hive, make sure you reduce all the entrances to just a one bee opening to help your bees more easily defend their hive. Only add boxes when the colony is strong enough to patrol the added space. Rule of thumb, 7/10th full of bees with frames capped with brood. The capped brood will emerge within 10 days requiring added space. A single mini frame holds up to 1000 capped bees, with a single box holding about 200 bees on drawn comb, or 1000 or more on open undrawn frames.

Keep your hive entrance and surrounding area clean. Don't discard unwanted wax or comb near the hive. During a simple Top-Bar or Warre inspection, you can create a robbing frenzy by nearby honey bees and other insects by removing attached comb that results in leaking honey. Don't encourage, tolerate, or place anything resembling food near your bee hive! A mature strong colony can be over-taken by an induced (intentional or unintentional) robbing frenzy.



Perforated cells are one of the signs of Foulbrood Disease.



A plastic frame from a hive infected with American Foulbrood. It was robbed of stores, then the wax moth ate the wax, foulbrood scales remain.

A Quick Word on American Foulbrood (AFB)

It's important to identify signs of AFB, as it is deadly and a highly virulent disease. Signs include:

- Tan colored larvae with signs of larva deflating precursor to decaying
- Capped cells are perforated but intact
- Sour smell, or smell related to decaying flesh
- A test to see if it is stringy / sticky with a tooth pick as ropes 3/4" or 2 cm.
- Dark scales on the lower portion of brood cells
- Spotty brood pattern



What do Drones Do All Day?

Drones are vital in the sustainability of your apiary and they exist for one sole purpose, to mate with virgin queens. Drone Congregation Areas (DCA) is the term used to describe an area drones fly to mate with virgin queens. Drones will fly 3-5 miles to the DCA and once a virgin queen is found, these drones compete to mate and die once consummated. One queen can mate with up to 15 drones, with 200 drones needed per mating event. A MUB allows a beekeeper to test viability of DCA mating in an area.

Drones are permitted to visit multiple colonies, and primarily eat harvested stores. Drones do not defend, as no stinger exists in their abdomen. They do not forage, other than helping themselves to stores already harvested. They provide body heat for a colony until fall, then are expelled prior to winter. Each spring a new generation of drones are created.



Horizontal Bee Sanctuary Luminary. This hive is indoors with two colonies, and access tubes.

What are My Bees Doing in There? Observation Window Guidelines

It's always fun to watch honey bees as they fly in and out of the hive. And of course, when we do hive inspections are intrusive, windows are considered less so a fun way to observe your bees in action is with the use of an observation window.

What does a bee "think" about an observation window? Jerry Seinfeld's character in the "Bee Movie" was exposed to a glass window. He repeatedly hit his head against it, and then said, "This is messed up!" Bees do figure the glass out.

There are some important "do's" and "don'ts" of using an observation window in a beehive.

Realize the window isn't for the benefit of the bee it is for visual inspections in a variety of settings. These settings can vary greatly from outdoors, classrooms and other educational settings to commercial venues.

Outdoor settings should eliminate direct sunlight to the window, as it heats the hive up like a terrarium. The increase in heat can decimate a colony quickly. If you're using an observation window outdoors, place the hive in the shade or face the window to the north. Provide temporary coverings that can be removed for viewing.

Indoor settings can have some light however make sure the light source isn't close enough to radiate heat into the clustering bees. An example is a light that is attached to the hive that illuminates an inner sanctum of the colony. Perhaps low voltage LCD lights can serve the same goal without the output of heat. This type of light set-up should always be considerate of the bee's world and have an ability to be turned off. Initial reactions to light by the bee are to block it, or go to it.

Bees fly based on their orientation to the sun, so light coming into the hive will attract the bees towards that light. Electric lights outside of the hive will resemble the sun to a bee leaving the hive.

Another option to consider is whether to use a glass or acrylic window for your observation window. Acrylic is cheap and can be modified easily with shop tools and protective gear, but with cleaning may appear to have a "smoke" film covering it. The smoke film can be repaired with a torch but needs to be complete disassembled from the hive to do so. Tempered glass or standard glass can be cleaned with heat or scouring pads. Keep in mind that standard glass can easily break, releasing the confined bees - which if you're in a classroom or other enclosed space might cause tremendous alarm. Tempered glass is very durable, but if holes are needed in the glass, they need to be cut prior and can be costly per hole.

The Eco Bee Box brackets allow for material equivalent from 3/4" inch or 19mm to fit in its inner system. By marking hole placement then drilling the holes out with a 1/4" bit, you can then cut wooden plugs to replace the hole which allows screws to be inserted in both glass or acrylic.

Once the screws are inserted, they form a compression fitting. The screw system with the bracket holds the panels like a jaw, so the plugs can't wiggle their way out. This is really a wonderful way to assemble non-traditional hardened materials, even stone!

Observation hives traditionally are a series of single frames with front and rear visibility. This application is ideal for displaying award quality honeycomb, or disease samples. Care should be taken to seal diseased frames, as well as preventing wax moth from gaining entry to the comb and destroying the display.

Feeding Bees with Entrance Feeders

An entrance feeder in the beekeeping tool-bag is a handy visible way to feed honey bees. It sits on the front porch of the hive, with the contents clearly in sight of the beekeeper. Not all entrance feeders are equal.

Entrance feeders work based on interfacial-lock (a lesson learned in science class), which is the pressure inside the glass pushes down is not as great as the outside pressure pushing up, and this pressure difference is enough to counteract the gravitational force pulling down on the liquid feed. So, the liquid feed appears to be suspended. This allows the bees to insert their proboscis (tongue/straw) into the hole to forage, displacing the extracted liquid with air, all while being underneath the liquid.

An inverted jar with many holes, versus few holes would then have different interfacial-lock pressure. A jar with less liquid compared to full, has different amounts of pressure retaining the liquid.

Available for distribution are feeder lids that vary. Some lids have more than 30 holes, others with about 13. Many holes may be good for large colonies with access to lots of feed. Some colonies are small and don't need many access points. Remember, as the liquid is displaced, less pressure is holding it from pouring out. Wisdom again tells us that a feeder that is above half filled will retain it's contents better than a jar less than half due to counter pressure on the liquid. A mason jar lid with a single perforation is suitable for smaller colonies.



Entrance feeders also vary in way they are made. Cheaper models have areas liquid can leak from, which WILL induce robbing and is potentially fatal to a colony. Robbing is not typically a threat during times when forage is abundant. This behavior is common in summer when resources are scarce and competed for. In desert climates for instance, in spring when forage is abundant and colonies are small, robbing is almost non-existent.



A poorly sealed entrance feeder jar that is leaking, providing a feeding source for neighborhood bees.

In summer when the colonies are near their maximum size, foraging opportunities are dried out in the summer heat. Honey bees during these time of famine, test nearby colonies for their resources. If those resources are dripping out the front of the hive, a robbing frenzy occurs. Bees show up en-mass from the area. A novice beekeeper may determine their colony is thriving due to so much "wonderful" activity. However, you will see bees fighting with each other, you will see bees attempting to enter any crack in the hive. Robbing bees want to get in and get out fast without a contest. Once the entire neighborhood's bees have zoomed onto the unattended leaking supplies of life, hours can deplete a colony of it's stored resources.

Problems occur when the liquid leaks out too quickly. This is a result of low resistance pressure inside the jar, so fill it back up. Or, it can be your lid has a tiny leak, allowing air in, and liquid out. When refilling your jar, be sure the lid and the glass rim are clean. Any debris can prevent a seal. If the lid is old, replace the lid. Most feeders allow for a small mouth mason jar lid. A single thumb tack puncture is sufficient for small colonies, more once the colony has grown.



A poorly sealed entrance feeder jar that is leaking, providing a feeding source for neighborhood bees.

Universality of the Mini Frames

Beekeepers are drawn to standard equipment, as similar sized equipment provides a lot of flexibility within your apiary. A question that is often asked, "how is the mini frame compatible with other equipment?"

The mini frame that was made to fit Eco Bee Box equipment was developed for a true 1/2 sized Langstroth hive. A standard 10 frame Langstroth hive is 16 1/4" across, so a half of that is 8 1/8", compared to a standard industry 5 frame Nuc of 9". When placing two standard 9" Nucs side-by-side there is a 1 3/4" overhang, which is why the MUB was made as a half box.

Even though the little 6"x6" frame was made for the 1/2 sized Langstroth box, inherent in its size is a universal characteristic. An eye-opener is this frame fits in all other systems available Here are some examples of how to use the mini frames with other equipment:



Two Bee Sanctuaries set up on a canal wall.

