

Bee Culture's

BEEKEEPING

Summer '16

YOUR FIRST THREE YEARS



CITY BEES & BEEKEEPING

TOP BAR HIVES: YEAR 2

SPRING MANAGEMENT

REGIONAL REPORTS

ROOT PUBLICATIONS \$6.99
 Leave on Newstand Through June 62 >

0 74470 29478 8

BEE Keeping

- 5 **WHY BEES**
JOE TRAYNOR
- 7 **COOL NEW STUFF**
- 9 **CITY BEES**
ROOFTOP APIARIES
TONI BURNHAM
- 15 **YEAR 2 TOP BAR HIVES**
CHRISTY HEMENWAY
- 18 **COLONY DEVELOPMENT**
LARRY CONNOR
- 23 **BEE SPACE**
ROY HENDRICKSON
- 26 **LIVING WITH A SMOKER**
JAMES E. TEW
- 29 **CATCH THE BUZZ**
- 30 **BORING SPRING
MANAGEMENT**
ROY HENDRICKSON
- 32 **WHAT YOUR
MENTOR FORGOT!**
ED SIMON
- 38 **ALLERGY TO BEES?**
NANCY WADE
- 41 . . **DEEPS, MEDIUMS, SHALLOWS**
ROSS CONRAD
- 44 **REGIONAL REPORTS**
- 48 **SECOND & THIRD YEARS**
MATTHEW ALBERT
- 50 **SWARMING**
STEVE REPASKY
- 53 **WITHOUT CHEMICALS**
ERIC TALLEY
- 55 **THE EDITORS HIVE**
KIM FLOTTUM
- 56 **BUILD A SWARM BUCKET**
ED SIMON
- 58 **PHIL KNOWS!**
PHIL CRAFT
- 60 **GOOD STUFF FROM ANN**
ANN HARMAN
- 62 **INSTALLING PACKAGES**
KIM FLOTTUM

800.289.7668

Publisher - John Root
Editor - Kim Flottum, Kim@BeeCulture.com ext 3214
Editor - Kathy Summers, Kathy@BeeCulture.com ext 3215
Layout & Design - Allexandrea Nank, Joy@BeeCulture.com ext 3220
Social Media & Event Specialist - Amanda DeSimone, Amanda@BeeCulture.com
Advertising - Jean Newcombe, JNewcombe@BeeCulture.com
Summer 2016 Volume 1, Issue 2, is published quarterly
By A.I. Root Co., 623 W. Liberty Street, Medina, OH 44256
Advertising - 800.289.7668, Ext. 3216; JNewcombe@BeeCulture.com
Newstand Price \$6.99
Published by the A.I. Root Co. Copyright© 2016. All rights reserved



Photo by Kim Flottum

Why Bees?

~Joe Traynor

Ask a beekeeper – commercial, sideliner or hobbyist – why he/she keeps bees and the answer could be any or all of the following.

1. The opportunity to be outdoors – to commune with Nature
2. Fascination with observing the organizational skills and inner-workings of honey bee colonies
3. Setting yourself apart from the crowd – delving into a vocation or avocation that few would consider
4. Producing honey
5. To earn a living
6. For the therapeutic value of bee stings (or for masochists)
7. For the relatively independent life-style
8. You inherited a bee farm

One or more of the above answers probably fits many beekeepers, but from a five year stint running 500 colonies + 30 years of observing commercial beekeepers, I have concluded that the major reason people keep bees is difficult for them to articulate because it is so embedded in the fabric of the endeavor that it doesn't stand out and is therefore not readily apparent – a “can't see the forest for the trees” phenomenon.

Here's my take (and I certainly won't argue with anyone who feels differently): the main reason we keep bees is to experience the highs and lows that come with the job. What other occupation can provide so many highs and lows?! – not only from year to year, but from month to month, day to day or even hour to hour as one tends hive after hive during a working day. The dour German philosopher Arthur Schopenhauer has stated “To overcome difficulties is to experience the full delight of existence” Welcome to the world of beekeeping Professor Schopenhauer!

For a commercial beekeeper, going from one apiary site to the next can be a roller coaster ride – exhilarating if all the colonies are packing in nectar and pollen, depressing if one finds disease or pesticide damage or that another beekeeper has parked a semi-load of bees across the road from your location.

Beekeeping highs and lows can also be experienced in a single apiary site on a given day as one goes from a robust colony to a failing colony only a few feet away. When spending a day in an apiary of about 100 colonies – re-queening, medicating, feeding, if necessary – many beekeepers have learned to end the day with a top-producing colony, thus allowing a pleasant ride home and a restful sleep that night. Ending the day with a sick colony can put one in a dark mood followed by a silent supper and a restless night of sleep. For the backyard beekeeper with only two hives, it may be more difficult to wind up the day with a gang-buster colony – add two more colonies to improve the odds.

The highs and lows of beekeeping usually Fall into a seasonal pattern. As colonies build up in the Spring and happy, busy workers communicate ever expanding flower sources, the beekeeper can't help but catch the mood of the colonies and feel that all things are possible. An occasional cool spell in late Spring or early

Summer can trigger a nosema outbreak for the unprepared beekeeper but the Summer months are generally happy months for both bees and beekeepers as nectar flows continue and extensive brood-rearing keeps colonies well ahead of any visible damage from omni-present *Varroa* mites. In contrast to Spring, the Fall months, and certainly the Winter months, can be tough as colony populations shrink and beekeepers face the onerous, often depressing task of culling out or killing weaker colonies that might not make it through the Winter or that will require expensive feeding and medication to meet February almond pollination standards (usually eight frames of bees).

When honey bees are thriving, the beekeeper enters into an unspoken pact with his charges: you help me, and I'll help you. Or, as some beekeepers have put it: if I take care of my bees, my bees will take care of me (a basic axiom of commercial beekeeping). A silent, cooperative bond develops between bees and beekeeper when the bees are thriving, so one can understand why a beekeeper might feel betrayed when he enters a bee yard in the



A pile of memories.

Fall and robbing bees inflict multiple stings during his attempts to service their colonies; the beekeeper might mutter under his breath: ungrateful so and sos – after all I've done for you this year, you treat me like this?? It's as if your always-friendly, always-loyal dog snapped at you when you fed him instead of licking your hand in gratitude. The beekeeper inherently knows that such thoughts are not rational – that bees respond to environmental cues and have no concept of any relationship with their keepers – but it's still difficult for a beekeeper not to feel resentment if/when their bees become aggressive in the Fall. Taking the bees' point of view, they may feel that the friendly giant that worked side by side with them in the Spring has turned into a menacing intruder that must be repelled in the Fall.

In his detailed scholarly article, *The Fall and Rise of the Honey Bee*, Peter Loring Borst reminds beekeepers that the 30+% Winter losses currently incurred by U.S. beekeepers are no different than the losses reported during the 100 years prior to the introduction of *varroa* mites to the U.S. and to the later finding of *nosema ceranae* here. It is a tribute to the skill of today's beekeepers that they can continue to hold Winter losses at historic levels. Certainly, shrinking bee habitat and the efforts needed to control *varroa* and *nosema ceranae* have made beekeeping far more difficult today than in past years but overcoming these difficulties can provide the "delight" envisioned by Schopenhauer.

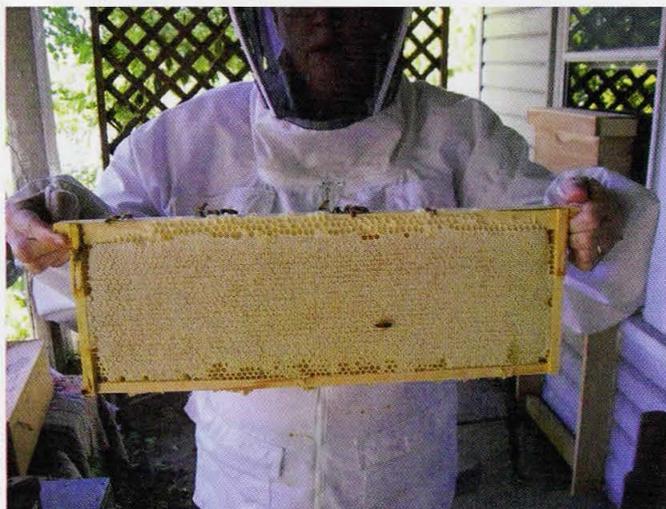
Bee colonies in temperate climates cope with Winter by reducing their metabolism to remain young and to preserve resources (much like hibernating bears). Although hibernation is not an option for beekeepers some have adopted another honey bee strategy: repairing and upgrading equipment. Bees plug cracks and holes in their homes with propolis as Winter sets in. Beekeepers sort, replace and repair old combs and supers. Keeping busy is a proven antidote to the Winter blahs.

The extreme contrast between the euphoric days of Spring and the somber, shorter days of Fall and Winter sets a beekeeper up for mild to severe manic-depression. Little wonder that more than one commercial beekeeper has been diagnosed as manic-depressive (aka bi-polar) and that many more lie along a continuum from mild to moderate manic-depression. Many individuals in the general population are also susceptible to depression during the shorter Winter days, but most are isolated from nature's cues. For beekeepers, the silent, dormant state of honey bees in the Winter is a constant reminder that things aren't quite right. The highs of beekeeping are much higher than those experienced by the general public, and the lows probably lower as the bees transfer their moods to beekeepers during the year. A future psychiatry journal may well contain an article: *Transference: Explaining the above normal incidence of manic-depression among beekeepers*. A number of drugs are available for those with clinical manic-depression but it can take time to arrive at the proper combination

or dose for a given individual. Some manic-depressives quit medication because they miss the euphoric highs of past years – they have also discovered that they can get twice as much work done and require very little sleep during their high or manic intervals. An understanding spouse is probably better than medication in treating manic-depression (here's to the long-suffering wives of manic-depressives!); the camaraderie enjoyed with fellow beekeepers at Winter bee meeting can also pull one out of a depressive cycle and for California beekeepers, a wet Winter can be uplifting.

Knowledge and patience are tools that can be used by beekeepers that suffer from Winter depression: knowledge that the days get longer after December 21st and that Spring always has and always will follow Winter; patience to hold on until almond bloom starts in February. Here's a sure-fire cure for beekeepers that suffer from Winter depression, especially suitable for those

that store their bees in controlled-temperature buildings in December and have a competent person monitoring the storage facility: Schedule a trip to the southern hemisphere – Australia, Chile, New Zealand, South Africa – and poke your head into a few bee hives while you're there. When you return in time for almond bloom you will enjoy a seamless re-entry and be better able to cope with that picky almond grower or bee broker who complains that your bees aren't working like they



Only one of the rewards should (the remedy: suit him up and open a few hives for him).

Beekeeping can be one of the most rewarding of all professions if one can overcome our current challenges. Pity the poor accountant, bank teller, bank CEO, stock broker or government bureaucrat who must endure day after day of the same old monotony. Relish and retain the highs of beekeeping and develop coping mechanisms for the inevitable lows, buoyed by the certain knowledge that the highs will surely come again and may well be just around the corner.

Note: This article is not meant to imply that most beekeepers suffer from any degree of manic-depression – many are totally immune from the malady. As one who has been hit by the depression demon from time to time, the intention here is to ensure affected beekeepers that they are not alone and that measures exist to minimize depression. Those that have depression-immunity may have wasted their time reading these words but if their immunity has a genetic basis they might well consider volunteering for a DNA analysis by Monsanto in the hope that as DNA data accumulate, Genetic Modification will eventually cure depression in everyone. 

~Joe Traynor a pollination specialist and long time beekeeper living in Bakersfield, CA

CITY BEES

~TONI BURNHAM



Rooftop apiaries are probably the signature image of urban beekeeping. Downtown, we are often short on personal space, and long on neighbors, but the sky is wide open. City rooftops have surprising benefits for both bees and their minders, though like every other hive site, local features will have a lot to do with both upside and downside of skyside beekeeping.

There is one major advantage to urban roofs that needs to be mentioned right away: despite any concerns we may cover here, the presence of large, increasingly green city rooftops means that almost any urban dweller should be able to find a safe and healthy place to partner up with *Apis mellifera*!

In fact, I am a beekeeper because of the rooftop paradise we encountered when we moved here. Our roof has a flat deck, and you reach it via a spiral staircase to a level where the bees are looking straight at trees and not at frightened humans. My roof practically demanded that I take up beekeeping. To be fair, you may have to convince yours.

Looking at the upside of rooftop beekeeping, many rooftops greatly reduce neighbor and vandalism concerns, and there are some pests which don't seem to do as well a story or so above ground. On the downside, beekeeper access can be difficult or even dangerous, hive moves achieve new dimensions in complexity, and wind has a whole new role to play. Luckily, others have come before us to tackle some of these problems, and we can look at a few cases here.

And a disclaimer: Nature being the way she is, you are likely to encounter variables not covered in this article, but here's my "Top Ten List" of issues which potential urban rooftop beekeepers should consider up front.

The Rooftop Beekeeping Top Ten:

- 1) Access
- 2) Beekeeper Safety
- 3) Honey bee Health and Safety
- 4) Structural Safety
- 5) Neighbors, Vandals and Other Third Parties
- 6) Honey Harvests On High
- 7) Moving a Rooftop Hive
- 8) Pest Management Issues
- 9) High Altitude Habitats
- 10) Wintering on the Roof

Number One: Access

As important as the bees are, your beekeeping plans have to start out with how you are going to get all the pieces into place, and how you are going to manage to take care of them and yourself over the long haul. History shows that stairs, hatches, and ladders can quickly turn into a very long haul. Also, many rooftop beekeepers share their roof with other tenants, or may even have an out apiary on a roof that does not belong to them. In many cities, beekeepers have hives on publicly owned buildings like community and recreation centers, and it is not unusual for a business (especially a hotel or restaurant) to solicit a beekeeper to place colonies on their premises. These hive hosts, however, may impose access rules or restrictions that you have to take into account in your management plans.

Getting Established

You can set up a rooftop hive several ways, fortunately. And don't be foolish: never attempt heavy maneuvers at altitude alone.

If you have access via a wide opening like a doorway or a bulkhead, you can move a nuc or split relatively easily, and can bring fully constructed hive components via additional trips. Many of us are lucky enough to have stairs leading up to a roof door or hatch, but it is possible to lift complete components up a sturdy enough ladder



Smiles with bees on the roof

(preferably angled and with good treads to avoid slippage).

At the Trinidad Rec Center, we used a high quality hand truck with good thick rubber tires to set up the apiary there. We lashed a three-medium hive (secured with staples) to the body of the cart and lift/rolled it up a ladder, rung by rung, from above and below through a hatch used by the HVAC people when they move components. Remember, if your roof has large equipment on it that someone repairs, it is worth your while to get to know the maintenance team and learn how he or she gets the job done.

After this adventure, my co-conspirator Del Voss used his ex-Iowa farm boy expertise to build a Hive Crane from parts in farm implement catalogs. His crane can be secured on a roof with cement blocks and can lift a small hive a couple of stories. (He also uses the thing to lift mature hives off of rickety stands so the latter can be reinforced or replaced—my hero!)

When the hatch is small

Most of the townhomes in this city do not have full sized doors or hatches for roof access. In these cases, beekeepers often carry up unassembled hive parts up and hammer them together on site. Packages are easy to carry up and install, nucs a little more tricky. Just remember, for harvests, splits and hive moving purposes, what goes up must come down! We have hints about this later.

Tools and feeding

Most beekeepers end up carrying loads of stuff around with them as they tend their hives, and running to get a missing tool, or making separate trips for sacks of sugar or buckets of water have a whole new meaning when a hatch and a ladder and several flights of stairs lie between you and your kit.

Beekeepers need all that stuff. One of my favorite early beekeeping stories comes from the Montgomery County Beekeepers 2005 Field Day. Several experienced beeks were taking a few dozen newbees through our first hive inspections when a swarm landed 40 feet up a tree in the same apiary. Before you know it, middle-aged beeks in veils were running to their cars, one grabbed a saw, another a hundred feet of rope, someone had bed sheets, one an empty nuc box, and another was up that tree before the car folks got back. They got the swarm, but I got the impression that they were absolutely nuts.

However, today my car contains, among other things, just about everything you need to take down a bee tree. Beekeeping is like that. How are you going to guarantee access to all the stuff you need when you are a couple (or more) stories up?

At most of our rooftop apiaries, we either request storage space in a nearby stairwell or place a waterproof plastic container (secured with bricks, bungee cords, or both) with a minimum set of 2 hive tools of different types, a bee brush, entrance reducers, note pad, pen, smoker, fuel, lighters, hat veil, gloves, and a sealed white plastic HDPE bucket with a bag of dry cane sugar inside. Some sites keep complete jacket veils on site, but if the public has access, those can be expensive to lose. We also post a "Warning: Apiary" type of sign within 20 feet of the hives.

We are lucky in that many of our roof sites have working hose nozzles, and at some folks have rigged a hose up the back of the house. If not, you will have to haul your own H₂O up there. Use the plastic bucket for mixing food on site (if robbing is not an issue at the time). And keep in mind a water source for your bees!

Case Study One: The Less-Than-Perfect Roof

Matt Braun started his third year as a rooftop beekeeper in 2012, and his hives are on the roof of a row house on Capitol Hill. They're about 2.5 stories up, though his neighbor's house is one story taller and provides a decent windbreak.

Matt has a slightly slanted, antique tin roof with ridges and a small wooden hatch in the ceiling of his spare bedroom. Matt finds that being on the roof adds a bunch of complications that terrestrial beekeepers don't have to worry about. In no particular order, here are some things that he's spent a lot of time thinking about:

1. As his wife likes to point out, the roof structure and the surface are designed to keep weather and water out, and not to hold hundreds of pounds of bee hives, and more importantly, to hold up to foot traffic. Some roofs are certainly sturdier than others: his is 86 years old. Matt occasionally lies awake at night in bed staring up at the ceiling, wondering if the roof is about to give way, and 60,000 startled honey bees are going to come pouring through the roof. Realistically this probably isn't too much of a worry, but leaks are. Water damage from even a small leak could cost a small fortune and ruin your relationship with fellow residents (or the landlord). So, you have to be confident that the roof is going to hold up, and you should be vigilant about inspecting for damage, recoating more often than is the norm, and minimizing the number of extra people you take up there for show and tell.

2. On a similar note, I recommend a hive stand that spreads the load out, preferably perpendicular to the direction of the joists. This could be a pain with the metal ridges, and if the roof isn't flat. Matt cut 2x8s on an angle and ran them parallel for ~8 feet. You're probably planning on one hive, but spend a lot of time thinking about your stand, and make it from day one with space for a least three hives. When you're standing on the roof with a recently collected swarm in a burlap sack and need a place to dump them you'll be glad you planned ahead.

3. Invent a system where by the screen bottom board isn't dumping directly onto the roof coating. Lots of wax/propolis/crap builds up down there and it makes it harder to keep an eye on the roof itself underneath.

4. Matt's hives originally were not strapped down in any way – the telescoping covers had two bricks on top, and that was it. For about 24 months, that was fine. Since then, he recommends building a strapping system into your hive stand, especially if you're higher up and more exposed. If a heavily laden hive fell in strong winds, it could easily punch a hole in the metal roof. Also, if something goes wrong, you'll likely only figure it out on your next inspection since you don't see the hive every day like you would in your yard: the stakes are a bit higher. The rational engineer in Matt didn't think he needed straps at the beginning, but then his emotional human side concluded that he'd sleep better through Super storm Sandy with them, so he added them this Summer. And the hives did fine!

5. Carrying things up and down through the hatch is a pain. When you forget something and have to run back down it's a hassle. If you can leave tools on the roof in a plastic tub (also strapped down so it doesn't fly away), it'll save you a lot of suffering. Similarly, maneuvering through the hatch and down a ladder carrying a 10 frame medium super full of capped honey is really difficult/dangerous (31 year old male in reasonably good shape here). I won't be doing that again. I'm building some boxes to carry four or five frames at a time.

Matt's bees haven't had any problems from the hottest Summer days or the windiest Winter nights. He says that all new beekeepers seem to worry about those things, but in practice they are rarely problems.

Matt's advice basically comes down to plan really well before you bring a colony home. Everything is more logistically challenging on the roof. He promises that you won't regret spending extra time working out as many details ahead of time as possible. Do whatever it takes to ensure your peace of mind on the windiest stormy night.

Case Study Two: Out Apiaries, or "What if it's not your roof?"

If your bees are not located on a roof which you own, you have special responsibilities and potential liabilities to other, non-beekeepers, as well as the chance to keep bees in locations that may be healthier than the limiting hive site options in tiny ground level yards.

For many urban beekeepers, their first hive is not going to be located in the same place they are living, especially for those in apartments or condos, or in rented accommodations. Many beekeepers are able to find public beekeeping programs at gardens or recreation centers, or are invited to place their hives at businesses such as hotels or restaurants, or even at their employers.

In many cities, building LEED-certified green buildings (with green roofs!) is the norm, and beekeepers are finding it relatively easy to pitch beekeeping to organizations that are already making these investments.

The opportunity is there, but it is always wise to weigh it against risks and responsibilities. And it is a good idea to get them spelled out in advance – key contacts, access times and means, on site storage, core responsibilities, what happens in case of damage, and what arrangements are necessary for exiting or expanding the apiary, among others. Look online for sample agreements related to public beekeeping, and consider adapting them for your apiary's needs!

In 2009, Izzy Hill, Chloe Wardropper, Rebecca Davis, and Gretchen Anderson launched an apiary that has since grown to three thriving hives on the roof of a community center in the most densely populated part of their city. They got help from, and volunteer for, a beekeeping education project sponsored by the Parks Department and Whole Foods.

There were strings attached with the offer of this apiary. The new beekeepers were expected to help care for publicly owned hives in the same apiary, and to participate in education and outreach programs involving both of the sponsors. Located above playing fields and fountains, they were also expected to keep an eye on swarms, robbing, and the need for water. Finally, they had no access to the apiary on Sunday at all, and could only get nighttime or early morning access with special

assistance, arranged in advance, from official staff members.

Sundays have developed into nail biters. Several major windstorms and blizzards have pelted DC on Saturday nights over the past three years, with hives located five stories up and wind barriers only on one side. The beekeepers made it through the first storm with no damage, and quickly ferried large cement blocks up to the roof and placed them on tele covers. Thus far, snow loads have not blocked lower entrances, but the beekeepers maintain upper entries just in case.

The Spring of 2012 was also a rare one for swarms in Washington, DC, and Izzy and Rebecca's hive popped out a monster, which attached itself to a tree trunk next to a very popular basketball court. Luckily, a history of close communication with not only the key staff member but also the front desk and the maintenance staff (and just about anyone in the building who showed the least curiosity) resulted in a quick phone call to an available beekeeper, as well as an invitation to bystanders to watch the swarm get hived from a safe distance and learn more about honey bee behavior and the environmental strength of their neighborhood.

Because everyone knew about the bees, knew who to call, and saw what a quick and informative response they could get, the program only got stronger.

When key collaborating staff left the Park department, it became important to seek out and develop a new relationship with her successor, who might not share the same interest in public beekeeping! Thus far, that request has come in the form of a greatly ramped up public education schedule, which is a challenge for such a small team of beekeepers. The next stage is to sit down and negotiate a clearly spelled out set of responsibilities and guarantees by both parties – something missing before now – including emergency contact plans as well as some scenarios for current participants exiting and others entering the project as needs change.

Just recently, the beekeepers harvested three supers of honey from this apiary, with several bottles designated for the public hearing on the broader legalization of beekeeping now under consideration. Their efforts have been a key component in making these steps forward possible, in part because keeping bees on someone else's roof inevitably leads to talking about bees with people who would never have encountered them any other way!

Number Two: Beekeeper Safety

While it's a shame if an apiary does not work out for the bees, it's a tragedy if it causes harm to the beekeeper. Call it common sense, but look after yourself first when you are running around a story or more above grade.

Factoring in everything we said about access, remember that a Fall or a back injury from hefting yourself or your tools and hive parts onto roofs ups the ante considerably. Take it slow. Take several trips, rather than rushing it all into one or two. Bring a buddy with you as often as you can when tending a rooftop apiary, and failing that, bring a well-charged cell phone. Keep it within reach.

Your bees are not the only ones who need water up there: during the Summer, you will, too. I put a weather station up next to my hives the same year they were installed, and discovered that Summer temperatures were routinely five to 10°F higher on the roof than on the ground, with less shade. Too many beekeepers let themselves get dehydrated in the average Summer

beeyard: dizziness brings an additional hazard at elevation.

