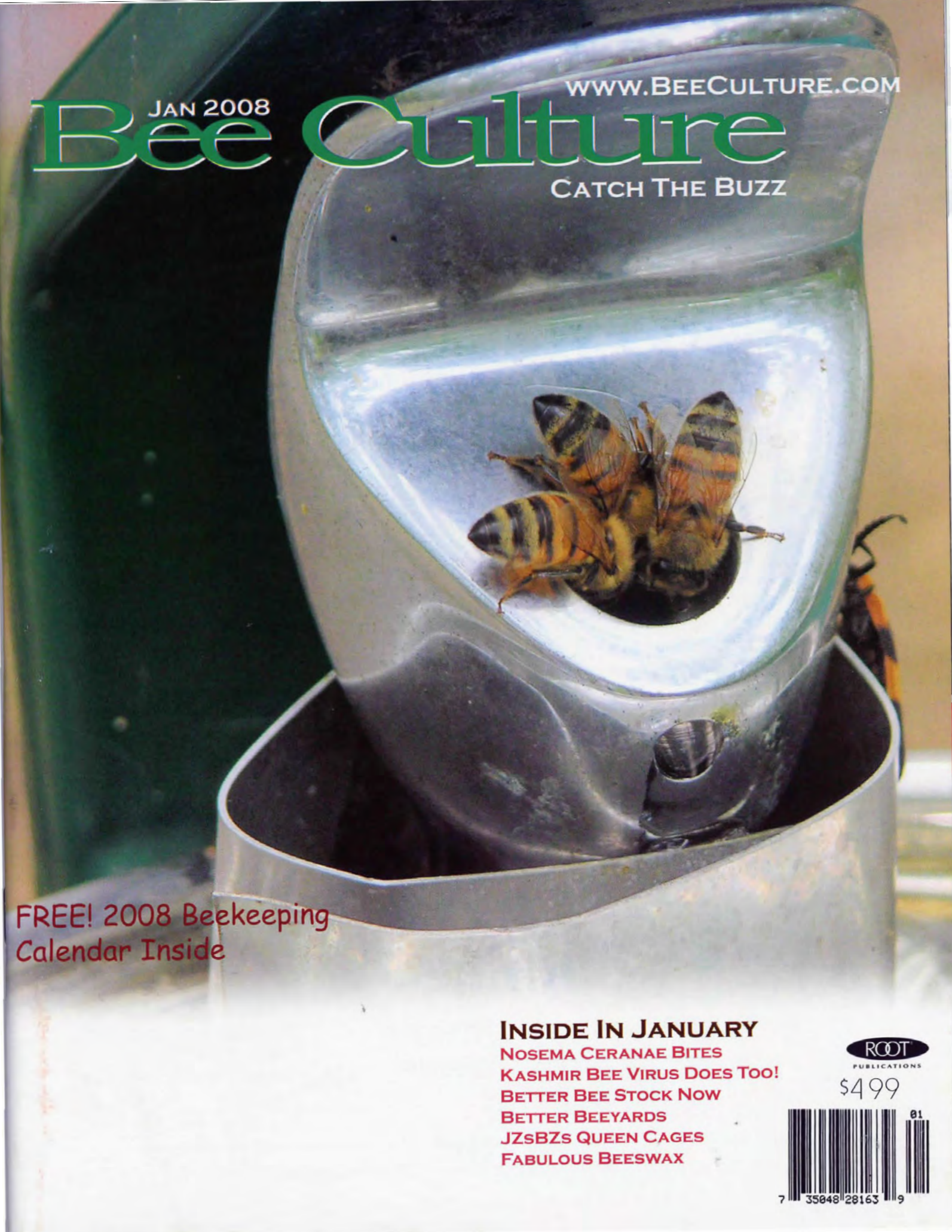


JAN 2008

Bee Culture

WWW.BEECULTURE.COM

CATCH THE BUZZ

FREE! 2008 Beekeeping Calendar Inside

INSIDE IN JANUARY

ROOT PUBLICATIONS
$4.99
01
7 35048 28163 9

Like kittens at a food dish, these bees are seeking something they don't have much of water. Right now in the north water can be the enemy . . dripping down on your cold, damp bees. That'll kill a colony just as sure as Varroa *or starvation. But if the drought continues next Summer water will be a most necessary ingredient for colony health. If you don't normally supply water for all your colonies, outyards included, this year might be the year you want to start. It'll be one less stress for your bees. This great photo of bees at a water fountain is by Andrea Thomson. We don't know what the beetle is after maybe water, or just the company of the bees.*

800.289.7668 • www.BeeCulture.com

Publisher – John Root

Editor – Kim Flottum, Ext. 3214, Kim@BeeCulture.com

Production Coordinator – Kathy Summers, Ext. 3215, Kathy@BeeCulture.com

Circulation & Advertising – Dawn Feagan, Ext. 3220, Dawn@BeeCulture.com

Contributors

Clarence Collison James E. Tew • Ann Harman

Malcolm T. Sanford • Steve Sheppard

Larry Connor • Connie Krochmal

Subscription Information

U.S., one year, $25; two years, $48. Newsstand price: $4.99. All other countries, (U.S. Currency only), $15.00 per year additional for postage. Send remittance by money order, bank draft, express money order, or check or credit card. Bee Culture (ISSN 1071-3190), January 2008, Volume 136, Issue 1, is published monthly by The A.I. Root Co., 623 W. Liberty Street, Medina, OH 44256. Periodicals Postage Paid at Medina, OH and additional mailing offices.