Top-bar hive — A mini frame offers unique options for this hive. If the colony has lost their queen and has no brood, a mini frame of eggs and larvae can be zip-tied or wired onto a top-bar frame. By adding the mini frame, even if raising a queen isn't wanted, it gives the beekeeper insurance against an evolving laying workers situation. The queen cycle begins once the frame is added, allowing time to purchase and introduce a new queen, or to let the bees grow their own queen. Another appealing option is to intentionally add mini frames under each top-bar frame. Everything is still all natural, but now there is side-to-side supports, allowing a frame to be not only flipped end-to-end, but sideways as well. If an unsupported frame is removed on a warm day for inspection, the heavy honey in soft wax can just disintegrate causing a huge mess. Having the mini frame inserted this way also helps prevent cross-combing. Once the mini frame is attached by the bees with support comb, the zip-ties may be removed. Or for a more permanent method, you can cut notches on the top-bars and then screw the mini frame directly to the top bar frame.



Nicolaj's home-made Warre hive, with Mini Urban Beehive next to it.

Warre hive — A mini frame is used similarly as the top-bar method already noted.



Eco Bee Box Deep along side some older Langstroth hives.

The Langstroth hive — can be a variety of sizes, but typically a brood box is a deep 9 5/8". To assist a hive with a failing queen or one that has already vanished, a couple of mini frames can be inserted in a similar fashion as noted prior on a deep frame. If you are using medium frames in your hive, that will be more challenging, due the mini frame already being a medium size.

Taking a mini frame with eggs and fresh young larvae opens the door to other methods of rearing queens and producing capped queens ready to emerge. The Miller method instructs how to use v-shapes to produce hanging queen cells that are readily acceptable in more commercial operations with existing caps and cages. The Hopkins method utilizes a section of brood placed horizontally above a brood chamber (nest) of a queenless colony with nurse bees. The royal jelly secreting nurse bees migrate up care for the brood. The horizontal placing of the brood generates perfect vertical queen cells.

The small size of the mini frame provides tremendous flexibility in your apiary and provides a solution for failing colonies with the simple introduction of viable brood resources. It doesn't matter if you're using a Top-bar, Warre, Langstroth or a Flow-hive; all can utilize the universal mini frame.

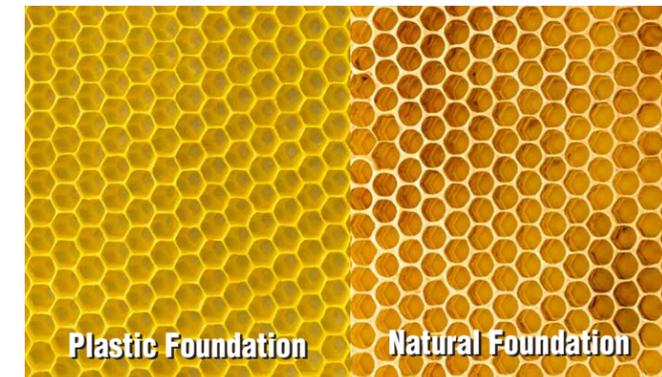
A Word about Plastic Foundation vs. Natural Foundation

Drawn out wax cells called comb is where everything happens in a beehive. Bees naturally engineer comb. Many think honey bees need plastic foundation to draw comb, but nothing could be farther from the truth. Bees have been building comb in nature for millions of years. Plastic foundation was developed for a number of reasons: for high velocity centrifuge honey extraction; uniformity in hive production; management/control of population sex type; and aids in building perfect reusable comb. Plastic foundation can be manipulated and manhandled at will, it is very durable. A frame can be flipped and manhandled with little risks of damage. A mini frame is foundationless frame, naturally drawn by the bees. A mini frame can be seeded with thin surplus or small formed wax portions and elastic. Each mini frame will be uniquely constructed by the bees, so grooming of the frames is required. If a colony is permitted to build "cross comb", inspections and harvesting can be a challenge. For a hive to be legal in the United States, the USDA requires the use of removable frames.

Dynamics of Hive Moisture & Effects on Woodenware

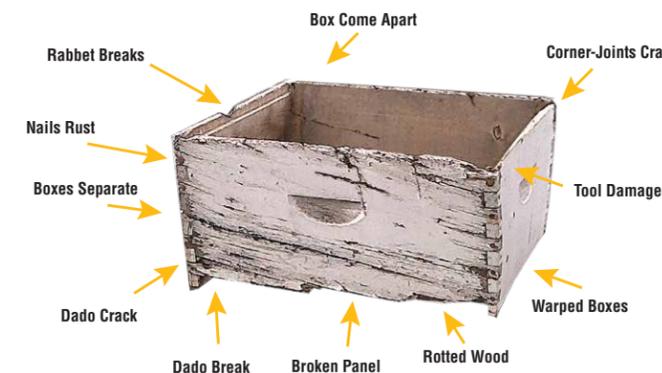
A bee hive is a complex structure with many evolving dynamic systems of . In nature a hive exists in hollow cavities created by erosion or decay. Each cavity will have issues honey bees adapt to rectify, with possibly generations of bees dying in achieving their ideal home. The modern-day beehive is usually four pine panels joined in the corners with a box joint - called a dado joint. Beehive styles went through a transformation in the 19th century, as seen by the hundreds of patents filed and granted. The Langstroth hive became the gold standard. Ultimately, a commercial "deep" hive ideal for migratory beekeeping, with removable frames that can withstand multiple extraction processes, with reusable drawn comb — is what we now call our "standard beehive". Beekeeping woodenware has a dynamic system in place that can aid the honey bee, but can also be a challenge to a beekeeper, costing the industry millions of dollars in replacement or yearly repairs. Solutions may aid the beekeeper, but ultimately cause related issues for the honey bee. The process is like a tug-of-war, or perhaps a give-and-take relationship is a better way of looking at it.

Trees grow and depending on the moisture in the area, growth rings inside a tree can be thick to thin; a thick growth ring indicating that the tree had excellent growing conditions. These growth rings represent a year of life for the tree. Every year of growth will vary depending on the growing conditions, and you will also see a variation in the growth rings in an upper tree branch versus a lower branch. You can see these growth rings when looking at a plank of lumber and every plank is unique. When lumber is milled for a bee hive, various boards will be cut to form a single box. This .



Several times a year I am asked to help with a colony that built as they would in nature. This defensive comb labyrinth is that for a reason, as it is a fortress invading insects can lose themselves in — as well as the beekeeper for a time! Every now and then, you will hear about an "open-air" colony, where the honey bees take up housekeeping on a tree branch and not in a cavity like they normally do. This gives a fascinating look at the intricacies of a beehive.

Ultimately your frames are how you permitted them to be: good, bad or ugly.



The image shows a Langstroth box corner beehive. As the boards absorb moisture, or as they dry, the interlocking corners conflict, resulting in stress cracks and damage. Some planks may not fit, even when new. Lumber ideally dries from exposed end-grain. The multi-layers of exposed tree growth wick out its moisture through the end-grain, more so than any other location. A tree transfers moisture from its roots to the branches and leaves through this same process.

The inherently weak area to fasten a board then is through this moisture passage. A finger-joint also utilizes staples or nails, traveling one of the multi-layers of one board, and penetrating the second panel's end grain. The fastener then goes parallel to the grain, which has the least amount of strength. It is like pushing a needle into a pin-cushion. Once the fastener is exposed to the natural moisture inside the wood, it begins to decay and can release by warping. To make matters worse, a colony of bees produce moisture inside the box, which is also absorbed into the lumber, aiding this natural lumber moisture waterway. At first glance this seems like a no-win solution.

The Solution The Eco Bee Box Bracket

The Eco Bee Box bracket (patent pending) allows for moisture to radiate out from the lumber and moisture producing colony. The patent pending corners allow for lumber to remain natural if desired, but also allows for exposed end-grain and makes repair of a panel simple. The fasteners hold the plank like teeth in a jaw, securing the plank from both sides. The fasteners also pass through multiple layers of tree growth, which is where the strength of the lumber lies for a fastener. Moisture may pass the fastener and not weaken the structure of the box. The Eco Bee Box brackets can come in any material, but usually are manufactured using aluminum and copper, or in some cases plated and anodized. Aluminum has an ability to dissipate heat, instead of retaining it, while copper will provide a beautiful patina to your hives.

A beehive is an incubator for bees. In order for bees to produce young, a moist humid environment has to continually exist. Compare the exposed end-grain in an Eco Bee Box bracket to a beehive moisture control. Built up moisture is allowed to dissipate. Paint the end-grain and you create a moisture dam.