Throughout the year, we've recorded roof wind speeds that were not as high as the airport, but much higher than at ground level. Don't leave a lot of loose stuff (buckets, feeders, bottom board inserts, dead frames, etc.) laying around for you to trip on or to blow into your or a neighboring yard.

Finally, site your hives well away from roof edges, and let the bees fend for themselves during thunderstorms, hurricanes, and tornados. Even if they get toppled, they have handled worse, but you probably haven't.

Number Three: Honey bee Health and Safety

Roofs are actually fairly groovy places to be a bee. Dr. Tom Seeley tells us that they would prefer to be at least 40 feet up in a tree anyway, and in places where trees are their main forage, rooftops are like front row seats.

Nonetheless, some roofs hold unnatural hazards for honey bees. Mine has air conditioning units and satellite dishes, bigger buildings have all this at a far larger scale, with additional ventilators for things like kitchens and furnaces and labs that may not be honey bee friendly.

If you have a choice, try to site your bees far from any roof edge, but also a good distance from machines that vibrate or blow fumes. Windbreaks make all the difference in long term hive vitality, and you can try to provide one (shrubs, pallets, hay bales) if you want to experiment.

On your initial site survey, keep an eye out for equipment that leaks (especially air conditioners) or other pools of suspicious liquid that might prove tempting to a thirsty bee. Make sure there is something better, like a really murky tray of algae filled water that you provided, if you think this might be an issue.

Some beekeepers have reported that pools and fountains have created honey bee problems, for different reasons. Fountains that run all Winter do that by using antifreeze – hazardous to bees as well as family pets – and some of the more luxurious apartments or hotels have them.

On the benefit side, it appears that pests like Small Hive Beetle have a relatively harder time completing their life cycles on roofs (though they can continue to fly in) and *Varroa* and wax moths are rumored to struggle a bit more in this more highly ventilated environment. Bees in North America do not seem to mind the hotter and colder temperatures, though I have used fans that help cool the hives on the hottest days.

Number Four: Structural Safety

If your potential rooftop apiary is on a private residence or an older public building it pays to have a look at, and account for, the structural strengths and weaknesses of the roof.

My roofer advised me to place my hives as close to the bearing walls as possible, and directly over roof joists that he identified for me. For townhomes, bearing walls are often the party walls between units, and they often jut above roof surfaces. This provides a double benefit of a windbreak and visual barrier from neighboring structures.

He also provided me with a protective roof walkway pad that I could place over the roof membrane itself in the places I would be traversing most frequently. These are available online in 30' rolls – consider splitting one with a friend.

If your roof surface requires a hive stand, place its

supporting members on joists and near bearing walls if at all possible, and try to spread the load, especially if your stand will hold more than one hive. It might not be a bad idea to use a skid proof pad here, too.

Try to watch the loads placed on your roof by numbers of visitors or the kinds of activities you undertake up there. I once terrified a fellow beekeeper by jumping around on his antique roof, trying to dislodge a swarm from an overhanging tree branch. Duh.

Educate yourself about the strengths and weaknesses of the roof surface you have been dealt. I found out the hard way that I needed to be more careful where I put down my lit smoker. Prepare to be honest with yourself if your roof needs significant repair before it can take on such a role, or if it's just not the right place for you or your bees.

Number 5: Neighbors, Vandals and Other Third Parties.

Probably the main benefit of urban rooftop beekeeping is the extraordinary solitude and separation from the ground level hubbub it brings, but even here other people do play a role. In the city, there is a strong statistical likelihood that you will run into someone who does not want bees and does not want to hear about it. Roof apiaries tilt the odds in the bees' direction!

Hiding in plain sight is just good policy for a home apiary in dense environments. It means that the people paying attention to your bees are more likely to be on the lookout for them because they appreciate them. While I am lousy at keeping them secret (I write about bees in magazines, for example) about half of my neighbors still have no idea what I am doing up there. And we are both happier that way. My apiary is visible from an apartment building about a block away, so I painted the hive bodies the same color as the trim of my house. Most times, I think the hives look like additional HVAC gear.

We have had sad conflicts where rooftop beekeepers here have had to remove hives in adverse conditions due to neighbor threats and complaints, and I do believe this could happen to anyone. The roof can protect you from a lot, but not from stupid or angry. You can do a lot to prevent the latter with good hive management, but there is no cure for the former. Try to manage your risk by lowering your profile and figuring out, in advance, with whom you are going to share.

Rooftop vandalism is rare, but if other people use the roof, make sure you post a sign that indicates that the bees are there, and that they are beneficial, but that unauthorized visitors place themselves at risk. It is a good idea to communicate in advance with other roof users to prevent inadvertent interactions, and to build channels of communication that might come in handy if a swarm emerges or a weather event or accident topples your hive.

In summary, if it's your roof, it's your business, but if you are sharing premises, be prepared to share information and expectations. 

~Toni Burnham Keeps bees on rooftops in the Washington, DC area where she lives.

YEAR 2 OF A TOP BAR HIVE

~Christy Hemenway

Well! Here it is, Spring again, the weather has warmed, there is bee food in bloom, and your most recent trip to the top bar hive(s) in your bee yard or back yard has you fairly hopping with excitement. The hive is thriving!

Congratulations on joining the growing ranks of top bar hive beekeepers who have successfully overwintered a top bar hive! Surviving Winter can be more of a challenge if you live in a cold climate than if you live in a place that is perpetually warm and has bee forage all year round, but wherever you live, here you are now going into Year 2 with your top bar hive.

So...what do you do now? What a great question to need the answer to!

If Spring has truly sprung in your bee yard, and there is early Spring forage available to your bees - your first step should be to reverse the steps you took to provide the hive's Winter protection. If you built a windbreak, now you can dismantle it. If you wrapped the hive, unwrap it. If you insulated inside your roof, remove the insulation. If you installed a mouse guard - remove that as well. On a nice early Spring day, with appropriate temperatures, inspect your hive. Be sure to check their food stores, and look for early signs of swarming, such as the building of queen cups or cells along the edges of the combs.

Now let's consider - what's different between Year 1 and Year 2 in your top bar hive? In general there are 3 significant factors that figure into your second year management:

1. You've got Wax!
2. There's honey, Honey!
3. You're about to have MORE BEES!

1 You've Got Wax. The most important difference and the most obvious - is that now, instead of an empty wooden box filled with blank top bars and a loose batch of bees hanging down from those bars in a tight cluster, you now have a box filled with drawn comb - and not just any old drawn comb, but natural wax combs built by your bees without the use of any artificially sized foundation.

All that beautiful natural wax means that your bees can change their focus - from start-up to build-up. Instead of devoting a lot of their energy to building their combs from scratch, the bees can concentrate on Spring brood rearing, and early season foraging.

The trickle down benefit of this one fact - drawn WAX comb - is widespread. It will help them expand the

brood nest more quickly, and earlier in the season. This will soon mean a bigger field force, and that means more nectar and pollen being collected, which means HONEY, and... it will soon mean - MORE BEES!



2 There's honey, Honey! As a general rule, the focus of top bar beekeepers is to support the bees' natural systems going on inside the hive. So it's very likely that a first year top bar hive went into the Winter with all, or certainly most, of the honey they were able to produce in their first season. It's typical for a top bar beekeeper to harvest honey in the Spring, after the bees have survived the Winter on their own natural food. But now it IS Spring. There is bee forage everywhere, and more on the way as the season progresses.

Take into consideration what you know about the bloom season and the nectar flow in the area where your bees forage. Look around your bee yard or your backyard - what is available for your bees? Watch your bees - are they coming back to the hive with full pollen baskets? You may not know where they are gathering food from, but you can see the signs that there is food out there.

Some of the earliest sources of nectar and pollen include dandelions, maples, and willow. If those have begun blooming, the weather is warming, and your area is more or less past the danger of a late Spring frost, then you should take a look at what your bees have left in the way of honey stores, perhaps even with an eye toward having a bit of it for yourself - a sweet celebration - and the bees have a full season to make more, and to prepare for Winter once again.

There are two ways to enjoy this treasure of the hive. When your bees have made their own wax in a treatment-free top bar hive, that wax is free of the chemical contamination in wax foundation. This makes it a perfect candidate for a premium product: comb honey. To harvest honey as comb honey, simply remove it from the hive, gently shake and/or brush the bees from the comb, and cut the comb away from the top bar. Have on hand, hive-side, an appropriately sized container with a tight fitting lid, to prevent the bees from getting back to the comb.

Take the comb inside, away from the bees, and lay it out on a flat surface such as a cookie sheet. Use a sharp



knife to cut it to fit your choice of storage containers. If you have never had comb honey – I suggest you treat yourself to an extraordinary taste experience: Toast a piece of bread, then with a butter knife, spread a chunk of comb honey on that warm toast. Known as “bees on toast,” the light crunch of the warm toast and wax, along with the sweet honey is exquisite.

If you would like to harvest liquid honey – remove the comb from the hive in the same way, then crush-n-strain. Place the comb into a strainer. A 600 micron paint strainer from the hardware store is fine enough to remove wax and bees parts, but still leave the pollen, preserving the terroir of your local honey, as well as its nutritional and medicinal benefits. Crush the comb to open the capped cells. Allow the honey to drain through the strainer. Bottle in a glass container of your choosing. Honey can crystallize over time, so be sure to avoid plastic containers; partly because of the taste they can impart to your honey, and partly because you want to be able to de-crystallize the honey by setting the jar into warm water in order to melt the crystals back into liquid. A plastic container may be damaged by heating.

3 You're about to have MORE BEES! Your thriving hive now represents something very important to the bees themselves. If your hive did not make an attempt to swarm last year, you can be reasonably certain that they will this year – so it's important that you be prepared to manage the bees' swarm impulse.

Knowing that you're about to have more bees, you can make some thoughtful and purposeful decisions. The first question to ask yourself is, do you actually want more bees? Do you have additional hive equipment; do you have enough space; do you have the time to care for more hives; do you really WANT more bees? If you do, then you should “manage for increase.” This means you do all you can to help your bees to reproduce at the colony level and to increase the size of your apiary.

If a larger apiary is not for you, consider doing one of two things:

- Do what you can to slow the swarm impulse, and possibly convince your bees that they aren't so big and bad as they thought they were, and wouldn't they really rather stay in the box and make lots of honey for you this year?
- Support the swarm impulse, and share those bees with another top bar hive beekeeper.

So... if you DO NOT want more bees, how do you slow the colony down, and convince them to stay home? The way to do this is to increase the amount of empty space in the brood area of the hive. We call it “opening the brood nest.” Increase the available space in the brood nest slightly – by inserting empty top bars into the “new” end of the brood nest. You want to do this somewhat judiciously, since the bees build each bar specifically to rest against its next-door neighbor, which you can see by the shape of each comb. Insert a blank bar between 2 bars of existing comb in the newer end of the brood nest, skip a few existing combs, insert another blank bar, skip a few more combs, then insert a third. This technique is disruptive to the purposeful building of the bees' brood nest; so 3 is the maximum number of bars you should add at one time. One thing that drives the swarm impulse is the sense of becoming crowded. Opening the brood

nest in this manner lessens their sense of being robust or feeling crowded.

Or... If you do not want more bees, but can provide thriving bees for another top bar beekeeper who does – we call this “paying it forward.” This is a good step in the direction of sustainability – and it also points out another important fact about hive equipment – that is, the need for hive parts that are interchangeable with other hives. For you to be able to split your hive and to pass the split along to another top bar beekeeper, your top bars must fit into the other beekeeper's hive. That way the new beekeeper can trade you blank top bars for top bars with bees and comb on them, and everyone will still have the requisite number of top bars to fill their hive.

To split the hive, have on hand a “nuc box.” Any box that will safely hold 6-10 top bars while they are being transported to their new home will work, the best choice would look like a short version of a top bar hive. You will need to divide the hive's resources – brood, especially open brood, and food – so that each hive has roughly equal amounts of each. If there are no swarm cells present in the hive, this process is a simple division of brood and food – one bar for you, one bar for me – with the intent of moving 6-10 bars into the nuc box to form the new hive. This is typically referred to as a walk-away split – the beekeeper can simply walk away afterward - with no need to worry about the location of the queen. The hive that has no queen will make one from the open brood you gave them, and the other hive has the existing queen.

If the hive has begun creating swarm cells, that makes this process a bit more complicated. You must decide whether you want to keep the existing queen, or pass her along to the new beekeeper. In either case, you want to be sure that the queen cells all wind up in one hive, and the queen in the other. You must know where the queen is for this split to be successful. The use of a queen catcher tool, designed to safely capture and hold the queen bee is very useful during this process.

Move the bees into the nuc box



A well formed top bar comb

with as many bees on the comb as possible. The new hive will have fewer foragers

because much of your field force is out foraging at the time this split is being performed, and so there will be a tremendous drop in the foraging population of the new hive. The more bees that make the move, the better, since the foragers currently in the field will all return home to the original hive.

The split procedure described here also works if you DO WANT more bees – you simply split them into a hive of your own.

Please note: At no point does it make sense to try to thwart the swarm impulse by simply destroying any queen cells that your bees make. This is just a sure-fire way of making your hive queen-less, the exact opposite of having more bees!

The Summer build-up and Fall shut down of Year Two imitates Year One, except that there is already plenty of drawn comb. Then... all too soon, you will find yourself preparing for another successful Winter. But you already know how to do that – you've succeeded once already!

