

A Lot About Queens

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Spring '18[®]

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BEEKeeping

Your First Three Years



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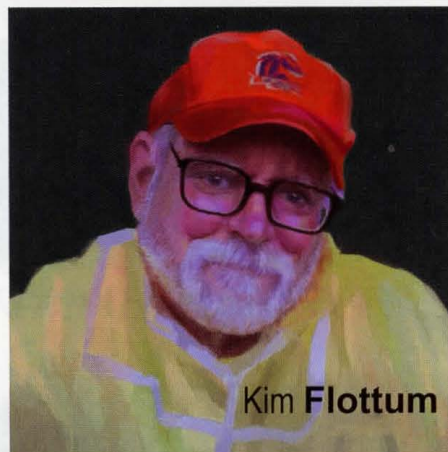
You'll notice there's a lot of paper devoted to queens in this issue. That's on purpose. Nowhere in today's world of food production has the pressure of modern chemistry been more detrimental, and had a more serious effect than on pollinators in general, and especially on queen honey bees. It's a tough world out there.

Almost every queen you purchase from a commercial producer or even the local supplier down the street, is, from day one as an egg until their too-early demise in your hive, subjected to a lethal swamp of agricultural chemicals both in and out of the hive. There are some, though, that are not. Seek them out whenever you can. But never has the toxic side of agriculture reached into so many places and touched so many people, animals, insects and soil and water organisms as it does today. Queen honey bees are only one of those touched. And the damage is subtle, unnoticed until fatal, but certain.

Most queens purchased today are raised in a world of parts-per-billion poison, spending their entire childhood surrounded in a beeswax world seeped in beekeeper applied miticides used to control *Varroa* mites. And add to this the chemicals brought back to the hive that have been added to or absorbed by pollen and nectar, plus what's on the bodies of foragers from the outside world. Only parts per billion mind you, only parts per billion. Hardly any at all.

This is what our environment is, you know. We are daily touched by traces of toxins in our water, air and everyday world. Not enough to kill, even to make us ill, but a constant stress our systems must negotiate to remain stable.

To this, add *Varroa* to our honey bee's world. Actually, the physical damage caused by a *Varroa* to a single honey bee is minimal. Not nothing, but minimal. However, the simple act of piercing the integument of a honey bee and feasting on the protein components of her internal organs immediately challenges her immune system. And even that wouldn't be lethal if that's all that happened. As this mite feeds on our bee she leaves behind as many as a dozen viruses that our now-immune-challenged bee has to battle. Just that alone shortens her life, by as much



as half. So now our hive has damaged bees, living shorter and shorter lives, trying to care for our queen.

But wait, there's more. Each season there is less and less available food for our bees to eat. Every year there are more and more sterile lawns, parking lots, roads, buildings, and agriculture. Especially agriculture. There's more land in corn and soybeans in this country than there is land in Texas. And corn and soybeans don't feed bees. Yet our bees are always nearby feeding on what flowers are available alongside these fields that are awash with herbicides to keep the weeds away, fungicides to keep disease away, and insecticides to keep insects away. And, unfortunately, this toxic cocktail doesn't stay exactly where it is put. It blows away, it washes away, and it soaks into the ground water we all have to have. It is everywhere. Only parts per billion, mind you. Only parts per billion. Hardly any at all.

So all of this comes home. Our bees must navigate through this to find not enough food to eat. And some of what they find is tainted. So not enough tainted food eaten by damaged bees shortens the life of the bees we have, and the queens they have. Queens, as powerful as they are, are really quite fragile when it comes to these challenges. And they do not live as long as they should.

Your colony can not survive without a queen, and queens do not do well unless protected from the world we provide out there. Take care of your bees, and your bees will take care of their queen. Provide clean, fresh water. Provide clean, nutritious food. Put them in safe places. Long live the queen.

SOME QUEEN PRODUCERS THAT CARE

A.N. Bees
Yuba City, CA 95991
530-300-0059
anbees@yahoo.com

Bastin Honey Bee Farm
Knightstown, IN 46148
765-987-8385
www.bastinhoneybeefarm.com

C. F. Koehnen & Sons
Glenn, CA 95943
530-891-5216

Gardner's Apiaries
Baxley, GA 31513
912-367-9352
spellbee912@bellsouth.net

Hardeman Apiaries
Mount Vernon, GA 30445
912-583-2710

Kona Queen Hawaii
Captain Cook, HI 96704
808-328-9016
www.konaqueen.com

Merrimack Valley Apiaries
Billerica, MA 01821
978-667-5380
cardbee@aol.com
www.mvabeekeepers.com

Old Drone
Piqua, OH 45356
937-773-3417
djohnson1202@woh.rr.com
www.olddrone.net

Old Sol Enterprises
Rogue River, OR 97537
541-582-2337
oldsolbees@msn.com
www.oldsolenterprises.com

Honey Land Farms II, LLC
Howey-In-The-Hills, FL 34737
352-429-3996
honeylandfarms@aol.com
www.honeylandfarms.com

R. Weaver Apiaries
Navasota, TX 77868
360-928-3125
rweaver@rweaver.com
www.rweaver.com

Strachan Apiaries
Yuba City, CA 95993
530-674-3881
orders@strachanbees.com
www.strachanbees.com

Wilbanks Apiaries
Claxton, GA 30417
912-739-4820

Sunshine Honey Bees
Lecompte, LA 71346
318-794-6961
donna@sunshinehoneybee.com

Olivarez Honey Bees, Inc.
Orland, CA 95963
530-865-0298
info@ohbees.com
www.ohbees.com

Olympic Wilderness
Port Angeles, WA 98363
936-825-2333
harbees@olypen.com
www.wildernessbees.com

Roberts Bee Co.
H & R Apiaries
Jesup, GA 31545
912-427-7311
stevenr111@gmail.com

Rossman Apiaries
Moultrie, GA 31776
229-985-7200
rossmanbees@windstream.net
www.gabees.com

Taber Honey Bee Genetics
Vacaville, CA 95696
707-449-0440

Hive Tasks



Attend local meetings.

Be a plant watcher.



- Review all equipment
- Place equipment orders in January (sales!)
- If planning on a honey crop, order equipment now
- Order swarm catching equipment
- Finish repairs and painting
- Is stored equipment still safe from mice?
- Block entrance of a dead colony until you inspect
- Veil, gloves, smoker clean and ready for use?
- Winter storm? Check hives and beeyard
- Arrival of Spring weather depends on climate
- Cold climate: check if colonies alive and need food
- Frames of stored honey can be moved close to cluster
- Never break the winter cluster – bees will die
- Cold climate: can feed “wet sugar” bricks
- Warm climate: check if colonies are alive
- Warm climate: feed 1:1 sugar syrup to encourage egg laying
- Bees arriving carrying pollen signals brood rearing
- Warm climate: can requeen if necessary
- Watch entrance for drones that signal start of swarm season
- When weather warms, colonies can be split
- Read a new bee book
- Be a Plant Watcher and a Weather Watcher
- Go outdoors and look for plants in bloom
- Attend your local club meetings
- Become an apprentice mentor – you will learn much



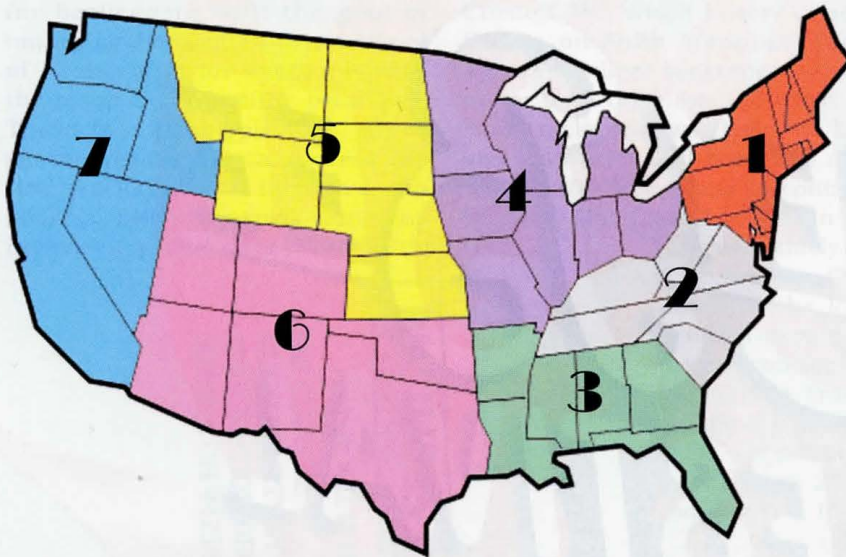
Clean that smoker.

Are there drones yet?



Watch for incoming pollen.

HONEY PRICES & MANAGEMENT REPORT



- Do you ever feed any of these?
 - Sugar Syrup - 100
 - High Fructose Corn Syrup - 34
 - Fondant - 20
 - Feeding Stimulant - 30
 - Pollen Substitute - 55
 - Pollen - 11
- What IPM do you use for *Varroa*?
 - Organic Acids - 54
 - Essential Oils - 30
 - Resistant Bees - 32
 - Drone Comb Removal - 23
- I belong to what Association?
 - Local - 68
 - Regional - 45
 - National - 25
- Equipment I use
 - 10-Frame - 73
 - 8-Frame - 14
 - 5-Frame - 30
 - Top Bar - 4
 - Warre - 0
 - Other - 7
- Queen Replacement
 - Buy all - 38
 - Buy some, raise some - 34
 - Raise all - 18
- Kinds of queens
 - Russian - 11
 - Italian - 64
 - Carniolan - 61
 - Local/Survivor - 38
 - Whatever I can get - 18
 - Raise my own 'Best Queens' - 25
- I change old comb -
 - Every year - 9
 - Every two years - 14
 - Every three years - 29
 - When damaged - 7
- Do you test for *Varroa* after treating? - 41

Some Management Practices

We asked our reporters about some of their management practices this month, expanding it some from the survey we did last year. One note are the changes in nutrition management. Last year, only 84% were feeding sugar syrup, this year 100%. HFCS up from 26 - 38%. But pollen substitute was down 10% from last year and pollen was half of last year. Significant changes in *Varroa* management, too. Organic acid use down 6%, and half as many are using drone comb trapping this year as last. But we expanded this report this year. Equipment - 73% use 10

frame, but 14% use 8. 11% are using Russian queens this year, a positive number certainly, and 25% are raising all their own queens. Even better. But, still, 18% have to take whatever they can get. Over 50% are getting rid of old comb every 3 years or less, and 41% are testing their bees for *Varroa* AFTER they have treated. That will improve next year, we hope. Association membership - Local - 68%, regional - 45% and national - 25%. All of those numbers are up from when we last asked this several years ago. Definitely an improvement.

**% Responding
Yes In Red**

REPORTING REGIONS										SUMMARY			History	
	1	2	3	4	5	6	7	Range	Avg.	\$/lb	Last Month	Last Year		
EXTRACTED HONEY PRICES SOLD BULK TO PACKERS OR PROCESSORS														
55 Gal. Drum, Light	1.85	2.12	2.29	2.55	2.25	2.11	3.25	1.50-3.25	2.26	2.26	2.23	2.14		
55 Gal. Drum, Ambr	1.78	2.07	2.08	2.37	2.23	1.99	2.88	1.35-3.25	2.16	2.16	2.17	2.09		
60# Light (retail)	222.14	184.67	197.50	215.25	159.60	194.10	200.00	159.60-270.00	203.60	3.39	119.89	189.23		
60# Amber (retail)	219.69	199.50	191.25	206.50	201.62	183.63	200.00	150.00-250.00	203.24	3.39	204.85	189.73		
WHOLESALE PRICES SOLD TO STORES OR DISTRIBUTORS IN CASE LOTS														
1/2# 24/case	89.74	77.60	88.15	60.00	57.84	84.00	89.51	57.60-134.40	83.01	6.92	85.48	80.43		
1# 24/case	130.36	108.50	127.14	114.08	127.16	127.44	148.20	86.40-211.20	126.46	5.27	126.50	117.20		
2# 12/case	118.33	94.00	113.01	103.30	97.44	98.40	114.00	79.20-192.00	110.71	4.61	110.74	105.03		
12 oz. Plas. 24/cs	107.17	86.73	96.63	84.00	74.40	102.60	97.20	66.00-172.80	97.13	5.40	96.28	92.92		
5# 6/case	138.54	105.73	128.17	126.40	102.30	115.50	134.37	70.33-210.00	128.57	4.29	126.38	121.70		
Quarts 12/case	170.91	137.13	123.84	154.05	155.32	141.36	192.00	90.00-255.00	149.02	4.14	141.27	138.59		
Pints 12/case	116.03	85.81	89.00	168.00	111.00	81.96	84.00	65.00-168.00	100.74	5.60	87.38	89.15		
RETAIL SHELF PRICES														
1/2#	5.77	4.32	4.39	4.60	3.26	4.75	5.43	2.92-9.00	4.90	9.80	4.77	4.30		
12 oz. Plastic	7.17	4.81	5.16	4.84	4.56	7.00	5.25	3.07-12.00	5.93	7.91	5.81	5.35		
1# Glass/Plastic	8.27	6.59	7.41	7.93	6.84	7.30	8.33	4.00-14.00	7.71	7.71	7.34	7.01		
2# Glass/Plastic	14.46	10.47	12.81	13.33	12.04	12.50	15.00	8.00-23.00	13.44	6.72	12.37	11.59		
Pint	13.09	8.68	9.99	14.83	11.00	10.19	8.00	6.00-19.50	10.65	7.10	10.19	9.67		
Quart	21.99	15.42	16.30	20.13	18.47	17.35	17.25	9.50-32.00	18.06	6.02	17.15	16.14		
5# Glass/Plastic	30.05	25.98	35.75	18.12	24.79	31.33	32.00	9.50-50.00	28.49	5.70	27.28	25.81		
1# Cream	10.88	8.16	9.12	5.50	6.92	5.50	8.00	5.00-16.00	8.90	8.90	9.23	7.80		
1# Cut Comb	13.81	9.50	9.33	8.83	10.00	6.50	14.00	6.00-24.00	11.15	11.15	10.67	9.40		
Ross Round	9.93	6.76	8.54	6.50	8.54	10.50	12.49	4.00-12.49	8.83	11.77	9.37	8.36		
Wholesale Wax (Lt)	8.35	4.75	5.50	6.30	6.00	4.67	9.00	3.00-15.00	6.68	-	6.01	5.75		
Wholesale Wax (Dk)	7.81	4.52	4.64	5.75	6.39	2.75	6.00	2.00-12.00	5.78	-	5.39	5.09		
Pollination Fee/Col.	101.43	83.33	51.00	78.33	84.29	90.00	55.00	30.00-150.00	78.57	-	81.30	76.29		

Introduction

Hive Tracks is beekeeping software created by beekeepers for beekeepers with the goal of improving the quality and experience of beekeeping for everyone with the result being healthy bees! Hive Tracks is a web application, which simply means you can access the Hive Tracks software through a web address, hivetracks.com, using any internet enabled device including smart phones and tablets. The vision for Hive Tracks was born in the minds of two beekeepers who live and keep their bees in the Blue Ridge mountains of North Carolina, an area rich in beekeeping tradition and well known for tasty honey varieties including the world famous sourwood honey. These two beekeepers, Mark Henson and myself, dreamed of utilizing cutting edge technology to build easy to use tools and services to help beekeepers, ourselves included, have healthy and productive honey bee colonies. Our hope was that by maintaining information like records of inspections and events in hives and beeyards, every beekeeper will be equipped with the information needed to make wise management decisions for their bees. Whether you have a couple of hives in your backyard or a couple of hundred in varietal honey production or several thousand colonies for pollination, knowing the current state your bees is essential to being a successful beekeeper. This article gives a brief backstory of the beginnings of Hive Tracks.

Founders

The story of Hive Tracks is full of coincidence or divine providence or whatever you want to identify as the cause of events that come together in just the right way. One example is how the creators of Hive Tracks found each other. Mark Henson was a professional software engineer with decades of experience in software development and a masters degree in computer science. He lived in Boone, NC, with his wife and daughter and telecommuted to work very early each morning with a software team in Great Britain. He was a relatively new backyard beekeeper with a hive count varying from a few to more than 10. I was (and still am) a Professor of Computer Science at Appalachian State University in Boone, NC, where

I have been teaching for 26 years, and I have a PhD in computer science. My wife and children and I live in Creston, NC, which is very close to Boone, on Faith Mountain Farm. We are sideline beekeepers as part of our farm business and when the Hive Tracks idea was born, we kept about 40 hives and now have more than a 100 with plans to continue to grow. Mark and I moved in the same beekeeping circles, namely the Watauga County Beekeepers Club and as honey sellers at the local farmer's market, so it was no surprise when Mark and I were considering our nascent ideas for Hive Tracks that mutual acquaintances suggested we get together. So, on a snowy afternoon in late February 2009, Hive Tracks was born over a lunch meeting.

Early Days

From the beginning, our ideas were very similar. I was standing at a hive in my beeyard that previous Summer of 2008 ready to perform an inspection. I scratched my head trying to remember what I observed the last time I was inspecting this hive. Ever done that? In a moment of clarity, I caught a glimpse of what the future could be like: walking up to a hive, a handheld mobile device (smart phones were not so smart back then) recognizes the hive being inspected and shares information with the beekeeper that will help with this inspection, like the health or strength of the hive, the queen status including her age, any unusual observations at the last inspection, medications or feed that should be checked, honey flows in the region, tips on what to look for at this time of year, etc. I saw the future, but did not see how to make it a reality. Mark's innovation came to life in a conversation with his wife on a long car trip home during Thanksgiving of 2008. With two years of beekeeping under his belt, Mark's interest in improving his own beekeeping combined with his software expertise resulted in him being driven to create a prototype hive information system by Christmas of 2008, a month after his initial brainstorm. It was this prototype that he showed to me at our first meeting, bringing life to ideas that previously lived only in my head. Mark had already shown the prototype to Shane Gebauer of



James Wilkes

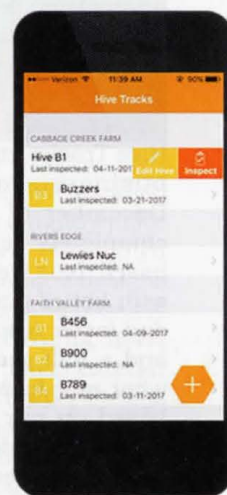
Brushy Mountain Bee Farm at a bee meeting and later we showed it to David Tarpay from the Entomology Department at NCSU at the North Carolina state bee meeting. Shane and David have both encouraged us and have been supportive of Hive Tracks over the years.

Launch

Ideas are relatively easy to dream up, but implementing them is the real challenge. In the case of Hive Tracks, a plan was made to develop the first production version of the software with a launch date of August 1, 2010 coinciding with the 2010 Eastern Apicultural Society Conference, which happened to be held in Boone, NC that year. One of those happy coincidences referenced earlier. The first production version of Hive Tracks was created during the year preceding the conference with innovative features including a digital representation of each hive in an apiary based on the hardware components of the hive and graphical indicators of hive health and queen status. The first of its kind (that we know of) hive editor allows the beekeeper to maintain the proper hive configuration as it changes throughout the season. Mark never knew how many different components beekeepers used until trying to represent them all! Components are still being added to this day so send us your favorite non-standard component to add to the list. Just kidding! Following the initial launch, we were excited to see 400+ users signed up by the end of August.

Growth

By the end of 2010, 800+ people had registered accounts with Hive Tracks with no real marketing other than a favorable review in *Bee Culture*





and word of mouth through bee club presentations. Growth in user accounts has always been steady with over 6000 users by the beginning of 2013 and continuing to this day. We now serve a user base including over 25,000 registered users in 152 countries managing over 125,000 hives in 25,000+ yards.

Most of this growth has predictably been in the United States and more specifically in the eastern half of the U.S. where there are more backyard beekeepers who make up the majority of our users. The average number of hives per user is around five, but we have a surprising number of sideliner and even commercial beekeepers who are finding it useful for their operations.

From early on we accepted donations, and a few users did donate which helped with some of the costs, but mostly expenses were out of our pockets along with a healthy dose of sweat equity (funny, that sounds a lot like beekeeping to me). In June of 2013, we added a business partner with the goal of advancing the development of Hive Tracks into a sustainable business. Toward that goal, in December of 2013 we released a completely rewritten subscription based paid version of Hive Tracks with better graphics, more features, and faster response time. After three and a half years of users telling us what new features they wanted and based on our own needs, the new version included a number of value added features including additional hive types like nucs, uploading of photos and videos, a hive hardware inventory, integrated calendar and to do lists, group sharing of data,

and iOS and Android mobile apps for offline work.