During winter, any help with a colony dissipating moisture is a good thing. In regional locations with high winter moisture, this bracket system will aid the colony by drying the wood.



Finishing Woodenware

Historically beehives are viewed as white painted boxes in varying degrees of condition (sometimes very decrepit looking!) Paint is meant to protect and preserve the wood by providing a coating or shell that can withstand exterior elements. Protecting the wood from external moisture is a major factor for painting, as moisture will decay wood and cause breakdown. The typical white color used on beehives may aid in resistance to solar heat by reflecting back the sunlight, but in some areas, your hive may benefit from added solar heat. Fasteners used in the corners are needed to remain free of moisture, again a plus for paint. Many beekeepers feel that adding different colors to the front of a beehive aids the foraging bee in returning home when multiple hives exist in one location.

Painting a Mini Urban Beehive is now a beekeeper option, but rarely chosen, as many urban beekeepers prefer the natural beauty of the Western Red Cedar. Coating the external components with oils for protection and beautification is common. There are many types of oils utilized for wood protection, so what is used is up to the beekeeper.

Eco Bee Box produces a natural "butcher block" type protective oil/wax called "Beck's Bees Wax". "Beck's Bees Wax" is made with four ingredients: bee's wax, coconut oil, canola oil, and lemon grass oil. The percentages of each ingredient are proprietary. If "Beck's Bees Wax" is chosen for coating your woodenware, several modes of application exist.



- You can warm the wax to a liquid and apply, but clumping may occur. Once coated, wipe with a cloth or paper-towel to remove clumps.
- Use the back of your fingernail to remove soft paste from the container and rub on the wood.
- Once coated, the individual boxes can be put in an oven at 150 degrees for 10 minutes to melt the wax to encourage absorption into the wood. Put a cookie sheet under the box while in the oven as the wax will drip. Once heated, again polish with a cloth or paper-towel.
- Coated boxes can also be put in the heat of the sun to naturally absorb into the wood.
- Uses of various heat sources have been utilized to melt the wax; each beekeeper may have individual ideas.
- The Mini Urban Hive can be coated yearly, while occupied in the summer months.

Note: The inside of the hive is left natural for the bees to care for. However, the entire bottom board can be coated to aid later in cleaning debris.

The landing board is an ideal spot to add some color if you have several hives and want to prevent drifting to a nearby colony. Adding a unique color or design, as is seen in European hives, is a classy touch.

Clubs

Knowing your area, with all its diversity and challenges, is best learned through local clubs. These clubs may have an online website, with associated blog. Many clubs have Facebook groups that encourage interaction. Magazines and journals exist for up-to-date education ranging from beginners to advanced. Conferences are held yearly in most areas with a bit of travel.

Winging it as a beekeeper will take you through first hand failures that others have already learned. Warning, some beekeepers will try to educate without having successfully done what they teach. Or, they teach based on what they were told, but have not been successful yet. Seek out mentors with experience, not just a love for beekeeping. Clubs may promote a particular "type" of method. If listed as a public club, and no identification on "method" is described, then an unbiased approach to all viable methods should be promoted. A challenge is that most clubs teach and endorse commercial beekeeping, which is a standard deep hive. Other methods exist, and someone fluent in a single method rarely know the ins-and-outs of other methods. Seek learning from those that practice the style and method you are using. Youtube.com is a great source of visual learning, but can be disguised where the entertainer is more fluff and less education. .



These are a just a few of the outstanding Bee Clubs in America



If You Want Your club send us an email.

Storage of Equipment

Idle beekeeping equipment can be ruined if not adequately cared for, and a season's work can be destroyed with improper storage. Consider all the life forms that creep and crawl that prefer to live in tight spaces and "boxes".

Beekeeping woodenware is an organic material, nicely suited for honey bees, but can:

- Have holes tunneled in it by creatures eating or burrowing in the wood
- Grow mold on wood that is saturated with moisture
- Attract wax moths who will eat all traces of beeswax/comb and will build cocoons buried in the inner panels
- Provide a home for ants, spiders, beetles, which can leave boxes in worse condition by having been there, and you'll be required to do additional cleaning of that woodenware
- Be clawed, kicked, chewed, trampled, dropped, thrown
- Become stained with lime deposits from regular culinary sprinklers
- Lumber will age and discolor with exposure to air if untreated
- Become home for many types of nests, including rodents
- Be destroyed if your location floods, has a fire or is exposed to any kind of oil, gas, diesel or chemical spills



Unused clean equipment should be stored in a safe, dry location preferably off the ground/floor, indoors if possible (like in your garage). Used equipment with ANY modification made by the bees has two different parts that need different protection. Frames that contain drawn comb or that have been disinfected by the bees, are a potential food source for insects like wax moth; some of which may have already laid eggs that will hatch when conditions are right.

Frames can be carefully placed in a freezer for a couple of days to kill eggs and any larva of potential pests. You should place those frozen frames in sealed or taped baggies until next season. You can also place them in a clear storage container with a tight seal. Wax moth don't like being exposed to light, so placing any frames with comb in a translucent container where it will be exposed to light will help reduce wax moth infiltrations.

Again, keep frames off the ground, in a safe, dry place in a shed or garage, or storage. Boxes have less damage risks than used frames, but it's a good idea to keep them stacked with the tops off for ventilation in a dry location. You don't need to seal up the boxes.

Bee Talk. How is it said and written, and why?

Beekeepers loosely speak of “hives”, but really they are not referring to a static box but the colony within the box. The structure is the hive, the living organism inside the hive is the colony. A hive can't do anything, in contrast, a colony does act and interact. How many hives you have, refers to boxes. How many colonies you have, refers to bees.

Is it a Langstroth or Langstrom hive? The inventor of the most widely used hive today is Reverend Lorenzo Lorraine Langstroth, which is his proper name with title.

Many discuss the bee apocalypse in a widely general fashion. The term “bees” refers to the 20,000 members or types of bees that belong to the Apidae family. A honey bee belongs to a group or tribe of insects in the bee family called Apini. Several types exist in the genus Apis. Apis is Latin for bee, and mellifera means honey-bearing. Apis mellifera means honey bee. European honey bees belong to the order Melifera. So using the term “bees” is a very broad way of referring to honey bees.

Is it proper to write honeybee or honey bee? Entomologists have a rule for common insect names. “If the insect is what the name implies, write the two words separately; otherwise run them together.” A house fly, and a horse fly are both a part of the fly family, so separate the words. A butterfly and dragonfly are not of the fly family but names only so they are joined. Because a honey bee is of the bee family, it is two separate words. Writing “honeybee” is comparable to writing my name AlbertChubak with no space. I am Albert of the family Chubak.

Is it a swarm, colony, hive...what? Some call and say a hive of bees flew into their yard. This is truly a remarkable sight, as a box of bees shouldn't be able to take on air and be navigated like an aircraft, unless of course a truck just lost it's cargo. "A swarm is in my home", is another challenging image of thousands of loosely flying bees, circling in your family room, but is possible. Once a swarm finds a location and enters to claim it as home, it is now a colony in a hive...which is your home.



Bee Health

Swarming is a natural process, and can be due to expansion or a defensive reaction. In nature, the most prolific queens swarm to start new colonies. Swarms that were the result of a defensive action, is absconding. Absconding is where ALL the colony left. Absconding occurs due to many reasons, such as:

- Robbing
- Invasive infestations such as mites and beetles
- Lack of water
- Uncontrollable heat

The traditional Langstroth method teaches to begin with one brood box, add a second usually on top the first. Honey supers are placed on top of the brood boxes for honey stores. Bees are forced down to older unhealthy comb when honey supers are removed until they are midnight black. In nature a colony starts at the top, forms comb, lays brood, then surrounds the brood on the top and sides with bee bread and honey. As this colony grows, more stores are placed above the brood and the brood expands downward. In fall, the colony is at the lower end of the hive with ample honey stores above them. Slowly the colony works it's way up during winter or dearth.

- Initial Brood Box
- Brood Expansion Box
- Honey Super Expansion
- Queen Excluder



The MUB mimics a natural tree colony. Begin with a single box, add the Second box added underneath to encourage brood and allows a honey wall to be formed on top the first box. Third box is added above the honey wall if it is formed, or under the third to encourage brood and again a larger honey wall. Once the honey wall is formed, all boxes placed above the wall will be honey and can be easily harvested. Mites directly affect the health of a colony. Many say they don't see mites on their bees. Random visual inspections of returning field bees is a poor judge of mite counts. Watch 100 flying helter-skelter and see watch for a mite that is smaller than a pencil tip. If 7 in 100 bees have mites, you need to do mite control. Chances are, you would not see 100 bees. If you do see bees with mites, then the mite issue is out of control. A mite count above 7% and your colony will die. A colony with a mite load of 2%, can change dramatically if the bees rob a failed hive, returning with spoils of war and mites. The result is that the mite counts can rise drastically in little time. If local beekeepers fail to control their mites, all local colonies will suffer with a faster than usual mite growth cycle..



