FEB 2008

Bee Culture

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INSIDE IN FEBRUARY

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It's Winter time in the north, and lots of other places, global warming not-withstanding. Take a look at all the articles on dealing with overwintering colonies this month.
photo by Kim Flottum

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Bee Culture

THE MAGAZINE OF AMERICAN BEEKEEPING
FEBRUARY 2008 VOLUME 136 NUMBER 2

FEATURES

DEPARTMENTS & COLUMNS

Say NO To Electric Shock

In the December 'Bottom Board' Ed Colby suggests that he would have tried a shock from his electric beeyard fence to restore a normal cardiac rhythm. Although I'm sure he's only kidding, someone might take it seriously A cardioversion is a carefully controlled event.

Defibrillators apply a specifically timed, shaped and powered shock. Even with that there can be complications. A random shock from an electric fence for someone in atrial fibrillation is just as likely to result in astolye their heart just stops. A rather catastrophic event, I'm sure you'll agree.

Please, don't even put these ideas out there.

Dan Harris
Athens, GA

SHB Trap

Tell Leroy Findley to occasionally paint the top of his frames with food grade mineral oil. It greatly reduces burr comb.

Wayne Craft
Los Gatos, CA

Dancing Bees

I read with interest the letter in the December *Bee Culture* regarding "Dancing Bees." Mr Cowan seems to be a keen observer and I envy all the swarms he has seen in his bait hives. Regarding the question about why scout bees on any face of a swarm cluster, when they have apparently reached an agreement on the new nestsite, all orient the (waggle run) dances to the same degree of vertical, you may have already received better replies than the following but here goes:

Picture the same bees in a one-frame observation hive. If, and no matter how, you rotate it, you would notice the consensus dances still all orient the same number of degrees from vertical* Vertical represents the direction of the sun from the hive at that time. If you wish to have the dancing bees point to the site, simply place the hive horizontal, then the waggle run can and will point in an obvious compass type direction – all consensus dances being the same. (*The direction of the sun from the cluster is point of reference!)

Bees can deduce the sun's location from polarized light.

The situation you described is exactly what one might expect among scouts in agreement. Front, back, or side, the dance indicates the number of degrees from the sun to the site from the cluster

Roland Walls
Beckley, WV

Discounts For Beekeepers

There's a slip I had at one time that waived sales taxes for beekeepers buying supplies. Where do I get a copy of this release from taxes?

What all does it apply to? Would it include table saws, routers, sugar feed, pollen/pollen substitute, lumber? Would it free up import taxes if I found interesting devices for beekeeping or bulk lumber?

Something we really need now for beekeepers is discounted postal service as I'm seeing the charge for one item ordered having postal fees close to the cost of equipment.

Then, I've exchanged honey overseas, as I was particularly interested in tasting heather honey Shipping mine to Britain costs more than the honey was worth. I shipped a round section to Russia and if I remember correctly, it cost around $15-20 to mail it. Simply way too much.

Then, I was interested in this particular type of wood and joinery used on this one style of hive and the company was willing to give me a full complete hive but shipping costs were too much for them and for me, even if we split the cost. Something like $400.

Personally, I like trying various honeys as some are better than others. I tried some from Greece that I received as a gift that was excellent. But with postal fees so high, it's interfering with commerce and the interchange of information and devices at least for beekeepers.

Is there any type of relief in international exchange as there is with the tax waiver? Maybe a waiver of fees for the transport of honey bees domestically, the sell of honey through the mail or exchange, or the purchase of prototype equipment from overseas?

I'd appreciate the information as well as where I can get a copy of the tax waiver

Thank you for your time.

Bert Clayton
North Charleston, SC

INNER COVER

I went to the Entomological Society Of America meeting in December The week-long affair was held in San Diego which usually isn't a bad place to be at that time of year, but by anybody's standards this time it was cold. How cold? One outside event in the courtyard of the hotel/conference center had a crew setting up tables and chairs and putting on table coverings. Ever try to spread out a tablecloth while wearing a down coat, stocking hat and gloves? I was surprised they even had down coats, stocking hats and gloves.

Still, I didn't go there for the weather I went to hear what the Apiculture people were going to tell us about Colony Collapse Disorder They had an entire half day symposium and invited everybody who had anything at all to do with CCD. A lot of people also involved in these projects were there who didn't speak but just came to listen, like me, though I was one of a very, very few who didn't have a PhD behind my name. I got to wear a press badge, though. Maybe I *had* to wear a press badge, just so they knew I wasn't one of them. It wasn't red however

Speakers, included Diana Cox-Foster, Dennis vanEnglesdorp, Marla Spivak, May Berenbaum, Jay Evans, Steve Sheppard, Evan Skowronski, Jeff Pettis, plus a few others.

Three hundred of the 3000 who attended the Conference came to listen, at least at the beginning. What we heard was both old and new, with some of the old refined and some of the new still pretty rough. Still, it was new. It's February now so the news is six weeks old, but not surprisingly the only place I've seen any of it is what I've written in other places so it might still be new to you.

There was lots of review of what CCD wasn't...you know, aliens, GMO crops...one comment made was about cell phones...it seems that if you give honey bees cell phones, the only ones they'll pollinate are the Blackberries.... well, I guess you had to be there....

Marla Spivak reviewed several items... but it keeps coming back to... beekeepers still can't control *Varroa*. And Nosema...one in Winter, and now another in Summer, and what does it do...you already know...

+ it affects the feeding glands so nurse bees can't feed
+ adults can't build fat bodies for wintering
+ there's reduced fat and protein content in adults
+ it makes adults susceptible to co-infections
+ even if Nosema isn't CCD, you need to pay attention to this new, and old disease

And then add *Varroa*, poor nutrition, those new pesticides (which are everywhere and used on everything), the poor economic situation in the bee industry...

Marla's economic example was for a beekeeper with 2000 colonies that produced 100 pound average at current prices he would make about $180,000 on honey But rent those colonies in California at $150 each and make $300,000. It's a no-brainer if you want to stay in business.

Then add these problems...

+ old comb loaded with ???? (see below)
+ increased acres of crops needing pollination, resulting in more $$$$/colony for pollinating and more miles/colony to do that...

Then, mix well, add something new...think virus here...and Poof!

The next speaker talked about some of the tests initially run on suspected CCD colonies taking samples of comb, beebread, trapped pollen, beeswax, brood, nectar, adult bees and royal jelly to analyze for what's-in-it.

Frankly, you don't want to know but we were told anyway. I couldn't keep up with the speaker, but here's what I got...(I'm pretty confident this is correct, but it went fast and it was pretty technical, please bear with me).

Up to 17 pesticides/sample were found, with 5 the average. All told, there were 43 different pesticides found, and at least 14 were systemic in nature. They found 17 different pesticides in pollen. The most commonly identified chemicals found were fluvalinate, chlorpyrophos, coumophos, endosulphan, atrazine and simizine (both herbicides) and malathion.

They found high levels of pesticides in beeswax with the pyrethroids dominant. But the loads were amazing. Fluvalinate (with a half life in beeswax of five years) was found from 4640 to 53,800 ppb, the two breakdown products from coumophos from 8 – 18,600 ppb. There were more but these were the biggies. They also found that the inert ingredients in pesticides weren't inert at all. That's enough of pesticides. I said you didn't want to know.

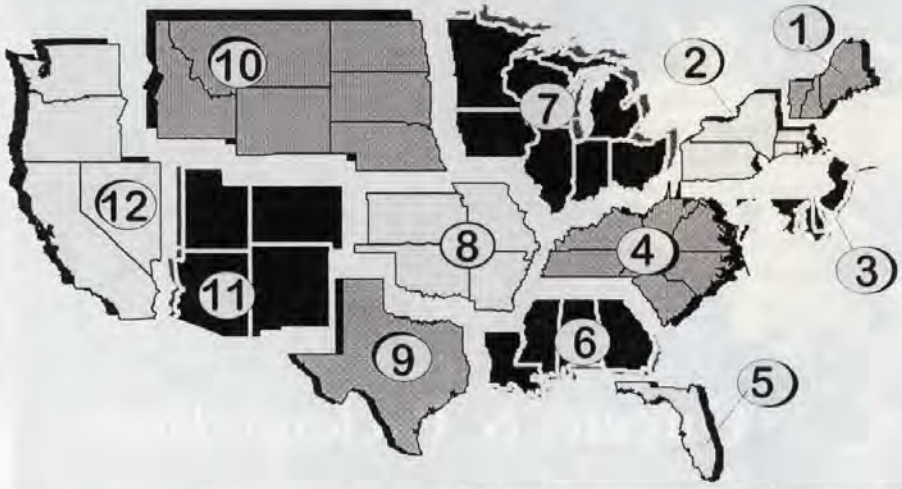
But what's new? Well, several things. May Berenbaum and other researchers from the University of Illinois have found from samples of CCD suspect bees that the genes for the immune response to bacterial infections were incredibly suppressed. They found that tissue destruction was going on that was destroying infected cells, or just cells, infected or not, and that the memory sections of the mushroom bodies in these bees' brains were also affected by this anomaly.

They also compared bees from 2004 with these CCD bees and found another teaser Looking at the 13,145 genes in a honey bee, some in CCD bees were over expressed, some under, but there were about 180

Continued on Page 62

Slowly Killing Our Bees

FEBRUARY – REGIONAL HONEY PRICE REPORT



We polled our reporters this month on their practices for feeding bees and disease and pest prevention and control. Given a list of management techniques, we asked if they used it every year no matter what, never no matter what, or only when needed.

For feeding, we took everybody who fed carbohydrates and asked which type of product they used. obviously, some beekeepers use more than one. For commercially available protein we took all the manufacturers together. For *Varroa* control we broke treatments into only four groups, not mentioning brands.

Treatment	% Using		
	Every Year Needed Or Not	Never Have, Never Will	Only If Needed
Nosema (Fumigillan)	17	14	54
AFB Treatment	45	14	42
EFB Treatment	34	14	45
Feed Carbs			
Sucrose	24	11	35
HFCS	20	24	18
Blend	8	24	15
Other (Honey, Fondant)	8	17	20
Feed Protein			
Commercial Substitutes	15	60	25
New Foundation	34		66
Varroa			
Organic Acids	18	42	38
Reg. Chemical Treatments	57	14	32
Powdered Sugar	41	34	25
Drone Comb	31	38	31
Honey Bee Healthy	22	52	26

Totals do not add up to 100 due to multiple uses, non-answers, and multiple answers.

	REPORTING REGIONS												SUMMARY		History	
	1	2	3	4	5	6	7	8	9	10	11	12			Last Month	Last Year
EXTRACTED HONEY PRICES SOLD BULK TO PACKERS OR PROCESSORS													Range	Avg.		
55 Gal. Drum, Light	1.28	1.35	1.28	1.34	0.92	1.15	1.20	1.28	1.28	1 12	1.06	1.13	0.92-1.35	1.20	1.17	1.06
55 Gal. Drum, Ambr	0.80	1.25	0.80	1.16	0.71	0.93	1.15	1.25	0.80	0.80	1.12	0.78	0.71-1.25	0.96	1.03	1.00
60# Light (retail)	110.00	115.50	120.00	113.20	110.00	124.00	110.00	110.20	136.04	136.04	146.53	115.00	110.00-146.53	120.54	122.34	118.85
60# Amber (retail)	110.00	105.00	120.00	111.00	110.00	122.00	102.50	110.00	110.00	132.87	146.00	126.00	102.50-146.00	117 11	115.52	117.28
WHOLESALE PRICES SOLD TO STORES OR DISTRIBUTORS IN CASE LOTS																
1/2# 24/case	45.70	48.98	42.00	42.62	36.96	43.25	40.97	36.96	36.96	35.76	39.60	65.00	35.76-65.00	42.90	51.16	45.36
1# 24/case	62.33	77.28	64.80	62.70	74.00	71.70	65.00	64.92	51.00	77.76	78.00	78.00	51.00-78.00	68.96	68.87	67.83
2# 12/case	64.08	61.08	63.00	55.33	60.00	56.93	56.40	72.00	50.50	57.84	52.20	68.33	50.50-72.00	59.81	62.61	58.71
12.oz. Plas. 24/cs	56.56	64.60	45.60	52.20	54.00	63.50	39.50	53.16	43.20	47.28	56.40	62.00	39.50-64.60	53.17	57.47	52.82
5# 6/case	75.75	70.98	70.50	61.38	72.25	65.50	66.67	77.40	60.00	61.86	66.00	80.67	60.00-80.67	69.08	68.56	62.71
Quarts 12/case	109.08	120.75	109.08	84.91	84.00	77.88	75.00	78.70	102.00	125.00	80.20	96.00	75.00-125.00	95.22	91.21	89.17
Pints 12/case	58.99	69.98	58.99	50.50	54.50	47.71	46.00	47.82	66.00	64.68	46.20	54.00	46.00-69.98	55.45	55.81	47.50
RETAIL SHELF PRICES																
1/2#	2.88	2.68	2.89	2.88	2.44	2.33	2.64	1.69	2.53	2.39	2.03	3.50	1.69-3.50	2.57	2.70	2.58
12 oz. Plastic	3.25	3.57	2.49	3.23	3.25	3.42	3.22	3.60	3.43	2.74	3.03	3.92	2.49-3.92	3.26	3.43	3.29
1# Glass/Plastic	3.80	4.19	4.25	4.06	4.73	4.18	3.67	4.25	3.73	4.12	3.98	5.00	3.67-5.00	4.16	4.13	4.02
2# Glass/Plastic	7.67	6.74	6.79	6.43	7.00	6.79	6.33	7.08	7.36	6.52	6.28	9.92	6.28-9.92	7.07	6.89	6.87
Pint	6.64	7.58	6.64	5.07	5.90	5.17	3.99	5.72	6.25	8.00	5.52	7.92	3.99-8.00	6.20	6.15	5.95
Quart	12.33	11.98	9.00	9.15	7.95	8.68	7.49	9.90	10.75	15.00	8.93	12.31	7.49-15.00	10.29	10.26	10.01
5# Glass/Plastic	18.25	14.45	15.29	14.63	19.44	15.25	14.83	16.50	15.00	12.88	14.33	18.00	12.88-19.44	15.74	15.66	14.77
1# Cream	4.75	5.58	5.45	4.81	4.74	3.85	4.46	5.23	4.74	5.78	4.55	5.00	3.85-5.78	4.91	5.15	4.92
1# Cut Comb	5.00	5.28	5.19	4.58	5.51	4.75	7.00	5.46	5.51	5.94	24.00	8.00	4.58-24.00	7 18	5.80	5.52
Ross Round	5.29	3.97	5.60	5.28	5.29	3.50	6.50	5.50	5.29	5.29	5.75	6.00	3.50-6.50	5.27	5.57	5.08
Wholesale Wax (Lt)	3.33	3.12	2.00	2.05	2.15	3.81	2.40	2.25	2.50	2.11	2.37	2.25	2.00-3.81	2.53	2.84	2.11
Wholesale Wax (Dk)	2.67	2.73	1.80	1.78	2.00	3.33	2.25	1.75	1.99	1.99	1.51	1.99	1.51-3.33	2.15	2.07	2.00
Pollination Fee/Col.	60.00	91.00	54.00	41.67	42.00	46.00	48.00	60.00	87.83	87.83	30.00	146.67	30.00-146.67	66.25	74.54	61.19

RESEARCH REVIEWED

The Latest In Honey Bee Research

Steve Sheppard

". . . the researchers concluded that worker behavior was the primary determinant for the outcome of queen replacement"

Reproductive swarming is one seasonal activity of honey bee colonies that is quite familiar to beekeepers. During a typical annual cycle with adequate floral resources, an unfettered honey bee colony expresses a suite of behaviors that leads to the eventual exit of the laying queen together with a portion of the workers. Once departed, this "primary swarm" sets about to establish a "new" colony in a new location. The bees remaining in the old home site go on to rear a variable number of virgin queens, one of which will become the replacement queen of the "old" colony Prior to or concurrent with queen replacement, variation in the process is possible. In some cases, one or more of the virgin queens may leave the colony with their own group of workers as "afterswarms" and, like the primary swarm, attempt to make a go of it in a new home site. In other cases, there are no afterswarms and the replacement queen remains as the sole survivor of all the virgins that were produced as a result of reproductive swarming

From the perspective of beekeepers, the key word in the above scenario is "unfettered." All things being equal, most beekeepers manage their colonies to reduce the likelihood of swarming and the associated loss of field force and potential honey yield. Finding means to circumvent the natural tendency of honey bee colonies to engage in reproductive swarming is a fascinating dimension of the art of beekeeping all by itself, but it is not the subject of this month's column. Instead, this research under review comes from a study of the process of queen replacement, related to the presence or absence of afterswarms and genetic background of the bees (Schneider and DeGrandi-Hoffman, 2007).

In their introduction, the researchers describe the process of reproductive swarming and note that when multiple virgin queens (VQ) are produced, it is the VQ themselves who kill each other, either through "duels" between emerged VQ or by emerged VQ killing other VQ unfortunate enough to still remain in queen cells. However, the authors point out that worker bees can effect the outcome of the queen replacement process (and likelihood of afterswarms) by interacting with emerged VQ (chasing, biting, vibration signals) and altering their behavior The authors were interested to study queen replacement in colonies with and without afterswarms and to examine this process in colonies of bees from both African and European genetic backgrounds.

The authors used detailed observations they had made of the process of queen replacement in 21 observation colonies. These observations came from three different investigations made between 1991 and 2003 in locations as diverse as Botswana, North Carolina and Arizona. The colonies were described as being "African-matriline" (9) or "European-matriline" (12). The colonies either swarmed naturally (2) or in response to queen removal (19) and produced a total of 194 sealed queen cells. These cells produced 61 virgin queens, with the other 133 being destroyed "pre-emergence." The virgin queens were observed from emergence until a replacement queen was established in the colony Information collected on individual VQ included. 1) the order of emergence (relative to other VQ produced in the colony), 2) fate (killed, departed in afterswarm or became the "replacement" queen), 3) number of rival VQ she eliminated and 4) vibration rate (number of vibration signals received from workers during 30 minutes). The researchers also measured the duration of the rival elimination period (time from first VQ emergence until a single queen was left in the observation hive) for each colony and whether or not the colony had produced afterswarms ("reproductive strategy").