The subscription based model provided just enough resources to engage the beekeeping community in a continuous improvement cycle in which we are always working toward the ultimate goal of improving the quality of beekeeping for everyone. And this year subscription fees and grant funding from the Healthy Hives 2020 project have supported several important initiatives. One is the community feature that brings beekeeping clubs, classes, and friends together on the Hive Tracks platform to share information and insight with one another. In addition, we now offer a simplified hive health measure called the Healthy Colony Checklist that is putting the beekeeping community on the path to bee data standards which are the foundation for bee data analytics. Another important initiative is the ability to record varroa loads for each hive and monitor those

of our current users are of the backyard variety, but there are several hundred users in the sideliner and commercial category as well. Inquiries at beekeeping conferences and through our web site have shown an increasing demand for software solutions for sideliner and commercial beekeepers. In response to that demand, over the past three years we developed Hive Tracks Commercial, a commercial apiary management system, that was officially released at the 2017 North American Beekeeping Conference in Galveston, Texas. In talking with commercial beekeepers and from working in their operations, we've found that keeping updated data as fundamental as yard locations, hive counts per yard, and hive grade/status is a struggle for many operations. This observation alone supported the need for apiary management software that can make this information easily accessible and accurate. Once the day to day operations and associated task

management are added to the mix, commercial beekeepers quickly acknowledge their need for help in managing the flow of information and communication within the operation.

Future

There is much more to come as the potential benefits of technology to our collective beekeeping experience are quite profound and exciting to consider and pursue. As you begin your beekeeping adventure, I invite you to join your fellow beekeepers and the Hive Tracks team as we all strive to be better beekeepers by equipping ourselves with the right tools and information

to keep healthy honey bees. Hive Tracks is committed to pursuing excellence in beekeeping and will continue to work to add features and functionality useful to all beekeepers. In the end of course, the most important part of your beekeeping is to spend time in the bees! 🐝

<http://www.hivetracks.com>
<http://go.hivetracks.com/commercial/>
<http://www.facebook.com/hivetracks>
james@hivetracks.com



loads over time both individually and collectively. Hive Tracks also joined with the Mite-a-thon and MiteCheck projects to promote a focused week of *Varroa* monitoring in early September in which Hive Tracks users were able to share *Varroa* load data they collected automatically with the MiteCheck web site. We have no shortage of great ideas and will continue to build on them in the coming year!

Meeting New Demands

Statistics show that the majority

Build A Better Beeyard

Tom & Fran Davidson

We began beekeeping seven years ago and have evolved from two colonies of bees to a successful sideline business with 37 hives. For the past four years our bees achieved a better than 90% overwintering survival rate in Southwest Ohio. Part of our success can be attributed to lessons learned as we expanded our bee yard. This article is meant to share commonly understood principles of beeyard design and offer a few innovations that might improve your beekeeping success.

Site selection:

Before installing our apiary we checked property covenants and government regulations (State, county, township) for applicable restrictions. We fortunately live in a rural area, zoned for agricultural use on six acres. The State of Ohio has code requirements governing our apiary operation. Most cities will issue additional ordinances preventing or limiting the number of hives, location, distances from property lines and requirements to erect barriers to force bees to fly over human traffic. Check and comply before building.

We chose a site for maximum sun and faced entrances southeast.

We provided a Winter windbreak on the East, North and West sides of the Apiary. Plants, fencing, straw bales, pallets, plywood, buildings or a natural area will also work. We chose three panels of attractive fencing but removed the panel on the East side after poor hive performance the first two years from excess shade. We have better survival from hives enjoying full sun in the apiary. Consider use of attractive fencing to force bees to fly up over neighbors property even if ordinances do not require a barrier.

We Installed hive stands on 4x4 cedar posts about 30 inches deep on pedestals 12-16 inches above the ground. Most posts were set with a 40lb bag of pre mix concrete in bottom of the posthole. We should have gone below the frost line and set all posts in concrete because after years of use we have had to add supports to several hives as height and weight increased. Posts were spaced so we could work on either side and from the rear of hives. We allowed space for rear removal of white boards and to insert an oxalic acid vaporizer from the rear of the

Use of gravel on top of 30# felt reduces weed growth and we believe small hive beetle reproduction.

Hives on pedestals discourage skunk predation, mice, and ant invasion. Tarps, plastic, or landscape fabric would also work under gravel. (photo by Fran Davidson)



hive for mite treatment. We installed hangars on fencing as a handy place to hang frames if needed. We painted outside of hives with unique designs or colors to protect wood and possibly reduce drifting by returning bees. We used water based (latex) exterior paints and untreated lumber for box construction. We do not paint inside of boxes. We permanently named our hive pedestals but numbered our hives and nucs for ease of record keeping. We now keep our hive notes in a water resistant note book after losing months of record keeping from



Fence panel on the left side shaded hives in the afternoon and was eventually removed to allow maximum sunshine all day. Hives face southeast. (photo by Fran Davidson)



Consider locating apiary with future expansion in mind. Once you have learned to split two hives into four you may end up with 36 or more. (photo by Fran Davidson)

heavy dew/rain (Don't leave overnight out in beeyard).

The most innovative improvement in our apiary is use of a modified inner cover in hives with an empty super on top to keep bees out of our face when feeding. The empty super prevents robbing and provides an air space buffer against rapid changes in temperature extremes in Summer and Winter. When needed; sugar syrup in quart mason jars are inserted into 3½ inch diameter circles cut in the

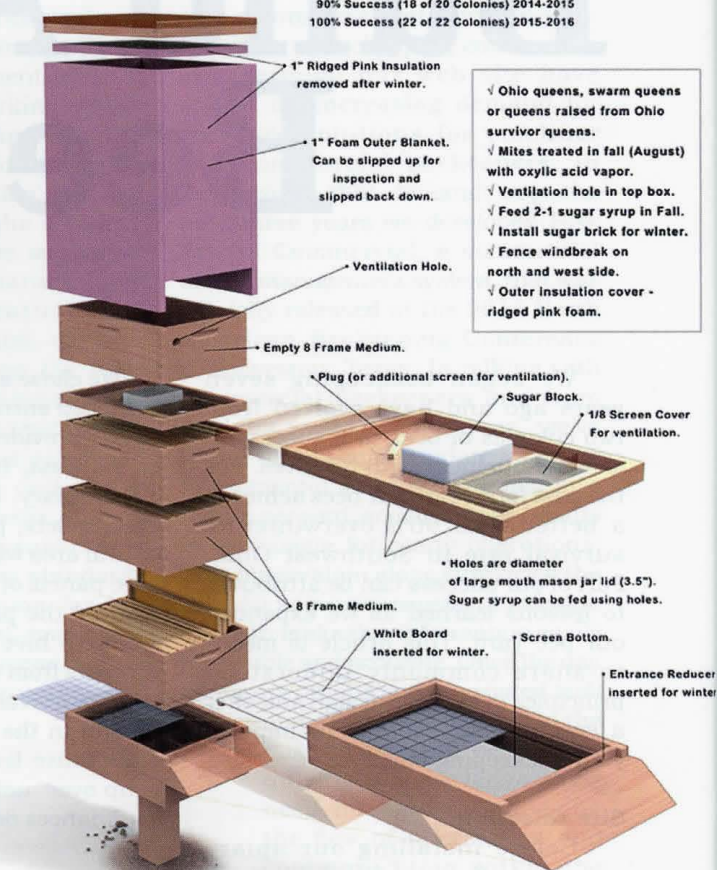


Plugs are made from 3½ inch piece cut when making holes. Maintain bee space when framing the plywood inner cover. Bees are kept below inner cover and out of beekeepers face when inspecting food and bee status. Protein is easily added under plugs or movable screen.



Tom & Fran Davidson Overwintering

91% Success (10 of 11 Colonies) 2013-2014
90% Success (18 of 20 Colonies) 2014-2015
100% Success (22 of 22 Colonies) 2015-2016



Use of all eight-frame medium Langstroth supers for brood and honey. Modified inner cover expanded. Screen bottom board used with white board which is left inserted over Winter. (Illustration by ryan@artist-rendering.com)

inner cover. The jars (when inserted in the holes) just fit inside the empty medium super without need of shims. In Winter, sugar bricks or fondant in clear containers are placed over the top of the holes for emergency feed. Installation of round plugs and a rectangular ventilation screen over unused holes prevents bees from entering the space inside the medium super above the inner cover. Safe and easy winter inspection of food status is accomplished by taking a quick peek under the telescoping cover without loss of much heat and zero disturbance to bees or beekeeper.

Our hive bodies are all medium eight-frame supers with a modified inner cover. For ventilation we use a movable rectangular 1/8 screen cover over an inner cover hole which contains bees to lower boxes. In

Winter we insert rigid insulation inside top of the telescoping cover for added insulation and to prevent condensation dripping back down into the hive. We make a removable one inch rigid foam outer insulation cover for extra Winter insulation. Two Insulation panels are glued and screwed into a V then two Vs are just screwed (not glued) to attach as a box around the hive. The Vs are then unscrewed and stored after Winter as space saving Vs for use again next Winter.

We use a permanent marker to write the year frames were put in use on one end of each frame so it is readable. By placing removed frames back in hive boxes with printed year at the same end, less disruption of hive occurs. Stack boxes so the marked frames systematically faces to front or rear of hive (your choice). This habit helps insure boxes are returned to their original positions unless you have a reason to rearrange.

Additional considerations

It lessens back strain to use a low bench in the beeyard to set boxes on while working hives. For liability concerns we post warning signs that bees are present in our apiary and

Some commercial inner covers lack a ventilation notch. Ventilation is critical to hive survival. Cut notch if needed and don't block with telescoping cover. (photo by Tom Davidson)



protection is required. Using screen bottom boards with removable white boards facilitates monitoring hive health especially mite loads. We find some commercial inner covers lack a notch for upper ventilation. Adequate hive ventilation even in winter is important for hive survival. Cut a notch if necessary and don't block ventilation when closing the telescoping cover.

We started with just two hives but expanded each year as we became addicted to the "Beekeeping Disease." Allow space for possible growth when locating your beeyard. Consider Keeping apiary to 20 hives or less in a single yard based on available nutrition within the 2½ mile

radius your bees will forage. Keeping less than 20 hives was an enjoyable recreation for the two of us but a sideline business with 36 colonies requires serious man hours (work). We were fortunate to have room for an apiary in our backyard so easy access was obtainable. If we were to build an out apiary, year round access to the hives would be a prime consideration and feeding syrup in quart jars would likely change to use of refillable gallon feeders of some design to reduce frequency of visits.

We hope some of our shared beeyard practices will benefit your beekeeping experience and improve the life of your bees. 🐝



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Water During Cool Weather

This is not just another how to water your colony article.

~James E. Tew



Bees need water – I get it. What else have you got?

Bees and their warm weather water needs have been the subject of numerous articles that many others and I have written in recent years. Primarily, my pieces centered on the concerns that my near neighbors had about water foragers at birdbaths and how the bees were keeping the birds away. At times, swimming pools were involved in the complaints.

Initially, I defended the bees to my neighbors, but over time and after viewing many water-foraging episodes, I was forced to admit that my bees were keeping birds from watering at my neighbor's device. At any given time during the warm day, there could be hundreds up to a few thousand bees gathering water.

Just for a quick review of these past articles, I put out my own watering devices. I never let them run dry. I asked you what you were using for watering devices. You responded with many interesting suggestions. In general, a good discussion was had during the following months and the topic seemed finished. Indeed,

my neighbor finally just gave me the birdbath that my bees loved so much, and she got a new one. All of you who have kept bees for a few years know how that aspect of the story ended. Regardless, that part of the bee water story is not what interests me right now. This water-need subject seems to have a lot of unanswered questions. Maybe written more appropriately – this water-need subject seems to have many questions that have never been asked.

Why do bees collect water?

The current best concept is that a colony needs water for honey dilution for brood feeding, for cooling the hive, and for individual bees that are thirsty. As far as this traditional information goes, I agree. But over the past few years, it would appear that there is more to this water question that has been addressed.

They show up abruptly at the watering device

As I write, it is mid-November. On typical days, gentle wind, partly cloudy, at 42-44°F, foragers suddenly

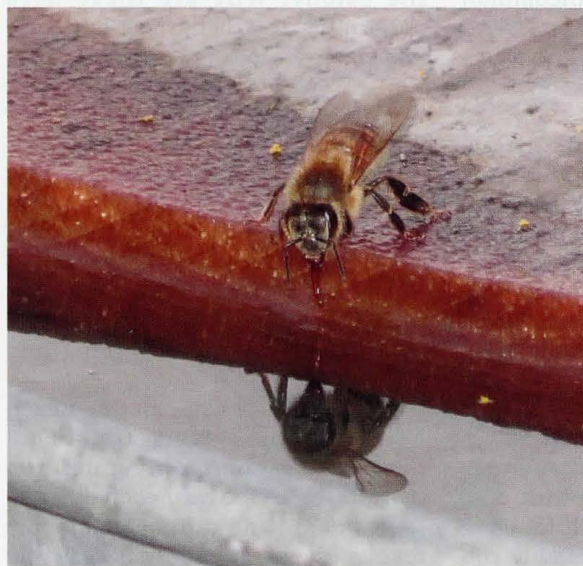
begin showing up at the watering source. There is precious little brood in my colony. I can't imagine any water is needed for brood? The hive that houses the colony is certainly not overheated. There is no obvious reason for cooling the hive. Are these just individual thirsty foragers? What about all the nurse bees and young bees back in the colony? Is this collected water to be shared with them? Why would some bees be thirsty and others not? I contend that the general reasons that are offered as to why bees need water begin to (somewhat) fall apart.

Not like warm weather foragers

These water foragers are alike in some ways, but very different in other ways. On occasion, a few warm weather foragers have stayed at the water source overnight¹. Additionally, on hot days, they are there by the thousands. Clearly, there is a need for abundant water to feed brood and to cool the hive. So what are these cool weather water foragers up to? Rather than 1000s, there are hardly 25 foragers gathering water. Plus, please consider that these bees are flying while the temperature is in the low 40s(F). That is very chilly weather for a honey bee. Then, by 3:00 or 3:30 PM, it is all over. These bees have either drowned or supposedly gone back to the hive.

Obviously, this is a dangerous trip

As is so typical, we have no way to know how many foragers are searching for water and how many are successful. I can only see the few dozen at my watering sources. These bees are flying on the very low side



A cool season water forager on the job.

¹Truth be told, I did not mark the "overnight" foragers so that I cannot say that they were the same bees. What I can say is that there are a few water foragers already at the water source around dawn.



Unsuccessful foragers in my neighbor's birdbath.

of their temperature range. Some really interesting methods of heat production must be underway that help the flying bee deal with wind chill as it flies through the cool air. I would expect them to be clumsy as they approach the water source and hover searching for a proper landing site, but they appear to be fine.

Then these bees take on a load of 40°F water. If the bee is able to carry about 25mg of water (up to 50mg), then how can a bee that only weighs about 50mgs herself, maintain her own internal body temperature with that great of a cold load? I weigh about 200 pounds (yes, I have been told numerous times that I should lose to 165 or so. I know I should. I plan to work on it.). If I were able to consume 100 pounds of 40°F water, I certainly feel that I would not be in a healthy state. I can say with certainty that my core body temperature would drop. Yet, I watch water foragers – all the time – depart from the water source as if nothing has been going on. Maybe it is nothing more than the fact that the cold water is in her abdomen and has little effect on the flight muscles in her thorax.

But the cool weather bees seem to stand around a lot. In fact on typical cool days, only about 50% of the bees may be actively imbibing. Are these other foragers warming up in the sunlight?

Bees routinely drop into the drink

I have worked out a little procedure that I use when I am so inclined. Bees commonly fall (drop? slip? tumble?) into the water source. I have tinkered with these clumsy

bees and brought many back to life. It usually seems to go like this: once in the cold water, the bee struggles for a while and then – being coldblooded – becomes chilled and immobile – but not frozen. They float near the surface in this stupor state for several hours before sinking. Once they sink, they are waterlogged and do truly seem to drown. But, if I scoop those that are not yet waterlogged out of the water, bring them into my heated shop, and place them on a paper towel, they will usually recover in five to 10 minutes. I hold them in a container, and once they are buzzing about, I simply release them to do whatever they have planned for the remainder of their lives. From that point, I have no idea what happens to them.

Is this high accident rate common?

I routinely see bees that are dead at very shallow water sites. I do what you do, I guess. Pesticides? Old, aged bees? It is just not uncommon to see from one or two up to several dead bees around nearly any water site – especially one commonly used by numerous bees.

Or is this death rate partly due to my water-feeding source? Do bees have problems flying over the reflective surface of the pool? Bees frequently tussle with each other and one (or both) will fall in the water. Most seem to get out, but a meaningful number do not make it.

Some dissociated thoughts and comments

This is a cool weather behavior. Every food producing plant has finished. The bees are still foraging for water, and they will readily rob

from each other. Everything else has finished for the season. Some individual comments follow.

Are we doomed to have roaming water foragers?

As beehive managers in urban situations, are we doomed to have to deal with pesky honey bees at neighboring water sources? I am now in a frame of mind to guess – “yes” – we are. Having struggled for about four years to keep my water foraging bees at **my** water sources, I am now guessing that water foragers will always assume that the current source will dry at some point. As with nectar, I'll bet that they are always going to be interested in multiple sources. From their standpoint, it would make survival sense. I feel that the bees are going to be serious about knowing where **all** the water sources are in their foraging area – just in case. My provision of a water source in my yard does not mean that all the bees will abandon the one in my neighbor's yard and happily depend on mine alone. *(It would appear that my bees know me very well.)*

A humidity thing?

This desperation water foraging behavior would seem to be a colony humidity thing. Don't you think? I just can't accept that these seemingly specialized foragers are making death-defying trips simply because they are individually thirsty. Alternatively, compared to the Summer water foragers, the foraging results of these few hundred bees would not seemingly be able to be able to seriously affect the conditions inside the colony. Why are these bees performing this behavior? It clearly has colony value?

Tousling, jostling cool water foragers

At the water source, individual bees will occasionally groom each other, feed each other, and occasionally, expose their scent glands. Additionally, they will frequently brawl with each other resulting in one or both going into the water.

I don't know what all this mixed behavior means. While traditional beekeeping commonly puts too many colonies too near each other so that robbing and drifting commonly results, the same cannot necessarily



A water forager that managed to fall into the cold water.

be said of water foraging sites. While I am aware of the three spots on my property where bees can commonly be found gathering water, there must be many, many other spots in my general area where other such small pools are available. I must assume that there is a similar interaction of foragers from different colonies coming in close contact with each other. As it were, bees meet at the common water holes – somewhat like animals coming to water holes on the African plains.

Varroa on the move (possibly)

Earlier in this piece, I described my attention and concern about drowning bees at the water source. Last week, I gathered about 10 soggy, cold-water foragers and brought them in for warming and releasing. There it was – just as plain as day. There was a *Varroa* mite on one of the

cold, wet bees. I have no idea if the mite was on the same bee it came to the water on, or if it had managed to change bees at the water site. Either way, as has been reported in the literature, the potential for transfer was there. It was intriguing to see *Varroa* biology in motion.

This is what is nagging at me

Our efficient methods of wintering bees have not overstepped humidity issues within the wintering colony – right? The bees propolize everything tightly, and in order to release “moisture-laden” air from the wintering colony, we routinely break that natural seal. Are the bees just confused with all this propolis collecting process or are they responding to bee biology issues that we are presently unable to appreciate.

Alternatively, is the modern hive configured in such a way that the bees are not able to practice their natural biology within this artificial nest cavity? Beekeeper-assisted procedures may now be required.

So, back to the foraging behavior of cool-season bees – are we putting some kind of stress on the colony as it prepares for Winter to such an extent that bees are scrambling to re-adjust the internal hive environment? Natural nests are not necessarily highly ventilated, but it should also be said that many natural nests fail each year. I don't know that anyone has ever been able to delineate what ventilation/humidity features make up a perfect feral cavity for a colony. We have accumulated many

years of perfecting bee management in traditional equipment but seem to know little about natural nest ventilation characteristics.