Congratulations! 

~~~~~  
~Christy Hemenway, Author of The Thinking Beekeeper series, including "The Thinking Beekeeper – A Guide to Natural Beekeeping in Top Bar Hives" and the forthcoming "Advanced Top Bar Beekeeping – Next Steps for the Thinking Beekeeper."

# Colony Development



Larry Connor

Before obtaining the first bee colony, the future sustainable apiculturist must master key aspects of bee biology. Beekeepers must know the basic biological developmental rates of the three kinds of bees. It is not something that should be dismissed or ignored. Using the animal husbandry example, a beekeeper should know the developmental time of bees just like a cattle or dog breeder must know the developmental time and growth milestones of a calf or pup. Here are some common examples that I have seen happen with many new and less-experienced beekeepers:

## **There is no open brood. I think I lost my queen!**

Events within the beehive take a set period of time, yet many beekeepers are in a big hurry for these things to happen and, as a result, ignore biology. If a European colony replaces a queen, it takes time for the new queen to develop, reach mating age, mate and then start laying eggs. Here's a breakdown:

|                                               |                           |
|-----------------------------------------------|---------------------------|
| <i>Queen development from egg to emerging</i> | <b>16 days</b>            |
| <i>Days to reach mating age</i>               | <b>7 days (or longer)</b> |
| <i>Days to mate</i>                           | <b>2 days (or longer)</b> |
| <i>Days to develop eggs after mating</i>      | <b>3 days</b>             |
| <b>TOTAL</b>                                  | <b>28 days</b>            |

That is four weeks from future queen egg to her first worker egg! Some untrained beekeepers often expect to see new brood in two or three weeks as if Mother Nature will speed development just for them. Convinced the queen is gone, these beekeepers often buy another queen and really confuse both themselves and the bees by trying to introduce a queen to a colony that already has a queen in development! That is both wasteful and expensive, and it is poor animal husbandry.

## **My queen must be dead because I cannot see any eggs!**

Bee eggs are small, and many beekeepers will carefully inspect a frame of brood on a dark day or without a bright light (the sun over the shoulder is best) and declare that the frame does not have any eggs or young larvae. When I take the frame and look, the frame is often filled with eggs and newly hatched larvae. Yes, the young



larvae will appear nearly transparent, especially on light colored beeswax or plastic foundation. I often suggest these untrained folks get a flashlight and a hand lens to make these important inspections. While this is not really biology of the bee, it is about the biology of the beekeeper who cannot see. Schedule an eye exam!

## **I've had a queen in the hive for five weeks now, there is open and sealed brood in the**

**frames, but the colony is losing bees. What is happening?**

Many things can cause a colony to go into population decline, but five weeks is a critical time for bee populations if you let bees raise their own queen. If you add the 21 days it takes for new worker bees to grow from egg to emergence, you still have to add the time it took the queen to start laying, or 28 days.

Adding 21 and 28 days gives you seven weeks. It takes a long time for a colony to raise a new queen from the accidental death of the queen or when a beekeeper makes a walk-away split. Seven weeks is a very long time for a colony to be without emerging bees in the hive, especially if it did not have much sealed brood when it was originally set up or made queenless. Within three to five weeks you will notice that the population of adult bees is declining unless you intentionally selected or added frames of sealed and emerging brood specifically to boost the bee population.

## **I keep bees in South Florida and I have trouble keeping the colonies from mating with Africanized bees. What can I do?**

Researchers have shown that African queens develop about two days faster than European bees, while the hybrid Africanized bees develop one day faster than

European queens. What does that mean to the beekeeper?

Because African queens emerge faster than European queens, your first concerns for producing queens in area with African genes is when you emerge queen cells in an incubator or cell finisher. Just one African queen cell will produce a virgin emerging a day or two early and the complete destruction of all the remaining cells. If you put queen cells you found on frames of brood into a new nucleus increase hive, you will find that the African queens will be preferentially favored.

Second, if you mate your queens in an area where both African and European drones are present, several studies have shown that the European queen is more likely to mate with European drones – they fly longer hours and are produced in larger numbers.

The beekeeper trying to mate queens in an area with African colonies need to develop a European-drone saturation program or develop an off-season mating program. Otherwise, they need to find an area that is free of the African bee and mate their queens to European drones at that location.

Here is a summary of the developmental time of the workers, drones and queens:

### Workers

Most of the bees in a colony are workers. All worker bees are female but in a different caste than the queen. They do all the work in the hive and gather all the food (pollen and nectar) and water that the bees need to survive. Workers also collect resin from trees to coat the inside of the hive – we call this propolis. They are unable to mate with drones, the male bees and they do not attempt to make mating flights. They have very small reproductive structures and are only able to produce eggs in the absence of a queen bee's pheromone. These eggs are unfertilized and will only become male bees.

Worker honey bees control the queen's behavior and replacement as well as the number and age distribution of the drones in a hive. Unfertilized eggs are haploid, having just one set of chromosomes. In Hymenoptera (bees, wasps, ants), these develop into males. Worker-produced drones may or may not be significant in terms of passing on genetic information, depending on which scientist you ask. Is there a genetic benefit of the haploid-diploid sex determination system if a worker bee produces sons that contribute to the genetic composition of future colonies?

### Worker Development

In whole days, the intervals of metamorphic honey bee worker development follow a mathematical progression: three days as an egg, six days as a larva and 12 days in the sealed cell. Remember this simple relationship: 3+6+12 equals 21 days. Like many things in the hive, these are averages, and the timing is not in exact 24-hour measurements. Temperature and nutrition apparently impact development rates.

### The Egg

After first inserting her head into a cell to determine its size, the queen deposits one worker egg. As she positions

her body into the cell, she releases some of the sperm stored in her spermatheca to accomplish fertilization. Queens may deposit both fertilized and unfertilized eggs, both workers and drones in worker cells, depending on the size of the cells. All worker eggs are fertilized, and a good queen will produce a pattern of 95% or more worker cells and a few missed cells where diploid drone eggs are deposited (they are removed soon after hatching). This is the time period for the union of the sperm and egg with the resulting embryo feeding on the yolk in the egg. There is rapid growth of the embryonic bee during this short three-day period. Eggs are held vertically, head down, by a small amount of cement at the bottom of the egg. At the end of three days, the outer egg shell, called the chorion, softens as it is reabsorbed into the body. The egg flattens onto the bottom of the cell and becomes the larva.

### The Larva

Once the larva hatches, it immediately enters a period of continuous feeding and extremely rapid growth. In six days the bee grows from a tiny egg to a large larva. Nurse bees feed the larva many times per hour and provide a surplus of royal jelly at the bottom of the cell for the first 48-50 hours. This is the same food as fed to a queen bee larva throughout her larval period.

After this initial feeding, the diet of the larva changes to a more complex diet that inhibits the formation of queen characteristics and promotes the formation of worker features. The special diet, called worker jelly, contains additional carbohydrates and lipid molecules that turn characteristics of worker development on and turn characteristics of the queen caste off. The worker larva floats on a bed of royal jelly.

When raising queen bees, this is the start of the perfect time to remove larvae and put her into a queen cup. The larva floats on the bed of royal jelly and molts at least four times before the final molt to become the pupa. The molting skin is extremely thin and hard to detect. During the sixth day, the bees place a beeswax 'cap' on the cell, even though the larva inside has not completed the larval developmental phase. At this time, the larval body changes into an intermediate prepupal form, which is intermediate between the larva and the pupal stage.

### The Pupa

The larva spins a thin brown silk cocoon with special glands located in the head. Then, she molts the final time to become the pupa, with characteristics in the form of the bee but without wing development and integument pigmentation. The first parts of the bee's external body to change color are the two compound eyes, first to pink and then to purple. Internally, the body is becoming more differentiated, with the formation of adult bee organs, like the honey stomach, developing out of the simpler larval digestive tract. Just how many changes take place during the 'quiet' or 'resting' phase of development is not known, but it is both large and essential to the adult bee's many roles in the hive.



## The Emerging Individual

Twenty-one days after the queen has deposited a tiny egg in the cell, the worker bee emerges, soft of body, unable to sting and covered with body hairs that have not yet dried in the atmosphere of the hive. Some refer to emergence as 'hatching', but we restrict the term hatching to refer to the egg-to-larval transformation, and the term 'emergence' for the worker bees cutting the protective silk capping off her cell and walking, ready to begin her initial adult bee duties. These callow bees are responsive to the queen bee and quickly learn her odors which helps them in various parts of their adult life.

## Differences in Developmental Rates

European races of honey bees follow a similar developmental pattern. When compared to African honey bees, the European queen and worker bee require additional time for development than the same castes in the African bees.



## European vs. African Honey Bee Developmental Time from Egg to Adult

From Ellis, J., University of Florida and A. Ellis, Florida Dept. of Agriculture and Commercial Services. FDACS.DPI|EDIS. Accessed online 9 Aug. 2015.

|        | European honey bees | African honey bees |
|--------|---------------------|--------------------|
| Queen  | 6 days              | 14 days            |
| Worker | 21 days             | 19-20 days         |
| Drone  | 24 days             | 24 days            |

## Division of Labor

The Nurse Bee (In the Brood Nest)

These young bees quickly assume duties. No other bee provides instruction or hints at the job ahead. There is no mentoring or internship.

Cell cleaning – Newly emerged bees clean the cells of newly emerged cells; they remove remaining royal jelly, larval fecal materials and trim the capping of the cell. They also remove any lingering *varroa* mites still in development and destroy them. Once the cell is clean, I suspect they either remove any objectionable odor that might repel the queen, or they coat the empty cell with a special odor or



*raising queens means extreme attention to detail*

pheromone that stimulates the queen bee to deposit a new egg into the cell, thus starting the brood production cycle all over again.

Feeding brood – Newly emerged bees quickly feed themselves pollen and nectar and are fed by other worker bees as part of the 'community stomach' of the hive, which includes food and chemical components collected

from the queen. The feeding process stimulates the digestive tract of the bee to process the food and convert the proteins and carbohydrates into royal jelly. When beekeepers feed colonies of bees, only a small percentage of the bees collect food from the feeder device, but all the bees in the colony benefit from the feeding due to food-sharing behavior.

Royal jelly production – Each worker bee undergoes a period of abundant royal jelly production when the season and food supply allows. Most of the year this feeding is almost immediately after food intake, but in the Fall and early Winter, the royal jelly production is delayed as the

colony takes a break in brood rearing. The appearance of the first larvae in January (in the northern hemisphere) stimulates royal jelly secretion by select nurse bees.

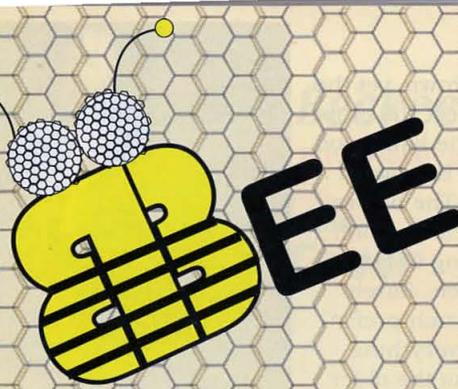
Brood regulators – It appears that these young bees determine the amount of royal jelly to produce, and, thus, the amount of brood to rear, based on stimulation by the increasing day length as well as the food budget of the hive. Here the 'community stomach' controls population growth. Bees with proper nutrients in their body cells and their digestive tract produce more royal jelly only when there is an abundance of food stored in both the combs and coming into the hive from foragers that find early season food. Quality food reserves in the body cells of over-Wintering nurse bees are essential for the care and feeding of a healthy brood cycle early in the season. If in the prior season the colony had poor food reserves, it was exposed to parasitic mites and diseases, or the colony was undergoing any other stress, then the nurse bees are less fit for brood rearing. It is not the temperature outside the hive that determines the amount of brood that a colony produces, but the bee population and nutritional status of the nurse bees. This relationship makes these young bees critical to starting the new season properly.

Queen attendants – Nurse bees also feed and care for the queen. They regulate the amount of food she receives and they themselves are subject to complex factors that include the food reserves, the nutritional composition of the 'community stomach' and the population of young bees inside the hive. Part of this network is the feedback the nurse bees provide to the queen by returning modified queen substance to the queen – she then responds to her own chemical signals (pheromones and hormones). The queen retinue of attendants constantly changes. Look for queens with large retinues, at least ten and perhaps over a dozen worker bees, while resting. Queens with small retinues often do poorly in the hive.

Visit the Wicwas Press website at [www.wicwas.com](http://www.wicwas.com). And 'like' us on Facebook. 

~Larry Connor

# The



# Space

~ Roy Hendrickson

The bee space was the discovery by the Rev. L.L. Langstroth that made moveable frame beekeeping possible. Through patient observation Langstroth discovered that a separation of approximately one quarter to three eighths of an inch prevented the bees from filling the gaps with either propolis or wax. The development of the moveable frame hive followed shortly thereafter.

In practice, the bees will seal any open space narrower than one quarter of an inch with propolis. When you attempt to remove a frame or separate hive bodies, you'll find that everything has been glued together making the task at hand much more difficult. Conversely, any opening wider than three eighths of an inch will encourage the construction of burr comb, comb that is often filled with drone brood during the Spring and early Summer buildup period.

The most common cause of bee space abuse is improperly built woodenware, not all equipment manufacturers build to the same exact specifications. When you interchange frames and hive bodies from different manufacturers bee space abuse often results. For example, I've seen tolerances for hive body depth vary by a quarter inch or more. The depth of the rabbit or frame rest, and that of a deep frame can also vary between manufacturers. When hive bodies and their corresponding brood frames aren't in sync, the resulting bee space abuse can turn deadly. The burr comb that is built between top bars of the lower hive body and the bottom bars of the upper hive body is a potential death trap for queens. Every time you remove a brood frame or raise the upper brood box, you run the risk of crushing the queen upon reassembly. And it's virtually impossible to know that anything is amiss.

Another classic example of bee space abuse is found in the commercially manufactured inner cover. For manufacturing simplicity most commercial inner covers have a raised border on both sides. Regardless of which side is turned down, the resulting bee space is incorrect, often by as much as a quarter of an inch. Ever wonder why the bees build burr comb between the top bars and the inner cover? In good crop years it can become virtually impossible to remove

the inner cover due to the excessive buildup of burr comb.

Prevention is by far and away the simplest solution to the bee space issue. Compare before you buy. If you plan on purchasing hive parts from more than one manufacturer, request or purchase samples and check the measurements before you buy in quantity. Next time you attend a bee meeting take a ruler and compare the differences between the products on display. I'm hesitant to recommend specific products, but I noticed at the recent OSBA meeting that Brushy Mountain had an acceptable inner cover on display, i.e. one side of the cover was almost flat. And the cover appeared to be built to last. That's not often the case with commercial inner covers. With existing equipment your only option is remanufacture the boxes. It's far more important to have the correct bee space in the broodnest than in the supers. In a good honey flow year burr comb in the supers is almost unavoidable no matter how accurate the bee space. If the bee space is too large, (The most common type of abuse) use a table saw to cut the excess off the bottoms of your hive bodies or supers to conform to the size of the existing frames. If the spacing between the upper and lower brood boxes is such that the brood frames are glued together, add an appropriate sized strip of wood to the bottom edges of

each brood box to achieve the correct spacing. Generally speaking, I've found that deep brood boxes with a standard 5/8th inch rabbit will have the correct bee space if the box is 9 1/2 inches deep, give or take a 16th of an inch.

### Nectar on the Backside

Contrary to popular belief honey flows don't necessarily commence with the onset of a specific honey plant bloom. Black Locust is perhaps one of the best examples of this phenomenon. Inclement weather aside, early in the blooming sequence abundant bloom but a total absence of foragers is a very common, almost routine occurrence. A check of colony flight activity or the quick shake of a brood frame to check for the presence of incoming nectar will usually confirm the visual observation, no flow in progress. However, once the bloom reaches mid-stage and beyond, incoming nectar becomes plentiful as evidenced by flight activity and work in the supers. I've



An observation hive with the glass too far from the comb so more wax is made to close the bee space

seen locust bloom that has started to turn brown, yet the bees were working at a feverish pace to collect the crop.

Unlike the black locust, the bloom of the basswood tree, more specifically the Native American Basswood (*Tilia Americanus*) doesn't open all at once. The blooming sequence is often spread out over a week or more. Quite often the earliest blossoms are starting to fade just as the last blossoms are starting to open. Rarely do the bees work the newest bloom, they much prefer older blossoms. In extremely hot weather everything is compressed, but under normal conditions the older blossoms are king. At least that seems to be the norm in this area. I've observed similar scenarios albeit to a slightly lesser

degree with blackberry, one of the seasons first honey plants, and with goldenrod, generally the last major bloom of the season. In general the bees tend to concentrate on the older blossoms.

Goldenrod is a very interesting honey plant. There are over a hundred different varieties, with only a small number occurring in any given area. Locally the earliest goldenrods start to bloom in mid-late July. These early varieties don't produce any pollen or nectar; as a result there isn't any bee visitation. The first sign of bee activity begins with the arrival of bright yellow goldenrod pollen in the latter half of August. The first scent of fresh nectar very reliably occurs around the 26-28th of the month. However, the main flow, if the weather cooperates, rarely occurs prior to the 8-10th of September. And it's rare indeed if the flow persists past the 21st of the month. Perhaps most interesting of all, the varieties that produce the bulk of any surplus have barely reached the early bud stage when the first blooms appeared in mid July.



*Propolis is sticky and makes working with bees more difficult*

result there isn't any bee visitation. The first sign of bee activity begins with the arrival of bright yellow goldenrod pollen in the latter half of August. The first scent of fresh nectar very reliably occurs around the 26-28th of the month. However, the main flow, if the weather cooperates, rarely occurs prior to the 8-10th of September. And it's rare indeed if the flow persists past the 21st of the month. Perhaps most interesting of all, the varieties that produce the bulk of any surplus have barely reached the early bud stage when the first blooms appeared in mid July.

### **Northeastern Ohio Bear Alert**

Intermittent bear problems have been an ongoing problem in this area for the past fifteen to twenty years. As a rule mother bears kick the young males out by the end of their second year. Our previous bear issues have generally involved young males reared in Pennsylvania,



*When the bee space is too small, propolis is added to fill in the space*

who when looking for a mate headed in the wrong direction. Occasionally these wandering juveniles would stumble across a beehive and create a minor degree of havoc. Dislodged covers, or the occasional tipped over colony were the usual end result. Rarely were colonies completely destroyed.

That is no longer the case. Today's problem bears are full time residents, and the mischievous behavior is rapidly becoming past tense. Bears like any other animal need a reliable food supply, and beehives are a treasure trove once their ingredients are fully understood. Today is December 6th and I just finished moving a small bee yard (eight colonies) because the ninth colony, the most productive, had been completely destroyed. Unknown to me a couple of neighboring colonies had suffered the same fate a couple of days earlier. Initially I considered installing an electric fence, but that's not a twenty minute process, and I didn't want to risk losing a couple more colonies during the interval. So I opted to move the colonies to another location with a pre-existing bear fence.

If you're located in an area that is subject to occasional black bear depredation don't wait until it's too late. It's much easier to prevent bear problems than it is to rectify an ongoing issue. If your bees are located close to an established electrical source I recommend a plug in fence charger. There're generally the cheapest and most reliable. If not, then either a solar or battery operated charger is required. Acquire a decent charger, something with an output of at least one Joule. (A Joule is an international power rating) And make sure to install an adequate grounding system, especially if your soil trends toward the sandy or loamy side. This is truly a situation where "an ounce of prevention is worth many pounds of cure"!

*~Roy Hendrickson a 40 year beekeeper from Northeast, Ohio. He writes for many bee journals and is active in the Ohio State Beekeepers Association.*



# Living With A Smoker

~James E. Tew

## What else can we do?

I wish there was an alternative to smokers and smoking a bee hive. I have reasons that I will discuss later. But first I need to prepare you for my thoughts. Maybe, over the years, I have evolved into some kind of crabby honey bee complainer. If that is the case I don't really know exactly when it happened. I don't think it was abrupt. In past articles I have written about some of the cruddy things that have happened in my bee life – things that could make a rational person wonder why anyone would ever continue to work with these specialized bugs, but continue I will. And I would like you to know that my complaining does not mean that I have any plans for quitting anything beekeeping, but that I do expect to continue complaining – apparently even increasing in my grumble rate a bit. I have my reasons.

In my own bee-life experiences, I have seen a lot of changes and though I freely admit that some of those changes have been great, I must say that not all changes have been so good. Well, maybe at first flush they didn't appear to be good, but I am now realizing that "good" is a moving, flexible kind of target. Early in my life it was good to drink whole milk. Not now, and no, smoking cigarettes is not good for your after-dinner digestion. We used to think it was.

Within beekeeping, take *Varroa* for instance . . . How can I rank the horribleness that *Varroa* has caused beekeeping when presently *Varroa* is at the very heart of the biggest boom that U.S. beekeeping has ever experienced? If honey bee populations had not declined precipitously, would we now have this wonderful influx of new bee people? Would all honey bee meetings be packed out the way they are? Would the public still be sympathetic, and would cities all across the U.S. still be inviting bees into town? I have no way of knowing but I do know that *Varroa* has single handedly put our craft on a different trajectory than the one it was on in 1984. Am I saying that *Varroa* is

a good thing? No, *Varroa* is not a good thing, but I am saying that *Varroa* and our current related beekeeping problems have spawned some unexpectedly good, even very good, attributes in modern-day beekeeping.

So for many beekeepers there are two versions: Pre-*Varroa* and Post *Varroa*. Pre-*Varroa*

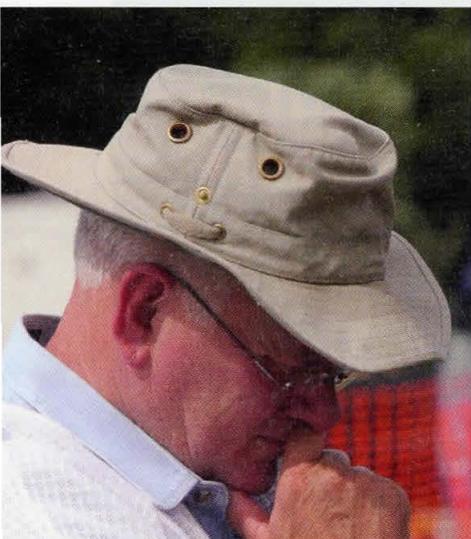
beekeeping is filled with information and recommendations that simply do not apply to proper beekeeping any more. For instance, you can no longer buy cyanide from bee supply companies. In the 1960s you could. But everything else has changed, too, not just beekeeping. Any slide rule users still out there? Who of you still dials a telephone? Oh . . . and wait a few days while I write you a letter and drop it in the mail. All those years ago when you and I were dialing phones and talking on party lines, did I ever have any notion that, one day, I would walk around with my phone in my shirt pocket? Nope – never had the thought once. So it is with beekeeping. *Varroa* nearly killed us but the episode redesigned and restructured beekeeping as an industry. Arthur C. Clarke wrote, "How can it be, in a world where half the things a man knows at 20 are no longer true at 40 – and half the things he knows at 40 hadn't been discovered when he was 20?"

## The unchanged bee smoker

And through the entire paradigm-shifting, *Varroa*-initiated event, there is the bee hive smoker – essentially oddly unchanged. To work bees, you just build a fire in a smudge pot with any readily available fuel that will produce white cool smoke and then you puff smoke into the colony. Well, that's certainly technically complex. Out of all the changes in beekeeping, techniques for using a smoker are exactly as they always have been. As I have already written, I wish there was an alternative to smokers and smoking a bee hive.

If you have been a beekeeper longer than about twenty minutes, you should already know the fundamentals of smokers and smoker lighting. At some meetings, there are even smoker lighting contests. Who of you does not have a "favorite" smoker fuel? Like a fine wine, if doing serious bee work, I like to use a blend. I start with a piece of paper. As the flame catches, I add pine needles and puff up white, billowing smoke until the flames come from the smoker barrel; then another charge or two of needles on top of that and puff the smoker bellows back to a flame. As the flame dies back, I add either thick planer shaving or dry chipped mulch and puff until I get good smoke flow. Then lastly, to keep wood chips from blowing out of the nozzle, I add a final charge of pine needles or dry grass clippings. This concoction will burn for several hours and can easily be recharged on top of the hot coal bed in the smoker. If I am doing quick bee inspections, I just stay at the paper and pine needle level – quick, white smoke that burns out readily. My way is not necessarily correct for all of you, but these are the fuels I have at hand that provide a dependable source of smoke for me.

Beehive smokers and their use are at the very core of beekeeping and they have been at that core point since our earliest days of honey robbing. There are all kinds of varieties and sizes of smokers but they all require the



<sup>1</sup>Clarke, Arthur C. 1977. *The View from Serendip*, Random House