Overall, five of the 21 colonies produced afterswarms. Two of these were from the colonies that naturally swarmed and three were from the 19 colonies that produced virgins in response to queen removal. Of the 16 colonies that did not produce afterswarms, eight of them produced multiple VQ and eight produced a single VQ. One the average, the "rival elimination period" of the five colonies with afterswarms was three times greater than in the non-afterswarming colonies. Thus, colonies with afterswarms took five to six days to establish a replacement queen, while colonies without afterswarms completed that task within 24 to 48 hours. The authors found differences in the reproductive strategy of African and European matrilineal groups. Thus, the number of VQ produced by "African" colonies did not differ between the three colonies with afterswarms and the six colonies without afterswarms (mean of 6.5 and nine VQ produced, respectively), whereas more VQ were produced in the two European colo-

nies with afterswarms than the 10 colonies without afterswarms (mean of 23 and 7 VQ produced, respectively). African colonies engaged in higher levels of pre-emergence destruction (killing VQ in cells) in colonies that did not produce afterswarms, whereas European colonies had higher pre-emergence destruction in colonies with afterswarms.

One remarkable finding was that the emergence order of the queen that ultimately survived to take over the old nest was significantly different between colonies with and without afterswarms. In colonies that did not produce afterswarms, the first VQ to emerge became the replacement queen about 88% of the time. This held true whether the VQ was the only one to emerge (having killed potential rivals pre-emergence) or whether multiple VQ emerged in the colony In the eight examples of the latter (no afterswarms, multiple VQ emerged), the first VQ to emerge became the replacement queen in six of the cases. In colonies where afterswarms were produced, there was no "first queen" advantage. Thus, in the five colonies that produced afterswarms, only one first emerging VQ left with an afterswarm and none of them became the replacement queen for the old nest. The researchers reported that the amount of worker-queen vibration signaling was 25 times greater in colonies with afterswarms than in colonies without afterswarms. They also found that, regardless of the colony reproductive strategy, the survival rate of VQ depended on the amount of vibration signal received. Queens that were vibrated at higher rates were more likely to survive than queens that received little signaling from the workers.

Given the differences between the two reproductive strategies in time until queen replacement (five to six days for colonies with afterswarms and about a day for colonies without afterswarms), the 25 fold difference in vibration signaling between the two strategies and the correlation between vibration signals and VQ success, the researchers concluded that "worker behavior was the primary determinant for the outcome of queen replacement." Thus, in colonies without afterswarms, the workers did little to "interfere" with queen replacement and the first VQ to emerge usually was able to become the replacement queen. With afterswarms, higher vibration signaling activity may have influenced the "fate" of each emerged VQ. The authors also discussed the possible interaction between the genetic makeup of the colony (in the population of workers) and potential replacement queens. "Divergent interests" in the outcome of queen replacement could be more pronounced in situations where afterswarming provided a more complex set of genetic relatedness differences, although the authors suggest that additional experiments along those lines will be needed to "assess the roles of cooperation and conflict." While that research remains for the future, in this paper Schneider and DeGrandi-Hoffman clearly showed that being first out of the starting gate (or queen cell) doesn't always make a queen the winner From the standpoint of a first-emerging virgin queen, what a grand disappointment it must be to emerge in a colony that has plans to produce afterswarms. No longer the "favorite" daughter of the hive (with an 88% chance to become the replacement queen), but just one of the crowd of virgin queen contenders. BC

Dr. Steve Sheppard, Thurber, Chair, Dept. of Entomology, WA State Univ., Pullman, WA 99164-6382, shepp@mail.wsu.edu; www.apis.wsu.edu.

S.S. Schneider and G. DeGrandi-Hoffman. 2007 *Queen replacement in African and European honey bee colonies with and without afterswarms.* Insects Sociaux. DOI 10.1007/s00040-007-0973-2

'Bout A 100 – Sideline Beekeeping
EQUIPMENT DECISION
The equipment you buy depends on time, budget and space

Larry Connor

In General

There are, of course, some subtle differences between a Sideline beekeeper and a Hobby or Commercial Operator But frankly, most of these are not the least bit subtle, but pretty easy to pick up on. We are calling a beekeeper a sideliner when operating somewhere between 25 to 300, or using my working definition, *a sideliner is someone who has another source of income* (retirement, lotto winnings or most usually a real job) other than bee related activities to pay the bills at the end of the month. For a majority of sideliners, beekeeping is what they do when they want to escape from real work.

Some of these differences come about slowly if the number of colonies creeps up by ten percent each year, or dramatically leap forward when you discover that *you really can* increase one strong colony in April into 16 colonies by the end of the summer and you have the audacity to do this with 20 colonies and survive to tell the tale a year later Or not, depending on your skill level, weather and dumb luck.

So we start with the number of colonies we have at the start of the season, the *live hive count*, adjusted for those welfare units that barely made it through the Winter and should be put out of their misery Or so you think. Your plan of management will be different if you are looking at 50 overwintered colonies in March or 250. I think I can almost manage 50 colonies with the car and a loaner or rental pickup, as well as someone (kid, buddy, spouse) who will help when things get busy and extract honey if any is produced. If we follow our theme in this series – *About 100* – we will approach this with 100 colonies at some point in your beekeeping year I'll let you decide if that will be at the low point or the high point of the season.

The temptation of pre-assembled frames and hive bodies is great. Enjoy the smell!

There are 100-colony beekeepers that manage outapiaries by riding their bike to the yard, and have a bee suit, smoker and various supplies locked in a trash can (with a tight lid) chained to a tree or cement anchor Then there are 100-colony beekeepers with the latest diesel-bleaching monster trucks with dual air conditioning, so they can cool off between hives. You will have to find your own transportation system, but at some point in the operation of an apiary you will need to move honey supers or honey containers. I still like the image of bicycle beekeeping. It would seem to be so civilized if it never rained or problems never developed in the apiary

Equipment – It should be pretty obvious that you will need a home for these bees, since the practice of leaving them in screen and cardboard boxes is not well perfected. Do you want to make your own equipment, assemble pre-made equipment or take advantage of the supply companies that now offer fully assembled *and* painted hive bodies, and use frames with foundation installed.

Build it yourself – I am in general awe of those folks who are really gifted in the woodshop. I always wanted to be that person, but family needs and my highly evolved ability to transform one small project into a huge mess pretty much scared me out of the garage. But even for the most unskillful person a few items, like hive stands, drip boards, and migratory covers are within a realistic skill level. The fact is that most beekeepers are forced to build things they cannot live without that most bee supply companies do not sell, or sell at such a huge price that it seems unreasonable to take up catalog space for the darn things.

At other times, when I look at most of the equipment for sale in the catalogues, and the woodshop tools I would need to make a solid frame or hive body with proper box joints, I consider it a bargain to pay the price and consider it an investment. Of course there are endless horror stories of beekeepers buying somebody's homemade equipment and how it does not fit with standard stuff, and well, I just remind myself that every buyer should beware of the deeply discounted price. And always ask the beekeeper why he/she is selling something that seems to be in such good shape. Maybe it isn't working for them either!

Assemble pre-made equipment – This makes the most sense to me, and optimizes the cost of the materials against the savings that my fully discounted labor

will factor into the matter It is one thing IF I do ALL the gluing and nailing and painting and schlepping, but quite another IF I decide that this is too crazy or there are too many things that need to be done at the real job that gives me money to support my beekeeping habit. So I hire someone to do the work for me, and spend more than I expected, but OF COURSE I don't realize this until the next Winter when I figure out the taxes and see that I could have purchased pre-made and already painted boxes and frames for the same cost or even less than I had invested when I hired John or Jane All Thumbs to do the work for me! The person who helps you is good at what they do – paid or unpaid (translation: a somewhat willing and very skilled family member) – will make a big difference in your decision-making. Frankly I am amazed at the number of beekeepers who have parents working for them, often for nothing, just to help out and to have something to do.

At this point in the season (unless you are working bees on Almonds or operating in a climate warmer than Kalamazoo), you still have a few days or even weeks ***to plan for 2008*** and spend some time with a spread sheet or pocket calculator to figure out which direction you should take. Once I had all the answers for these sorts of things, but I must have gotten really stupid lately since I have trouble figuring out which way I should go to add 50 new beehives.

Then there are people who your friends know who are looking for some simple project to do for extra money, or in the case of retired people, some excuse to get out of the volunteer work their spouse has signed them up for, or that Winter cruise of the Detroit River that was such a great deal.

Pickup Pre-Assembled Equipment – Your ultimate choice may be to rent a truck or cargo van and pick up the pre-assembled and fully painted equipment and pay the bill with the knowledge that the equipment is standardized and solid. A few years of this sort of thing and you may never want to return to the woodshop or self-assembly ever again. Until Tax Time, when you have trouble justifying the added expense to yourself, much less to that penny-pinching accountant you hired. So make up your list of needed equipment and email/fax the order off for a quote, and do it right now, in February, before the season is here. Again, for many of you the 2008 season is already here and you are asking what AM I THINKING?

Dangers Of Used Stuff

Is there something I forgot to mention about buying used equipment? Yes, why is the seller getting rid of it? I have friends who read the bee magazine classified ads and look at the stuff for sale and try to figure out who is going out of business and who is getting rid of the old stuff so they can buy some new. I imply no criminal practices in this, of course. But I do have concerns about the person who knows that the equipment being sold is (1) Really, really old and in horrible shape, (2) Loaded with American foulbrood spores or some insecticide residue, and (3) Filled with mousy moth and beetle destroyed frames.

I hope that a beekeeper with 25 or more colonies has the experience to recognize American foulbrood scales upon inspection of the equipment. Most folks can smell it. Nasty odor, like something died (well, something did die, dummy, the brood!).

When looking at used equipment, even bottom boards, look at the edges and see if they are still tight and well maintained.

Unfortunately there is no field method to recognize brood combs that are contaminated with miticide residues. To this I have a simple reply – Don't buy old brood combs! Some would say NEVER, EVER buy any used brood comb, even if nearly new. But that makes it really hard to purchase nuclei colonies and I support that management decision. So you have to avoid the obvious risks and be prepared to take some small ones.

So, if you do decide to purchase old equipment, limit it to stuff you can clean up, scorch out, or run through a treatment chamber for sterilization. One of the up sides of CCD has been the discovery of sterilization chambers in different parts of the country. They are expensive, but I gather cost less than the box you want to decontaminate. No, I do NOT know where they are, but check with your nearby bee associations, they seem to know this sort of valuable information I always forget.

If you really know the beekeeper you might be able to trust them. Frankly I am not sure I would buy old combs from me if I had them for sale. Which I do not, so don't ask. My point is that it is impossible to know exactly what risks any comb or box of equipment carries with it, so there are too many risks and there has to be a really low price to make this a wise decision. Only one cell of foulbrood can really cause you a lot of hurt if you start spitting and expanding in the Spring.

So, what's the bottom line about sideline beekeepers and equipment? Here is a checklist you will just have to complete yourself – And try to be honest or at least realistic!

1 How skillful are you in the wood shop?

2. How much do you enjoy working with wood and making beehives? Do you have an adequate work area to assemble 100 boxes or will this end up in your soon-to-be former living room?

3. How much time to you have to put into the woodshop? Or, how many demands do you have on your job or from your family?

4. Are you likely to put off a major project, like building 100 bee boxes, until just as you need them? Will the brood boxes you need in April be finished in February or May?

5. Do you have someone who will work doing equipment assembly for you for next to nothing? And do a beautiful job?

Wax moth damage makes this comb unacceptable. True, a strong colony will tear this out and rebuild. Why not start fresh?

6. Do you have the financial reserves to invest in pre-assembled equipment?

7 If offered used equipment, carefully measure it against standard hives to make sure the boxes are uniform and will work well together

8. If you are thinking about buying used drawn brood frames from someone you know nothing about, **don't.** If you are thinking about buying honey supers, are they well drawn and fresh or partially drawn or brittle to the touch?

9. Do you have a hive treatment facility (I believe most are now using radiation to sterilize equipment) within a reasonable drive and available at an affordable cost?

10. Does this all integrate well with the rest of your sideline operation? Do you have the locations for the hives ready to go? Do you have the bees ordered or an expansion plan for making increase in place? Are you raising your own queens in this operation?

Bee Stock

Before I finish I think it is critical that I mention bee stock, and how you will go about the process of selecting the right one for your operation. In my new book, *Bee Sex Essentials*, I make a huge point of the need for diversity in the apiary, especially in the drone side if you are serious about having strong colonies. These diverse drone colonies are ideally ones that come from mite-tolerant, disease- (American foulbrood and chalk brood) resistant, Winter hardy, productive colonies that rarely require you to wear a veil.

I used David Tarpy as resource for this book, and mention his name and his research several times. When I sent an early draft of the book to him to edit and review, he made many useful suggestions. But the one I want to share with you here is the need to have at minimum six different (unrelated) drone stocks in your apiaries if you plan to mate queens. The reason for this is based on the work Tarpy did with genetic diversity, where he found that the colonies that were the most diverse had the best chance of surviving natural diseases and were most productive. By relying on six different stocks, you had a total of 12 theoretical drone types, and this is very close the average number of drones virgin queens mate with in the open.

So, by introducing a minimum of six different stocks into your production colonies, you should be producing 12 different drone types and providing good genetic diversity with the least amount of trouble and management.

You are not grafting from these queens, but producing drones in your colonies during the season when you may have queens produce via swarming or supercedure and they provide the drones needed to provide vigorous colonies. Oh, I know some of you are already pushing the *Varroa-mite panic button.* Fine. Plan on using a screened bottom board and powdered sugar system to manage your mite load and *if necessary* use a miticide at the end of the season treatment after the honey is removed.

Don't panic, I will continue to talk about his in the next few months as we look at decisions facing sideline beekeepers as they grow their operations. But the reason to mention bee stock now is simple, it better be on order when you read this.

Whoops! BC

Dr Connor is busy recovering from the production of *Bee Sex Essentials*, which should be delivered about the time this reaches your mailbox. This assumes that boats and trains and trucks and multiple holidays do not completely thwart the process. For details contact ebeebooks@aol.com or go online to www.wicwas.com.

Malcom T Sanford

Honey – An Environmentally Friendly Food

"The carbon foot print of honey is measurable, and useful to know."

I always appreciated the motto of the folks from Brazil's Apacame (São Paulo Association of European Queen Breeders)[1]: They say beekeeping is "Environmentally Correct, Economically Viable, Socially Just." There and elsewhere beekeeping continues to be the darling of development agencies that see it as an activity which is labor intensive, requires minimal land purchase with no cultivation, and produces a cash crop. These characteristics certainly justify the motto reflected above. Now another set of evidence indicates that the main product of the honey bee also qualifies as "environmentally friendly "

Annika Carlsson-Kanyama, Environmental Strategies Research Group, Stockholm, Sweden and colleagues at Göteburg have written that climate change has emerged as perhaps the most urgent global environmental problem. They concluded that one of the most polluting every day activities people engage in is food consumption.[2] Greenhouse gases from the food sector are more than substantial and lowering them can help stabilize addition of these gases to the atmosphere.

In an effort to quantify the above notion, the authors have studied the energy inputs from food life cycles. It turns out diets with similar dietary energy consumed by one person can vary by a factor of four (4). The energy measurement chosen is the megajoule (MJ). This is a difficult number to get one's brain around, and after attempting to calculate what it means, I now understand why the authors decided not to define the unit in their paper Rather they prefer to simply use it in a relative sense. Thus, factor of four mentioned above means a range of 13 to 52 MJ. This is further refined by using the ratio of MJ per kilogram (Kg) of weight in the calculation (MJ/Kg). One Kg equals 2.2 pounds (lbs).

The authors review in some detail a body of published evidence showing how food is a main contributor to human energy use. Its production and consumption can affect every thing from greenhouse gas emission to methane production from livestock, and nitrous oxide (N_2O) from fertilizer use. In general, moving from consumption of meat and cheese to vegetables and locally produced fresh foods lowers energy inputs and results in less greenhouse gases. However, the authors have gone much further than this in their study by adding into the equation other aspects of energy use in food production, including transportation and other cultural practices. The measurements are so detailed that the authors believe the information in their research will allow menu planning and recipe evaluation in average Swedish food consumption patterns.

An example of the intensive calculations by the investigators is provided for jam. Most jams in Sweden displayed in stores were produced by either a large company with a manufacturing plant in the south of Sweden or smaller producers located in the north. The majority of the sugar was produced in southern Sweden or Denmark and cultivated fruits were generally frozen on arrival and came from Eastern Europe or Central America. Berries harvested in the wild were also frozen on arrival, originating in Northern Sweden or Russia. Recipes differed in amount of sugar and fruit used. Given all these variables, six typical jam types were selected by the authors for final calculation based on visits to retailers, contacts with suppliers and importers, and selection of specific products.

The results revealed a mix of obvious conclusions and a few surprises. For all foods measured, calculations ranged from 2 to 220 MJ/Kg. For meat, beef had the highest rating (75 MJ/Kg), while chicken was 35 MJ/Kg and pork and lamb 40 and 43 MJ/Kg respectively. Seafood revealed shrimp with an "astounding" 220 MJ/Kg and clams only 19 MJ/Kg. Cooked legumes ranged from five MJ/Kg to 20 MJ/Kg. Vegetables and fruits ranged all over the place based mainly on transportation. Fresh carrots from Sweden were 2.7 MJ/Kg, but frozen broccoli from overseas was 20 MJ/Kg and fresh greenhouse tomatoes came in at 66 MJ/Kg. Predictably, fresh Swedish apples were 3.5 MJ/Kg, while tropical fruit from overseas was 115 MJ/Kg. An intriguing category is drinks, where we see that tap water is 0 MJ/Kg, but bottled water rates 2 MJ/Kg.

A large category was sweets. These can have large energy inputs, according to the authors, averaging 18 MJ/Kg up to to 44 MJ/Kg. In Sweden consumption of sweets and snacks is equivalent to the amount of fish eaten (12 Kg/Yr). They concluded: "The increasing consumption of sweets is therefore not only a health concern, but also an ecological issue." I personally am not happy that chocolate rates the highest 44 MJ/Kg, but am delighted to see that local Swedish honey has the lowest rating of all foods provided in the paper, 1.3 MJ/Kg. Even imported honey gets a good score at 5.6 MJ/Kg.