Understanding Your Colony's Community

To some a beehive is occupied by bees, with little attention given to other organisms essential to the colony's well-being. For a century, treatments and chemicals have been used to thwart a problem. Until recently, we have known little about supporting organisms in a hive. There are permanent and temporary supporting organisms, as well as invasive organisms. A blanket approach of eradicating invasive organisms also can kill supporting organisms, resulting in colony death. Envision the colony as an incubator with unique life in each hive. Disease can be spread by using unclean hive tools and gloves. Colony hygiene is essential in beekeeping. Here is a few tips you can follow:

- Torching hive tools following inspections
- Having multiple hive tools, and keep them in alcohol when not used
- Using thick latex arm length gloves instead of leather. Leather is difficult to clean. Latex gloves can be thrown in the washer and reused
- Regularly washing your suit
- Limiting contact with foreign colonies, that are not your own
- Cleaning hands with bleach wipes after inspections

The exterior community colony expands from the hive to encompass an area of 2 miles in all directions, and 3 miles for drifting drones. Whatever is happening in a bee's foraging area, can affect the health of a colony. Threats to a colony can include:

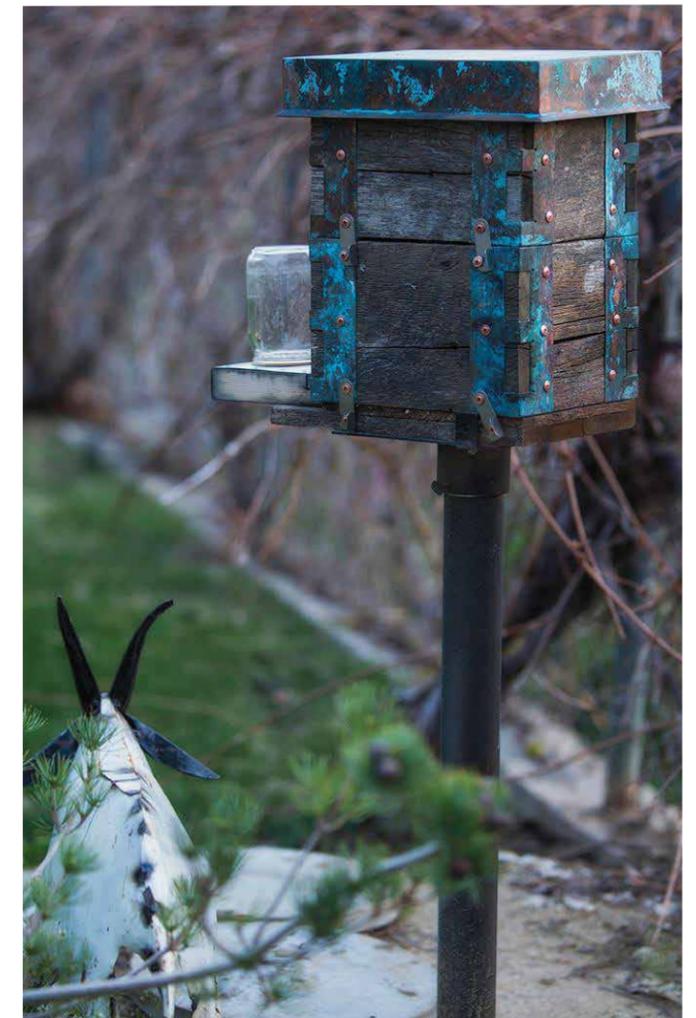
- Improper application of pesticides
- Lawn weed & feed applications where flowers are involved
- Orchard, farm, and garden spraying
- Discarded industrial waste sugars
- Open feeding of honey
- Beekeeping equipment with honey left outdoors to be locally cleaned
- Neighbors that buy honey to feed to visiting bees.
- Understanding the threats is one area of concern, but also understanding the forage in your area is another.

A new beekeeper requested help with their first harvest. Three new hives were begun that spring, two were weak and one was strong. Most of the frames were free formed with lots of cross comb. Their honey frame revealed the bees foraged on local buckwheat, which had an unappealing pungent aroma to this beekeeper.

What type of honey does your area produce? Each yard can vary, so can hives side-by-side. Honey bees find what they want and direct their foragers to cultivate it. This foraging can be from plants or can be robbed from weak or dead colonies. Honey bees are the best recyclers of sugars on the planet. If it is sugar and unattended or discarded, honey bees will be all over it. Companies may discard sugars, threatening nearby beekeepers with an unnatural flavored bi-product.

Companies may discard sugars, threatening nearby beekeepers with an unnatural flavored bi-product. Using a MUB allows a beekeeper to initially test the area's bee density, aggression, and what types of honey it produces.

An amusement park was temporarily shut down due to health risks involving rouge honey bees. Two feral colonies were identified, one was in a tree. As it was being removed, comb was tasted and revealed it was a cola flavor. Next a red comb was inspect and placed on the tongue - it was a red snow cone variety. Interesting the bees isolated the flavors in their hive. At the park's fence, many bees could be seen crossing in-and-out of the park boundaries. Trash can lids in this area protecting against scavenging by insects or rodents is vital. How many local bee colonies scavenge from sugar dumps like this?



An aged copper vintage hive looks old, but is sturdy and functional.



Using a Beehive Blanket to aid in wintering your colony.

You Did It! You Overwintered Your Bees! Now What?

It is quite the challenge to over-winter a colony, making it to spring blossoms. Some areas have a short winter, others a long, but both are equally challenging. These challenges continue into the second year. Second year colonies are mostly drawn out with wax, and already have reserves of bee-bread. Brood is beginning as soon as nectar and pollen are brought in, as it stimulates the queen to begin laying.

Problem Areas

Honey-bound: This is when honey or pollen stores in the hive are restricting the size of the brood laid by queen. Honey is for winter, as bees prefer nectar to honey in spring. Remove honey stores to allow the colony to expand and grow. Full frames may remain, but only the outer two edges of the box. Next to the honey frame, bee-bread can be placed, then open frames for the queen to lay and fresh supplies stored.

