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BEEKeeping

Your First Three Years



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Ontario Bee Journal

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Ask an expert. Four questions and answers reprinted from a special edition of the Ontario Bee Journal, by the Tech Transfer Team. Reprinted with permission from Ontario Bee Journal.

800.289.7668

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POSTMASTER: Send address changes to BEEKEEPING, The A.I. Root Co., 623 W. Liberty St., Medina, OH 44256

Subscription Information

U.S., one year, \$20. Newsstand price: \$6.99. All other countries, (U.S. Currency only), \$20.00 per year. Send remittance by money order, bank draft, express money order, or check or credit card. BEEKeeping (ISSN 2475-4854), Winter 2017, Volume 2, Issue 4, is published quarterly by The A.I. Root Co., 623 W. Liberty Street, Medina, OH 44256. Periodicals Postage Paid at Medina, OH and additional mailing offices.

Subscriptions, Book Orders – 800.289.7668, Ext. 3220 • www.Beekeeping3.com

Advertising – 800.289.7668, Ext. 3216; JNewcombe@BeeCulture.com

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Cover – Jennifer Berry, Research Leader at University of GA Honey Bee Lab working her bees.

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Autumn

Most of the things you need to be doing this time of year!

~Ann Harman

Celebrate October First by putting mouse guards on all hives!

It's time for the queen to take a rest from egg-laying. Do not worry if brood diminishes. Use this broodless period for Varroa intervention until daytime temperatures are below 57°F.

In cool weather bees will start forming a cluster at 57°F.



Your queen will slow, or cease laying eggs as the season turns cooler, with shorter days.



Make sure you have more than enough honey, and pollen, to keep your bees well fed until the dandelions bloom next Spring. How long is that?

Use controls for small hive beetle until weather cools.

Check each hive for adequate Winter stores.

Warm climate 40 pounds

Temperate climate 60 pounds

Cold climate 90 pounds

If colonies are disease-free, frames of stored honey can be moved to provide adequate Winter stores. Watch carefully so you do not move the queen!

If feeding is necessary the mixture is two parts sugar (or slightly less) to one part water. If you are feeding sugar, be sure to feed protein supplements at the same time.



If you are feeding sugar – carbohydrates – make sure you also feed protein at the same time. You don't eat just carbs, do you?

Do not feed liquid syrup when temperatures are below 57°F.

Do not leave queen excluders on the hive. Remove for cleaning on a cold day. Wax will snap off.

Inspect queen excluders for damage and discard. The queen will find a bent rod or torn plastic.

Inspect all equipment for damage. Set aside for repair - or - fix it now!

Five Tasks



Fix, repair or replace damaged frames, boxes and combs.

Inspect stored comb for damage, excessive drone comb or lumps of cross-comb.

Protect all stored equipment, including plastic queen excluders, from mice.

Woodenware and brood comb can be placed in plastic bags and frozen for a week to kill wax moth eggs. Leave bagged and protect from mice.

Clean up the beeyard. Do not leave pieces of equipment lying around.



Clean up the beeyard, remove weeds from entrance flightways and make sure you can get to the yard even in the deepest snow.



Make a Christmas list of what you'll need for next season.

Make sure hive entrances are clear of weeds and grass so bees can take cleansing flights. Check the bear fence if you live in bear country.

Wash all bee clothing - veils, jackets, coveralls, gloves. Replace household gloves with new ones.

Clean up your smoker. Make sure it is free of ashes under the grid.

Check on hives once a month to see if food stores are adequate. Do not break the cluster!

If you harvested honey this year use it in cooking, especially during the holiday season.

Read beekeeping magazines and bee books. Be sure to tell Santa what equipment you are wishing for. 🐝



And Don't Forget Your Next Club Meeting

A Beekeeper's Wish List

Ann Harman

The busy bee year is winding down for both the bees and for us. However, the bees are simply entering another phase of their New Year that began back in August. In many areas of the country the queen is taking a well-deserved rest from laying eggs. In the warmer areas she will actually not work as energetically as during the rest of the year. So in a sense she is resting also.

Now you have some time to review your bee year. First go out and clean up your beeyard. How well did it work for you? Did you consider moving one of the hives? Remember, moving an established hive is not a simple task. The bees know where their home is located in its surroundings. If you move the hive too far from its original spot you can end up with a clump of lost bees. A general rule is you can move them two feet or two miles but no distance in between those. If you



Go out and clean up your beeyard, and especially the weeds in front of your hives. Remove all unused equipment, sticks and such so you don't trip when they are covered with snow, and secure covers and hives from strong Winter winds.

live in a cold climate you really cannot move hives if the outside temperature is below clustering temperatures. If the cluster is broken during the bumps and thumps of moving and they cannot reform a cluster, then the bees will simply die.

Make certain you have not left pieces of equipment here and there in the beeyard. If something broke during bee season, either remove it for repair, discard it, or make use of it somewhere else. You need to be able to examine your hives comfortably without tripping over junk. If you live in bear country you still want to make certain your bear fence is working properly. If you neglected to cut down grass and weeds, this is the time to do that. Your bees may wish

to take cleansing flights throughout the Autumn and Winter. Also you just might discover something you lost during bee season.

Now that the beeyard is ready for its rest period let's start with your bee clothing. Check your veil for any rips or holes. Bees are really very clever! They can find that hole before you even know it's there. Repairs can be made but if the repair interferes with your visibility put a new veil down on your Replace It List. (You are making a note of necessary items aren't you?) Were you satisfied with your veil? If you found it was awkward or kept falling this way and that, plan to buy a different one.

Next – wash your bee jacket or



How did your bee suit work out this season? Too big, not big enough? Not quite a perfect protector? Two things to think about this time of year are getting that old bee suit replaced with something that fits better and works better. It at all possible, try on a new suit before buying it. reach as high as you can – does it cover your middle, ankles, wrists? Squat all the way to the floor. Does it bind anywhere? Kneel on the ground. Same thing, does it bind or expose any part you don't want exposed? Is the thickness OK? Too thick and it will be too hot, but too thin and you'll have some bad days.

coveralls! Dried bee venom in clothing can result in sting allergies. If, for some reason, your clothing received a number of stings during bee season then it should have been washed at that time. What about gloves? If they are beekeeper gloves, propolis can be removed with rubbing alcohol. This can also be used to remove propolis from clothing although it may not

completely remove a stain. If you use the household gloves, discard the used ones and buy several new pair for the coming year.

Now for a review of equipment. Your smoker is an important tool. Check the bellows. A leak can be very annoying. If it's badly damaged you can buy replacement bellows. Sticky propolis can be cleaned off the bellows with some rubbing alcohol. Sometimes ashes collect under the grid and block airflow. You can use a wire brush or some plain dry steel wool to clean off the creosote buildup around the rim and the cap for smoother operation.

The smoker and hive tool are your most important pieces of equipment. Do you like your hive tool? A cruise through the equipment suppliers will give you an idea of the many styles of hive tool available. If you see one you would like to try, write it down on your New Equipment List. If you belong to your local bee club (and you should) perhaps some of the beekeepers can give you recommendations about hive tools they like. Whatever you decide, clean off your current hive tool. If it is not too gummed up, a trip through the dishwasher will clean it up nicely (caution – you might get some complaints about this).

Although it is Autumn and going into Winter it is time to consider the hive parts that you may need for next Spring and Summer. If you are just finishing your first year and your hives now have a good population of bees, you are probably looking forward to having a honey crop next year. If you did have a honey crop this year you might have needed more honey supers and found you could not get them in time. The equipment suppliers do their best but all the procrastinators are ordering honey supers at the same time. As soon as you get your 2018 calendar write down "order bee equipment" in January. That is when the equipment suppliers have sales! You'll save money and time and be ready for that bumper crop.

Take a few minutes to think about the times you have inspected your hives. Did you start out with deeps for hive bodies? Or 10-frame mediums for hive bodies as well as honey supers? If you were surprised at the weight of these when full of

bees and honey, perhaps you gave a thought about 8-frame equipment. Next year as the weather warms, the bees have moved up and it is time to reverse for swarm prevention. This time would be ideal to move from 10-frame into eight-frame by putting eight frames from the empty bottom hive body into the eight-frame hive body now on top. However, you will have to temporarily close off the gap between the two with wood or something waterproof. Since reversing time in Spring is the best time to shift to eight-frame, those boxes will have to be ordered in January.

What to do with the now-unwanted 10-frame boxes? If your bees are disease-free certainly someone in your local club would be happy to purchase them. Or you could keep them for storing frames with comb or as a useful frame-holder when inspecting your hives. But you might prefer a frame holder that hooks onto the side of a hive body. The equipment suppliers all carry them. This type of frame holder helps you keep the frames, especially brood frames, in order and safe. And it does prevent you from stepping right in the middle of a frame of brood or food that fell over when you thought you propped it against a hive.

For those who had a honey crop this year, did you use queen excluders? After you have cleaned them check for any damage, whether plastic or metal. You can put the plastic ones in a plastic trash bag and put in freezer. The cold wax will snap off when you take it from the freezer and wobble it. The metal ones can be frozen and then immediately scraped when taken out of the freezer. If you see any damage you will need to replace it. The queen will always find the bent wire or the rip in plastic. Again, now is the time to put them on your list for January purchase.



Feeding pail – here's a deep 10 frame hive body (white) sitting next to medium eight frame hive bodies. A 10 frame deep, full, will weigh close to 100 pounds. And eight frame medium, full, will weigh about 40 pounds. How's your back this Fall? The pail is a pail feeder. It holds a gallon of syrup, is easy to use, inexpensive and just the thing for Fall feeding.

One very important item is a feeder for sugar syrup. The equipment catalogs show many different types. Which type did you buy? How well is it working for you? For the bees? You may now be feeding syrup for Winter stores. If you are satisfied with your syrup feeders, that's good. But if you are not, then why not order the kind you want right now? It's an item you will use again and again.

Hives have bottom boards. In the past there was basically only one type. Today, with varroa and small hive beetle, bottom boards come in different designs to help with pest control. Were you satisfied with the ones you are using? If not, then you need another tour of the equipment suppliers to find one more useful. Oh yes – if you are changing over to eight-frame you will need a whole new set of bottom boards.

Many beekeepers use cement blocks for hive stands. Although an assortment of hive stands are being sold, just remember that they might not be a suitable height for you to



If you are expanding your beeyard for next year, recall how the height of the hive stand you have now works for your back, knees and equipment. Make it the right height the first time.

work comfortably. Some are metal and some are a durable heavy-duty plastic. If you are using cement blocks then you probably have your “stand” at the height you want.

Today our bees have to cope with *Varroa* mites and in some areas the small hive beetle (shb). The equipment catalogs show a number of ways to monitor and cope with these. Think back through this year. How successful were you at keeping these pests under control? Is there something else you would like to try? See what is available that is compatible with your style of



Small Hive Beetle Trap.

beekeeping and make your plans for the coming year.

Now that the basic shopping list has been made for next year, perhaps it is time to consider some other pieces of equipment. Yes, beekeepers are always looking for better ways to make beekeeping easier and more fun.

Did any of your colonies swarm this year? Were you able to capture them or did they fly up, up and away? This coming Spring perhaps you can capture them. Swarm traps and lures are very popular. Why not try to recapture your swarm – or another beekeeper's who lives somewhere in the distance.

Did you have any problems with robbing during a dearth of suitable plants this year? Robbing screens are available and can be very handy in some areas and some conditions. The one made by Country Rubes (www.countryrubes.com) is a very nice one

Another piece of equipment, useful during potential robbing times and also for colonies that are especially agitated upon opening, is the manipulating cloth sold by Brushy Mountain Bee Farm. It is a canvas cloth with an opening in the middle. This opening allows you to remove one frame for inspection and replace it without disturbing any of the other frames. The bees stay quietly inside their hive body. You can move the cloth's opening over any frame you wish to remove. This cloth could be especially useful in urban or suburban environments where you may not wish to have a number of bees in the air.

When you have a few minutes, go back and review your records (Oh! You *are* keeping records aren't you?). Do you see any time when you thought “there must be a piece of equipment for that?” If so, search for it *now* to put it on your New Equipment List. Otherwise you will forget about it until you really need it again – naturally during a hive inspection.

Bees store food for the Winter so they can raise bees to be ready when Spring arrives. You need to follow the bee's plan – get your bee gear in shape and equipment bought. Don't let those clever bees get ahead of you!

Leave your list out on Christmas Eve just in case Santa drops by and wants to know what you need for your next year of beekeeping. 🐝

New For B

Naked Bee Hives products are designed and manufactured by LWO Corporation of Portland, OR. Since 1980, LWO Corporation has developed a nationwide reputation as a designer and manufacturer of innovative, high-quality wood products for the home and garden. We are proud to feature high quality bee hives and materials as part of our Naked Bee Hives family.

Our beehive products are made right here at our factory in Portland, Ore., from natural and renewable Western Cedar - a naturally pest and rot resistant wood.

Why Naked Bee Hives?

Unlike other softwood boxes, Western Cedar can be left unpainted if you so choose, achieving a slivered look over time. This is where we get our name, our boxes are just fine being 'naked'.

Our philosophy of integrating fine design, materials and craftsmanship and our dedication to customer satisfaction are the legacy of years of experience working with clients to improve the quality of the spaces in which we live and play.

This tradition of excellence con-

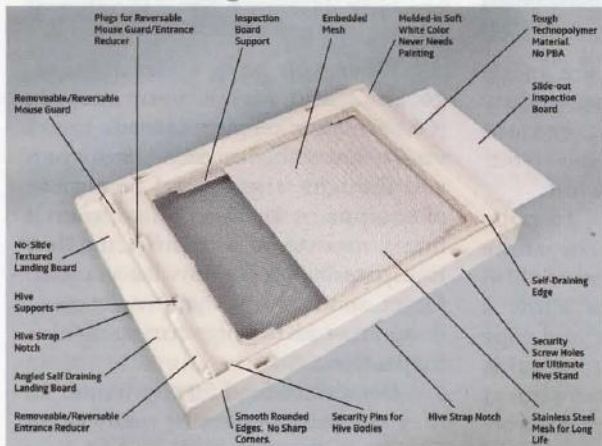


tinues with ongoing development of innovative new products and improved construction techniques.

In addition to the Naked Bee Hive line, LWO manufactures the Woodway and Arboria product lines, which includes high-grade wood lattice, deckrail, post cladding, post caps, fencing products and interior solid wood paneling (Woodway), and distinctive, high quality sustainable furniture and garden structures (Arboria).

You may contact Naked Bee Hives in the following ways: Online Contact Form; Naked Bee Hives, a division of LWO Corporation, P.O. Box 17125, Portland, OR 97217; 503.286.5372; Customer Service: 800.459.8718; Fax: 503.286.4092.

Bee Smart Designs introduces the Ultimate IPM Bottom Board System



Discover the most versatile, user friendly, easy-to-use Universal IPM Board System. With Landing Board, and modular combination Entrance Reducer/Mouse Guards, stainless mesh and Inspection Board plus optional Robbing Screen to make it

easier to keep happier and healthier bees.

- Standard model is for 10-frame boxes with optional eight-frame adapters
- Includes reversible Entrance Reducers/Mouse Guards for three opening functions
- Rounded inner corners restrict hiding places for small hive beetles

Ask Your Dealer or visit www.beesmartdesigns.com.



APICARE forms a protective layer on the receptor cells of honey bee's tissue, disrupting communications points needed for bacteria and viruses to reproduce. This protective layer also makes it difficult for fungal spores to develop. APICARE also stimulates the growth of natural anti-fungal bacteria in the honeybee's gut.

Apicare has tests showing effects against nosema from multiple bee informed partnerships across the country

Presented at 2016 CSBA by the USDA link to presentation <https://www.youtube.com/watch?v=w-64NeenUNPE>

- Increases number of bees that survive the Winter which means increased revenue
- Prevents viruses even black queen cell virus
- Aids with removing toxins
- Prevents bacterial and fungal disease
- Aids in digestion and nutrient absorption
- 100% organic no honey contamination
- Easy application reduces stress in hives

Contact Justin @ 209-777-8985



Beekeepers

The Hive Butler™

"Working, even when you're not!"

Tired of precious honey frames in dirty supers, old coolers or cheap office totes? We sure were. Every time the frames stuck together or gashed each other open, we swore we'd make something better! Something designed just for holding frames securely – something food-grade. No more grass, paint chips, spider webs or bug parts. No more honey lost in a dirty cooler. Harvest equals joy, and profit. Beekeepers work hard – we wanted a better solution for our customers and for ourselves!

Today's consumers, and beekeepers, will appreciate bringing the harvest home in a food-grade HDPE, BPA-free storage tote designed for beekeeping. The large notches hold the frames apart, so even the wonky or extra-wide ones will fit. Additionally, the lid secures the frames from the top.

The Hive Butler™ will hold up to eight deep frames. (We know deeps aren't typically used for honey, but we often find deeps that need spun to make room for brood, and we knew we'd be frustrated if the box only held mediums.)

The Hive Butler™ is very heavy-duty and durable. The extra-large rim was designed in consideration of gloved hands. Carry it from any side, no sag or twist. Stackability was a priority as well. Even with an 80lb-max load, the Hive Butlers™ can be stacked up to four-high. No slip and slide, with the foot and deep lid well holding the stack securely.

The opacity of the box allows light in, which helps deter wax moths while you store your drawn comb in the off-season. (The Hive Butler™ is freezer safe.) Of course, we cannot guarantee that you'll never have a wax moth, but the convenient zip tie holes, and large contact area between the rim of the box and lid will be a great deterrent to varmint large or small.

We knew the Hive Butler™ needed to work year around for customers, so we designed the lid to have an optional, removable center pane, to allow installation of a screen top for ventilation. Now you can use the Hive Butler™ in the beeyard!

Take it with you on your hive inspections – as you remove frames, stow them safely in the Hive Butler™, allowing the screen lid to keep everyone safe – (you and the bees!) If you save one queen from flying off or getting stepped on, you've paid for your Hive Butler™!

Need to make a split? We gave you 1.5" below the bottom of a deep frame, so you find a frame with a queen cell on the bottom, it can safely be transported to the new hive, or yard. Use those zip tie holes to secure your lid when moving bees on the frame.

Collecting a swarm? Carry the 8lb. HB with one hand up the ladder. Drop them in on drawn frames. The lid snaps securely and the frames aren't going to slide as you head back down. No more heavy, slippery wooden ware on the ladder.

The Hive Butler™ will also make a great un-capping tub, and with the solid lid on, should solar melt your cappings in the hot sun. One commercial beekeeper told us he was going to use it as a scoop box, when making packages of bees.