The authors stated that sweets and drinks may contribute up to a third of total energy credits for food consumption. They suggested it might be interesting to look for energy-efficient and non-consumption alternatives, and concluded: "If eating sweets means comfort, perhaps an energy efficient back-rub could do the trick?"

So there it is in black and white. Based on this study, honey can in fact be advertised as one of the most environmentally friendly foods. Your customers will like it that your local honey is king when it comes to protecting the atmosphere. Well almost? I suppose some skeptics will say that humans can't live on honey alone

and the per capita consumption isn't all that high, although it probably is more in Sweden than in the United States. In addition, any transport of honey, which is mostly water, certainly reduces its energy efficiency.

It seems obvious, however, that local honey can for sure outperform the imported stuff when it comes to climate change. And eating local is becoming a bigger thing these days. In fact guess what is the 2007 Word of the Year for the Oxford American Dictionary. Go to the head of the class if you chose "locavore."

According to one web site on the subject, we should celebrate our foodshed: "We are a group of concerned culinary adventurers who are making an effort to eat only foods grown or harvested within a 100 mile radius of San Francisco for an entire month. We recognize that the choices we make about what foods we choose to eat are important politically, environmentally, economically, and healthfully. In 2005, we challenged people from the bay area (and all over the world) to eat within a 100 mile radius of their home for the month of August. In 2007 we extended that challenge to the month of September We encouraged folks to try canning and preserving food for the wintertime. We hope you're enjoying your homemade creations."[3] Clearly someone's missing a bet here as there is no link on this site to any local honey producer.

Some think all this is a bit much. According to Chef Jacqueline Church when discussing the benefits of local food, "Mostly, it (local food) just plain tastes better It's also healthier for us and for our environment. But some folks want me to give up anything not grown within a 100 mile radius of where I live. "*Que loco!* I'm going to have another sip of my Ethiopian coffee and then dash off a note to the President. But here's the thing: we *should* 'eat local'; we just shouldn't get *loco* about it. (Note to my editor and other astute readers: I am aware that 'local' is not a noun.)"[4]

Another way to look at all this is through a term we are going to hear more and more about in the future, food miles. "The concept of food miles is part of a broader issue of sustainability which deals with a large range of environmental issues, including local food. The term was coined by Tim Lang (now Professor of Food Policy, City University, London) who says: 'The point was to highlight the hidden ecological, social and economic consequences of food production to consumers in a simple way, one which had objective reality but also connotations.

"A report in 2005 undertaken by Paul Watkiss and AEA Technology Environment, entitled The Validity of Food Miles as an Indicator of Sustainable Development for the United Kingdom's Department for Food and Rural Affairs included findings that 'the direct environmental, social and economic costs of food transport are over £9 billion each year, and are dominated by congestion.'

"Recent findings indicate that it is not only how far the food has traveled but how it has traveled that is important to consider. The positive environmental effects of specialist organic farming may be offset by increased transportation, unless it is produced by local farms. But even then the logistics and effects on other local traffic may play a big role. Also, many trips by personal cars to shopping centers would have a negative environmental impact compared to a few truck loads to neighborhood stores that can be easily accessed by walking or cycling. A favorite endeavor is to eat food from within a 'food shed' having a radius of 100 miles."[5]

Ah, but this may be too simple. Consider the concept of fair miles: "Researchers at the International Institute for Environment and Development argue, however, that consumers should not look only at distance but also at the source of food. They say that vegetables air-freighted from East Africa to the United Kingdom produce a fraction of the emissions that transporting food by road within the UK causes. They add that more than a million poor farmers depend on this trade and argue that moves to limit food choices on the basis of miles traveled will harm these farmers' livelihoods."[6]

This widens the net considerably for no longer is the notion of honey's energy efficiency enough. This relates back to Apacame's motto quoted at the beginning of this article, which includes the term "socially just."

Some other allied initiatives are coming along, however, to help consumers and producers better estimate food production efficiency via what is called the carbon footprint. "This is the total amount of carbon dioxide (CO_2) and other greenhouse gases emitted over the full life cycle of a product or service. Normally a carbon footprint is usually expressed as a CO_2 equivalent (usually in kilogrammes or tonnes), which accounts for the same global warming effects of different greenhouse gases (UK Parliamentary Office of Science and Technology POST, 2006). Carbon footprints can be calculated using a Life Cycle Assessment (LCA) method, or can be restricted to the immediately attributable emissions from energy use of fossil fuels."[7]

The above article reported that the calculation can vary. Some might say from the sublime (the carbon foot print of those aged 50 to 65 is higher than any other age cohort) to the outlandish. As an example of the latter, analysis of the carbon footprint of Christmas in the UK shows that consumption of items such as food, travel, lighting and gifts at Christmas produces as much as 650 Kg of carbon dioxide (CO_2) emissions per person – equal to 5.5% of the UK annual carbon footprint. Over Christmas, the average person could produce as much as 26 Kg of CO_2 from Christmas food, 96 Kg of CO_2 from Christmas car travel, 218 Kg of CO_2 from extravagant lighting displays, 310 Kg of CO_2 on Christmas Shopping. It is concluded that Christmas carbon emissions could be reduced by up to 60 per cent to about 250 Kg. Bah, humbug indeed from the land that brought us A Christmas Carol!

Other initiatives include the Carbon Trust's label,[8] which shows the carbon footprint embodied in a product in bringing it to the shelf, The Climate Conservancy's green house gas (GHG) label (CO_2e per $)[9] and the Canadian Carbon Counted,[10] a "live" carbon dioxide emission footprint with the entire supply chain continually participating as opposed to a static calculation. Look for more of these in the future.

No matter how counted or calculated, however, few foods, especially sweets, will be able to compete with honey in the future in terms of car-

bon footprint. Thus, honey marketers would well be advised to begin getting their campaign advertising in synchrony with an emerging marketplace measured by energy efficiency and concurrent societal benefits. The people at Apacame were way ahead of the curve on this one, and now the rest of us can employ the motto they pioneered in yet another context. BC

Dr. Sanford is a former Extension Specialist in apiculture at the University of Florida.

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a closer look

DRONES

Clarence Collison

What Is The Reproductive Advantage To Producing Large Drones? And Do Queenright Colonies Produce Better Drones?

The reproductive success of drone honey bees seems to vary among drones depending on their body size. Honey bee colonies furnish their brood nests with two types of comb distinguished by cell size; large cells for rearing males (drone comb, 6.2-6.4 mm diameter, about four cells per linear inch) and smaller cells for rearing workers (worker comb, 5.2-5.8 mm diameter, about five cells per linear inch). Most drones are reared in the larger drone-size cells. Small drones are usually produced when the queen runs out of sperm and lays unfertilized eggs in worker cells or when laying workers in a queenless colony lay unfertilized eggs. The comb cell size determines the body size and weight of emerging drones. Drones emerging from worker cells are smaller in weight and size than those emerging from drone cells (Berg 1991, Berg et al. 1997, Schlüns et al. 2003). Because honey bees invest energy into building special comb with larger cells in which to rear drones and they preferentially rear and foster large drones, large drones must have a reproductive advantage.

Drones emerging from worker cells weighed significantly less than those emerging from drone-size cells, 151.8 mg and 260.8 mg, respectively (Berg 1991). The length of their wings was also significantly different 11.21 mm vs. 12.09 mm. Schlüns et al. (2003) found a mean wing length (distance between the two branching points in the wing venation pattern which reflects about 50 percent of the wing length) for large drones to be 6.03 mm and 5.27 mm for small drones. The wings of small drones that emerged from worker cells were about 13 percent smaller compared to the wings of large drones which emerged from drone cells. This is substantially more than observed by Berg et al. (1997) who reported a seven percent difference for wing length of small and large drones.

Drones reared in queenright (a colony having a healthy, egg-laying queen; opposite of queenless) colonies in drone combs and in laying worker colonies both in worker combs and in drone combs were compared with respect to their live weights at different ages, reproductive capacities, and differences in various body structures (Gencer and Firatli 2005). Depending on the comb and colony type, the weights of newly emerged drones varied. At emergence, the drones from drone comb in queenright colonies were 17 percent heavier than drones from drone comb in laying worker colonies. Drones from worker comb in laying worker colonies were 36.6 and 23.7 percent lighter than drones from drone comb in queenright and laying worker colonies, respectively The differences between the two groups of drones produced in the colonies with laying workers may result from dietary differences. Drones sampled from drone comb in queenright colonies, drone comb in laying worker colonies, and worker comb in laying worker colonies lost 18.8, 16.1 and 13.3 percent of their initial weights during maturation from emergence to 18 days of age, respectively Body weights (reflecting investment of workers into the male) of small drones reared in worker cells are 41.9 to 52.3 percent lower compared to the weights of large drones reared in drone cells.

Comparison of different sized drones indicated that large drones have larger mucous glands and seminal vesicles and produce more spermatozoa than small drones (Gencer and Firatli 2005). The average number of spermatozoa in drones from drone comb in queenright colonies (12.01×10^6) was significantly greater than that of drones from drone comb in laying worker colonies (10.17×10^6) and from worker comb in laying worker colonies (8.62×10^6). The other reproductive and body structures, such as weight of mucus glands and seminal vesicles and extent of hamuli (wing hooks), lengths of hind leg parts, total length of hind leg and head width, all had significantly higher values in drones

Welcome to Clarence Collison's first 'A Closer' Look column. If you've followed Clarence's 'Do You Know' quiz for the last 20+ years what you'll see now is how he gathered the information for his questions. 'A Closer Look' examines several resources, some new, some not so new, that detail research on a particular subject. His article will provide you with an indepth analysis unavailable in any regular magazine article, plus he adds his own interpretation of what all the data means. We hope you enjoy our latest endeavor as much as Clarence is enjoying the challenge.

from drone comb in queenright colonies, and the lowest values were from drones produced in worker comb in laying worker colonies.

Africanized honey bees and their comb cell sizes are normally slightly smaller in size than the European honey bee. Rinderer et al. (1985) reported that Africanized drones weighed significantly less (194.6 mg vs. 220.2 mg) and had significantly fewer spermatozoa than European drones (4.6 million vs. 5.7 million/ seminal vesicle), although their seminal vesicles and mucous glands were not significantly different in weight. The reduced weight of Africanized drones possibly results from the smaller cell size and less feeding of drone larvae by Africanized nurse bees in comparison to European nurse bees.

The effect of drone honey bee's body size on semen production was further evaluated (Schlüns et al. 2003). In the same colonies, drones were either reared in drone cells (large drones) or in worker cells (small drones). Wing lengths (size indicator) and sperm numbers of small and large drones were compared. Small drones (~13 percent reduced wing size) produce significantly fewer spermatozoa (7.5 ± 0.5 million) than normally sized drones (11.9 ± 1.0 million spermatozoa). The sperm numbers ranged from 1.09 x 10^6 to 30.31 x 10^6 spermatozoa and the overall mean was 9.19 x 10^6 spermatozoa per drone. There was a significant positive correlation between sperm number and wing size within the small drones and in both groups combined. In the large group alone no correlation was found. Small drones produce 20 percent more spermatozoa in relation to their body weight. The rearing investment per spermatozoan is lower for small than for normally sized drones because small drones produce more spermatozoa in relation to their body weight. Since colonies usually produce large drones, the enhanced investment must be outweighed by a mating advantage of large drones. Traits other than sperm numbers have to out weigh the costly investment in large drones. The lower flight performance of small drones in drone congregation areas or a potential difference in semen quality could contribute to the preference to rear large rather than small drones.

Sampling of drones in a drone congregation area in Germany with a drone trap and excluder grids to discriminate between large and small drones, over a three-week period, found an average of 9.14 percent (min = 7.2 percent, max = 13.2 percent) of the captured drones had developed in worker-size cells. Thus small drones appear frequently enough under natural conditions to play a substantial role in sexual competition among small and large drones (Berg 1991).

Berg et al. (1997) trapped drones within drone congregation areas (DCA) and were able to show that small drones originating from worker cells in comparison to large drones reared in drone cells had a reproductive disadvantage in drone congregation areas. Trapped drones from the drone congregation area were compared to drones emerging in an incubator. There was no significant difference in wing length between small drones from the DCA and small drones emerged from worker cells and large drones from the DCA and those emerged from drone cells. The difference in wing length between small and large drones was highly significant.

Several fitness components of regular and small-sized drones were studied (Jarolimek and Otis 2001). Flight characteristics and longevity of large and small drones were quantified. None of the attributes of drone flights: average flight duration, total flight duration, number of flights per drone per day, and maximum duration were affected by drone size on two days with good flight conditions (e.g., sunny, > 20°C). On a cooler day (~ 18° C), a higher proportion of large drones (61 percent) than small drones (7 percent) took mating flights, but because few if any queens take mating flights at these temperatures, this cannot explain the higher reproductive success of large drones. In one colony the large drones had higher longevity; in the other colony there was no difference, so those results were ambiguous. There was a highly significant positive correlation between number of sperm and drone size.

While beekeepers are unable to choose the actual drones that a queen mates with while she is on her mating flight(s), they can select the drones that will be used during instrumental insemination. The size of several body structures have been shown to have positive correlations with the drone's body size and weight and indirectly number of spermatozoa. These characteristics e.g. wing length, could be used in selecting which drones would be used to supply semen for instrumental insemination.

It appears that body size and weight does not fully explain why large drones have a reproductive advantage over smaller drones during mating competition. Differential sperm numbers may primarily account for the greater reproductive success of large drones. Flight ability (Moritz 1981) has also been shown to vary between drones. Both traits clearly would affect individual reproductive success. Furthermore, honey bee drones may indirectly compete post copulation (semen quantity and quality) since honey bee queens mate with numerous drones. After mating, the semen of many drones is mixed and stored in the queen's spermatheca, with a large proportion of the semen being expelled from her body.

When rearing queens and saturating a mating area with desirable drones, it would be advantageous to have big populations of large-sized, sexually mature drones available. In order to achieve this, drones should be reared in colonies with large quantities of drone comb, large nurse bee populations, and abundant supplies of pollen and nectar

A similar approach in areas that have Africanized honey bees, saturating a mating area with slightly larger European drones, might reduce the probability of queens mating with Africanized drones and aid in slowing the Africanization process.

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The Year The Bees Died

David Rectenwald

Is weather a key factor in recent colony losses? Maybe so.

I started beekeeping in the Spring of 1992, for two basic reasons. First, I was starting a garden on the farm that my wife and I had purchased in Kenna, West Virginia and bees seemed to be in short supply. Second, I suffered from hay fever every Spring to the point of near disability and had read that eating honey from the area that you live in would help treat seasonal allergies.

Prior to that my total knowledge of beekeeping was comprised of one fact: my Uncle had kept bees. But I was willing to learn and would do anything to escape from the allergy shots that I had to receive each week. So with an empty hive that was given to me and the assistance of an elderly beekeeper as my mentor, I began a growing hobby, promising my wife that I would keep it to two hives.

I immersed myself in every book I could find, determined to learn as much as I could about the fascinating world of the honey bee. I worked with my mentor until his death, helping him with the labor while listening to his stories and advice. I soon joined the West Virginia Beekeepers Association (WVBA), and began attending every meeting and lecture possible.

I must have learned something along the path. My wife and I now maintain 70 hives in nine apiaries. Hard work and research allowed us to expand during the aftermath of the mite invasions. Currently, we teach beginner beekeeping courses and are officers in our local and state associations. We present lectures and hands-on demonstrations for schools and other organizations, and now, I often find myself acting as a mentor to anyone who needs me.

Three years ago I decided to test my knowledge and advance my beekeeping skills so I entered the WVBA's Master Beekeeping Program. I have since completed all three tests and need only to complete the honey judging portion of the program to receive my Master Beekeeper's Certification.

Part of the requirements for the Master's level is to prepare and present a public speaking program. This past June I agreed to draft and present a speech for the WVBA's Fall Meeting, to be held 21-22 September 2007 I was told to pick any subject that I thought would be educational to the association's members. I chose to speak on Colony Collapse Disorder (CCD) and the many near misses of diagnoses. James Copenhaver, the Chairman of the WVBA Master Beekeeping Program, told me to tie my talk into honey bee nutrition. This started a three month research and re-writing ordeal that lead to a surprising finding.

I wanted to use this speech to bring attention to the many different and sometimes wasteful research programs that CCD has brought about. But with the requirement to tie in nutrition and still impress my fellow beekeepers, I knew that this was going to be tough. Dozens of drafts later I was still struggling to create a comprehensible lecture. Then the August 2007 issue of *Bee Culture* arrived and with it came Randy Oliver's article about a little known protein called vitellogenin.

I read this article very thoroughly, and then followed up with several of his references. What interested me most was that even with heavy pollen collection, bees could still have deficiencies of this vital protein molecule. How could this be? What would cause pollens to be deficient in the amino acids, lipids, minerals and other elements that the bees need for a balanced diet?

Additional research found a list that noted the years of the major bee losses going back to 1868 (As shown below). A list that showed 140 years of devastation and loss. The name of the syndrome changed almost as often as it occurred. However the symptoms almost always remained the same. The only new thing with this recent loss was the delayed robbing and or infestations. One thing that has remained constant over the past 140 years and that has been the lack of a confirmed diagnosis.

The list of suspects have changed over the years including insecticides, toxic pollens, toxic nectars, diseases, molds, bacteria, viruses, *Varroa* and tracheal mites, aliens, black holes, cell phones, terrorists, and the latest Israeli Acute Paralysis Virus (IAPV). But with all of the usual suspects, two things remain absolutely the same – no confirmed diagnoses and the lack of predictability

But something kept nagging at me. There was a pattern to the chaos, something in the fog that I had not seen explained. Weather! None of the reports noted the weather! So I went looking for historical weather information and found the Palmer Drought Indices on NOAA's web site.