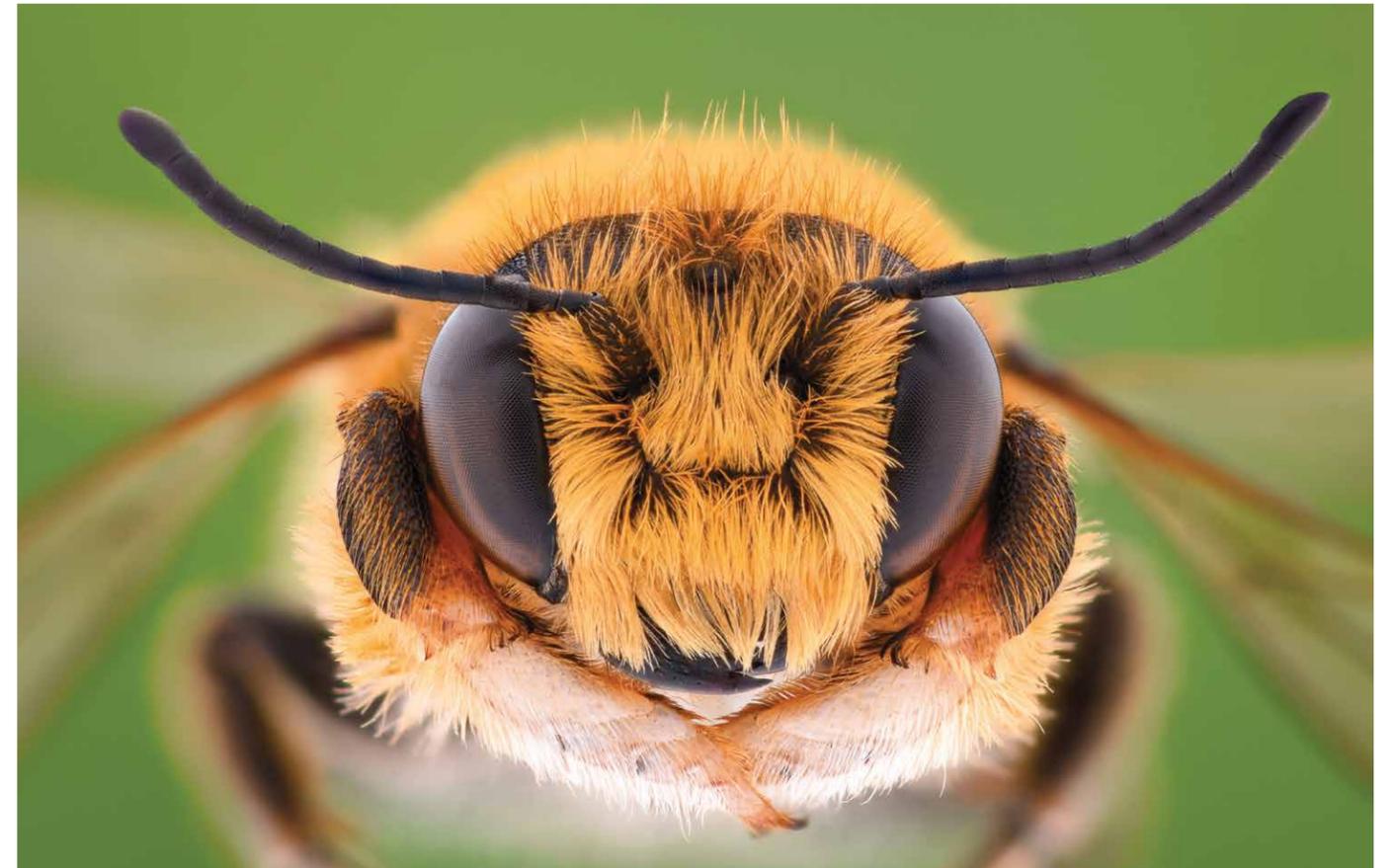
Disease: During warmer days of winter, successful colonies visit colonies that have failed, and return with their stores. Honey taken from failed colonies may be infected with disease. Most diseases will show up during brood build up, identified by the beekeeper through inspection. Feeding honey to a colony that did not produce it, poses risks of introducing threats familiar with the colony that produced it. Sugar water feeding with supplements, has little risk of spreading disease.

Invasive threats: Colonies that survive winter, have a greater risk of increased mite counts. Spring Nucs usually have mites that over-wintered with the bees. These mites expand quickly through brood build up, incubating with developing pupae. This can threaten the colony, resulting in complete abandonment of the hive, or subtle initial issues like wilted-wing virus.

Swarming: A uninspected hive, may build up in spring faster than a beekeeper is aware. This results in an over-crowded hive, and equals swarming. Beekeepers need to be prepared to split or look to free up space for the spring colonies. Splits can be performed by dividing a colony, either adding a new queen or allowing the colony to requeen. Splits are made with with additional boxes, or separation boards.



Liquid feed should not be used in times of winter. Once you begin feeding in spring, keep doing so until blossoms. This spring snow storm is only a small set back.



Challenges That the MUB Resolves

Creating Queens

is an essential part of beekeeping. Reproducing stock we know and like with traits we are familiar with. Every beekeeper should have a queen savings account, where they can go for a queen or queen cell or young larva, if they need them. At times a queen will be "balled" by a colony; this means that the worker bees have decided to kill the queen, and they essentially "cook" her with their body heat. Knowing how to raise queens with your MUB gives you assurance that in the case something like that happens, you have the means to re-queen your colony.

Storing Queens

in areas that have Africanized Honey Bees, you can use the MUB to store extra queens until they are needed. If you discover that you do have an Africanized queen, you can kill her and replace with a gentle queen. The queens being stored in the MUB can lay eggs and so do not feel the effects of being isolated too long.

Laying Workers

If a queen isn't formed, hatched and mated, the result will be a "laying worker" in your hive. There are a number of methods used to solve having a "laying worker", but I have my own method.

Making Splits

are useful, as I've mentioned before. Some say, well...these frames don't fit anything I have now. Actually, they fit everything including a top bar as we discussed in the segment on the universality of the mini frames. When the MUB is filled four boxes high, take the top three boxes of frames and zip tie them into medium or deep frames and place into standard Langstroth boxes. Or take a top bar frame and zip tie it in there as well. I would always keep one box so there is always a mini nuc in waiting.

Swarm Control

Every responsible beekeeper needs to have a swarm control hive near their apiary. A mini hive is suitable for this. Can also be used as a swarm lure. Melt some dark comb to the inside panel of the box and let it sit or hang in your yard. Your MUB becomes your first line of defense during swarm season.

Research

Researchers benefit from using a MUB because it is a fully controlled environment; faster build-up; clean wax; simple to relocate; comb box for many natural splittable frames; easy to attach comb to test for many factors such as varietal issues in wax, bee bread, propolis; relationship with fed bees and insecticide tainted foods; small frames for grafting; comparing small colonies of honey bees to solitary bees, and so on.

Conclusion

Guidelines for Life Removals

Removing a feral colony from a cavity in a home can be a challenge, and includes risks. A list of rules that can make the situation from becoming a nightmare.

Rule 1: If pollen isn't coming in... then either scouts are visiting, or it is being robbed.

Rule 2: Don't seal up or spray a beehive entrance unless you know the specifics of what is going on inside. If you do either of these, and there was an active colony inside, the bees will look for another way to get outside - which is usually through the inside of the home.

Rule 3: If bees have been there before, they either never left or are returning due to location or scent. Find out history of the area in question.

Rule 4: Once bees are in a location, it can take a bit of time to relocate them so plan on that.

Rule 5: A swarm is a ball of bees with a queen or a cloud of bees with a queen. A colony / hive is a structure where the queen is inside and laying babies. So if you say you have a swarm in your wall, that is not true.

Rule 6: If honey is leaking out of the hive, something has gone wrong with the colony. A strong colony won't tolerate this.

Rule 7: Trap outs are time consuming and the least effective way to remove a colony. Trap outs primarily thin out the old field bees, not the queen or nurse bees. The field bees have less than 2 weeks of life left in them. Do this when bees can't be removed, so they use up their resources prior to a kill. This prevents honey leaking later.

Rule 8: Brood or babies are in the most protected area of a hive. If only honey is removed, then the colony and brood nest are still intact.

Rule 9: When speaking with the homeowner on the phone, ask, "is there yellow on your bees", if they say "yes" it isn't a honey bee. Honey bees are brown, no distinct yellow.

Rule 10: The bees need a cavity the size of your torso. Typically the bees do not contend with insulation. They will remove insulation and Styrofoam. Bees typically don't live in the ground, but can live in rock cavities. Honey bees will not live in old railway ties, as the space isn't big enough and they hate the kerosene the ties are soaked in. Remember, bees smell parts per billion.

Rule 11: Colonies will naturally swarm off to regulate the population, so if there is a colony that can't be removed...place a bait hive 25 feet away to capture them.



Cavity with honey bees and electrical supply line poses risk of death if improperly removed.



Figure out how to remove the bees in a way that can be easily repaired when done.



Knowing where to start is important.

Rule 12: Baiting a box for a swarm isn't done with food or honey, this only causes a looting / feeding frenzy. Scents such as beeswax, Propolis, queen pheromones, or lemongrass are used for baiting.

Rule 13: Removing the colony, harvest the honey and take the eggs and larva and rubber band them into a new frame bees from any colony. If the queen died in the removal, the bees will make a new queen from the resources you provided.

Rule 14: Be prepared with tools, beehive equipment, suit, vac, and camera. Use a boom-lift any chance you can instead of risking your life and health.

Rule 15: Don't place this removed colony near other domestic colonies, until you have inspected for disease.

Rule 16: In removing a bee colony, try to plan on the least intrusive access. Cutting brick, vinyl siding, drywall, stucco...will all cost lots to repair and usually only allows a limited access. Go through floors under carpet, instead of brick, siding, stucco, and painted drywall. If bees are flying inside the home...turn off lights, make as dark as possible, then open a window with full sunlight. Bees will fly right out.

Rule 17: If you can not remove the bees due to location or expense - smear the smelliest honey all over the front entrance to induce robbing by other colonies. After a month, seal it up. Wax moth will devour the remaining drawn comb. Know that bees wax is bee fat, and many little creatures that crawl, are excited to eat it all up.

Rule 18: Be careful not to have honey dripping out of the new hive, as it will induce robbing. Anytime you inspect a colony and you damage comb where it is leaking, you pose risks to the safety of the colony by robbing. Robbing can be by insect, birds, rodents, and large animals.