Designed by beekeepers – for beekeepers, and produced entirely in the U.S.!

Hive Butlers™ will be available through our online store at www.thehivebutler.com or our FB page!



DANIELLE'S BEE

Hello bee lovers! My name is Emily Austin. I have been designing jewelry for the past 24 years in Scottsdale, Arizona, specializing in hand setting tiny Swarovski crystals in my pieces.

Several months ago friends of mine lost one of their lovely daughters who was just 21 years old in a tragic accident. Her name was Danielle Côte, a beautiful young lady inside and out who loved the birds, bees, flowers and trees. She worked at a nursery and was very involved in spreading the importance of saving the bees and the planet.

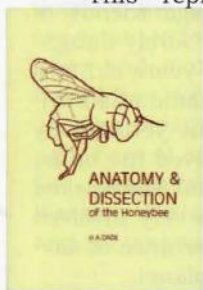
When Danielle's family asked me if I made a bee necklace, I knew I had to do something. Therefore, I designed a bee to comfort her family and help raise money and awareness in Danielle's name. Every bee necklace is made by hand with sterling silver (over plated with rhodium to prevent tarnishing) or gold fill chain and gold vermeil charms. You may choose your favorite Swarovski crystal color in the center of the flower charm. The bee pendant sells on my website for \$95. Fifteen dollars of each necklace will be immediately donated to your favorite bee or gardening organization. Thank you.

Please visit my website for ordering information: <https://www.emilyaustin.com/ProductDetails.asp?ProductCode=bee>



Good Fall Reading –

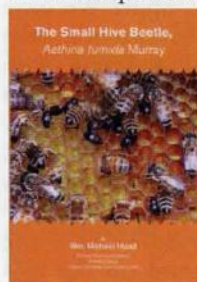
Anatomy & Dissection of the honey bee. H. A. Dade. Published by Northern Bee Books and The International Bee Research Association. ISBN 978-0-86098-280-7. 196 pgs., black and white line drawings. Soft cover. Available at bookstores and Amazon, for \$37.



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*

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 an ongoing basis, and this is the book for you. Check it out.



Kim Flottum

The Asheville Bee Charmer Cookbook. Sweet and Savory Recipes Inspired by 28 Honey Varietal and Blends. Written by Carrie Schloss. 208 pgs., hard cover, all color, 7.25d” x 9.25”. ISBN 978-1-57284-228-1. \$21.95. Available from Agate Publishing, at agatepublishing.com, and book stores almost everywhere.

Now I love cookbooks. I've written several, published more and even did a show for Japanese television on cooking with honey out on the deck. But it's a 'I know what I like' more than a 'I'd just love to try this recipe' kind of thing because I can pretty much look at the ingredients and the technique and taste the result before turning the page.



I've been doing that for years, and I'm pretty good at knowing how something will end up. So, after looking at what's inside this book I decided I had to try some. I wasn't disappointed, and you won't be either. What I like most is that the recipes call for varietal or specific blends of honey. I have some of these. So do you. Get a copy. Make some good food. See if I'm not right.

Kim Flottum

Top bar hive beekeepers – The derth is over!

Simple and easy to manage, top bar hives have been gaining traction in the U.S. as more and more people become aware of the plight of the honey bee. A top bar hive supports the bees' natural systems inside their hive, as well as making life easier for the beekeeper – since there's no heavy lifting involved. But learning about this natural beekeeping method has been difficult – until now.

This professionally produced online class will help beekeepers, both new and experienced, learn the management techniques that work best in a beehive where “It's All About the Wax!” The class was produced with assistance from a grant from the Eva Crane Trust. Dr. Eva Crane, “without doubt – one of the greatest writers on bees and beekeeping in the 20th century, formed

the Eva Crane Trust with the aim of advancing the understanding of bees and beekeeping by the collection, collation and dissemination of science and research worldwide as well as to record and propagate a further understanding of beekeeping practices through historical and contemporary discoveries.”

Taught by Christy Hemenway, herself the author of two books on the subject of top bar beekeeping, the class supports natural beekeepers with practical, real-life methods and richly detailed information on the “why” of top bar hive management. Hemenway's dedication to teaching the underlying reasons for bee management is evident in both her books: *The Thinking Beekeeper - A Guide to Natural Beekeeping in Top Bar Hives* and its sequel *Advanced Top Bar Beekeeping - Next Steps for the Thinking Beekeeper*.

Visit the Gold Star Honeybees

website to get started right. There you'll find information and support, along with all the tools you need to keep bees naturally in top bar hives – including bees! To connect with other top bar hive beekeepers – visit our Top Bar Hive Beekeepers group on Facebook!



Beekeeping with Children and School Groups. By Undine Westphal. Published by Undine Westphal. 143 pages. www.beesfordevelopment.org. 6" x 8 1/2", color, hard cover. £23.00.

Thinking of starting a beekeeping club at an elementary school? Undine Westphal shares strategies and ideas from her experiences teaching beekeeping to school children in Hamburg, Germany for over seven years. This is not a comprehensive book about how to keep bees but a guide in ways to structure beekeeping sessions with groups of school aged children.

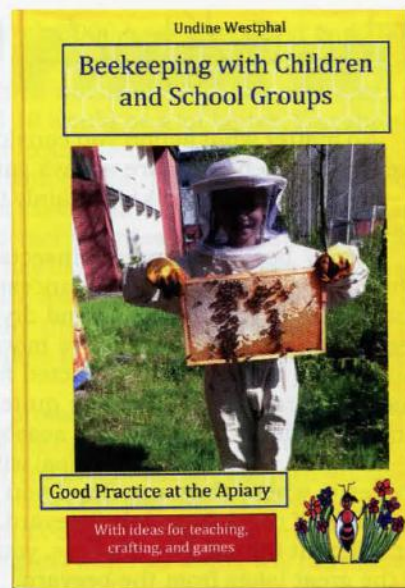
Working with a group of children can be challenging. Add beekeeping to the mix and the need for extensive planning and preparation increases enormously. This book offers suggestions on establishing ground rules, creating smaller groups, and assigning duties to create successful experiences for all. As you would expect, one chapter is devoted to safety issues. Beekeeping does involve fire, potential allergic reactions, and sharp objects. Highlighted side bars throughout the book also offer pre-

cautions and things to be aware for the projects in the apiary.

Each of the 23 beekeeping activities includes a list of required materials and a description of the activity, along with classroom management ideas for varied age levels. Beginning with preparing children for their first hive experience, the author continues with early Spring manipulation, adding a super, swarms, making nucleus colonies, queen rearing, Winter feeding, and more. Tasks involving honey extraction incorporate honey care, bottling, labels and selling honey.

The last section of the book includes 20 craft and game ideas specifically geared for children. For instance, one project involves making a game to match pictures of beekeeping tools with their corresponding vocabulary word. Another inspires children to create a mini pasture puppet theater using a paper plate.

The directions for the crafts and games are in paragraph form. Even though I find numbered steps easier to comprehend and follow, many of the activities are fresh and would be



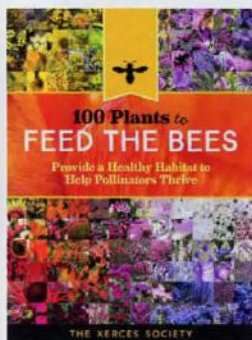
fun for children.

If you are an experienced beekeeper interested in setting up a beekeeping club at a school, with a 4-H unit, or home school group, this book offers great suggestions to get you started and keep you going for an entire year.

Kim Lehman
BC's Kids' Corner Author

100 Plants To Feed The Bees. By The Xerces Society. Published by Storey Publishing. ISBN 978-1-61212-701-9. 6" x 8", 240 pgs., color throughout, softcover (hardcover and ebook available). \$16.95.

This well written, useful and extremely attractive, user-friendly field guide shows what you can do to feed pollinators. The Xerces Society for Invertebrate Conservation offers browsable profiles of 100 common flowers, herbs, shrubs, and trees that support bees, butterflies, moths, and hummingbirds. The recommendations are simple: pick the right plants for pollinators, protect them from pesticides, and provide abundant blooms throughout the growing season by mixing perennials with herbs and annuals! Each flower has excellent photos, info on where it grows in the U.S., what to plant it with, when it blooms, best growing requirements, uses, height, color, more. — *Kim Flottum*



A Practical Handbook on honey harvesting and extracting. By Bill Winner and Doug Somerville. Published by Tocal College, New South Wales, Australia. 8.25" x 11.5", 122 pages, color throughout. Soft cover. Hardcover \$30A, plus post. Digital version available.

Honey Harvesting and Extracting is from Australia, but it might as well have been written in Iowa. It's primary audience is for the commercial market, but backyard beekeepers will learn much from this as it is a multitude of things that can go wrong when moving honey from hive to honey house to uncapper to extractor to storage to market. Plus, much of what our soon-to-be food safety regulations will become are already standard and we do have much to learn to catch up to the rest of the world.

"This practical guide will assist beekeepers whether they are small-scale recreational or commercial operators," Dr Somerville said.

"It has important information on the best way to handle honey, including food quality, food safety and compliance with basically international legislation and regulatory

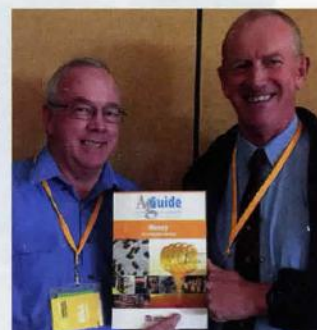
principles are covered in the guide.

Dr Somerville said the guide outlines the best principles for the design, construction and cleanliness of a honey house, and there is also a section on mobile extracting plants, as many of the requirements for central extracting plants also apply to mobile plants.

I've not found an up-to-date resource like this, and with new laws coming into effect, US beekeepers can use every resource they can find.

The Honey harvesting and extracting AgGuide is available in hard copy, online from www.shop.nsw.gov.au/pubdetails.jsp?externalCode=B966 or mail order from Tocal College or as an ebook through iTunes and Google Play.

Kim Flottum



The Editor's Hive -

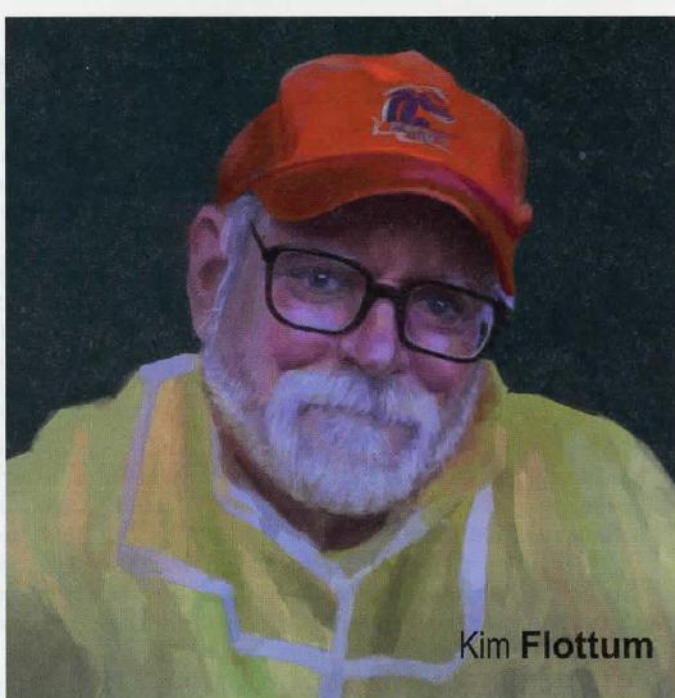
No matter what action you consider relative to honey bee management, you are always safe if your first move is - Well, it depends. This is certainly true when preparing your hives for Winter.

Honey bees are tropical insects, or at least that's where they developed. Their ancestors were more acquainted with rainy seasons and dry seasons than temperate and cold seasons. We've moved them around so much, and have carefully selected for tolerance to cold that some races have become quite adept at handling long, cold, dark, frozen Winter seasons.

Even so, they still have to deal with Winter, whatever Winter is where they are. So, if you and your bees can see the gulf coast from your beeyard your Winter will be far different than if, like my bees, you can see the shores of the great lakes from the beeyard.

And, if your bees can see the gulf, the Winters they will have to endure will be far less stressful than mine, they will most likely have brood and be able to forage for 12 months of the year. Managing bees in the far south is way different than the north in what the bees will need, and when they will need it. Northern bees are already being stretched for food, protection and health issues in October, while these issues don't usually surface until after Christmas in the mid-south and perhaps not at all way far south. So, since northern bees will need the most, now, let's look at what northern bees will need for the next three months, so we can get them ready for the worst, and not have to hope for the best.

Let's start with how much food will they consume between now and the first nectar flows next Spring. Figure late March/early April (and sometimes even later) before nectar and pollen in any abundance is available. That's six-plus month's worth of food. An Italian colony with a population of about 25,000 now will slowly decline in both adults and brood until about January 1, and will consume



Kim Flottum

about 40 pounds of honey. After that brood rearing begins in earnest and between January 1 and April 1, they'll use up 50, maybe as much as 60 pounds of honey. It all depends on the weather, health and the queen's ability to produce a normal number of eggs a day. On average, a good guess as to how much food you'll need for that colony is 90 - 100 pounds right now. If your beeyard is further south, say halfway between the great lakes and the gulf, figure on 40 - 60 pounds, right now. And if gulf breezes are common, maybe none at all, or at most a few frames for those few cool nights you'll have. Otherwise, they'll be able to forage and make what they need as they need it. Mostly, usually. Maybe. If the weather is average, no hurricanes, fires or droughts. Any bets?

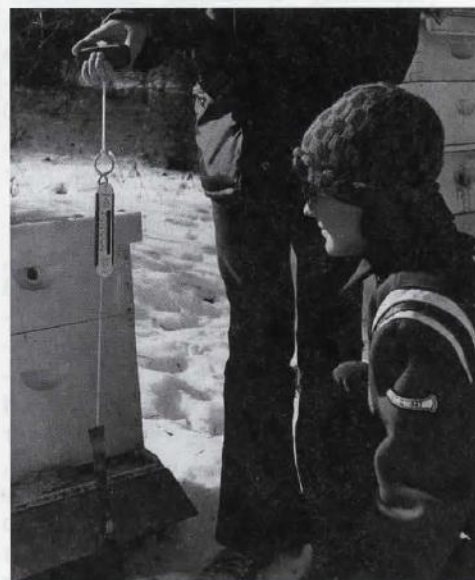
If you have darker northern European bees, like Carniolans or Caucasians, or northern adapted bees like



A plastic sheet with insulation on one side provides a black exterior and a bit of insulation to slow temperature change inside. Easy and affordable.



This is the collapsible cardboard box you can use. Slip it over the colony, fold the flaps down so rain doesn't come in, put a couple of bricks on top to keep the flaps secure and you're done.



This is how to weigh your colony. Lift the front, lift the back, add the two and you have the weight of the colony. Do you need to feed?

the Russians, or even some that have become adapted to where you live now, you won't have that many to start with, say 15,000 or so now, and they will decline to fewer than 10,000 or maybe even fewer, by January 1. Figure maybe 30 pounds of honey for the adults, with probably very little brood to feed. Then, depending on what you have, they'll either gear up and start raising brood to be ready for the honey flow in your area, or, more likely, to be ready for the honey flow where they used to live (Carniolans take off fast, Caucasians and Russians wait until there's lots of food available). Either way, it will most likely be slower than the Italians, so figure maybe 30 - 50 pounds far north, less a bit south. That's 50 - 70 pounds total. A deep has more than that if it's full. A medium with a couple of frames in the brood nest is what it'll take. Most years.

So. As much as 100+ pounds from now to Spring, or as little as 40 pounds. You still have to have it now. You can't hope you can do an emergency feeding in December. Or January. Now is the time to make sure you have that much food available so there is NO stress on the colony, no holding back on brood rearing, no starvation of any kind at all, all Winter long.

If you have to feed carbs there are a number of techniques to get carbohydrates into the colony. Sugar syrup now while it's still warm enough. Jars and pail work on top inside and you can replace them with little disturbance. Don't ever use an entrance feeder this time of year to avoid robbing. You can use an in-hive frame feeder, but you have to open the colony to refill them. Fondant, available from bakeries works too. The good thing about fondant is that you know exactly how much sugar is getting fed. Slice a 50 pound cube into five slices and each colony gets 10 pounds. Lay it right on the top bars, use a shim to make room and put the inner cover over that. If you need more than 10 pounds, add another slice when the first one is almost gone.

Of course honey is always best, and had you saved some in the freezer you'd be set. Or, do you have extra from stronger colonies to share with those on the dole? Either way, honey is best.

OK, that's carbs. What about protein for feeding the young that will be coming along soon? Figure a deep frame with most cells filled with pollen will have 7000 or so cells of pollen. It takes a cell of honey, a cell of water and a cell of pollen to raise a bee, so one frame will raise

7000 or so bees. There's 3000 bees in a pound and 7000 bees will cover three frames or so, and your colony, when the first honey flow hits, will need AT LEAST six frames of bees and brood, and 10 would be a lot better. You should have, minimum, the equivalent of two, and better four frames mostly filled with pollen. That's about six pounds of fresh pollen, right now. Don't have that much? Start feeding pollen supplement patties. Today. But watch for small hive beetles. They like these patties even more than the bees do. If you are feeding these, feed half a patty at a time, throw out any that get beetle larvae in them or dry out, use traps galore to get rid of the adults and keep your eyes open.

But what about protection? How much do your bees need? Northern bees are used to the cold, right? Russians are tough and don't need much. Locally adapted are used to the winters you have where you are, so they should be OK. Well, maybe. Think about this a moment.

Yes, bees from regions with real winter will have better adaptability than the tropical Italians, or those with some of the Africanized blood in them, that's for sure. But even the toughest bees will do better if they have protection from wind, from dripping water from condensation, from pests and predators, from anything that causes stress. They may do OK in a box in the backyard, but they will do better in a protected box in the backyard.

So. Think three things. Wind breaks, ventilation and wrapping. Provide the best of those worlds and you will have nearly stress free bees all Winter. And stress free, well fed bees hit the road running come Spring. No hunger issues, lots and lots of adults and brood coming along, enough room for a good queen to be laying in for even more bees - reduce stress and make their lives better.