In 1901, when wintering assistance was taken more seriously than it is today, chaff cushions were put on top of the wintering cluster to absorb excess moisture and prevent mold growth within the hive. As the weather warmed, the absorbed moisture was available back to the colony as needed. We know now that silken cocoons in old, black combs absorb moisture (approximately 11%) and provide a similar buffer as the cushions. The humidity level must be maintained one way or the other – either from internal hive water sources or from bees eating honey to generate metabolic water. Are we helping or hurting this biological need?

Our bees talk to us

In their own way, our bees frequently communicate with us, but we are not always able to understand. Washboarding behavior is an example. Late season swarms are another instance of bees' behavior that baffles us. Making death-defying cool season water foraging trips is yet another behavior that seems strange to us. We have learned a great deal about our bees, but there is oh so much more that needs to be learned. Keep watching. Keep learning. 🐝

Dr. James E. Tew, State Specialist, Beekeeping, The Alabama Cooperative Extension System, Auburn University; 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



Varroa on a wet water-foraging bee.

A beekeeper in West Virginia writes:

I have always heard that you can't take honey from a hive until it has survived thru its first Winter.

From what I could tell, at the beginning of spring last year (first hive to survive in my five years of beekeeping) when I opened up the box after Winter, the bee volume was about half of one medium. I don't know if that was normal. They survived and then thrived so I didn't care.

My question is, when you get a nuc, it would seem to be the same size as my surviving hive, so why can't I take honey from them their first year? Why wouldn't they be able to produce their own honey stash after a regular honey flow like all other 1+ year old hives?

Phil replies:

I never tell beekeepers that they cannot take off honey from a first year hive – only that they should not expect to. Our goal for a young colony is for it to draw out all the frames in the desired number of brood boxes, increase in population, and have enough food stored by late Fall to survive the upcoming Winter. Excess honey for harvest is a bonus.

It's a step by step process. First you, the beekeeper, watch for the bees to draw out most of the foundation in one brood box (about eight frames out of 10) before adding another. Repeat until all boxes are drawn out. The typical hive consists of two deep brood boxes, but that can vary depending on climate and personal preference. Where Winters are long and severe, a colony might need three deep boxes to house the bees and the food stores it needs to survive until Spring. Then again, some beekeepers, like you, prefer to use mediums as brood boxes. In that case, three would be the most common configuration. The next step, after the top box is drawn out, is for the bees to fill it with brood, honey, and pollen. Only then, and only if there is still a nectar flow, is it time to add a honey super. If they draw that out and start to fill it with nectar, add another.

Whether or not a new colony produces harvestable honey in its first year depends on a number of factors. Was it started from a nuc or from a package? Nucs arrive with several frames already drawn, a queen that is laying, and at least some brood. To begin with a package is to start from scratch; package bees must draw out comb before



Frame with drawn foundation.

Got Questions?

Phil Craft

Phil Knows!

the queen can begin to lay. Since there is no brood to start with, there will be a delay of several weeks before any new bees emerge. A rapid build-up is crucial to making the most of a spring nectar flow and is one of the reasons that many beekeepers prefer to begin colonies from nucs – when they can find them. It's also why timing is another variable in honey production. How early in the Spring was the new hive established? The earlier the better in terms of build-up, but temperature is a limiting factor, leading to the next question: in what part of the country is the new hive located? In Florida beekeepers start new hives in January, but in northern Michigan it isn't safe to do so until late May or early June. Regional location also dictates factors such as length of the nectar flow, dearth periods, and length of day. In North Dakota, for example, the growing season is short, but the days are long and bees forage nearly from dawn to dusk. The final factor is luck. Was it a dry year with little available nectar? Did it rain throughout most of the blooming period so that the bees were unable to fly and forage? Clearly, with so many variables affecting the chances of a first year harvest, there can be no hard and fast rule about it.

Congratulations on successfully wintering a colony for the first time. If it makes more honey than it needs this year, don't hesitate to take your share. Some people call it robbing the hive. I call it charging rent.

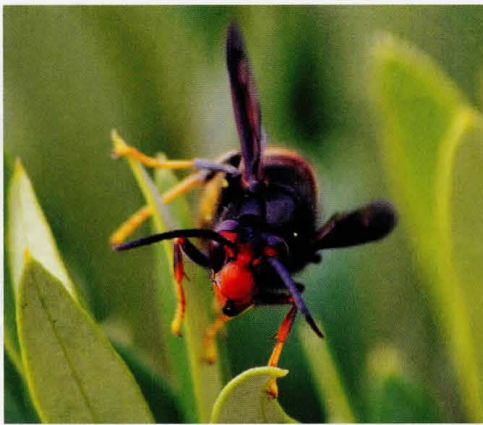
A beekeeper in South Carolina writes:

I live in South Carolina and the winters are comparatively 'warm'. I just started beekeeping and completed the Beginner Course in January-February of 2016. While many people in this area insulate the top of their hives and put a cover below their screened bottom boards, I have not talked to anyone who actually insulates their hives. If I were to follow the pack and insulate the top and put a cover below the screened bottom board AND put R-3 insulation on the sides of the hives (making sure to keep the notch in the inner cover clear for ventilation), would I create a problem for the bees?

I noticed something disconcerting today. It was overcast and ~50 degrees today. I watched a yellow jacket (they've been especially bad this year) land on the landing board and after several seconds walk into the hive. I expected to see the yellow jacket exit the hive pursued by guard bees. I did not see it exit after about a minute. Should I be particularly concerned or is this something that happens now and then?

Phil replies:

With the exception of those in the far north, beekeepers in the United States do not find it necessary



Asian
hornet.

to insulate their hives during cold weather. The only physical modification that I recommend for Winter is the installation of mouse guards. A warm, dry hive can be an enticing refuge for mice. Beekeepers who fail to take precautions (and I admit to being one of them from time to time) may find nests, damage to comb, and sometimes mice themselves in their hives come Spring. Mouse guards, or entrance reducers as they are also called, often consist of solid blocks of wood which fit in the hive entrance and restrict it to an opening that a mouse cannot get its head through. Unfortunately, some beekeepers have the mistaken impression that the purpose of entrance reducers is to help keep the hive warm by restricting reducing drafts of cold air. In fact, as from your question you seem to be aware, good ventilation is just as important in winter as it is in Summer. That's why I prefer (when I do get around to it) to use mouse guards made of perforated metal strips which effectively block mice, but do not impede the flow of air. A colony is capable of dealing with cold temperatures, but is stressed by the cold, wet conditions created in a poorly ventilated hive.

Though honey bees are cold blooded animals and therefore not individually capable of thermoregulation (meaning that they cannot control their own body temperature), collectively, they use an impressive array of strategies to regulate temperature within the hive. In Summer, they deposit droplets of water throughout and fan them with their wings. As the drops evaporate, the change of state produces a reduction in temperature much as evaporating beads of sweat cool our skin in hot weather. At the approach of cold weather, the bees "caulk" unwanted cracks and openings in the hive (whether it be a brood box or a hollow tree) with propolis produced from resin and other plant material. Every beekeeper who has ever used a hive tool to pry two boxes apart knows what an effective sealant propolis makes. The key to winter warmth, however, is the cluster. When the interior temperature reaches the mid 60s, the bees have already formed a loose ball to share body warmth. The cluster shrinks as it becomes colder and the colony huddles closer. Meanwhile, some individuals flex their thoracic muscles to produce heat in an action that resembles flying in place. By the time a thermometer placed in the hive would read in the mid 50s, the cluster consists of a compact shell of stationary, flexing bees and an inner core where individuals can move about on the comb and feed. The shell can be several layers thick, made up of bees with their heads facing inward. Workers change

positions, rotating between the shell and the core, but the queen stays always in the sheltered center. In this way, by muscle contractions, by expanding and contracting the cluster, and by increasing or reducing the number of bees in the shell, the colony can maintain a temperature of about 68°F within the cluster even when it's well below freezing outside. Pretty amazing!

Honey bees are also, in most cases, self-sufficient when it comes to protecting themselves against carnivorous, predatory insects. Yellow jackets, hornets, and cicada killers, all of which are actually wasps, will attempt to prey upon colonies. In tropical countries these (and one species of Asian hornet, especially) are a serious problem. Most predation in the U.S., however, is by hornets and non-wasp insects such as damsel flies, dragon flies, and a particular species of praying mantis, and it tends to be by individual insects. Our hives, for the most part, do not experience the mass attacks which take place in other parts of the world. Europe, for instance, has not been so lucky. Since they were accidentally introduced in France about 10 years ago, the Asian hornets (*Vespa velutina*) have created consternation amongst beekeepers there, and have since spread to nearby countries. Their modus operandi is for several dozen hornets to wait at a hive's entrance and bite the heads off bees as they emerge. After killing and eating most of the adult bees, the predators can finish robbing out the hive. On a couple of recent visits to France I have seen Asian hornets around bee hives, though each time it was only a single insect. On both occasions it was quickly dispatched by the beekeeper. As an alternative to individual assassination, many beekeepers now use hornet traps. These are not generally marketed here because *Vespa velutina* has yet to cross the ocean.

In the U.S., mass attacks are usually perpetrated by yellow jackets, especially in the late Summer, and Fall. They are after the dead bees, including drones, which tend to accumulate around the entrance, though they will rob hives for honey as well. I have occasionally seen them in my colonies, but they have never posed a real problem. Some beekeepers do report serious raiding and robbing of hives by groups of yellow jackets, the colonies most at risk being those which were already weakened from other causes. Other than maintaining strong hives, I can only suggest yellow jacket traps for large scale or persistent problems. There is a lot of, mostly reliable, information about them available on the internet. A few dozen of the pests can be dealt with most easily by squishing them with a hive tool or even a finger. (Do this last quickly. Take my word for it.) However, I am certain that your single yellow jacket was not a threat to your bees, and should not be of concern to you. A honey bee colony is well prepared to defend against a single insect predator. One common defense is balling: a number of bees surround the invader and flex their wing muscles, just as they do in warming the cluster, and literally kill by overheating. Then there is always stinging. Either way, I'm sure the intruder was quickly dispatched.

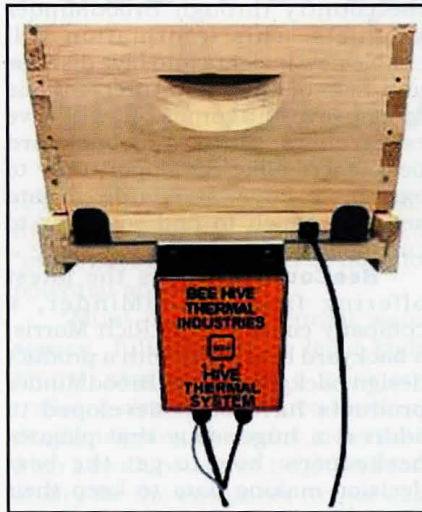
I give you full credit for being a conscientious first year beekeeper. By taking classes, talking to beekeepers around you, asking questions, and noticing what is going on in your hives, you're doing everything right. But give the bees some credit too – they've been doing this for a long time. 🐝

New For The Fall –

Bee Hive Thermal Industries, Breaking News, Saving Honey Bees Organically

An organic and noninvasive solution in targeting and killing *Varroa* Mite infestations, that are killing honey bees, was developed by the joined forces of, Bee Hive Thermal Industries (www.beehivethermalindustries.com) and OVEN Industries (www.ovenind.com), experts in temperature control.

In the fight against today's *Varroa* Mites, beekeepers are often, if not always, resorting to pesticides as the solution. Bees have many other predators and hardships to endure, including weather related issues such as cold temperatures, moisture and diseases. The effect of the Mite on the overall colony is paralyzing to both general activity and honey production within the hive. This revolutionary product is showing positive results in killing and controlling mites and hive bee-



gles, with only a few applications annually. Visit our website: www.beehivethermalindustries.com

Lynn Williams

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Entrepreneurs Needed For Sales & Support

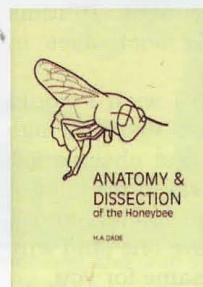
The Small Hive Beetle, Aethina tumida Murray. By Wm. Michael Hood, Prof. Emeritus, Clemson U. Published by Northern Bee Books, www.northernbeebooks.co.uk. ISBN 978-1-912271-07-8. 6½" X 9½", 139 Pgs, color throughout, soft cover. \$15.75.

The basics on this bee hive pest. Mike Hood did much of the ground work on this pest before he retired from Clemson, and has updated much of the information he presented in the first edition. Biology, history, importance, and most importantly (and easily 90% of the book, control. This includes preventing, cultural practices, monitoring, genetic control, mechanical control, physical control, biological control and finally chemical controls. He finishes with the Top 20 Small Hive Beetle Management Recommendations. For some this is a pest to deal with on and ongoing basis, and this is the book for you. Check it out.

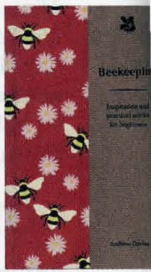
Kim Flottum

Anatomy & Dissection of the honey bee. H. A. Dade. Published by Northern Bee Books and The International Bee Research Association. ISBN 978-0-86098-280-7. 196 pgs., black and white line drawings. Soft cover. Available at bookstores and Amazon, for \$37.

This reprint of the original 1962 classic is still the basis of teaching beekeepers the structure of the honey bee in part 1, and how to dissect one to expose all the components of this amazing insect in part 2. The drawings are accurate and superb and easy to use. Additions include the changes in technology in microscopes up to a point, and techniques in dissecting soft tissues. But if dissection is part of what you want to be doing, this is a good reference, and it includes hundreds of other references for you to check. – Kim Flottum



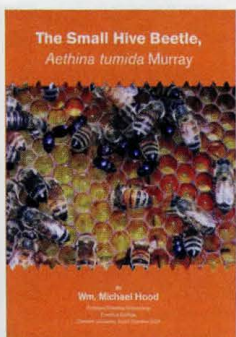
Beekeeping. Inspiration and practical advice for beginners. By Andrew Davies. Published by The National Trust Books, a registered UK Charity. Available at www.pavilion-books.com. ISBN 978-1-909881983 5½" x 7½", 95 pgs, hard cover, black and white and color drawings. \$12.95.



This is one of those little books you give to a friend who is thinking of taking up bees and doesn't have a clue where to start. Yes, eventually a beginner's class, an association and all the rest, but this is a good place to begin. Chapters include life in the hive, equipment needed, bee biology, inspections, managing bees, honey, problems (including *Varroa*), and the beekeeper's year. The chapters are short but to the point, in an easy to read format, with good art, though not photos, to support the information. Got a friend who is thinking of bees? Give them a head start this Winter with this fine little book. – Kim Flottum

VENOM. The secrets of nature's deadliest weapon. By Ronald Jenner and Eivind Undheim. Published by Smithsonian books, www.smithsonianbooks.com. ISBN 978-1-588344454-0. 6¾" X 9". 208 Pgs. Color throughout, soft cover. \$19.95.

VENOM will bring you face to face with some of the most dangerous creatures on the planet, including jellyfish, snakes, and wasps. It explores the difference between venom and poison and how each is used for predation, defense, competition and even communication. Fossil records and DNA traces venom back to its origin. And finally, it examines the relationships between these dangerous creatures and humans. And even using them to create new drugs, treatments, and vaccines. This is a definitive guide to this most deadly way of life. And it is, even with these explanations, still the scariest book I've read. The very last chapter is on honey bee venom and how it works, and how people have made it work for us. Compared to some animals, honey bees pale in comparison. Be very glad. – Kim Flottum



Mini Urban Beehive. A Sustainable Method of beekeeping. Albert Chubak. Published by EcoBeeBox. www.ecobeebox.com. ISBN 978-0-692-91865-4. 8½" X 11", 40 pgs., color throughout. \$24.95.

This isn't a typical book. It's more of an occasional magazine in format, but it has book-like information, and, magazine like articles, and, no advertising. It defies description. There will be more in this series, and they will be similar in size, content and scope, but they will cost much less. If you like the first one, and you will, the rest are easy to get, see below, and should probably be in your collection. Nevertheless, it has a focus and a good discussion on a lot of beekeeping application. The author lets the science to the scientists, and shares from that what it takes to do well with bees. It starts with lots of history of bee hives, and small hives in particular. This hive, named the Mini Urban Beehive, or MUB, is the focus here, after the history and other information. It has information on setting up one of these smaller hives, and using any one of nine techniques to do so, ranging from swarms, packages, splits, joining colonies and more. There are notes from users on how they coped with these hives and bees, what to look for when inspecting a MUB, different configurations of the four-box hive, contacts in every state, good neighbor beekeeping, types of bees, forage, propolis, using the observation windows to best advantage, feeding, using the foundationless frames, the Eco Bee Box Bracket, which holds everything together, wintering – this list goes on and on. Each topic briefly explained in the context of using these small hives. It has a useful glossary at the end. You can find out more about these hives, and this book at www.ecobeebox.com. – Kim Flottum



BeeCounted.org is a map-based public website where beekeepers and the general public can see the extensive data being collected across the country through BroodMinder products. This information will enable new insights into hive distress and help develop new interventions to improve outcomes. It will give researchers, clubs and backyard beekeepers alike the opportunity to examine a large, standardized data set from which to find solutions to common issues.

BeeCounted.org is the latest offering from BroodMinder, a company conceived by Rich Morris, a backyard beekeeper with a product design background. All BroodMinder products have been developed to address a huge issue that plagues beekeepers: how to get the best decision-making data to keep their bees alive.

According to company founder Rich Morris, "Our message is simple: every hive counts and BroodMinder products have been created to give you the reliable, consistent and trackable information you need. **BeeCounted.org** is the next logical step."

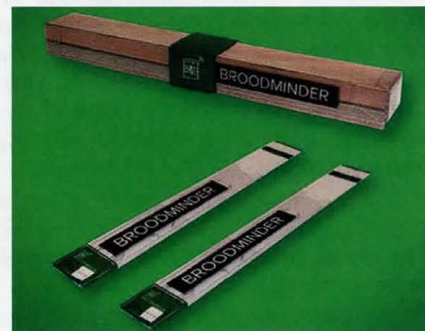
It all started simply when Rich was frustrated at losing bees in the Wisconsin winter. In many Midwestern states, more than 40% of hives were lost in 2016. The real issue is that it is difficult to resolve a problem that has no solid information

from which to draw conclusions.

From his experience working on medical products, Rich knew that the answer was to develop a system that gives you data that can be measured accurately, installed economically and shared widely.

Broodminder has created these devices using Internet of Things (IoT) interconnectivity principles: first, to measure hive temperature and humidity (BroodMinder-TH); second, to measure hive weight (BroodMinder-W). Continual testing all over the United States (with new sites coming on board every month) has enabled them to evolve the devices and their operation. So far, over 5,000 devices have been installed covering more than 1,000 hives with a reachable goal of over 10,000 devices by the end of 2017.

For information, see BroodMinder.com or BeeCounted.org. You can reach Rich Morris at 608.201.6227.



The Observation Hive Handbook. Studying Honey Bees At Home. By Frank Linton. Published by Cornell University Press. ISBN 13 9781501712210. 7" x 10", color, 95 pages. Soft cover. SRP \$24.95. Available from *Bee Culture's* Book Store. www.BeeCulture.com.

The Observation Hive Handbook is a comprehensive text that provides all the necessary information needed for a beekeeper to select an observation hive design, stock it with bees, maintain it, and enjoy the experience that the hive will provide. This is from Jim Tew's blurb on the back of Frank's new book. It sums up nicely what this book does in only 95 pages.

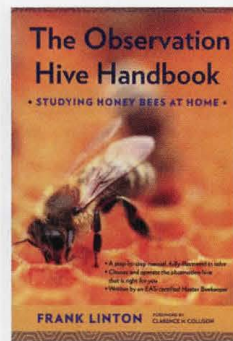
But I'll tell you, I wish I would have had this book 30 years ago when I started my first observation hive. It would have saved me a lot of time and energy and money, and if you don't already have one (and why not?), it will do the same for you.

I've managed observation hives off and on for that long, and I think I've seen nearly everything that can go wrong. Starting with which hive do you buy? That's a good question because every location has different requirements. This book reviews all the commercial models available and will save you a lot of grief down the road.

But it also looks at installation, how to work an observation hive (easier than you think if you know how), general management (like overwintering, feeding, cleaning), keeping a hive in a public place, both permanent and temporary, and fun things you can do with a hive once installed.

If you have plans for, or already have one of these, you need this book. It's worth every penny.