The Palmer Drought Indices was developed by Dr Wayne Palmer during the 1960s to establish a base line for severe weather historical data and forecasting. He developed a grid pattern that covered the North and Central American continents. He and his teams then gathered samples of tree cores, archeological surveys and earth

The List

- 1868 Kentucky, Tennessee
- 1915 Portland, Oregon
- 1915 Florida to California
- 1917 United States, New Jersey and Canada
- 1930s United States
- 1950s United States
- 1960s Louisiana, Texas
- 1960s Louisiana
- 1963-64 Louisiana
- 1964 California
- 1970s Seattle, Washington
- 1974 Texas
- 1978 Florida
- 1995-1996 Pennsylvania
- 2002 Alabama
- 2005-2007 United States, 27+ States

References

Wayne Palmer, Drought Indices Report, NOAA 1960-2007

NOAA and USDA Web Site Drought Research Files

Dewey M. Caron, University of Delaware, September 2006

ABC-XYZ of Beekeeping, 38th Edition

Kleinschmidt & Kondos, Research Papers 1976 & 1977

Randy Oliver, *Bee Culture* Magazine, August 2007

cores correlated to this grid. The grid points are indicated by the red dots shown in Figure 1

This data gives a record of severe weather across the North American continent dating back 2000 years. I then found a computer graphing program that was tied to the Palmer Indices' and would plot weather graphs back to 1895.

I plotted a graph based on the entire area of the Palmer Indices from January 1895 to August 2007 (Figure 2). Note that the graphs are shown as the systems plots them and the dates are indicated as (189501-200708). The Palmer Drought Severity Index (PDSI) noted on the left of the graph uses 0 as a base line for normal weather and negative numbers for drought. For example -2 would be moderate drought, -3 severe and -4 extreme. Conversely this same PDSI indicates excessive rainfall or moisture in positive numbers as noted above the 0 line. Drought is also shown as yellow and wet weather as green.

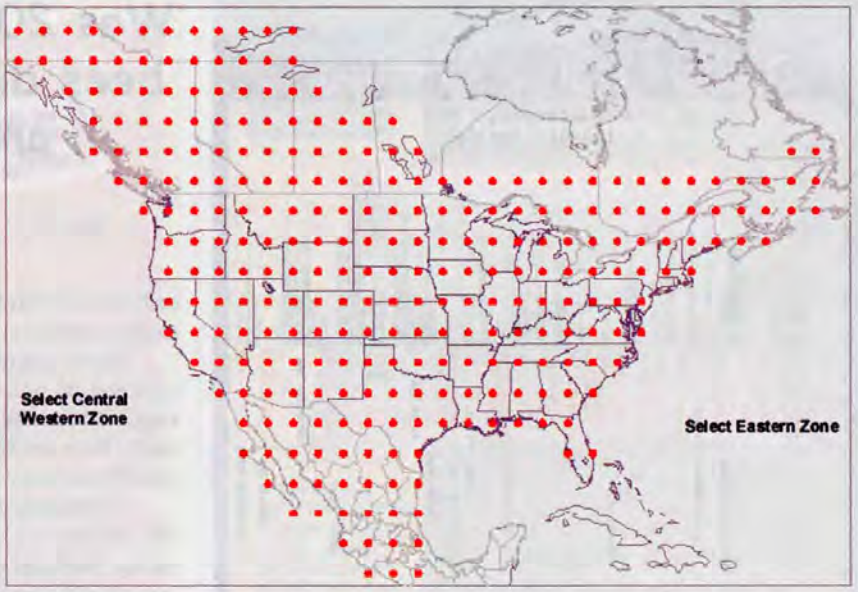


Figure 1 *The Palmer Indices Grid*

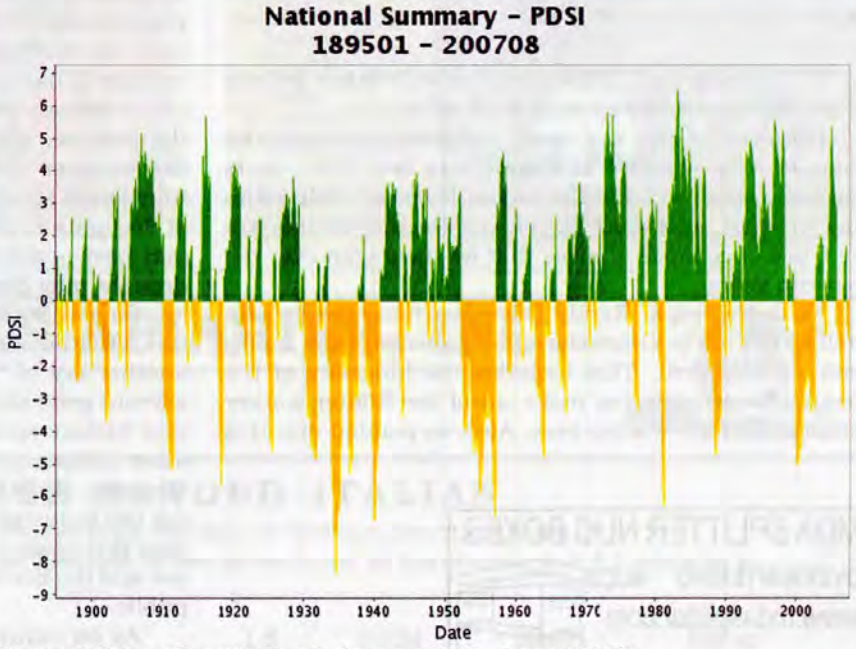


Figure 2 *Palmer Drought Graph January 1895 August 2007.*

Then I placed the dates of the major hive losses (as noted previously) over this graft as shown in (Fig 3). To my surprise every year of reported DDS lined up with a period of severe drought, with the apparent exception of the 1995-1996 Pennsylvania outbreaks. However, when I looked regionally, there was a deep drought across Pennsylvania, Maryland, the eastern panhandle of West Virginia and into New Jersey during those years.

So how could drought cause the unexplainable loss of bee populations over the Winter and even into the following year or years? Newton's third law of motion came to mind. "For every action there is an equal and opposite reaction" All living things have the desire to reproduce and survive. Plants, especially perennials, have an amazing ability to reduce or withhold nutrients from their extremities even sacrificing reproduction and sometimes whole limbs to save the core.

This can be seen during a dry Summer as apple trees shed some, or if stressed sufficiently, all of the growing fruit before it ripens. If this dry spell comes prior to or during the bloom, nectar flow is suppressed and nutrients are withheld from the pollens. If this dry spell is short our bees can make

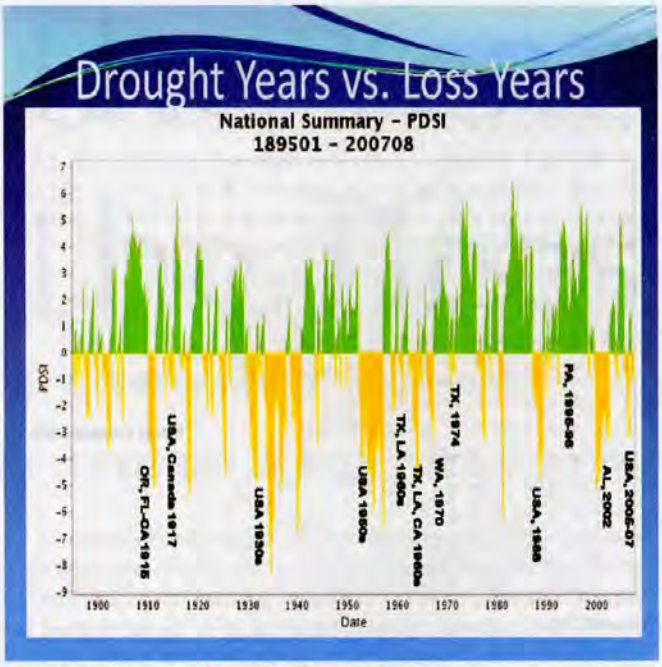


Figure 3 *Drought Years Vs. Loss Years*

up the Spring's poor quality pollens with other pollens as the Summer and Fall seasons continue.

However, if the dry spell continues through the Summer or starts late and lasts into late Fall, plants that are needed to build the proper levels of vitellogenin may produce poor quality pollens. Results of this are the types of collapse of hives that we have seen over the past two years.

As described in Randy Oliver's article, the protein vitellogenin is the controller of all aspects of the honey bee's development. This includes the longevity of the queen and the different make up of the Winter worker bees vs. Summer worker bees. Also, as pointed out, this

Was 2006-07 the year the bees died? Or, was it just another year the bees died?

critical protein is responsible for regulating the bee's immune systems.

When plants withhold nutrients during the development of pollens, the critical elements in the pollens required for the bee to produce vitellogenin are also withheld. This sets the scene for DDS, CCD or whatever the syndrome may be named.

The current drought cycle started midsummer 2005. The Winter of 2006-2007 was warmer than normal in many parts of our country Worker bees were observed foraging in December and January when they should have been clustering. Some hives had larger than normal Winter brood patterns due to the warm weather Without the proper levels of vitellogenin Winter workers aged and died early Immune systems may also have failed allowing the ravages of bacterial and viral infections to take hold.

Whatever the final cause of the heavy losses over the past two years, I am sure it can be traced back to the weather conditions, plant stresses and resulting nutritional stresses. What's worse, the historic patterns of droughts that can be seen in Figure 2 shows that we may have problems for the next few years and the current drought may deepen and spread.

So was 2006-2007 "The Year the Bees Died" or was this "Another Year the Bees Died"? I don't want to add another cry of "the Cause has been found" to the list without good scientific facts to back me up, but I believe that history speaks pretty loudly by itself. As with the other occurrences the exact cause may never be found. However, if nothing else comes of CCD, it has infused the bee industry with badly needed funds, aided us with past due research and brought the plight of the honey bee and the bee industry into the lime light of the general public.

As an industry we need researchers to look closely at the nutritional needs of our honey bees and improve the nutritional value of the supplemental feeds that are available.

We as beekeepers can help during stress conditions with timely supplemental feedings of nectar and pollen substitutes, as well as monitoring for pests and infections. Treat only as needed using the lowest impact treatment that is believed to be effective, such as the soft organics that are available. Avoid using antibiotics as preventative medications whenever possible. And always follow recommended procedures to the letter By following the directions we may extend the effective life of our available treatments and avoid the creation of improved super pests that may well end our stewardship of this wonderful creature. BC

David Rectenwald has been keeping bees in West Virginia since 1992. You can contact him with any questions or comments at drectenwald@earthlink.net.

All The Buzzzz in...

Hello Bee Buddies,

It's been cold outside but when I think of all my good friends I get all toasty warm inside. I hope you have a wonderfully warm Valentine's Day. I am thinking about you.

Your Friend,

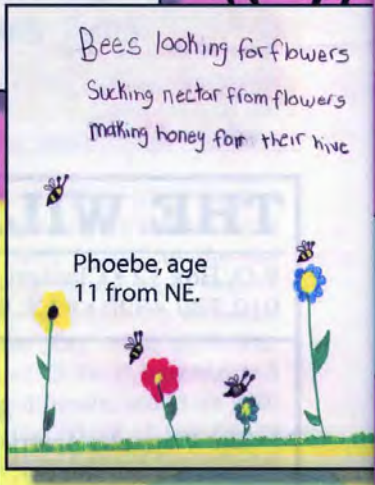
Bee B. Queen

Robert, age from OH.

Madison, age 8 from KY.

Sydney, age 8 from SC.

PDPhoto.org

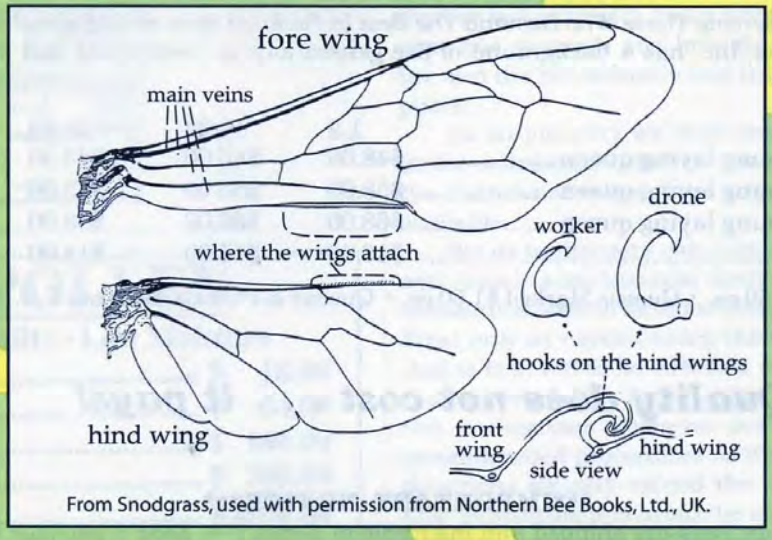


Phoebe, age 11 from NE.

Winging It

The honey bee has two sets of wings that are attached to the thorax. The wings are a very thin layer of tissue strengthened by veins. When the bee is resting, the wings lay folded back on the body.

The fore wings are larger than the hind wings. They work together while flying thanks to little hooks that help to keep the wings connected.



From Snodgrass, used with permission from Northern Bee Books, Ltd., UK.

How Do Bees Fly?

That is a very good question that scientists have recently begun to answer with the use of digital images and robotic wings. The moving up and down of the wings by the flight muscles is not enough for a bee to fly. The bee twists the wings like a propeller

Faster Than the Blink of an Eye

How fast do bee's wings move?
Cade, age 6, TX

Honey bees move their wings about 200 times a second. Count how many times you can blink your eyes in one second. It is probably about 5 times. In other words, bees move their wings 40 times faster than the blink of an eye. That's a whopping 14,400 beats a minute! I'm tired just thinking about it.

Answers: mosquito, honeybee, housefly, bumblebee, hornet, hummingbird, butterfly.

... Bee kid's corner

Produced by Kim Lehman -www.beeladyprograms.com
www.beeculture.com
February 2008

Egg-citing Art

Ukrainian Eggs or pysanky are beautifully decorated eggs using beeswax and dye. A tool called a kistka is used to create designs on the egg with beeswax. The area covered in the wax will not pick up the dye.

Writing on an egg with a kistka.

Make a Simple Version of Pysanky.

1 Hard boil your eggs.
2. Take a white crayon and draw designs on the egg. Cheaper, waxy crayons work the best.
3. Mix your dye according to the directions.
4. Dip the egg in the dye for 15 minutes.

Nature's Dye

Try making dyes with things in your kitchen.

1 Put your eggs in a single layer in a pan.
2. Cover the eggs with water.
3. Add about two teaspoon of white vinegar. If you want, add ½ teaspoon of alum to make the colors brighter
4. Add plenty of onion skins, or whatever you want to use, to the pot.
5. Bring the water to a boil, then turn down the heat and simmer for 15 minutes.
6. Turn off the stove. Carefully remove the eggs.

Some Dyes to Try:

Red/Pink: beets, cherries
Orange: yellow onion skins
Light Yellow: lemon peels, orange peels or ground cumin
Golden yellow: ground turmeric (a kind of spice)
Blue: red cabbage leaves or blueberries (crushed)

To see more photos and find out more about pysanky go to:
www.ukrainianegg.com or
www.learnpysanky.com
Photos used with permission.

Wings and Things

Scientists can use sound frequencies and mathematical equations to figure out how fast the wings of different insects move.

A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z
					2												7	5		17					

Fill in the blanks to find out how fast different insects move their wings. Each number matches to a letter. The letters bps stand for beats per minute.

_ _ S _ U _ _ _ S 1 4 5 15 17 21 22 4 5	600 bps
_ _ _ _ _ _ _ _ 26 4 23 12 3 8 12 12	200 bps
_ _ U S _ F _ _ 26 4 17 5 12 2 6 3	190 bps
_ U _ _ _ _ _ _ 8 17 1 8 6 12 8 12 12	130 bps
_ _ R _ _ _ 26 4 7 23 12 22	100 bps
_ U _ _ _ _ _ R _ 26 17 1 1 21 23 19 8 21 7 24	52 bps
_ U _ _ _ R F _ _ 8 17 22 22 12 7 2 6 3	12 bps

Become a Bee Buddy

Send two self addressed stamped envelopes and the following information to: Bee Buddies, PO Box 2743, Austin, TX 78768. We will send you a membership card, a prize and a birthday surprise!

Name: _____
Address: _____
City, State, Zip Code _____
Age: _____ Birthday: _____
E-mail (optional) _____

Send all questions, photos and artwork to:
beebuddies@hotmail.com or mail to the above address.

- BEES IN A POSITIVE SETTING
- SERIOUS OBJECTIVES OF OUR ASSOCIATION
- PROVIDES PUBLIC EDUCATION
- FUN TO HAVE

OBSERVATION HIVE APIARY

B Starrett

The article by Rich Frey about the Observation Apiary (January 1995) maintained in the city park at Kendalville, Indiana, led our Greene County Beekeepers' Association to a similar project. An observation apiary in a public place would help us gain some positive exposure for bees and beekeeping as well as provide a convenient, public location to conduct demonstrations for the Association. We contacted the Greene County Park District to see if there would be any interest in having bees at The Narrows Nature Center in Beavercreek. We explained that our Association would maintain the hives and provide speakers for public programs.

With the article by Frey showing that bees can and are being successfully kept in places accessed by the public with little threat to safety, our request was approved. We agreed on several conditions designed to assure the safety of the public and the security of the hives.

The Observation Apiary is located on the edge of a wooded area at the end of a small meadow near The Narrows Nature Center A mowed path encircles the meadow containing a number of bird houses and abundant wild flora, passing near enough to the apiary that it can be seen, but with brush and trees providing a barrier sufficient to force the direct flight of the bees up and away from the main path. A secondary path is mowed to give access to the front of the apiary enclosure for those who desire a closer look.

The enclosure for the hives is 10 feet deep by 20 feet wide with an eight foot high chain link fence on three sides. The front observation area is an eight foot wide screened panel, while the rest of the observation side is solid board privacy fencing. The screened panel is number eight hardware cloth, stronger than regular window screen so that attempts to cut it will prove difficult. A padlocked gate secures the enclosure.

The Park's Board required that public events be incorporated into our use of the apiary One of the reasons our Association exists is to educate the public about the value of bees and the hobbyist nature of beekeeping, so this requirement was consistent with our purpose for the apiary's existence.