So. Protection. Start with wind breaks. Evergreen trees, of course are great, but if you don't have them you can get other items. Think used pallets, a section of fence, better three sections of fence so that the only open side is the leeward side, away from the direction of the prevailing wind. In this best of all worlds, the windbreak will be at least, at least two feet taller than your hive. Three is better. If using pallets, think two layers, with something to fill in the cracks on the outside layer. After Christmas used evergreen trees are free for the picking so get some of those, too. If using fence sections that are essentially solid, make the two sides not quite parallel. Wing them out a little, say a couple of feet so the opening is wider than the back to deflect the wind even more. If



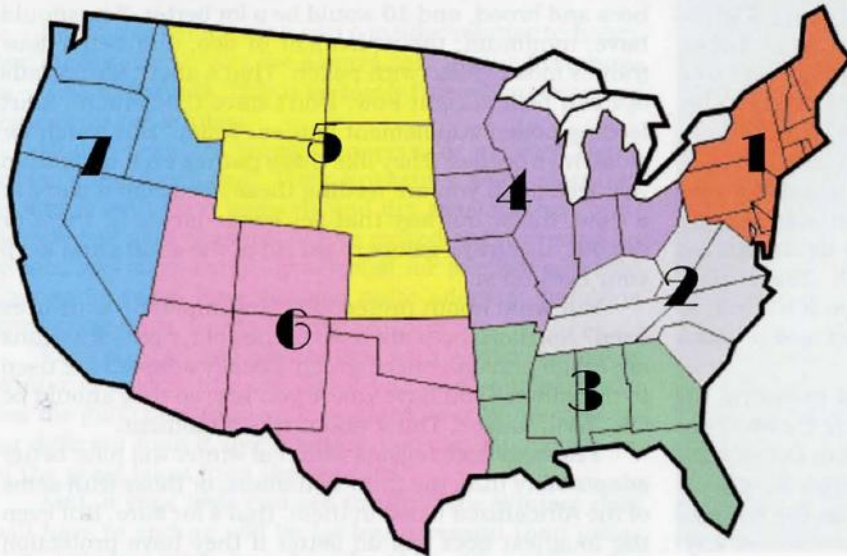
If you feed pollen supplement patties, watch for small hive beetle larvae, and don't feed more than the bees can eat in a few days. Remove infested and dried out patties.

This colony died because it got trapped by cold air and couldn't move to where the food was. A wind break and wrapping would have helped.



Continued on Page 19

AUTUMN - REGIONAL HONEY PRICE, WEATHER AND MANAGEMENT REPORT



Imports, Drought, Wholesale and Retail Demand And Future Plans

Prices and Weather

The evolution of the U.S. beekeeping industry continues unabated, though at glacial speed. Very inexpensive, and by most counts illegally imported honey is slowly gutting the U.S. honey industry on the commodity scale, but, importantly, actually helping on the local level. Imports from several countries have increased dramatically in the past couple of years, while the lack of honey imports from China remains the elephant in the room, or should we say beeyard. At the same time, weather has been the beekeeper's worst enemy this season

with too much rain in some places and far too little in the breadbasket where most of our crop is made each season.

So, we went to our reporters and asked about prices, the weather and some management efforts that will help some of these issues. Here's what we found out.

Overall, 34% of our reporters (primarily our smaller scale reporters) plan to raise prices this year, 59% will remain the same, and only 7% (pretty much our commercial reporters) will lower prices to compete. Regions 1, 2 & 3 are mostly steady, while 4 & 5 are a bit more

aggressive in increasing prices.

Producing less honey and more of something else is always an option, so we asked if that was in the cards next year. Overall, fully 63% said status quo, no change, but 2% will increase pollination, 21% are raising more nucs and queens, while 14% will actually increase honey production to meet local demand.

Then we switched to the weather. Rain was mostly the only topic, with an interesting split. 25% too much, 50% about right, 25% too little. Regions 5, 6 & 7 on the lower side, the rest of us split all over the map. It will be interesting to see how NASS

honey production reports later this season reflect this. Big picture, 41% will have a reduced crop, the rest average or a bit above. A couple of caveats here. The survey was, perhaps, a bit too early to grasp final numbers, and, no single region was all up, or all down. Time will tell here, as will NASS.

Summer weather will dictate some management chores, too. 70% will be Fall feeding with carbs, 29% with protein, 37% will be combining their colonies to take their winter losses in the Fall (I wonder how either NASS or BIP figure those numbers?), and 57% will be double checking queens before Winter really sets in.

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	1.88	2.12	2.33	2.18	2.08	2.18	2.08	1.50-2.50	2.16	2.16	2.22	2.27
55 Gal. Drum, Ambr	1.80	1.98	2.19	2.26	2.06	2.07	2.06	1.35-2.70	2.09	2.09	2.12	2.12
60# Light (retail)	205.00	182.25	198.33	223.75	192.45	174.94	180.00	129.00-250.00	195.40	3.26	208.53	205.81
60# Amber (retail)	203.50	201.83	191.67	194.33	203.16	171.62	180.00	129.00-300.00	191.82	3.20	200.72	202.48
WHOLESALE PRICES SOLD TO STORES OR DISTRIBUTORS IN CASE LOTS												
1/2# 24/case	95.78	74.60	88.80	67.50	87.68	84.00	87.68	60.00-121.20	84.76	7.06	87.32	83.08
1# 24/case	131.61	107.23	137.69	110.91	148.00	128.78	128.40	86.40-192.00	126.27	5.26	128.69	124.28
2# 12/case	119.23	95.88	115.27	95.87	120.11	100.80	114.00	70.00-192.00	109.22	4.55	112.74	110.67
12 oz. Plas. 24/cs	105.38	87.25	82.00	83.86	91.51	107.00	97.20	30.00-148.00	94.03	5.22	101.06	99.08
5# 6/case	144.56	106.00	154.35	105.25	134.14	136.00	134.14	71.50-210.00	127.53	4.25	127.95	129.45
Quarts 12/case	198.86	134.88	129.00	165.05	185.00	135.08	132.00	109.20-275.00	153.10	4.25	152.12	149.32
Pints 12/case	117.74	86.25	86.20	109.00	111.00	75.73	84.00	65.00-168.00	96.02	5.33	93.22	91.94
RETAIL SHELF PRICES												
1/2#	5.96	4.15	4.70	4.47	5.00	3.84	5.40	2.68-9.00	4.96	9.92	4.74	4.55
12 oz. Plastic	7.36	4.59	5.68	4.77	5.00	6.50	5.73	3.79-12.00	5.80	7.74	5.84	5.83
1# Glass/Plastic	8.26	6.73	7.65	6.26	7.50	6.50	8.00	3.00-14.00	7.37	7.37	7.39	7.20
2# Glass/Plastic	14.27	11.37	12.60	10.28	10.00	9.00	14.00	4.79-21.00	12.40	6.20	12.60	12.35
Pint	13.99	9.11	9.24	12.30	9.33	9.65	8.40	6.00-18.90	10.17	6.78	10.45	9.84
Quart	20.06	15.63	17.64	16.20	16.33	16.11	19.10	8.50-32.00	17.31	5.77	17.04	16.75
5# Glass/Plastic	30.24	26.00	37.13	23.67	26.00	20.63	28.64	15.00-43.50	28.03	5.61	26.99	26.80
1# Cream	10.62	8.85	11.25	8.12	16.00	5.50	9.00	5.50-16.00	9.91	9.91	9.29	8.86
1# Cut Comb	14.56	9.38	8.33	11.10	10.00	6.50	14.00	5.00-24.00	11.59	11.59	11.54	10.75
Ross Round	9.99	6.65	20.00	10.83	11.68	10.50	8.40	6.00-20.00	10.36	13.81	9.56	8.94
Wholesale Wax (Lt)	9.75	5.08	5.80	5.48	7.61	5.00	6.00	3.00-15.00	6.21	-	5.94	6.16
Wholesale Wax (Dk)	10.50	4.72	5.00	4.95	6.28	4.50	5.00	2.00-12.00	5.56	-	5.39	5.58
Pollination Fee/Col.	96.00	60.00	68.33	77.50	80.00	95.00	95.00	30.00-150.00	80.00	-	87.58	79.12

OVERWINTERING NUCLEI COLONIES

Some northern beekeepers have success overwintering nuclei-sized colonies. This may be based on a particular stock or genetic trait, and should be tested carefully. More beekeepers are able to overwinter a single, deep hive body by packing the hive out with honey or sugar syrup in the Fall. In addition to food reserves, make sure such colonies are protected from the harsh winds of Winter.

Late Summer and Fall nectar flows. In many northern locations, there are important nectar flows that will make the Summer increase colonies strong in stores and perhaps produce a surplus, depending upon how you have made them up. Look for flows from purple loosestrife (*Lythrum salicaria*), sweet pepper bush (*Clethra*), Japanese bamboo (*Polygonum*), goldenrod (*Solidago*) and asters. Failing that, a good feeding program is essential.

Evaluating colonies. When you evaluate new queens established in increase colonies, there are several characteristics to consider:

Brood pattern – Look for a compact brood pattern with few missed cells.

Hygienic behavior – Test for hygienic behavior using the frozen brood or liquid nitrogen method for definite results. Lacking that, look for rapid cell cleaning if infected with chalkbrood.

Comb building/propolis – Excessive brace and burr comb, as well as excessive use of propolis, are no excuse to send a queen packing.

Temper – How defensive are these bees? Are you getting too many stings? Remove ‘hot’ colonies from your apiary and requeen.

Temperament – Are the bees quiet on the comb or running away as you work the hive. Quieter bees are easier to work and their queen is easier to find.

Food gathering – Are the bees adding to the stored food in the hive? If one group of colonies needs feeding while another is producing honey, that should tell you what to do.

Pollen storage – A band of pollen between the brood and the honey on a brood frame tells you a great deal about the pollen foraging of a colony. You want colonies with good pollen foraging behavior and reserves.

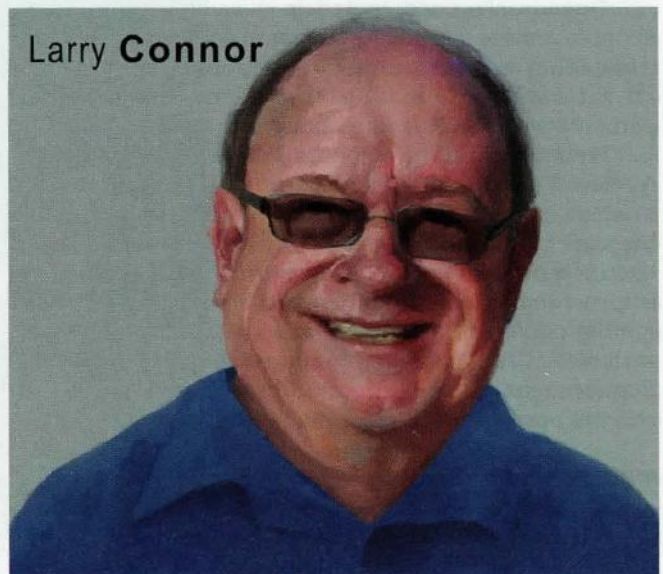
The queen is the wrong color for your tastes. Having said that, I try to ignore queen color, knowing some beekeepers want darker bees because they believe they are more *Varroa*-tolerant and work better at low temperatures and low light conditions. Other beekeepers want only bright yellow queens because they are easier to spot on the comb.

Incorporating key concepts from Brother Adam and G.M. Doolittle, beekeepers can successfully overwinter nuclei colonies. They mate and evaluate queens in Summer nuclei and overwinter the best for Spring increase or replacement hives. Two commercial beekeepers from Vermont, Kirk Webster and Mike Palmer, have developed similar and successful programs, both of which influence many beekeepers throughout the continent.

Webster and Palmer use double nucleus hives, an adaptation of the four-way nucleus used by Brother Adam. The colony uses a solid half-inch bottom board and a three-eighths inch rim. The bottom board is divided by a shim or divider down the middle to keep the two colonies separate when a special feeder is put in place. A deep hive body is fastened with a double division board feeder that sits on the center rim and divides the hive to create two separate nuclei. The feeder allows the worker bees to enter from one side only. The double nucleus provides room for four standard deep Langstroth frames for each nuclei. The feeder may be moved to be used as an eight-frame nucleus. Five-frame nuclei are possible when a Masonite™ or thin plywood divider is used.

Kirk Webster

Using double nuclei, Kirk Webster (Middlebury, VT) has successfully incorporated a high level of *Varroa*-mite tolerant survivor stock in his own operation. The spread of *Varroa destructor* in North America prompted





The Brood Factory Apiary wrapped for Winter.
(photo by Mike Palmer)

him to obtain long-term survivor stock from the USDA bee-breeding program using daughters of Russian queens from Russia's Pacific coast, an area called the Primorsky Territory where *Apis mellifera* and *Apis cerana* are both exposed to *Varroa destructor*. There, surviving *A. mellifera* colonies gradually developed adaptations helping them to tolerate the mites and increase honey bee survival.

The Russian bees differ from most stocks found in North America which are largely Italian in origin. The pressure of the *Varroa* mite population favored Russian bees that maintain a very small brood nest until the primary spring flow begins (May in Vermont) at which point the colony populations explode. Russian bees produce queen cells throughout the season and have an increased likelihood to swarm. After introducing these genes, Webster's bees are gentle and require minimal stored food for Winter survival.

Webster sets up his colonies as mating nuclei and produces the first queen cells in late May. As the season progresses, he runs five or more cycles of queens through the mating nuclei to meet queen orders and his own needs. At the end of the season he establishes queens that overwinter in the nuclei. His bee-breeding program incorporates 15 different genetic families so he must produce queens from each of the 15 families as well as any new genetic stock he is trying.

Queens are open mated in a semi-remote valley, an area where mating nuclei are somewhat isolated from other colonies and target drones are provided for saturation and mating, thus maintaining a larger percentage of the Russian characteristics.

Webster Winters colonies in four packs of eight nuclei. The colonies are positioned so four double nucleus colonies are shoved together. Empty grain feed bags are used as inner covers to wick out moisture and two-inch insulation is used as a top. No upper entrance is provided. These colonies are then wrapped with roofing paper and the entire arrangement is tied down with cord. Using this combination of genetic control and management manipulation, Webster has been able to run his operation miticide free since 2002.


Mike Palmer

Less focused on developing a mite-tolerant northern stock than Webster, Mike Palmer (St. Albans, VT) seeks to develop a stock that is productive in Vermont. He

treats colonies for mites as necessary and makes up and overwinters double nuclei as a means of keeping his operation filled with productive honey-making colonies. He makes up nuclei during the Summer, at least ten weeks before the end of the main brood rearing cycle in northern Vermont. As they enter Winter, he provides young, newly mated queens with three and a half frames of honey in the lower chamber and four frames of honey in a second box.

Palmer identifies the least productive colonies in his operation and eliminates them to create nuclei. None of the original colony remains. From the middle divider, each colony gets an empty frame, a frame filled with brood, a partial frame with brood, and a frame of honey. They are given a queen cell the following day.

Overly strong nucleus colonies are cut in strength by removing a frame of brood. In September, both sides of the double nuclei are fed sugar syrup so three and a half frames are filled with honey or syrup, leaving half a frame for late brood to emerge and provide a cluster space for the bees. A second box of honey is added as an additional, divided box. The Winter cluster is very small and is given just 20-25 pounds of stored food. Most of the consumption of Winter reserves does not take place until April.

The double nucleus may be wintered by itself on an empty hive body as shown in the photos or on the inner cover of a strong production hive. On top of the double nucleus, Palmer adds a two-inch piece of insulation under the telescoping cover. The lower hive is wrapped with roofing paper, and the double nuc is given its own Winter wrap. 



Rock Bridge Trees

Trees Grown On Purpose For A Purpose

Trees to Fill Your Nectar Flow Gaps Where are Your Gaps?

Sourwood	30' Zone 5-9	Blooms Jul-Aug
American Linden	80' Zone 3-8	Blooms Late June
Little Leaf Linden	80' Zone 3-7	Blooms Early June
Black Locust	50' Zone 3-8	Blooms May
Seven Sons Tree	25' Zone 5-9	Blooms Aug-Sept
Korean Bee Bee Tree	30" Zone 5-8	Blooms July-Aug
Northern Catalpa	90' Zone 4-8	Blooms Late June
Southern Catalpa	50' Zone 4-8	Blooms Early June
Tulip Poplar	90' Zone 4-9	Blooms May
Tree Lilac	25' Zone 3-7	Blooms May-June
Glossy Abelia	06' Zone 5-9	Blooms May-Frost
Summersweet	3' to 6' Zone 3-9	Blooms July-Aug
Japanese Pagoda Tree	60' Zone 4-8	Blooms July-Aug
Golden Rain Tree	30' Zone 5-9	Blooms June-July
Black Gum	40' to 60' Zone 4-8	Blooms May-June

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you have the means, put a partial roof over this enclosure for even more protection. This isn't reasonable if you have several colonies, but don't skimp on the back barrier one bit. Sides are a luxury, but your bees will appreciate it.

Ventilation. Even if you are not going to wrap your colonies, think about ventilation. With new-ish equipment there aren't many, or any chinks or cracks and the bees will have sealed all box junctions with propolis, so there is no way for warm air, laden with moisture, to escape. As the bees warm the cluster, warm air rises, drawing in cooler air from the front door opening below. The warm air leaving the cluster rises, rubbing off the cold sides and eventually hitting the bottom side of the inner cover. If it doesn't have anywhere to go it will sit there and slowly condense, like your breath on a window on a cold morning. The condensation will collect, gather together and finally form drops which will fall to the top bars below, run down the sides of the boxes and some will fall onto the bees below. What you'll see when you open the colony below the inner cover is frost on the top bars, some of the comb on those top frames, and some perhaps on the bottom board. The water that falls on the cluster below drips on the bees on the outside top of the cluster and gets them wet, on the cold side of the cluster, and makes it a lot harder to keep warm. Imagine being outside when it's 30° and somebody dumps a pail of 33° water on you. Brrrrrrrr.

To avoid this, the warm air needs an unobstructed path to the outside, where it will there condense and crystalize and fall to the ground, and not on the bees. You can do this several ways. The diagram shows one

of the best ways I know. It has two adaptations to look at that can both be provided in other ways if you use your imagination. First, it is made of thick Styrofoam insulation cut to fit inside the rim on the top of the inner cover. This keeps the inner cover warm, so warm air rising and hitting the bottom of the inner cover doesn't condense, but rather keeps rising or escaping with all its water still as vapor. It also provides an escape route for that air. There's a channel that lets the air rise, escape through the hole in the inner cover and keep right on going to the outside. Because the channel has insulation above it the escaping air remains warm and doesn't condense until it's outside. Another plus for this technique is that it provides an excellent upper entrance for the bees if accumulated snow has blocked the entrance at ground level.