same basic procedure – build a fire, snuff it out and puff smoke from its embers. Indeed, it is the very trademark of beekeeping. Recently, we were clearing and cleaning my recently departed Dad’s disheveled shop, and a Woodman smoker turned up. It was like an old friend. It represented hours and hours of bee work from years gone by. We kept it as though it was one of the greatest treasures from Dad’s estate. Outside of beekeeping, many other people seem to feel that way, too. How many common smokers have you or I seen in antique shops as though they were highly coveted? Even burned up and worn out, they still bring about one-third to one-half of their original selling value.

But as with so, so many other things in life, as we have learned more, we realized changes might be needed. But as far as smokers and their use are concerned, I don’t know of anything truly new on the horizon. We seemed to be destined to use them for years to come. I know that all bee supply companies either manufacture smokers, or at least, sell them. Other companies are presently offering new and improved smoker models. I have four or five smokers that I plan to continue using. So there . . . we have used smokers for a long time and will probably continue to use them for a long time, but being the complainer and whiner that I am, can I very, very tactfully ask, “Should we?”

I have absolutely no science, no citations and precious few examples to support a distant, foggy concern that I have about smokers and their use. I know, I know, we have nothing else to use, and the bees will kill us if we open their hive without smoke, but bronchial asthma and I have been lifelong companions. I have never had a life-threatening experience, but I can – nearly on command – come up with restricted breathing issues. When I am in and around bee smoke (any smoke for that matter), I feel more than just a bit threatened. I become wheezy with watery eyes and have trouble getting enough breath. I have smoked colonies hundreds of times and plan to do it hundreds more, but is this procedure as benign as it has always appeared to be? What should we do with the following information? Abundant citations are easy to find. Have a look at the literature for yourself.

### Using dry leaves to generate bee smoke

“The smoke from burning leaves contains a number of toxic and/or irritating particles and gases. The tiny particles contained in smoke from burning leaves can accumulate in the lungs and stay there for years. These particles can increase the risk of respiratory infection, as well as reduce the amount of air reaching the lungs. For those who already suffer from asthma and other breathing disorders, leaf burning can be extremely hazardous.

Moist leaves, which tend to burn slowly, give off more smoke than do dry leaves. These moist leaves are more likely to also give off hydrocarbons, which irritate the eyes, nose, throat and lungs. Some of these hydrocarbons are known to be carcinogenic.

Carbon monoxide is an invisible gas that results from incomplete burning, such as with smoldering leaf piles. After inhaling carbon monoxide gas, it is absorbed into the blood, where it reduces the amount of oxygen that the red blood cells can carry. Children, seniors, smokers and people suffering from chronic lung and heart disease are more susceptible than healthy adults to carbon monoxide effects<sup>2</sup>.”

### Concerning my wood chips that I frequently use

“The tiny airborne specks of pollution known as particulate matter, or PM, produced by wood-burning stoves appear to be especially harmful to human health. Small enough to penetrate deep into the lungs, they carry high levels of chemicals linked to cardiopulmonary diseases and cancer, and they can damage DNA and activate genes in hazardous ways comparable to cigarette smoke and car exhaust.

Exposure to the particulates in smoke irritates the lungs and air passages, causing swelling that obstructs breathing. Wood smoke can worsen asthma, and is especially harmful to children and older people. It also has been linked to respiratory infections, adverse changes to the immune system, and early deaths among people with cardiovascular or lung problems<sup>3</sup>.

### This is not a “cause” for me

I only did a quick literature check on using pine needles as a smoke source, but the literature was vague and most citations focused mainly on burning pine wood;

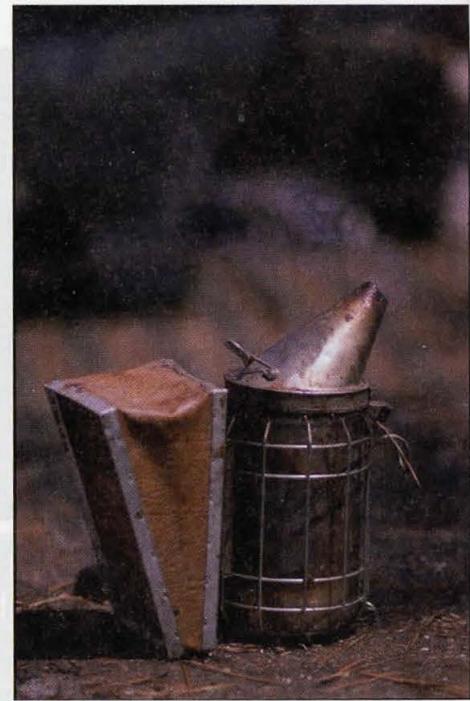
but absolutely, it was not easy to find good reasons for breathing pine needle smoke. Terpenes in pine needle smoke seemed to cause the problems. I tried to find sources for reasonably safe smoke sources but so far, I have not found anything – not a thing. Again, my comments in this article do not represent science and I am not promoting vanquishing the smoker to the ash pile; but I sense that this longtime, universal smoking procedure may have a darker side.

### What effects does smoke have on bees?

To my knowledge, that question has no definitive answer. If I am able to readily find health references on harmful effects on humans and animals, why would it not logically follow that smoking bees has some harmful effects on bees? As I discussed above, we all have our favorite smoke sources, but no one has ever ranked those sources for bee safety. Why would they? It’s only smoke! If bee colonies are frequently smoked (commercial colonies), are those colonies sicklier than “unsmoked” colonies. I have no idea.

<sup>2</sup>B. Rosie Lerner, 1997. Purdue Extension Consumer Horticulture Specialist. Please Don’t Burn Your Leaves. <http://www.hort.purdue.edu/ext/burnleaves.html>

<sup>3</sup>Cheryl Katz and Environmental Health News. March, 2011. Scientific American. Wood Smoke Wafts Up Health Concerns <http://www.scientificamerican.com/article.cfm?id=wood-smoke-health-concerns>



As long as there has been human civilization, there has been fire (and smoke). Bee colonies have been smoked millions of times and life has gone on for a long time, but how significant are the effects of smoke on our bees? I suspect the harmful results of hive management would be much greater if the colony was not subdued some before manipulating.

### I doubt that smoking bee colonies is good for the colony

But overall I really doubt that smoking the colony is good for its health but I simply don't know how bad it is for the health of the colony. Clearly, if there are any effects they must be chronic in nature for it is a rare colony that has been literally smoked to death. If there are chronic harmful effects, wouldn't that be interesting? Really interesting?

### My new plan?

I really don't have a different plan other than using the least amount of smoke possible. I've already been doing that for years. But every time my bees and I breathe smoke, I will suspect that it really is not a great health benefit for either of us – but I'm just an old complaining beekeeper trying to catch my asthmatic breath. 

~Dr. James E. Tew, State Specialist, Beekeeping, The Alabama Cooperative Extension System, Auburn University; Emeritus Faculty, The Ohio State University. [Tewbee2@gmail.com](mailto:Tewbee2@gmail.com); <http://www.onetew.com>; One Tew Bee RSS Feed ([www.onetew.com/feed/](http://www.onetew.com/feed/)); <http://www.facebook.com/tewbee2>; @onetewbee Youtube: <https://www.youtube.com/user/onetewbee/videos>

## CATCH THE BUZZ

### Moncton Researchers Abuzz Over Possible Arthritis Treatment Using Propolis

**Moncton researchers** are hoping honey bees could be a link to a new treatment for inflammatory diseases. (CBC) University of Moncton researchers are buzzing over the possibility that honey bees could help them unlock a new treatment for inflammatory diseases, such as arthritis. Dr. Luc Boudreau is leading the project, which explores the medical properties of a material called propolis, which is a resin collected from tree buds by honey bees. Boudreau has identified a compound in propolis that reduces inflammation in laboratory tests.

He said the early tests conducted by his team are promising. "When we did in-vitro tests, this compound is actually better than most compounds that are already out there on the market," he said. Boudreau and his three-person research team are awaiting approval from Health Canada before beginning clinical trials of their product. They are hoping to have approval in

the next three months. If the trials are a success, there is a growing market for the treatment. Nearly 20 per cent of New Brunswick's population is over the age of 64 and it is estimated that more than 125,000 people in the province suffer from arthritis. Krista Phillips, the community education co-ordinator for the Arthritis Society, said the number of citizens living with arthritis

is going to increase with an aging population. "We'll be watching this project very closely, with great interest because hopefully it leads to big things for people living with arthritis," she said.

#### Research Grant

Boudreau's research team was recently awarded \$75,000 from the New Brunswick Innovation Foundation to go toward research into therapies for inflammatory diseases. The researchers already have a company name, NaturoBee Ltd. and they're looking for partnerships with investors and beekeepers across the province. They hope to have a product on store shelves in about three years. Samuel Poirier, a graduate student is one of those researchers, said the economy can benefit from their work as well. "Sometimes our options

are limited for ... especially in the field of science, so by spinning off this company, we're really hoping that we're going to eventually manufacture products here, hire people to work with us and at the same time, create my own job," he said.



# Boring

## SPRING MANAGEMENT

~Roy Hendrickson

No matter how many colonies you operate there are certain early Spring chores that require attention prior to the start of the active beekeeping season. I'm talking about the really boring, nasty stuff, those jobs you would prefer to put-off indefinitely. In my opinion, number one on the detestable jobs list is cleaning up Winter dead-outs. Locally this event generally takes place sometime around the middle of March, depending on the temperature and the amount of mud in the apiary. In the home yard I simply use a wheelbarrow to move any deadouts to the equipment storage building. In the out yards the pickup bed becomes the initial staging area prior to transfer to the storage facility. Should circumstance prevent deadout removal, the affected colonies are sealed tight to prevent any robbing. Weak colonies have their entrances reduced for the same reason.

On the first cool-dry day when the bees aren't flying, I begin the cleanout process. My first goal is to perform a simple post-mortem. If I can figure out why a colony died, perhaps I can prevent a repeat loss in the future. My first question, was starvation an issue? The absence of honey, coupled with dead bees head first into the cells makes the diagnosis easy. If that's not the case, is there any honey in the immediate proximity of the dead cluster? Had the colony started to rear brood? Honey bees won't abandon their brood. In a continuously cold climate this often results in partial or total starvation. The colony starves to death with honey only a couple of inches away. On the other hand, the absence of brood might indicate that the colony died early in the Winter before brood rearing could be initiated. Starvation can take many forms and more frequently than not the final diagnosis is nothing more than an educated guess.

Next to starvation, I'm looking for any sign that *Varroa* played a role in the colony's demise. The first and most obvious sign that *Varroa* was involved is the absence of dead bees. With starvation, dead bees are everywhere, not so with *Varroa* and its associated viruses. Occasionally a small cluster of dead bees will remain, but just as often the colony will be virtually devoid of dead bees. Generally speaking, *Varroa* deadouts will have ample honey in and around the broodnest area, assuming the colony had sufficient stores going into Winter. Locally, about half of the *Varroa* deadouts will contain varying amounts of dead brood. However, trying to make a diagnosis based solely on dead brood is a very tricky business. Instead, factor in colony strength, late season mite loads, the treatment schedule, or lack thereof, and the condition of any other surviving colonies. This analysis combined with the dead colony's obvious symptoms should aid in the final diagnosis.

Starvation and *Varroa* aside, both queenlessness and outright queen failure also contribute to over Winter colony loss. Queenlessness is defined as queen loss just prior to, or during the over Winter period. It's not uncommon for queenless colonies to survive the Winter. If you can identify the condition early enough in the new season, it's quite practical to unite the queenless unit with a queenright colony in need of additional bees. If the queenless colony has perished, the lack of brood or any evidence of an existing queen makes for a relatively easy diagnosis.



Top view of the dead cluster



The end result of a comb containing moldy pollen

Dead cluster and queen, note the first sign of mold formation



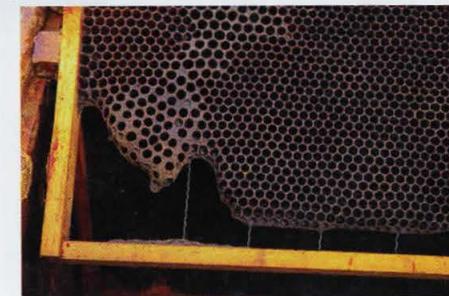
Dead bees head first into the cells, obvious starvation



Dead bees shaken out of the top brood box



Brood box sorely in need of scraping



Old chewed up comb, ideal replacement candidate



Propolis buildup due to improper bee space, note dried out dead queen to right

Queen failure is expressed somewhat differently. Perhaps the queen became a drone layer, (lost her ability to fertilize eggs) or died outright in late Summer or early Fall. If the colony's attempt to replace the queen was unsuccessful, the end result is usually a laying worker colony. These colonies rarely survive the Winter. Again the evidence is clear-cut. Quite often the center brood combs will be filled with drone brood that has been reared in worker size cells. This is an obvious sign of a drone layer! If all the brood has emerged, the tell-tale evidence is clearly exhibited on the face of the comb. Hold the comb in question, horizontally at eye level. The surface of a normal worker comb has a flat or smooth appearance. Once a colony becomes a drone layer, a comb where all the brood has emerged will have an uneven or mountainous appearance. This is the result of a larger drone having been reared in a smaller worker size cell. With a little experience this condition is recognizable at first glance.

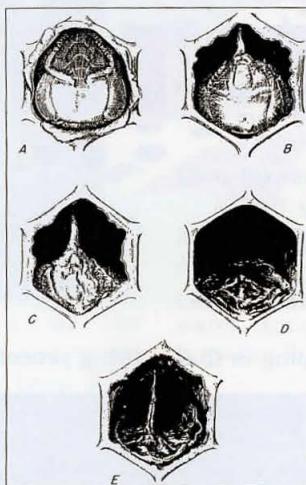
Regardless of what caused a colony's demise, I'm constantly on the lookout for any residual sign of brood disease, particularly AFB. (American Foulbrood) I carefully scan all of the dark brood combs for any sign of this despicable disease. Diagnosing an active case of AFB isn't all that difficult once you're familiar with the symptoms, and assuming the disease is somewhat advanced. Diagnosing AFB in a Winter deadout is an entirely different matter. In a Winter deadout it's very easy to confuse or misread dead brood. To the casual observer there is very little difference between brood that died because the colony died, dead brood resulting from virus issues, or brood that died as a result of AFB.

There is however one major distinguishing difference. If the brood died as a result of AFB, the affected combs will contain dried down scale. The scale is formed as dead larvae gradually disintegrate and dry out. Black in color, the scale lies flat on the bottom wall of the cell. Unlike European Foulbrood or dead brood resulting from virus issues, both of which can produce scale, the scale from AFB adheres tightly to the cell wall. It's virtually impossible to remove AFB scale without destroying the cell wall. If you're unfamiliar with AFB and its various symptoms, contact an experienced local beekeeper, or your local bee inspector for assistance.

Comb quality or condition is the last major consideration in the deadout cleanup process. Current wisdom dictates that due to pesticide contamination one third of a colony's brood combs should be replaced on an annual basis. With a couple of notable exceptions, I respectfully disagree. If you're colony(s) are repeatedly exposed to agricultural pesticides, or if your *Varroa* control program relies on any of the heavy-duty synthetic controls such as Apistan, Check-Mite, Apivar, or certain essential oils, that idea is certainly valid. However, the vast majority of small or startup beekeepers do not fall into either of those categories. When you couple that with the fact that producing top quality brood comb is perhaps the greatest challenge facing the new beekeeper, that idea is totally lacking in merit! Remember, next to the bees, top quality brood comb is the most valuable asset in your apiary. Don't needlessly throw it away!

Instead, be selective. Damaged or poorly drawn combs that contain large patches of drone comb should get the heave-ho. If your inventory contains any ancient pitch black brood comb, get rid of it. The same holds true for moldy combs, particularly those combs that contain the sodden remains of the deceased Winter cluster. I view these combs as a detriment to productive beekeeping. Perhaps

most detrimental of all are the pollen filled combs where the pollen has started to mold. These combs are usually the result of a heavy Fall pollen flow where the excess incoming pollen has filled most of the open comb in the lower brood box. Anyone operating in good goldenrod territory will recognize this picture. Once the weather turns cold, the cluster will move upward to maintain contact with the Winter food reserves. During the Winter period the now unprotected pollen gradually deteriorates and begins to mold. Once this happens the pollen becomes totally worthless. To rid themselves of the offending pollen most colonies will remove everything down to the foundation mid-rib and replace it with drone comb. Why not save them the time and effort?



Successive stages of AFB. (A-C) Progressive stages of decay; (B,C and E) show tongue adhering to cell roof; (D and E) Show scale. USDA photo.

Colonies can die for a multitude of reasons. Regardless of the cause, I view the loss as an opportunity to completely rework the now empty equipment. The first and most critical rework involves the brood comb as described above. Beyond that I take a hard look at the hive components, the bottom board, the inner and outer covers, and especially the brood boxes. If there is any sign of wood rot, warping, or structural integrity, the offending component is either replaced or

repaired before it's returned to use. I also pay close attention to the broodnest frame spacing. Are the brood boxes and frames in sync? If there is an inappropriate buildup of propolis or burr-comb on the frames between the brood boxes, the corresponding bee space is out of whack. I make the necessary adjustment by either increasing or decreasing the depth of the offending brood box(s). Generally speaking, deep brood boxes that have a standard 5/8<sup>th</sup> inch rabbit will have the correct bee space if the box is 9 1/2 inches deep, give or take a 16<sup>th</sup> of an inch. This may sound like over-kill. But, I learned long ago that it's far easier to replace or repair hive components when the equipment is out of service, than when it's occupied by a strong colony that's less than happy with the untimely intrusion.

The last phase of the rework consists of removing the excess propolis and burr comb from the brood box walls, corners, and especially the rabbits. I also routinely scrape bottom boards along with the inner and outer covers as needed. I sharpen the curved end of a standard hive tool for this purpose. I use a collapsible workbench (a pair of saw-horses will work equally well) to maintain proper height, and an old outer cover to catch the scrapings. The rest is self explanatory. There is one caveat, make sure you wear a pair of gloves; otherwise you run the risk of a nasty gash, or worse yet, a trip to the emergency room!

Depending on your latitude, late Winter or early Spring is an excellent time to replace, repair, or set up new hive stands. Again, it's not the most exciting of work, but it's far easier to perform these chores when the bees are not flying than vice-versa. The same goes for tree trimming or brush removal should the need arise. If you're an urban beekeeper this is also a great time to plant shrubbery or construct a barrier to keep your colony(s) out of the sight of unhappy or overly inquisitive neighbors.

In summary, while early Spring cleanup and maintenance work may not be the most exciting of jobs, it's important in the sense that it gets the nasty stuff out of the way.

Once warm weather arrives, more time can be spent on the truly important bee work, colony management! 

~Roy Hendrickson a 40 year beekeeper from North East, Ohio. He writes for many bee journals and is active in the Ohio State Beekeepers Association.

# WHAT YOUR MENTOR FORGOT TO TEACH YOU!

ED SIMON

The conventional wisdom about beekeeping is that there are no pat answers. Whatever works for you is the right way for you to do something. Of course, most beekeepers are never satisfied and are sure there is always a better way of accomplishing a task or solving a problem. Consequently, if you ask five beekeepers the best way to accomplish something you get seven or more answers. None are wrong they just differ, they are what works for that beekeeper at that particular time. Here is a collection of hints that may help you in your beekeeping endeavor.

**Ants** – They will find an easy meal.

Cinnamon sprinkled around the feeder rim and on the inner cover takes care of the ant problem. (Most of the time)

**Attaching Wild Comb** – Attaching to a frame

After you have collected a wild colony and need to attach the wild comb to a frame, be sure to keep the top at the top. Comb cells have a definite slope to them. The outer edge of the cell is higher than the bottom of the cell. When you attach comb to your frame be sure you keep the top at the top.

**Cows/Horses** – Hives make good scratching posts.

Cows are curious and like to scratch themselves. A bee hive is just about the right height. Unfortunately they are not very stable when a 1200 pound cow has an itchy butt. Horses also like to scratch. If your hives are in a pasture or where a farmer may release cattle into the area then string an electric fence up to keep them away from the hives. Usually the farmer will let you tap into their electric fence to power your hive fence.

**Crystallized Honey** – Mix it up

Creamed honey is honey that has been forced to crystallize in a controlled state. When starting a new batch, incorporating it into the liquid honey can be a

tiring process. Instead of mixing a couple of pounds of starter culture into 40 or 50 pounds of honey, start be mixing it into a small amount of honey (4 to 5 lbs.) until it's thoroughly mixed with no lumps. Then add the small amount to the larger amount.



➔ **Which way to use an Entrance Reducer** –

Opens up. When installing a wooden entrance reducer, make sure the opening is up.

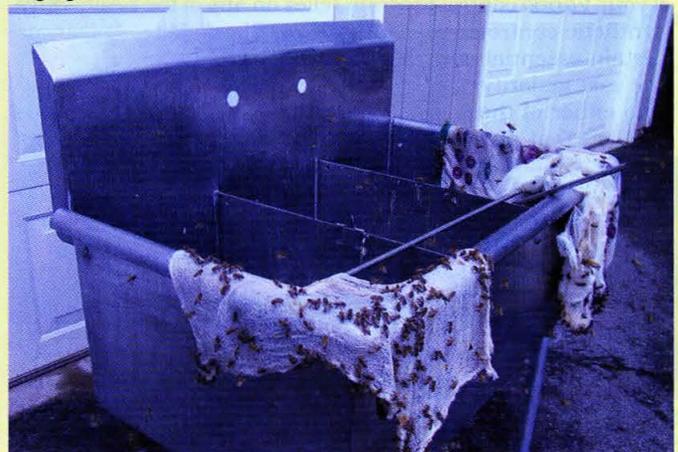
That way the entrance will be least likely to get clogged with dead bees and debris. This is very important when closing the hives up for the Winter.

**Entrance Reducer** – They never fit correctly.

When building a wooden entrance reducer, make sure the entrance reducer is smaller than the smallest opening you have on a bottom board. Then use a wad of newspaper on one end to work as a Spring and force a tight fit of the reducer.

**Extraction Clean Up** – Let the bees do the work.

Extraction is a sticky mess and your helpers have a tendency to disappear when it's clean up time. Move your equipment out of the extraction area and let it set for a





**Let the bees do the work** couple of days. All the junk honey that you would normally wash away will be reused by your bees. Wipe up the thicker/deeper puddles of honey with a wet rag so the bees won't drown and then hang the rags up for the bees to clean the honey off. Cover the equipment so if it rains the bees can still get to it but the rain can't wash all the honey away.

The removal of honey from capping is easily accomplished by spreading the capping wax out on a cookie sheet (I use commercial cookie sheets) and letting the bees reclaim the honey. It's best to take them in at night as the raccoon also like the honey. As a side note, a five gallon bucket of moderately packed capping wax will yield about five pounds of cleaned wax.

**Feeder Jar Holes** – If they are too big they'll leak syrup.

When punching holes in a jar lid to make a jar feeders use a brad gun with 18-gauge brad. The 18-gauge brad is a nice convenient size for a feeder hole. The brad gun allows for making quick and non-finger



smashing hole. Place the jar lid on a soft surface like a piece of insulating foam, so the brads won't nail the lid to the workbench. Removal of the brads is then quite easy. If the holes are to big then use a nail and hammer and put the lid on something solid so just the tip of the nail penetrates the lid.

**Frame Feeder** – Bees will drown or get stuck in honey.

When using the one or two gallon frame feeders or division feeders that sit inside a super, add straw before filling the feeder. The straw provides a foot hold for the bees. It will allow them to escape if they get stuck in the syrup. The straw has to come to the top of the syrup.

**Hive Air Flow** – A stick will do it.

Placing a stick or a piece of wood between the inner cover and the top cover will allow a better flow of hot air from the hive during the Summer months.

**Hive Placement** – Do not place your hives in straight rows.

If hives are placed in a row, the end hives will eventually have more bees. If you have your hives in a row, your bees will tend to drift to the hives at the ends. Place your hives at irregular distances and at angles to one another. This past year I was standing by the end hive in a row. Within 30 seconds there were bees returning to me – not to the hive.

**Hive Placement** – Not in a damp valley.

Hives should not be placed in an area where there is a lot of fog or the possibility of a creek overflowing. A friend looked out his kitchen window one morning and saw the bottom brood box of one of his hives under water. Not a good thing to see first thing in the morning. It makes for a bad day.

**Honey Storage** – Five gallon pails - Do NOT use pails that previously stored dill pickles.

Five gallon pails are a very easy to use and a great way to store honey. If you fill them full they weigh about sixty pounds. Before placing the lid on make sure the rubber gasket is in place. Then put a piece of food storage plastic (Saran Wrap) over the top before sealing the pail. This will keep the honey off the top of the pail when you move it. It is also easier to scrape clean than the lid of the pail. Sixty pounds is a lot of weight for the more mature (politically correct) person. Each pound of honey weighs about 12 pounds. Reducing the volume to four gallons can make lifting the pails a lot easier.

As was noted at a bee club meeting, when selecting pails for honey storage do not and I repeat do NOT, NOT, NOT use pails that were used to store dill pickles.

**Hive Stand** – Keep your stands low.

Be careful when placing your hive stands. Think about the following items.

The higher your hives, the higher your supers are when you want to remove them. When full they weigh about 50 pounds each. You do not want to climb a ladder to retrieve a super.

**Hive Stand** – Make sure your hive stands have a solid base.

Spend the extra time to insure your hive stands are on a solid/level base.

You don't want them to tip over as you add hive bodies and supers.



### Honey Wax Removal – Wax floats on honey.

After extracting is finished and your new honey has sat for a while, the wax and other debris will float to the top. To remove this scum, use a piece of plastic food wrap. Lay it on the surface of the honey and pat it down gently. When you carefully remove it, much of the wax and other debris will come off with it. I haven't tried this yet but it sure sounds promising.

### Inner Covers – The thick and thin of it.

Inner covers have a thick rim side and a thin rim side. The thick rim side faces the bees during the Winter. This allows the bees to navigate above the frames. The thin rim side faces the bees during the Summer. In theory, the thin side is small enough to the bees won't build comb between the frames and the inner cover.

### Inner Covers – Why use them?

Inner covers allow the top cover to remain loose. The construction of the top cover with its dropped down sides would be very difficult to remove if it was glued down with propolis or comb. By using the inner cover you can remove the top cover with ease and the use a hive tool to un-stick the inner cover.

### Installing Bee Packages – They will miss the hive.

Even though you wet down the bees before shaking your new package into the hive, they seem to miss where you want them to go and spill out over the sides of the hive. To eliminate some of this, use an empty hive body and place it on top of the target hive. Then keep the shipping box inside the top hive body while shaking the bees into the bottom box. This will help channel the bees into the lower hive box. You can then use your brush to force the bees clinging to the top box down to the hive.

### Marking Queens – They have a tendency to fly away.

Bees have a tendency to move up and to the light. When marking a queen, use this trait. First convince your spouse that queens don't sting. Then hint that the bathroom is an excellent work area. Next ensure her/him that if she escapes you can find her before the next shower.

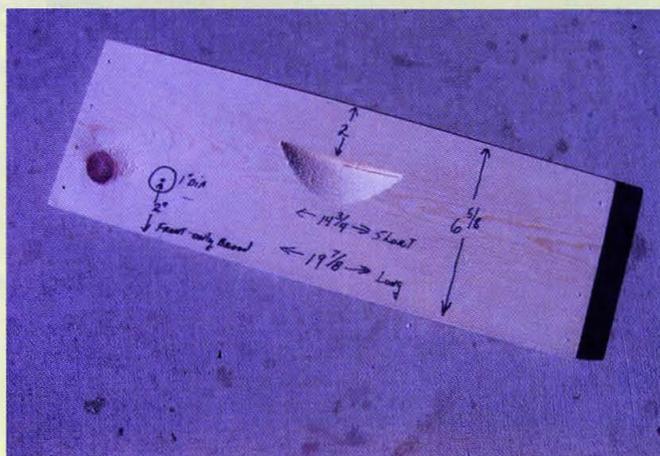
Close the bathroom door, remove the curtains from the window and turn off all the lights. Then use the window sill as a workstation for the queen marking. From then on everything is fine