Rule 19: Never assume you removed everything, until you have checked the spaces on all sides of where you removed it from. Even when you remove all the comb, bees can move to stay out of the expert's way. Look to make sure everything is gone.

Rule 20: A thermal imaging device can be extremely helpful, but does have it's limits. If the hive is being robbed, the thermal image it will show heat during the day, but nothing at night.



Chimney removals are the most difficult, but with the right know-how it is possible.



Take the brood, and try to keep the new hive as clean as possible



Safety and Protection Tips

Regardless of your hobby, safety should always be a priority for yourself and people around you. This is extremely important when you're keeping honey bees! A sting from a honey bee can cause a localized reaction that can be quite painful, and for those with severe allergic reactions. A bee sting can result in anaphylactic shock, which constricts airways and without emergency treatment can ultimately lead to suffocation.

The result, many people are scared of "bees", yet most people can't even identify a honey bee versus a wasp! They believe if they hear a buzzing sound, they should swat it or kill it! Sadly, honey bees have morphed into an insect that instills fear just at the sound of a "buzz". Remember, even common house flies "buzz", so not all buzzing sounds result in stings. When asked what a honey bee looks like, many describe a variety of descriptions similar to wasps, hornets, yellow jackets... not honey bees.

Special clothing exists for inspecting and being around stinging insects. Invest in a veil, jacket, or full body suit – as your budget permits and according to your fear level. Protective clothing is NOT 100% guaranteed, as "Houdini" bees will find a weakness in your defense. Bees will test every way to deter you and can sting through thin areas of the suit. For added protection, wear a long sleeve shirt under the suit to ensure arms are safe. Ideally, wear a baggy or loose suit with good elastic seals at the waist, ankles, and wrists.

Recently, a beekeeper employed some non-beekeepers to help load hives onto his truck at night. Understand first, at night all the guard bees are home and ready to act at a moment's notice. The beekeeper was a large man, but his temporary help were a fraction of his size. The jackets they put on gave a false sense of protection, as they were sized to fit the "big guy". Of course, the bees were disturbed, and so out they came to defend. The guard bees began banging on the face shields, which is enough to terrify most people unfamiliar with bees. But the real problem began when those "Houdini bees" tested every possible failure in the "big guy's" suit.

Bees will regularly start at ground level, and crawl up looking for an entry point. Because these suits fit a larger man, they did not seal at the waist, wrists or really anywhere. Once the hired help experience Houdini bees crawling under their clothing, a level of terror set in. They could hear the bees buzzing, perhaps even the air circulating from their wings. Then the moment a bee touches the skin, all sanity is gone! "They made contact." The terrified help began the challenging task to remove "Houdini" bees from inside the clothing. Off the clothing came, piece by piece at night, on a well lit side-street. Can you imagine the sight? These guys were all the way down to their underwear and dancing around like they were on hot coals. A video would have been priceless! While we can chuckle at that image, the moral of the story is, bees can and do get inside your clothing and will sting through fabric, so use proper fitting suits to provide ample protection. You are responsible for your safety.

Most pharmacies carry "Sting Ease" or "Bite Away" or similar products. The active ingredient is ammonia, which draws out the venom. Ammonia is inexpensive in ½ gallon containers in the cleaning aisle, but does not come with the applicator sponge. This is great to have in your bee bag to use as needed. You should also consider keeping some over-the-counter Benadryl in your bag, in case you or someone else has a strong allergic reaction.

Remember, "the bee's stinger is about a 1/16 of an inch long, the other two inches is all in your head". Keeping bees is a rewarding and a fascinating hobby.



A few facts to consider:

- If you were repeatedly stung by an insect, it most likely was hornet or wasp. Bees have one stinger, and lose it (and their life) when they use it!
- If you were mowing a lawn and insects came boiling out of the ground, it was probably a hornet or yellow jacket. They can be aggressive, ill-tempered, and territorial when disturbed.
- If insects are bothering a picnic or cookout hovering around the hamburgers and smoke, again is probably a hornet or yellow jacket. These insects consume protein in many forms, including decomposing animal flesh.
- Honey bees forage on flowers, unlike a wasp or hornet that feasts on meat.
- Honey bees sting in defense. If a honey bee is on a flower gathering nectar or pollen, it is unlikely to sting as there is nothing to defend. If you swat at it, it will defend.
- You may see thousands of honey bees in a "feeding frenzy" when plants bloom, but are preoccupied with foraging.
- Not all honey bees in a hive are prepared or able to defend.
- Nurse bees are young bees that have not developed into defense guard bees.
- Drones are larger than worker bees. A bee can "buzz", as can a fly, but drones "do not" have a stinger, nor do they bite.
- A queen bee may leave the hive to mate, swarm or abscond.
- If you threaten a colony, alarm pheromones alert guard bees. Once stung, the alarm pheromones remain on your skin or clothing to attract other guard bees. Not all bees in a hive are guard bees.
- Honey bees are not attracted to hanging wasp traps.
- Honey bees recycle sugar. This recycling includes hummingbird feeders.
- Bees are loyal to their source of food, and return until it is no longer viable.



Glossary of Terms [add brief definitions]

If you're new to beekeeping, the terminology can get confusing. Here is a brief list of

Absconding – when a colony of bees abandon the hive. Primarily this is a defensive behavior, due to robbing, high numbers of varroa, competition for food, access to water, external conditions threatening their colony.

Africanized – Honey Bee (AHB) – An aggressive cross of *Apis mellifera* (European Honey Bee - EHB) and an African Honey Bee (*Apis mellifera* *scutellata*). Originally crossed to increase honey production in Brazil, but in 1957 several swarms escaped quarantine. These hybrid colonies spread across South America, Central America the southern half of North America. Commonly referred to as “killer bees”.

American Foulbrood (AFB) – A contagious bacterial bee disease that shows signs beginning in the larva stage of the bee growth cycle, accumulating in decayed pupae. The decaying pupae results in the “foul” smell. Caused by spore-forming bacterium called “*Paenibacillus*”. The spore stage of the bacterium can remain dormant for 50 years and there is no cure, though studies are being done using bacteriophages (phages) to immunize colonies. Isolating the colony at night, and burning everything infected with AFB is generally the accepted practice. AFB will also be on the ground surrounding the infected colony, so relocating a future apiary is also a good practice.

Apiary – A location with one or more colonies or beehives. Also known as a bee yard.

Apis Mellifera – The scientific name of the European honey bee, and is primarily the type of honey bee found in the United States. *Apis Mellifera* is native of Europe and was imported to the United States colonies in the 1622.

Bearding – When bees gather on the exterior of the hive. This behavior is a defensive trait against summer robbing threats, as well a way to regulate the temperature inside the hive. Bearding also can be a threat to a colony in areas with AHB, as a Africanized colony can attach to a portion of the hive (not the entrance) long enough to simulate the colony's pheromones, then destroys the local queen, replacing her with their queen protected in the cluster on the exterior of the hive.

Bee – In this book, references to “bee” will mean *Apis Mellifera* (European Honey Bee - EHB), unless otherwise noted.

Beeswax – A tiny flake of bee fat secreted by four pairs of special glands called “wax glands” on the worker bee's lower abdomen and used for building comb. Inducing fat production is best with “nectar” based flows or feed.

Bee Bread – Is a mixture of collected pollen, nectar, or honey laced with bee gut enzymes, partially fermented and packed into comb cells surrounding the “brood chamber”. This is a colony's source of protein, and essential in producing “royal jelly” that feeds young larvae, in raising a queen, and is the sole diet of the queen.

Bee Brush – A soft bristle brush used to gently manipulate bees. Ideally not made of soft nylon, and can be easily cleaned in hot water.

Bee Day – A day set for when beekeepers collect packages of bees to populated their empty hives in spring.

Bee Space – 3/8-inch space between combs, or hive parts. Bee spaces are used as corridors to move within the hive, and are directly proportional to their size.

Brood – Underdeveloped or immature bees that have not yet emerged from their cells. Brood can be in the form of eggs, larvae, or pupae of different ages. Brood is the colony's nursery.

Brood Box – The box(es) of a bee hive containing the brood chamber of the colony, usually the bottom box of a hive.

Brood Capping – When the maturing larvae are about to turn evolve into pupae, worker bees cover the cell with a brown colored capping, made from wax and bee hair.

Brood Chamber – A protected area in a hive where the brood is reared. It may be multiple frames/combs, as well as hive bodies called “brood boxes”. Usually has honey above it, with multi-colored bee bread between the honey and the brood.

Burr Comb and Bridge Comb – Randomly built wax structures used to fill a space, restricting it to 3/8” or ideal bees space, or used as an access point from one comb to another.