Using these ideas, you can imagine a number of ways to insulate the inner cover and provide an escape. You can make these easily enough and they will save your bees an immense amount of discomfort, grief and even death. Cold, wet dead bees are a mess to clean up in the spring. Provide good ventilation.

Finally, let's look at wrapping. I learned to keep bees in central Wisconsin, where Winters are a serious matter. And even though Winters in northeast Ohio aren't quite as wicked as Wisconsin, I still wrap my bees every Winter.



Don't forget mouse guards to keep mice out, and reduce the breeze coming in a large front door.

Wrapping does several things that are positive for the bees. First, a good wrap is a perfect windbreak – every crack is covered (but don't neglect a windbreak if possible). Second, a dark material – roofing paper, plastic sheeting or the like – will warm the inside of a hive far more than a white box on a sunny Winter day, no matter how cold the air temperature is. It won't get cozy inside, but it will help warm the air surrounding the cluster and allow the cluster to more-easily move a bit to where there is more food. And, because it keeps the air inside warmer than a not-wrapped hive, when the sun goes down in the evening the wrap slows the cooling rate of the air inside and allows the cluster to reform in the right place.

Of course a wrap will also reduce ventilation if not applied correctly, and you'll still end up with cold, wet, dead bees.

What to use? Well, there are several materials available from bee supply companies that work well. But simple roofing paper works also. It's weather proof, can be applied with a staple gun and is reusable. It's also probably the least expensive material you can find. I use the thin plastic sheeting with a thin layer of fiber insulation on one side. It too can be applied with a staple gun, and comes in rolls, or sheets to fit a single colony.

There are corrugated, weather-proofed boxes that you can slip over a colony. Each end folds to close the box. To use, remove the cover and slip over the hive and fold the flaps down that overlap. The folded flaps allow more than adequate ventilation, but not an upper entrance. They too last a long time.

So. Windbreaks. Ventilation and wrapping. Three things you can do right now to protect your bees from the worst of Winter. 🐝



Even if you don't wrap your colonies, a evergreen windbreak will help a lot.



Some beekeepers will gang their colonies together and wrap them as a bunch. This means every colony is protected on two sides with an insulated wrap and two sides with another colony.

Find A Bee School

Indiana Has A Great Bee School For Beginners, But Nearly Everywhere Has One. Find Yours This Fall Or Spring.

Ryan Trares

Buzz filled the hallways and classrooms of Decatur Central High School – Indiana Bee School was in session.

First-time beekeepers learned how to identify a queen bee in their hives and how to don a hood to avoid stings.

More advanced students listened as world-class experts demonstrated how to rear healthy queens. They discovered secondary pests of bees, such as wax moths and zombie flies.

Beekeepers from all over the state swarmed to the 14th annual Indiana Bee School last February. The day-long seminar offered a one-stop learning environment for everything from proper hive management to bee behavior and honey extraction.

than 1,000 people attend the bee school, with another 200 who wanted to come but didn't get tickets before it sold out, Shenefield said.

Andrew Gray and Melia White of Indianapolis came to glean what they could about raising bees. Gray knew a friend who had bees and thought it would be fun to try to start his own hive.

They had joined a small bee club in Mooresville, where the members encouraged them to attend bee school.

"We didn't know anything about it but thought it was a great resource," he said. "It's been very informational so far. A lot of people have talked this up."

The main goal of the bee school is to make new

keepers comfortable with the hobby and to ensure they have that initial success to stick with it, said Mike Seib, one of the school's coordinators.

Such a large number of beginners had signed up that three full classes for newbies were offered, each class comprised of four sessions during the day.

"Honey bees are having a lot of trouble surviving in the current environment, with more chemicals and more pests coming in," Seib said. "People are getting involved in beekeeping,



While the focus is on education, it also gives bee enthusiasts a chance to catch up on the past year's honey harvest, hive health and overall bee activity.

"It's an exciting time in beekeeping. We keep getting more beekeepers all of the time," said Dave Shenefield, president of The Beekeepers of Indiana. "New bee clubs are forming all of the time. That means we have a responsibility. It's up to us to educate people."

The bee school is an annual event organized by The Beekeepers of Indiana, the state's main apiary organization. The group is composed of two separate beekeeping associations that joined together in late 2015, and this session of bee school was the first time everyone would be gathering as one.

Attendees arrive around 8:00 a.m. and stay for the entire day. A group lunch is included, as are social events such as a silent auction, a live auction and a raffle. More

and they're getting discouraged if they buy their bees and they die that first year. We are trying to show them how to prevent that."

Orleans beekeeper Rebecca Eldridge has been raising honey since she was a young girl. The 19-year-old was an award-winning young beekeeper in 2010 and was named the state's Honey Queen in 2015.

Despite her years of experience, she remembers what it was like when she first started keeping bees.

"It's really a beautiful thing to start to see these things," she said. "It's fantastic to see how bees take care of their colony."

Eldridge walked people through honey bee biology, identifying drones and workers and the bee life cycle. She helped explain the best ways to start a hive, either through a nucleus colony or a shipped package of bees.

Explaining the "waggle dance," she showed how bees

let each other know where the best flowers are.

But one of her best pieces of advice was the reality of keeping bees.

"You will get stung. Sorry to burst your bubble," she said. "I've heard one beekeeper say we're part of an extreme sport, and that's true."

Nearly 20 experts and guest speakers appeared throughout the day, highlighted by keynote speaker Kim Flottum. A researcher with the U.S. Department of Agriculture's Honey Bee Research Lab in Madison, Wisconsin, Flottum focused on honey bee nutrition and diseases.

In his course on making honey, Flottum emphasized the importance of plotting where your bees would be searching for food. Using simple technology such as Google Maps, you can make sure your hives are within flying distance to forests and other sources of pollen to ensure a good honey harvest.

At the same time, it is imperative to keep track of the queen, when she'd be laying eggs, and when the hive population would peak.

"You absolutely have to know what your queen is doing," he said. "No exceptions, no excuses."

In another classroom, Kathleen Prough made sure beekeepers were aware of secondary pests that can wreak havoc on the hives. Indiana in particular has a big problem with yellow jackets which can invade a hive and take over.

"They take advantage of a weak hive. They're opportunistic little monsters," Prough said.

The Franklin resident is the chief apiary inspector with the state Department of Natural Resources, inspecting all of the hives in the state. She has seen what makes a hive successful and the mistakes that cause beekeepers to lose bees. That's why programs such as the bee school are so important.

"Education helps everybody, and it helps with beekeepers. It's nice to have a place where you can go and learn about beekeeping, the different things you need to know, what you need to be aware of," she said. "You should always be trying to learn something new. You should always be learning. This is a good chance for people to get here and learn something new."

When keepers weren't in class, they were browsing through the bazaar-like marketplace set up for everything bee-related.


Vendors sell everything from books to honey molds to protective gear. Beekeepers offered honey sticks, butter-whipped honey and raw honey straight from the hives.

New apiarists could pick up hand-crafted hives for their emerging operation, while established keepers checked out the latest mite repellent to keep their bees healthy.

Juanita Graham, co-owner of Graham's Bee Works in Morgantown, stood behind her table, unloading equipment and getting ready for a day's worth of beekeeping questions.

Her table displayed a wide array of beekeeping literature, tools and other supplies. One of their biggest features was a selection of nucs – nucleus colonies that people can use to start a new hive.

Graham has been attending the bee school since the first session in 2002. The event offers a chance to connect with the beekeeping community from all across the state, all in one place.

"We've been doing this since 1994, and I've found that beekeepers are the most honest, good-hearted people," she said. "This is a great group of people to be involved with." 

Ryan Trares is a staff writer for the Daily Journal.



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Beeswax And Candles

Using this valuable honey bee product

~James E. Tew



It is late November, cold and raining. The yard is loudly quiet. No bees flying, no birds singing, no noisy insects – just quiet, cold rain. What to do? Reflect about last year or anticipate next year? As I stood in the yard, I decided to do some of both. *(I did note that we were able to stop the bee shack roof from leaking by applying caulking last Summer – but it still is in need of painting.)* In a friendly way, the Winter beeyard is a lonely, reflective place.

The honey – both extracted and comb – has been processed and is history. I got a decent crop – not great. For the most part, the wax crop has been rendered and is in holding as rough-rendered cakes. Now that things are so quiet with little beeyard work to do, it seems appropriate to turn my energies back to the wax crop.

Beeswax Production

Beeswax is produced as a highly vaporous liquid by four pairs of glands on the bees' bottom side. The liquid wax flows onto eight "mirrors" or shiny plates where it rapidly hardens into small, white flakes. Strangely, bees often drop these flakes where they can be seen accumulating on the bottom board. They are not retrieved. These discarded wax scales are an indicator that a nectar flow is underway. The wax-secreting bee uses a long spine on her middle leg to pass the crumbly flake to the front legs where it is chewed, enzymes added to harden it a bit, and then – using jaws that look like a couple of cement workers' trowels, it is molded in the familiar new comb that beekeepers have seen in past Spring seasons.

Wax is produced only when storage comb is needed. That is usually during spring and early summer in most parts of the USA. Since it takes about eight pounds of

honey to produce one pound of wax, it is a building material that bees do not produce unless it is needed. When a hive becomes packed with honey and nectar, returning field bees, loaded with nectar have no place to unload. During these times, even the house bees' internal storage structure (the crop) is filled with nectar. Bees that are of the right age, forced to hold surplus nectar, will involuntarily secrete wax. The beekeeper cannot make bees secrete wax – short of feeding heavy sugar syrup.

At this point in the crowded hive, the bees do one of three things:

1. If the hive is not given extra space, they do nothing. So part of the honey crop is lost.
2. In early Spring, crowded bees will swarm and again, part of the honey crop is lost.
3. The colony is given extra space, so it can build comb and continue to grow and store surplus honey.

Before the major flow starts, be sure to give colonies the space they need BEFORE they need it.

Processing Beeswax

Melting down beeswax is a pleasant process. Beeswax has a pleasant aroma. However, beeswax is highly flammable and can result in a quick, hot fire. In many commercial beekeeping operations, the wax rendering facility is a separate building from the main facility. Beeswax melts at 147°F and molten wax floats on water. Beekeepers having only a few hives can render a small amount of wax in a double boiler where it can be ladled off and allowed to solidify into molded beeswax cakes. For larger operations, there are many models of melting devices that can be used to melt beeswax. Though most of these devices require hot water to accomplish wax rendering, some wax melters use hot air as the heat

source. Wax is extremely durable and stable but will readily absorb residues from surrounding chemical sources.

A popular melting device for the hobby beekeeper is the solar wax melter. It is primarily a box, painted black on the outside and white on the inside with a glass covering. The box is normally tilted in order for melted



A double boiler hobby wax rendering system.



Cakes of rough rendered beeswax.

wax to run out into a collection pan. Many times, discarded refrigerators with the door replaced with a double glass cover have been modified into solar wax melters. Other beekeepers have put their melters on pivot posts to have the melter always facing the sun.

Though solar wax melters are extremely cheap to use, they are inefficient. Probably only about 50% of the wax is recovered from a solar melter. Additionally, old hard combs are nearly impossible to melt in solar melters.

Slumgum

Slumgum is that ugly residue that clings to the bottom of a rough-rendered cake of beeswax. It is made up of everything that is not honey and wax – though it does include a significant amount of wax. As it builds up inside the melter, it begins to form an insulating layer between the heat and the wax to be rendered. Melters require frequent cleaning – a messy job. Having a large content of cocoons and hive litter, the dark slumgum can be pressed under pressure in order to yield more wax, but pressing devices are rarely available to hobby beekeepers. Other than being an excellent fire starter for wintertime fires, slumgum has little use. Neither is it attractive to bees or wax moths.



A box of slumgum and spent filter papers.

Beeswax candles from molds.



In years past, the production of beeswax candles was a prominent reason for keeping bees. Even today, beeswax candles are high quality candles that are nearly smokeless and driplless. Candles can be either poured or dipped. Poured candles are generally smoother, but may not have the character that hand-dipped candles have. Though still available as new devices, antique candle-pouring molds are frequently seen in antique shops and are expensive. Candle making is an aspect of beekeeping that many people do without ever owning a hive.

The Candle Wick. Clearly, a wick is required for a candle to burn. The wick absorbs the wax in a liquid form and burns the molten beeswax absorbed by the wick. Too large a wick and the candle sides burn out from excessive heat, while too small a wick results in a hole burning down the center of the candle until the flame is extinguished. All wicking today is braided. When burned, braided wicking curls to one side and does not require frequent trimming (snuffing). Wicking can be purchased from candle supply stores or from craft shops. Specify the diameter candle to be made when you purchase wicking.

Hand-Dipped Beeswax Candles.

Always remember that beeswax is highly flammable. When making simple hand-dipped candles, liquefy enough beeswax to yield the length of candle desired in a non-ferrous container. Attach a weight to the end of the wicking and dip the weighted wick into the molten wax to the depth desired. Pull the wick from the molten wax and wait a few seconds for the hot wax to solidify. Then dip and wait, dip and wait until the desired size candle is produced. This procedure does not guarantee a perfect candle, but a functional candle will be dipped.



A shop-built jig for dipping eight candles at once.

Poured Candles. Depending on the mold, either tin or rubber, thread the wicking through the mold and pour the molten wax into the mold. Craft stores sell a candle release compound so the wax will not stick to the mold. After thoroughly cooling, open the mold and remove the candles. In many cases, poured candles will be attached by the wicking and will require cutting the wick in order to get two separate candles.

Beeswax Foundation Candles. Beeswax foundation, as is used in frames, can be rolled around a wick to produce a beeswax candle. This candle will burn more quickly than either a hand-dipped or poured candle but does not require any heat or molten wax. Candle sheets come in a variety of colors and are easy to make.

The End of the Year

Finishing the wax crop and pouring a few candles really is the end of the past beekeeping year. Life in the hive goes on. Next year will be more of the same, but with continual



Pouring molded Christmas ornaments.

improvements. Next year, healthier bees, more honey, fewer swarms, and more stories. I'm planning already.

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Jennifer Berry

Fall Inspection For The Southeast

You've got time, but not much!

So far, 2017 has been a fairly decent year for most of us southern beekeepers. Years of disappointing nectar flows, (due in part to water-starved or water-soaked landscapes), didn't occur. This year, when the spring rains did arrive, they stopped just as the bloom began to open, letting the sun shine in and the nectar flow. Assuming we were diligent beekeepers and took care of any issues throughout the Summer, our bees could be stronger than ever going into Winter and hence into the 2018 Spring nectar flow. But, if we haven't prepared our colonies for Winter yet, it's already October, so we better get moving! This is the time to check our colonies for food, queen performance, disease and pest activity, and take care of any other issues as well. So grab those colony data sheets and let's get cracking by checking each and every colony from top to bottom.

Start by removing the lid and looking for small hive beetles (SHBs). Populations are higher than normal this year due to our warm Winter and moist Spring and Summer; therefore some colonies may have more than they can handle. If you see these little black devils scurrying about, placing traps in your colony may be the way to go. There are several on the market and available through the bee supply companies. We've tried them all and have had the best success with the Beetle Jail Baitable (plastic, 2-chambered reservoir, with a center chamber to place bait which snaps onto a frame) and the Beetle Blaster (single chambered reservoir which rests between two frames). Both work by filling them with oil. The beetles scurry into them to hide from the bees and end up drowning in the oil. However, be careful when

filling these traps to not fill them to the top. Only fill the reservoirs about half way, otherwise you may spill oil onto the bees when placing them into the hive and the oil will kill bees **instantly**. Since temperatures are still warm, beetles mainly keep to the outskirts of the hive, so place the traps where you see the most beetles. As temperatures begin to drop they will begin to migrate towards the cluster. But, for now, most SHBs can be found in the upper supers, hiding in the corners and in-between the frame parts. A word of caution; SHBs love frame spacers and plastic frames because they provide little pockets into which the beetles can hide and disappear.

Another new strategy for dropping beetle populations, is a Brawny Dine-A-Max beetle towel. It's basically a micro fiber, industrial paper towel, that the bees chew on, causing it to

be turned into fluffy/fuzzy material. Once the towel has been transformed the spines on the beetle's legs become entangled and ensnared in the fabric. After a few weeks, the fabric may be covered in beetles or not. Every colony is different. From my experience, if the bees heavily propolize the towels, then very few beetles get trapped, but if they don't and "fluff" them up, then there are plenty of beetles caught within the threads.

The next task is to assess the amount of honey stores. Depending on numerous factors, nectar flows can differ drastically from one apiary to the next. If flows were below par, or too much honey was taken for human consumption, feeding must become a priority. Once the temperature drops, it is difficult for the bees to break cluster to collect and store the food. All the syrup in the world will be useless if the bees



A Small Hive Beetle larvae mess. My advice - trash this frame.



Lots of honey stores.



If there isn't much stored honey, you'll have to feed a 2:1 (sugar:water) sugar syrup.

can't get to it. And think in terms of gallons when feeding. It has been my experience that five gallons of a 2:1 sugar solution (two parts sugar to one part water) will yield one full medium super (roughly 35 pounds). Depending on your neck of the woods, this may not be enough. If you are unsure of how much honey is required to get a colony through Winter in your region, consult an experienced beekeeper in your area. The further north bees are kept, the more honey is required to survive the Winter. The rule of thumb we go by this time of year and here in the Piedmont region of Georgia; for every frame of bees/brood, they will need a frame of capped honey. But depending on how the Winter shakes out, you may still need to feed during the critical months of January and February when the queen is laying eggs like crazy in anticipation of spring.

A word of caution; feeding this time of year can be tricky, so be careful not to trigger robbing (when bees from a neighboring colony/ies invade and steal most or all of the invader's honey). A single drop of sugar syrup clinging to the side of a colony or spilled at the entrance will attract attention, especially if nothing else is available. Once bees start robbing it becomes a feeding frenzy, with even strong colonies succumbing to the onslaught. That is why I don't use top feeders, entrance

feeders, or baggies. We use two to five lb honey jars, so I'm feeding one gallon at a time. Also, if a colony is starving or in desperate need of food and the weather outside is chilly, I can put the food directly above the cluster so all the bees have to do is lift their heads and eat. Bees cannot, will not, break out of the cluster and traverse across cold surfaces in order to eat. They just can't do it. So another item for your check list is to make sure the honey is properly placed. Honey should be above and surrounding the sides of the cluster. Not on the bottom. As winter progresses, the bees move up and into the supers above.