Kim Flottum





Jennifer Berry

Moving Bees

When you have to or want to.

There are many reasons we find ourselves “having to” or “wanting to” move bees. The “have to’s” might occur when a neighbor complains they are bothering the children or the hive is not in the right location. The “want to’s” might be moving bees to fulfill pollination contracts or to take advantage of different nectar flows. Whatever the reason, moving bees, whether a few feet in the backyard or across several thousand miles, is no easy task. Not only is it hard work (hives are heavy), it’s also a bit intimidating to think about picking up a box with hundreds, no thousands of insects that when disturbed or agitated, will become stinging agents of pain. Since this can be a tricky job, let’s talk about how we can move hives without harming the bees or more importantly, ourselves. But Wait!! Stop the Presses!!!! Placing hives in the right spot, the first time, will save a lot of headaches, backaches and work down the road. So, before we ever move in the first hive of bees, let’s consider the following things.

How suitable is the location (soon

to be apiary) where you want to place the bees? Below is my check list of “must haves” and “would be nice” for potential apiary sites.

“Must haves”: perennial water source, full sun (or at least eight hours), easy access for a truck and trailer, a cleared, level area free from deadly tripping obstacles, not visible from a road, house, or neighborhood, ability for the entrances to face east to southeast, bees access to floral sources, high spots not prone to flooding, electric fence if in areas that include cattle, horses, pigs or bears.

“Would be nice”: non-agricultural area (i.e. pesticide use), fenced area with a lockable gate or other security measure, not near swimming pools, a mountain view with a sparkling clear waterfall, gentle cool breezes, slippery slide, snow cone machine.

Most of these make sense, but why don’t I want the hives visible from the road or my neighbor’s house? Once people know you have bees, issues may arise. Here’s what I’ve encountered over the years once the bees were detected. Suddenly, everyone in the area was allergic to bees, or when somebody got stung, it was my bees, or some kids decided it would be fun to knock over the hives, or throw rocks or shoot BBs at them. But the worst was when thieves pulled up in the cover of

darkness and hauled them away. That is why now, I always keep my hives concealed from the public. If the hives can’t be seen, they will never know they’re there, unless, of course, there is a pool nearby.

Honey bees are extremely attracted to swimming pools. If you have a pool, I would highly recommend you get a cover for it, and keep it covered when not in use, especially in the hot, dry summer months. Even if other water sources are close by, they may still prefer your pool. If your neighbor has a pool, feed your bees water before it turns hot, to keep them from exploring other options and hence becoming an annoyance. We start getting calls from frustrated pool owners around June and they run until September. It is always the same complaint; we are unable to use the pool because there are hundreds of bees floating or swarming around. Once, in the past, we had to move bees because they became programmed to this gentleman’s salt water pool. We tried everything but nothing worked. Then he started threatening that he was going to set out poison; that’s when we figured it would be best to find another location for our bees. If possible, research the area first to make sure the location will be suitable so you won’t have to move



Set blocks next to the hive being moved.



Slide one corner over and onto the block.



Next slide the back corner onto the block.



Keep sliding the hive until it now rests on the new blocks.



Using foam to close an entrance during the Winter.



Using hardware cloth to close an entrance during the Summer.

the hives down the road later.

However, even the most well thought out apiary site may end up not being suitable. For example, the entrance may not be facing in the right direction, the hive is too close to the swing set, dog house, clothes line or is getting too much shade from that old oak tree or maybe you just don't like the look of where the hive is located. The arrangement and orientation is breaking up the flow of the landscape or the Feng Shui is now disrupted. That's why it may help to put out a dummy hive, one with no bees, before the bees arrive and place it in several locations first to see if you like the "look" of where they are.

But for now, and for whatever reason, let's move some bees. Ok, say you want to move the bees from the front yard to the backyard. No problem, right? We'll just pick them up and move them. Well, it's not that easy. Unfortunately, when you move bees in this situation, you must move them at least one to two miles away from the initial location. Then

once moved, you must leave them there for several weeks to rewire their brains if you plan to move them back anywhere close to the original location. Why? As bees age and begin to take on foraging tasks, they memorize the location of their hive location by using landmarks (the red barn, big tree, scraggly shrub). As they venture out farther and farther from the hive, they recognize these landmarks in order to make it back home. That's why it is important to move bees a good distance away since they will fly back to the original location while out and about on their foraging trips. Not only will you lose a considerable foraging force, the homeless bees will continue to swarm around the old home site, causing issues.

But let's say, you don't have a place to take them miles away: now what? One method is to just leap frog them through the yard over a few weeks. Each day move them a few feet, and continue this until the hive is resting in its new location. You

can accomplish this by placing the hive onto a tarp and slowly over time, sliding it into the new location. This works great as long as the landscape is pretty level. If this isn't the case, then set up blocks next to and even with the blocks the hive is resting on. Once in place just slide the hive over from one block to the next. Word of caution here, it is always a good idea to strap the hive first before you ever begin to move it. In either example, if the hive is top heavy (or not), it can easily tip over. And a knocked over colony is no fun to deal with.

But, what if the worst-case scenario arises, and you have to move the bees immediately and you still don't have another location to take them to for several weeks? Here's what we recommend. If possible, move them during the evening hours, when all the girls are home. If you move them during the light of day, when temperatures are warm enough to allow the bees to fly, a substantial number of foragers will die. Plus, they will not be very happy to find their



Screened top for added ventilation.



Colony strapped and ready to be moved.



Two person hive lifter, works great!

home has disappeared, and decide to take it out on anything moving in the vicinity: i.e. you. Next, place a dummy hive (a five frame nuc box works great) where the bees were initially located, with one or two frames inside. This will help collect any bees that may have been left behind or can't seem to find their new home. Then once the sun sets, close the entrance, pick up the box, walk over to the mother hive, open the lid and dump the bees inside. You may have to repeat this process for several weeks, but it will help to collect those girls with good memories.

Hopefully, the above emergency will occur during the colder months, when the bees are unable to forage. If bees are trapped inside, for several days to weeks due to cold weather, it helps to scramble their brains enough so they forget where they used to live. Also, moving bees in the light of day, since cold weather keeps the bees from flying, is far less stressful than stuffing, strapping, loading, traversing roads and fields, unloading, placing, and un-stuffing entrances during the darkness of night. That's why Winter to early Spring is an excellent time to move bees since daytime temperatures are still relatively cool, keeping the bees home. One more point. Since bees can be knocked out of the cluster while being moved, let's hope you can wait to relocate them if it is going to be bitterly cold. Chilled bees will be unable to crawl back into the cluster and will die. That is why we try to pick days where night-time temperatures

are in the 30s to 40s and day-time temps are in the 50s. We get to the apiary early in the morning, while temperatures are still cold and close the entrances before the bees start flying. Then, by the time they are loaded and we are driving, the temps have warmed up enough so that if they do hit the bottom board, they will be able to crawl back up. February is a perfect month for us here in Georgia, since there are always days that fall into the above temperature ranges. This is another reason why it is really important to choose your apiary wisely so you are not caught in a bad situation.

Ok, now it's time to get busy moving bees. First off, let's get the moving gear in order. The following is the list we use. There are many different items you can choose, but this is what has helped us over the years safely move bees: trailer and/or bed of a pickup, smoker, pine straw, lighter, hive tools, moving straps, rope, duct tape, bungee cords, hive lifter, hand truck, material to stuff the entrance, first aid kit, fire extinguisher, water bucket, tool box, nails, flashlights, and charged up cell phones. Hopefully, some of these items will never be used but it is always better to be safe than sorry.

Now that the gear is loaded, take a deep breath and let's get busy. The first thing we do, whether cold or hot, light or dark, is smoke the entrances. This will cause the bees to go inside if any are lingering on the front porch. Then we close the entrances, paying close attention to

any holes or cracks at the ends, so no bees can escape (this is where duct tape comes in handy). During the Winter months, we use foam that completely closes off the entrance. In the warmer months, we use a screening material or hardware cloth to close the entrance and screen tops for ventilation. Closing colonies during warm months can be risky, so be careful. If the bees can't cool themselves, they will quickly overheat, and die. That is why you see hundreds of bees hanging out on the front porch when temperatures get hot. Too many bodies inside, too much heat. If moving during warm temperatures (above 70°) make sure to provide plenty of ventilation as mentioned above and please, don't keep them closed for too long. If you have to traverse long distances in hot weather, you may want to consider using a moving net which several of the bee supply companies carry. It's just that, a net that covers the entire hive so you don't have to close the entrance. See, so many options, so little time.

After the entrances are securely closed, we strap the colonies. I prefer using moving straps as opposed to hive staples. I've had issues in the past with hive staples coming loose over time, allowing hive bodies to slip apart, and releasing bees. Plus, hive staples leave holes in the wooden ware. However, everyone has a method they prefer. For me, strapping colonies is easy and not too expensive. The main issue here is to make sure the straps are cinched



The ole handy hand truck to the rescue.



Strapping the colonies into the trailer.

down tight and the loose pieces are tied securely so that they're not flapping around or getting tangled.

After all the colonies are strapped, it's time to move them into the bed of the truck or onto a trailer. Two person hive lifters work nice for lighter colonies (Photo #9), or adjusting colonies once loaded but for the larger double-deeped, or triple-supered ones, a hand truck comes in "handy". Word of caution here; if your bottom boards are screened, you need to make sure the tongue of the hand truck is long enough to clear them, otherwise, you may puncture your screen.

Once colonies are loaded it is very important that they are strapped to the trailer or the truck bed. Insert motto again: "Better to be safe than sorry!" Swerving to miss a critter in the middle of the road or having to stop suddenly to avoid crashing into the vehicle that just pulled out in front of you, can wreak havoc on unsecured hives. Sudden changes in direction or speed can result in hives tipping over and breaking apart, which is not a good thing! Now it's time to take the girls to their new

home. Try not to beat any speed records while pretending to be Mario Andretti, just take your time.

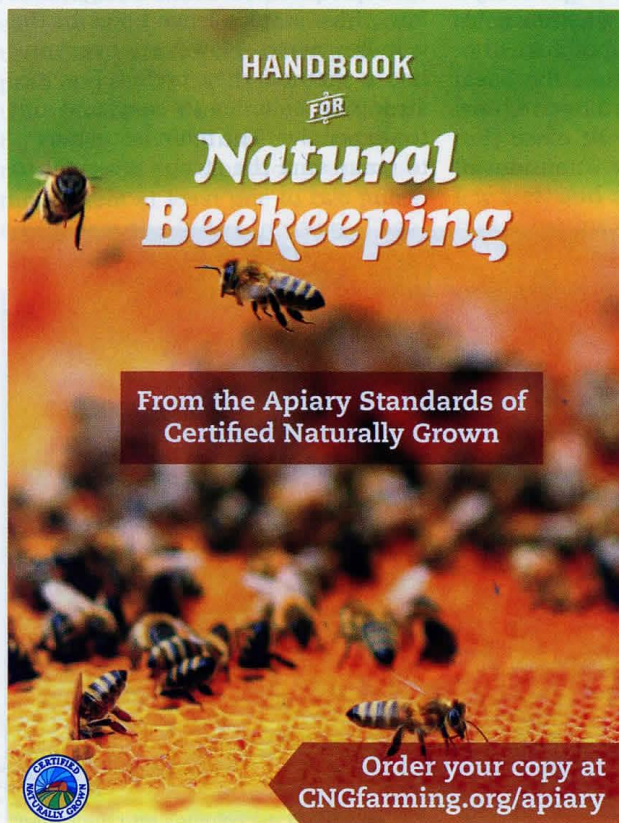
Unloading can be hard on the ole back, but I always breathe a sigh of relief once we and the girls have made it unscathed, and safely to our destination. Also, unloading colonies, especially heavy ones, can be tricky, so it's always a good idea to have at least two people while moving bees. Slowly take bees off the trailer or back of the truck, being careful of top heavy colonies that tend to tip over.

Once the colonies are in place, it's time to put on a veil, remove the straps first and then unplug entrances. Even if it is cold outside, I HIGHLY recommend you wear a veil, at least. I've unstrapped and unscreened plenty of colonies over the years, and have learned to be ready to take off running, if need be. Our girls do not like being screened, loaded, unloaded and bounced down roads, therefore, they will come out and let you know how displeased they are, so be prepared; even a puff of smoke can help. Once they are successfully placed, unstrapped, and unscreened, check to make sure

they are stable in their new location. After which, it is time to pack up the equipment, jump in the truck and head home for a warm cup of tea (or a cold cocktail, whichever you prefer).

There are thousands of reasons why one "wants to" or "has to" move bees, but hopefully, it won't be under dire conditions. That is why it's so important to pay close attention to where you put your bees in the first place, since having to move them may not be very pleasant. And for those of you moving bees for the first time, here's the final pointer. First and foremost, take your time!!!! Never, never, never get into a hurry while moving bees. Moving bees is not easy and when something goes wrong, it can be bad, really bad, dangerous even. So please, take your time, be prepared and always expect the unexpected. And, bring extra of everything and then some! Or better yet, have someone who's moved bees before, assist you. Just make sure you have a cold beer and an awesome grilled something waiting for them when it's all said and done.


Be good to you and your bees! 🐝



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Dear Queen Buyer –

Thank you for buying a queen from our small queen-rearing operation. We appreciate your support and loyalty. Over the past few years we have purchased scientifically selected, instrumentally inseminated breeder queens that possess genetically controlled traits for mite tolerance. We have also sought out local breeder colonies that have survived our strong and long local winters and produced large honey crops. We have attempted to improve our local drone population by producing abundant daughter queens that carry these and other desirable traits. Unfortunately, a few swarms have issued from our colonies, but this also has a positive benefit on the drone population for several miles in all directions.

Please take a few moments to review this page to understand the importance of properly caring for your queens both before you put the queen into a colony and after the queen has been introduced into a hive of bees.

#1: Remember, Your Queen is a Living Animal

Think of your queen bees as a pet dog, cat or chicken. Protect them in transit and while introducing them into a new home. Queen bees of all ages (virgin, newly mated or several years old) require frequent contact with worker bees and must receive food and water. Your queen should have worker bees either in the cage with her or surrounding her in a packaging container designed for queen shipment. Small queen shipments usually contain worker bees (which are carefully removed from the brood frames while taking a drink of honey from cells on the brood frame).

Queens also need water during transit. This may be a drop of water put directly on the queen cage, or water obtained from the worker bees attending her. This will prevent her dehydration, a common cause of queen death during shipment and introduction. When the temperature is above 75°F, dehydration can occur in a matter of an hour when queens are put into exposed locations.

While sealed queen cells do not require feeding, they benefit from a stable environment with uniform temperature. Either carry sealed queen cells in an incubator or with worker bees stabilize cell temperatures.

#2: Never Let Your Queen to Become Overheated or Chilled

It is very easy to overheat and dehydrate a queen in an auto or truck cab. Do not leave the queen in the sun or inside the cab when you go into a restaurant, even for a few minutes. Avoid letting the queen dehydrate and overheat.

If the weather is cold (less than 50°F), put the queen cages into a pocket of your coat or jacket while you run errands or check bees. Don't leave the cages on the top of the next hive for more than eight seconds (yes, I just made that up, but I think it makes my point).

If you plan to carry queens around all day, perhaps while you visit several bee yards, make up a queen bank consisting of a frame of brood and nurse bees. Put this

into a nucleus box (screened so they cannot fly out in the car or truck). Add a second frame containing some honey and more bees. Put the queens in a queen-holding frame that is positioned between the two frames. The bees do the best job of keeping the queens alive through feeding and hydration.

If you have less than a dozen queens, make up a box to carry queens with a tight fitting lid, like a cigar box. Put an activated hand warmer or two in the bottom of the box and cover it with a small dishtowel. Put the queens in their cages on top of the towel. Or leave out the hand warmers and shake a few hundred worker bees into the box. Put a sponge filled with sugar syrup for the bees to feed and hydrate. I've kept queens like this for several days when the weather is warm, and I always have a safe place for my queens as I work colonies.

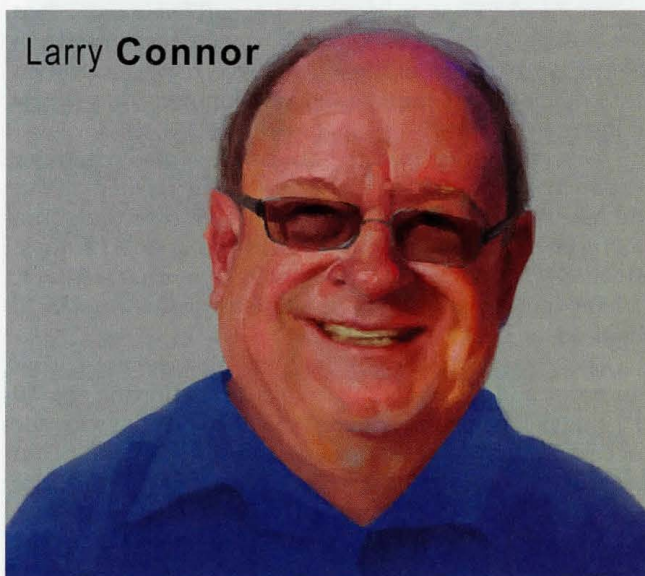
#3: Check the Queen Candy

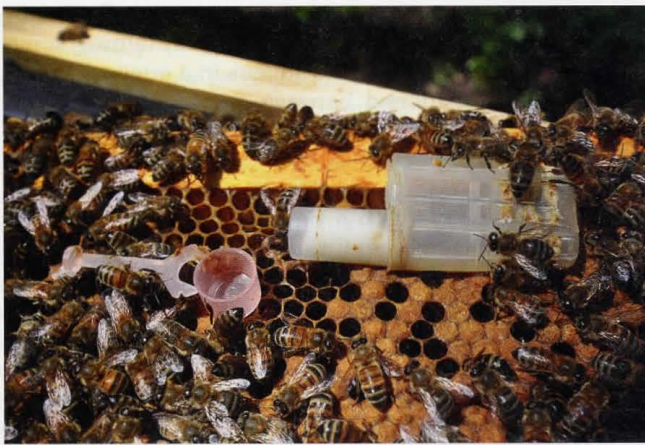
When we put queen candy in the shipping cage (the white material), we take care that it is not too moist. Unfortunately, queen candy takes up moisture, and the surface may become too liquid and the queen may become stuck to the candy. If this should happen, immediately remove the queen and put her into a cage with dry queen sugar or with no sugar mixture at all. Add young nurse bees and allow them to clean her body of all sugar residue before introduction of the queen into a colony.

#4: Colonies Set Up To Accept Queens

NEVER introduce queens into a colony that has another laying queen, might have another laying queen or has laying worker bees producing eggs. The workers most certainly will kill your new queen and we cannot replace queens abused in this manner. If you have any question about the queen-status of a colony, it is better to wait and see what the colony does (by producing a new laying queen as evidenced by brood), or by taking steps to stimulate the laying worker bees from producing eggs and conflicting pheromone signals.

Just because you have inspected a colony and did not see a queen does not mean the colony is queenless. New queens – virgin queens – are smaller than laying





The plastic JZ's-BZ's queen cage may be used for both shipping and introduction. Place the queen between two frames of brood with the plastic cap on the tip of the candy release. Return on the third day and the queen will be introduced to the bees, her pheromone spread throughout the hive and the bees will be familiar with her odor. Note how the bees have added propolis to her cage.

queens and are harder to see. They also seem to hide under worker bees as they search the comb looking for sister queen cells and queens to destroy. This behavior makes them very difficult to find a queen in even a colony of moderate strength. Keep in mind that you may have inspected the colony when the queen is making an orientation, cleansing and mating flight.

With the growing use of darker-race queens, it is difficult to see the queens against dark combs. Mark these queens for easier queen finding in the future.

During normal queen replacement, the bees will start to polish cells just before a new queen will start to lay eggs. Areas of the comb that had previously been filled with pollen and honey will be empty and the bottoms of the cells shiny, ready for the queen.

#5: Timing is Everything

Consult your records against the calendar to see what options the bees may be expressing in queen rearing. Remember it takes 16 days for a queen to complete her metamorphosis from egg to larvae, but if a colony already has brood in production, the bees will select larvae one to three days of age (after the egg hatches) to use to raise a queen. That means that that colony has suddenly lost a queen, perhaps by a beekeeper error, and the queen will require between 10 to 12 days to complete her development into a new young queen.