Contact Information

V800.289.7668 • V330.725.6677 • F330.725.5624 • www.BeeCulture.com
email: info@BeeCulture.com

Advertising

For information on advertising contact Dawn Feagan at 800.289.7668, Ext. 3220

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

Bee Culture

THE MAGAZINE OF AMERICAN BEEKEEPING

JANUARY 2008 VOLUME 136 NUMBER 1

FEATURES

DEPARTMENTS & COLUMNS

Public Perceptions

You and many other minds much better than mine in the U.S. beekeeping industry have been emphasizing for years that it is imperative that individual beekeepers and the industry as a whole protect and promote our products as being just as they are produced in nature; uncontaminated and unmodified.

Though I understand your "Gleanings" department in each issue of *Bee Culture* to be a collection of news items obtained from outside sources and reprinted with little editing, the "Golden Heritage Foods" article on page 57 of your November, 2007 issue came as a bit of a surprise and disappointment to me.

The opening paragraph of the Golden Heritage article correctly refers to Golden heritage Foods LLC as being " one of the nation's largest honey packers " The second portion of the combined article appears to have been written from the point of view of the Toledo-Lucas County Port Authority by someone unfamiliar with beekeeping. (It was: *Editor.*) The writer indicates that Golden Heritage is going to operate a 'honey factory' and refers to Golden Heritage as being a 'honey maker' and as ' one of the four largest U.S. honey makers '

While I am not current on how much the Barkmans and Stollers are now involved in beekeeping and its resulting honey production or to what extent the expanded plant will produce modified honey products such as creamed honey, flavored honeys, etc., it is my belief that it is important for the beekeeping industry to refer to such facilities as packaging, packing, or, at the very most, processing plants.

On with some more minutiae also related to public perceptions. I have greatly enjoyed Larry Connor's series "Naked Combs, Empty Spaces." Each in the series was educational for beekeepers in that the personified thoughts of the bees were based upon actual needs and activities of the colony though even the most compassionate beekeeper would understand that bees do not possess the understanding suggested. Each of the series brought a lump to my throat and some brought tears. I am happy only when my bees are thriving and thus seem to be happy We spend much more time than can be economically justified trying to save individual bees and trying to audibly explain to the workers that if they sting us they will die without benefiting their colony

Dr Connor obviously put much effort and skill into that series but I am concerned how a radical animal rights activist might use such writing especially when written on an adult technical level by a recognized Ph.D. apicultural scientist and published in a trade magazine. Perhaps we need to begin a PR program telling how beekeepers help bees.

Frederick Burdell
Bidwell, OH

Global Warming

Over 30 years ago when I started to keep bees, I remember a map of the U.S. that showed it broken up into regions depending on the main nectar source was for that area. Here in Southern MD, our area was called the tulip popular region. For many years we did real good with the nectar flow from tulip popular It was dark with a nice taste; not a strong taste that you might expect from a dark honey

For the past 15 years at least, we got no tulip popular honey We talked about it at our beekeeper meetings (Association of Southern MD Beekeepers). During the past several years I have watched a tulip popular tree that is right next to my deck. Anytime I looked I saw no bees on the large tulip shaped flowers. No one seemed to know why but we all recognized that the bees weren't working the tulip trees. I was asked if I checked early in the morning. I hadn't. The following year I checked at all times of the day No bees; only an occasional insect would come by to inspect the flowers.

I live on a small tidal pond next to a large river As a young boy and for a short while after I got married, we ice skated on this pond every Winter It has not frozen over enough for ice skating for years.

It recently occurred to me that the warming we are experiencing may have an effect on the tulip popular trees. Maybe the trees need a long hard freeze to produce the nectar The only things I am sure of is that the weather is warming and the bees are not working the tulip popular trees.

Bill Bartlett
Leonardtown, MD

Something Sinister

I am writing to comment on the letter in the October 2007 issue of your magazine from Larry Goltz. I have threatened to write letters to editors of various publications frequently in my life, but rarely do. My handwriting is poor, I cannot type, but I feel strongly enough to sit and peck this out.

I have had bees since 1964, done it for a living since 1972. I have worked with bees from NJ to CA, TX to ND. Raise my own queens, make my own nucs, have loaded and netted a semi by myself and then crawled behind the wheel for 1200 miles. I have been in the almond groves of CA, I have produced back to back 200 pound crops in SD. I held three terms as President of the NE Honey Producers Association. I have a little experience with the bee world.