Next moving into the brood chamber, check the viability of the queen. How does her brood pattern look? Are there skipped/open cells? Do you see any supersedure cells? If the pattern is spotty and the colony population is weaker than most, you may want to look for other problems first, such as disease or mite infestation before automatically assuming there are queen issues. However, the queen could be old, poorly mated, injured, or not properly reared. If you determine that the queen is failing, and the colony is weak, your best bet is to combine the colony with a strong one or one needing a boost. Weak colonies rarely survive the winter, so there's no sense in allowing the colony to limp along when you could have spared the

bees and equipment from eventual disaster. Plus, re-queening this late in the game can be tricky, even if you could find a supply of queens.

Goldenrod blooms in North Georgia during September and moves south, with the Piedmont region usually experiencing a pollen flow by early October. So far, there's good ground moisture in place and plenty of sunshine, so the south should experience a decent bloom. In years past, drought prior to, or excessive rain during the bloom meant minimal amounts of late-season pollen. Since adequate amounts of pollen must be available to produce winter bees (which we'll explore in a minute), check the pollen supplies. If pollen stores are lacking you may not want to wait for the fall pollen, just in case it doesn't materialize. Pollen patties are simple and easy to install and can be purchased already mixed together or in powder form. You may want to try several to see which you prefer. Another word of caution: SHBs love pollen patties. If you are seeing SHBs, portion out the pollen patties in stages (a $\frac{1}{4}$ or $\frac{1}{2}$ patty at a time) otherwise they remain in the hive too long and the beetles will oviposit into them creating a wiggling, disgusting, beetle larval mess.

Next, examine the brood area for disease. You want to see healthy, white larva in the cells. Also, look for depressed cappings or ones with holes. Open these and inspect the pupae. Anything slightly off-color may be a sign of trouble (unless the pupa is in its later stage of development). Again, if you are unsure about what may be ailing your colony, consult a professional for diagnosis and treatment options.

Another chore before the Winter winds come a howling, is to inspect your equipment. Move frames with old comb to the outer edge so that they can be removed in the spring and replaced with new foundation. Old brood comb is a reservoir for numerous contaminants, which can be detrimental to the developing brood and should be removed every two or three years. Replace old, decrepit hive bodies, supers, lids, inner covers and bottom boards with newer equipment. Bee hives don't have to be pristine little palaces; however, they do need to protect the bees from the upcoming frigid Winter weather. Gaping holes and cracks



Poor brood pattern. NOT what you want going into Winter.

allow access for critters to come and go. Mice especially love to make their Winter homes in a bee hive. A continual food supply, plus a warm cozy environment, make hives a suitable rodent dwelling. Structurally tight equipment and mouse guards discourage these unwanted guests.

Queen issues, food supplies, disease, and bad equipment are all things that need to be addressed before the arctic air descends upon us. Yet, there is still one more thing that we must not overlook: *Varroa* mites. By the end of Summer, mite populations may be skyrocketing. Please don't wait until your colonies are crashing. Once the downward spiral begins, it is almost impossible for them to recover. Check those mite populations today. Not only is it important to get their numbers under control for the existing bees, but also for the future bees that will bring the colony into the New Year. I'll get back to the importance of reducing mite populations, but first let's talk about these future bees.

The average lifespan of honey bees varies considerably based on the season when they emerge. These variations have been designated into two groups of bees dubbed summer bees and winter bees. Summer bees live approximately one month, while winter bees can live anywhere from six to eight months. Winter bees will begin to emerge in August or September, depending on location, and differ from Summer bees by several physiological characteristics. Scientists have determined that the lifespan of honey bees can largely be determined by the amount of protein stored in the fat body, hemolymph, and hypopharyngeal glands. The most

Good brood pattern going into Winter.



notable and scientifically relevant type of protein is the high-density glycolipoprotein vitellogenin. It is loosely described as a female-specific, hemolymph storage protein, or more specifically, an egg yolk protein precursor. However, since worker bees rarely lay eggs, this protein is stored in fat bodies for future use. The relevance of this specific protein is largely based on its abundance in honey bee hemolymph as well as its high zinc concentration which regulates many functions within the honey bee. Vitellogenin is also thought to be a powerful anti-oxidant which significantly slows the effects of aging.

Now, getting back to the importance of reducing mite populations. Higher mite populations going into Fall, (and the viruses associated with them), coincide with the production of these winter bees. Research has shown that mite infestation during the pupal stage has a negative impact on the bees because they are unable to accumulate the necessary hemolymph proteins, including vitellogenin, to the same extent as in non-infested bees, thus reducing their ability to overwinter. In order for the colony to have a chance of overwintering successfully, it is imperative to reduce mite levels before the production of these winter

bees. And to step back even further, the bees rearing the winter bees need the proper nutrition and development as well. They must be healthy enough to rear the winter bees, and the bees rearing those bees need to be healthy, and so on.

Managing mites is the most important and difficult task for beekeepers since it is the number one reason bees die. If mite loads are



Pollen stores.

high or if you are new to beekeeping, we recommend that you treat immediately for mites, especially if you haven't done so this year. We recommend several products for use this time of year, Api Life Var or Apiguard, both using essential oils as the active ingredient. There are temperature restrictions for this product, so follow all directions while using these or any products in your colonies. There are other miticides available, but we have the most experience using the ones with essential oils. Next issue, I will discuss our research results using oxalic acid and vegetable glycerin to combat mites.

Re-queening, appraising honey and pollen stores, checking for mites and disease, inspecting equipment (while keeping robbing at bay) will help the colonies do what they want




Plan on taking enough time to do your assessment right.




to do, survive! By storing honey for energy and pollen for protein, European bees have evolved to survive long Winters. But unfortunately, with introduced exotic parasites, diseases, viruses and a whole host of other non-indigenous species, "we" have thrown this whole process out of

kilter. Now "we" the beekeeper must be better stewards of our bees or face the consequences of finding more and more of our hives devoid of life.

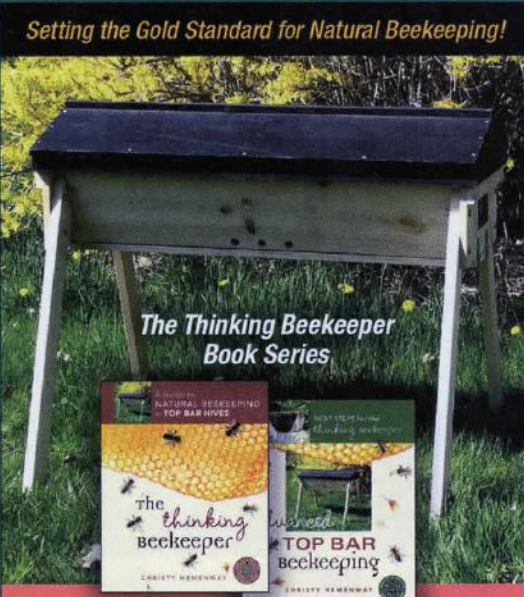
Take care of you and your bees! 

Jennifer Berry is the Research Leader at the University of Georgia Honey Bee Lab.



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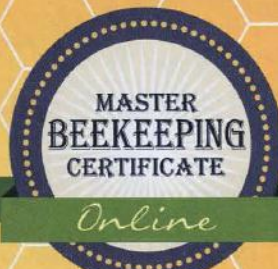


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Got Questions?

Phil Knows!

A beekeeper in Kentucky writes –

Q: I always enjoyed your tips when you were our state apiarist, and your “Ask Phil” column in *Bee Culture* is the first thing I turned to each month.

My question concerns small hive beetles, which apparently was a major issue in Kentucky this year. I had one beeyard with just two hives, and when I concluded they had a mite issue early in the Fall, I put in Miteaway Quick Strips (MAQS), which I'd never used before (hadn't treated with anything for several years). The day after I put in the strips, a robbing frenzy began that I was unable to stop. I'd hoped at least it was one colony robbing the other so that I might lose only one hive and retain the stored honey, but alas, the thieves came from elsewhere and wiped out both of them.

When I opened the dead-out hives a couple days later, I found them absolutely crawling with hive beetle larvae, which took hours to clean out so I could freeze the frames. On the advice of another beekeeper, I mixed up a slurry of mineral salt and dumped it where the hives had been in an attempt to kill the pupating beetles in the ground.

My question is how to proceed in the future. Is mineral salt effective, and how large a radius around the hives must be treated? Should I leave that yard hiveless for a year to interrupt the beetles' life cycle, or do they not winter over in the ground anyway? Would putting the hives a couple hundred yards away make any difference at all?

I've also put vegetable oil traps in some other hives in which I've seen beetles, but they've caught only a couple of them. Those colonies look strong otherwise, but I didn't get down into the bottom box for fear of setting off another robbing frenzy.

Any advice you can offer would be most appreciated – by a lot of Kentucky beekeepers, I'm afraid.

Phil replies

A: In most of the U.S., adult small hive beetles (SHB) are common squatters and pests, and last Summer's rain and humid weather in Kentucky created more favorable conditions than usual for their proliferation. I'm sure that, as beekeepers, we would all like to completely eliminate them from our hives. Hence the numerous commercial beetle traps, designs for homemade traps, and suggestions for soil treatments to kill the beetles in the pupa stage. However, SHB are very difficult to eradicate. You can never kill them all, and if you could, they would quickly repopulate. Adult beetles can fly several miles, are attracted to odors from hives, and are capable, as you observed, of producing thousands of larvae in weak or dying hives, as well as in unmanaged, feral colonies. As the colonies collapse, the remaining bees abscond – fly away to seek out a new home. The adult beetles also fly away to find new honey bee colonies to establish themselves in. Therefore, even if we dramatically reduce

the number of adults beetles in a hive, it's likely to be only be a temporary victory. Because of this, the most practical method of managing SHB is to maintain strong colonies.

A colony with a strong, healthy population of bees can control a large number of adult beetles and prevent damage to the hive. (I've touched on this topic in a previous column; see the June 2013 issue of *Bee Culture*.) Honey bees will literally herd adult beetles into the inner corners of the hive or of the inner cover, and inhibit their reproduction by separating them from their favorite egg laying location – in or on the edge of brood comb. They prefer the periphery of the brood because, like honey bees, small hive beetles require pollen to reproduce. We often refer to the corralled adult beetles as being held in *bee jails*. Understandably, controlling them in this way becomes more difficult as a colony's population drops because of *Varroa*, disease, or queen problems.

In this case, what caused the sudden explosion of SHB larvae in your hive and what set off the robbing? I suspect that all three events; the *Varroa* problem (possibly including your treatment of it), the sudden appearance of the beetle larvae, and the robbing, were interrelated and that they all began with mites – especially since you say you haven't treated with anything in several years. *Varroa* mites weaken hives, and both robbing and the production of large numbers of SHB larvae are common problems in weakened hives. In addition, opening the hive as you did to insert the MAQS, may have disrupted the bees' efforts to control the beetles. You may have unwittingly aided a jail break, but I suspect that it was a jail break waiting to happen. The robbing most likely occurred after the larvae explosion, but it's possible that it happened first and provided an opportunity for the SHB. The bottom line is, weakening of the hives by a *Varroa* infestation is probably what started this sequence of events. I suspect that you waited too long before attempting to control the mites.

Let's talk about the strategies you mentioned for controlling SHB in the future. Applying salt to the ground around a hive is an attempt to interrupt the beetles' reproductive cycle by drying out the soil. As you indicated, SHB larvae must leave the hive and make holes in order to pupate underground. To do that, they need moist earth. Treating the ground around a hive with salt may make it less hospitable to the larvae and perhaps somewhat reduce their ability to achieve the next stage in their life cycle, however, SHB larvae are capable of



crawling long distances. Most of them will probably just crawl to untreated soil. This may be true for any method of ground treatment. Leaving the bee yard hiveless for a year would more effectively interrupt the cycle because, as you suspected, small hive beetles do not Winter in the ground. Only the adults live through the Winter, and they survive by moving into the colonies' wintering cluster during cold weather. Unfortunately, moving hives – either a few hundred yards or to a different beeyard – does not eliminate beetle problems since the beetles move with hives. One thing which will help is destroying the SHB larvae from your dead outs. Don't let them get into the ground. Dumping the larvae and larvae containing frames into a bucket of soapy water will kill them quickly. If the frames are not heavily damaged they can be rinsed off with a hose, dried, and re-used.

I typically have large numbers of adult beetles in my hives and while I occasionally do some trapping, using the small traps that fit between the frames, I have never used ground treatments and rarely suffer larvae damage in my hives. The times when I have had a problem have involved hives that have become very weak, usually due either to the loss of a queen or because I made a new nuc without enough bees to control the beetles. I have always considered these instances to be as much a management problem on my part as a SHB problem. My response is to quickly combine weakened colonies or to disassemble them and remove them from the apiary, shaking any remaining bees from the frames, before the beetles have a chance to gain control.

Of all the management techniques available to

beekeepers to control SHB, maintaining strong, healthy colony populations is by far the most effective. That means monitoring and/or treating for *Varroa* and maintaining queen right colonies. We need to think of adult beetles as predators waiting for an opportunity. The opportunity comes when the population of a hives declines or is weakened and the bees lose control. Listen to any talk on small hive beetle control or read articles on this topic and you will hear the same refrain: *maintain strong colonies*.

A new beekeeper asks –

Q: I think my bees have enough honey to get them through the Winter, but I'm not sure after that. Should I start feeding my hives in the Spring?

Phil replies

Hives should be fed, not according to the season (though there are specific times of year when they are most likely to benefit from supplements), but depending on available food stores and nectar sources. I often draw an analogy to farmers feeding hay to their cows. (Many of the beekeepers in my neighborhood also keep cattle.) They feed with hay, not by the calendar, but rather when there isn't sufficient grass in the fields for cattle to subsist on. We should think about feeding bees in the same way. Hives should be given supplemental feed (typically sugar syrup) when there is insufficient stored honey in the hive, and a lack of nectar for the bees to collect.

How much honey is sufficient? At any time, a healthy hive should contain at least 10 to 15 pounds (the equivalent of about four deep frames) of honey to provide for the colony's immediate needs and to get them through cool or rainy weather when the bees cannot fly to forage. During certain times of year and under certain conditions, such as in winter or during periods of drought, hives require greater quantities of stored food. Without a sufficient amount going into Winter, a colony may exhaust its stores before Spring flowering brings a fresh supply of nectar and pollen, and it will need supplemental feeding to survive. In fact, most Winter starvation occurs in the late Winter or early Spring, so you have reason to be concerned at this time of year.

However, instead of feeding automatically in early Spring, you should first check your hives' honey stores. It is important to know, in the Fall, what your hives food stores are like and to feed, if necessary, before the onset of cold weather. If you're unsure about the stores in your hive and if weather permits (see the question and answer in my *Bee Culture* February 2013 column about Winter feeding and opening hives), open them up and have a look inside. If not, you can get a rough idea by hefting, or lifting up on, the back of each hive. While not as accurate as direct inspection, hefting your hives can help you gauge approximately how much honey is inside by the weight alone. Even with little experience, you can conclude that when a hefted hive feels very light, it is also light on food stores and that emergency feeding is in order. Emergency feeding of hives in danger of starvation should be done using heavy syrup (two parts granulated sugar to one part water) or, as an alternative in the very early Spring, using bee candy. (again, see my February 2013 column for more on emergency Winter feeding). 🐝

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ASK AN EXPERT

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SPECIAL EDITION THE BEST OF TECH-TRANSFER

MELANIE KEMPERS ANSWERS THE QUESTION “WHY DID MY BEES DIE OVER THE WINTER?”

ANSWER: A colony of bees can succumb, over the Winter, for several reasons. The answer often begins at the beginning of the previous year.

VARROA Brood production begins in the early months, while there is still snow on the ground, which means that *Varroa* production is also beginning in the early months.

Did you monitor for *Varroa* last Spring and apply treatments if necessary? *Varroa* reproduce at an exponential rate, and small numbers in the Spring can equal high numbers in the Fall. This increasing population of *Varroa* can cause damage throughout the season. Bees that are weakened by *Varroa* emerge damaged, contract viruses, experience poor nutrition, and typically have low population growth. Reducing the level of *varroa* in the spring helps the colony thrive through the production season.

NOSEMA Did you monitor for nosema last Spring? This Spring, was there excessive fecal matter on the top bars and hive front? Studies show that nosema alone doesn't directly cause overwintering losses, but it does affect population growth and feed storage levels, and can add to a colony's overall stress.

NUTRITION Did the colony experience other points of stress over the course of the previous season? Were there times when nectar and pollen weren't available? Were provisions provided during those times of dearth? Bees that are raised with poor nutrition may emerge stunted, and are less likely to last as long as well-nourished bees. Record keeping can help identify when these issues arise throughout the year. The BeeYardManager app is an example of a good record keeping option.

MONITORING Did you monitor throughout the season? Checking for pests and diseases on a monthly basis



can really help identify when there are spikes in infection or infestation levels. Brood chamber checks should occur at least once a month.

Did you monitor and treat in early fall? *Varroa* can damage the Winter “fat” bees that are being produced before they emerge. Bees that are damaged during their development may not have the ability to process nutrition properly.

QUEEN AGE How old was your queen? Younger queens tend to have better chances of overwinter survival. A population size of at least eight frames of bees will also help the colony survive.

FOOD STORES Did the hive have enough feed stores to last through the Winter? Signs of starvation include a hive that is light in weight; dead bees found head first in the cells; empty frames, or bees “stuck” away from the feed stores.

MOISTURE Was there airflow to keep the hive dry throughout the Winter? Moisture is a by-product of the bees ingesting food and respiring, which creates humidity within the hive body. If moisture doesn't have a place to escape (a tilted bottom board, for example) and the air flow is hindered (such as a lack of both top and bottom entrances), the resultant pooling of water can lead to mould growth and may also dampen the bees.

TEMPERATURE Was the hive sheltered from the cold winds? Was it wrapped for winter? Minimizing temperature fluctuations can help reduce the work the bees need to do to maintain a cluster temperature adequate for survival.

All of these aspects can be controlled by the beekeeper through vigilant management. While some factors cannot be controlled (i.e. environmental contaminants), doing what you can as the beekeeper throughout the season should help diminish Winter losses.

There are publications that offer advice to beekeepers for decreasing Winter losses.

Photo courtesy of Tech Transfer Program.

LES ECCLES ON SUPPLEMENT FEEDING IN THE WINTER AND SPRING

QUESTION: I was watching some YouTube stuff on feeding bees and came across mid-Winter feeding of sugar cakes made of cane sugar, water and vegetable oil, plus another ingredient. On a mild day, a piece of cake would be put under the inner cover. What's your opinion?

ANSWER:

It's hard to make it through Winter without thinking that there's something you could be doing to help out your colonies. Feeding is usually the number one concern as you watch the temperature drop and wonder how much feed the colony must be munching down to stay warm (that cold weather feeding feeling hits a little too close to home, to be honest).