But don't forget that the queen must also reach her sexual maturity and mate with drones located about one mile from the hive. I feel that the average time from emergence to egg-laying for a queen is about 12 days, but there can be delays due to cold or stormy weather, and the queen may not mate and start laying eggs until she is 14 to 16 days old.

This means that when you look at a calendar, that you must add these numbers together, allowing the 10 to 12 days for metamorphosis and 14 to 16 days for the queen to reach maturity, mate and begin laying. That means that it will take between 24 and 28 days before you can expect to see eggs. If you have trouble seeing eggs and larvae, you will need to wait up to another nine days before there is sealed brood, putting us at 33 to

37 days after the colony was last worked. (The visually-challenged beekeeper should obtain a magnifying lens and a high-powered LED flashlight to see the eggs and newly hatched larvae at the bottom of the cells).

All this shows how easy it is for a queen-right colony to be examined by an inexperienced beekeeper who rules the hive queenless and introduces a new queen, only to have her lost or killed by the queen in development.

Here is a chart of time requirements for various hive functions regarding queen production in European bee stocks. African stocks develop faster, a fact that should be kept in mind wherever Africanized honey bees are found, such as Florida, Texas, Arizona, New Mexico and parts of California.

Biological Event	Days for the event to occur (average)
Worker egg to queen emergence	16
Worker egg to worker emergence	21
Drone egg to drone emergence	24
Worker egg to queen mating	28 (16 days for queen, 12 for mating)
Worker egg to brood (eggs)	31 (16 days for queen, 12 for mating, three for egg development)
Worker egg to emergence of a new queen's brood	52 (16 days for queen, 12 for mating, three for egg development and 21 for new brood development)
Development of Drone Layers	28 (21 for all brood to emerge and seven without brood)
Minimum days for a ripe queen cell to be left in a hive, the queen emerge, mate and lay	15 (12 for mating and three for laying some brood (proof of laying, nothing more))
Recommended days for a ripe queen cell to be left in a hive, the queen emerge, mate and lay	22 days (12 for mating and 10 to allow the queen to fill all cells with eggs and mature physiologically).

#6: Very Common Problems

Queen Failure in Package Bees – Because the queen placed into a package of bees is not the mother of the bees in the package, there is a strong sense of queen replacement by these new colonies. Nucleus colonies, on the other hand, usually have had the queen in place for three to five weeks before they are delivered to the customer, and the bees and workers are better adjusted to each other.

Package bees frequently experience queen introduction failure. This is when the worker bees never accept the new queen, and the colony is hopelessly queenless. Many queen shippers send additional queens with package bee shipments to cover such losses, but most new beekeepers don't know enough to recognize that there is no queen in the hive (they are still trying to tell sealed brood from sealed honey). If the beekeeper has access to sealed brood, she should obtain a frame of brood (one with a mixture of ages of bees, but ideally with an area of eggs and small larvae so the bees in the package can start to raise their own queen). If this is not possible, combine the bees in the queenless package with a queen-right colony, perhaps another package with a well-laying and accepted queen, so the worker bees are not lost.

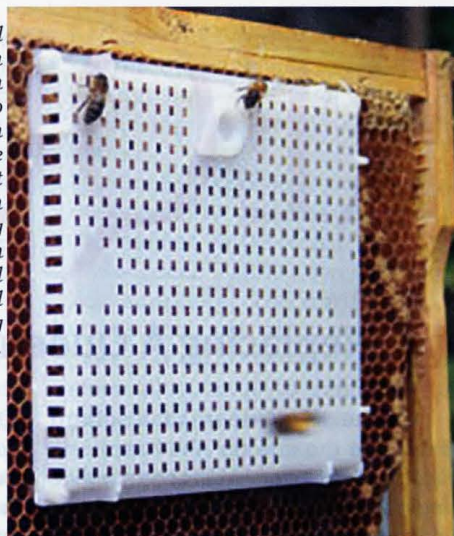
Early Queen Failure in Package Colonies – Too often, the package queen starts to lay eggs but stops, or is killed and replaced by the worker bees within a month or so of the package introduction. If there are queen cells in production in such a hive, the bees will eventually have about a 75% chance of producing a new queen, and the package colony is saved. This is when the introduction of a mated and laying queen is ideal for the benefit and overall outcome of the colony. The time needed to get a new queen laying is shortened by many weeks.

#7: Best Queen Introduction Methods

We have very good luck placing a queen into a colony confined in the shipping cage with a plastic cap or cork firmly in place, preventing the queen's release. We leave the queen like this for three or more days and then return to remove the cap or cork, and let the bees consume the candy to liberate the queen. The three days allow the queen to produce her odor – her pheromones – and provides a time for the queen to be fed by the worker bees. If there is something wrong with the queen, and the beekeeper returns after three days and finds her dead in the cage, then the beekeeper knows that something must be done, rather than wasting days and weeks trying to determine if there is a queen present or not. When it comes to bee management, knowing bad news almost always wins over not knowing anything.


We have used push-in cages for queen introduction and will use them when there is a valuable queen to be introduced. The key is either place the cage and queen

Plastic and metal queen introduction cages (also called push-in cages) allow the beekeeper to put a queen over an area of emerging brood (or with nurse bees) and stimulate food exchange during introduction.



over emerging worker brood or add worker bees to the cage prior to the introduction.

Queen liberation in less than three days often leads to early queen death. New queens will be suffocated by balling (hundreds of workers pile on her body and overheat her until she dies), or she may be stung. Like a change in human politics, a new queen is in a delicate position until she is able to prove herself as an egg-laying, pheromone-producing machine worthy of her subjects' trust and support.

I hope this helps you understand some of the challenges of introducing a new queen into a colony and just how complicated queen rearing can be. 

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REQUEENING

Morris Ostrofsky

Replacing A Queen Isn't Difficult, But Requires Some Care

Unlike the Queen of England honey bee queens do not have long reigns. One or two years is the average time a queen stays on the throne. Strong, productive colonies are the beekeeper's goal. After roughly a year (sometimes two) the queen's job performance does not support this goal. This means the beekeeper must initiate multiple reign changes.

There are several reasons for the reign changes: poor performance, defensive disposition, improvement of *Varroa* resistance, reduced susceptibility to disease, and reduction of swarming tendency. While a beekeeper can let the bees produce their own new queen, the consequence is a delay of brood production for one month. If this takes place just prior to the main nectar flow, waiting for nature to take its course may not be the best option. When a beekeeper replaces an old queen with a new one, it is referred to as requeening.

In most cases the beekeeper can decide when the reign change is going to take place. You can requeen most times during the year except Winter in the northern states. The easiest time to requeen is Spring. The reason is when there is a nectar flow in progress the bees are in a good mood. The colony is also smaller in the Spring than later in the year making it easier to locate the old queen.

Queen availability is another plus for spring requeening. Additionally requeening in Spring means you have time to try again should the first attempt fail.

Other than a larger population Summer requeening is similar to Spring. Requeening in Fall is more of a challenge; you have to find the old queen in a larger population. Getting the bees to accept a new queen during this time is challenging due to less food coming into the colony. There are, however, advantages to requeening in Fall; commercially produced queens are more available, often times better mated, and there is not the brood interruption that occurs in Spring.

In an emergency situation, when the queen is missing or dead, both the bees and the beekeeper must take immediate action. If the beekeeper determines that the colony is queenless and there is still brood in the hive, it is still possible to introduce a new queen. Purchasing and introducing a new queen is the most expedient way to solve this situation.

If a new queen is not introduced before all the existing brood emerges, some of the workers will begin laying unfertilized eggs. Laying workers are not receptive to being requeened and without a new queen the colony starts a downhill spiral. Small drones will

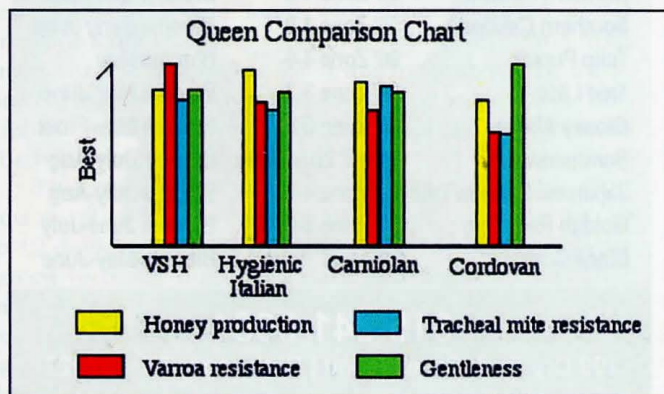
emerge from the unfertilized eggs laid by the laying workers. Although the drones are fertile, this is the last genetic gasp of breath for the colony. No new workers are produced in this situation. The easiest and most humane way to solve this problem is to add the colony with the laying workers to another queenright colony.

So how do you select a successor? When selecting a new queen you have many choices. High priority characteristics should include *Varroa* resistance, gentleness, and productivity. This chart provides a comparison of the most desirable characteristics among the various queens. You have to decide what works well for you in your area and select accordingly.

The ads in this and past issues of this magazine are a source for locating queen producers. Look for sources that offer queens with desirable characteristics you seek. Locally produced queens are adapted to your area and are a better choice than queens from a different climate. Talk to other beekeepers to find out what has worked for them. Don't forget to request that your new queen be marked with the current year's color. You will be very grateful later that you did this.

Raising your own queens can be rewarding as well as possibly producing a higher quality queen than one you purchase. As *BEEKeeping* editor, Kim Flottum, has written, "The difference between queens you buy and queens you raise yourself is almost always the difference between light and lightning." Bottom line to requeen you need a new queen in hand whether you purchase or raise her yourself.

If you purchase the queen, she will be shipped to you in a cage. There are a variety of queen cages. Regardless of the type of shipping cage used, they all have a screen



Tests made by Glenn Apiaries



through which the existing colony bees care for the new queen; the screen is also a source of ventilation. The queen should be placed into the hive shortly after you receive her. When you get her, give her a drop of water to keep her hydrated. Do not use sugar water or honey. It will get her sticky and possibly plug her breathing apparatus. Keep her at room temperature and away from drafts and in a dark environment. If you cannot introduce on the day you receive her, continue to give her a drop of water every few hours and try to move her to her new home as soon as possible.

Before going through the steps to install a new queen, feeding needs to be addressed. Feeding the bees sugar syrup while requeening, simulates a nectar flow. A simulated nectar flow in progress makes it more likely that the bees will accept the new queen. Even during an actual nectar flow you need to feed the colony. You do this because the nectar flow could stop at any time and you want to keep the bees in a receptive mood.

My preference for feeding is to use an inverted Mason jar with a lid perforated with 1/16th inch holes. The jar needs to be centered and placed on top of a hole in an inner cover or



one drilled into an outer cover. It is important to put an empty box over the feeder; this protects the syrup from sunlight and excessive heating. Because you do not want to open the hive unnecessarily during this sensitive time, using an external feeder is helpful. Note the entrance reducer in the photo. This is used to prevent robbing.

Before introducing a new queen, the old queen must be replaced. That means you must find the old queen. The method I recommend is one I learned from Harry Vanderpool, commercial bee keeper and current president of the Oregon State Beekeeper's Association. He gives credit to Kenny Williams, recently retired commercial beekeeper, as his source for this technique. This is his recommendation:

The following steps apply to a one or two brood box hive. In the case of a two brood box hive, you must first separate the two boxes before proceeding. Note: use little or no smoke while looking for the old queen. Too much smoke disrupts the queen's normal behavior of "hanging out" where there are polished, empty cells and freshly laid eggs. When you smoke her, she leaves the nursery and you have lost your advantage of knowing where she usually is. She could now be any place making your search more challenging.

1. Take the outer cover off, invert it and place it on a stable surface; i.e. hive stand. If there is an inner cover, remove and set it aside. Place the top box on top of the inverted cover. Position yourself so that the sun is at your back and shining into the space between the frames.
2. Working in the bottom box, pull out the first frame closest to you. Don't take the time to look at it; just hold on to it as you look into the box at the next frame. You are looking to see if the queen is on the front of that frame. If the queen is there, she should stand out due to her larger thorax and abdomen. If you don't see her, look at the frame in your hand checking both sides before leaning it on the side of the hive or placing it in an empty nuc box.
3. Remove the second frame. Hold on to it without examining it and look at the face of the next frame in the box. Then look at the frame in your hand. After examining it, return it

- to the box. Continue this process.
 4. If the queen is not found in the bottom box, continue searching in the top box as you did in the bottom.
 5. Continue to work your way through the hive until you find the queen. The easiest way to capture her is to use a Queen Catcher available from bee suppliers. The spring action snaps the cage shut around the queen and the worker bees sized slots allow them to come and go while keeping the queen inside.
- If possible make up a small nuc with two or three frames of bees, honey and pollen and put the old queen there. It is always best to have an emergency replacement in case your queen supplier can't replace her quickly.

Now the fun part; installing the new queen. Among the common shipping cages are the three-hole Benton cage and the JZ BZ cage. The queens in these cages come with attendants. It is not necessary to release them before placing the cage into the hive. The Benton cage has two ends: one has a small cork and the other a candy plug covered with a cork. Remove the cork that covers the candy. The JZ BZ cage has one open end where the candy is located. It sometimes comes covered with a plastic cap. The candy plug is a time release mechanism. The bees chew on it, taking a few days, during which time they all "become friends". When the workers remove the last of the candy, the queen is free to walk out. Do not poke the candy plug. It will ruin the time release mechanism.

To increase the likelihood of her acceptance, I recommend wrapping a single layer of cheap masking tape minimally around the candy plug; preferably around the entire cage. Covering the candy plug provides additional time for the queen and workers to get acquainted. Do not cover the screen with the tape.

Place the queen cage slightly off center of the brood area on the frame. This keeps her from being drowned by dripping syrup from your centered feeder. The cage should be on a 45 degree angle with the candy end up. The frames on either side of it can be squeezed around the cage to keep it in place. An alternate way to hold the cage in place is a rubber band. Note: the screen must not be blocked.

After five days, check on the



queen's status. One of two things will have taken place: she has been accepted or rejected. The majority of the time the queen will be accepted. On occasion she is not. If the queen is still in her cage and the workers appear to form a tight ball around the cage (referred to as balling), this indicates lack of acceptance. Non acceptance usually means there is an existing queen or queen cells in the hive. The workers will not accept a new queen under these conditions. The existing queen or queen cell(s) have to be removed in order to successfully introduce a new queen.

The more common situation is that the queen is accepted. She will either be released into the colony within the five days or she will

still be in her cage. If she has been released, remove the empty cage and don't bother the bees for two weeks. Sometimes with smaller populations it may take longer to release the queen. After five days, if she is still in the cage and the workers are feeding her, you can speed her release by removing the tape and poking a hole in the candy. Then put the cage back into the hive. Give it two to three days and check again. In most cases the queen will have been released. If she is still in the cage and alive, remove the remaining candy and quickly put the cage back into the hive before she can walk out. The reason the cage

is returned to the hive is you want the queen to walk out of it in the darkness of the hive. Don't bother the bees for two weeks. At that time you can remove the cage.

Waiting two weeks to look for the first brood is the hardest part of requeening. When you do open the hive, you should see brood. This is a sure sign that the bees have accepted their new queen. A young, new queen is the most effective way to raise strong and productive colonies. In your beekeeping career you will have the opportunity to participate in the successful coronation of many queens. 🐝




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Installing A Queen



Queen and attendants in mailing cage

Jim Thompson

What seems to be a rather routine procedure may not be. At various times a beekeeper finds that the queen needs to be replaced. Different reasons for this replacement might be: the queen is old or failing, the attitude of the hive is not what you would like it to be, the hive is non-productive, the hive needs a break in the brood cycle to clear up disease, you may want to retard the hive from swarming, or there is no queen in the hive.

When introducing a queen to a hive, there are the different techniques or procedures that can be used: introduce a mated queen, introduce a virgin queen, introduce a queen cell, or encourage the bees to raise their own queen. The percentage of acceptance by the bees in the installation of a laying queen is rather high. The acceptance of a virgin queen by the bees in a hive is the range of 50 to 60%. While putting in queen cells or allowing the bees to raise their own queen may also have a high percentage rate of acceptance, there are further conditions that the hive must have in place. When raising a queen from a cell more time is required for the queen to develop, get mated, and start laying eggs. The amount of time could be critical if the nectar flow is missed or the drones have been eliminated from the other hives, or the weather is not conducive to bee flight.

There are many devices that beekeepers have invented for queen introduction and some of the situations within a hive make queen

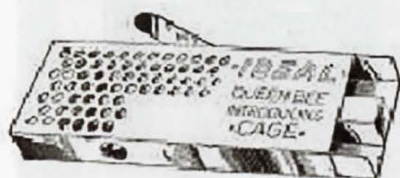
introduction difficult. It also seems that every beekeeper has their own way of doing things and their way seems to be the only way to do things. So when you talk to other beekeepers, the more confused you will become. When you add all of these factors, the "simple task of introducing a queen" is not so simple.

If you decide that you are going to requeen a hive by installing a laying queen, the normal procedure is to order a queen. A day before you install her, you either catch the old queen and put her somewhere other than in that apiary or kill her. You need to be assured that the hive is queenless. There is some debate on whether you leave the body of the old queen in the hive or remove it if your choice was to kill her. One thought is to have the bees carry out the body of the old queen so they are absolutely sure that they are queenless. Another thought is that even a dead queen could emit a residual amount of

the queen substance pheromone indicating that they are queen right. Perhaps in your efforts to kill the queen, you only stun her or injure her and thus the situation is worse by having a wounded queen in the hive emitting pheromones when you believed that she was dead. If your choice was to remove the old queen and move her to another yard, you will have the advantage of having a queen in case something goes wrong. However she may still have the problem that caused you to want her replaced.

If you wait too long before introducing the new queen and the hive is queenless for a while, there is the possibility that a worker(s) will assume the duties of laying eggs. This is known as a **laying worker(s)** and all these eggs will develop into drones.

Laying workers are very difficult to find as they look like all of the other workers and the hive has accepted them as queenlike. A tell tale sign of laying workers, is that the eggs in the cells are not well centered and in many cells there are multiple eggs. Some say that solving a laying worker situation can be solved by *multiple* attempts in introducing queens, while others say that the hive is hopeless and the hive should be combined with a strong queen right hive. The reason that the combining method



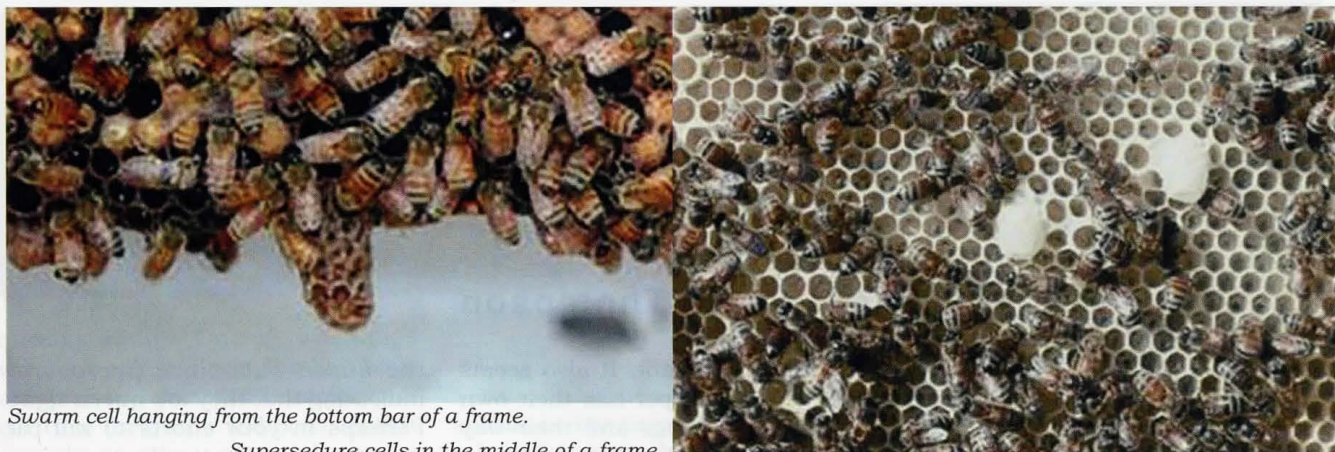
Ideal Introduction Queen Cage



Plastic Introduction Cage



Queen Mailing Cage



Swarm cell hanging from the bottom bar of a frame.

Supersedure cells in the middle of a frame.

works is that the pheromone of the laying queen is stronger and usually the hive has a larger population.