**Note:** Unless you are concerned about the date/year of the queen, then yellow or white are easy colors to find. Red or green on a brown background is very difficult for a person that is red/green color blind to see.

Note: Be sure to allow the marking to dry before releasing the queen.

### Measurements – Keep them handy.

Keep a "Story Board" in your work room with all the measurement you need to build your equipment. Here is the one I have for super measurements. It hangs directly above my saw.



### Mouse Excluder – Keep them out.

When you Winterize your hives and you are unable to find any 1/4 inch hardware cloth to use as a mouse excluder. Cut up plastic queen excluder. Unfortunately it will also stop drones from leaving the hive. So when the workers drive the drones out they will be unable to exit the hive.

### Mowing Grass – The bees really get upset.

It only takes one time of mowing the grass in front of the hives to convince you to not do that again. Unfortunately, your spouse (notice the gender non-specific reference) requires the grass to be mowed.

Old shingles to the rescue – Placing an old but serviceable tar paper shingle in front of the hive will at least allow you to not bump the hive when mowing. A normal shingle will normally suffice. If more depth is needed then really go overboard and use a second shingle. You will still have to mow the grass but you won't have to get as close to the hives and possibly bump them with the mower.

A package of unmatched shingles is cheap at the local building supply store.



### Nosema Dead Out – Bees can't wait to go.

In the Spring and you found a hive that has a severe case of nosema, clean it out the best you can and it should be safe to use it. Then when you put bees in it, treat the syrup with fumagilin-B. Hopefully that will stop it from recurring while the bees clean up the rest.

Note: If the comb is over four or five years old then it is best to replace it.



*Close the doors*

**Paper Towels** – Indispensable

Cheap bulk paper towels that can be tossed away can save you an unbelievable amount of time compared to cleaning out cloth rags.

**Painting** – Extend the life of your woodenware

When painting a group of woodenware, use a paint roller to apply the paint. Then smooth it out and work it in with a brush. The time saved in not dipping the brush can be significant.

**Painting** – Cheap rollers

Watch for sales on the cheap rollers. Buy the cheapest you can get and keep them handy for when you need them. It's easier to toss them in the trash than it is to clean them. A little fuzz on the hive does not stop the bees from using it.



**Painting** – Multiple coats of paint

After using a roller to apply the first coat of paint to the wooden ware, wrap the roller in a plastic bread bag. This will keep the paint on the roller from drying out and allow you to use the roller for the second coat.

**Pasture Gates** – They are there for a purpose.

If you have your hives on a farmer's property, pay attention to the gate positions when going to the hives. If there are animals in the field, be sure to close the gates. If not, then make sure the gate is in the same position when you leave as it was when you got there. A loose animal will lose you your apiary privileges with that farmer (and all of his friends).

**Removing Supers** – Less sticky supers

The burr and cross comb you didn't cleanup has come back to haunt you. Even if you did keep things orderly the bees have a way of getting ahead of you. Besides it being a mess you lose honey. To help eliminate this problem, try this procedure.

The day before you remove the supers for extraction swap and reverse the supers on each hive.

Remove each super. Place them in order and all the fronts facing the same direction.

Reinstall the supers starting with the first removed. At the same time make sure the front of the next super is now above the back of the previous super. This placement maximizes the possibility that torn comb and runny honey will not be replaced back in the original position.

The bees will clean up all the loose honey by the next day and the removal should be a lot less sticky.

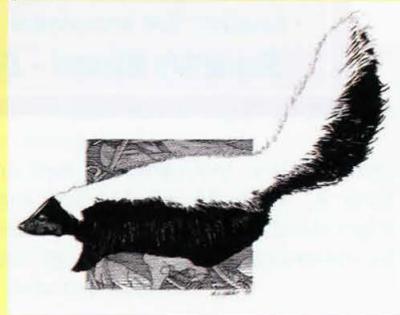
**Swarms** – It will happen – be prepared

Be ready. Have an extra brood box or a nuc available to store the swarm. A cardboard box will do in a pinch. If you can, it also helps to have a prepared site to set the swarm. It doesn't hurt to have an extra stand leveled and ready to go.

**Skunks** – They will find a good meal.

Carpet tack strips nailed to the bottom board will stop most skunks. Face the sharp tacks toward the opening.

After trapping and killing three skunks this year I finally gave up and installed the carpet tack strips. We still have a lot of skunks but I don't have to strip in the garage before my wife will let me in the house.



**Smoker Ash Disposal** – Don't start a fire.

Your smoker of ash residue could still be hot. Dump it into a metal bucket. Any still burning fuel can smolder safely without burning your barn down or catching your neighbor's hay on fire. To extinguish the smoker and save some of the fuel, use a cork to smother the fire.

**Smoker Cleaning** – Your lid never goes on easily due to soot and creosote buildup.

Remove the bottom grate and clean. Don't forget the holes in the bottom grate

**Burn it out** – Use a MAP or propane torch to start the residual creosote afire. Then use a scraper or screwdriver to chip the rest away.

Use a wire brush to loosen the soot – After cleaning the big chunks out of the smoker, use a 3" it 4" wire brush on an electric drill to remove the remaining soot and creosote.

You'll probably never get it completely clean but, at least you can put the top on easier.



**Smoker Fuel** – If it burns than you can probable use it as fuel.

Everyone has their own favorite fuel. I use dried cow manure mixed with landscaping shredded wood and pine needles. The hard part is collecting the manure. You have to be fast with the smoker when

the cow decides to void itself. A second method is to invade a pasture with a wagon and a shovel and get the not so fresh manure. After drying it out on the patio and chopping it into small pieces, store it in the ever present five gallon buckets. Other forms of fuel are: Jeans, Pine cones, Pine needles, Rags, Sawdust, Wood chips, Landscaping shredded wood and bark and anything else that burns. Try for something that is cheap and easy.

**Smoker – Easy start.**

Two easy ways of starting your smoker are by using a propane or map torch. If you are having trouble starting the smoker, give the fuel a squirt of hand sanitizer. Most sanitizers are about 66% alcohol and catch fire very easily.

Warning: Do NOT use anything that will explode.

**Temperature Requirements** – Thermometers get sticky

One of the most used tool I have in my toolbox as an infrared thermometer with a laser. It will allow you to take the temperature of honey, wax or anything else without having to clean it afterwards. To take a temperature, you just aim it and pull the trigger. Three seconds later the temperature is displayed on a screen. No mess no fuss.

**Wax Cleanup 1** – Wax is almost impossible to remove completely. Use a paper towel and place it between the iron and your clothes with wax on it. Press the cloth through the paper towel. The towel will absorb the wax when it has melted. It may take a couple of passes to remove most of the wax.

**Wax Cleanup 2** – A 300 – 500 degree Celsius (centigrade) heat gun and cheap paper towels will clean up the sticky wax. First remove as much wax as you can with a scraper. Then warm the wax a little bit with the heat gun. Use the scraper to remove more wax once it is loosened. As a final pass melt all the remaining wax with the heat gun and wipe it with a clean paper towel.

Heat guns are available at all hardware and lumber supply stores. A hair dryer will do in a pinch. But must hair dryers don't get hot enough to heat the underlying metal or wood for an easy wax removal. They are also not built for continuous use. Spouses have a tendency to get upset when you ruin their hair dryer.

**Wax Molds – How to form wax cakes.**

Cheap and readably available wax molds are:

- A. 1 oz. – – Mini cupcake mold (look in the Salvation Army Store)
- B. 1.5 oz. – ¼ cup – Cupcake baking pans (look in the Salvation Army Store)
- C. 8 oz. – 1 cup – Butter containers.
- D. 20 oz. – 2 cup – Small baking bread or meat loaf pans (look in the Salvation Army Store)
- E. 52 oz. – 6 cup – Larger bread or meat loaf pans (look in the Salvation Army Store)

Be sure to use a releasing agent when forming wax cakes. After they cool you can usually pop them out.

**Wax Moths – How to stop them.**

Wax moths don't seem to bother supers that are stored where it is freezing. I have kept my "DRY" and some "WET" supers in a barn with no problem. Of course it gets to 20 degrees below zero here in Minnesota.

**Weight of Honey** – A quick easy way to estimate the weight of honey.

Honey weight about 1.5 times the volume of the honey.

A gallon of water weighs about eight pounds. A gallon of honey weighs about twelve pounds.

Another conversion that is convenient is that honey weighs about 1.5 times the volume of water. A good example of this is the standard honey bear. It holds eight ounces of honey or water by volume. But it is considered a twelve ounce honey bear (by weight).

**Weight of Boxes** – A generalized weight for standard bee equipment

|              |                                      |
|--------------|--------------------------------------|
| 55-60 lbs    | Fully filled 9 frame Medium Super    |
| 12 - 18 lbs. | Wet 9 frame super (After extraction) |
| 90-100 lbs.  | Large 10 frame brood box             |

*~Ed Simon What your mentor forgot to tell you about beekeeping. These hints and shortcuts have been collected from experienced and neophyte beekeepers. Additional hints would be appreciated. Please send them to: [Ed@TheBeeShed.com](mailto:Ed@TheBeeShed.com)*

# BEE CAUTIOUS WHEN IT COMES TO A BEE ALLERGY!

Jack M. has been a beekeeper in Keene, NH for over 10 years. Like most beekeepers he has suffered uneventfully through many bee stings. He considers it a hazard of the job. In October 2011, however, he had a sting that was different from the rest. Almost immediately after the sting, he began to feel itchy all over, turned bright red and developed hives over his chest and abdomen. He went to the emergency room.

Jack had a generalized reaction to the honey bee venom, a rare but potentially life-threatening reaction. Approximately 3% of the adult population develops a systemic or severe allergy to bee stings and 40 persons die each year from bee sting reactions. Symptoms following a bee sting are usually mild with pain and irritation at the site. Some people experience large local reactions where redness and swelling extend a distance from the site of the sting. A much smaller percentage experience systemic reactions like Jack did. In a systemic reaction, symptoms occur away from the site of the sting. Symptoms may include shortness of breath, wheezing, itchiness over the body, redness of the face and extremities, loss of consciousness, hives and trouble swallowing. Having a sting on the hand and developing hives on the chest and abdomen would be symptoms of a systemic reaction while having a sting on the right hand with swelling to the right elbow would qualify as a large local reaction. Systemic or generalized reactions are an emergency and should be treated immediately.

Beekeepers have frequent exposure to huge numbers of bees and therefore are at higher risk than the general population of frequent bee stings. Beekeepers average about 58 bee stings a year. The average person has far less exposure to bee stings and much lower risk.

So what can be done? In the emergency room Jack was treated and fortunately did not have further progression of his symptoms. He was referred to a local allergist, advised to avoid getting stung again, and to carry an emergency EpiPen with him to use if he should have another sting.

Five types of bees are responsible for most allergic bee sting reactions. Yellow jackets are the most aggressive bees and are responsible for many bee stings and reactions. They frequently build their nests in the ground and are disturbed by gardeners and landscapers. Wasps are also responsible for many stings. Honey bees tend to be docile unless disturbed. They are one of the few bees that leave their venom sac behind with their barbed stinger left in the skin.

Allergic reactions to honeybees tend to be more severe than those from other bee varieties, and honeybee



allergy is more difficult to desensitize successfully. Venom allergy injections are approximately 95% successful in preventing systemic or severe reactions on subsequent stings. With honey bee injections, success is closer to only 80%. This is still far

superior to the potential of 25-70% chance of a repeat severe reaction without allergy injections. Similarly while most people who have had three to five years of venom desensitization may discontinue their venom allergy injections, with honey bee allergy injections, treatment sometimes needs to be continued indefinitely to provide adequate ongoing protection.

An interesting finding among beekeepers is that with their frequent bee stings, many actually desensitize themselves. Frequent stings act almost as allergy injections in providing a stimulus to the beekeeper's immune system to make protective antibodies. But not always! With Jack and countless other beekeepers the careful symbiosis sometimes breaks down, the bees feel threatened and sting. Whether or not a severe reaction will result can't be predicted.

At the allergist Jack was tested for five venoms including yellow jacket, yellow hornet, white face hornet, wasp and honey bee. He had an immediate reaction to honey bee venom. His doctor advised rapid desensitization since his risk of a repeat sting from a honey bee was high.

Jack is very happy to continue tending his bees. He receives a honey bee allergy injection once every month.



Before



After

He carries an EpiPen to use only if he were to develop another systemic reaction, unlikely on allergy injections. He wears a full protective suit when he tends his bees. The risk of a severe reaction is relatively low as long as he completes his treatment.

Beekeepers and the general public should be aware of the warning signs of a serious bee sting reaction. The reaction develops quickly and can rapidly progress to a life-threatening situation. If a

person is having a serious reaction, call 911 immediately. If they have an EpiPen, encourage them to use it. 

~Nancy Wade

## Bibliography

1. Munstedt, K, Hellner M, Winter G, et al: Allergy to Bee Venom in beekeepers in Germany, *J Investig Allergol Clin Immunol* 2008;18(2)100-3
2. Golden DB, Moffitt J, Nicklas RA editors: Stinging Insect hypersensitivity: a practice parameter, *J Allergy Clin Immunol* 2011;127:852-4
3. Bousquet G, Menardo JL, Aznar R, Robinet-Levy M, Michel FB: Clinical and immunologic survey in beekeepers in relation to their sensitization, *J Allergy Clin Immunol* 1984;73(3)332-40
4. Golden DBK, Marsh DG, Kagey-Sobotka A et al: Epidemiology of insect venom hypersensitivity, *JAMA* 262:240, 1989
5. Muller U, Helbling A, Berchtold E: Immunotherapy with honeybee venom and yellow jacket venom is different regarding efficacy and safety, *J Allergy Clin Immunol* 89:529, 1992
6. Golden DB, Kwitrovich KA, Addison BA, et al: Discontinuing venom immunotherapy: continued observations, *J Allergy Clin Immunol* 83:1049, 1989



# Deeps, Mediums, Shallows

## Decisions, Decisions, Decisions

~Ross Conrad

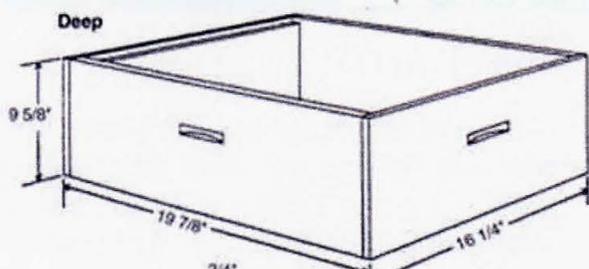
**In the old days** choosing a home for your bees was relatively easy. Bees were kept in a portion of the original tree that the swarm had moved into (log gum), or other handy containers made of wood, ceramic or straw (skeps). Beekeepers being the way beekeepers are, started to experiment over time with various designs and styles in an effort to "make 'em better." Some developed frames (or top bars), designed to be placed inside the skep. Others developed additions that could be placed on top of the log gum, or under the skep in order to provide the colony with additional room for expansion when needed. One thing led to another, and today we have so many options and choices for bee hives that it can create a bewildering experience for the beginning beekeeper.

Now if you are just getting started and preparing to choose the style of hive your bees will call home, the easy thing to do is to just ask your mentor, the instructor of your beekeeping class, or your neighborhood beekeeper what hive is best. This approach will help you cut through all the options to the best choice for you and your area...or will it? The person you ask is likely to simply recommend what they use which is usually what they were taught to use by their mentor or teacher. Their decision may work well for them, but is it really the best choice for you? In order for you to make a more fully informed choice, here is a summary of the primary options currently available.

### The Conventional Deep Langstroth Hive

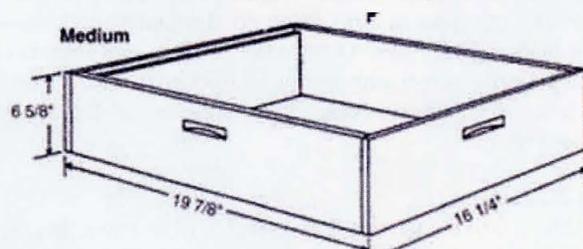
The hive patented in 1852 by L. L. Langstroth that opens from the top and features movable frames has become the most commonly used style of hive in the world.

The deep Langstroth-style hive body that is 9-5/8 inches high, holds 10 frames and designed with bee space in mind has long been the standard brood box for managed colonies. While a single deep box is often sufficient for bees in Southern climates, in Northern regions, two deeps are usually utilized for the hive proper in order to provide additional room for brood rearing and food storage. The deep super can weigh upwards of 80 pounds when filled with honey, so having an additional empty deep box into which frames can be transferred during manipulations/inspections rather than moving the whole hive body at once, might just save your back. Of all the options, the deep Langstroth hive body tends to provide the greatest expanse of uninterrupted comb into which the queen can lay her eggs (something that queens seem to prefer). Nowadays however, the conventional Langstroth hive made up of deep brood boxes is starting to become not so common and conventional.



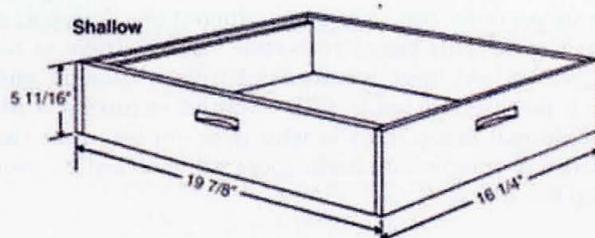
### Mediums

With the advent of so many backyard beekeepers taking up the craft of apiculture during the past decade there is a growing trend in the use of medium sized boxes for hive bodies which, at 6-5/8 inches tall, only weigh about two-thirds as much as a comparable deep when full. This size box is often called a Western, or Illinois Super. The big advantage of using all medium boxes for both the hive body and the honey supers is that you only have to inventory a single frame size for all your equipment and never have to worry about the incompatibility of your frames of comb and boxes. When three medium boxes are used for the brood chamber it creates just about the same size hive cavity as two deep hive bodies. Beekeepers down south may use two medium supers in place of a single deep. The drawback to using all mediums is that you will need to use more pieces of equipment and will end up with significantly more frames to handle when conducting frame manipulations and inspections compared to deep brood boxes. Also due to their shorter height, more medium boxes will be required for honey storage than when deep supers are used. The additional frames will significantly increase the amount of work needed to extract honey during the harvest.



### Shallows

At 5-11/16 inches high, the shallow box is the lightest option for regular use as a hive body or honey super. Shallow boxes can be used as hive bodies if need be, but they have the same drawbacks as the medium sized boxes only accentuated! As a result, shallows are most commonly used as honey supers. You may see boxes that are 4 3/4 inches deep being offered for sale by beekeeping supply companies. These are not extra short shallow supers, but specialty boxes made especially for comb honey production.



## Eight-Frame Equipment

Another fairly recent development is the popularity of eight-frame Langstroth-style equipment. Available in either the deep or medium sizes, an eight-frame box is lighter by about 20 percent than its ten-frame counterpart and being narrower, the center of gravity when grasped with both hands is closer to the body making it easier to lift. The downside is that an eight-frame hive will need to be taller than a comparable 10-frame hive due to the smaller cavity space created by the eight-frame box. This can provide an additional challenge in years when there is a strong honey flow and the supers are stacked up like a skyscraper requiring use of a ladder to reach the top. The narrow base can also make the eight-frame hive more likely to topple over in heavy winds, especially when top heavy during those good honey years. Since the majority of beekeepers still use 10-frame equipment, it may also be harder to resell used eight-frame equipment to another beekeeper should you ever decide to give up your beekeeping career.

## Mixing It Up

Today the hive that is made up of a single sized box is still relatively rare. Most hives utilize one size box for the hive body and a smaller box, either a medium or shallow for the honey supers above. Down South for example a medium is often placed above a single deep, while the double deep more common in Northern regions, is often topped with medium or shallow supers that are placed above for the collection of honey that is intended for harvest. Eight- and ten-frame equipment however, cannot be used on the same hive very effectively due to the varying widths. This lack of interchangeability suggests that one should get either eight-frame equipment, or 10-frame equipment and stick to that size throughout their beekeeping days. Otherwise the day will inevitably come when a ten-frame super is needed and all that is available are supers designed to hold eight frames, or vice-versa.

## Top Bar Hives

Alternatives to the Langstroth hive have become popular. The most common alternative to the Langstroth hive is the Top Bar Hive (TBH). The Top Bar Hive comes in two styles, the Kenyan TBH that features sloping walls, and the Tanzanian TBH that has straight walls. Top bar hives typically consist of a single box, but since their use and production has not been standardized in the way that the Langstroth hive has, the TBH comes in a wide variety of sizes. Beekeepers who build or purchase top bar hives that feature a top bar that is the same size as the Langstroth top bar find that their compatibility with the Langstroth hive is very convenient when performing certain hive manipulations or if they decide to move their bees from one style of hive into the other. Top bar hive inspections can only be conducted one frame at a time. Unlike with Langstroth-style supers, there is no ability to move large numbers of frames quickly and honey production tends to be limited requiring a lot of additional labor. This is why it is unlikely that the majority of commercial beekeepers will ever switch over to top bar hives.

## Warré Hives

The Warré hive offers another alternative to the Langstroth hive. Unlike the top bar hive however, the Warré has established interior dimensions that are standardized and the hive has the ability to be "supered" from the bottom as the colony expands. As with the TBH, combs are typically attached to a top bar and allowed to be built naturally without the aid of sheets of foundation. Warré hives tend to be better for honey production than TBH, though raising the entire hive in order to add a super to the bottom of the colony may be challenging.

## Unique/Original Designs

In the continuing effort to improve upon bee hive design, some beekeepers will experiment with their own unique hive designs. Here again, designs that feature frames or top bars that are compatible with the standard Langstroth hive make life easier, especially when transferring bees, brood and comb into or out of a Langstroth hive. As long as the hive design incorporates the bee space and a removable frame into its design, it should not run afoul of the bees preferences, or state laws that require a movable frame to enable inspections for diseases and pests.

So what type of hive is best for you? If lifting heavy objects is a concern, the top bar hive or a Langstroth hive especially those made up of eight-frame medium boxes may be the best options. Much also depends on your purpose for keeping bees. If honey production is important then a Langstroth or Warré hive is likely to be more satisfying. If you will be keeping bees such as Italians that tend to build up early in late Winter/early Spring, Langstroth and Warré hives rather than a TBH will allow for easier expansion of the honey storage area in order to help ensure enough room for the extra honey that the Italian bees will need to survive the Winter without supplemental feeding. Just remember that if you experiment with more than one style of hive, try to ensure that the top bars from each hive are the same length so that combs may be moved from one hive to another to simplify any hive manipulations that you may want to make in an attempt to correct hive issues or relocate colonies. Bees are incredibly resourceful and adaptable and are able to thrive in almost any type of cavity that we provide. From my point of view, it is not the box that you keep your bees in that is critical as far as the bees are concerned, but how you care for them that matters most. 

---

~**Ross Conrad** is author of *Natural Beekeeping*, revised and expanded 2<sup>nd</sup> edition. Join Ross and the Colorado Beekeeping Association in Broomfield, CO from 8:30-5:00 for an advanced beekeeping workshop on Saturday January 24, 2015. <http://coloradobeekeepers.org/ross-conrad/>





# Regional

## Reports

### PRIMARY NORTH WEST

April, May and June are the busiest bee months for PNW bee colonies and beekeepers. Weather can be highly variable. If bees can fly, pollen is generally available and strong colonies can even begin to store surplus. In the valleys, beginning in March and continuing into April and May, with increasing day length, a stronger sunshine and new pollen, colonies will rapidly increase brood rearing. Weaker colonies and new divides (some colonies can be split by April) will benefit from sugar syrup and pollen patties, while stronger overwintered colonies will swarm in April through May (and sometimes into June) unless cut back. The first supers need go on colonies in May but beekeepers in areas where big-leaf maple is common will want to super in early April.

Pollination events requiring bee servicing are plentiful in the PNW, from back-yard fruit, vegetables, and berries to commercial plantings of pear, sweet cherry, apple, blueberries, cane berries and the seed fields of turnip, radish and other "Spring yellows" during these three months. June will bring other pollination needs like the clovers, meadowfoam, onions and, before June is over, the desert seed growing areas (most are irrigated) will need pollination.

The months of April, May and June are intense colony manipulation stewardship time. Colonies in an apiary may range from weak (installed packages, nucs, splits, smallish swarm captures) to very strong (large swarms, overwintered colonies). Each hive needs be read, sometimes quickly, as weather is not always cooperating, and then decisions made as to need for feeding, halting swarming, reducing brood/adult population and/or supering. Brood frames, initially located in top box but eventually occupying two (standard size) or three (western super) boxes, need be checked frequently (every 7-10 days) for developing queen cells or there is risk of swarm emergence.

By June beekeepers should be doing powder sugar shake or alcohol wash to determine percentage of mites. Mite populations will double each month and if June numbers are 3% (3 mites per each 100 adult bees of sample) or higher, beekeepers should consider using HopGuard II (which will only keep lid on mite populations when there is a heavy capped brood presence) or MAQS (formic acid), if temperatures are not elevated. Dividing

colonies (and requeening new splits) is a non-chemical alternative, but divides must be done skillfully or honey surplus may be sacrificed. All other chemical treatments must be avoided when bees are storing surplus honey.

### SOME TASKS FOR APRIL

Check hives to insure hive covers/rain shelters remain in place, especially following stormy weather.

Confirm hive activity on warm, sunny days with temperature >50 degrees. If colony has only a bottom entrance, insure it remains free and not clogged with dead bodies. If deadouts are detected, remove the equipment to storage.

Check food stores by hefting back of hive – feed sugar syrup if light and to stimulate brood production.

April is month to start packages or nucs. Stronger overwintered colonies can be split, with queenless divides allowed to raise their own queen or requeen them with purchased queens.

Swarm control, when colonies are starting swarm cells, or continuing swarm prevention by providing good ventilation, room for brood expansion and early supering (room for nectar storage).

Watch the weather. Strong colonies may have too few pollen resources to survive a cold, rainy spell of 2-3 days and, even though there may be abundant flowering plants, if the foragers are unable to leave and get pollen big colonies can starve.

April is BEE LOSS SURVEY MONTH – participate with BIP National survey ([https:// beeinformed.org/](https://beeinformed.org/)) and the PNW survey ([www.pnwhoneybeesurvey.com/survey/](http://www.pnwhoneybeesurvey.com/survey/))

Some Tasks for May

Strengthen weaker hives (via feeding or adding brood from stronger hives) and reduce congestion in stronger hives (make splits, remove brood frames). All colonies should be expanding.