Hopefully, all of the Fall supplement feeding needed to get through Winter was done by late October, and a small amount of Spring feeding may be in order by mid-April. There are a number of reasons why colonies may need supplemental Spring feeding, including:

- 1) Overly strong populations that could be draining resources.
- 2) Cold Winters with little snow cover to insulate colonies.
- 3) Poor Fall feeding conditions.
- 4) Insufficient Winter protection.
- 5) An early Spring that stimulates colony build up, followed by a cold spell that depletes the last of their resources before

Sugar cakes are commonly referred to as fondant. The catch with this sugar supplement is that bees need moisture to take down the fondant and make use of it. There is also a misconception that fondant is stored by honey bees – but it is likely only used while it's being consumed. If there is adequate moisture and temperature for the bees to work the fondant, it can help to get them through a short stretch in the Spring, before a nectar flow begins to get them on their way. It will not, however, help them through midwinter when the temperatures are too cold to “liquefy” the fondant and provide access to the whole cluster.



HOMEMADE PROTEIN SUPPLEMENT RECIPE

PARTS	QUANTITY	INGREDIENT	SPECS	PRICE
8	100 lbs	Granulated Sugar		\$38.00
2	25 lbs	Brewer's Yeast	48% protein	\$39.25
1	12 lbs	Dried Whole Egg	47-48% protein	\$26.40
	5litres	Water		
	3 cups	Veg Oil		\$1.75
	3 cups	Lemon Juice		\$1.25
TOTAL	150 lbs	11.2%		\$106.65

Another method of Spring feeding is to top-feed with 1:1 sugar syrup. This supplements the colony that's running short on feed, and also provides moisture for them to re-process stored honey that may have crystallized over the Winter. This can be done using the baggie feeding method – fill a gallon zip-lock bag with ½ gallon of 1:1 syrup, then lay it across the top-bars; cut two slits into the top side of the bag, then add a rim spacer to give the bees enough space to feed. Depending on the season, a second ½ gallon feeding may be necessary to sustain the colony, as this type of feeding will also stimulate reproduction and growth.

Spring feeding should be a last resort to rescue colonies that did not receive enough feed in the fall to make it through to the Spring nectar flow. Ideally, the goal of spring feeding is not to prevent starvation, but to stimulate the colony to start reproducing and increasing populations quickly to get a jump on the first nectar and pollen flow. It also gives the anxious beekeeper an excuse get out of the house and see how the colonies fared through the Winter.



LES ECCLES ANSWERS THE QUESTION “ARE IN-HIVE SUPPLEMENTS EFFECTIVE FOR TREATING PESTS AND DISEASES?”

ANSWER: Over the last several years, a range of new products has appeared in beekeeping catalogues and magazines that claim to enhance colony health by providing a number of advantages. These range from feed stimulants to formulas that claim to treat pests and diseases such as *Varroa* and nosema. These products sidestep direct claims of treating honey bee pests and diseases, instead using catchwords such as “promote”, “enhance”, “accelerate”, “boost”, and “revitalize” to justify their claims of prevention, treatment, and control of various colony stressors.

Because these enhancement products do not make direct claims about treating a specific pest or disease, they aren't currently required to be registered. There is a significant grey area that allows them to be sold despite the fact that they often share active ingredients with products that are registered for treating pests and diseases.

Our industry has maintained a high standard of approval for products meant to control pests and diseases, bees, and economic advantage for the beekeeper. Although this necessitates a significant investment by the manufacturers, it enables us to provide tested recommendations. Despite the fact that these supplements generally use botanical ingredients such as thymol (thyme), oregano, spearmint, lemongrass and other “natural” products,



their unknown concentrations have the potential to contaminate hive products and negatively to beekeepers due to a lack of evidence supporting their claims.

The best evidence I've seen that enhancement products could provide an advantage is in their role as a feed stimulant, which is an important component of any livestock nutrition program. Work by Frank Eischen at the USDA showed that Honey-BHealthy did, in fact, stimulate bees to consume sugar syrup more rapidly, which in itself could improve the overall strength of a colony. Eischen also saw a reduction in nosema that was comparable to Fumagilin-B.

There may be a place for these supplements in our industry, however we need more evidence about how they work. Their labels should also provide proven recommendations for treatment of specific diseases, as well as instructions on how to prevent hive contamination.

It is generally agreed that the USDA EPA needs to provide a position statement on these products to ensure they are safe, effective, and economical for use. This would also allow those who provide information and training to beekeepers to recommend their use. In the meantime, it is up to beekeepers to understand the risks associated with these products and the unknown benefit of their use.

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ASK AN EXPERT – DANIEL THURSTON

QUESTION

I want to cull old brood chamber frames and replace them with new foundation. How often should I exchange brood frames? How do I tell which frames should be removed? What do I do with my old frames when culling equipment?

ANSWER

Periodically replacing frames in your brood chambers is a great way to incorporate Integrated Pest Management (IPM) into your beekeeping operation. Over time, brood frames accumulate material that can be detrimental to colony health. This accumulation may include the spores of AFB, Nosema, or acaricides from mite treatments. Furthermore, as brood cycles through the cells of each frame throughout the season, the individual cells become smaller in size because a cocoon-like structure is left behind with each bee's emergence. You may have also noticed frames with significant portions of drone-sized cells in your colonies. While some drone production is advantageous, increased drone brood can also result in increased *Varroa* production.

To combat the accumulation of the above-mentioned colony health problems, it is recommended that beekeepers replace two to three old brood comb frames in a brood chamber per season. This level of exchange efficiency should ensure that the potential pest, disease, and chemical resistance influence on the health of your colonies is reduced. Color coding your frames is a relatively simple way of tracking the age of a frame. Using the industry standard for color coding queen years can be applied to frame tracking. In the coming 2015 season, when adding new frames to your colonies, mark your frames blue to indicate the year they were added. During the next few years, mark your new frame top bars white (2016), yellow (2017), red (2018), and green (2019). Coming across a blue frame in 2020 will indicate it's time to swap it out.

Identifying frames to cull out of your brood chambers does not require any investigative equipment or analysis beyond the naked eye. Older frames of comb will appear dark in color – even black, depending on their age – with seasons of brood having cycled through their cells. As a result of this brood cycling, the cell walls of these older frames will appear much thicker than fresh wax cells. As mentioned earlier, older frames may have significant patches of drone-sized cells to indicate their age. The next time you accidentally break a frame, or find a frame with holes chewed through it, evaluate the age of the comb and consider replacing rather than repairing it.

Disposal becomes your next concern, once you have decided which frames to pull. If the frames you're removing are wooden with wax foundation, save them for your next bonfire. They make great fire starters, although you should keep the presence of wax and nails/staples they harbor in mind. If your frames are wooden with plastic foundation, or constructed entirely of plastic, disposal may be



more complicated. While plastic foundation can easily be popped out of a wooden frame, and the frame re-used or burned, you are still left with the plastic foundation – or the entire frame if culling plastic frames. For obvious reasons, it's not suggested you burn old plastic frames or foundation, so as it stands, the landfill is the ultimate destination for these castoff frames. When sending frames to a dump site, they should ideally be placed in a sealed bag to prevent other bees from visiting them and picking up the spores you're attempting to remove from your own hives.

Cleaning/recycling plastic frames is something our industry still needs to work on. While scraping down these frames achieves some level of removal, this practice alone does not entirely clean the foundation. Web content exists to suggest that a mixture of boiling water and lye, paired with a little bit of scrubbing, can return your plastic foundation to a nearly new state. This method, however, doesn't appear to have any research behind it to assure its validity.

Drawing out cells on new foundation takes time and resources, and feeding (in the absence of a good nectar flow) helps the bees do it quickly. Using frames from deadouts or previous years' deep supers – since they're already drawn out – can minimize the time it takes the colony to get up to speed.

Winter provides an opportunity to plan equipment for next season, so consider stocking up on new frames to ensure you'll have plenty to swap for old ones in the Spring.



Try A Nuc Next Year

But Order Early

Ralph Harlan



During our beeschool, there is always discussion about the differences and benefits of packages and nucleus hives, both of which frequently contain approximately the same number of bees. While there is a pretty clear expectation of what comes in a package of bees, it seems that little is discussed of what defines a “nuc”. Since there is some variation in the size of what can be considered as a nuc, let’s first review the concept.

A nucleus hive is a fully operational colony of honey bees that contains frames of drawn comb, a laying queen, some supply of food, and an area on the frame or frames that contains brood. The argument is often made that a nuc will outperform a package based on the facts that there is brood and food with drawn comb and the queen is related to the brood (new work force) in the nuc. That is why a nuc costs more than a package.

The size of a nuc can vary, and is usually determined by the number of frames occupied by the colony inhabiting it. Mating nucs can be considerably smaller than what is typically offered for sale and may contain only two or three frames that are half the size of the standard Langstroth frame, really only one or perhaps one and a half Langstroth frames. The nucleus hives usually found in “queen castles” are either two or three Langstroth frames, and typically are deep frames but medium frames are recently becoming more common. The nucs most often offered for sale contain either four or five deep or medium Langstroth frames although occasionally a six frame nuc comes available.

This variability in size by the number of frames directly affects the survivability of this colony. It is not the question of whether the colony can survive and thrive on its own, but how readily it will be able to do so without frequent intervention by a beekeeper. The smaller the colony is the less the number of bees in it, which directly limits the number of foraging bees available as well as the ability of the adult bees to cover the brood in order to properly keep it warm and feed it. Since brood is a critical factor the more brood of varying ages from eggs to capped brood then the better the chance of the colony survival. As five frames is half of the usual 10 frame colony and since that seems to be the most prevalent nuc available for sale, for the purpose of this discussion we will primarily be referring to a nucleus hive as being five frames. Keep in mind that whether you are buying a three, four, five, or even a six frame hive the “coverage” proportions of adult bees, brood, and food on the drawn comb should be consistent with the number of frames in the box. In the event you are offered a “full hive” of honey bees, you

should expect the coverage should still be within the proportions we are discussing. Keep in mind that a five frame nucleus hive can be placed into an eight or a 10 frame box and still be considered a “hive” of honey bees.

Again, let’s consider that the colony being offered is a five frame nuc. This should imply that it contains five frames of drawn comb with enough bees to cover them! Drawn comb is an expensive commodity for the bees considering the resources it takes to make it. With a limited number of bees available to procure the resources and to actually draw the wax, one frame of drawn comb amounts to a lot of effort by a nuc or a package; more than is implied by the 20% a frame of drawn comb physically occupies in a nuc. Each of those frames of drawn comb should contain food, pollen, or brood. I have heard the argument that a nuc can contain one frame of foundation, supposedly for “expansion” or growth room of the colony. Otherwise, a frame of foundation would only fill space in what would otherwise be a four frame nucleus, it certainly does not hold a food supply that will be provision for the colony or contain brood that is the growth of that colony. It seems there is an ethical question here. If a five frame nuc sells for more than a four frame nuc, then by adding a frame of foundation the cost would go up without providing the benefits of that added frame of food or brood?

Considering that this is a nucleus hive, it is intended to be either moved into a full sized box or sold when it fills the five frames so why should there be “expansion” room? There is no doubt that a nucleus colony can and will swarm, or that it will swarm more quickly than a colony in a larger container simply because if the queen is doing her job well the bees will soon become crowded in such a small space. So, producers of large quantities of nucs have a problem with the delivery time to the customer, especially if they are marketing through a bee supply company. They are locked into being able to provide a strong nuc with a certain number of frames through a middleman to the customer by a set deadline on the calendar, and if a nuc is getting too crowded one remedy is to pull a frame and replace it with one of foundation. The reasoning also is that if a nuc is growing well and the flow has started then the bees will draw the comb on the foundation and put nectar or brood in it by the time it is delivered to the individual purchasing it through the supplier. But if that does not happen, it is still a four frame nuc with an extra frame of foundation. If, by the time you receive the nuc and the frame of foundation is partially drawn and contains eggs and/or brood, food,

or pollen, then we are entering a “grey area” in deciding between four and five frames that begs the question of how much of that frame is actually in use.

In our five frame nuc the queen is perhaps marked in order not only for the beekeeper to more readily see her but also for the ability to verify that she is not a “replacement” queen in the colony since the last time the beekeeper saw her. Supercedure of a queen can and does occur in nucleus colonies, and usurpation of a queen is becoming more common. As we know, replacement of a queen can and frequently will affect the temperament and productivity of the colony. While the adult bees in the nuc may or may not be related to the queen in that colony, the queen being offered for sale with a nuc should be the queen that produced the brood you see in the frames. While there is the benefit of having five frames of drawn comb for the storage of food and for the queen to lay, having the laying queen with her brood and workers that all interact is the major difference between a nucleus colony and a package of bees and is the primary reason for the difference in cost. As we pointed out before, a nucleus hive is a fully functional colony. If a package of bees with a queen is placed in a five frame box of drawn comb with brood and food from another source, it should not be considered a nucleus hive since it lacks the working relationship between the workers as well as their working relationship with the queen that has been placed in the box with them. Only once a queen has been accepted by the workers (whether she was introduced as a queen cell, a virgin queen, or a mature queen) long enough for that queen to produce a good pattern of brood then the working relationship of that colony has been established. To some degree you must accept the integrity of the person or establishment selling you the nuc in trying to determine whether the brood was produced by that queen, but you can ask the question and you look at the pattern to see if it has a continuity in the pattern and from frame to frame.

In a five frame nuc that is offered for sale the brood is a progression of ages from eggs to capped pupa or emerging adults should cover three or more of the frames. By looking at capped brood in these frames of brood you are able to determine that the queen is producing: 1. worker brood, 2. in a consistent pattern even if she is also producing some drone brood, 3. The pattern should not have the “shotgun” appearance that might indicate a severe mite/viral problem. Bearing in mind that this is a small and usually a young colony, often there is no drone brood present. A large quantity of drone brood in a nucleus hive should be considered when purchasing that colony as it could be an indicator that the queen was not sufficiently mated or has been injured.

Occasionally queen cells will turn up in a nuc and should be assessed as either supercedure cells or as



swarm cells. Queen cells in a nuc you are being offered should not cause an automatic rejection of that nuc because you are being presented with options that can be beneficial to you. You have the ability to remove either the queen or the cells to create another colony using a frame of nurse bees and food and keep the remaining four frames as the colony you are purchasing. Keep in mind that by doing so you may end up with another colony as the cells mature, emerge and get mated. Wow, two for the price of one! But (particularly if the cells are supercedure cells) you may lose the queen you received with the nuc, in which case you only have to combine the now queenless nuc back to the one with the new queen.

Along with the three + frames of brood you should also find one or more frames of food, some of which may be capped. There may or may not be pollen stored in the frames depending on the time the nuc has been in shipping. Altogether each of the five frames should have drawn comb with brood, food, or pollen.

When buying a nuc, you will find that some sellers will expect the number of frames with foundation that is equal to the number of frames in the nuc in exchange for the frames and drawn comb in that nuc. Some sellers will have you bring your equipment to them for them to place the colony into for you to take to your yard, while others will provide the frames without exchange and the box the nuc is in for you to take with you (although there may be a “deposit” required for the return of the box). It seems that if the seller is exchanging frames that there is a slight price difference to you while those installing your nuc into your equipment for you to take is a service that can be to your benefit.

In some states, the apiaries producing nucleus colonies (as well as queens for sale – with or without a package) will be inspected by the state apiary inspectors for indications of disease and other problems.

Buying a nuc that is produced locally has many benefits to you as the beekeeper compared to the nucs and packages that are produced elsewhere and shipped in, but that is a topic for other discussions.

So in review, we find that a five frame nucleus colony should have:

1. Five frames of drawn comb
2. Enough adult bees to cover those five frames adequately,
3. A queen that is perhaps marked
4. Three or more frames of brood of various ages from eggs to emerging adults from that queen
5. One or more frames of food which may contain capped as well as open cells of honey/nectar/sugar syrup and pollen
6. No indication of disease

Remember, a three pound package has approximately 9,000 bees and a queen in a cage that must be introduced. A five frame nuc contains approximately the same number of bees and the additional resources of having the valuable five frames of drawn comb as well as the food and pollen that is stored there. A nuc has an established working relationship between the queen and the workers which reduces the likelihood of supercedure. A nuc also contains the coming next generation of workers which can put it weeks ahead of a package in terms of growth. And the brood pattern that is in the nuc can offer clues to the health of the queen and the colony. 🐝

*Sometimes you just have to stop and stand still.
When you have a thousand-plus bees crawling all over you,
for instance.*

Beekeeping Buddhism

Jessica Schley

Tonight I suited up to go feed my bees. In the Winter, bees don't have nectar to collect from flowers, so beekeepers often feed them sugar water using a special feeder inside the hive. I feed my bees organic cane sugar. They deserve the best.

They live in a Langstroth hive in the backyard of my parent's place. I live in an apartment, so they offered their yard with fruit trees and a stream running through it for the bees to call their home. My parents are awesome like that.

The bees hadn't been checked on in a while, so I was curious to see how they were doing, and a bit worried the colony might be dwindling, as I had neglected them of late. I carefully opened the hive's lid, gently prying with my hive tool. The lid was pretty tight; bees tend to seal the lids on to keep the hive more secure. As I opened the top and peered in, I saw that the hive was thriving; not only that, but they were super aggravated with me. Who was I, to show up unannounced, out of the blue, after months of no-call, no-write, no show . . .

I quickly poured in the sugar-water and gently replaced the lid. As I walked away, it began. There was a loud, eery hum. There was a crawling feeling. I looked down at my arms and body through my face screen. My bee suit, which is white, was speckled and dancing with black patches of little angry soldiers.

My Dad had come out to watch and learn. I told him to walk away, that I needed to stand still for a few minutes to let the bees calm down and go back to their hive. He did, and quickly. He crossed the bridge above the creek and shut the back door behind him.

I sat there. I remembered the advice of my beekeeping friend, Catherine, who had the same thing happen to her early one morning. She just stood still. So I told myself, as my heartbeat rose and my anxiety level threatened to spike, that all I needed to do was trust in my suit, be still, and everything would be okay.

I had to keep my eyes open. If I closed them my imagination ran away with me. So I stared out into the dusk, watching hundreds of upset bees trying to do their job and defend their hive. They marched around and around in circles on the face screen, centimeters from my nose and eyeballs. I could feel their wingbeats on my

cheek, on my eyelashes, on my chin. They wanted in. They wanted me away from their hive. They wanted vindication for the injustices of my indecency, my rude barging in of their sacred temple.