The enclosure was completed in the Spring of 2000 and bees belonging to one of the Association's members were introduced into the new apiary The following September we organized an extracting demonstration that was open to the public. Our demonstration was located in the Nature Center meeting room with the floor well covered with plastic. Association members staffed displays of beekeeping equipment, general bee information, diseases and predators, and the products of the hive and their uses. We also had jars available so the honey we extracted and strained could be purchased on site. People were permitted to taste test the product with tooth picks and plastic spoons we provided. Many visitors had no idea how honey was harvested so this event proved to be very enlightening to them.

Currently, the extracting demonstration is held in conjunction with the County Extension sponsored Farm Tour held every September This partnership has increased our attendance. Additions to our extraction demonstration include: an observation hive complete with a laying queen; a cut comb packaging demonstration; and cut comb tasting station. One member who began beekeeping to have a source of bees available for the treatment of her MS demonstrates stinging and shares her successful experience with sting therapy Her booth always draws an interested crowd. Each "station" is

staffed by Association members who explain and share their knowledge and passion about bees. We continue to receive positive feedback from appreciative visitors.

Our apiary also enables us to demonstrate specific beekeeping techniques. In May 2001 we had our first demonstration installing a package of bees and splitting existing hives to make increases using different splitting methods. This was held primarily for the benefit of the beekeepers of the Association, but the public was invited. In the weeks following, members were able to judge which method of making increase worked better, and they have learned the technique of making increase from their existing hives using a method of their own choice.

Both these events are now yearly activities which serve to encourage backyard beekeeping and increase public knowledge about beekeeping and the value of honey bees. Many people who have thought about beekeeping but didn't know how to get started learn about our Association and the support network that it provides, including the Beginning Beekeeping class the Association sponsors as a Park District activity during the Winter

These events show bees in a positive setting, encourages beekeeping, serves the educational objectives of the Association, and provides another Park District offering for the people of Greene County and the surrounding area. BC

Questions regarding this project can be directed to Bill Starrett, 1678 Sioux Drive, Xenia, Ohio 45385, or by e-mail: bpstarrett@peoplepc.com

BRUSHY MOUNTAIN BEE FARM

Jennifer Berry

In The Brushy Mountains of North Carolina Sits This Innovative Bee Supply Company

Being an Air Force brat I spent the majority of my younger years bouncing from school to school, neighborhood to neighborhood, and state to state. Moving about was trying at times, but also exciting. By the time I was 13 we had lived in nine different states and 11 different homes. Leaving those homes meant leaving my friends behind which was always difficult. It seemed the minute I was finally asked to join the group at lunchtime or finally **not** the last to be picked for a team it was time to pack up and move to the next location. I was sometimes envious of my classmates who had resided in the same place most of their lives. They had shared memories with others since kindergarten or before. The trend continued into my adulthood. Even after college, work moved me about from state to state. It gave me the opportunity to meet some extraordinary people, some of whom I'll never forget. But there have been some of those I've met that I've felt truly lucky to call friends. Steve and Sandy Forrest are two of those folks.

Inside the old log cabin which is now the retail store.

If you have ever been to an Eastern Apicultural Society meeting or a North Carolina meeting, or others too numerous to mention, and found yourself wandering through the vendor area, then you must have met Steve or Sandy Forrest. They are the body and soul of Brushy Mountain Bee Farm. Each year they will attend anywhere from eight to 10 different beekeeping meetings. They tirelessly stand from sun up to sun down explaining anything from how to become a beekeeper to why this bottom board is the best you can buy, or try this hat on or what do you think about this new item? Steve is definitely the salesman in the family but he won't ever sell you anything he doesn't believe in or wouldn't use himself. That is why when I was a beginner I enjoyed hanging out at their booth listening to each of them explain the wonders of beekeeping.

Brushy Mountain Bee Farm, like most businesses, wasn't created overnight. It took years to evolve. So let's take a look at the road leading to the conception and creation of Brushy Mountain Bee Farm.

Steve and Sandy met in college while Steve was attending graduate school. Of course they immediately fell in love, were married and began to pursue their calling, teaching. Sandy taught Kindergarten for five years and Steve taught business classes in high school for six years in Statesville, North Carolina. Even though it was a grand time, they both wanted a business of their own, especially one in agriculture. They decided to move to the country and pursue their dream. On Steve's birthday, November 7, 1977 they received their first business license. Their initial thoughts for a business was to either dry apples or produce honey Thankfully, the latter made more sense. Steve will be the first to admit, "it hasn't been easy, but we sure have had fun along the way "

The property they purchased is located in the Brushy Mountains of Eastern North Carolina. In the beginning their property consisted of 60 acres with a house, a small

Crew busy at work assembling equipment.

barn, and a separate two room house just down the hill. The first night in the house they slept in the attic because they felt safer on higher ground. "The bathroom didn't have a sink; no septic system, just a big barrel out back; no closets; over 30 window panes knocked out and it was in the middle of nowhere. I was scared that first night" Sandy said. The house they purchased is what you call a "fixer-upper" They completed some of the work themselves but eventually had to hire help to do the remaining repairs.

During construction they stored all their belongings in a tractor trailer parked in the front yard. Sandy laughs about how their stove and refrigerator stayed on the front porch for several months while they refurbished the kitchen. "The house had so many holes in it you could stand in the kitchen and see the basement" she said. After a year's worth of construction they finally settled into their dream home. Soon the basement became Steve's wood shop where he began designing and building bee equipment and the extra bedroom became the office. The barn later became the working warehouse and the two room house was used for storage. Next they decided to add onto the old two room house just down the hill. They wanted to turn it into a retail store with office space. Just above their house rested a 200 year old log cabin. It would be the perfect addition if they could only get it down the hill. Steve had the perfect relocation plan all worked out. They asked the gentleman who owned the property if they could have the cabin. He said it was theirs as long as they kept his field bush-hogged. Not a bad proposition they thought. The neighbors hearing of the plan told them, "you'll never be able to move that there log cabin, never, never, never" This only made Steve want to achieve his goal that much more. "We'll show them" he thought.

The plan was first to remove the extra rooms built around the cabin that had fallen in. This would expose the actual log cabin. Next Steve and Sandy cut down three big poplar trees, drug them with their tractor and placed them next to the cabin. A neighbor came over and helped them jack up the corners so they could roll the logs under the cabin. Then it would be so simple, they'd just "drag" the cabin down the hill while resting on the logs. The day arrived for the move. All the neighbors were convinced the cabin wasn't going anywhere. To them Steve and Sandy were city folks and didn't have a clue what to do. They lashed the logs with chains, got a bulldozer and drug the cabin down the hill and right next to the ole' house. Success they thought. Not only did they move the cabin but it still remained intact. They were proud and the neighbors amazed. Moments after the celebration began reality hit. They couldn't get the cabin to line up next to the house; therefore the adjoining buildings would never be level. After all the planning and hard work (and effort to prove they weren't just city folks) here they had to tear the cabin down after all. Each log was numbered and set aside for reassembly After Steve told the story he said in his most serious voice, "Which brings forth the axiom in which we live by ain't nothing easy at the bee farm."

But exactly how they got into manufacturing and designing bee equipment is another story After moving to the country they acquired 100 hives and were on their way to producing sourwood honey Weekly Steve and Sandy would ride to the apiaries and check on their mounting amounts of honey Sandy explained how exciting it was to see their very own colonies producing the prettiest sourwood honey they had ever seen. The last time they laid eyes on their colonies, each one had two supers completely filled with honey. The very next week they went to extract their bounty and found 80 of the 100 hives gone. They had vanished into thin air They were just here a week ago, they pondered, what could have happened? After a few moments the harsh truth sunk in and they realized, the hives had been stolen! "They even took the railroad ties the hives were resting on," Steve added. It's a sad day when someone steals from you, no matter what it is. Yet, this story does have a silver lining. Steve and Sandy have both expressed that there is very little they would have changed in their lives. "In retrospect," Steve said, "it was a blessing in disguise, because after that incident we decided to shift gears and focus on building woodenware products instead. Hallelujah for small miracles." Steve admits that wood working is his true passion.

During the late 70s, early 80s, flyers advertised their business and were placed in stores around the area and handed out at bee meetings. Each morning Steve and Sandy would walk hand in hand down the long drive to the mailbox. Sandy would prepare the orders and take care of billing while Steve built and shipped the equipment. Word of mouth also helped boost sales in the early years. It wasn't until 1982 that the first Brushy Mountain Bee Farm catalog hit the stands. "One of the major successes of a business is where to put the advertising dollars" Steve said. The catalog they publish each year is the hardest thing they do. It is extremely time consuming because it has to be perfect.

As with most businesses, the early years can be the leanest and with beekeeping demands occurring in spurts it was tough keeping the doors open. One minute the phone was ringing off the hook and then the next, silence. In order to sustain a business year round Steve and Sandy decided to try their hand at selling non-beekeeping items. For several years they sent out a 20 page catalog called the "Mountain Mercantile" in which they sold porch swings, pottery, fat lamps, honey pots, and other mountain crafts. After that endeavor they decided to try food items and sold under the name of "A Taste of Carolina" with a colored paged catalog which focused on foods of the south: country hams, peanuts, pickles, artichokes, smoked duck, turkey and trout. Meanwhile, they still worked hard at expanding the bee supply busi-

ness and eventually were able to let go of these other ventures.

As the business grew they moved the wood shop out of the basement and into the barn. After a few more years it was time to build a large warehouse which they did in 1986. Unfortunately it didn't stand long. A strong wind storm took the entire building to the ground. One morning, a few days later, twenty-six men showed up and tore the whole mess apart. Two women also appeared and fixed food while the men worked. A true southern cuisine was served; two meats, seven vegetables, and two desserts. It only took two days to clean up the mess and stack the usable wood under plastic sheets. Next they even brought in the local fire truck and blew off the pad. When they were completed a neighbor patted Steve on the back and said, "try it again son, we're with ya." Sandy laughed, "instead of a barn raising it was a barn cleaning." "It was amazing to see all these people band together and help us out; we were flabbergasted," Steve said. They figured the neighbors would never really accept them living in their neck of the woods. It may have been because they were city folks or the fact that they showed up in the country with Afghan hounds. In the early days they didn't have the typical farm dogs; no, they had what the neighbors swore were overgrown goats.

Steve and Sandy don't look back much but when I asked them if there was something they could change what would it have been? They both said, almost together, that they wished they had purchased a large warehouse in the small town down the road and moved the business there instead of running it out of their own house. They love the business but they can never get away from it. Their house sits less than 100 yards from the store and numerous warehouses.

Even though they both left the classroom, they never left behind the love of teaching. Their mission has always been to not only provide the best equipment available but also to help people succeed in beekeeping. "Our philosophy is to bring innovative products to beekeepers, to make the job of keeping bees easier, and to keep introducing beekeeping to folks all across the United States. Helping them to succeed in beekeeping is our dream" Steve said. They intentionally concentrated their efforts towards the hobbyist. They also wanted to offer quality equipment that the commercial folks were able to purchase. Today they are one of the largest suppliers to backyard beekeepers in the country

Walking around the shops and warehouses Steve is like a kid, excitedly showing me the latest new piece of equipment or the quality of the craftsmanship, or where they render the wax or how they take orders. However, anytime an employee walked by he stopped and introduced me to them and chatted awhile. Then off to the side he said, "the strength of our business is our employees and we really have the best." It was a realization they learned early on when starting their own business. "The whole success is hiring good people and trust me we have great people" he said.

Larry Baily in the rendering area holding a block of newly formed wax.

Thirty years later the office and basement wood shop have now turned into 20,000 square feet of working space. It consists of a wood shop, metal shop, sewing room, wax room, warehouse space plus offices and the retail store. If you ever find yourself in the Brushy Mountains of North Carolina and you're in need of some beekeeping supplies, you should stop by and check out the store. The log cabin and old house are still standing and now the base of the business. No more Afghan hounds, now you'll be greeted by Jake, the friendliest chocolate lab this side of the Mississippi. You may have to throw a stick a bit but he'll love you for it. Steve and Sandy have no plans on retiring anytime soon. They are having too much fun. They love their business, they love their employees, they love their land, they love each other, and of course, they love their dog Jake.

See ya! BC

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

Late Winter Management of Bee Colonies

James E Tew

Some Tweaking Suggestions

Keeping bees is not as easy as it once was.

In past articles, during presentations, and during interviews, I may very well have acquired a cranky reputation that I'm not sure I want. My wife frequently tells me I sound a bit negative in some of my comments and writings. I certainly don't mean to sound pessimistic but rather appear realistic and adaptive. Simply stated, I have become increasingly convinced that today's beekeepers need to reconsider their goals and expectations for their bees. *Across the U.S. – indeed even across the world* Varroa *mites have dramatically changed the way we manage our bees.*

I speak for no one but myself. I have taken no surveys. I have no science. Even so, I have slowly and reluctantly grown to accept that my beehives will not soon look like the hives I managed 20 to 25 years ago. Generally, my present hives will have smaller populations, will not swarm as much, and will need much more assistance from me. In 1999, I wrote that beekeepers seemed to go through four phases as their colonies were found to have *Varroa.*

Phase I

My bees will not get *Varroa*! It will ***not*** happen to me. Then – BOOM – I find *Varroa* in my colonies. This is the shock phase.

Phase II

It ***has*** happened to my bees! My colonies clearly have *Varroa* mite infestations. Oh, my stars! This is the panic phase, but thankfully, it's fairly short. During this phase, I blame my neighboring beekeepers. I blame my package provider Someone must be held responsible for this pest invasion. A common suggestion during this phase is to set up regulations and blockades to keep our bees safe from outside infestations.

Phase III

This is the frenzied treatment phase. If I use enough special chemical treatments combined with hygienic queens, my bee colonies will be like they once were – strong and productive. This phase can last for many years while the beekeeper searches for the Golden Fleece of beehive chemicals and super queens. I don't know that anyone has ever found the perfect answer

Phase IV

This is the final phase and is the phase of acceptance. Essentially, by this phase, years have passed and we have punched ourselves out. We have tried everything, yet our bees still have some level of *Varroa* and they will seemingly always have some varying level of infestation. At this phase, could it be said that we are defeated or that we have simply become realistic?

Why all this review?

Varroa mites have been having their way with U.S. bees for well over 20 years. Why all this review about the trauma of this pest's establishment? Because, I sense that Phase IV has a lingering quality that slyly gives false hopes for the return to the years of glory beekeeping. True, my bees will seemingly always have some varying level of *Varroa* infestation. True, there is not a perfect chemical or hybrid queen that will end my colonies' *Varroa* problem. True, managing these infested colonies will be more challenging, but bee life must go on.

I verbally say that my bees have chronic *Varroa* infestations but secretly in my heart, I still cling to the hope that somehow – someway – the bees and the mites will work out an amicable agreement. I know I need to control *Varroa*, but I still hope that the bees and mites will come to an agreement, but what should I be doing while I am hoping? What significant management changes should I make as Spring arrives? What can I expect next season from my embattled colonies? So, which management concepts do I keep? Which concepts do I discard and which concepts do I change? And what new tactics should I be exploring?

My Winter survivors

In years past I hoped for strong colonies coming out of Winter Now I am content with the colonies simply being alive as they come out of Winter Live bees give me something to work with, while dead bees just give me more work. I don't know why the bees don't seem to Winter as well as they did two decades ago. Even if I did know, would it really matter in the short term? Already, I am trying to control *Varroa* within the colony. I can't really do anything about virus infections other than to know what they are. I've always known that *Nosema* infections should be treated, yet I rarely apply the medication. American foulbrood is still an occasional problem that I try to eliminate when I find it. So I don't know why my bees don't Winter as well, but even if I did know the reason, I suspect my bees would still be wintering poorly. I can

Spring/Summer management directly affects Winter management.

reduce this complicated scenario to the simple statement – *"I just hope they are alive in the Spring."*

General management change #1 – feed heavily during late Winter/early Spring

Supplemental feed – carbohydrates and protein

During the past couple of years I have presented conflicting advice and opinions on supplemental feeding. I have frequently recommended leaving the beehives undisturbed as much as possible and I still recommend that procedure. But when these weakened colonies come out of Winter, recovery will take much longer if you are not there to help with supplemental feed.

In years past, there were two kinds of Spring supplemental feeding procedures – stimulative feeding and survival feeding. Stimulative feeding involved giving the bees thin, watery sugar syrup to "stimulate" them from their Winter dormancy so they could get on with foraging. This no longer seems important to me and probably never was a very important management procedure. If you are going to feed your bees, feed them copious, thick syrup and feed it to them long-term. Feed them something on which they can survive.

Which type of feeder

There are several designs of feeders. I have described them in previous articles. I feel a need to be blunt. Use hive top feeders. You can get more feed in place quicker with the least amount of disruption to the recovering colony I have several hundred internal division-board feeders but I plan to leave them in storage. They require opening the colony, sloshing syrup around while I try to pour it into the narrow feeder Entrance feeders are nearly useless for serious feeding – too small and too far from the wintering cluster Open feeding in transitional weather is "iffy" and depends on the bees having good foraging conditions. Additionally, open feeding stimulates robbing and fighting among the bees. While this technique is labor-efficient, it is not particularly efficient for weak colonies. I say again, *use hive top feeders.*

What carbohydrate to feed?

If possible, feed traditional sugar syrup mixed from granulated sugar I presently have several drums of corn syrup that I will probably use later in the year, but during late Winter/early Spring, I want to go with something that I know works. Syrup made from clean granulated sugar works. Corn syrup is probably fine as a Winter feed, but nagging questions keep arising about the use of corn syrup as a bee feed. If you have your personal reasons for wanting to use corn syrup, I don't object but feed something and feed plenty of it.

Protein supplements

Throughout the passing years, research interest has waxed and waned on the subject of pollen substitutes. Each time I comment about pollen substitutes I get correspondence from those who manufacture it. I am in a position of information weakness here. While I have not objectively compared the various protein diets that are available, I have used all the common diets. During some years, some colonies take some of the diets. I assume it helps meet my colonies' nutritional needs, but I don't know how much. That's not much of a recommendation.