Supers should be placed on all strong colonies – use queen excluder if concerned about brood rearing in supers. Check super after 3-4 days to confirm bees are actually working in super, especially when supering with foundation or using natural comb system. If bees do not move into added supers, stimulate bees to move into them.

Draw "extra" frames of foundation. Swarm captures do an excellent job of drawing foundation – you may need to crowd established colonies after putting 2-3 foundation frames in middle of top box or first super to "force" bees

into drawing foundation.

Capture swarms – issuing from feral colonies and other beekeeper colonies. Inspect colonies every 7-10 days to reduce swarming in your colonies; if swarm cells are seen, make splits, remove brood frames, relieve brood congestion, and insure enough storage space for incoming nectar. Avoid having your colonies swarm.

Some tasks for June

Super, but continue to insure that strong colonies have sufficient brood rearing room so they do not start swarm cells.

Continue to stimulate (via feeding) new colonies, swarm captures, nucs, splits. New colonies should have expanded into or be ready to occupy 2<sup>nd</sup> brood box to help insure they have sufficient stores to overwinter. Brood frames can be supplied to boost weaker units from strong colonies.

Nectar flow likely to begin, depending upon elevation, in PNW apiaries this month. Over-super strong colonies, especially if seeking to maximize harvestable surplus and drawn comb is available. If adding supers with foundation, check to insure bees are working in the super(s) after 3-4 days.

If producing honey in the comb, monitor colonies for start of nectar flow. When it starts, crowd brood chamber and over-super. Check within 2-3 days to insure bees are occupying supers and within week to insure there is still adequate space for storage of surplus. Remove promptly if nectar flow terminates.

Draw “extra” foundation frames in brood areas, rotating older, darker combs to the sides of the top box for removal after the nectar flow.

Sample adult bees for mites using powder sugar shake or alcohol wash. Use control treatment (splitting and requeening or chemical – HopGuard II and MAQS) if numbers greater than 3-5%. ONLY these two chemicals are permitted while bees are storing surplus. Resample (if treatment used) to check control effectiveness. 

~DEWEY M. CARON

## NORTHEAST

Spring is the time to replace colonies lost during the Winter, or increase the number of hives in your apiary. If you were successful in overwintering a colony than the focus will be on growing the worker population. A strong overwintered colony will provide extra bees for starting new hives, and it will have the strength to produce a honey crop. If starting a new hive from a package of bees, or a purchased nuc, your management will still focus on growing the colony, with a few additional tasks.

The requirements for increasing a colony are to have a mated queen, healthy brood, and a steady source of pollen and nectar to feed the growing population. Spring management is about assessing these requirements, and implementing the tasks to support the colony's development. Feeding syrup, evaluating the queen, and inspecting for mites and disease should be done early in the Spring. Equipment should be ready for package bees, or nucs requiring more space. As you inspect the overwintered hive it is a good time to pull poor looking comb, and old frames, replacing them with new foundation. When using plastic foundation, paint with extra beeswax to speed up

bees drawing out the comb.

- When a colony dies during the Winter. Close it to prevent robbing, inspect to diagnose symptoms for failure. If American Foulbrood is not the cause, then clean the hive and repopulate with a package of bees, or a five frame nuc.

The overwintered colony should be checked on a warm day (50F+) when bees are active at the entrance. Confirm there is a queen and that she is laying worker brood (flatter-capped brood, not bullet shaped drone brood). Estimate the honey and pollen reserves. Keep in mind that for every frame of brood you should have two frames that contain pollen and honey. Look at the brood nest and the queens laying pattern. A queen will lay a tight area with eggs, larvae and capped brood. The pattern will be concentric starting from the center and expanding to the edge of the comb. Oldest brood in the center. The nest will grow as more young bees emerge, increasing nurse bees to feed larvae and regulate incubation temperatures. In May the brood nest will have expanded to six or eight frames, and what began as a hundred eggs per day will reach a thousand plus new bees emerging daily.

Package bees are brought to the Northeast in late March until mid-May. As warm weather advances from south to north so does the optimal time for installing bees. Replacement queens are also available during this time, from southern and western producers. Mid-April is a good time for new beekeepers to start, as the average temperatures stay above freezing, and natural forage becomes available. Contact your local supplier for advice on when to receive your bees.

- After installing package bees check to confirm the following has happened: Two-three days the queen has been released from her cage, a week later she is laying eggs, week two confirm capped brood is worker, not drone cells. The population should begin to expand at week four or five. Replacement of a missing, or poorly mated queen should happen within the first two weeks after installing the bees.

- Locally raised queens and nucs are ready in late May or June, earlier if from an over wintered nuc. Expect to pay more for locally raised queens and nucs. State and county bee associations can recommend reputable local suppliers.

- Prices for 2016 are about \$120. For a three-pound package, and \$150. - \$240. a nuc.

**Feeding:** Check early and be prepared to feed. Lift the back of the hive – is it heavy? Remove the telescoping cover and look in the hole in the center of the inner cover; are bees at the top of the hive? If they are this can indicate they are low on honey. Determine that there is capped honey in the top hive body (box) – at least three deep frames in April. If bees are at the top, then feeding is required. Feeding serves two purposes; to feed (2 parts sugar: 1 part water), and to stimulate the queen to lay eggs (1:1). Thick syrup to feed and thin syrup (similar to nectar) to stimulate brood rearing.

- Add a frame of honey next to the cluster. A deep honey frame can carry the cluster for several weeks.

- Sugar syrup (1part sugar: 1part water) in a zip lock bag, frame feeder or jar with a metal cap (six to eight pin holes punched into the cap) placed over inner cover hole. Entrance feeders can be used when temperatures are above freezing night and day.

- Pollen patty directly over cluster – add on a 50F+ day in late February.

- Adding essential oils to syrup will stimulate appetites, reduce spoilage of syrup and help reduce Nosema disease. Honey-B-Healthy & Pro Health are two brands of premixed syrup additives.

**Queens:** If a tight brood pattern is observed (but a small area on the frame) queen may lack the support to expand the nest. Add workers and feed to increase the brood nest. Spotty brood or no brood, suggests no queen or a failing queen. Replace the queen asap. Find and remove the failing queen, allow 24 hours as a queen less hive, before trying to introduce a new queen. Purchase marked queens. Learn to mark your queens for easy identification.

- A colony with a large population in March or April most likely has a productive queen.

- Egg laying starts in late January or early February. This is critical as the Fall workers have reached the end of their lifespan, and replacement workers must emerge to take up thermoregulation and brood care.

- Check a brood frame to evaluate the queens laying pattern. The pattern should start in the center, and work outward with most cells containing eggs, larvae or capped cells. 10% empty cells indicate a desirable level of hygienic behavior. A tight pattern represents a healthy queen. The size of the brood nest is a reflection of the number of workers, and the available honey & pollen.

- To increase the brood nest, add young worker bees, feed syrup and pollen patties. Increasing the worker population can be accomplished by: adding a frame of capped brood (with adhering bees) from another hive, or adding bees from a package of bees.

**Swarm Prevention:** May through June is when colony populations peak, triggering swarming (colony reproduction). One of the conditions leading to this behavior is an over-crowded brood nest with too many young workers. Slowing this down is most often accomplished by removing young bees and brood, or by separating the queen from young workers. Equalizing (moving brood frames) from a strong colony to a weaker colony will help slow down swarming if accomplished early in the season. Six to eight brood frames in early May with a second hive body of empty drawn comb will provide enough room for another month of growth. Colonies should be inspected weekly for queen cells between the hive bodies. Brood can also be used to build nucs, or to a package of bees to quicken their buildup.

- Removing brood may reduce honey production, unless the colony has time to replace foraging bees. In western Massachusetts this time is early May, two weeks before the nectar flow begins.

**Health:** Colony die off during the Winter is most often the result of queen failure, starvation, or disease. Each time you visit your hive confirm there is a laying queen (eggs found, queen is seen), at least three frames of honey, and pollen surrounding the brood nest. Also look for signs of *Varroa* mites; deformed wings on workers, perforated capping's, mites on backs of bees. Decide on a method to test for mites and test in the Spring, mid-Summer and August. Do not ignore mites as they will destroy your hive, if their populations are not reduced. *Varroa* is the most common reason hives fail.

- *Varroa* mites – test and treat as required; formic acid, thymol, or Amitraz – are approved treatments. Plan to rotate your treatments, and always follow directions for best results.

- Nosema disease – test and treat with Fumigillin, or essential oils.

- Chalkbrood – is usually a self-limiting disease. Treatment is to remove heavily infected frames and replacement of the queen.

- Chilled brood – result of freezing temperatures late in the Spring. It can look bad as workers remove dead brood, but it is a temporary problem that the bees will correct.

May is time to prepare for honey production. Over-Wintered colonies in good health should have one or more honey supers (with drawn comb) on by mid-May. One super if using foundation. This coincides with dandelion and apple bloom. Most of New England has a strong nectar flow May through June. Harvest supers in July, inspect your hive, and return the supers to the hive for the goldenrod and Fall honey.

Early *Varroa* mite counts should be below 9 mites in a sample of three hundred. Levels above 3 mites per one hundred bees should be treated. It is critical to know your mite levels and to reduce them before they damage the colony. Prevention is better than trying to remedy a serious infestation as the viruses and infection, carried by mites, can stress the bees long after the mites are controlled. Nosema disease is the second common killer of bees. Alone mites or Nosema can kill a colony, together they are lethal to a colony going into a northeast Winter. Both require testing for threshold levels of infection/infestation before treatment. Bees can thrive if *Varroa* mites & Nosema disease are below levels that cause damaging thresholds. All colonies have mites and Nosema, their health is measured by numbers found to be below those considered economically damaging to the colony. All beekeepers need to monitor the mite and Nosema levels in their hives, and know when to apply treatments.

- *Varroa* mite testing – use sugar roll or alcohol wash with a cup of bees. 0-9 mites no treatment. 9+ treatment required. Using hygienic bees that remove mites from the population aids in keeping mite levels low.

- Nosema testing – pull abdomen from thorax and examine alimentary tract for swelling and tan-brown color. Follow up with lab testing. Consult your state inspector, or the USDA Beltsville Lab before sending samples.

- Thymol, Formic Acid and Oxalic Acid are approved for mite treatment. Check with your state inspector for a list of approved and recommended treatments.

- Drone trapping, interruption of the brood cycle, and other non-chemical interventions are also useful in lowering mite levels.

- Essential oils; including lemon grass, spearmint, and thymol oils are helpful in reducing Nosema. Add to syrup as a Spring tonic.

April, May and June is when the colony experiences its fastest growth rate. Large numbers of worker bees, drones, and even queen cells indicate a healthy colony. The beekeeper assists by providing food, replacing a failing queen, and monitoring for disease and pests. In the northeast we have a shortened season to build colonies, harvest honey and prepare for Winter and this leaves little room to start over during the season. Anticipate problems, consult beekeepers successful in your bee community, and make setbacks an excuse to learn and find answers 

~DAN CONLON

## MID WEST: IN THE MIDDLE

April, May and June are the make or break months for both bees and beekeepers in the mid-west almost every year. Note – almost every year. Fickle weather can move things a month in either direction, and probably will again this year, so watch the weather channel more than CNN and the election reports this Spring.

If you're just starting out you'll be getting packages in April or early May. Take a look at the very last page showing some basic installation techniques. There's more than one way to skin a cat, and there's more than one way to install a package. Shown is one tried and true method, but if you have friends or a class that go in another direction, by all means. Once installed though, the tasks for caring for that package are pretty standard.

Primary, most important, critical and don't forget to feed, feed, feed. Your package is starting from scratch and has no resources to call its own, so they have to be provided by you. If the weather is perfect, Spring is on time or ahead of schedule there will be forage available for your bees to gather. But your package doesn't have enough bees to gather enough food to thrive...survive, perhaps, but thrive, no. Nope, nada, never. It's up to you to make sure that not one minute goes by that your bees don't have more food than they can use. Any food shortage, even an hour, is stressful, and brood, who get fed thousands of times a day, won't get fed thousands of times a day. Imagine your children having to go without food. They get fussy, they get mad, they suffer. Your package has enough stress, what with a brand new queen, no comb, a strange environment, maybe lousy weather, maybe not but are you going to bet on the weather? And now you don't give them enough food. Feed, feed, feed.

There are a variety of ways to get food into the colony, but what are you feeding them? Don't feed them honey, at least yet. Honey may contain bacteria spores of American Foulbrood, a deadly honey bee disease that will kill your brand new colony. Rather, mix up sugar syrup. Equal parts of both. A quart jar full of sugar and a quart jar full of hot water in a pot big enough, heat, stir until dissolved and feed. Use a pail or jars to feed on top of the top bars or inner cover. DO NOT USE a front door feeder, called a Boardman feeder, because if the weather turns the bees won't break cluster inside to go all the way down to get food. So they will get hungry, and if it's cold long enough, they may starve, with food only inches away. This is only one of the reasons bees don't rule the world.

May and June tend toward being major honey flow months, so no matter if colony is just starting or you overwintered a buster, this is when you need to pay attention. Walk around the neighborhood and see what's blooming. Look at trees, shrubs, ground covers and lawns. Real early bloomers in the Midwest are willows, both shrubs and trees, maples, especially red and sugar. Dandelions show up about now and a sea of yellow is a sea of gold as far as your bees are concerned. Because your colonies are more in the growth stage than the storage stage most dandelion honey is fed to a growing population rather than stored for future use... by you or the bees.

Following is fruit bloom, both ornamental and orchard based. Some of the best honey there is comes in now, while rebuds and certainly all the Spring flowering bulbs are showing up. Black locust is a prime crop to watch and be ready for. Make sure you have enough room all the time to catch this crop, and get it off in time so the clovers don't get mixed in, which come next. White and yellow are the standards in the honey world, but all that white dutch clover you see in almost everybody's lawn is a staple too. See if you can convince your neighbor to wait a week on mowing the lawn so your bees can take advantage of this formidable crop right outside their front door.

Right about the end of June you may see basswood trees blooming, or at least coming into bloom. This is another don't miss crop, so make sure you've got the clover supers off, and empties for the basswood on so you don't miss a drop of this wonderful honey.

Certainly pay attention to *Varroa* in the Spring. If your samples show signs of an infestation, be sure and do something to reduce their numbers. Treating with formic is good now, as is making splits and going for a broodless period a good idea. If you use chemicals, make certain that honey supers aren't on and you follow label instructions to the letter.

Where are your bees getting water? A nearby creek, river, pond or lake is lucky for them and you, but if they don't exist, make sure you supply this necessary commodity. A colony will use a gallon of water on a hot day, and they'll get it somewhere...make sure it isn't your neighbor's swimming pool.

And on a warm, sunny afternoon, when time is slow, take a chair and sit and watch the front door for awhile. Sit to the side, wear a veil so they don't get caught in your hair or glasses and just watch. Where are they going? How long are they gone? What color is the pollen? Listen to the hummmmm. It's the sweetest sound there is 

~KIM FLOTTUM



# Your Second & Third Year

~Matthew Albert

Quite frankly, if not done the during the first season of keeping bees, the second and third year are the years that set the course for many beekeeper's success or failure. Once the first year is completed, beekeepers are either challenged to start over for a variety of reasons: package bee failure, queen failure, general colony neglect, ignorance of basic bee management practices, failure to recognize problems with queens, diseases and mites, and countless other issues. Or, through a combination of luck and good training and self-study they have managed to keep their colonies alive and are ready to grow their colony numbers or increase production through better management.

At the end of a beekeeper's third year, we would expect that he or she will have mastered all of these areas and perhaps dived into queen rearing, specialized honey and hive products, teaching beekeeping, equipment-bees-queen sales, and more – If they did not start some of these activities in their first season. It is always amazing to see inexperienced beekeepers jump into something others consider too technical and come out smelling of great success.

There are beekeepers that take the minimalist approach to doing as little as possible with their bees during the first three years, so I need to say that it has been my experience has been that this is somewhat risky for their overall success in long-term beekeeping. Without a solid basis of knowledge, it is harder for beekeepers to sustain themselves over the years using their good luck as their primary asset.

It is often repeated that a second year beekeeper is the most dangerous beekeeper in the apiary and classroom because they have all the answers. Certainly those who were blessed with positive experiences and good luck with their bees are quite often adamant about their 'proficiency' as a beekeeper. They have often not learned the challenges of a difficult beekeeping year, of growing mite levels, and exposure to pesticides and the growing threat of disease infestation. While we do not want to minimize the importance of second year beekeepers as teachers of first year beekeepers – they are closest to the experience – they still require monitoring by more experienced beekeepers. Therein lies the conflict, finding a balance between learning and growing with bees versus a large area of inexperience.

What should a second and third year beekeeper be able to do?

Here are some of my thoughts of the many areas they should master during the first three years of keeping bees:

**Bee Anatomy** – Full knowledge of the parts of the bee, both internal structures and internal anatomy, coupled with a good understanding of what each part of the bee does in the life of the individual bee and colony function. They should be able to teach this to other beekeepers.

**Floral Anatomy** – They should be able to identify the parts of common flowers, how nectar and pollen are produced, the keys to pollination of key plants for their region, and be able to teach this to neighbors, growers and other beekeepers.

**Bee Venom and Stings** – More experienced beekeepers should be able to recognize a local reaction as compared to life threatening anaphylactic shock. The experience of these beekeepers is critical when working with both new and established beekeepers, as we all hear of those who have suffered a major scare following a bee sting. Second and third year beekeepers should always error on the side of caution, but be able to determine if a bag of ice is the best treatment, or when to phone 9-1-1 with a possible emergency.

**The Beekeeper Annual Cycle** – Starting either in the later Summer or in January, a beekeeper should be able to review in some detail the key changes that take place during each month of the year in the area where they keep bees. They should be able to show how different seasons produce different results in pollen and nectar production, and how this impacts colony management. This cycle should be broken into several themes:

**Population Cycle** – Following the Winter/early Spring decline, beekeepers should be able to discuss the increase of brood and bee populations as the seasonal buildup leads to stronger hives and robust forager populations. In his writing Dr. Dewey Caron reminds beekeepers that the key to successful bee colony management is through proper bee population management, and all teachers and mentors need to remind their students of this.

**Swarming Cycle** – These beekeepers must attempt to master the Spring and late Summer/early Fall swarming cycles, adapted for the regional area where the beekeeper keeps bees. Methods of swarm prevention and swarm control should be strongly established within the beekeepers skill set. Methods of swarm capture and management

are suitable at this or an earlier level. While not all beekeepers should be able to perform colony removals – it requires non beekeeping skills not all beekeepers possess – but the second and third year beekeeper should be able to work with a well-protected carpenter or another beekeeper to remove a colony using various techniques, and be able to tie up combs into empty frames or onto top bars (in frameless management systems).

**Honey Cycle** – Know when to super, when and how to harvest honey, and how to deal with honey processing-storage-bottling-sales. I am always amazed at the number of two to three year beekeepers who are overwhelmed when their colonies produce surplus honey and they do not know what to do with it. Excuse me, why did you start a dozen colonies of bees?

**Disease Cycle** – The use of the word cycle applies mostly to *Varroa* mites, as true diseases follow a more random pattern of infection based on contamination exposure. But chalkbrood and nosema are both known to follow certain highs and lows as influenced by the weather and seasonal influences. *Varroa* mites will increase in numbers as related to levels of mite tolerance, mating accuracy, drone production and other factors stimulate mite development within colonies in an apiary. Depending upon the region where a beekeeper keeps bees, the mite population cycle may take a year or more to be fully expressed.

**Disease, Pest and Pesticide Detection** – Every third year beekeeper should be able to determine if a colony, or a sample from it, should be checked by a qualified laboratory, like USDA-Beltsville, for American foulbrood, European foulbrood, chalkbrood, nosema, tracheal mites, *Varroa* mites and pesticide damage. The best of all beekeepers will be able to do much of the recognition work at this stage, but all third year beekeepers should be able to determine if they should have a colony sample checked by qualified individuals or services.

**American foulbrood** – By this time a beekeeper should be able to inspect old beekeeping equipment to look for AFB scale left from a previous dead out from American foulbrood. The beekeeper should be able to perform a field exam for AFB killed larvae in the late larval stage by checking for a strong sour odor and ropiness.

***Varroa* mites** – Using a standard sampling method using powdered sugar, ether, or a full screened bottom board and powdered sugar, a third year beekeeper should be able to measure the mite level in each colony in a small apiary and compare that data from colony to colony and apiary to apiary. This should become a preliminary aspect of determining if the colony needs to be treated for mites, using any number of treatment options.

**Miticide and chemical Use** – Beekeepers should be able to read the label of any chemical and examine it for its risk to honey bees and other pollinators. Apiary pesticides should be carefully studied before being selected for use.

The beekeeper must follow treatment procedures and safety concerns. If a residual strip or artifact remains after treatment, its correct removal and disposal should be followed. All efforts should be to provide safe application to the bees without causing bee mortality and contamination of honey and hive products.

**Equipment and Terminology** – Take the glossary from a good beekeeping book and see if you can identify at least 80% of the terms and items of equipment listed there. Know the key leaders in the development of American beekeeping, and study global beekeeping development as well. Using that 80% standard, you should be able to identify most items in a commercial or sideline beekeeping operation, even those producing package bees or queens. Much of this will come with normal curiosity with bees and beekeeping.

**What is Honey?** – Does filtering convert honey into non-honey? Does heating at 160° do the same? This is a fuzzy, grey area for a lot of beekeepers, and all must know what the law and marketing rules say about putting Pure Honey on a jar, as compared to Funny Honey or some other label. While there is a great deal of misinformation out there, get the facts and follow them. Is there a legal description of Raw Honey? More to the point, every beekeeper should be able to look at a container of honey and point out any mislabeled items, such as lack of weight, location of source and producer.

**Comb Analysis** – Third year beekeepers should be able to identify the content of each cell on each frame in a hive. This includes ALL stages of brood, stored nectar, stored honey (sealed and open), loose pollen, new bee bread, water and propolis-covered cells. The beekeeper should be able to rearrange a set of frames into the natural position that the bees would produce without beekeeper interference.

**Other Hive Products and Handling** – Third year beekeepers should be able to produce honey, pollen, beeswax and propolis. They should know the best practices to use for the harvest, processing, storage and marketing of these products. Knowledge of labels, limits on claims of product properties and general legal issues concerning these products fits the third year level. They should have submitted at least one of these items of their own production in a local fair, honey judging event or have their product evaluated by a trained professional.

**General Entomology** – By third year, beekeepers should be able to identify common non *Apis* bees, wasps (including yellow jackets and hornets), flies and bee mimics typical to the area where the beekeeper operates. They should understand the system of naming insects, starting with a common name, and followed by the Latin name. They should be able to identify regional pollinators and stinging insects and their mimics by common name.

During the fourth and fifth year of keeping bees, most beekeepers perfect their skills, and be actively involved in honey and hive sales, pollination, and teaching new beekeepers. 

---

**~Matthew Albert 40 years a beekeeping instructor and author from MI.**

# Swarming

## A Look at the Biology and Mechanics Behind This Fascinating Phenomenon

~Steve Repasky

In temperate areas, beekeepers look forward to many things in the Spring, such as the first pollen coming in from skunk cabbage, crocus, willow and snow drops, the beginning of a nectar flow when the maples bloom or the start of a new hive from a nuc or increase hive. These events herald the beginning of the annual cycle of reproduction for honey bee colonies that may reach its climax only a month or two later. Just as the flowers bloom in the Spring, honey bee colonies across the United States begin preparations for their annual colony reproductive event of swarming. It's a natural phenomenon; a process that nearly all colonies go through, both managed and unmanaged. For many beekeepers, the thought of their colonies swarming brings mixed feelings of tension, worry and excitement. It causes "new-bees" to switch their concern from making sure their colony survived the Winter to trying not to lose a colony the potential honey harvest and with it.