For about 20 minutes I stood there, hands out, palms up, staring ahead. It began to feel surreal, like a test. There were parallels to human life. The bees began to resemble the challenges in my personal life; if I swatted

at them and lost my cool it was inevitable I would be stung. If I remained calm and tried to train that inner still, things could work out okay; you just had to trust in the "bee suit" to keep the stingers away from my skin, as it were.

So I stood there, telling myself over and over to "trust in the suit" and it felt like when I sometimes tell myself to "trust in the universe" – as if the suit or the universe is the only thing standing between me and a thousand stingers or a thousand ill-wills of the world.

They were beginning to subside; the plan was working. The majority of them had realized I wasn't putting up a fight and they might as well get along back to their hive a few feet away. But the bravest ones, the angriest ones, the ones with the longest heritage, millions of years worth, of dying in defense of their colonies; they stuck with it

and with determination.

It was exactly that moment when I felt it. Six little legs crawling on my neck, up toward my ear, into my hair. So much for that trust in the suit. Suddenly the urge to freak, scream, bat and collapse in a panic surged into me. If one bee had gotten through, more could be following. The adrenalin hit me hard. My heart was suddenly racing and I began to tremble. If it stung, I would have to brace for the inevitable flinch, and then, the melee of beestings to follow.

She crawled around on my neck. She crawled up



Photo courtesy of Red Bee Honey

into my hair and back out. Then I couldn't feel her any longer. My heart slowed down. She was definitely still in the suit. And yes, I was petrified. But there would be nothing worse for me than being rash; so I stood there, and focused on breathing, and focused on the bees that were outside of my suit; how many were left, and if there were fewer. I could hear the difference as they dwindled; the pitch of the buzzing lowered and lessened in decibal. Being inches from my ears, it sounded like Daytona to me, but in reality it must have actually been very quiet.

Maybe he read my mind; I was hoping he would come back out to check on me. My Dad opened the back door and looked out. In a quiet voice I said, "please bring me the smoker and the bee brush. . ." He carefully followed my instructions to light the smoker with kindling and walked it over to me. He puffed smoke onto me with the smoker as I carefully brushed the remaining 50-odd bees from my face net, arms and legs. We walked back to the house and I unsuited. Not a single sting. Not one.

As I stood inside recounting the story to my mortified mother and my amused and heroic father (he braved the situation with no suit at all to save me), I looked down onto the dining table next to my hat.

She was slowly crawling on the table, looking for home, disoriented from the smoke and tired from the battle. I scooped her up with my hat and nudged her off into the cool evening air. 🐝



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. – Joe is having knee replacement surgery so we're not able to attend meetings. He is concerned about our bees wintering well and thinking about drilling a small hole in the top deep on each hive (he read about it for circulation and prevention of freezing). What is your advice?

Bill's Answer

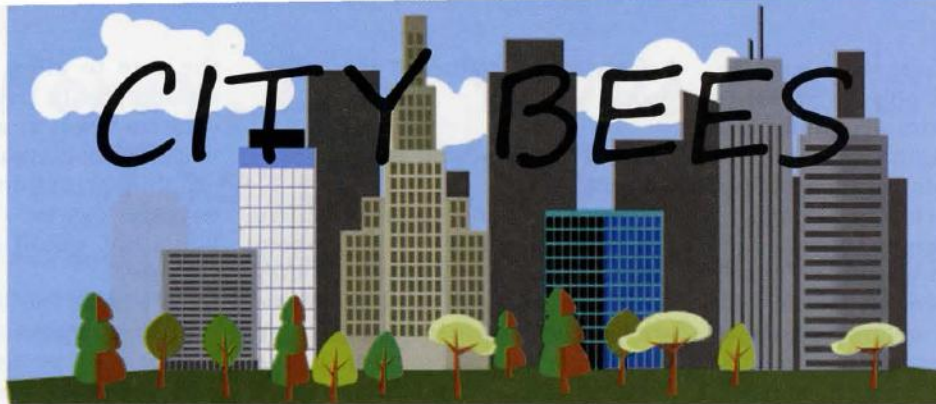
My opinion is: "It can't hurt" BUT I always think how honey bees live in nature, usually in the hollowed center of a tree. In a tree there is usually only one entrance hole and the bees seem to do very well. Inside the tree the colony is surrounded by a "pithy" wood, which absorbs the moisture given off by the bees' respiration. The colony is also well insulated compared to our domestic bee hives. In our man-made domestic beehives with less insulation around and above the bees cluster the moisture hits the inner cover (which is in direct contact with the outer cover) and condenses, dripping down on the cluster causing stress and most like causing the cluster to freeze. An upper entrance or ventilation hole will help exhaust the warm moist air and help avoid condensation on the inner cover. My thought is to provide a better environment for the bees we keep. I like to place some insulation between the inner and outer cover. I've been using Styrofoam insulation board, about ¾" thick. Instead of drilling holes in my hive bodies and supers I

prop my outer cover up about a ½" with a small stick or stone for an added bit of ventilation.

Q. – Could I trouble you for your thoughts about a bee question? I noticed that the snowstorm has covered the entranceway to our hives. They still have the top hole for air but the snow covering the bottom entranceway will block circulation. Given the low temperatures, is it better to just let the bottom remain blocked by the snow to hold in the warmth? Your thoughts . . .

Bill's Answer

You have a very good question and I don't know that I can give you the perfect answer but I'm sure many beekeepers lie in bed during a Winter storm and think about the same thing. I've seen this happen to my hives over the years and on some of them I've seen a small gap in the snow at the entrance. I don't know if the air circulation opened it or not, and on many of mine the snow is just piled up on the bottom entrance and I've left it like that with no ill effects. I wouldn't be overly concerned about the lack of air circulation due to snow on the bottom entrance. I haven't experienced any losses due to snow covered bottom entrances, of course many of my hives have damaged corners from using my hive tool to pry them apart so there are always some extra entrances or air gaps for added ventilation. To answer your question: "Is it better to just let the bottom remain blocked by the snow to hold in the warmth?" I would not recommend leaving a bottom entrance blocked but I don't think snow is completely air tight, ice is another matter. I've seen a bottom entrance closed by melting snow freezing into ice but my bees still had other entrances/exits to access through worn corners of supers and hive bodies. Some beekeepers choose to reduce the entrance size; I leave my hive entrances wide open all year long.



As You Make Connections Try To Avoid Conflicts and Build Consensus

“Do I tell anyone?” is one of the most frequently asked questions in urban beekeeping. And of course I am going to give you a relatively complicated answer! It’s not a simple “yes or no” because how much and what you have to say about beekeeping will change over time, as will your interactions with the people around you while you keep bees. Of course, the fact that you are reading this in a national beekeeping magazine is a pretty fair indication of how well I succeeded in being a “secret” beekeeper. And coming out from undercover has turned out to be a blast, while it was also tempting to lecture you here about the benefits of connecting and sharing with your neighbors.

But this is the real world, and the whole idea that someone can tell you how to handle your hometown relations is preposterous. But after ten years of doing this downtown, some of those experiences might inform your own, and I would like to have your back on this.

No Trust for Strangers

Tell me if you have heard this one – in my city neighborhood, con artists actually go door to door saying that they are the not-too-distant relative of a household “just a couple of houses away,” that they have locked themselves out and need cab fare (neither assertion true, FYI.) This ploy often works, because in greenifying neighborhoods like the ones where urban beekeepers tend to congregate, we tend to have little idea who moved in years before we did. There’s often a demographic fault line, too, that

makes us that much more unknown to each other. If we do not know who actually lives in a house, it’s pretty hard to judge how they might feel about the beehives on the roof. So how should we proceed?

It’s probably a good idea to start carefully and a bit worriedly, and then build your comfort zone over time. You will need to know more about your neighbors in order to relax more in your apiary, but this does not have to be instant. You can reduce the fear your bees inspire if you are more of a known quantity and introduce yourself bit by bit. In addition, anything you can do to reduce the actual risk your bees represent, and to deploy more resources, both in skill and helping hands, to ensure the health and peaceable-ness of your bees will benefit you, them, and the unsuspecting masses around you.

Being ready to answer their questions, lots of them, is another way to reduce the strangeness, build interest, and increase the trust your neighbors feel toward you and your bees. Even if you are new, you can answer almost everything they can think of if you have attended a short course or read through a good textbook. You might want to let your neighbors know that you have completed a course if you have! If you want a cheat sheet, we have a compilation of dozens of questions (and answers) asked by America’s elementary school students in a national pollinator webcast at <http://tinyurl.com/kd68w5m>. Dr. Elizabeth Capaldi Evans of Bucknell also has a fun book called *Why Do Bees Buzz* published by Rutgers.

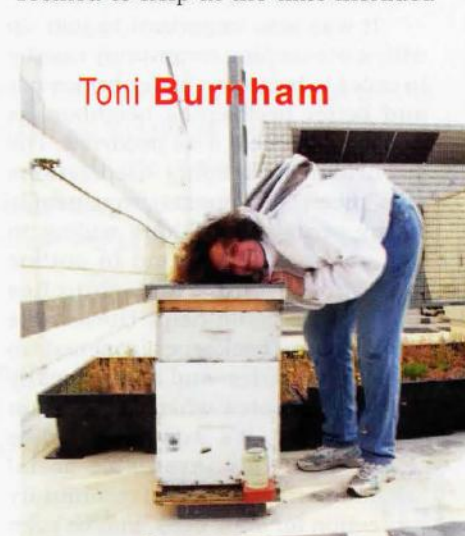
Risk = Probability x Impact

How much should you tell, who, and when? Your mileage will vary,

based on this easy calculation. *The risk you face is roughly related to how likely a problem is to emerge multiplied by how bad the situation can get.* But your risk might start high and get lower, or go the other way if you or your neighbors act like jerks. A lot of this is in your hands. You can build protection through social connections, building your own skills, alliances with community institutions, thoughtful bribery, acting like the kind of person who deserves trust, and avoiding the battles you might not win.

When I started keeping bees on my townhouse roof, I had nowhere else to place an apiary, and no allies to help me out in a pinch. Beekeeping was also not specifically protected in this city, and I did not yet know how to move a hive, let alone a full sized colony or two down a spiral staircase. My risk went all the way from possibly being sued to problems with the police. I lost a bit of sleep, and decided to keep a low profile. No surprise there.

Cloak and dagger strategies that seemed to help at the time included



Coming Out To The Neighbors?

painting the hives to blend in, working the bees only on weekdays (when my neighbors were unlikely to be outside, looking up), storing empty woodenware indoors, obsessively preventing swarms and robbing, providing a delicious, algae-edged water source, and keeping my mouth shut within a 10 block radius. I got the chatter out of my system by anonymously blogging like a maniac and going to beekeeping meetings in the suburbs.

A decade later, a lot of this seems quaint. Beekeeping is now legal, most of my neighbors know, there are at least two crisis apiaries available in or near town, a bunch of urban beeks are around to help each other out, and we have moved many a hive in our time. We have even been known to hive sit for each other. It's a nicer world. But it wasn't instant, and not everyone gets here.

What happened in between was piecemeal – the standard advice is to hand out honey from your first harvest, but I would give slightly different advice. My husband and I first shared honey with folks in the general vicinity (but not next door) whom we knew through other connections, mainly dog walking and gardening. We gauged their reactions, and asked them to try the honey, tell their friends about it, and tell us what folks said. And then we tried closer, and closer. We found that having some other connection ahead of time really helped neighbors get over the strangeness of the idea of urban beekeeping, and that having a relationship they valued tempered an out-and-out rejection or complaint. It's easier to trust someone you know, and most folks are conflict-averse.

It was also important to join up with a beekeeping community nearby in order to become a better beekeeper and better beekeeping neighbor, as well as to get help if we needed it. The suburban beekeeping associations also received requests from people in my town for speakers willing to talk about the bees, and to outline how garden clubs and churches and schools could help. Those talks created more beekeepers, opened up potential apiaries, and created many citizen advocates when legalization came around. It's worth your while to invest in this invaluable social insulation from risk, and community protection for your bees, maybe even

before you talk to the gal or guy next door.

There's the Law, and Then There's Life

But here's another truth – there are people on my block with whom I do not share a language, and they have still not heard from me. There are people here who complain to the authorities rather than to the neighbor who is irking them, so they may never know about my colonies (if we can help it). This is all really a shame, but even with the law on my side, with an out-apiary in my back pocket, with a much stronger skillset, and friends with helping hands, it's easier to let those neighbors slide. In a pinch, the law and peer pressure will probably win, but we still have to live with each other.

My buddy Karl was kind of an "out" beekeeper from the beginning: he had a cool completely legal hive-on-a-porch setup that his neighbors OK'd – until they didn't. They probably would not have won the lawsuit which they threatened, but who needs a new hobby like that? Luckily, Karl is a great community minded guy and his gals moved to the top of a crypt in a nearby cemetery. Another friend, Bradley, wrote his neighborhood bulletin board that he would be getting a completely legal hive on his roof, to which all but one neighbor said, "Ok, cool." But that one neighbor wrote an email that was almost funny to read: she started out ill at ease about her *possible* sensitivity to stings, and worked her way up to a terrified state where she would become a prisoner in her own home, no longer able to eat jam on her toast in the garden (the latter 100% verbatim). Bradley got his hive, but the neighborhood stopped getting updates. And freaky lady is still eating toast in happy ignorance.

Consensus or Else: Choose Your Battles

When I first started shopping for out-apiaries, especially at sites run by bureaucracies, one facet of human nature showed itself loud and clear: if something is strange, scary, or unfamiliar, the easy answer is "No." That negative can be devastating in the fragile environment inhabited by most urban beekeepers: many times I have been to zoning boards and city council meetings where

the vote to allow bees had to be unanimous to pass, though there was no legal reason why. Most neighborhood organizations operate on this principle, and one loud naysayer can blow away a lot of the fight that would otherwise be on your side.

If I think "no" is coming, I don't ask. More hopeful strategies such as lobbying that person's boss, creating peer pressure, presenting fun and inspiring information, and seeking forgiveness rather than permission (be careful with that one!) are all more likely to work, with fewer permanent consequences. Once a person issues that "no!" they tend to be dug in, and the fight will not be pretty. If you do manage to overturn a "no," you will likely have a long term opponent who does not wish you or your bees well.

Basic advice

Your situation is probably as unique as your spot on the planet, but I do think some wisdom applies in most cases. First, don't make the bees pay for the tortured relationships that can exist between people. Reveal as much about your beekeeping as your community connections can handle, and manage your bees with an eye to the impact their presence might have on those around. As your expertise and your alliances grow, you can share more. Keeping yourself undercover can be a long term strategy, but you never decrease the risk you face or the worry you carry around with you if you don't work to make space for beekeeping where you live. Make sure that the folks who share their space with your bees get some benefit at some point, maybe a jar of honey, maybe some information about how the environment works, maybe a unique visit to the inside of a colony. But realistically know this: you will never get 100% of everybody to be comfortable with anything, and as you make connections try to avoid conflicts and build consensus. If you take care of your bees responsibly, and are within the letter of the law, sometimes that is the most that anyone needs to know. 🐝

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

The Beekeeper's Daughter

Ariele Sieling

The decrepit house loomed in front of us, paint peeling from the weathered clapboard. The collapsing porch roof nearly blocked the front door and broken glass littered the grass. Dad and I gazed up at it, dressed in white and carrying a toolbox, buckets, duct tape, and a homemade bee vacuum.

The owner planned to demolish the house in a few weeks. He had noticed a bee colony living in one wall. Being the conscientious sort, he wanted it removed and protected before the house was destroyed, and was willing to pay us to do it.

Bees entered and exited from several holes in one wall. Dad pulled out his stethoscope.

"We need to estimate out how big the colony is," he explained, "so we know how much of the siding to remove and can estimate how long it will take. I'm guessing two or three hours."

"Sounds easy enough," I said. While I had helped my dad catch swarms and harvest honey, this was the first time I'd assisted in removing bees from a building.

I watched as Dad moved the stethoscope around the wall, reaching up higher and higher until he was standing on his tiptoes.

"It will be easier to work from the inside than from a ladder," he said, so I followed him into the house.

Dad walked through the front door with me at his heels. We stepped over heaps of twenty-year-old magazines and around stacks of mattresses. Broken eight track tapes, shattered dishware, and all sorts of filthy and damaged household goods filled the house. We ascended the treacherous staircase slowly and found the bee-filled wall. Dad listened for a few more minutes with the stethoscope, and then said, "I think there are two colonies here. We had better get moving or this will take all day."

Working on a pre-demolition house was good – it meant we didn't have to fix anything after we finished collecting the colony. We cut into the wall upstairs and tossed the lath and plaster into the corner. Sure enough, there were two colonies.

Inside the wall swarmed with bees. They didn't like us opening their hive, revealing their brood to the world. The guard bees began to dive bomb us. I put on my veil.

Dad handed me the vacuum and a pair of gloves. "It's all yours. Get as many of the bees as you can, and I'll go downstairs and open up the downstairs colony."

I nodded, and turned back to the wall. I hoisted the vacuum onto my back and got to work. The vacuum roared in my ears as I moved the tube around the wall, trying to suck up the bees that rushed here and there in a panicked rhythm. One landed on my gloved hand.

"Dad!" I yelled as I felt the first stinger pierce the

leather of the supposedly protective gloves. "Got my first sting!" It hurt a lot. I winced and shook my hand around in the air, as if that would do any good.

Dad ran up the stairs. "Are you okay?" he asked. "Do you feel swelling anywhere else in your body? How's your throat? Have some water." Dad worried when I got stung because my mom and brother are both allergic and carry Epipens. Not to mention that the nearest hospital is 30 miles away.

"I'm fine," I said, and quit waving my hand around. "What're you up to?"

"Two stings," he replied. "Well, 82 if you count everything this year."

I laughed. About an hour later, I stuck my head out the window. "Second sting!" I yelled. He didn't run upstairs this time, just shouted back, "I'm up to three!"

A short time later I yelled, "Three!"

"Four!" he called back.

When I got to five, Dad was still at four stings, and from that point forward, I was winning the 'who got stung more times' contest. I learned that stings lose their impact after the third sting. You hardly notice them. There is a sharp pinch, like when you get your blood drawn, and then nothing. No swelling and almost no itchiness. They can have other side effects though. If you eat one, it tastes like banana, for example. And my dad told me that one of his instructors got stung so many times in one day, that as he was driving home, he saw a pink rabbit running beside his truck.

I topped out the day at 11 stings, and Dad with eight. We worked for eight hours vacuuming bees out of that decrepit old house with no lunch and only one gallon of water. Then, we carefully fit the combs into the supers with bee-sized spacers and drove the bees home.