Why recommend these protein supplement products at all? Assuming we agree that our bees are generally more challenged than they were a few decades ago, and assuming we agree that all the precise reasons for this challenging situation are unknown, I personally want to eliminate as many variables as possible. So, I plan to feed pollen substitute in late Spring this year

General management change #2 – weak colonies

In a publication I have written, I stated, "*In most cases, it is poor management to overwinter a small or weak colony because in most locations the weak colony will not have time to increase to its peak population for the Spring nectar flow*[1] " Why my change? It used to be that weak colonies were the minority category Now, for many of us weakened colonies coming out of Winter are all too common. In early Spring I would commonly combine weak colonies into stronger units, being hopeful that they would build up, and then I would divide them later in the Spring back into two units. I am not totally comfortable with that procedure now – especially for colonies that have a chance of surviving even if they are weak. Why? For two reasons.

Intensive colony manipulation

Combining colonies is a simple process on paper In the beeyard it's disruptive and chaotic. Drifting bees may be lost. Occasionally, colonies being combined are trapped between newspaper-divided units and it's extra work for me. If I combine two weak units, I now have a colony that is not as weak as it was – but still weak. Counting my labor and counting the extra stress I put on the combining colonies, I say again, I am not totally comfortable with this recommendation now.

[1] *Backyard Beekeeping*, James E. Tew www.aces.edu/counties/Montgomery/documents/BackyardBeekeepingANR-0135.pdf.

Wintering smaller colonies is now more common.

Queen loss

When I combine weak colonies, I lose queens. They were not good queens or the colony would not have been weak, but they are a living queen in late Winter/early Spring. This is a time of the year when replacement queens are difficult to get. My present attitude is that I would rather have a poor queen than no queen at all. I refer you to one of my opening comments above – *"I simply want them to be alive."*

Let me be clear If the colonies are profoundly weak, combining them is proper If the weak colonies have a chance of making it to Spring, let them have a shot at it. A stronger colony is not made much stronger by adding a weak colony to it. During this time, when U.S. colony numbers are declining, I tend to keep smaller colonies until they become really small before combining.

General management change #3 – stores reapportionment

This really is not a change so much as it is just more important. True, supplemental feeding seems to be increasingly important, but nothing beats honey in the comb as food stuff for wintering beehives. Last Spring (I wrote about it), I supered with many more deep supers than I would have in past seasons. Last November, I left more honey on the bees that I used to. In fact, most of my colonies are tall for wintering colonies.

As has always been the norm, some of my colonies stored more honey than others. As Winter progressed, those that tended to be lightweight were given capped honey – in deep frames – from those colonies having more stores than they could use. This was a significant change in my Winter management scheme. I intentionally reduced my overall extracted honey crop in order to have honey in deep frame reserves. I still have had colonies die with honey stores on the hive. I have moved some of that unused honey to colonies that seemed to be light. But, my point is that I ***had*** some honey to give back to them. I can't lie to you. It was hard to keep that extra honey from going under the uncapping knife. I'm glad I resisted. As the Winter shifts into Spring I will try to present an occasional update as to how well this "extra honey" campaign worked out.

Traditional Winter management procedures

Don't throw out the baby with the wash water The established wintering hive management scheme is not totally dysfunctional – far from it. In all my rants I have never meant to suggest that all we have ever done in wintering hive management is now wrong. What I have been saying is that we should change some of the ways we manage our bees in the light of the present colony shortage. Seasonal management of bee colonies is a common topic. For those of you needing to read a complete discussion of traditional hive Winter management, look at nearly any current bee book. Several times I have referred to management information in *Backyard Beekeeping* at: http://www.aces.edu/counties/Montgomery/documents/BackyardBeekeepingANR-0135.pdf

Honestly

The best current wintering recommendation is to send your colonies into Winter with a strong population of workers, headed by a young queen, having abundant food stores, and with a reduced pest population. That would be the perfect bee world. If you are having to feed your colonies, as I described above, something went wrong. If your colonies are small and possibly will have to be combined, something went wrong. If your colonies need extra frames of honey added during the Winter, something went wrong. Clearly our goal is to send our bees into Winter in strong shape. If that doesn't happen, we must do whatever we can to apply management bandages during the Winter Do whatever it takes to keep your bees alive. BC

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SPRING MANAGEMNT OF OVERWINTERED COLONIES

Roy Hendrickson

Spring management is entirely dependent on successful overwintering. There are three requirements necessary for a workable Spring management program – a good queen, an adequate population of young bees, and more than enough food. These are the same basic requirements necessary for a colony to overwinter successfully, and all three have to be present in the colony prior to the onset of Winter The food situation in particular needs to be addressed the previous Fall. Come Spring, good weather is far too valuable to be wasted on supplemental feeding. Spring is the time for broodnest management, not remedial catch-up chores.

Late Winter Checkup

The actual Spring management process starts in late Winter, weather permitting. The first step is to check colony weight and cluster location to determine the general food situation. Remember, food consumption increases dramatically once brood rearing begins in earnest. Any shortfall of stores in late Winter will either result in a lost colony, or one that fails to buildup in the Spring. Cluster location can also have a direct connection to the available food supply

Strong colony in Spring.

Off-centered clusters are often an indication of limited stores. At the first opportunity, open up the broodnest and reposition the cluster toward the center of the box, and place any frames containing honey next to the brood. If surplus honey is not available, then some form of supplemental feeding is required.

Spring Feeding

In order to feed sugar or corn syrup effectively via a top feeder or an internal division board feeder, outside air temperatures should average in the low to mid fifties. Otherwise, the cluster may fail to adequately access the feeder In many parts of central and northern U.S. late Winter or early Spring conditions fail to meet these minimums. The only practical alternatives are candy boards, granulated sugar, or bakers' fondant. Candy boards, while very effective, require some special preparation equipment and a considerable amount of time to prepare. Granulated sugar poured around the center opening in the inner cover will keep the colony alive, but in most instances it will not sustain brood rearing. Baker's fondant purchased from a bakery supply house, or the bakery department of the local supermarket is the most practical option. When cut into slabs and placed on the top bars directly above the cluster, access is all but guaranteed, even in the worst of weather Best of all, like the candy board, this highly concentrated sugar product provides all the carbohydrates necessary for colony expansion. Avoid purchasing fondants that contain artificial colorings or flavors. Stick with products that contain recognizable sugars such as sucrose and high fructose corn syrup. Recommended product: (Karp's Fondant Mfg by H.C.Brill Co. Tucker, Georgia)

Frame Management

With the food situation in hand your attention can now turn to more traditional management concerns. The first order of business is to clean up the dead colonies. This is a great time to cull out undesirable combs and make any necessary equipment repairs.

With the arrival of warmer weather the colonies can be briefly opened to allow for some internal hive maintenance. I start by scraping the burr and bridge comb off the top and bottom bars. If colony expansion hasn't progressed too far this will take only a minute or two. If drone brood is present in the bridge comb the process is slowed a bit. Either way, I want to minimize the chances of accidentally crushing any queens while equalizing brood. If time and temperature permit I will also scrape the bottom boards and the inner covers. Again, it's much easier to manipulate clean equipment when time is in short supply

Frames of brood that are removed in the equalization process described below should be replaced with drawn comb, which allows the weakened colony to continue its buildup unabated. Replacement combs can come from Winter dead outs, a drawn comb reserve, or in a pinch they can be moved up from the lower hive body, but if drawn comb is unavailable then foundation becomes the only alternative.

Never place foundation in the middle of the broodnest, it will divide the broodnest and drastically reduce the amount of egg laying space available to the queen. Quite often the broodnest will be restricted to the side of the foundation that contains the queen. The end result is a second rate colony that has absolutely no chance of reaching its maximum potential in time for the honey flow. Instead, place the foundation outside the main broodnest area where it will not disrupt normal colony development. Once the colony has become well established you can reposition the foundation for maximum benefit.

Foundation – Comb Production

While on the subject of foundation I would like to offer a few brief thoughts on how to get "good drawn broodnest comb." **First** of all, there has to be a honeyflow. If not, you will have to provide some form of stimulative feed. **Second**, the colony drawing the comb has to have a decent population of young bees of comb-drawing age, bees 12 to 20 days old. **Third**, warmth is important. Foundation placed in the bottom box with an open entrance or an open screened bottom board will be largely ignored,

chewed up, or poorly drawn at best. In this case keep the bottom closed tight. Install an entrance reducer, and further restrict the reducer opening if the colony is on the weak side. If you're feeding to stimulate wax production, top feed and watch the heat loss around the inner cover or the one piece top feeder

Without question, the most efficient method of getting good drawn comb is to place the foundation above the established broodnest. Bees put brood down and honey up. With the foundation *above* the broodnest the normal upward colony movement is automatically factored in. Colony strength will dictate the amount of foundation that can be added. Average strength colonies should be able to handle three to five frames without any problem. Boomers, the really strong colonies, can usually handle a whole box of foundation. Install a bait comb containing some young brood and honey right in the center of the box. This will entice the bees upward. Once comb production is underway, additional foundation can be added as needed throughout the duration of the honey flow.

Plastic or wax foundation, which is best? Your personal opinion based on a variety of factors will determine the answer If you decide to go with plastic, and many have, then there is one more task to complete. To elevate plastic foundation acceptance to the level of wax you need to add some additional wax to the edges of the cells. This gives the bees some additional raw material with which to initiate comb construction until their wax glands kick into high gear Once additional wax has been added, plastic foundation becomes not only the equal of its older brother, but in my opinion it becomes superior to wax foundation. (See *Waxing Frames.*)

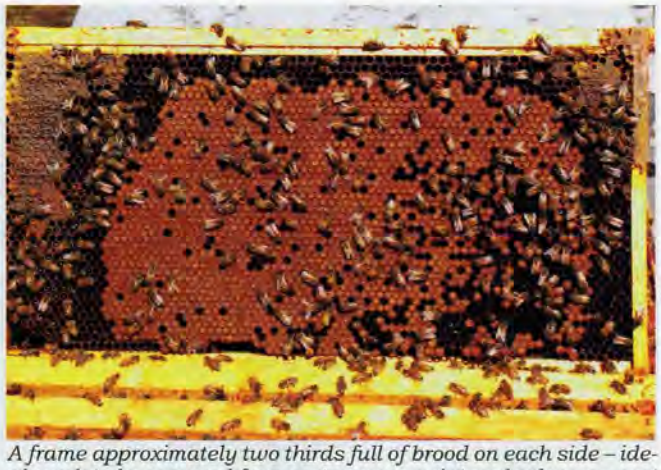
Requeening Overwintered Colonies

I operate on the assumption that a strong colony in early Spring has a queen capable of carrying it through the main honey flow. In other words, if it isn't broke I don't attempt to fix it. A quick check of the brood pattern will usually confirm whether or not the queen is up to par The queen's age certainly has a bearing on her ability to maintain a large broodnest, but unless she is marked or clipped it's impossible to know how old she really is. If I know for certain that a queen is over two years old, even though the colony appears normal the chances of an untimely supercedure are just too great to ignore. This type of colony falls into the category described below and should be treated accordingly

Conversely, there is an old beekeeping adage that states, "80 percent of your time is spent on 20 percent of your colonies." Any attempt to requeen an overwintered colony with an old or failing queen speaks directly to that adage. The same holds true for very weak or laying worker colonies. Why waste your time or take the chance of losing an expensive queen trying to requeen a colony with no future? Instead, use the new queen to make up a replacement split. Treat the failing colony as a lost cause, dispose of the old queen, and use the remaining bees and brood elsewhere in the splitting or equalization process.

Equalizing Overwintered Colonies

The equalization formula I describe assumes a six week buildup period prior to the main flow, and uses the double hive body broodnest as the standard colony configuration. Brood is defined as any stage of bee development, from eggs to emerging adults. A frame of brood is defined as a standard frame two thirds full of brood, *on both sides.* Strong colonies in early spring can have varying amounts of brood spread out over eight or even 10 frames, often in more than one box. With a little practice you can learn to estimate the equivalent of four, five, or six frames of brood as needed.



A frame approximately two thirds full of brood on each side – ideal comb to be removed from a strong overwintered colony as part of the brood equalization program.

Starting approximately six weeks prior to the main honey flow (you do know when that is, right?) I want to leave the colony being equalized with the equivalent of *four* frames of brood, a good queen, and adequate stores. Colonies in that condition will develop into strong honey producing units in time for the flow. For each seven days that pass, leave one additional frame of brood in each equalized colony In other words, if I start by leaving four frames of brood on April 15th, that will increase to *five* frames on the 22nd, and *six* on the 29th. Six frames of brood along with the accompanying field force equates to roughly one full hive body

Only the very strongest colonies – those with the most brood and the largest adult populations – are equalized on the first trip through. Start by removing the surplus brood and adhering bees, as per the above formula. To help equalize the adult bee population, shake the bees off one additional brood frame for every frame of brood you removed during equalization. This helps reduce broodnest congestion and minimizes the chances of swarming prior to the main flow. (CAUTION) Make sure you don't remove the old queen, either with the brood or when you shake out extra bees.

The following week the whole process repeats itself. Colonies bypassed on the first trip because they were not quite strong enough are equalized at this time. Generally speaking because of the time advance, not as much brood, nor as many surplus bees will be removed from these colonies. The strongest colonies, those worked on the first trip through, are checked again on week number three. Strong overwintered colonies tend to have very large adult populations, i.e. field forces. These extra bees enable the colony to rebuild its broodnest very rapidly. Quite often these colonies have to be equalized a second time, especially the adult bee populations. The equalization process continues until all the overwintered colonies have been worked *at least once.* If possible, I try to have all the brood equalized two weeks prior to the flow. This allows the field force, the bees that will gather the early

WAXING FRAMES

Roy Hendrickson

The most efficient method I've found of applying additional wax to plastic foundation is with a four inch foam paint brush, available at most paint or home improvement stores. (*Home Depot has the most durable brushes, at a very competitive price*) Simply dip the brush into melted wax and lightly sweep it across the plastic foundation. The object is to build up a wax reserve *on the edges of the cells*, not fill the base of the cells with wax. Start with several horizontal strokes working across the foundation from top to bottom, follow up with a couple vertical strokes from each end. Repeat the process on the flip side. Several repetitions may be necessary to build up the desired thickness.

Snap-in plastic foundation should be installed in the frame prior to applying any additional wax. There will be a modest amount of warping when the first wax is applied. Apply a light coat to one side, flip the frame over and repeat the process on the other side. Continue until the wax reaches the desired thickness. Once the foundation has returned to room temperature the warp will disappear.

Applying wax with a vertical stroke.

Applying wax with a horizontal stroke.

Wax Preparation

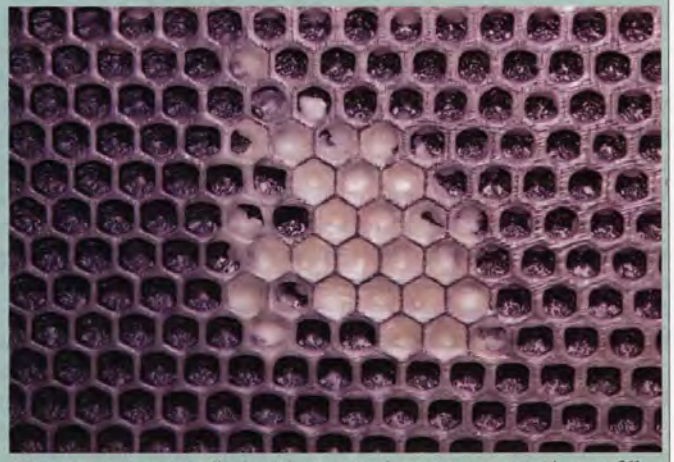
The first requirement is clean wax, i.e. wax that is free of sediment and crud, color doesn't matter. Dirty wax complicates the application process, and can have a negative effect on the quality of the drawn comb. The temperature of the wax is the most critical aspect of the whole waxing process. If the wax is too hot it will puddle and fill the cell bases, and will take forever to congeal. If it's too cold it will start to solidify in the brush, or go on in clumps. In either case wax usage will increase dramatically.

Once the wax has been cleaned up, the final reheat should be in a vessel with some form of thermostatic control, preferably a vessel with an inner container, such as a double boiler, or electric roaster oven. NEVER HEAT WAX OVER AN OPEN FLAME, and never leave heated wax unattended. The chances of fire are too great.

Beeswax melts at approximately 145°F(63°C). For waxing foundation I would suggest a wax temperature somewhere between 150°(65.6°C) and 155°F(68°C). With the electric roaster oven I set the thermostat at about 150°F. When I see the wax starting to congeal around the edges of the pan, I know the wax temperature is about right. Even with the utmost care wax will eventually start to solidify in the brush. Run two brushes, lean one against the inside of the oven to re-heat while the other is in use. When the brush in use starts to clog up, switch, and use a pair of hive tools to squeeze the excess wax out of the re-heated brush.

Like just about everything else in beekeeping, a little practice will go a long way toward improving the end result. The key points to remember are: clean wax, proper wax temperature, and the appropriate fire safety precautions. The end result will be well worth the effort.

Additional wax applied correctly – Dadant white brood foundation.



Wax too hot, or applied with too much pressure, starting to fill the cell bases.

crop, adequate time to redevelop. I will however continue to equalize adult populations in the strongest colonies, primarily as a swarm control measure.

While working colonies to equalize brood, I also try to even out the honey stores. Double hive body colonies should have the equivalent of at least three and preferably four frames of stored honey to tide them through the cold Spring period. Any surplus frames of honey are removed and replaced with empty drawn comb, or with frames of brood if the colony is a little on the weak side. If stores are in short supply the process is reversed, empty combs are removed and replaced with frames of honey Supplemental feed should be supplied as necessary

Strengthening Weaker Colonies

The other side of the equalization process involves putting the surplus bees and brood to good use. The first priority is to makeup all the necessary splits. Once that has been accomplished, any overwintered colony that falls below the Spring formula strength gets a brood boost. In other words, the equalization process is reversed. Surplus frames of brood and bees that were removed from the strong donor colonies are used to boost the weaker colonies. Empty combs are removed from the receiving colony and replaced with frames of brood and adhering bees. Enough brood is added to bring the receiving colony up to the same strength as the weakened donor colony. Stores are equalized at the same time, using the same procedure. Colonies equalized using this formula should be almost identical in strength at the beginning of the main honeyflow.

(CAUTION) Equalizing adult bees between colonies works best if the colonies are located in different yards. This will prevent the older bees from drifting back home, thereby negating the benefits of adult bee equalization. The same holds true when making up splits as described below.