Losing a swarm may evoke feelings of failure from some beekeepers if it issues from your own apiary, but capturing a swarm is a measure of great success. Catching a swarm is often viewed as a transition from a new beekeeper to one with more experience under the veil. Swarming is exciting and isn't something to fear; instead, it is something to appreciate and respect. The behavior of a swarm of honey bees, and the colony's preparations that lead up to a swarm issuing from the hive, give us a wonderful opportunity to study this marvel of Nature.

### What is Swarming

Swarming is the colony's way of reproducing on a large scale. It is a process that colonies go through to divide one colony into two or more independent units, as the season allows. It is asexual, meaning that the "reproduction" occurs by fission, where the colony actually divides in half and the "new" colony is the swarm that leaves with the mother queen and the rest of the colony remains behind to raise a new queen. This process also provides a reduction or a break in the brood cycle, which also may aid in the reduction of the *varroa* mite, a major pest to the Honey bee. It is important that beekeepers understand how to manage or deal with the swarming instinct of Honey bee colonies and in order to do that, they must understand the biological processes that take place within the hive.

### What Causes Swarming

Various factors contribute to the initiation of swarming behavior in a hive, including the queen's age, distribution of workers (congestion and colony size), temperature, brood nest availability, pheromone quantity and distribution, and availability of resources—a factor tightly tied to the season and the geographical location of the colony—all influence if and when a colony will swarm. As Spring approaches and the conditions for swarming

come together, overwintered colonies will begin their preparations for swarming.

- **Dilution of Pheromones**

A key to understanding the reproductive swarming process is the queen substance, or queen pheromone (QP), produced by the queen and passed along to every member of a hive through food exchange and physical contact.

These pheromone levels play an important role in the hives decision to decision to swarm. If a reduction in queen pheromone occurs, this triggers the swarm impulse to begin. Young, newly mated queens have higher pheromone levels and are less likely to swarm in their first season when compared to older queens in other hives. In older queens, when the levels of queen pheromone declines, the queen is stimulated to deposit eggs into the numerous queen cups found throughout the colony. Because the eggs laid in the cups are fertilized, they are recognized by the colony as future queens and the swarm process begins. How many of these new queen cells are present will assist the colony in potentially issuing afterswarms after the primary swarm departs.

- **Congestion** As the queen reaches her peak in egg laying (upwards of 1500 or more a day) her level of queen pheromone can be affected by the amount of space available for her to lay in. If she is laying at her peak she produces higher levels of queen pheromone and as space become less available, the level of pheromone produced becomes less. This reduction triggers a genetic mechanism that we call swarming instinct. As laying increases so does the number of bees emerging as adults, the amount of pollen and nectar being stored also

- **Genetic Strain** The genetic race or strain of the honey bee is a factor in swarming as well. Italians, and Caucasians have a moderate tendency to swarm. These are the bees kept by most beekeepers and can be managed fairly easily with the right know-how. Buckfast bees, which were developed by Brother Adam at the Buckfast Abby and are now are bred in Denmark and propagated in Ontario, have a low tendency to swarm and are known for their gentleness.

On the other end of the spectrum you have Carniolans and USDA Russians (a genetic derivative of Carniolan bees). Carniolans overwinter in smaller clusters but can build up rapidly. They have higher tendencies to swarm than Italians but not as much tendency as the Russian queen families—it has been speculated that swarming is one of the mechanisms of *varroa* mite tolerance developed when Carniolan stock was introduced into Eastern Russia where the *varroa* mites are naturally found on their native host, *Apis cerana*. The effects of isolation in close proximity with *varroa* mites in Eastern Russia may have included an increased tendency to swarm and create breaks in the brood cycle as a method of colony survival. Russian bees are well known for their tendency to swarm.

- **Age of Queen** The age of the queen can also play a role in the swarming instinct. Not only do young queens produce a large amount of

queen substance (pheromone), young queens also tend to swarm less than older queens (not never). Part of this contrast is due to the reduced pheromone production found in older queens. Manipulating the condition of the queen bee is the primary way many beekeepers influence swarming frequency and timing. As mentioned previously, it has been shown that younger queens are less likely to produce swarms when all the other space and crowding issues are reduced. Also, the use of a less-likely-to-swarm race or strain of bees will influence swarm production in an apiary. Remember that all strains of honey bees must swarm eventually to produce a new colony, and nearly all will swarm when conditions are favorable, especially when those conditions are related to resource abundance.

### Swarm Behavior

The actual process of swarming is quite interesting. Dr. Tom Seeley, in his book *Honeybee Democracy*, he details the decision making process from early on in the swarm's development within the hive, the issuing and clustering of the swarm itself, the advertising of selected sites by the returning scouts and final decision making on the new hive location. These worker bees, called scouts, are often older foragers and can number from several dozen to several hundred bees.

Once the swarm issues from a hive, it will cluster on an object nearby, often a limb within 100 meters of the mother hive. The swarm may remain there for several hours and up, to a few days, until a new site is found for the swarm. It is not uncommon for a swarm to move to several temporary locations as new sites are scouted before one is chosen.

A beekeeper may receive a call from a homeowner stating that they have been suddenly overwhelmed by a swarm of bees inside of the living space of the home. This may be the scouting party conducting a site inspection. You, as a beekeeper, may intercept that swarm by placing a swarm trap nearby where it can be discovered by the bees.

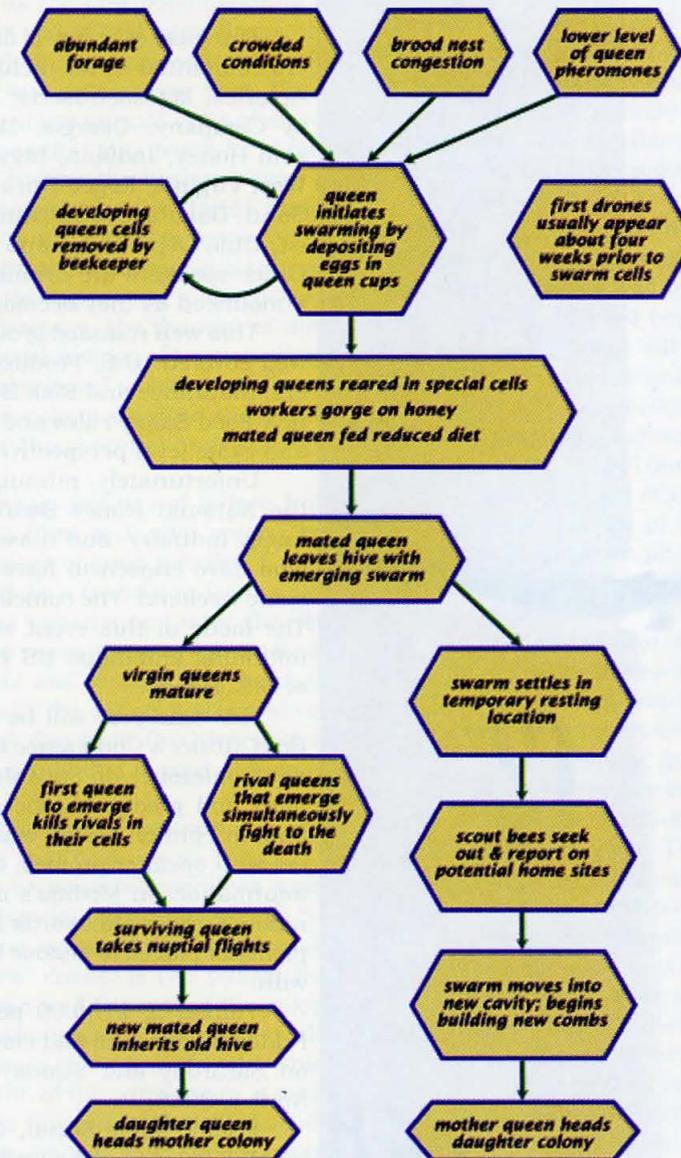
A swarm prefers calmer days when the temperatures are warmer and dry. This is typically 75-85 degrees Fahrenheit. Following a weather period that confined them to the hive, bees often swarm on the first day that is sunny and warm with calm or low velocity winds (5 mph or less). The time of day is also an important part of the equation. I've noticed that swarms would typically issue from a hive between the hours of eleven o'clock in the morning and two o'clock in the afternoon, though early and late day swarms are not uncommon.

### Calendar Timing

Each area of the world where honey bees are kept has its peak swarming seasons. In Florida, the peak swarming activity is in late February and March, while in Pennsylvania it is late May to early June. In Michigan, swarming peaks in late May to early June and in Louisiana it peaks in April, but as in all areas, swarming in these areas is influenced by the season. If there are mild Winter and early Spring conditions, swarming will develop much earlier and last much longer than in a year when the Winter is severe and the foraging delayed. However, the rate of increase in swarming after a severe Winter may be stronger, and still produce abundant swarms if there is adequate forage.

Determining the swarming period using environmental cues can be fairly reliable. In Pennsylvania, we know that we can expect our swarm season to begin approximately four weeks after dandelions begin bloom. This cue is a turning point for most of us to change our management techniques in our own hives to minimize swarming.

A second swarm season develops when late Summer and Fall forage stimulate drone and worker brood production, resulting in later swarms. For example, in 2012 and 2013 I observed heavy swarming in September in Pittsburgh, Pennsylvania. 



~**Stephen Repasky** is an EAS Master Beekeeper and author of *Swarm Essentials*. He can be reached at [www.meadowsweetbees.com](http://www.meadowsweetbees.com)

# WITHOUT CHEMICALS

~Eric Talley

Yes it can be done. No, you cannot completely rid your colonies of either pest, but by reducing the numbers of Small Hive Beetles and *Varroa* Mites, you can give your colonies a better chance of survival. This is not a lesson in Small Hive Beetles or *Varroa* Mites; this is simply an article to explain how I have been successful in controlling these pests without using chemicals.

There are a lot of articles written, by folks who push using chemicals to control the SHB and other chemicals to control *Varroa* Mites. I understand that the Commercial Beekeepers don't really have an option and must use chemicals, they cannot afford the labor involved to use the 4 methods listed here. I have read articles written by beekeepers that choose to do nothing to control Small Hive Beetles or *Varroa* Mites, these folks usually call themselves "Organic Beekeepers". I suspect that they are purchasing packages every couple of years to replace their "organic bees". But I applaud their efforts to be chemical free. The back yard beekeeper who wants to put in the extra time and effort, and the Organic Beekeeper, can both stop using chemicals and use these Integrated Pest Management items to control SHB and *Varroa* Mites.

If you choose to use chemicals to control any pest you must follow the instructions printed on the manufacture's label. By reading the label you can determine if it can be used during the honey flow, does it need to be taken out so many days or weeks prior to placing your honey supers on the hive, how many treatments are required for the product to be effective, etc. I for one have chosen not to place chemicals of any kind in my bee hives, so if the nectar flow is on or not it makes no difference to me, and I have had really good success by using these four items and methods put together.

All beekeepers who deal with **Small Hive Beetles** know that they will lay eggs around the hive either in cracks or in stored pollen located on the brood comb. I read an article online written by Jon Zawislak with the University of Arkansas that states that "a single female beetle can produce over 1,000 eggs in her life time. The eggs generally hatch in 2 to 4 days and the larva immediately begin to feed on pollen, honey and bee brood. In 10 to 16 days, beetles complete their larval development and will exit the hive to pupate in the soil." The larva burrows into the ground about 4 inches and completes the pupal stage. Three to four weeks later they emerge and can fly to a bee colony and start the process all over again. So I ask you, knowing this, if you can break the cycle and stop the larva from getting to the ground why would you not do so?

**1 Small Hive Beetle Trap** - There are a lot of beetle traps on the market, some are placed inside the hive between the frames, others are places under the frames on the bottom board, but none of these type traps address

stopping the larva from getting out of the hive and into the soil. There are a number of mechanical beetle traps on the market that use a removable tray that you partially fill with vegetable oil to catch the adult SHB, the larva that is headed for the ground and *varroa* mites that are groomed off or Fall to the bottom board. The "West Trap" was one of the first on the market to use a tray to put oil into, there is also the "Freeman Beetle Trap" which has a tray to put oil in as well, there are others as well that are meant to replace your bottom boards with an oil filled tray. I purchased one from [www.greenbeehives.com](http://www.greenbeehives.com) years ago and modified it to my preference and have made my own since then. I have not used the West Trap or the Freeman Trap brands so I won't advertise which one is best or worse, that is not the point here, any mechanical beetle trap that has a tray of vegetable oil under the colony to catch ALL pest is what you're looking for. The key to the bottom board with an oil tray is the size of the openings that allow adult beetles and the beetle larva to get through without allowing your bees to get to the oil. If the opening is too small then the adult beetle can't get through, too big and then the bees get into your oil and it kills them as well. The trap I purchased uses a 6 X 6



Screened bottom board with pullout tray

wire mesh that I order from [www.TWPINC.com](http://www.TWPINC.com) when I need more. I make bottom boards for my 10 frame hives and my NUC colonies as well.

I have seen folks who use a screened bottom board with something sticky sprayed onto an insert with a grid on it to collect mites over 3 days to determine if they need to chemically treat for *Varroa* Mites, whereas I am disposing of mites that are groomed off of bees every day by using my Small Hive Beetle traps.

**Varroa Mites** crawl into an

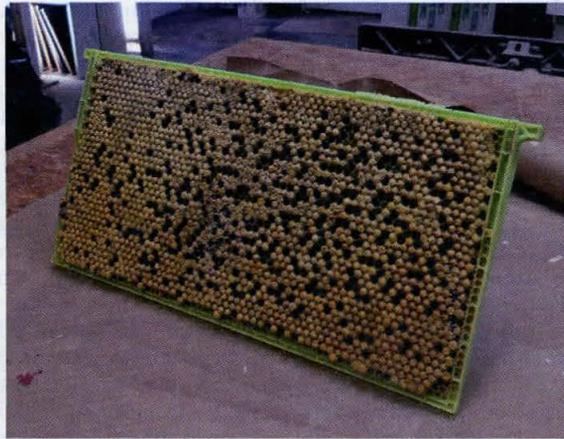
open cell containing a honey bee Larva just before it is capped and raise their young by using the hemolymph of the developing Pupa to feed on. I have read that at any given time 80 to 85 percent of the *Varroa* Mites in a colony of bees are under the capped brood. The *Varroa* Mite prefers the developing drone pupa over the worker bee pupa, since it takes an extra 3 days for the drone to emerge.

**2 Drone Brood Frames** - The second item I use is the drone frame, they can be purchased at about any bee supply. They are simple to use, and cheap. By placing a frame of drone comb in each of your hives, you can capture and remove a lot of mites. I place the frame directly in the brood area and when I work my colonies every 12 to 14 days any time I have a drone frame with capped brood I take it out and place in the freezer for at least 48 hours, put another drone frame in the hive when you remove the one with capped brood, and start the process all over again. I don't bother to clean the dead brood from the frames once frozen, I simply take out of the freezer the day before I'm going to work bees and thaw it out,

once inside of a colony the bees will clean the dead brood out and your beetle trap will show the capping's and all the dead *varroa* mites that were killed when you froze the drone frame. A word of caution, if you use drone frames, you must check your bee hives regularly. If you place a drone frame into your hive and leave it you have placed a *Varroa* Mite Bomb that will cause your *varroa* mite count to explode.

### 3 Break the brood cycle

- After the nectar flow is over, you need to break the brood cycle. Some folks say that you can cage the queen for a period of time, I'm not sure I like the idea, so I choose to make reverse splits instead. Buddy Marterre wrote an excellent article that appeared in the May 2015 issue of *Bee Culture*. I can't do a better job of explaining splits than he did so I won't try. By making a reverse split and starting a NUC using the Queen and no capped brood, you leave the majority of the *Varroa* Mites in the old colony. Now the original colony must raise a new queen, this could take 12 to 16 days, based on the eggs that are used. By the time the new queen has mated and laid eggs all of the original queen's eggs will have hatched, to include the drones. By making a reverse split you end up with a new queen to go into the Winter and Spring, leaving less chance of a queen failing during the late Fall or early Spring and less chance of them wanting to swarm in the Spring. I check the original colony on day number ten or eleven after the split to make sure that there are queen cells present. If the original colony has failed to make queens, harvest the original queen from the NUC, place her in a cage, and reintroduce her to the colony. It should take 3 to 4 days for her to be released and start laying again, by the time these eggs get thru the larval stage and are



Capped plastic drone comb frame

ready to be capped, all of the eggs that were laid before the split will all be hatched.

**4 Sugar Water Spray** - Check the original colony at day 10 or 11 after the split to make sure they are making queens. Once you verify that there are queen cells, close the colony back up and leave them alone until day 24 after the split. On day 24, using (1 to 1) sugar water with a little Honey- Bee-Healthy, lightly spray both sides of every frame in the original colony. As the bees are cleaning the sugar water off of each other they are also grooming any *varroa* mites from each other. If you find any capped brood left, they will be drones and you can either wait until the next day and return to that hive to spray the frames, or use a nut pick and uncapped the remaining drones and continue to spray. The object is to have no capped brood and let the bees groom as many *varroa* mites as they can get off before the mites have capped pupa to raise their young on. Some folks use a powdered sugar and sprinkle on the bees instead of spraying sugar water, I tried the powdered sugar one year but decided that the sugar water seems to work best for me.

I have not yet dealt with replacing queens with *Varroa* Specific Hygiene's (VSH), or Suppress Mite Reproduction (SMR). I have been able to control the pest in my apiaries without re-queening with VSH or SMR queens so far. I reserve the right to add the SMR or VSH queens to my *Varroa* Mite control methods in the future if need be. Using the four methods I have outlined above won't completely rid your bee hives of SHB or *Varroa* Mites, but your bees stand a better chance of fighting off other diseases and pest if they are not fighting SHB and *Varroa* Mites. Good luck and Bee Good Beekeepers. 

~Eric Talley I got involved with Honeybees as a Future Farmers of America project in 1973. After a successful career in the Marine Corps, I retired in Eastern North Carolina and took up beekeeping again. In the 30 years that I was absent from the beekeeping industry there were a lot of pest and diseases introduced to America, I am doing what I can to figure out how to keep Honeybees alive without using chemicals to do so.

The latest in **Apiculture news** everyday!

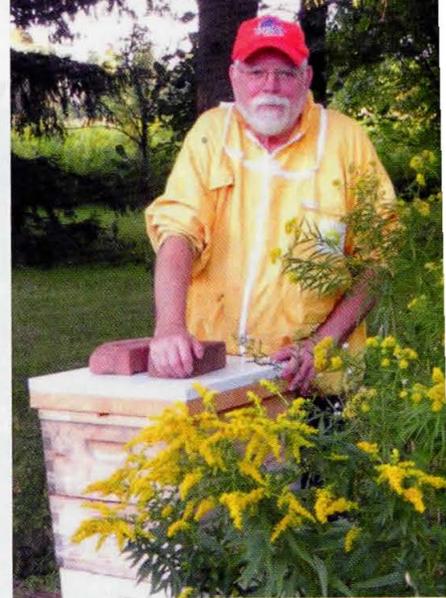
Right here from **Catch The Buzz.**

To sign up visit our website

**www.BeeCulture.com**



# The Editor's Hive



## Managing Risk

The Bee Specialist in Alberta, Canada is a good friend, and he routinely writes a column in the Alberta Bee News. This winter he had some thoughts on managing risk when it comes to your bees. And yes, there is risk in the real world of honey bees. All manner of things are interested in eating the bees, the brood, the pollen, the honey, the wooden boxes, even the wax. A beehive is one big meal waiting to be devoured by something, and your job, now that those bees and that hive are yours is to prevent that from happening. You need to be proactive in this endeavor, rather than reactive. Because, mostly, reactive is too late to save the colony.

Let's start with watching for and dealing with *Varroa* mites. *Varroa* is at the top of the list of things that can go wrong with your bees. Learn how to measure *Varroa* populations in your colony and what to do when that population gets to the point of needing to be controlled. This isn't when you find your bees dead and dying. Rather, is when you find only one or two mites in a 300 bee sample. That's when to act, when to stop them cold, when to make sure they don't get ahead of you. And, of course, you need to check again, and again and again to make sure you did your treatment right and you stopped them cold. *Varroa* will kill your colony if you don't do the right thing at the right time.

Now, of course, the best thing is to have bees that are resistant to this beast. The beekeeper who sold those bees to you swears they are the toughest bees on the planet, and nothing, ever, will get them. Check and make sure. Check again. And again. It's time well spent if they aren't and good insurance if they are.

How's that queen doing, by the way? If she's a year old or more, signs of swarming will be showing up right about now. Be ahead of that activity before they get ready. Making splits, adding room, replacing the queen. All these are anti-swarm, proactive things you can and should be doing now.

Got a record book? Keeping good records is a task, a skill, a burden and will save more bees than you can imagine because it will tell you again and again what you did wrong when you find a problem that you should have caught last week, last month or last year.

Have you gone to the latest beekeeper meeting? Not your county group, but the big one, down state. That's where you'll find the latest, from the best, just in time to make a change, get the newest and fix it before it breaks. Too, the vendors there will have all manner of things you absolutely can't keep bees without so bring your CC and be prepared to save some more bees with what they will sell you. And buy a book you don't already have about something you don't know anything about. Queen rearing or breeding. Removing bees from houses and trees. How to manage an observation hive. Try something new this year.

## Pay attention.

Every time you go to the beeyard make notes on what's going on. Weather, temperature, sky cover, bee activity, sounds, smells, everything you see and look at. What's the queen doing? How much brood - eggs, open and sealed. Take photos. That's what your phone is for. Save them for later. Be ahead of the curve, not behind it.

## Who We Are

A quick note of introduction. This is our second issue of *BEEKeeping* and we think we have it figured out. Well maybe we do. We also publish another beekeeping magazine here. Our sister tome, *Bee Culture*, has been on newsstands for over a dozen years now, but we've been publishing it for over 145 years. The A. I. Root Company, in Medina, Ohio used to manufacture beekeeping supplies and they published beekeeping books and our magazine. They moved to candles decades ago (beeswax and candles just go together), but they so loved bees and beekeeping they continue to publish, now, these two beekeeping magazines. Getting all this together is myself, *Bee Culture*'s editor for 30 years, Kathy Summers, a 20+ year veteran in layout and design and, Joy Nank is mostly spearheading *BEEKeeping* and future issues in design. Amanda DeSimone is our social media guru and Jean Newcomb handles all those ads you see inside. We're a small outfit actually, but we really like what we do here. Kathy and I have been keeping bees forever it seems, and the new folks are learning as they go. This magazine has helped all of us get a better grasp on the fundamentals.

We have additional copies for friends or classes available on *Bee Culture*'s web page, along with a whole library of great beekeeping books. And there's CATCH THE BUZZ, which is the very latest in the world of beekeeping news and information, which you can see there too, or have delivered everyday to you as an email. More than 20,000 beekeepers and those interested in the world of honey bees get the BUZZ and it's free. Take a look and see if you might be interested.

Finally, we want to welcome you to the FANTASTIC world of honey bees and beekeeping. I've found it absolutely fascinating for over 40 years and every day I learn something new, something fun, something exciting about this world. It has held my attention this long, and I know it will hold yours, too. There's a saying we have here - Give Bees A Chance. Welcome aboard!

*Don Johnston*

# BUILD A SWARM BUCKET

We all have been caught short when we have had more swarm calls than we had hives to put them. But before we can put them in a hive, we have to get them into a container and get them back to the beeyard. Cardboard boxes work great except they are either too large or too small and they require a quickly added screened opening or small holes to be added so the bees won't overheat. Bee vacuums work. But sometimes they are overkill for the location and size of the swarm.

Let the good old five gallon utility pail come to the rescue. Cheap (usually free), adequate size and almost indestructible, the plastic pail is an indispensable around our workshop and barn. So why not use it to collect the next swarm.

## Parts

- Plastic bucket with a lid – 5 gallon size works great
- 8 mesh hardware cloth – 1/8" holes
- Epoxy or pop rivets and/or silicone sealant

## Construction

### Step 1: Remove lid seal

A rubber gasket is almost always located under the locking rim of the bucket lid. Use a screw driver to pry the gasket out.

There is no need to keep the rim hermetically sealed in when you are going to put a big screened hole in the top. The gaskets also seem to get in the way at the most inconvenient time.



### Step 2: Cut a hole

Drill a starting hole in the lid, and then use your scroll saw to cut a bigger hole in the top. Make this hole as large as possible and still leave room to attach the screen. I use the outside rim of the lid to guide the saw. It makes for a nice neat hole.



### Step 3: Remove some lid locking tabs

Note: Remove the locking tabs a few at a time. You want the lid to be easy to remove and at the same time be firmly attached when set in place.

Decision time: most buckets have locking tabs that make it very difficult to remove the lid. What you don't need is to be fumbling around with the lid while the bees inside are getting madder and madder. The best way to make the lid removal easier is to cut most of the tabs off while leaving a sealing ridge to keep the bees in. The buckets I've been using have eight distinct locking tabs. I completely remove every other one. This leaves four locking tabs. One at each corner. (Did you know that circles have corners?)

Then I also cut all but 1/2" off of the remaining tabs. This makes for a very easily removable lid that will still stay locked in place when closed.

### Step 4: Clean up cuts

Use some sandpaper or a utility knife to clean up the ragged edges on the cuts you made. Now isn't it pretty!



### Step 5: Fit hardware cloth

Use the lid as a pattern and cut the hardware cloth to fit inside the top ridge.

### Step 6: Staple cloth over hole

Staple the cloth to the lid. Use long enough staples to allow you to crimp the staple on the reverse side of the lid. A 1/2" staple works great. You can staple the lid into your work-bench or a piece of soft wood and then pry it off with a screw driver.



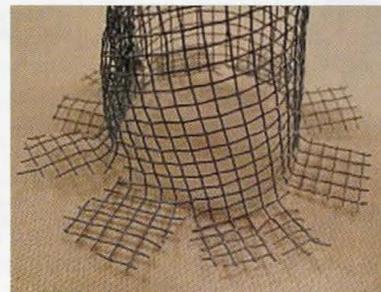
### Step 7: Crimp the staples

Turn the lid over and crimp the staples so they will hold the screen in place.

The funnel you're about to make acts as a one way opening. It makes use of the bee's inability to recognize a small opening that is not on a flat surface as an exit. The same concept (cone entrances) is used in many bee related devices such as pollen traps and escape boards.

### Step 8: Once the lid is complete, create a funnel

from the hardware cloth (part 2). Make the funnel about seven inches long and taper it from a two inch opening to a half inch opening on the other end. Epoxy or pop rivet



the hardware cloth into the funnel shape.

**Step 9:** After the funnel is complete, use a pair of tin snips to put a flange on the large end of the funnel. Then using the top of the cone (the inside edge of the flange) as a guide cut a hole in the center of the top you made in step 2. Slip the funnel into the hole and use epoxy or silicone glue to hold it in place.

**Step 10:** Allow the epoxy or the silicone sealant to dry and you have a very useful piece of equipment

#### Usage

After initially getting the swarm into the swarm bucket, put this top on the bucket. Then set the bucket near where the swarm was originally caught and wait. Assuming you caught the queen, eventually all the bees in the swarm will try to get close to her. They'll walk down through the large end of the funnel and be unable to exit the bucket.



#### Thoughts

In addition to having a simple swarm collection bucket that is always ready, you can use it to carry equipment when the need arises. Have more than one swarm bucket handy. In the past three years I have come to rely on this device for most of the swarms I have caught.

Twice during the peak swarming season I have been called out on a second swarm retrieval before I was able to hive the first swarm. On a third occasion the swarm was so big and difficult to get that I missed the queen on the first try. The bees immediately started to return to the original swarm location. I put the lid on this first bucket and used a second bucket to get the queen and the remainder of the swarm.

This device is cheap, easy to make and works fantastically.

Get a copy of Ed Simon's book *Bee Equipment Essentials* with detailed drawings, construction hints and how-to-use instructions for dozens of beekeeping tools and equipment from [www.wicwas.com](http://www.wicwas.com). Ed can be contacted through [Ed@TheBeeShed.com](mailto:Ed@TheBeeShed.com). Now online are all of Ed's *Bee Culture* & *BBKA* magazine articles. They can be accessed through The Bee Shed website at <http://www.thebeeshed.com/publications.html>.

That's all folks, Happy Hunting. 

~Ed Simon