Candy Board – A supplemental feeding method used to feed bees in the winter, that aids in ideal placement by absorbing detrimental moisture. Created by making a shallow vertical box with the bottom covered in 1/4” or bigger hardware cloth. Eco Bee Box's recipe is: 8 cups sugar, 3/4 cup water, a cap-full of Complete (from Complete Bee), mixed until uniform, placed on hardware cloth, then press, and let set a day to dry. This mixture can also be put into a drawn wax frame with empty cells and placed near the cluster to supply a food source.

Capped Brood – The final stage of pupae development, which lasts about 10 days.

Cappings – The thin layer of beeswax found over cells of ripe comb honey. The capping seals the cell, preventing further dehydration or absorption of moisture. Cappings are also the bi-product of the extraction process in commercial settings. Cappings consist of both wax and honey.

Cell Size – Refers to the size of cell that the honey bees create. On wax or plastic foundation, cell size has increased from 4.9mm to 5.4mm. Using foundationless frames will allow the bees to build the cell size they want, which is generally 4.9mm for honey and worker bee cells. Drone cell size is larger.

Colony – Refers to all the bees in one hive (worker bees, drones, queen, and developing brood). A colony can be with or without a queen, and with or without brood. Many mistakenly refer to a colony as a hive. The hive is the structure a colony resides within.

Comb – A mass of six-sided cells made of beeswax (bee fat), where brood is reared and honey/pollen is stored. Feral colonies have structured comb formed into labyrinthic defense system.

Crystallized Honey – A state and process where honey solidifies. Not all honey will crystallize, whereas some honey, like Sunflower, crystallize quickly. Ideally, bees in winter eat crystallized honey with low water content. Adding crystallized honey, referred to as seed honey, to non-crystallized honey, will mimic the consistency of the original crystallized honey. This process of adding seed honey is used in producing creamed honey, and honey butter.

Cut-Out – A process of removing an established colony from a feral location, such as a wall, floor, roof, tree, or other similar locations. This process can be a “live” removal, or a dead-out. A dead-out refers to a colony that has died at some some prior point. In some cases, improperly kept bees, can require a similar removal process due to: improper placement of frames; insufficient frames; no foundation; unmaintained top bar – Warre – Flow Hive styles.

Dado / Box Joint / Finger joint – A method of snugly fitting two corner panels of wood together using an interlocking system created by cutting a set of complementary rectangular cuts in two opposing panels of wood.

Dead-Out – A condition of a colony found during spring inspections, refers to a colony that has died.

Deep – A Langstroth style hive body or box, that is 9-5/8” high. Can hold up to 10 frames, for a variety of purposes: brood box, honey super, 8 or 10 frame, Nuc, or observation hive. Weighs about 80lbs once full.

Drone – A male stingless honey bee, incapable of defense. A drone can fly 3-5 miles, and may visit multiple colonies. Drones participate daily weather permitting, in “drone congregation areas”, in a competition to be one of several mates for a virgin queen. Life span is one season, being ousted from a colony by female worker bees in preparation for winter.

Drone Congregation Area (DCA) – An area where drones gather to compete in fertilizing virgin queens. This is typically done between the hours of 11am – 4pm.

Ecosystem – A group of organisms working in harmony. A honey bee colony is considered a superorganism, with thousands of permanent and transient residents.

Entrance Feeder – A feeding system that fits snugly into the bottom entrance of a Langstroth beehive, or mating Nuc. Perforated metal capped attached to an inverted jar, allows quick non-intrusive external feeding. Also called a “boardman feeder”. Can be made of plastic, wood, or metal.

Extraction – The process of removing honey from frames.

Extractor – A machine that removes honey from frames by centrifugal force.

Feeding frenzy – When foraging bees compete over a food source. Food source may be: blossoms; a dead-out; weak colony; leaking entrance feeder; discarded sugars; improperly discarding or open cleaning of equipment.

Festooning – A system when bees build comb, they hook legs to form “bridges” or “scaffolding” across open areas.

Field Bees – Worker bees 2-3 weeks old, that collect resources.

Flight path – The path bees fly to and from their hive.

Forage – Vegetation that bees utilize for nectar and pollen.

Foundation - A man made sheet of bees wax or plastic, with an impression of comb cells on both sides.

Frame – A removable piece of equipment (wood or plastic) designed to hold the contents of a hive. May hold brood, pollen, or honey comb, with varying amounts of propolis.

Growth Cycle - Bee development goes through 4 stages: egg; larva; pupa; and adult. A queen takes 16 days from the time an egg is laid to emerging from a cell. Worker bee cycle takes 21 days. Drone cycle takes 24 days.

Guard Bee - Worker bee about three weeks old that serves to protect or challenge all incoming visitors. A maturing colony has about 300 guard bees. Hygienic behavior by guard bees includes removing threats and debris from the hive.

Hardware Cloth – A square wire mesh, used for candy-board, queen excluder, pollen trap, and ventilation.

Hive – The physical structure of a bee's home.

Hive Tool – An essential metal tool used to open hives, pry frames apart, and scrape wax and propolis from the hive parts.

Honey Super (or Super) – A hive body or box that is placed above a brood box to collect/store honey.

Honey Wall – A method/practice of isolating a queen in a hive, by creating wall barrier of honey instead of a queen excluder. A queen has attendants that consistently feed her, and are located on brood frames. When a queen lays an egg, nurse bees care for it until it emerges. If a queen wanders away from the brood and nurse bees, eggs she lays will not be cared for and she will not be fed. A honey wall can be formed in a horizontal or vertical hive.

Horizontal Hive – A style of hive where bees continuously build across, as compared to a vertical Langstroth hive where expansion is up or down. Various horizontal style hives exist, such as a top-bar, long-box, Tanzanian hive, and Dartington hive.

Hygienic Behavior – Behavior related to disease resistance; bees have increased olfactory sensitivity to odors of diseased brood. This genetic trait shows resistance to invasions of disease and pests. Bees with this trait are efficient at detecting, and removing infected pupae prior to the spread of disease, and removing pests from their hive.

Incubator – A protected area with regulated moisture and heat, ideally situated in a nursery.

Inspection – A process of evaluating a hive. Inspections include: external threats; hive condition; placement; effectiveness of cleansing flights; bearding; ventilation; and assessing debris. Internal inspections include: size of cluster; location of frames; development of comb; smell to initially detect disease and health; temperament; size of cluster; development of brood; laying pattern of queen; detection of laying-workers; drone cells and population; nectar and honey stores; invasion by hive beetles; assessment of mites; robbing threats; refilling feeders; growth issues and expansion; swarm risks; bee bread stores; assessment of quality of older wax frames; repair and cleaning of comb, including bridge and burr comb; potential for splits; moisture issues; are a few of these.

Landing board – A slanted entrance area attached to a bottom board, that aids the returning bees.

Langstroth hive – A vertical hive, patented in 1852 by Rev. L. L. Langstroth. Used with removable frames that utilize the 3/8” bee space.

Larva (plural, larvae) – The second stage of bee metamorphosis. A white legless grub-like insect that initially is fed with royal jelly. Larvae sex can be determined by the cell size, large being a drone, small being a female. Female larvae can be either a worker or a queen, depending on it’s diet.

Laying worker – Colonies that have been queenless and broodless for over 10 days may develop issues with laying workers. An unmated worker produces infertile eggs which develop into drones. Colonies with queens can have laying workers, but do not pose a threat as the mature bees manage them. Excessive drones pose a threat to the vitality of a colony. Drones produced by laying workers are poor quality mates for virgin queens.

Life Cycle – Queen bees can live up to 5 years, but usually 1-2 years. Worker bees live up to 6 weeks in the summer, and several months in winter. Drones die upon mating. Drones are forced out of the hive in early fall in preparation for the colony entering winter.

Mating Flight – A flight, or series of flights, taken by a virgin queen to a “drone congregation area” where she mates in the air with up to 15 drones. Artificial insemination replaces the “mating flight”.

Mating Nuc – A small hive where a capped queen cell is placed, waiting for the queen to emerge. Once emerged, it takes up to 8-21 days for a queen to effectively mate, depending on weather and local drone populations. 200 drones are needed per queen for breeding. Once mated, the queen may take a couple days before she begins laying. Once a queen begins laying, she does not engage in mating flights again.

Mead – Alcohol made with honey as the fermenter. Called honey wine, or honey beer.

Medium – A Langstroth style hive body or box, that is 6-5/8” high. Can hold up to 10 frames, for a variety of purposes: brood box, honey super, 8 or 10 frame, Nuc, or observation hive. Benefits of using a medium is, once full, it weighs about 40lbs.