A queen that is failing sometimes will lay only eggs that will develop into drones, thus she is called a **drone layer**. Because of her appearance, she can be identified easily and caught so the situation can be corrected by requeening.

By requeening every year you generally prevent having a failing queen for whatever reason. A new or young queen tends not to swarm as much as an older queen and usually the disposition of the hive is calmer.

Many beekeepers believe that the bees are a better judge on the condition of the queen, and if she needs to be replaced they will develop supersedure cells. You can tell the difference between supersedure cells and swarm cells usually by the position that the cell occupies on the frame. A supersedure cell can be anywhere on the frame as it was built out of necessity, but usually it is in the middle part of the frame. A swarm cell usually is on the bottom part of a frame and usually there are several cells. You should also be aware that many times bees will build queen cell cups on the frames and it is worth inspecting to see if the cup is polished and being primed with royal jelly or already have eggs present.

A general rule is that you do not destroy supersedure cells. If you

start destroying swarm cells in hopes of preventing swarming, you may end up with a hive that swarms and leaves your hive queenless. If you see the swarm cells, the bees have made the decision to swarm and there is little that you can do to prevent it. You can split the hive, and use the cells to queen the split(s), while keeping, or replacing the queen in the original hive.

It is also handy to know how to read what is happening to the queen cells in a hive. When you see open queen cells, you should look at the bottom of the cell to see if the queen emerged from the cell or was killed. An emerging queen chews the bottom of the cell open so the bottom of the cell will swing open like a trap door. A queen that has been killed in her cell will have evidence where the cell was opened from the side of the cell.

More controversy exists as to how long a queen may live and store semen. Most of the books indicate that queens living under normal conditions will last approximately two years. As proof, the books point out that when a hive swarms, the swarm begins to make supersedure cells in the newly established hive. However if a beekeeper can keep the hive from swarming, there will be days where

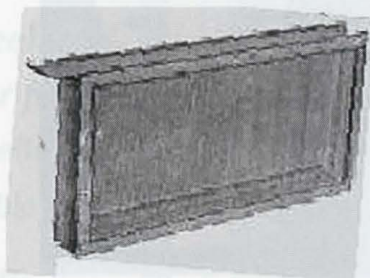
the queen cannot be found in the hive and there are no eggs but a few days later everything is back to normal and a queen is present. This indicates that the original queen took another mating flight or was superseded.

You also should know the usual timing procedure of a swarm. The bees around the queen decide when the hive should swarm and build many queen cells and start reducing the diet of the queen. The queen stops laying eggs and shrinks in size so she can fly. When the swarm issues, we call it the primary swarm and because it may have the old queen and the bees usually settle at a low location. Scout bees are already looking for a new home and when decided which of possibly several locations is best they go directly there.

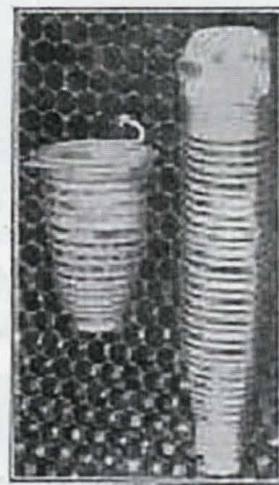
If the weather is good, a queen will emerge from a cell in the original hive and take her maiden flight about three days after the primary swarm



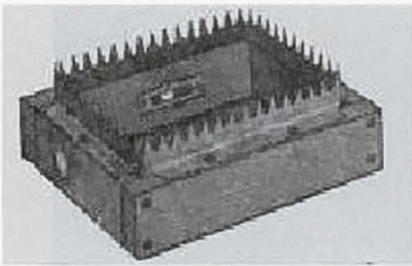
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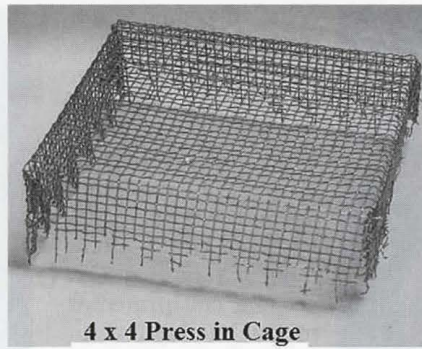
issued. Sometimes the timing gets off and another swarm issues from the hive and this is called a secondary swarm. Because the old queen has gone in the previous swarm, the queen or queens in this swarm are virgin queens.

I have seen a secondary swarm with seven queens and was busy catching them and putting them in mailing cages. A secondary swarm usually settles on higher objects and once hived takes longer to start up as there is the decision which queen will be dominant and the mating flight or flights will be done after the hive is established. If too many secondary swarms issue from the same hive, there is the possibility that the hive can go queenless as there aren't eggs or larvae that are of the right age to make a queen.

A very successful method in getting ready for the introduction of a new queen is to build a Nuc (nucleus hive) by removing the frame that the queen is on along with a frame



A five-frame nuc.



4 x 4 Press in Cage

of honey and a frame of brood with the hanging bees and take them to a new location. I mentioned three frames but you could have more, it just depends upon the size of the Nuc, most beekeepers prefer five frames. You may take frames from other hives and put into the Nuc as long as you do not include the hanging bees.

Essentially what you have done is remove the old queen from the original hive in preparation for the introduction of a new queen and provide the old queen an opportunity to build up a small hive while also giving you a backup queen in case something goes wrong with the original hive.

Sometimes this is considered a method of swarm control. In the old hive you have the essentials for queen rearing such as larva of the correct age, plenty of bees to provide the bees with heat and hive duties, and plenty of food. In case the introduction of the new queen does not work, they could raise their own queen. If in the case you didn't purchase a queen, you could use this technique as the hive may develop supersedure cells. You must take the nuc to a new location as they will return to their original hives if left in the same yard. As the nuc grows, it may be transferred to a regular hive.

If you purchase a queen, normally that queen has been mated and has been laying eggs. She is sent to you in a mailing cage which over time has had many configurations. The mailing cage can be made of wood with two or three "holes", metal, or plastic. There will be room for the queen and a few attendants,



Miller Queen Catcher and Introduction Cage



Queen introduction frame

ventilation, and a compartment that holds queen candy. There usually are two outlets in the cage so that the queen may be released directly or released after the candy has been eaten.

Queen candy is usually made of a mixture of finely ground confectioner's sugar and high fructose corn syrup. If you were making a queen candy for your use, several beekeepers have used a mixture of honey and powdered sugar. Some people have claimed that using honey in the mixture may contain pathogens. Getting the candy to the correct consistency is very important as if it is too thin, it will not stay in the correct location of the cage and if it is too hard, the bees will have trouble eating it. The hardness of the candy has led to the idea that you should poke a hole through the candy with a nail.

Some beekeepers have used marshmallows instead of the conventional candy to get away from the consistency problem. The idea of using the candy is to provide the queen with food during her transportation to her new home and to provide a slow or timed release of the queen. The timed release is very important as the bees in the hive need time to accept the queen. However, there are still a bunch of questions. Where and how do you place the cage? Do you remove and replace the workers? Do you direct release the queen? Do you treat the hive for mites and other diseases while introducing the queen? Many of the answers to these questions depend upon your own experiences, training, and schedule.

If you are putting a queen in an apiary that is miles away from your home, you may wish to remove the "cork" from the candy end because it may be some time until you return to the yard. If the hive that is receiving the new queen is in your front yard, you may wish to keep the cage corked until you choose to release the queen at a later date.

Many years ago, it took nearly a week for a package of bees to be delivered in the mail, allowing the bees' time to become accustomed to the queen. Thus beekeepers got in the

habit of releasing the queen directly into the beehive. Today, some beekeepers are receiving packages that were shaken within the last 24 hours, so there needs to be some time where the queen is kept caged.

When you place the mailing or introduction cage in the hive, care must be given to not put the cage directly underneath where a top feeder is located.

This is just a precaution in case the feeder malfunctions and drowns the queen in her cage.

There is a lot of discussion about how to place the cage in between the frames. Generally the candy end of the cage is higher than where the queen is located. The reasoning for this is that if an attendant bee dies and covers the candy, she traps the bees in the cage. Thus some suggest removing the attendant bees, while others suggest that the attendant bees should be replaced by bees from the colony where the queen is being introduced. Some queens are sent in bulk packaging meaning that several queens are in their own mailing cages without attendants. The balance of the bulk package is filled with loose bees to feed the various queens in the package.

I would suggest that no chemicals be used to treat diseases and mites during the period of time that a queen is being introduced as it could interfere with the pheromones of the queen. Once the queen is released and laying eggs, the chemicals for mite control could be started.

Some beekeepers advocate that the laying queen should be confined to a certain frame or within a special area. It seems that once a queen is laying eggs in a hive, her acceptance is very close to 100%. Other reasons for confining a queen is to be able to determine the age of larva in queen grafting situations or to cause a break in the brood cycle without destroying a queen.

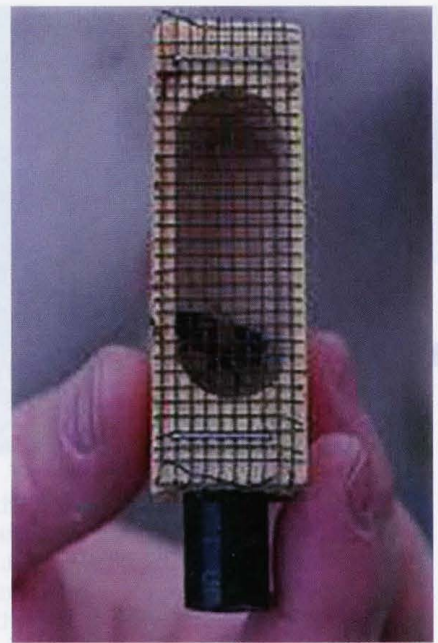
In making nucs and splits you may transfer frames that have queen



cells on them. Other times you can cut the cells out of a frame for transfer or have the queen cells that have been developed from a specially designed queen cell base or cup. In hives where there might be many queen cells, a cell protector might be used until you put the cell where you want it to belong. Cell protectors have been made out of wire or plastic.

In difficult situations where you need more time for the bees to accept the queen or the weather

has been inclement, there is an introduction frame available where you can insert a wooden mailing cage and let the queen be released into an area where she can be attended by the bees in the hive. After you feel that she will be accepted, you can open the release hole in the top of the frame. This idea is very similar to the Miller Queen Catcher and



A California queen cage.

Introduction cage of the 1920s, but solves the problem of catching and handling the queen.

You can see that there are many options in introducing queens.

Many of the illustrations came from the 1920 and 1930 Root Catalogs.

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Lessons Learned The Hard Way

William Powers

Mentoring new beekeepers is one of the few aspects of the science that provides a sense of contentment to an apiarist. Helping humans make the successful transfer from classroom to the beeyard is both a teaching moment and a personal refresher course as the newbie poses questions about aspects of beekeeping we may have all but forgotten. It's rewarding to talk about what is to be done and stand back and let the work proceed, ready to step in if help is needed.

This year I'm providing some mentoring to a millennial working on an organic farm in the Blue Ridge three hours from my home in the lower Piedmont. That's where I take many of my colonies after I pull honey in late June. I learned of Tyler Huskinson after he took a local course and purchased two nucs. Springhouse Farm owner, Amy Fiedler, who had kept bees, e-mailed me when things did not seem right in one box. From what Amy said about angry behavior and little, unfilled queen cells, it seemed that the colony was queenless. That turned out to be the case, and she helped him get a free replacement queen from the seller.

We decided that when I brought my first load of bees to the farm that we would go through his hives if he would help me unload mine. An equitable arrangement. As we unloaded my girls he mentioned that the requeened hive still was pretty testy about human interactions. So we saved it for our last action that day.

The first of his two hives smelled sweet and was indifferent to our visit without our using any smoke. Staying smokeless, we approached the second colony. Because my perspiration pheromones trigger attacks, I nearly always have to wear gloves and helmet. By wearing the full gear, I often don't use smoke – I just work slow. Tyler had been encouraged to work with bare hands, and

was determined to do that. But this was his first trip into a colony without using the smoker. When he opened the inner cover, the again queenless bees rose with the usual roar and sharp scent and went right after his hands. He tried to stay calm and focused, but when his hands were covered with stinging bees, pain superseded the plan. He retreated while I confirmed the lack of eggs, larva

and brood. I closed the box and found him with hands swelling to twice their normal size. Three days of pain followed as using hands is an essential part of work on an organic farm. It was a hard lesson for him to learn. But now he knows that bee gloves have been manufactured for centuries because they have a purpose. From now on, if things seem funky he will light the smoker and put on the gloves to determine what's going on in there.

A few days later we talked about requeening again, but Tyler decided that a merger was a better way to go. The honey flow was on, and the extra bees would boost collection in the happy hive. He also figured the calmer queen would take the edginess off the queenless group. We discussed the procedure and he did it by himself, seemingly flawlessly.

Some three weeks later, with the honey flow finished, I visited Amy's again. I brought up some supers in case some colonies needed extra room, but the pressing need was to

treat all the bees for *Varroa*. Tyler and I would look at his colony, too – as it was still pretty chippy about human interactions.

It rained the night before I left, so I didn't load the supers till morning. Then, a few early odds and ends tasks made me decide to wait until rush hour was over before departure. Getting underway, I heard on the traffic report of some Charlotte construction backup on my normal route, so opted for one with no congestion. Of course,



after the radio report and before the next one, a wreck blocked one lane on my alternative route. The net result being that I arrived at noon, not nine.

As I pulled up to the row of hives Tyler was waiting. I know the farm crew eats together. I felt time pressure to work with him first so he could get to beans. As I zippered together my bee suit and hood, I decided we could save a few minutes if I used a new trick I devised to distract the bees while I added medication. On the bees in my apiary, instead of using smoke, I had been gently wafting some BeeGo or BeeQuick over a colony. While they cursed, complained and retreated I did my work.

So I grabbed the spray, my hive tool and walked toward his hive. I did a mild double take as I saw he had a hive body over two supers and another hive body. Rather than have him do the spraying and opening, I asked him just to take charge of rearranging the woodenware. I would take the hive apart to look for queen and add meds. I pulled the top cover and let go with two pumps of spray before removing the inner cover. The response was the usual roar of disgust and hasty exodus from the top boxes. Barely pausing to put down the spray, I pulled off the top box while bees were still in retreat. I kept going. Bees were dropping out of the bottom of supers as I handed them to Tyler. When I got to the bottom hive body, I dug right in with my hive tool and pulled a frame. I saw no queen activity, so I pulled another. Frustrated, I pried another one side and saw comb beautifully filled with capped brood.

As I said out loud "Good news" I also found out how far one can push the bees with a push of spray. As I saw the brood, the bees stopped their withdrawal and turned to fight. A rage of bees came up out of that hive body like a Polaris missile out of nuclear sub! And they saw what I had not noticed. In my rush to get to work, I had not completely zipped my suit together and there was a tennis ball sized hole right under my chin that they were pouring through. They exploded in my helmet like a cluster bomb!

With gloves on, I could not zip the opening closed, and certainly did not want to seal every bee in with me. I started to walk away – and then run! I was trying to pull off my gloves at the same time I was trying to swat bees inside my helmet – an impossible challenge. I was now 30 yards from the hive and still bees kept coming after me, and any that got inside my gear were stinging. Tyler was chasing me, trying to use the spray to drive off the bees, but they were not having it.

Somehow, I found myself on my knees pulling gloves and suit off over my head – turning gear inside out. Hoping they would stay on the clothing, I ran toward the barn. But the bees knew their target – saw I was even more vulnerable – and stayed after head and hands.

I did not know what I would do next, but one of the lads working on repairing a chain saw, picked up a hose and started to spray my head with icy cold well water. This stream subdued the armada of bees. But my savior paid for his heroism with a sting or two.

With the stinging stopped, I now could think. But I had to think fast as the pain was mounting from pricks to a wall of hurt. I realized getting into Amy's barn was where I needed to be. That place is the coldest place in the county. It is also dark in there. Bees don't often venture into cold, dark places. I hoped I just might be safe in there.

Staggering past tools and packing supplies at the barn door, I found Amy and her crew waiting for me. One had an ice pack. One had two tabs of Benedril. One had an aspirin. And one sat me on a bale of hay, and wielded a big kitchen knife to scrape out stingers. What I thought was a barn was actually an emergency room staffed by caring angels. I moaned and groaned and tried to explain what had happened and that it was my fault and it had nothing to do with Tyler's bees.

In 10 minutes time the pain and swelling were walled off by the medicine, and the stingers were gone, except for the one in the roof of my mouth – no kitchen knife was going in there!

The crew drifted back to their lunch and I assessed what I needed to do next. I still had varroa to deal with, so I walked to where I left my gear. Bees were still hovering around the jacket and came after me as soon as I got near. I retreated to the barn where I decided I needed to get the bee venom scent off my head. Amy has an outdoor shower where I made a very soapy wash followed by a poor rinse. That soapy scent helped as I retrieved and donned my gear. I walked back to my truck checking and double checking I was properly attired to work with bees.

Then, in the most traditional way, I lit the smoker and started in with the *Varroa* treatments. Tyler showed up and we got the job done with no trouble from any colony. We even added a few supers to my girls. Well, except Tyler decided he would do his colony the next day, and having not an iota of macho man remaining, I made no objection.

I got out of my gear and drove back to the barn. I wanted to thank everyone again, but a minivan loaded with pre-schoolers arrived and I noticed bees hovering around the supers still in the truck bed. I decided to avoid putting the kids in harm's way. I drove to the road, changed out of my sweat soaked tee and started the long drive home.

As I drove I reflected on what a hard lesson I brought upon myself. I let time pressure rush me into careless preparation, I took a practice that worked in a simple setting and pushed it beyond its limits. I had no plan to follow if anything went wrong. A triple failure for a 20 year veteran of the beeyard. Very, very pitiful!

After driving 15 minutes, I knew I needed to regain some energy. I started to look for some food. With a swollen face, I did not want to go into a store or restaurant. So I made a rare stop at a fast food drive through window. I got a couple of basic burgers and a large coke. The burgers were soft on my swollen lips and in my sore mouth, and the caffeine in the soda off set some of the drowsiness of the Benedryl.

I was in no mood for music or talk or rushing along the road. So I drove along at posted speed as cars and trucks sped around me. My legal drive got me to Charlotte in time to join the evening rush hour. For me, at that moment, going along at slow speed or stop-and-go was much better than weaving through high speed inner belt traffic. I finally turned on the radio, and heard a sports report about some upcoming fight. Thinking of boxing, and what had transpired at the farm, I recalled what the referee says to the fighters just before the first bell – and how I should embrace it, "Gentlemen, protect yourselves at all times." 🐝

VARROA

An IPM (Integrated Pest Management) plan to reduce the *Varroa* mite population is a must these days. We have been fighting *Varroa* since 1987 when they showed up in the USA. All manner of miticides are available. Some are good and others are harmful to bees after long term usage. Coumaphos and Fluvalinate are being phased out since the mites have developed resistance to these miticides. They probably work to some degree, but there are several new chemicals and methods to apply that are helpful in reducing the 'mite count' in your hives.

One of the big problems with the above mentioned miticides is that they leave residues in the wax. Beeswax is a fatty acid and tends to collect hard chemicals. We now have what I will call 'soft' chemicals available and some newer compounds are not harmful at all if used properly and not so often that they could affect the functions of the honey bee.

One of these is Thymol which exists naturally in – guess what – nature. Hops is another one.

There are a few strips available that kill mites and not the bees. Look for ads on them in the bee journals.

These strips are placed in the brood box between the frames and left in for specific periods of time. Read the label, always read the label first and follow its directions to the letter.

Testing For Mites

There are three acceptable and highly useful methods to test for mites. The most obvious sign of *Varroa* is DFWV deformed wing virus. All of these require collecting 300 bees from the brood area of a hive. The most accurate way to test for mites is the alcohol wash. Make yourself a wash jar. Go to a fabric store and purchase the plastic mesh used for needlepoint sewing. It has about 1/8th inch openings. Cut this to fit the lid on a pint mason jar. To test bees, take the jar to the bee yard, along with a 9" x 12" plastic dish pan and a half cup measuring spoon. Open the test colony with as little smoke as possible. Remove a frame from the center of the brood nest with

lots of nurse bees. Make certain the queen isn't on the frame. Thump the frame in the pan, knocking off most of the bees. Scoop up a solid half cup of bees and put in the jar and quickly replace the lid. Pour enough alcohol into the jar to cover the bees. Yes, this kills them and the mites. Roll the bees in the alcohol wash for a few moments, then dump the liquid back into the original pan. Count the mites. A half cup is about 300 bees. One mite/300 bees is the lowest level acceptable without treating. Obviously, this hive has more mites than it should and treatment is necessary.