In the course of my 27 years, I have done plenty of bee projects with my dad. I had my first hive when I was 10, and of course it died, because very few 10-year-olds are willing to put in the work needed to keep it alive. Swarm catching was one of my favourite activities; my dad caught swarms everywhere from people's backyards to 30 feet up in trees, and sometimes showed off by sticking his hands into the swarm.

Every year the whole family helped Dad extract the honey from the hives. We spent the day in the honey room, getting sticky, dirty, and sweaty as we uncapped the frames, spun them in the extractor, and strained the honey into jars.

I didn't often go with him to catch colonies, however. This was only my second job – the first being much easier as a swarm had simply started building comb on an old fence post.

So I wasn't jumping into beekeeping head first per se – it was more like wading in up to my ankles and then stepping off a ledge.

But for whatever reason, I keep going back. I guess that's just what happens when you're a beekeeper's daughter. 🐝

This Is How Memories
Are Made!

Cooking With Honey



Ann Harman

October brings Halloween and the Trick-or-Treat gremlins. Then comes Thanksgiving and the start of the holiday season. Honey just has to be a part of all the festivities.

GINGERBEE COOKIES

Use some Halloween cookie cutters for these.

- 1½ cups honey
- ¾ cup butter or margarine, softened
- 1 egg
- 5 cups all-purpose flour
- 2 teaspoons baking powder
- 1 tablespoon *each* ground ginger and ground cinnamon
- 1 teaspoon ground cloves

In large bowl, cream honey and butter until light and fluffy. Beat in egg. Add flour, baking powder, ginger, cinnamon and cloves. Mix until combined. Wrap dough in plastic wrap and refrigerate for at least two hours. When dough is chilled, divide dough in half; return one half to refrigerator. Dust work surface and dough with flour. Roll out dough to 1/4 inch thick. Cut into desired shapes using cookie cutter; transfer to well-greased baking sheet. Bake at 350°F for 10 to 12 minutes. Remove cookies from sheet and cool on wire rack. Prepare and bake other half of dough. Makes about three dozen cookies.



CRANBERRY PECAN PIE

This pie can be a useful dessert any time during the holidays.

- 2 cups fresh or frozen cranberries
- 1 cup orange juice
- ½ cup honey
- 2 tablespoons cornstarch
- 2 tablespoons cold water
- ½ teaspoon orange extract
- 1 baked 9-inch pie shell
- Pecan topping (see recipe)

Combine cranberries, juice and honey in medium saucepan. Cook, covered, over low heat 15 minutes if using fresh cranberries or 20 minutes if using frozen berries. Cool. Puree cranberry mixture in blender; return to saucepan. Combine cornstarch and water in cup. Stir into cranberry sauce mixture. Bring mixture to a boil over high heat and cook until thickened. Stir in orange extract. Cool, then pour into pie shell. Spoon pecan topping (see recipe) evenly over cranberry mixture. Bake in 350°F oven for 20 minutes or until top is bubbly. Cool on wire rack. Serve at room temperature or chilled. Makes eight servings.

PECAN TOPPING FOR PIE

- ½ cup honey
- 3 tablespoons butter or margarine
- 1¾ cups pecan halves

Combine butter and honey in medium saucepan. Cook and stir over medium heat for two minutes or until mixture is smooth. Add pecan halves and stir until well coated.

Both recipes from National Honey Board

Honey scorches very easily when heated so be careful when a recipe calls for heating a mixture containing honey. When baking cookies made with honey check them frequently because sometimes oven temperatures can vary and the bottom of the cookie could be burned.

If you had a good honey crop this year be sure to bottle, label it nicely and use as gifts during the holiday season. Everyone appreciates pure local honey. 🍯



Wonderful Desserts For The
Upcoming Holidays!

UP IN SMOKE

Jim Thompson

In searching eight million plus United States patents that have been issued, only 35 that relate to smokers and fumigators. Then consider the number of devices that were never patented or may have eluded the patent search and no one knows just how many smokers have been developed.

One of the earliest forms of a smoker or bee control device may have been the torch as shown in the drawings in the pyramids.



In the Wooster, Ohio bee museum, there is a perforated tin can on a wire that was used as a bee smoker. The idea was to build a fire in the tin can and then swing it around which would distribute smoke around the area. It might keep the

person swinging the can safe from being stung but it didn't direct the smoke into the hive.

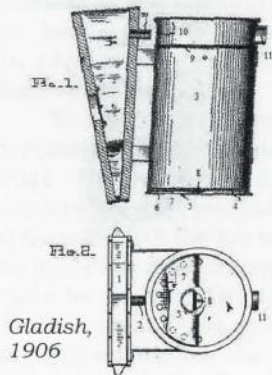


I remember talking to old time beekeepers that simply moved in a slow deliberate manner when working bees and they didn't use a smoker or veil. Then there were those that always had a cigar in their mouth and used the smoke or odor of the cigar and juices to calm the bees. This idea led to the pencil type smoker that one would blow into the hive and the pipe type smokers.



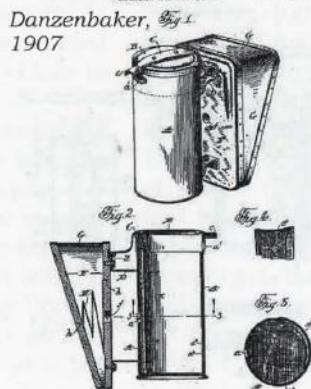
Dr. C.C. Miller wrote about soaking rags in salt peter and using the rags in a smoker. This reminds me of junior high school days when I made gun powder using Potassium Nitrate, Sulfur and Charcoal. The local drug store made a store policy not to sell Potassium Nitrate to minors which didn't slow me down because my request quickly turned to salt peter. Yes, I bet Dr. Miller's smoker really burned rapidly as the rags would take the place of the charcoal. However Dr. Miller also mentioned that in lieu of a smoker one could use a shaker bottle full of sugar water. This idea works very well and one could use sugar water in a spray bottle. Even the meanest hives can be calmed using sugar water as they immediately begin cleaning up the hive.

OCT. 22, 1906. E. B. GLADISH. BEE SMOKER. 834,121



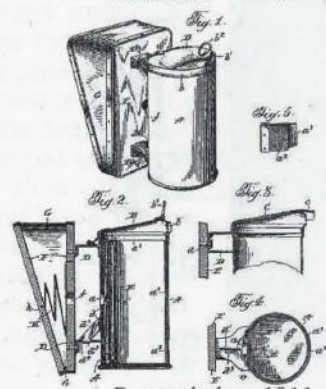
Gladish, 1906

JUNE 4, 1907. T. DANZENBAKER. BEE SMOKER. 856,133



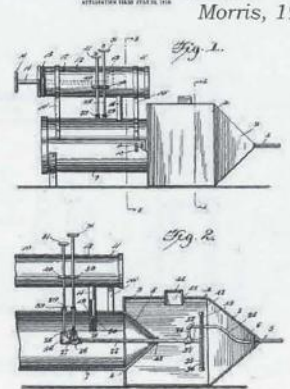
Danzenbaker, 1907

MAY 30, 1911. T. DANZENBAKER. BEE SMOKER. 993,439



Danzenbaker, 1911

JUNE 23, 1914. L. J. MORRIS. BEE SMOKER. 1,101,466



Morris, 1914



Over 40 years ago I was at an auction where a "bee smoker" was sold. Because I was new to beekeeping, I mentally questioned if it really was a bee smoker. Thus I let it pass. Afterward I came across some evidence that proved it really had been a bee smoker. However it was never patented and I have to go with what I had seen in two or three minutes. It looked like a fireplace bellows with a fire chamber attached and a nozzle. I have plant dusters which seem similar.

Some of the beekeeping books of the 1920s mention that beekeeping required at least two individuals. One of the people was responsible to operate the smoker. Thus if the smoker had two handles as a fireplace smoker it makes sense. I

came across another type of smoker that makes the two person approach necessary as it must be held by the pistol grip and the canister pulled out and pushed in.

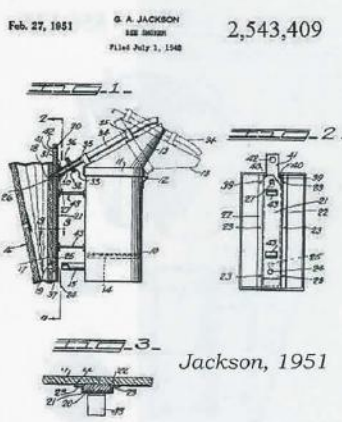
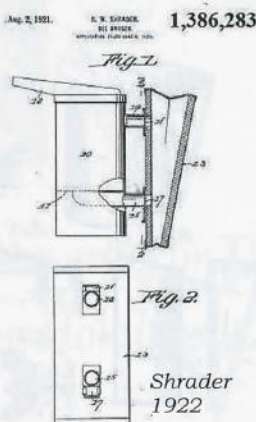
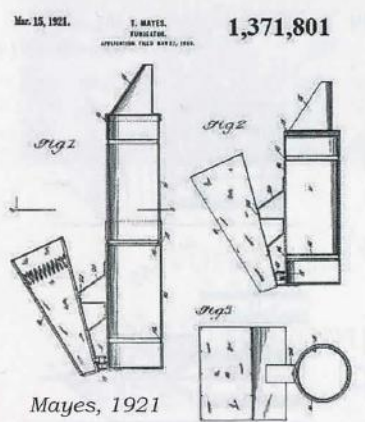
Some of the early smokers consisted of a bellows and a fire chamber. The bellows could be the conventional rectangular shape or be a pentagon. The attachment of the bellows to the fire chamber could vary. The "Simplicity" had the base of the fire chamber mounted to the side of the bellows. The "Clark cold blast" had bellows mounted in the conventional manner or upside down.

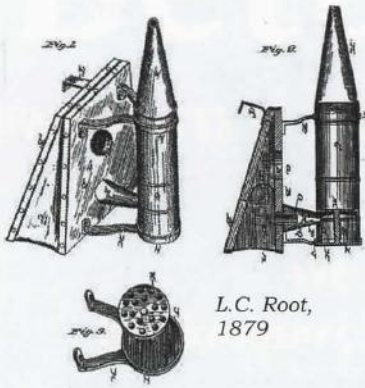
The Clark cold blast smoker had special piping to route air through the top of the fire chamber rather than through the fire. This prevented burning bee's wings and spewing sparks. Plans for building the Clark cold blast smoker were written in

the early issues of *ABC & XYZ of Bee Culture*. This explains why there are so many different examples. The Clark cold blast smoker was hard to keep lit.

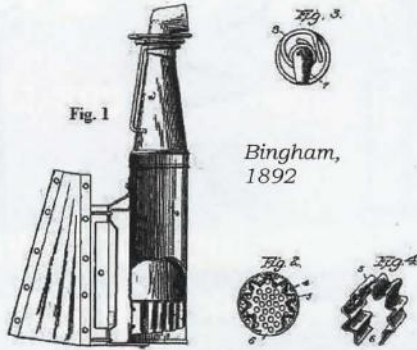
Smokers have been made out of a variety of materials such as galvanized steel, aluminum, copper, and stainless steel. A common thought is that one should have a large smoker to drive the bees away. Therefore a large smoker was developed to control the African bees. The one pictured is 18" tall, 9" wide, and 27 1/4" long. The belief that you should have a lot of smoke was advanced by a beekeeper acquaintance that made a smoker containing a five gallon milk can on a two wheeled cart. It was powered by a Volkswagen blower fan and a 12 volt battery. It produced so much smoke that the bee yard would disappear. Yes the bees would run and the beekeeper did not receive many stings. The honey supers could be removed. However the beekeeper failed to realize that when an abundance of smoke is used, the bees start uncapping the honey cells and the smoke could taint the honey in the cells.

A similar situation occurred 30 or so years ago when an extension agent working at Ohio State University in Columbus made a film. He wanted to show how to use a smoker and shortly after getting a 4 x 10 smoker lit he stuffed approximately a bushel of tall grass into the smoker. One could hear the coughing of a beekeeper within the cloud of smoke. This also shows that the smoke produced by the smoker should be a safe and pleasant smelling smoke. Don't burn noxious plants. Don't use baling twine or burlap that has been treated with pesticides. Some people mention

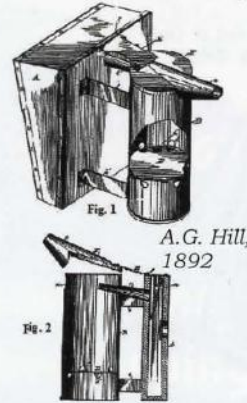




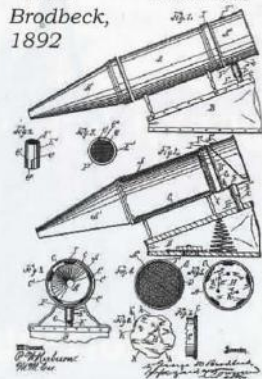
L.C. Root, 1879



Bingham, 1892



A.G. Hill, 1892



Brodbeck, 1892

that Sumac berries and other plants yield a carcinogenic smoke. I like to use pine needles and pine cones and sometimes punk wood, however the fuel gets hot, so a layer of green grass is required on top of the fuel.

A hot smoker should be avoided as the hot sparks from the snout can burn the wings off of a flying bee. It makes one feel good especially after being stung by many honey bees, but a hot smoker is hard to handle. When you cradle a hot smoker between your legs you can make nice holes in polyester jeans and sometimes burn your legs. Be careful where you place a hot smoker as it could damage the top of a plastic bee hive. Avoid putting the hot smoker in the bed of a truck that has a plastic liner. It is best to contain a smoker in a metal container when not in use. If you don't have a metal box, a smoker can be plugged by taking a handful of green grass and forcing it into the snout of the smoker from the fire chamber side and closing the smoker.

Many smokers have hooks on the bellows or in front of the fire chamber. These hooks are very handy for hanging the smoker on the side of a hive. Some smokers have a fire shield which is also a good feature to have and saves burned hands. By far the most common insurance claim made by beekeepers is for a fire started by placing a hot smoker too close to flammable material.

To avoid fires make sure the smoker no longer contains burning fuel. When finished empty the contents on the ground and step on it to extinguish the fire (when exposed to fresh air, smoldering fuel will flare up - be careful). Or, simply lay the smoker on its side and the lack of air will extinguish the fire in a few moments.



A common complaint by new beekeepers is their smoker will not stay lit. As a result some people have suggested using volatile substances such as charcoal lighter, kerosene, tungsten chips or self lighting propane torches. Some of these items burn so hot that damage could be done to the smoker. Other items need to be burned until the foreign odor disappears. A smoker should be emptied before lighting and the match or lighter held under the handful of fuel at the top of the fire chamber. Once the fuel is lit, the lighting device is retracted and the fuel is dropped into the fire chamber. The bellows are pumped until a lot of smoke rises and then additional fuel is added. Do not drop butane lighter into the fire chamber. When a smoker gets hot and sparks fly, more fuel or green grass should be added.

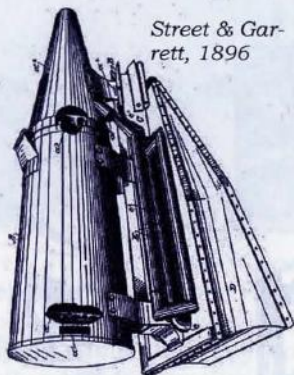
Smokers have different power devices to force the smoke to be emitted. The most common driving



force is the bellows but there are fans with batteries, spring motors, aerosol containers, pump containers, electric "drills", and propane canisters. The German spring motor type looks unique as you control the motor with an on-off lever.

I used to buy most of the gadgets that were available and purchased an electronic bee repeller. It emits a high pitched sound that was to repel bees. You were to clip it to your pocket, turn it on and work your bees safely. If you work slowly and the hive is small, you might be okay. If the hive has any size or strength, you should be ready to close the hive and retire quickly. Where are the





Street & Garrett, 1896

bee's ears? Do they hear sound or pick up vibrations? I have heard that the "ears" are located on the antenna so bees are picking up vibrations. It makes you wonder about the old saying urging you to beat on an old pan to get a flying swarm to settle. Is this a practice of futility?

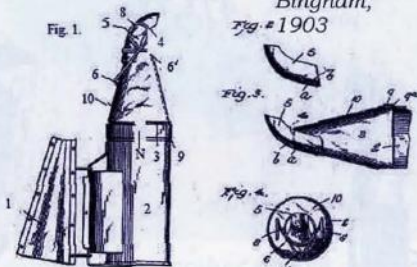
Many years ago there was an aerosol can that was produced in England called the hive bomb. It worked extremely well and was good to carry for emergency periods. I was told it was discontinued due to importing costs or carcinogenic claims. A California firm made a similar product call liquid smoke which works well when you are working a single hive. However I have had problems when moving a truck load of uncontained strong hives.

My experience with the newer propane powered smokers and the instant on power heater "drill" smoker is limited. I have found them to be quite expensive and bulkier than some of the other types. One propane model had instant smoke but the trigger control allowed you

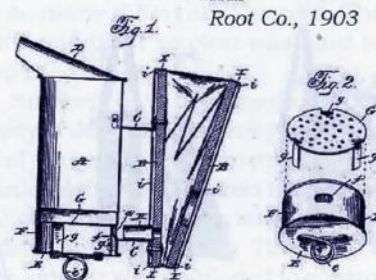


Bingham,

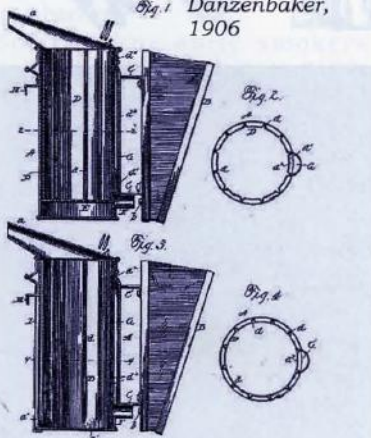
Fig. 1 = 1903



Root Co., 1903



Danzenbaker, 1906



to have either full smoke or none. It didn't seem to have a variable amount of smoke. There needs to be more testing and development with the propane type smokers. Most often you need to have just enough smoke to turn the bees around on the frames or enough to let the bees know that you are in the area. If you use more smoke, the bees start to run, it is harder to find the queen, and some bees become agitated.

All this makes one believe that the old timer beekeepers knew what they were doing when they used smokers that were 5" tall or sugar water containers. If you decide to use a spray bottle of sugar water, the mixture should be less than a one to one ratio. When you have more sugar than water the nozzle clogs easily and then you end up unscrewing the sprayer and pouring out the mixture where you think it will do the most good.

Very few of the patented smokers shown in the drawings have been mentioned in the article.



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