Making up Splits

My standard practice is to start splits in five frame nuc boxes. The small box confines the heat given off by the cluster, thus allowing the small split to grow at a much faster rate than would be possible in standard equipment. The lightweight, compact, nuc box also simplifies the job of moving the splits to prevent drifting. Splits are started with two frames of brood and as many adult bees as the donor colonies can spare. A caged queen, *with the candy access hole covered*, is installed at the time the split is made up. The splits are checked in four or five days for queen cells and the general attitude of the bees toward the caged queen. If no cells are found and the bees are not acting hostile toward the queen the candy can be exposed for a timed release, or the queen can be manually released. In 10 to 12 days, weather and time permitting, the splits are checked for a laying queen. If all is well they are left to build until they are ready to be transferred into ten frame equipment, usually about four weeks after makeup. No attempt is made resurrect or requeen any splits that end up queenless. They are broken up; the bees are shaken off and allowed to drift into neighboring units. Any remaining brood is either transferred into the weakest splits, or incorporated back into the equalization process.

Local conditions can vary considerably from year to year Don't be afraid to experiment, keep good records, and make the necessary adjustments the following season. In time you'll develop a management program suited to your territory and specific situation. BC

Roy Hendrickson is a sideline beekeeper, photographer and frequent contributor to these pages. He lives near Chardon, Ohio.

Overcoming Resistance To PLASTIC

Grant Gillard

"It's been my experience that the bees in my current beeyards demonstrate an incredible affection towards wax foundation with an obstinate resistance toward plastic foundation."

From the very beginning of my beekeeping journey in 1981, I've been infatuated with plastic foundation. I love the perceived idealism of opening a shipping carton of these one-piece units and moving them directly into the hive body. My bees, however, have been a different story.

I started with a couple of cases of Pierco-brand frames and a pick-up bed full of nucs. With the explosive and seasonally-intense flow of a Minnesota Summer I had no problems with the acceptance of plastic frames. The bees did a masterful job of drawing out the foundation to produce a beautiful crop of honey

While I didn't know it at the time, I possessed the major keys for success with plastic foundation: a good, healthy hive of young bees and emerging brood headed by a young, vigorous queen, during an intense nectar flow, and the needs of the colony to make room for an expanding population of bees and an abundant flow of nectar

I'm now living in southeast Missouri and our nectar flow is much shorter, less intense, even fickle at times. And my success with plastic foundation is likewise shorter, less intense, and at times, fickle. I long for the ease of my former success, but I also have to realize we have a host of other complications since my pre-mite beekeeping days in Minnesota.

The present dilemma is simple: my bees are not in love with the idea of drawing out plastic foundation. They get balky I get frustrated. Some people say, "You just got to 'starve' them to it, offer them nothing but plastic. That'll get them to draw it out."

Unfortunately, the bees are not amenable to that kind of logic. They don't draw; they dwindle. Then we both lose.

It's been my experience that the bees in my current beeyards demonstrate an incredible affection towards wax foundation with an obstinate resistance toward plastic foundation. And it's a familiar story in beekeeping circles around the country

I still greatly prefer plastic foundation, particularly the "Pierco-style," all-in-one frame/foundation. As my colonies have expanded and my time seems ever in short supply, I appreciate the significant convenience of all-in-one plastic frames. Dr James Tew of Ohio State University shares this same thought as plastic has become his replacement frame of choice because of the savings in time and labor For me, it's about becoming more efficient with my available time, and it seems the more hives I acquire, the less time I have.

Funny how that works.

The benefits of plastic foundation are many. I like the durability and resistance to wax moth and mouse damage. I don't worry about "blow-outs" in my extractor Dr Tew also brings out the option that plastic frames can be scraped of old comb and reused, and this is particularly true of the webbing and waste left behind by wax moths.

So What Does It Take?

While I like the benefits of plastic foundation, my bees absolutely refuse to read the promotional material. So I'm presented with the challenging opportunity of convincing, perhaps persuading my bees to see things my way and make better use of plastic foundation.

Dr Tom Seeley of Cornell suggests one of the tricks of enticing bees to draw out foundation is to limit the availability of drawn comb, and replace it with new foundation as the bees feel an urgency to draw the foundation into comb. This works best in a strong colony

However, there's a catch-22: If you add too much new foundation the existing frames of drawn comb could easily become congested with in-coming nectar before the frames of new foundation are drawn out. You might accidentally stimulate the swarming impulse which is most likely to occur in a strong colony

You'll have fewer problems with plastic foundation if you have a **healthy, strong colony with young bees and emerging brood headed by a vigorous queen** with plastic introduced during a **seasonally-strong nectar flow. Limit the availability of drawn comb**; forcing the bees to work on the plastic out of necessity. This reduces the resistance and you'll have a fairly easy time with plastic foundation. I don't always have all these factors in southeast Missouri.

In an area with a slower honey flow like I have I've found if I take out the outer frame from the #1 or the #10 position, create an opening in the middle of the brood nest and **slide a new frame of plastic foundation between two frames of open brood**, the bees jump all over the frame and it is readily drawn out. I believe the higher concentration of younger "nurse" bees who still possess active wax glands, and the necessity to draw out comb for an expanding brood population are the significant factors here.

Dr Dewey Caron from the University of Delaware also concurs with this thought of placing new foundation where it is accessible and "in the way," that is, in

the middle of the brood box. In the University's teaching apiary he has his students add new plastic foundation in the middle of expanding brood boxes in April (not the first nor last period of Spring expansion but in the middle of it) which also is done in conjunction with swarm prevention and control.

If I was pressed to limit my options to one technique to accelerate the acceptance of plastic foundation, it would be placing new foundation between two frames of brood. If I was short on time and energy, this is the number one managerial investment that pays the greatest dividends when it comes to drawing out plastic foundation.

This technique works best in the strong colony – and you'll probably start to catch my drift that strong colonies are one of the key factors to a host of current challenges of modern beekeeping. It has been my experience that starting packages and swarms on plastic foundation is disastrous.

"It has been my experience that starting packages and swarms on plastic foundation is disastrous."

In side-by-side comparisons of purchased packages for my bee yard, packages established on ten frames of wax foundation were much more successful than packages established on 10 frames of plastic foundation. The difference was significant.

Even when a couple of frames of fully-drawn comb were added at the time of installation to the package started on plastic foundation, the package bees quickly jumped to the drawn comb, but soon languished refusing to move over to the plastic. All packages were fed sugar syrup.

Likewise, feral swarms shaken into hive bodies with 10 frames of wax foundation flourished while swarms shaken into hive bodies with ten frames of plastic foundation seemed to stumble along with limited production. Feral swarms seemed to be less reluctant than packages when forced

$ $ & ¢ ¢ Costing Plastic

The Economics of Plastic Foundation

How do the costs of plastic foundation really add up? I went to several leading beekeeping suppliers via their catalogs and web sites to price the components of frames. I compared like quantities and qualities but didn't add shipping. So what are the average costs of plastic foundation? Some suppliers charge more, some less. What I present is an average, and rest assured, prices will be higher next year.

Conventional wood frame with crimp-wired, wax foundation, including *supporting horizontal wires*, the average cost is 82 cents per frame and the average cost of crimp-wired, wax foundation is 89 cents for a total of $1.71 per frame. Then you also have your labor. I place an estimated opportunity cost of $10 per hour, and I've roughly timed myself at assembling, wiring and installing wax foundation at 32 frames per hour. My labor costs then add another 31 cents per frame. I come up with a total cost of **$2.02 per frame**.

For the **wood-bound, plastic foundation frame**, the "hybrid," I have an average cost of the wood frame at 82 cents, with the average cost of plastic inserts at 98 cents for a total cost of $1.80 per frame. I can sit down and assemble and insert about 45 frames in an hour's time. If I want to coat these frames with melted wax, I'm going to add another 47 cents for wax, and using my costs of $10 per hour to add 22 cents per frame for assembly labor, and 13 cents for waxing labor, I come up with a cost of **$2.62 per frame**.

The **all-in-one piece plastic frame/foundation** averages a cost of $1.83 right out of the box. If I add my opportunity costs of the additional wax, and, once I get set up I can easily coat 80 frames in an hour (that's about one per minute) so I add an additional 47 cents for wax and 13 cents for waxing labor for a total of **$2.43 per frame**.

Interestingly, a couple of companies sell pre-assembled "hybrid," wood-frame and plastic foundation frames averaging $2.40 per frame. Adding my wax and the associated labor costs would push these expenses for pre-assembled, wood frame, plastic foundation frames to **$3.00 per frame**.

Here's how it shapes up. The first column shows how the three frame formats stack up from pure, out-of-pocket costs. The second column provides the additional opportunity costs for wax and labor, if that is something important to you.

Plain wood-frame, wax foundation	$1.71	$2.02
Hybrid wood frame, plastic foundation	$1.80	$2.62
All-in-one piece plastic frame/foundation	$1.83	$2.43
Pre-assembled wood-frame, plastic foundation	$2.40	$3.00

These are average prices for small quantities of brood frames. They will give a relative comparison of the costs but you can fine-tune and make adjustments for medium and shallow frames. If you have wax cappings sitting around with no other available market, and if you don't necessarily want to charge yourself for your own labor, then you can take those costs out of the picture.

Additionally, I find beekeepers have a specific loyalty to certain suppliers despite the costs or location. Use these figures for relative comparisons.

to establish their colony on nothing but plastic foundation, yet there is a great hesitancy, even when fed syrup, to accept plastic foundation.

Many people recommend **misting the frames with sugar syrup**, and in some cases, enhancing the syrup with a stimulative product called Honey-B-Healthy®. With all due respect, this never worked for me. The bees lapped up the syrup and ignored the plastic foundation.

Another suggestion I tested is to **increase the amount of wax coating** nominally applied by the manufacturer, and I had wonderful acceptance after I coated it with additional wax. In two experiments in my beeyard, the additional wax brought the acceptance of the plastic foundation up to the same level as wood-bound frames with crimp-wired, wax foundation.

In other experiments, I placed 10 frames of plastic foundation in a super, with extra wax coating added to three frames in the #3, #5, and #8 positions within the super, and again frames #2 and #9. This occurred in May during our normal nectar flow Checking on the development on a weekly basis, the bees quickly and without any hesitation began drawing out the frames that had the additional coating of wax first, then spread to the adjacent frames with the normal, nominal wax coating applied by the manufacturer

In my opinion these experiments showed the time and labor for adding the additional wax coating is an astute management practice that "levels the playing field." You obtain all the benefits and advantages of plastic foundation and you've made plastic as attractive as wax foundation to the bees, though it might not be necessary to apply additional wax to all the frames in a super Perhaps coating every-other frame would suffice, and this will save some time on our part. Applying additional wax creates a magnet-like effect and draws the bees.

Always start 10 frames in your boxes. My experience starting nine frames of plastic foundation only proved that the bees will draw out a parallel plane of comb, about ¼" to the side of the plastic foundation between frames. Given a large enough space, the bees greatly prefer to draw out their own cell-size agenda to that of the plastic foundation. Once the frame is drawn comb, you can reduce the number of frames to nine in each super

"You need a healthy, strong colony with young bees and emerging brood headed by a vigorous queen, and a strong nectar flow."

Don't mix wax and plastic foundation in the same super If you mix your foundation, especially if you alternate wax and plastic, you'll get big, fat, overdrawn frames of the preferred wax foundation and a skinny if not totally ignored, despised plastic foundation. Once frames are drawn out it makes little difference either way and you can mix frames that started out as wax and plastic.

Don't expand too fast. I only add one super at a time, and only when seven of those 10 plastic frames have wax on them will I add another super Generally, before adding that next super I'll pull the outer mostly ignored frames and move them to the middle of the super Then I'm ready to add my next super

Bottom super. I've found that bottom supering, that is adding the new super underneath and below the existing supers greatly enhances the bees' acceptance of plastic foundation.

Create a top entrance. I don't know why but colonies with top entrances, even a notch in the lower edge of the inner cover seemed to draw out the plastic foundation quicker and with less hesitation. Another observation, perhaps ignorant of a hundred other variables, is that supers with a ¾" hole drilled in the lower portion of the front of the super (under the hand hold) seemed to have more plastic foundation drawn into comb than conventional supers with similar plastic foundation.

And I make this recommendation with all due respect to those beekeepers who would rather take a poke in the eye with a dull hive tool before they drilled any holes in their supers.

Don't use a queen excluder under a super of plastic foundation. A queen excluder between the brood nest and a super of new plastic foundation is a recipe for congestion. Unless there is drawn comb above the excluder dynamite and wild horses will not drive those worker bees through a queen

Spacing can be a problem

When introduced correctly, plastic foundation is accepted by the bees just fine.

excluder Allow the bees to move up and draw out the foundation into comb, even at the risk of the queen laying eggs. Later you'll need to move the queen to the lower boxes, and add the excluder

Conclusion

Dr Tew readily admits plastic frames/foundation are not perfect, but recognizes that ease and practicality are sufficient to overcome the challenges. Dr Caron reminds us that plastic foundation requires more astute management than wax but the benefits make plastic frames a prudent choice.

In my own experience I have a warm affinity for plastic foundation, and if I could get the bees to agree with me I wouldn't start any wax foundation at all. An old-time beekeeper might complain everything about plastic foundation is the antithesis of the natural qualities of nature's perfect food. But plastic may yet become the standard once beekeepers hone their management skills to overcome the bees' reluctance.

I firmly believe the benefits and advantages outweigh the challenges. Plastic may soon become the choice of a new generation once the bees train us to make it more presentable. BC

Grant Gillard is a sideline beekeeper and author of "Beekeeping With 25 Hives," an e-book available at www.25hives.homestead.com.

The Honey Garden

Combining honey bee pollinated garden crops with honey recipes. The best of two worlds.

Connie Krochmal

The difference between enough and not enough pollination.

Cucumbers

Native to the Old World, cucumbers feel quite at home in American gardens. Among the most popular garden vegetables, these are a warm season crop.
For small gardens and containers, choose space saving varieties. Spreading about two feet, these require much less room than most cucumber plants.

Growing Conditions

As with other vine crops, cucumbers crave sunlight and warm temperatures.

They grow well in most any kind of fertile soil from sandy loam to muck and clay Lighter soils bring the earliest harvests. Disliking acidic conditions, cucumbers prefer a pH of 6.0 to 7.0. For best results, add compost or composted manure when preparing the garden plot for planting.

Planting Cucumbers

Wait until the weather is sufficiently warm before planting cucumbers. In order for the seeds to germinate, it must be at least 68°F Usually, they're planted around the same time as tomatoes and squash.

In areas with long growing seasons, these can be direct sown where they're to grow. Northern gardeners may wish to buy transplants or start seeds indoors.

Plant the seeds about ¾ to one inch deep. Spacing between the plants can vary somewhat, depending on the variety being grown. For the most part, they're typically planted in rows that are three to five feet apart with around four to six feet between plants.

Some gardeners spread black plastic mulch down the row, and then make slits for the plants or seeds. This method reduces the need for weeding and watering.

Caring for Cucumbers

Like most other vegetables, cucumbers will need watered during dry spells. This is especially critical for seedlings and during the time when the fruits are devel- ➢

RECIPES

Ann Harman

Oh goody! The seed catalogs have arrived. Just leafing through the wonderful pile of them makes me hungry for some homegrown vegetables. Fortunately many of them benefit from honey in their recipes, especially cucumbers. Just look at all those varieties! You can grow an assortment and then choose recipes to fit.

If you live in the colder regions, you will have to save some of these recipes for the warm Summer days. Yes, in spite of what you see out the window now, Summer will arrive. So don't forget where you put the recipes.

Cucumbers can produce quantities – not as crazy as zucchini – but still enough for your family plus friends and neighbors. Whenever you give away some cucumbers give a recipe for using them. If the recipe uses honey, include a jar or bear of honey

Cucumbers from the supermarket frequently have a waxed skin. It is quite edible but the waxed cucumbers would be better if peeled.

Let's start out with one of my favorites – a cool cucumber soup. This is a perfect recipe for a horrible hot day.

COLD CUCUMBER SOUP

2 cucumbers
1 onion
2-1/2 cups chicken stock (from bouillon cubes, not canned)
1 cup sour cream
1 three-ounce package cream cheese at room temperature
1 tablespoon lemon juice
2 teaspoons minced dill or mint (fresh is best)
salt and white pepper

Peel cucumbers, scooping out seeds. Chop in chunks. Chop onion in pieces. Mush up cream cheese. Combine all ingredients and put in blender, one cup at a time. Purée, then strain. Chill overnight. Serve sprinkled with dill or mint. Serves six.

But you might prefer this recipe, especially if you like the combination of mint and cucumber

TURKISH CUCUMBER SOUP

1 small onion
2 cups plain yogurt
2 teaspoons white wine vinegar

oping. Cucumbers can become misshapen, smaller than usual, pithy, and even bitter tasting if they experience dry conditions. Any time there isn't a good rain every 10 days or so, water cucumber plants.

Drip irrigation is preferred since this doesn't wet the foliage. If using a sprinkler or hose, water in the morning so the leaves can dry off before nightfall. Wet leaves are very prone to disease.

Once the vines begin to spread nicely, there should be little need for weeding. Until this occurs, weed within the rows to keep these intruders from robbing the cucumbers of nutrients and moisture. Between the rows, a thick layer of organic mulch will usually control weeds.

Cucumbers need a steady supply of fertilizer during the growing season. For the best quality fruits, plant growth needs to go unchecked. An initial application can be mixed into the soil before planting. Once the plants begin to vine, add a top dressing. Don't allow this to touch the stems or roots.

Insects and Diseases of Cucumbers

Cucumbers suffer from a number of pest and disease problems. So far as insects are concerned, the most bothersome ones by far are cucumber beetles. There are two species – the striped and the spotted. These undesirable pests spread bacterial wilt, which eventually kills the plants. To keep these insects at bay, cover the young plants with a floating row cover until the female blossoms begin to open.

Of the diseases, mosaics – caused by viruses – and mildews seem to be the most common. Downy mildew prefers cool, wet weather, while the powdery likes it hot and dry. Other potential fungal diseases include anthracnose and scab.