## Project Apis m. ...is the largest non- governmental, non- profit honey bee research organization in the USA.

*PAm is dedicated to enhancing  
the health of honey bees while  
improving crop and honey  
production*



**PAm has infused nearly  
\$4 million into bee research  
since 2006:**

- \* Developed BMPs
- \* Expanded forage resources
- \* Forged new technologies
- \* Discovered new pathogens
- \* Purchased cryopreservation unit for Washington State University
- \* Purchased Nexcelom for NC State to assess queen quality
- \* Supported Tech Transfer Teams

*You can help support PAm at  
[www.ProjectApism.org](http://www.ProjectApism.org)*

Project Apis m.



## Phil Knows!

**Q:** Getting beekeeping information on the internet  
From an Iowa beekeeper:

I'm a new beekeeper and trying to learn. There is a lot of information on the internet but some of it is so contradictory. Can you give me some assistance in finding reliable information on the internet?

**A:** As Roy Hendrickson wrote in the Spring issue of this magazine, beekeepers - especially new beekeepers - must be careful about using the internet as a resource. A wealth of knowledge is available online, but anyone with a camera and an internet connection can offer themselves as an expert. Some of the information presented there is incomplete, misleading, or just plain crackpot. Roy offered a specific warning about YouTube videos, and I would like to add a caution about beekeeping internet forums. The valuable and the questionable are so mixed in those venues that it's difficult to distinguish between the two.

Until a new beekeeper has gained enough experience to separate the wheat from the chaff, he or she would do well to stick to the online publications of reliable institutions. Many university apiculture programs have web pages. To name a few:

- The University of Minnesota bee lab (<http://www.beelab.umn.edu/>), is a great source for information on monitoring for *varroa* mites as well as lots of other good stuff.
- The Mid-Atlantic Apiculture Research and Extension Consortium (MAAREC) (<https://agdev.anr.udel.edu/maarec/educational-resources/>) is a cooperative effort of several universities, including Penn State. This site has a number of excellent instructive PowerPoints and fact sheets on virtually any beekeeping topic.
- I also recommend the University of Georgia's website (<http://www.ent.uga.edu/bees/>), This is the home of Jennifer Berry, who is a regular columnist for Bee Culture magazine.
- Another cooperative effort is the Managed Pollinator CAP (Coordinated Agricultural Project) ([www.beecdcap.uga.edu.](http://www.beecdcap.uga.edu/)), presenting scientific papers detailing results from many honey bee research projects.

- Dr. Jamie Ellis and his graduate students at the University of Florida (<http://entnemdept.ufl.edu/honeybee/>) have put together an educational webpage for beekeepers, including information about their honey bee research. They also have their own YouTube video page: <http://entnemdept.ifas.ufl.edu/honeybee/extension/Video.shtml>.

The various USDA honey bee labs have different area of focus, so the information found at their webpages differs.

- At Baton Rouge, Louisiana ([http://www.ars.usda.gov/main/site\\_main.htm?modecode=60-50-05-00](http://www.ars.usda.gov/main/site_main.htm?modecode=60-50-05-00)) the area of emphasis is honey bee breeding and genetics. Here you can find information about *varroa* and disease resistant lines of honey bees.
- The lab at Beltsville, Maryland ([http://www.ars.usda.gov/main/site\\_main.htm?modecode=80-42-05-40](http://www.ars.usda.gov/main/site_main.htm?modecode=80-42-05-40)) specializes in disease and parasite control and diagnosis. Information here includes how to send samples to the lab for testing.
- The honey bee lab in Tucson, Arizona ([http://www.ars.usda.gov/main/site\\_main.htm?modecode=20-22-05-00](http://www.ars.usda.gov/main/site_main.htm?modecode=20-22-05-00)) concentrates on honey bee health to maximize the number of bees available for pollination.

A few last suggestions:

- A lot of great things are being accomplished by the folks at the Bee Informed Partnership (BIP) program, which is headquartered at the University of Maryland (<https://beeinformed.org/>). For some good advice from a number of very smart BIP folks, go to their blog page at <https://beeinformed.org/blog/>. This is one of my favorite sites.
- And of course, Bee Culture magazine's webpage (<http://www.beeeculture.com/>), should be on your toolbar as a must go to site. You can catch the most recent digital copy of the magazine as well as other resources.
- You can also visit my webpage at <http://philcraftthivecraft.com/> where, in addition to more of the common sense beekeeping advice that I offer in my "Ask Phil" columns, you will find links to additional recommended beekeeping webpages. 

---

**~Phil Craft** I welcome your questions. You can send them to me by email at: [phil@philcraftthivecraft.com](mailto:phil@philcraftthivecraft.com), or by mail to Bee Culture magazine. Though only a few will appear in the magazine, I will respond to all questions personally. As in my "Ask Phil" column in Bee Culture, I identify correspondents only by state, never by name. I look forward to hearing from you, and wish you the best in getting started in beekeeping.

# Good Stuff From Ann

## **HIVE TASKS — First Year beekeepers April, May, June**

Goal—all comb drawn by end of June, colony numbers increasing

1. Feed package bees or nucs 1:1 sugar syrup.
2. Feed pollen patties until fresh pollen is available.
3. In small hive beetle (shb) areas, use caution with pollen patties.
4. Watch returning bees at entrance for evidence of pollen collection.
5. Keep entrances small until colony numbers increase.
6. Inspect hives only when weather permits—warm sun, low wind, temperature above 60°F.
7. Keep colony inspections as brief as possible.
8. Inspect for presence of queen from eggs, young larvae.
9. Monitor queen performance with brood pattern.
10. Replace queen if original is dead or is not laying enough eggs to increase colony numbers.
11. Lightly spray foundation (Langstroth hives) with 1:1 sugar syrup with Honey-B-Healthy® to stimulate drawing comb.
12. Move follower board (top bar hives) to keep up with comb construction.
13. Add next brood chamber (Langstroth hives) only when previous one has 90% drawn comb.
14. Do not consider a honey harvest until all brood chambers have 100% drawn comb and colony is full of healthy bees.
15. Bottled sugar syrup is not honey! Do not put honey supers on when feeding syrup.
16. Learn seasonal nectar and pollen plants in your area.
17. Learn about your bees' foraging area whether urban, suburban or rural.

## **HIVE TASKS —2<sup>nd</sup> and 3<sup>rd</sup> year beekeepers April, May, June**

1. Spring Hivecleaning Time!
2. Select a day with warm sun, low wind to inspect hives, top to bottom.
3. Clean off Winter debris from bottom board, whether solid or screen.
4. Clean up underneath hives.
5. Clean up apiary and inspect bear fence.
6. Repair or replace any hive parts that have Winter damage.
7. Select frames (Langstroth) or bars (top bar hives) with poor or old comb for replacement.
8. Wait to replace old combs until strong nectar flow.
9. If replacing comb with foundation spray foundation with 1:1 sugar syrup with Honey-B-Healthy® to stimulate comb building.
10. Inspect brood pattern and assess colony numbers—does queen need replacement now?
11. A weak colony, disease-free, can be combined with another colony.
12. Kill queen in weak hive to be combined.
13. If any disease suspected, have local apiary inspector or experienced beekeeper inspect colony.
14. If in small hive beetle (shb) area, keep further hive inspections to a minimum and use shb control methods.
15. Use your preferred method of swarm prevention. Brood chambers can be reversed at this time if bottom brood chamber is empty.
16. Do not split brood sphere when reversing.
17. Continue reversing until nectar flow starts.
18. Do you know your Spring nectar and pollen plants? If not, learn them.
19. Are you in an area with Spring nectar flow for honey production?
20. Have honey supers ready to put on hives.
21. Monitor the weather during strong nectar flow— increase or decrease honey supers as needed.

# WHAT DO YOU MEAN?

Beekeeping has a language, as does golf (what's a 'birdie?'), tennis (lots of 'love') and other pastimes. Learning the correct terms is like learning a new language. Beekeeping terms should help us understand each other as we discuss what we see and what we do. Long-time beekeepers tend to be careless with terms. Unfortunately new beekeepers who take classes taught by long-time beekeepers may be taught some wrong words. Such carelessness can cause great confusion when a new beekeeper asks a question and gets a response that may not make sense. As a new beekeeper you need to learn the correct terms so you can ask questions and even read the websites and equipment catalogs.

Some words never seem to be confused. 'Smoker' and 'hive tool' are quite universal although there are many styles of hive tools. Queen, worker and drone keep those names with no substitutes for them. Let's look at the confusing terms.

The 'hive' versus the 'colony.' The hive is actually the wood (or plastic) home for the bees. The colony is the group of bees themselves. These two words are very frequently used interchangeably. Beekeepers will ask 'how is that weak hive doing?' when they actually mean 'weak colony.' In the same way you will hear 'it is time to inspect the hive'—meaning the bees, the colony. Usually any confusion with these two terms is easily sorted out.

The Langstroth hive itself can be very confusing. Some terms do not cause much confusion but others are very confusing. The bottom board can be either screened or solid. Not much problem there. The *top cover* can be called a *telescoping cover* because it has a rim that fits down over the rest of the hive. Little problem there also. The inner cover comes in different styles but it is still called an inner cover. By the way it allows the telescoping cover to be removed easily.

Now for the rest of the hive. It is a series of 'boxes' that is an allowable term but does not describe very much. These boxes can come in several depths and widths. Widths can be 7-frame, 8-frame or 10-frame. The 'deep' is the deepest box; the 'medium' gets called 'half-depth' (it is not half of anything) or 'medium.' The word 'medium' seems to be in more common use. Then there is the 'shallow.' If the boxes are used for the place where the bees actually live they can be called 'brood boxes' or even 'brood chambers.' But sometimes they are called 'hive bodies.'

What about the boxes that you will place on **top** of the brood boxes to collect honey for your honey harvest? Here is where problems abound. The correct term is 'super' or 'honey super.' Because it is **superimposed** on the brood boxes. However many, many beekeepers call every box a 'super.' Such use of 'super' can be very confusing. Learn the correct terms for these boxes and use them and you will be understood.

Queen cups and queen cells are not the same thing. The bees make little beeswax cups, a few of which may be on the face of the comb all the time. The bees can use these to make a new queen. Most of the time the cups are not in use. But the minute an egg is laid in a cup the bees start to construct the queen cell, a long, textured cell. Just remember—small and empty is a cup.

We even give a number of terms to honey. You will hear such descriptions as crystallized, granulated, candied, sugared and solidified. **All** five terms given to honey that is no longer 100% liquid but has started to form crystals. The best term would be 'crystallized.'

Next come some beekeeping actions that you can do for a variety of reasons. However, many terms can be used and can frequently be heard in the same sentence. You can take a colony and make—a nuc, a split, a divide

and even an artificial swarm. You are taking some frames with brood, food and some bees from one colony to create another colony. Four terms for the same thing.

It might be a good idea to make yourself a little dictionary to keep the beekeeping terms straight.

## 10 Reasons you should attend a local Bee School

1. Bee School is the "fast track" to learning about both the Science - bee biology - and the Art - applying the Basic Biology - to help you accomplish your beekeeping goals AND bee school will help you better define your goals and expectations.
2. It will occur to you while driving home and in the re-telling of the school events to other family members that "I learned something" .... You will now know the answer to that nagging question why do bees do .....
3. You will be able to understand why experience helps one 'Anticipation rather than React' when it comes to colony care.
4. Bee school will help you better understand the honey bee's seasonal cycle and you will hear how to put such information to use within the next month in your colony management.
5. You will be looking in bee colonies with the practiced eye of Masters and, at some point, realize how "easy" and "fun" beekeeping really can be.
6. You will make new friends and have opportunity to network among beekeepers.
7. You will learn about good "deals" from speaking with vendors and other beekeepers- who will welcome your questions about bees and bee equipment.
8. You will have opportunity to connect to an on-going information channel of the latest mite control treatments and techniques and be at the forefront of bee "issues" that arise.
9. You will find out a reason why your bees may have swarmed or "have gone away" (or may do so this year)
10. You will be a part of doing something positive for the bees and for yourself (and maybe even influence your husband/wife/child/brother-in-law) because maybe they secretly also want to become a bee keeper.

~Dewey Caron

## LEARN TO BE A WEATHER WATCHER AND A PLANT WATCHER

Being a beekeeper means you will learn some new things in order to be a good steward of those bees. Becoming a Weather Watcher and a Plant Watcher are important for the success of your colonies. You should be keeping some records of your visits to and other observations of your hives. Now you are going to add some weather and plant records to that.

Since weather affects the plants that affect your bees and your beekeeping, you need to become both a Weather Watcher and a Plant Watcher. By the way 'plants' not only means small ones growing on roadsides and in gardens but also includes trees.

Weather affects what the bees are doing and what the plants are doing. Bees are dependent on plants for their food supplies—during their buildup of population in the Spring, during the collection of food for daily use and during storage of food for Winter. Yes, weather affects the plants that you will want for a honey harvest.

Normally people are just concerned with daily weather. Look out the window—raining. Better take a raincoat. Open the front door—whew! It's hot! No jacket needed today. Listen to TV or radio—severe cold snap due—where

are my wooly gloves?

If you are going to be a true Weather Watcher the weather today is only a small part of what you need to do as a beekeeper. Yes, today's weather may influence whether you will open up a hive today to see how the colony is doing. But Weather Watching, keeping records, involves yesterday, last month, perhaps the months before that and what the forecasts are for the next several weeks. Even if prediction mistakes are made, the trend can be important.

Those with vegetable and flower gardens are already sort of Weather Watchers and Plant Watchers. Look—the tomato plants are a bit wilted. Better water the garden. If you have been paying attention to your vegetable and flower gardens you are on the way to being a good beekeeping Weather Watcher and Plant Watcher.

Let's look at various aspects of weather and how it affects the plants and also the bees. Rain in moderation is beneficial. Now we need to see what happens with prolonged rain, too many days of rain, too much rain. If it is raining and the temperatures are about 60°F or above the bees will not be flying as they would if the sun were shining. A raindrop can knock a bee out of the air. When a rain shower is over the bees will resume flying. A day of rain will keep the bees in the hive all day. They will be eating from their honey and pollen stored in the comb. Endless days of rain mean their food stores could be severely depleted. Depending on the population of bees in the hive, the time of year and the climate, it could be necessary to feed the bees. Feeding them during times of stress does not make bees lazy. Feeding them can save their lives!

Too much rain does affect the plants. Many plants do not do very well in overly-wet soil. Roots that are sitting in pools of water in waterlogged ground for a prolonged time can decay thus affecting the entire plant. Roots that are taking up too much water and sending it to the rest of the plant can mean nectar can become dilute. Honey bees search for nectar with a good sugar content and will ignore blossoms that offer very dilute nectar. So nectar sources can diminish with an unusual increase in rain.

Rainstorm with wind can be very detrimental to blossoms that are fragile. The weight of rain plus snapping about in the wind means the ground can be covered with the soggy remains of the bees' former food supply. If those blossoms were to be the source of a honey crop for you, your honey supers will remain empty.

Now look at the opposite weather condition—not enough rain. This situation can be short term or long term. That is why you need some records about the rain-fall in your particular area. Severe droughts, ones that last a month or more, or even years, are usually given attention on radio and television news. However, depend on your records to give the situation in your own area.

In a drought the plants really suffer. Growth of the plant is slowed and blossoms can be small and sparse. The nectar supply will be minimal or simply stop. Small blossoms will not have the usual quantity of pollen. So scout bees in search of a good supply of food will be searching far and wide to find suitable supplies. In severe droughts the plants may just wither and die. You may be able to save the tomato plants in your backyard garden but the bees can be starving.

Here again is a situation that means feed your bees. They may be visiting the well-watered plants in your flowerbeds but that is not enough to sustain a colony. Remember the adage—2 million blossoms visited makes one pound of honey. If you live in an area with predictions of very long-term drought it would not be wise to increase your number of colonies. Bees need pollen as well as nectar. If your environment cannot sustain the bees their lives are up to you.

Do you live in a climate that has snow during the Winter? That counts as rain when the snow melts. Yes it is possible to have a 'Winter snow' drought when the weather is cold but little or no snow Falls. So Spring plants, including trees and shrubs, can be affected. In

hot desert areas the plants will burst into bloom after a rainstorm. So you can have a drought there if the storms do not occur.

Now we are going to consider microclimates. Your radio and TV weather reports are for the overall area you live in. But within that area are small areas that do not exactly match the reports given. These are microclimates and are areas affected by elevation, forests, open land, hills, mountainsides, actually anything that can modify temperature and wind and even rainFall. Cities can have these just as out in the countryside. In urban and suburban areas the buildings, houses, and paved areas can create microclimates. As you start to be a Weather Watcher and Plant Watcher you will become aware of these microclimates.

Flower garden plants are identified because you bought what you wished and planted them. In urban areas the parks are filled with familiar garden plants. Do you know what the wildflowers are in your area? What about identifying the trees? You need to have a good field guide for wildflowers and one for trees. Then you will be prepared for your bees' food needs and also for your honey crop.

After you learn the nectar and pollen sources of your particular area, find yourself some 'target' trees and wildflower areas. These target plants can be in or near your apiary or in areas you frequent. Then, using your Weather Watching skills you now are becoming a Plant Watcher. In temperate climate areas a target tree can tell you that early blossoms are appearing, perhaps a good pollen source. In rural areas a field covered with goldenrod can mean good Winter stores for the colony.

Don't ignore roadsides and highway medians. People—meaning not only beekeepers but also those interested in saving all pollinators—are encouraging the various states' Department of Transportation to stop so much mowing and plant pollinator-friendly trees and flowers. As you drive down roads and highways start watching for blooming plants (please don't run off the road into a ditch).

These plants can help you recognize the effects of rain and drought in the area where your bees are foraging. Even if some plants are not usable by bees they do indicate effects of weather. In a drought the plants will be shorter than normal, blossoms fewer and smaller also. They are indicating that you need to check your hives for adequate food.

As you are plant watching, keep microclimates in mind. Yours can be cooler than an area near you, or warmer. It can take a year or two to know your microclimate. Sometimes common garden plants can help you. Did your Spring bulbs, such as jonquils, bloom earlier or later than ones just two miles away?

In cities the parks frequently have built-in watering systems to prevent droughts from injuring the plants. If you are keeping bees in an urban environment, plan to go by your nearby parks occasionally to do a bit of Plant Watching. Your bees may be finding enough food in the flowerbeds there.

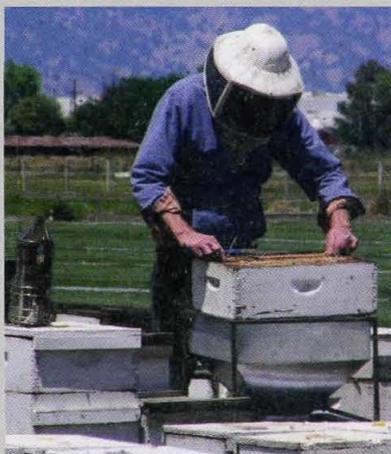
You may wish to raise some bee-beneficial plants for your bees. You need to choose ones for your particular climate. A comprehensive book is available; Garden Plants for Honey Bees by Peter Lindtner, published by Wicwas Press. Just remember—two million blossoms for one pound honey! Many pollinators will appreciate your flowerbeds but you need to plant acres to adequately feed your bees. However, watching honey bees at work, as well as other pollinators, is fascinating.

You need some way of keeping records. Perhaps you would like an attractive wall calendar to make brief notes on rainFall, temperatures, plants. Or you could use your computer. Whatever you choose be certain to keep it going. And save this year's entries to compare with the following year. As you progress in your beekeeping you can add a note about your honey crop for that year. Being a Weather Watcher and a Plant Watcher will help keep your bees alive, well fed and productive.

~Ann Harman

# Installing Packages

~Kim Flottum



Bees are collected, either by shaking frames in to a funnel that fills the package, or by bouncing a whole super over a collection box. A queen excluder on top keeps the queen in the super. Then bees in the box are then poured into a package.

Packages removed from the field and assembled in the warehouse, where a feeder can and a queen are added, and the opening covered to keep them all in.

Packages are shipped in specialized trailers with climate control.

Packages of honey bees come from, basically, two areas of the US., the southeast, mainly southern Georgia and northern Florida, and from the west, mainly central and northern California. There are differences in the queens you get from these places because of where they are raised and how they are produced. To make a package, in the SE, producers search for the queen in the production colonies and once found, isolate her, then shake about a third of the worker bees in that colony into a collection container to be doled out and weighed and put into a 3 pound package. West coast package producers simply sift a super or two of bees from a colony into a container that has a queen excluder on top, so only workers go into the collection container. Workers are poured into the package, a can of sugar syrup is added along with a queen raised specifically for this purpose and the entrance sealed. The package is then shipped in special trailers, with air conditioning and humidity controls to a local supplier who then distributes them to you.



Pick up the bees. Most of us have a car. Put cardboard or several layers of newspaper on the back seat to place the package on. When you arrive expect a crowd of anxious beekeepers – just like you. Make sure you get the kind of bees you ordered – Italian, Carniolan, Russian, Buckfast – and that the queen is marked. Your queen may arrive marked, or she may get marked there. The bees should be hanging around the queen and feeder can, and there should be only a very few dead bees on the bottom of the cage. If more than 20 the package may be old bees, starving, overheated or subjected to something not to their liking. Check with the supplier if there are lots of dead bees. Bring a mister with sugar syrup in it and before you put the package in the car, feed the bees. This will settle them down a bit and give them something to do while on the trip home. This is why you need the newspaper. Don't let the car overheat. Tend toward air conditioning to keep the bees cool.



*Often a local supplier will drive to a regional drop off and pick up only a few packages at a time, spreading out the delivery dates. Once they arrive they sit in the shade or a warehouse, are sprayed with water to keep them cool (a package will get very, very warm, and if not cooled will overheat and die), and sprayed with sugar syrup for feed. Make sure your queen is marked. Check before you leave.*

Your supplier will tell you when the packages are to arrive so you can be prepared the day they come in. Have your hive stand ready, make sure you have plenty of sugar syrup ready for feeding and your boxes, frames, bottoms and covers are ready. If new, paint the boxes. The day the packages arrive, before you go to pick them up, get all your equipment out to the beeyard. Smoker and fuel, the box and frames the bees will go in along with the bottom board, inner cover and cover, hive tools, spray mister full of 1:1 sugar syrup, extra boxes to house the feeders on top of the box you will put the bees in, rubber bands to hold the queen cage on a frame if there's no way to hang it from the top bar, a flat head screwdriver for removing the feeder can if it's stuck in the opening of the package. If the weather doesn't cooperate when you get back home, put your package in a cool, dark place until you can get it introduced. A garage or basement is common. Feed, feed, feed the bees. Assume the feeder can is empty and they have no food. Generously spray both sides of the package with your mister 3 or 4 times a day to the point the bees are wet. This many bees will easily consume a quart of syrup in 24 hours, so don't get cheap now. They will starve if indeed the can is empty and you don't feed. Introduce as soon as possible when the weather clears.



*Getting ready. Make sure your hive stand is strong, gather all your tools and be ready. Have feeder pails and mister filled with 1:1 sugar syrup.*





*When ready, assemble everything in the bee yard. To begin, thump the package to settle the bees on the bottom. Remove the cover and the queen and keep her warm. Remove 4 or 5 frames from your super. Thump again, remove can and cover and dump the bees in the super. Replace the frames, put the pail over the inner cover hole, put a super on to protect the feeder, close and done. If installing in a top bar hive, put a feeder (here a Boardman feeder works well) in one end without bars, put bars in about 2/3 of the hive, dump the bees where the opening is, replace bars and close.*



When the time is right, install your package. Ideally, this is toward evening on a warm, friendly day, but we don't always have that luxury. Sooner rather than later, within reason is the rule. Make sure all your equipment is in the beeyard. Put on your beesuit. You probably won't need your smoker, but light it anyway, just for the practice and have it ready. Make sure your feeder pail and your mister are full of 1:1 sugar syrup. Inspect the package again to make sure the bees are doing well. Mist them to settle them down. Place the package on a firm surface and remove the cover over the feeder can if there is one. If the queen cage is right there remove it, blow off any clinging bees and put her in your pocket for protection. If she's inside the cage, carefully thump the cage to knock the bees off the can and onto the floor. Pry the feeder can out, remove the queen and replace the cover. Remove 3 or 4 frames from your prepared box and hang the queen cage, using the metal

hook or hanger attached to the cage. If there isn't one, or it doesn't work, use the rubber band to hold the cage near the top and end of the frame. Don't put her in the middle because if the feed can leaks she will drown. Have the inner cover handy. Mist the bees. Knock them down again, give them a minute to settle a bit, then remove the feeder can completely. Cover the opening, take a breath, and begin slowly dumping the bees into the opening in the box. Shake it a little, tip it back and forth a few times and get most of them out. Then put the package in front of the hive and let the remaining bees find home. Carefully



replace the frames, letting their own weight push the bees out of the way. When done, put on the inner cover, the feed pail over the hole, the extra box to protect the pail, and finally the cover. It's done. Give them a day or so to settle in, make sure the feed pail stays full and that the queen gets released in a week or so. You're a beekeeper!

~Kim Flottum