Oxalic Acid

The common name for OA is wood bleach.

Oxalic Acid is the latest 'silver bullet', but there are some conditions you need to be aware of if you are going to apply this chemical to your hives. First and foremost you are killing only the "phoretic" mites and none of the ones already under the capped brood. Phoretic refers to the mites clinging to the adult bees and these can easily be transferred from one bee to another and even from one hive to another one by bees drifting throughout the beeyard.

Drones are notorious drifters and the guard bees readily accept them as they pose no threat to the colony.

To use the Oxalic Acid sublimation (vaporization) process you need a 12 Volt 'wand' that is available from several sources and companies. A 'wand' is attached to a 12 Volt car battery and becomes heated to 375°F.

The tip of the wand (you insert into a hive) has a cup that you've placed one gram of Oxalic Acid powder for each deep brood box you are treating.

Then you insert the wand into the hive and finally hook it to a battery. The exact time for the OA to sublimate is 2.5 minutes. Then you must disconnect it from the battery and wait about 10 minutes for it to be removed.

This method kills about 95% of the phoretic mites so we repeat it after 15 to 20 days, but not too often

Testing & Treatment

Wil Montgomery

as too much can harm the queen and drones along with the workers. Used properly this is an excellent tool and method to keep your mite count down.

I have read where if you have an eight to 10 mite count per hundred bees its probably too late to save the colony, but some treatment is better than nothing – I hope.

Each wand sold comes with a one gram spoon to measure the powder.

My favorite OA wand, I have two different models, is the one from the Kelly Beekeeping Co. as it has a timer in the handle and you can load the cup with the powder, insert it into the hive, while it is hooked up, and then turn on the switch which will rapidly flash a light and then shut itself off after the 2.5 minute interval. The light then continues to flash at a slower rate for a few minutes while the OA cup cools. When it stops its OK to remove the wand and treat the next hive.

The other models and brands must be disconnected from the battery as soon as the 2.5 interval is reached or they will continue to get hotter also they cannot be hooked up until everything is in place.

Now pay attention! Buying a face respirator with filters is a must. Breathing vaporized OA can be very harmful and if you ever get a whiff (voice of experience here) of it you will be more careful in the future. Also wear eye protection goggles.

A pair of nitrile gloves is also recommended.

As with any mite treatment you must not have any honey supers on the hive. Temporarily remove them and then replace them when you are through killing mites.

The Oxalic Acid Dribble Method

Another method using OA is the dribble/drizzle method. Brushy Mountain Bee Farm has an inexpensive kit with the needed syringe and some, approved by the FDA for use in beehives OA powder. You can contact them at 800-BEESWAX to get one of these kits.

The formula for using the dribble



All you need. a tub, a pint jar with a mesh lid, and 1/2 cup scoop and rubbing alcohol.



Select a frame from the center of the brood nest. Nurse bees will have the most phoretic mites. **DO NOT TAKE THE QUEEN!!!!**



Thump the frame in the pan removing the bees. Thump the pan and tilt to move all the bees into one corner. Scoop up a half cup, thump the spoon and add bees if not full. Put bees in jar and replace jar lid.



Thump jar to settle bees on bottom. Add enough alcohol to just cover bees. Roll jar for a few moments to kill bees and mites.

method is to mix 35 grams of OA granules into a 1 liter 1:1 sugar syrup solution. A liter is pretty close to a quart so this should work as a measuring device. And 1/4th teaspoon is 1 gram.

This method gives about a 55% kill rate. But don't repeat this method more than every two weeks. Waiting 16 days is a better time frame or even three weeks.

The Insect Fogger Method

Now for another device and method for treating *Varroa* is to use an "insect fogger". From my reading there are two formulas to use in one of these devices. I am told the Burgess



Pour alcohol into pan. Dead mites will show up. More than **one** mite means you need to do something to reduce the number. Today!

and Cutter models are good ones. One formula is 40 grams of OA mixed into 100 ml of grain alcohol. Try not to get a whiff of this one when using a fogger. Its not too strong, but you'll know it if you inhale any of this fog. From what I've seen on the Internet you just puff two to three times into the entrance and you're done.

Remember the old saying: "if one pound is good two pounds must be better." Forget this, it never applies to mite treatments of any kind. This idea is a good way to wipe out a colony in a hurry.

Remember throughout this article no matter what method you use only the phoretic mites are killed.

There is another formula to use in an insect fogger. It consists of one pint of food grade mineral oil to which four teaspoons of wintergreen oil has been added. Use the same procedure as for OA and alcohol.

I have not tried this one yet. You can find insect foggers at garden supply stores along with Lowe's and Home Depot.

Foggers use a small metal propane bottle to operate them. You light the coil area at the front of the device. Use a barbeque grill wand

Kelley wand.



lighter that works well.

Now for a couple more ways and items to treat *Varroa*.

There are so many ways to control *Varroa* now that I will mention a couple more. It depends on your wallet as to whether or not these appeal to you. I see a rather costly OA device advertised by Blue Sky Bee Supply that is claimed to treat a hive in 15 seconds. It requires a 120 Volt power supply to operate. Check their ad here in *Bee Culture*.

Now for a really different gadget that also uses 120 Volt power, claims to not only kill *Varroa*, but SHB. Not cheap, but you get what you pay for. Its developed by Bee Hive Thermal

Industries. (www.beehivethermalindustries.com) or 803.504.9313.

The gadget I'm waiting for is a model drone with something it carries that can remotely be dispensed as I fly it over my beeyard.

BTW the only supplier of FDA approved for use in bee hives and the highest percentage of pure OA is Brushy Mountain Bee Farm.

A final mention of the line of defense against *Varroa* is to purchase VSH queens. Along with proper hive treatments they are well worth their cost.

Also the better times of year to treat mites is when there is little or no brood. Late Fall and late Winter.

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The Mistakes I've Made!

Application Safety And Responsibility

Doug Galloway

When I started in the NC Master Beekeeper Program, (MBP), I knew I had a lot to learn about beekeeping. I still do. What I didn't know was how it would direct me to areas that I didn't know, I didn't know. I didn't recognize the inadequate way I was dealing with the safety and responsibility of applying, handling, storing and disposing of those pesticides I find important to keep my bees healthy. Most beekeepers acknowledge that the best course of action to keep our bees healthy is to promote hygienic behavior, allowing our bees to succeed either by resisting a disease or pest, or coexisting with them. Until the time comes when hygienic behavior is predictable, many of us see the path to sustaining healthy productive bees requires treating them with pesticides when their condition dictates it is necessary. The NC Pesticide Applicator Certification Core Manual states, "A pesticide is any substance that is used to kill a pest or prevent or reduce the damage it may cause". Herbicides, Insecticides, Fungicides, Miticides, Bactericide, plus others are all consider Pesticides.

As a beginning beekeeper, my many mentors, to whom I am so grateful, shared their approaches to keeping healthy bees. I listen and then chose what I thought best for my bees and my situation. Sadly, although I read the labels regarding application strength and/or length of time/exposure for treatment, I paid virtually no attention to the effect the pesticide being applied to the bees might have on me or the environment. Awareness to my previous neglect came from the education I received while studying for the Private Pesticide Applicators license, one of the many choices of Sub-Specialties I could pursue and hoped to achieve working on the MBP.

The Private Applicators License requirements are rather simple. Go on line to www.NCagr.gov/spcap/pesticides/index.htm. From this page you can order your study guide going to the bottom of the center page

choice box and selecting "Pesticide Exam Study Materials" and schedule your exam by choosing the "Online Exam Registration" box. The cost is minimal and your license is good for three years with a one day on going education requirement for renewal and of course a small fee.

The benefit of doing this, whether you decide to actually get you license or not, is that you become aware of the need to protect yourself, family and employees, from the risks associated with exposure to the pesticides we are now using to keep our bees healthy.

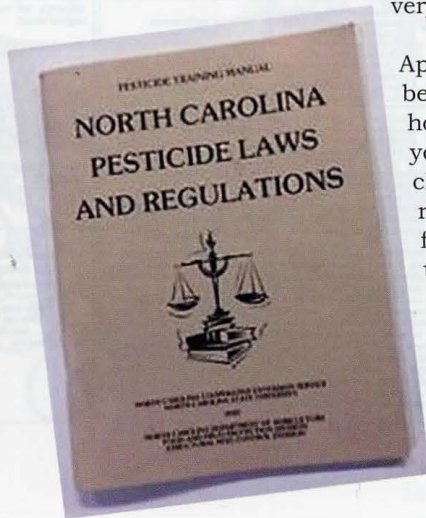
Having read the Core Manual a couple of times I am clearly no expert, but I am now much more aware of the importance of minimizing my exposure. The EPA has classified pesticides as either general use or restricted use. If you can buy it without a license, it is general use. Regardless of being restricted or general use, the label statements have the force of Law. "Anyone using a pesticide in a manner inconsistent with the labeling may be subject to civil and/or criminal penalties"¹.

Last year at the summer meeting in Hickory, NC, Prof. Marion D. Ellis, PhD, University of Nebraska, gave an excellent talk about treating for *Varroa*. He shared his experience of first treating *Varroa* after the last nectar flow and a latter treatment when no brood was present using Oxalic Acid vapor. I had been using Apiguard for my *Varroa* treatment, and decided to add the Oxalic Acid vapor treatment based upon Dr. Ellis' experience and instructions.

In early August I began treating with Apiguard. Though I followed the instructions for treatment, I paid little attention to the need for safety. I installed the Thymol trays using my bee gloves, followed up by removing two week later and installing the second tray which I removed in another two weeks. I left the used, empty trays in the back of my farm vehicle with the intent on collecting them and throwing them away when I got around to it. Not a very good plan.

In September I received my NC Pesticide Applicator Certification Core Manual and began to read. It is never easy to recognize how sloppy and to some extent, irresponsible your conduct is. So after reading once and chastising myself, I read it again taking notes and chose to set a higher standard for the way I handled the pesticides I was using.

Oxalic Acid Vapor is something that many people are now using for protecting our honey bees from *Varroa destructor*. The Label on Oxalic Acid as sold by a bee supply store or found on the internet is clear, very specific precautions are necessary to protect you or your employees during the application.





“Personal Protective Equipment (PPE): Handlers and Applicators who apply product by the Vaporizer Method must wear: Long-sleeve shirt and long pants, socks and shoes, protective gloves, protective eyewear (goggles or face shield), Half-face respirator with cartridge and/or particulate filter”². These instructions are followed by “User Safety Requirements”, which covers your conduct and clean up of your PPE. There is a lot more on the label and everyone who is treating with any pesticide, should read the Pesticide Label and comply with what is written there. Not only is it the law, but it is there for your protection, the protection of the environment and the proper application of the pesticide to treat the pest and not damage the host, i.e.: your honey bees.

Since my discovery, I have read lots of Pesticide labels and have been surprised by many facts I had not previously considered. Those essential oil based pesticides

like Apiguard, Api Life Var and Mite-A-Thol, have extensive pesticide labels on line that point out the extreme need for following label instructions. There are four signal words to identify the level of risk a pesticide offers. From the highest to the lowest risk they are “Danger-Poison, Danger, Warning and Caution”. You might be surprised what your treatments risk level is. Apiguard, Api Life Var and Mite-A-Thol are all “Danger”. ApiVar (Amitraz) risk signal word is “Warning”, while Oxalic Acids and Mite Away Quick Strips risk signal word is “Danger-Poison”.

The bottom line is: read the label and follow its instructions. Don't be creative with your PPE, use what is instructed on the label, don't smell or taste the pesticide and dispose of pesticide containers per the label instructions. Believe the EPA and make sure the only ones treated are your bees.

There are many sources for PPE on the internet. A few I have found to be reliable and competitively priced are:

Zoro: contact at www.zoro.com


Gemplers: contact at www.gemplers.com

Northern Safety: contact at www.northersafety.com

Most suppliers will not give advice as to what you need, it is up to you. One area I researched quite a bit was which cartridge to buy for the half mask respirator I use for Oxalic Acid vapor treatments. As Oxalic Acid vapor is an organic vapor/acid gas, I chose a cartridge that was recommended in the literature for that application. It has a built in particulate filter designated P100.¹

¹NC Pesticide Applicator Certification Core Manual, Wayne G. Buhler, PH.D. NC State University.

²Oxalic Acid Dihydrate pesticide label, EPA Reg. No. 91266-1-91832.

<p>PRECAUTIONARY STATEMENTS HAZARDS TO HUMANS AND DOMESTIC ANIMALS DANGER</p> <p>Acute Hazards: May be fatal if swallowed. Harmful if inhaled. Corrosive. Causes irreversible eye damage.</p> <p>Hazard avoidance: Do not breathe dust or fumes. Do not get in eyes, on skin, or on clothing. Wear protective clothing, eyewear, and respiratory protection as listed under “Personal Protective Equipment.” Wash thoroughly with soap and water after handling and before eating, drinking, chewing gum, using tobacco or using the toilet. Remove and wash contaminated clothing before reuse.</p> <p>PERSONAL PROTECTIVE EQUIPMENT: Handlers and Applicators who apply product by the Solution Method must wear:</p> <ul style="list-style-type: none"> - Long-sleeved shirt and long pants - Socks and shoes - Protective gloves - Protective eyewear such as goggles - Half-face respirator with cartridge and/or particulate filter <p>Handlers and Applicators who apply product by the Vaporizer Method must wear:</p> <ul style="list-style-type: none"> - Long-sleeved shirt and long pants - Socks and shoes - Protective gloves - Protective eyewear (goggles or face shield) - Half-face respirator with cartridge and/or particulate filter <p>User Safety Requirements: Follow manufacturer's instructions for cleaning/maintaining PPE. If no such instructions are provided for washables, use detergent and hot water. Keep and wash PPE separately from other laundry.</p> <p>Wash hands before eating, drinking, chewing gum, using tobacco, or using the toilet.</p> <p>Remove clothing/PPE immediately if pesticide gets inside. Then wash thoroughly and put on clean clothing.</p> <p>Remove PPE immediately after handling this product. As soon as possible, wash thoroughly and change into clean clothing.</p>	<p>Oxalic Acid Dihydrate <i>For Varroa mite control on bees</i></p> <p>Active Ingredient: Oxalic Acid Dihydrate 97.0% Inert Ingredients 3.0% TOTAL 100.0%</p> <p>KEEP OUT OF REACH OF CHILDREN DANGER-PELIGRO</p> <p></p> <p>FIRST AID</p> <p>If swallowed:</p> <ul style="list-style-type: none"> - Call a poison control center or doctor immediately for treatment advice. - Have person sip a glass of water if able to swallow. - DO NOT INDUCE VOMITING unless told to by the poison control center or doctor. - Do not give anything to an unconscious person. <p>If on skin or clothing:</p> <ul style="list-style-type: none"> - Take off contaminated clothing. - Rinse skin immediately with plenty of water for 15-20 minutes. - Call a poison control center or doctor for advice. <p>If inhaled:</p> <ul style="list-style-type: none"> - Move person to fresh air. - If person is not breathing, call 911 or an ambulance, then give artificial respiration, if possible. DO NOT use mouth-to-mouth method if victim ingested or inhaled the substance; use respiratory medical device. - Call a poison control center or doctor for advice. <p>If in eyes:</p> <ul style="list-style-type: none"> - Hold eye open and rinse slowly and gently with water for 15-20 minutes. Remove contact lenses, if present, after the first 5 minutes, then continue rinsing eye. - Call a poison control center or doctor for advice. <p>Have the product container or label with you when calling a poison control center, doctor, or going for treatment.</p> <p>For non-emergency information concerning this product, call the National Pesticides Information Center (NPIC) at 1-800-858-7378 seven days a week, 6:30 am to 4:30 pm Pacific Time (NPIC Website: www.npic.orst.edu).</p> <p>NOTE TO PHYSICIAN: Probable mucosal damage may contraindicate the use of gastric lavage. Provide general supportive measures and treat symptomatically. Treatment should be rapidly instituted by giving a dilute solution of calcium lactate, lime water, finely pulverized chalk, plaster, and/or milk to supply large amounts of calcium to inactivate oxalate by forming an insoluble calcium salt in the stomach. Gastric lavage is controversial, since this may compound an already severe corrosive lesion in the esophagus or stomach. However, if used, gastric lavage should be done with lime water (calcium hydroxide). Intravenous gluconate or calcium chloride solutions should be given to prevent hypocalcemic tetany; in severe cases parathyroid extract also has been given. Additionally, acute renal failure should be anticipated, and careful fluid management is necessary. Metabolically its toxicity is believed to be due to the capacity of oxalic acid to immobilize calcium and thus upset the calcium-potassium ratio in critical tissues. Effective therapy against burns from oxalic acid involves replacement of calcium.</p>	<p>DIRECTIONS FOR USE</p> <p>It is a violation of Federal law to use this product in a manner inconsistent with its labeling.</p> <p>READ THIS LABEL: Read the entire label. This product must be used strictly in accordance with this label's precautionary statements and use directions, as well as with all applicable State and Federal laws and regulations.</p> <p>USE RESTRICTIONS:</p> <p>Oxalic Acid Dihydrate applications are for outdoor use only.</p> <p>DO NOT use in enclosed overwintering areas.</p> <p>Use only in late fall or early spring when little or no brood is present. Oxalic Acid Dihydrate might damage bee brood. Oxalic Acid Dihydrate will not control Varroa mites in capped brood.</p> <p>Do not use when honey supers are in place to prevent contamination of marketable honey.</p> <p>Apply only when monitoring indicates treatment is required. Consult state guidelines and local extension experts for monitoring protocols and thresholds for treatment.</p> <p>(See next page for additional DIRECTIONS FOR USE)</p> <p>Brushy Mountain Bee Farm 610 Bethany Church Road Moravian Falls, NC 28654</p> <p>EPA Reg. No. 91266-1-73291 EPA Est. No. 73291-NC-001 Net Contents: _____ Batch Code No.: _____</p> <p>EPA Reg. No. 91266-1 page 1 of 2</p>
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Be Prepared Before You Ask for Help

Frank Mortimer

Beekeeping is a hobby that requires the beekeeper to have a certain amount of knowledge and also possess the tenacity to do what is necessary to make sure he has a firm understanding of what's happening in his hives. Success in beekeeping requires full and active participation; it's not something that can be done from the sidelines, or with just a vague basic belief of what might be happening.

It is every beekeeper's responsibility to have a thorough understanding of what is happening in each of his or her hives. Saying that, I can't help but remember an experience that taught me the value of being a prepared beekeeper.

Years ago, I bought an old house that was a real fixer-upper. I didn't have any experience or knowledge about the work that was needed, but I was determined to do most of the work myself. One of the first things I did was to replace the upstairs' bathroom fixtures and vanity. I had purchased the vanity, faucet, and shower head before I even closed on the house, as I thought they were the perfect complement to my soon-to-be renovated bathroom. Once I started replacing the vanity, I realized I was missing a lot of stuff, namely the correct tools, and the right replacement pipes to get the job done.

Luckily, there was an excellent local hardware store a mile down the road, so one Saturday morning I drove down to get what I needed. Over in the plumbing section, there was a gentleman helping another customer with his plumbing issue. I didn't quite know what they were talking about; other than I knew it was about plumbing, and what

was the best way to get the job done. (Apparently there was more than one way to approach the job, and they were discussing the varying approaches.) Based on the conversation I was listening to, I knew this guy knew plumbing and that he could help me.

I introduced myself to the plumbing expert and preceded to explain my situation, using my hands to show the shapes of pipes I needed. After about two minutes of me trying to explain what I needed, the expert finally stopped me and said, "I have no idea

what you're talking about." I was shocked! I just heard him offer expert advice to someone else and now he was telling me that he didn't even understand what I was saying. He then said, "What are your measurements?" and, "What size fittings do you need for this job?" I told him that I didn't know, and that I hadn't measured anything. This was my first lesson in how to speak with an expert: use details that are commonly used by experts,



Lots of brood, no bees.