Mini Urban Beehive – Designed and manufactured by Eco Bee Box (<http://www.ecobeebox.com>) and evolved from the Langstroth beehive. Four mini boxes are equal in outside dimension to a standard 10 frame Langstroth bee hive. The mini initially was manufactured as a shallow (5-5/8”), but now is produced as a medium (6-5/8”). The width of each box is 8-1/8” wide, and 10” long. This mini is compared to a Warre hive, but utilizes a hand-sized full frame with natural foundation. A mini hive have several options: flat flush mount top verses English Garden top with copper; multiple carvings; observation window; 5-6 mini medium foundationless frames; post stand bracket that fits a 2-3/8” steel pole; winter blanket; comes in copper or aluminum; stainless steel locking clips; and a top entrance with reducer.

Nectar flow – A period of abundant nectar producing blossoms.

Nuc (Nucleus) – A small colony focused on developing a queen or bees. Can be varying sizes, but typically a “nuc” is a smaller hive body. Can also be used to store, or bank, mated queens awaiting placement. 5 frame “nucs” come with 4 drawn frames of all varying types of brood, an empty frame for expansion, and a queen.

Nurse Bee - Young bees three to ten days old. They feed uncapped brood, as well as the queen. Also, act as attendants to the queen. No aggression, unfamiliar with defense.

Observation Hive – A hive made with varying degrees of glass or acrylic windows that allow visual non-intrusive inspection.

Package of Bees – 2lb – 5lb quantity of bees, usually with a caged mated queen of the beekeeper’s choice, and a liquid can of feed.

Pollen / Protein – Pollen is produced by the stamens of flowers, and brought back to the hive and stored in cells surround the brood chamber. Pollen is converted into bee bread and is the main source of protein for bees. This protein is critical for brood development and queen feeding.

Propolis – A sticky reddish-brown antibacterial substance that is utilized in sealing cracks, as well as overall hive and cell disinfection. It consists of over 190 ingredients collected from trees and plants (sap or other resinous materials) collected from trees or plants by foraging bees. Also, called bee glue.

Queen Bee – A mated female bee with a fully developed reproductive system. Usually only one queen per hive. She releases a queen specific unique pheromone that identifies her colony from others, and communicates with her family.

Queen cell – An elongated incubation cell for developing a queen bee. This cell looks like a peanut, and is about an inch long. There are queen “swarm cells” that hang off the bottom of a comb, or “supersedure cells” or “emergency cells” that are in the middle or edges of the comb.

Queen excluder – A metal or plastic device with spaces that permit the passage of worker bees and isolates drones and queen to a specific location in the hive.

Queen right – A hive with a viable queen.

Rabbit – Is a 5/8” x 3/8” recess cut into the top front panel, forming the frame rest. Eco Bee Box produces a replacement “rabbit” for damaged boxes.

Robbing – This exists when forage is limited, or a low nectar flow. Neighborhood bees, wasps, hornets and ants can test a colony’s defense system, and steal or loot their resources. Rodents can also pose a substantial threat. Any accidental morsels left after an inspection, water, nectar or honey feed, discarded dead, or hive debris too close to the hive can induce a robbing environment. A sloppy summer inspection of a top-bar or Warre hive can also produce relentless robbing.

Royal Jelly – A highly nutritious substance that is used to feed the queen and young brood. It is produced through glandular secretion in the heads of worker bees.

Slovenian AZ Hive – European framed hive, based on mounting inset in walls.

Small Hive Beetle (SHB) – The SHB is native to Africa and has been spreading worldwide. The larvae of this beetle, feeds on pollen and hive protein. Their excrement contaminates the hive and honey, creating awful fermentation. The small beetle flies onto the hive, and usually walks in uncontested. This invasive beetle lays eggs, which hatch and exits the hive to incubate in the soil surrounding the hive. The aggressive nature of the African Honey Bees prevents the Small Hive Beetle from becoming established.

Smoker – A device used to produce a low heat smoke, to mask bees alarm pheromones during inspections, or harvest.

Stinger – A female worker bee has a barbed stinger in their abdomen that contains venom. When provoked or threatened, a mature guard bee seeks to deter the threat by stinging. This sting releases alarm pheromones which attract other guard bees. The stinger stays embedded in the recipient of sting and rips out part of the abdomen of the bee, causing it to die.

Super – (See Honey Super)

Swarm – A group of bees that are relocating, taking with them: wax; honey; worker and drone bees; and if the first swarm – the mother queen. This activity can be a defensive behavior, as a result of an aging hive, or over-run with mites. This process will break the mite cycle, due to a break in brood production. A natural process in the life of a bee. A single colony can swarm a few times in a season, and vary in size from a fist, to large airline luggage. This is how a bee colony reproduces.

Swarming – The natural process of propagating a colony of honey bees. (See Swarm).

Thin surplus – A formed sheet of thin food-grade beeswax, ideal for new frames to aid the bees in forming straight natural comb.

Top-bar – Formally a “Kenyan Top-bar Hive”, with wooden v-notched top bars for bees to build naturally on. A form of horizontal hive. Produces comb honey. Summer inspections maybe difficult due to heavy warm comb. At times, the bees will attach the comb to the inner walls of the hive, requiring delicate separation. This separation may risk uncontrolled honey leakage during summer, causing robbing. A permanent large hive, not ideally suited for migratory beekeeping. Two suggested instructors, Philip Chandler “known as the Barefoot Beekeeper”, and Les Crowder.

Uncapping – The process of removing the wax cover on comb honey cells, prior to extraction.

Varroa Mite (*Varroa Destructor*) – A parasitic mite originally from Asia, where Apis Cerana has a natural defense of excessive swarming to combat this insect. Varroa is simular to a tick for a bee. It attaches to the bee and weakens it by sucking hemolymph (similar to blood), and as a result conveys viruses to the weakened bee. First found in the United States in 1987, this deadly mite has spread across the United States and is the major cause colony deaths. As of 2017, Australia is the only continent that has not been impacted by varroa.

Virgin Queen – A queen bee that has not mated.

Warré Hive – Developed by French pastor Abbé Emile Warré in early 20th century, who felt the current hive would be the death to beekeeping. A form of vertical hive with an inside diameter similar to the hollow of a tree. Usually begins with all boxes intact, allowing the bees to fill the cavity from top down. Utilizes wooden v-notched top bars for bees to build naturally on. Produces comb honey. Summer inspections maybe difficult due to heavy warm comb. At times, the bees will attach the comb to the inner walls of the hive, requiringdelicate separation. This separation may risk uncontrolled honey leakage during summer, causing robbing.

Wax Moth – A moth, Golleria mellonclia, that feeds on old dark wax inside a hive. Moth eggs are laid in a hive and if the colony is weak, or vacant, the moth is permitted to thrive. The larvae of the moth burrows through the empty comb destroying it from the inside out. A visual inspection of an invested hive covered with sticky spider type webs, cocoons, larvae, and tiny moths. A healthy bee colony keeps wax moth in check. When a colony fails, first robbing removes the honey and pollen stores, followed by this moth devouring the remaining wax. Wax moth does not consume American Foulbrood scales. The result of the moth is it consumes all the wax, preparing the hive for new occupants.

Winter Cluster – Honey bees survive the winter by forming a ball-like cluster of mature bees. When no brood is present, the cluster temperature is kept at about 85°F (29°C). When brood is present, the cluster maintains a constant temperature of about 93°F (34° C). A winter cluster will move in fall from a low position in the hive, to the top of the hive.

Winterizing – A process of preparing a hive and colony for winter. May include a covering on the external part of the hive, and candy boards inside the hive. Winterizing also involves an inspection to determine needs of the colony. A fall treatment for Varroa is usually performed in areas at risk. A colony winterizes their hive as well, propolizing uncontrolled air passages, and forcing drones out of the colony. Risks include excessive moisture from consuming liquid stores, so moisture cloths are used to wick out detrimental water. This winter moisture can kill a colony, as well as produce fungus and molds.

Worker bee – A female bee with underdeveloped reproductive organs. A majority of the honey bees in a hive are worker bees that do all the work, except for laying fertile eggs.

Varying Sizes, Assemblies And Styles

A better, stronger more sturdy hive with little-to-no maintenance is needed so that a beekeeper can focus on the bees and honey production. Eco Bee Box has parts to repair, enhance, replace, make them windows to the world and they are an evolutionary leap forward in hive technology. Our pillar is advancement Thru Education, Practice and Research.