For best results, select disease resistant varieties when possible. To minimize the likelihood of diseases, rotate crops so that you don't grow cucumbers in the same spot year after year Remove and discard diseased plants in your trash. Don't put them in the compost pile.

North Carolina Dept. of Ag photo.

Pollination and Nectar/Honey Status

Though there are some exceptions, most cucumber varieties will require pollination. This is done by honey bees. Inadequate pollination leads to underdeveloped and malformed fruits.

The bees collect both nectar and pollen from the flowers. In areas where cucumber plants are very plentiful, there may be a surplus of honey, but this seldom occurs. This will have a cucumber-like flavor, which becomes less intense over time. The honey varies from extra light amber to light yellow. It has a good body. Mostly, colonies on cucumber pollination decline due to the scarcity of food because of over population – too many bees competing for too little food.

Harvesting Cucumbers

Depending on the variety, these can be ready for harvest in about 60-70 days. Harvest cucumbers when

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2 teaspoons olive oil
12–15 fresh mint leaves or 1-1/2 teaspoon dried (fresh recommended)
1 garlic clove
1 teaspoon salt
1/2 teaspoon dried dill
1 large cucumber, peeled, seeded

Put everything except cucumber in blender and blend until smooth. With a grater, finely shred cucumber Stir into soup and chill well before serving.

So often we think of a simple salad with cucumber Here is a recipe that makes a good lunch. The recipe suggests serving with pita bread but you can choose another kind of bread or even chips.

CHICKEN, CARROT AND CUCUMBER SALAD

2 cups (about one pound) chopped cooked chicken breast
1-1/4 cups chopped, seeded cucumber
1/2 cup matchstick-cut carrots
1/2 cup sliced radishes
1/3 cup chopped green onions
1/4 cup mayonnaise
2 tablespoons chopped fresh cilantro
1 teaspoon bottled minced garlic
1/4 teaspoon salt
1/4 teaspoon ground cumin
1/8 teaspoon black pepper

Combine the chicken, cucumber, carrots, radishes and onions. Combine mayonnaise with cilantro, garlic, salt, cumin and pepper in a small bowl, stirring with a whisk. Add mayonnaise mixture to chicken mixture and stir until combined. Serve on a lettuce leaf. Makes 4 servings.

Cooking Light Magazine

Want a quickly-made salad that is a bit special? You can make the cucumber and dressing in advance but add the peanuts and onions just before serving. Rice vinegar is a very nice one to use in salads.

CUCUMBER SALAD WITH RICE VINEGAR DRESSING

3 cups thinly sliced seeded peeled cucumber (about 2 medium)
3 tablespoons rice vinegar
1 teaspoon honey
2 teaspoons dark sesame oil
1/2 teaspoon salt
2 tablespoons chopped green onions
1-1/2 tablespoons chopped unsalted dry-roasted peanuts

Combine the cucumber, rice vinegar, honey, sesame oil and salt in a medium bowl. Toss to coat cucumber Sprinkle with onions and peanuts just before serving. Makes six servings.

Cooking Light Magazine

This salad is a nice addition to grilled steaks and hamburgers. It is

they're still immature and tender At this stage, they should be crisp and firm with soft seeds. To encourage continuous flowering and fruiting, harvest every day

Culinary Uses

Though cucumbers are typically eaten as salads, dips, and pickles, these can also be served as a hot vegetable dish. They're deep fried, stuffed, and lightly steamed just until they're warm, and served with sauce.

Varieties of Cucumbers

Cucumbers come in an amazing array of shapes, sizes, and colors. In addition to the usual long, slender ones with oval ends, there is a perfectly round one called the lemon cucumber

The West Indian gherkins, which are typically used for pickles, tend to be rather short. With black spines, these are light colored. For premium pickles, pick these when they're very small.

The long, slender varieties grown for salads are usually uniform in shape. They have white spines, and usually reach about seven to eight inches in length. Dark green, these have rounded ends.

The largest cucumbers are the English type, which can reach twenty inches or more in length.

Of all the varieties, the following are exceptional.

Burpless 26

This non-bitter variety offers superior quality fruits. Ready in about 70 days, these can reach a foot in length. However, they're best if harvested when only eight to 10 inches long. With a thin rind, these are smooth and dark green. Burpless 26 tolerates both types of mildew as well as mosaic viruses.

Fanfare cucumber

For containers and small gardens, Fanfare cucumber can't be beat. An All-America Selections winner, this very productive, dwarf variety has vines that only reach 2½ feet in length. They begin bearing in about 63 days. The mild flavored, dark green cucumbers are eight to nine inches long.

This is one of the most disease resistant varieties around.

Homemade Pickle

This disease resistant variety is among the best. Bearing in about 56 days, the vigorous plants provide a heavy crop over a long period of time. The solid, crunchy fruits are medium green with small white spines. For tiny baby pickles, harvest when these are only 1½ inches long. For full size spears and dills, wait until they're five to six inches in length.

Lemon cucumber

This heirloom novelty apparently originated in Russia. A non-bitter variety, Lemon cucumber yields in about 60 to 70 days. Very suitable for areas with short growing seasons, this is a semi-bush.

The round, lemon-like fruits can be used for pickles and salads. When pickling, harvest when they're only 1½ inches in diameter For eating fresh, pick when they're two inches or so wide before they turn yellow. Very crunchy, these have a nutty flavor and a tender skin.

Marketmore 76

Marketmore 76 continues to be among the most popular Suitable for both the North and South, this dependable cucumber was bred at Cornell. It begins bearing in about 68 days. The top quality fruits are dark green and uniform in shape and quality The plants have superior disease resistance to mildews, scab, and mosaic viruses.

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best if the herbs are fresh from your garden. Peel the cucumbers if the skin is thick or waxed.

CUCUMBER-HERB MARINATED SALAD

2 cucumbers thinly sliced
1 small sliced onion
3 tablespoons rice vinegar
2 tablespoons water
2 tablespoons chopped fresh dill
2 tablespoons chopped fresh chives
2 tablespoons chopped fresh Italian parsley
3/4 teaspoon salt
1/8 teaspoon pepper

In a medium bowl combine the cucumbers and onion. Sprinkle with the vinegar and water Refrigerate one hour Drain excess liquid. Toss with the remaining ingredients. Makes eight servings.

Cooking Pleasures Magazine

Pickles start with cucumbers. It is best to use the small pickling cucumbers that have a thin, unwaxed skin. If you are not growing them yourself (why not?) I am certain you can find some nice ones at a farmers' market. This recipe is quickly made and the pickles can be stored in the refrigerator for up to one month.

EASY REFRIGERATOR PICKLES

6 cups thinly sliced pickling cucumbers (about 2 pounds)
2 cups thinly sliced onion
1-1/2 cups white vinegar
3/4 cup sugar or honey
3/4 teaspoon salt
1/2 teaspoon mustard seeds
1/2 teaspoon celery seeds
1/2 teaspoon ground turmeric
1/2 teaspoon crushed red pepper
1/4 teaspoon freshly ground black pepper
4 garlic cloves, thinly sliced

Place three cups cucumbers in a medium glass bowl. Top with one cup onion. Repeat with remaining three cups cucumber and remaining one cup onion. Combine vinegar and remaining ingredients in a small saucepan and stir well. Bring to a boil. Cook one minute. Pour over cucumber mixture. Cool. Cover and chill at least four days. Yield seven cups.

Cooking Light Magazine

Samuel Johnson, 18th century encyclopedist once said about cucumbers – "A cucumber should be well sliced, and dressed with pepper and vinegar, and then thrown out, as good for nothing." I don't think he ever tried one of these recipes, do you?

GLEANINGS

FEBRUARY, 2008 • ALL THE NEWS THAT FITS

CA STATE BEEKEEPERS 2007 CONVENTION

Joe Traynor

Andrew Max Eggman

One of the hottest topics during the meeting is the disagreement between Citrus Mutual and beekeepers. Gene Brandi, Steve Godlin and President Orin Johnson have been the lead team on this issue. Gene Brandi presented the latest news in the fight over bee locations as well as introduced members to Holly Fraumeni of Platinum Advisors. Platinum Advisors is the CSBA's lobbying firm working with the CSBA to educate elected officials on honey bee related topics.

Thursday the annual awards banquet was held. Award winners this year:

Beekeeper of the Year: Steve Godlin. Steve is a Tulare County beekeeper. He is helping with the Citrus/Mandarin issue, a member of the CSBA Board and a Tulare County Farm Bureau Director.

Joe Traynor, Lifetime Honorary Beekeeper. Joe and his company, Scientific Ag, is a well known almond crop advisor and bee broker providing almond orchards with honey bee pollination. Joe has been very active in the beekeeping industry and has been a major supporter of the CSBA research fund.

Andrew Max Eggman, Lifetime Honorary Beekeeper. Max, as he is known, is a Central Valley beekeeper who is a past CSBA President and was at the forefront of the Citrus/Mandarin issue. He is a former U.S. Marine who served in the Korean and Vietnam Wars.

Young Beekeeper of the Year: Bryan Ashurst. Bryan is a fifth generation Imperial Valley beekeeper. He is a member of the CSBA Board, an Imperial Valley Farm Bureau Director. He is a past winner of the FFA American Farmer Award with honey bees as his project.

Distinguished Service Award: Steve Rothernberg. Steve is a field supervisor for the Blue Diamond Growers. He works with almond growers helping with tree production, crop estimate, bloom harvest and works with growers and beekeepers to ensure adequate honey bee supply for almond pollination.

Gene Brandi. Gene was given special recognition this year for work with the Citrus/Mandarin issue. He is a Los Banos area beekeeper who has devoted much of his time to the fight for beekeepers right to farm. He and his wife were awarded a trip to Hawaii for some much needed time off.

OBITUARY

Norman E. Dunham, 77, of London, Ohio, died February 2, 2007, at The Ohio State University Hospital, Columbus.

He was born September 2, 1929, in Columbus, Ohio.

Survivors include his loving wife of 53 years, JoAnn (Thompson); devoted sons, Mark and wife Janet (Tanzie), Chris and Laura (Burkitt), Lee and Susan (Olsen); five grandchildren, Gregory, Matthew, Aaron, Sarah and Nicholas; his devoted collie Heath, who was his constant companion.

He was preceded in death by his parents, Winston E. and Cora (Chamberlin) Dunham.

Norman was a graduate of University High School, where he was class president for four years.

He was also a U.S. Army veteran of the Korean War.

As a boy, Norman worked tirelessly with his father building a beekeeping business, Deer Creek Honey Farms. After high school in 1948, he became more interested in this endeavor and went on to develop the honey packing business. This ultimately became and continues to be one of the largest honey packing operations in the country. Norman had an active role in this business until his death. Deer Creek Honey Farms now continues with the third and fourth generations of the family.

BORDER WARS

The New Zealand government is to change its border control law after the National Beekeepers Association won a court order blocking imports of honey and other bee products from eastern Australia.

Beekeepers won a ruling that it is illegal for the Ministry of Ag and Forests (MAF) to allow new "passenger organisms" including bacteria in honey, across the border, unless the Environmental Risk Management Authority (ERMA) approves them.

The ministry had accepted the Australian honey would eventually introduce a new bacteria, Paenibacillus alvei, which ERMA ruled on Feb.12, would be a new organism.

Beekeepers argued this meant ERMA must approve this organism, and other new passenger organisms.

The problem is conflicting laws. ERMA's enabling legislation, the Hazardous Substances and New Organisms Act, requires it to take a precautionary approach, but the Biosecurity Act allows the ministry to balance risks in allowing imports.

Legal experts say the ruling threatened the government's ability to use import health standards to regulate biosecurity at the border.

This could theoretically lead to imports grinding to a halt with the ministry unable to use import health standards because the goods might also bring in new microorganisms.

Most imports entering New Zealand carry passenger microorganisms, and many could be identified as new to New Zealand and new to science. Testing all imports for these microorganisms could leave New Zealand open to complaints of using a non-tariff trade barrier.

"The National Beekeepers Assn. is very concerned for all beekeepers and the industries they provide pollination services to, that no more new diseases enter New Zealand beekeeping. To put beekeepers and industries that rely on pollination at further risk, can not be justified."

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INNER ... Cont. From Page 12

that were significantly different from healthy genes. Narrowing this down to only 8, they found that apparently healthy bees expressed these genes differently than bees from colonies that were dwindling and in turn these were different from genes from bees in CCD colonies. It's a good indicator test, but tough to do in the field.

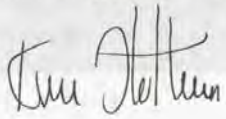
An off hand remark made by one of the speakers, and I can't recall who, was that there was good indication that *Nosema ceranae* has been in the U.S. for at least 10 years.. but I can't nail down the source on that, yet.

Diana Cox-Foster had the news of the day though. How did IAPV (that notorious Israeli virus) get to the U.S.? It's been here since at least 2002, long before Australian honey bees were imported, so that isn't it... maybe. But the same question can be asked about varroa and small hive beetle – how did they get here?

To find out she began looking hard at the IAPV virus that had been found in samples from 2002, and from samples taken from Australian bees. It turns out, according to Cox-Foster, that IAPV has been introduced into the U.S. at least twice... once, some time ago into the eastern part of the U.S., and a second time into the western U.S., presumably on Australian honey bees. Neither strain, it seems, even closely resembles the strain found in Israel. So how many strains are there? How many are lethal? Or are any of these strains lethal since they aren't even closely related to the original. And where did this virus originate, really? Some suspect it actually started here, others don't know

Perhaps by now some money has been distributed so more work can get done and some of these questions answered.

When all was said and done, I hope these very bright people, and you know, they were *all* the smartest people in the room, came away with the real message from this symposium – it's not the genes, not the viruses, not the cell phones and not the pesticides. The real message is that we are slowly *killing* our bees by the way we are *keeping* our bees. That simply has to change.



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Honey Talks

Ed Colby

My 1962 edition of ABC and XYZ of Bee Culture reads, "If the local beekeeper is not a good talker, let him employ some one who is, and he will be surprised how his honey will sell."

Personally, I don't have any problems talking about honey, or selling it. I have problems producing it.

I did grow up a bit shy On dates I was always afraid I wouldn't have anything to say, but I quickly learned not to worry, because lots of girls can hold up both ends of a conversation.

I still work at not being shy I know beekeeping helped. We beekeepers are masters of an intriguing art – the care and custody of insects that people find both fascinating and terrifying. And without bees, our food delivery system collapses.

Just about everyone understands this, and once you do, too, you need never be lonely again.

In any social situation, the beekeeper holds the cards. People are drawn to us. A lion tamer or Hollywood stuntman might be our equal, but not a banker We produce the most delicate and miraculous of foods, and we do so in perfect harmony with nature. Don't we?

We're celebrities, if we only knew it! People marvel at what we do. They're intrigued by bees, by honey, and especially by colony collapse disorder Whether they fear or revere honey bees, they can't imagine a world without them. The beekeeper is to them a sort of magician, and they want some of the magic to rub off. The easiest way for that to happen is to buy our honey.

Ann sells mine at the Woody Creek Store, outside of Aspen. She advertises my alfalfa honey as "rare." Alfalfa? Rare? "Of course," she says. "Nobody raises alfalfa around here anymore. It's all grass hay for horses."

And what's rare must be desirable, don't you think? You wouldn't want to be caught eating common, ordinary honey would you?

She doesn't care what I charge. She just marks it up. "Don't sell honey by the pound," she advises. "Sell it by the ounce."

She has a point here, so I sell my honey two ways – as food, and as gifts. Honey as food should be a good deal, while gift honey can be relatively costly, even if it's still a bargain relative to comparable gifts. It took me awhile to figure this out.

I describe my high altitude wildflower honey as having a "smoky" taste. That flavor stays with you even after the medicine goes down. I don't know every nectar-producing flower from the high country, but dwarf waterleaf, dandelion, mint, and coneflowers produce a lot of nectar up where I keep my little darlings. Last June a frost nipped the waterleaf, which yields delicate, water-white nectar Without the dwarf waterleaf mixed in, my wildflower crop came out particularly dark and especially smoky People love that taste, and they know the difference.

When Ann's customers ask what flower produces my wildflower honey, she says, "It's not a single flower It's a whole season of wildflowers. It's extraordinary "

I've known Ann for most of a lifetime. When I once questioned if she's completely truthful when she promotes honey, she looked at me like I didn't have good sense. "Of course," she said, then added: "But remember, my father was a magician. Everything is illusion."

I work on the Aspen Mountain ski patrol. Robyn is my new honey rep on the neighboring Snowmass patrol. She's young. She can ski. She charms the boys. When I worked at Snowmass, she was the one who for a time refused to buy my honey, "because you smoke out those bees, so you can kill them and take their honey " Educating Robyn taxed my patience and my good nature, but it paid off.

I store honey in my Toyota now that the Aspen bears are out of the neighborhood dumpsters and SUVs, and warm and cozy in their Winter dens. Robyn just picked up her first case of quarts from my car She knows where I hide the key On the phone tonight, she gushed, "I walked into the patrol room, and before I could set down the box, I sold three jars!"

Not being as cute as Robyn, I have to try a little harder Just before Christmas, the Aspen patrol was enjoying an after-work measure of grog. Deb said, "I need to do more Christmas shopping."

I said, "Honey makes a great present. I've got the small wildflower hex jars for five bucks, and the mediums for six."

She said, "I gave honey last year "

I said, "Give it again. Where else are you going to find five-dollar stocking stuffers? These are not only tasteful gifts – they're dirt cheap. Besides, you'd be helping out your old buddy Ed."

Tommy made some catcalls from across the room about my arm twisting, but Deb bought six jars, and now I had Isabel's attention. She took two.

Tommy has money, but he's cheap. Plus, being a guy, he's a procrastinator and an unimaginative gift-giver At the eleventh hour he confessed he was in a bind. "You got more honey, right? I need three, and I need 'em today Okay, three for presents, and one for me. I can pay you tomorrow," he said.

In the parking lot after work on Christmas Day, Tommy chose three 12-oz. hex jars for gifts but held off on one for himself. "I'll get it later," he said.

The next morning he handed me a twenty, and I had to force him to take his $2 change. And he's cheap, remember? I'm telling you, honey's a bargain, and an easy sell. Even if you're a little shy

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