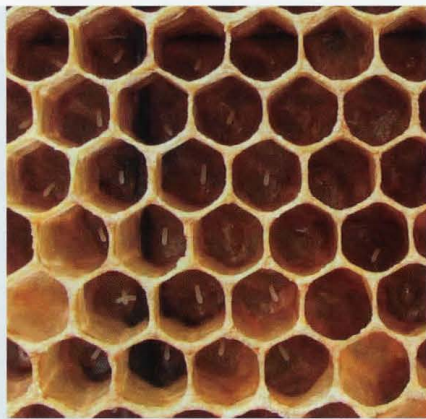
Do you see the queen?



Capped brood.



Larvae.



Did you see eggs?



Nectar and honey.

such as precise measurements and the names of actual plumbing parts.

I was determined to show him that I was not going to quit until I got the job done, and at one point, I even brought my faucet and pipes in a box to the hardware store so that the expert could show me how to sort them out.

That day it took me four trips to the hardware store and a lot of tenacity, but I finally learned how to communicate with the plumbing expert and earn some respect. I shook his hand, said thank you for the plumbing lesson and headed home with everything I needed to get the job done. Since I had all the information and supplies I needed, when I got home that last time, I was able to install my new bathroom faucet in "This Old House" record time.

The plumbing expert taught me, a first-time homeowner, how to approach a job and what I needed to know so I could get it done right. That daylong lesson taught me the importance of providing an expert with information he or she needs to be able to help.

So, what does my plumbing story have to do with beekeeping?

Everything . . .

Experienced beekeepers, mentors, and club officers are always available to help, but any real help first requires that the beekeeper also does his or her part. Specifically, a beekeeper should answer these questions every time he or she goes into his or her hives:



Brood and honey.

- 1) Did I see the queen?
- 2) Did I see signs of the queen, specifically:
Capped Brood?
Larvae?
Eggs?
- 3) How many frames of brood did I see?
- 4) How much honey/nectar do the bees have?
- 5) Did I see anything weird?
Swarm cells or supersedure?
Pests, foulbrood, DWV?
Lack of bees, chalkbrood, SHB, *Varroa*?

If you can answer these five questions, then you have done your part. You might still have a lot of questions,



Swarm cells or supersedure cells?



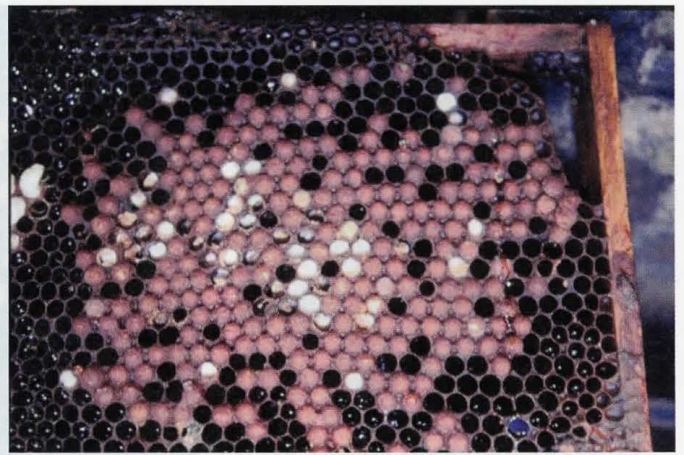
Could this be foulbrood?



Deformed Wing Virus.



Varroa.



Could this be chalkbrood?



Small Hive Beetle.

and you might not know what to do next, but if you can answer these five questions, then based on the details about your hive, another beekeeper can offer you advice on what to do.

If you're not sure how to tell the difference between capped brood and honey, then pick-up a book on beekeeping so you know what to look for. There are dozens of excellent books on beekeeping, many aimed specifically at when you are just starting out. There are also many great resources you can rely on, like the magazine you are currently reading, locally prepared manuals, or even your bee club's newsletters. Online, there are lots of photos, illustrations, and videos that you can view to gain a better of understanding of what's happening inside your hive. (However, like everything else online, make sure your information is from a reputable source or trusted beekeeper so you know that the information you are relying on is accurate and based on facts.)

Additionally, that's why it's so important for you to do a thorough inspection of your hives *before* asking for help. Being a beekeeper means going into your hives, pulling out at a minimum four to six frames per box so that you can answer those five questions. Also, you have to look at the frames, not at the bees, which means if "there are

too many bees in the way," then you have to move them out of the way to see what's in the cells on that frame.

Beekeeping is a real passion for most people who have been keeping bees for a while. There is a meme going around that says, "I don't always talk about bees, sometimes I'm asleep" and I do think that sums up how I feel and the passion one gets for beekeeping. Every time you open a hive and see your bees doing what you want them to be doing, and your hive growing as it should be growing, it only adds more fire to that passion. For most of us, it is a passion for beekeeping – successfully – and the desire to see bees flourish, that drives beekeepers to want to help new beekeepers. The more experienced beekeepers you meet, the more you'll hear a common theme to their advice: You can only learn by going into your hives, looking for signs that the colony is in good shape, and knowing when something doesn't look right.

You'll also notice that most beekeepers are quick to want to help. I think it's the nurturing nature of a beekeeper that's at the root of wanting to help others. But always keep in mind that an expert's help is only as good as the details he has to work with, and without details, an expert doesn't have what he needs to help. The thing to remember is that help comes in many different lessons and takes on a lot of different forms. It takes experience and a good teacher to know the best way to teach someone who is still learning the basics. A good teacher will let the student be the one who goes into the hive, because the student will learn more by doing it himself than by passively watching someone else do the work for him. The teacher is available to answer questions, and help the student when he gets stuck or doesn't know what to do next, but the student must always do his part first, gather information from the hive, then ask questions based on the details of what he has seen firsthand. That's the lesson I learned from my fixer-upper house with plumbing problems. Sometimes the best way to truly help someone is to teach him that it's his responsibility to first be prepared with all the necessary details before approaching someone else for advice or guidance. 🐝

Why Honey Bees Don't Have Problems

Miles Sarvis-Wilburn

Colony Collapse Disorder, *Varroa*, foulbrood, wax moths, chalkbrood – the list goes on and on. These are not problems of the honey bee. On the contrary, they are problems of the beekeeper, though this fact is rarely noticed. Instead, millions of dollars are dedicated to research, experimentation, scientific studies, and lobbying. We read of new treatment solutions for *Varroa*, learn about probiotics and antibiotics to be administered, and speculate as to how to improve that mysterious substance: honey comb. Such a paradigm is not wrong or bad, but it is dominant and mostly unchallenged. I wish to bring a preliminary critique forward regarding how we as beekeepers view ourselves in relation to the ailments of our subject, the honey bee.

At first glance this may seem like a mundane and asinine topic, but I believe it is paramount to our dialogue on beekeeping, agriculture, and the health of human beings. If we cannot adequately theorize our situation as apiculturists, how can we expect to accurately assess and address the practice at hand? This is to say that if we do not know who we are, how can we know what we are doing? So who are we and what are we doing?

We are beekeepers: people who host colonies of honey bees in manufactured boxes, attempt to manage them, and harvest the byproducts of their existence. This could be called a symbiotic relationship in that we provide the bees with a supposedly safe home and, in return, we harvest what honey and wax they do not require to overwinter. When we look at our honey bees, we want them to be healthy and happy, foraging for miles upon high quality nectar and pollen. We want them to live in a clean and tidy environment, with their young emerging

strong and their mother laying well. We want the world for them and become disturbed by the seemingly endless stream of problems impacting this world.

A common human response is to judge the situation in the following manner: honey bees should behave a certain way, they are not and the cause appears to be X, thus we need to eliminate or reduce X. There are three assumptions at play in this simple judgement: (1) honey bees ought to behave a certain way, or that their behavior is readily indicative of health; (2) the cause of this change in behavior can be isolated and identified; (3) if the first two assumptions are true, eliminating or reducing the cause is a solution. Should any of these assumptions prove to be false, we are in danger of creating new problems or furthering old ones. Indeed, the farther down this road we travel the less we are able to parse actual problems from ones we may have created.

We can begin to address this issue by looking at a classic philosophical item known as the Archimedean point. Archimedes of Syracuse (c. 287 BC – 212 BC) was a Greek mathematician, philosopher, scientist and engineer. While speculating on the power of the lever as an engineering tool, he is quoted as having said: "Give me the place to stand, and I shall move the earth." This phrase, in turn, led to the idea of a hypothetical point of view where someone can objectively see without obstruction. We could call this a 'God's eye' perspective. Archimedes of course could never leave Earth to find his point of leverage; his claim was hypothetical and used to forward his argument regarding engineering. But the idea of discovering a point of observation, pure and untainted by bias or subjective interpretation, is a long-standing one.



Opening the hive . . .



. . . changes it . . .



... but it is keeping the bees.

Let us bring this back to beekeeping by taking a simple example: inspecting the hive. Hive inspections are important aspects of modern beekeeping and most beekeepers – generally speaking – advocate for an inspection around every two weeks. Inspections seem vital for understanding the conditions within the hive, the health of the colony, and so forth. But note how, no matter the care and delicacy, the theory of hive inspections involves an implicit reliance upon the Archimedean point. After all, it is impossible to inspect the combs without opening the hive. And we know that honey bees seal the inside of their home with propolis, keeping it as clean and contaminant-free as possible, and that they maintain the temperature, moisture levels, and air flow within. Thus, opening the hive is akin to total internal ecosystem destabilization. Whatever may be in the air (particulates, pesticides, pathogens) floods the interior of the hive, contaminating every surface. No matter how docile the bees appear or how much smoke is used to force them to gorge on honey reserves, their stress level rises.

Stress in human beings causes the sympathetic nervous system to activate (the so-called “fight or flight” reflex): heart rate increases, bronchial tubes and pupils dilate, parts of digestion are stopped, and more glycogen is converted to glucose. Many new studies are looking into the impacts of chronic stress and excessive activation of the sympathetic nervous system, leading to new classifications of diseases and illnesses such as adrenal fatigue. Little research has been made into whether honey bees undergo similar stress responses, and less still into how such responses affect the bee over time. The question remains: what is the effect on the colony of disrupting the internal ecosystem of the hive?

The reason why I ask this question is because it returns us to a point of solid ground, outside the realm of a supposed Archimedean point. When we open the hive to inspect the colony, we are altering the characteristics of the very thing we are inspecting and cannot maintain a truly objective perspective. If we were to take this seriously, we would have to account for the environmental



The quality of the queen is a human problem.

changes made by our disruption, something that is excessively complex. We must ask ourselves: are we ever witnessing anything other than stress behavior when we inspect a hive? I think the case could be made that we are not, that our understanding of ‘regular bee behavior’ in the hive is stress behavior caused by our intersection into an otherwise private world. If this is the case, then the conclusions drawn from every hive inspection are skewed by our implicit assumptions.

My point here is not to demand that beekeepers cease inspecting hives, but to ask that we begin a critical look regarding our relationship to our – keeping. How is it that we keep our bees? This is not a superficial question, but a serious and necessary one. We must account for two things: (1) the lack of an Archimedean point and the effects of our actions upon the colony; (2) the context of our very –keeping. I have expanded upon the first point already and the second is a much larger topic that we can only begin to discuss in the context of this paper.

We must ask ourselves: what is the context of our beekeeping? This is to say, why am I keeping these bees? I think it is safe to assume that – beyond love and care for these creatures – most keep for some sort of profit, be it pollination services or honey sales. When a beekeeper looks at the health of their bees it is always contextualized by the reason for this keeping. For many, unhealthy bees mean less money. I do not wish this to be a critique of profit, but simply to note that this context is inseparable from the act of beekeeping. In other words, honey bees have problems in-so-far as we need them for particular reasons. We keep them for profit, for vital pollination services, and for their honey. Their problems are not, as we state casually, problems of the honey bee, but rather they are problems in that they jeopardize our needs. No beekeeper cared that *Varroa* has lived with feral bees for centuries. It is not until we use the bees that we believe them to have problems; thus, it is we who have the problem of *Varroa*, not the honey bee.

This argument is supported by the fact that, for centuries prior to modern industrial beekeeping, honey bees had few of the problems that we identify today. For example, *Varroa* was “discovered” in 1904. Does this mean it spontaneously emerged at this point in history? Doubtful. It is far more likely that in the preceding fifty years (Langstroth patented his hive in 1852) the territory and form of apiculture was changed so dramatically that the conditions for *Varroa* to flourish were created. The current and ongoing failure of honey bees to manage threats is not a problem of the bees themselves, the quality of queens, the vitality of genetic stock, and so forth. It is a human problem and it lives within us. It is born and bred through our practices and our actions. If human beings went extinct tomorrow the honey bee would be fine, but can we say the opposite? 🐝

Ask Bill –

As answered by Bill Mondjack, EAS Certified Master Beekeeper – Not all beekeepers work their colonies the same way. Anyone who has worked with me in the past knows that I do not do things by the book; I do what works for me. So when I answer a question I like to pass along my thoughts on what I would do if the situation in question happened to me.

Q – “I want to get started keeping bees this Spring. I’ve seen many ads selling packaged bees brought up from the south and I’ve read about ‘nucs’ but have not seen anyone advertising nucs for sale.” My question is: “What should I start with, a package or a nuc?”

Bill’s Answer

This is a question many are thinking, if not asking; and a darn good one. Many are starting beekeeping for the first time this spring and have to acquire bees for their first hive. I suppose the most popular source for this need is to buy a package of bees from one of the big bee suppliers down south. Well there’s another answer. Actually you have several ways to acquire bees if you are just starting. 1. Buy a package, 2. Buy a nuc, 3. Buy an established hive, 4. Catch a swarm, 5. Remove a honey bee colony from a building.

Let’s discuss some of the advantages and disadvantages of the above choices.

1. Buying a package. Advantages: A) Probably the most common method of acquiring bees to start. It may be easier to find a package bee supplier than someone who produces and sells nucs. B) If ordered early (Jan./Feb.) you can receive them earlier than a local nuc. C) Many times you can find a local beekeeper making the trip down south to bring them up north to a delivery point near your home instead of relying on the U.S. Postal Service. D) Pkgs. will come with a young queen. E) Package bees are inspected by the state inspector. Disadvantages: A) A package of bees will start much slower than a nucleus colony as it

only contains bees. B) You must feed them constantly after placing them on foundation so they can produce the much needed wax to draw foundation into comb so the queen (after being released and accepted) can proceed to lay eggs. C) During the first 21 days a package of bees will experience about a 35% loss in population. This occurs because new adult workers require 21 days to develop, during this time the older bees are dying. D) When hiving a package you must wait a few days till the queen is released and accepted by the population, this is all unproductive time. E) Sometime you may experience a dead queen in the package or the bees in the package do not accept her, this can mean another delay till you receive a new queen and she is accepted.

2. Buying a Nucleus colony. Advantages: A) A nucleus colony is a smaller version of a complete colony, consisting of four to five frames of drawn comb with food, a laying queen, brood in all stages and room for the queen to lay eggs. When you bring it home just place the frames into your hive body and fill the remaining space with frames of foundation or drawn comb. B) A nucleus colony will not decline in population like a package but will increase from day one. C) The nuc has a queen that is already accepted by the body of bees and is in the process of laying eggs, there is no wasted time waiting for the queen to be released and accepted. D) There is a better chance the nuc will produce a surplus crop of honey the first year versus a package.

Disadvantages: A) When obtaining drawn comb from another source other than your own hives you must be concerned about transfer of disease. Know your source well. Ask questions of your supplier. B) If obtained from a local source your nucs may not be available as early as packages brought up from the south. C) The nuc may have an old queen. Ask your supplier. D) The cost of a nuc is usually higher than a package.

3. Buying an established hive. Advantages: A) You have the jump on time. No waiting for queen acceptance, no feeding gallons of sugar syrup to draw foundation. The colony

is full strength. B) A surplus honey crop the first year. Disadvantages:

A) You may be buying a diseased colony! Know your supplier. Only buy if you or an experienced beekeeper can inspect the hive before you buy it. B) You may be purchasing a colony with an old queen and/or bad combs. Do a thorough inspection before purchasing.

4. Catch a swarm. Advantages: A) No purchase cost to you. You may even be able to charge for the collection of the swarm. B) Swarms can be larger than a 3 lb. package. C) The swarm most probably issued from a local hive. Disadvantages: A) The swarm may have a disease. Always hive a swarm on foundation, making them use up the honey in their stomachs to produce wax, therefore not storing any AFB spores in honey. B) Swarms usually aren’t available as early as other sources. Swarms usually issue right before the nectar flow. C) Primary swarms usually have the old queen with them and should be re-queened.

5. Remove a colony from a building. Advantages: A) Free, like catching swarms, you can even charge for the service. Disadvantages: A) Labor intensive! Make sure you have the proper equipment, (bee vacuum, ladders, scaffolding, ropes, buckets, temp. sensors, saws, liability insurance, etc.) and a helper! B) Disease! Be able to diagnose disease symptoms.

So . . . What would Bill do? If I was just starting out this Spring I would want to get an early start and most probably buy two packages. But if I could find a local beekeeper who is willing to sell a nuc I’d buy a local nuc and only one package of bees. With this choice I could compare the two and if for some reason the package queen failed I would have fresh brood from the nuc to give the package bees so they could raise a new queen.

Cooking With Honey



Ann Harman

February is a month with a number of special days, not necessarily holidays. Valentine's Day is in February so we can celebrate that with some special honey sweets. Groundhog Day is in February, too, but it's celebrated with a sleepy groundhog that is not interested in honey.

Chocolate is always paired with Valentine's Day but this year why not make an incredibly delicious chocolate cake, big enough to last more than just one day (maybe).

Double Chocolate Honey Ring

½ cup butter or margarine
1 cup honey
3 eggs
1 teaspoon vanilla
1-3/4 cups all-purpose flour
½ cup unsweetened cocoa powder
2 teaspoons baking powder
1 teaspoon salt
1 teaspoon baking soda
½ cup sour cream
1 cup semi-sweet chocolate chips
1/2 cup chopped nuts
White Chocolate Glaze (recipe below, optional)
Additional unsweetened cocoa powder (optional)
Blossom for decoration (maybe a red rose, optional)



Cream butter in a large bowl; gradually add honey, beating until light and fluffy. Add eggs, one at a time, beating thoroughly after each addition. (Mixture may appear slightly curdled.) Beat in vanilla. Combine flour, cocoa, baking powder, salt and baking soda in small bowl. Add dry ingredients alternately with sour cream to butter mixture. Fold in chocolate chips and nuts. Pour batter in greased 12-cup fluted tube pan.

Bake in preheated 325°F oven 50 to 55 minutes or until wooden toothpick inserted near center comes out clean. Cool in pan on wire rack 10 minutes. Remove from pan and cool completely on wire rack. Glaze with White Chocolate Glaze, sprinkle with additional cocoa powder and garnish with a blossom. Makes 12 servings.

White Chocolate Glaze

2 ounces white chocolate
2 teaspoons milk

Melt chocolate in top of double boiler. Stir in milk. Drizzle glaze over cake with spoon.

The Winter months usually bring sniffles and coughs. Honey is always soothing, especially for sore throats. Here is a recipe for a hot tea drink that will make you feel better.

Honey Citrus Soother

3 tea bags, green or black
1 cinnamon stick
3 cups boiling water
¼ cup honey
1 cup grapefruit juice

Place tea bags and cinnamon stick in a one-quart teapot. Add boiling water. Steep three to five minutes. Remove cinnamon stick and tea bags; discard. Stir in grapefruit juice and honey.

Honey Spice Cookies

2¼ c. flour
2/3 c. brown sugar
1 egg
1 tsp. vanilla
½ c. UCD wildflower honey
1½ sticks butter room temperature
1 tsp. baking soda
1½ tsp. cinnamon
1½ tsp. ginger
½ tsp. cloves
½ tsp. nutmeg
¼ tsp. fresh ground pepper
1/3 tsp. salt
Raw sugar

Preheat the oven to 350°F. Cream butter and brown sugar together until smooth. Beat in egg, honey and vanilla.

In a separate bowl combine flour, baking soda, spices and salt.

Add the dry ingredients to the wet slowly, mixing continuously until well combined.

The dough is very soft!

Pour the raw sugar into a small bowl. Take small amounts of the dough and roll them into balls about ¾-1 inch in diameter. Roll the balls in the raw sugar. Place on a parchment lined baking sheet about an inch apart.

Bake for about 13 minutes until cracks begin to show. The cookies should still be very soft. IF you prefer a 'snap', continue cooking for another few minutes. Once cool, they will harden!

Place on a cooling rack and enjoy thoroughly with friends and family. Makes about 48 2" cookies. 🍪



National Honey Board Recipes

February Favorites