Larry Goltz, who has experience of greater length than mine, wrote that many people are in a state of denial of the state of OUR environment. CCD has grabbed the headlines, but look at the decline of bees and beekeeping over 30 plus years. Larry is right, something sinister is going on. Global Warming is all the talk, but I believe there is something even more dangerous happening that people are oblivious to. The average person looks around and sees blue sky and green grass and the world is fine. We beekeepers work on a nuts and bolts level with nature, some thing is wrong, and I cannot tell you what it is, but I am afraid if it is not acknowledged and figured out, Global Warming will be a picnic!

Pick up any bee publication and all you read is trouble. My life has been bees, and my stomach is turning. The phrase "canary in the coal mine" is used more and more frequently about bees. Why do plants not yield as they did? Why are our queens failing so quickly? Bee nutrition is a hot topic, but why? These are bees for God's sake! If they cannot function and thrive in the world, how can we? A friend suggested that we are trying to fix a bullet wound with a Band-Aid.

How many of you are rolling your eyes? Don't worry I have put up with it for years. He's crazy they say

I have been telling anyone who will listen, AND those trying to flee, that EITHER there is something terribly wrong with our environment or we have really screwed up the genetics of our bees. I believe it is BOTH and we are in a heap of trouble! Both as beekeepers and as inhabitants of the planet Earth!

What can be done? I have no idea. But I have put in my two-cents, and I hope some of you are listening and thinking. I hope someone smarter than me, that is not in a state of denial, can give us some answers. So far all I see are Band-Aids. Keep those Band-Aids handy, but might I suggest a prearranged mortuary plan?

Chris Baldwin
Belvidere, SD

Right On!

Kim, your editorial is so RIGHT ON! It is a new world out there – I was wondering some this year if it wasn't me – after 40 years it seemed like all I taught was not quite right, somehow not totally valid. Was I getting too old for this job? Although YES probably it is also that things moved so quickly and were so off center that it was not just me having trouble keeping up – we all are the rules HAVE changed. Those artists out there – who I have written about for years are a different brotherhood these days – artistry is still needed but of a different kind.

Your essay really did have it right. You are a great listener, Kim and when you speak we listen too!!

Dewey M. Caron
Newark, DE

What Kind Of Curse?

When we were asked by data collectors in the industry earlier this year if we had experienced CCD losses, we carefully looked over the symptoms before giving our negative reply. Even though we had a larger percent of Winter deadouts than any other year, it was clear it wasn't CCD. If anyone were to ask me now if we have been affected by CCD, I would have to answer, "Positively "

It is not a case for media headlines: "CCD Hits Hawaii." No, it's a case for everyone of us beeks to understand that all of this information and misinformation as well as cartoon movies for kids that have come about because of this CCD issue, we are now the enemy of the bees. It used to be that the kids respected us for the work we do for the bees, and taking the time to educate them. Now I hear questions like, "You're not one of those people that use smoking guns on the bees, are you?" or "Do you really keep thousands of bees in a tiny box?"

It seems not to matter in the view of the public just how you keep your bees or what you do to them or for them, if you're a beek, you're the cause of CCD. I see the CCD losses to have gone far beyond the number of hives disappearing mysteriously

Molokai Meli
Kaunakaki, Hawaii

Nu Bees In PA

An article in *Bee Culture*, September 2006, by David Tarpy and titled Recruiting Beekeepers, described a successful state-wide approach to Beekeeper recruitment in North Carolina. It in turn inspired us to try something similar on a county level. What we could not have foreseen was the media attention given to beekeeping because of CCD, which has given dramatic imperative to our initiative.

At the February meeting of the York County Beekeepers' Association the following was accepted unanimously·

"This proposal is designed to attract and support new beekeepers in York County, not only benefiting the agriculture and environment in our area but also doing something proactive to counteract the decreasing number of bees, beekeepers and members of beekeeper organizations nationwide.

This program involves

1 Requesting financial support.
2. Advertising for participants.
3. Providing each with a starter hive. Bees and queens will be donated by members of the Association. Some financial input from the participant is required – for veils, smoker, gloves and later, further equipment.
4. Each participant connected with a mentor
5. Each participant becomes a member of the York County Beekeepeers' Association."

Six members agreed to be mentors and three businesses responded immediately – Stan Brown of Brown's Orchards, David Miller of Miller's Plant Farm, and Bob Kinsley of Kinsley Construction.

At the same time Daina Klimanis, a journalist and a member of the local bee association wrote an article in the paper

Within a week we had not only 10 interested new beekeepers and calls from people who wanted help.

Late in March we had an 'Assembly Day' and in May a hands-on afternoon in which the nu-bees met with Jeff Davis and his breeding colonies to witness their queens being reared. This was followed by a visit to the hives of one of the club members.

By June 15th we had 15 new hives established for 15 new beekeepers.

And in the Spring of 2008 we'll start talking about supers.

The May meeting of the County Beekeepers' Association was better attended than any in recent memory The real success of the program will best be measured by how many of those who began this Summer survive the Winter and are still actively involved next Spring.

Jeremy Barnes
Seven Valleys, PA

Pesticide Indemnification

This proposal has been sent to several newspapers and was considered as an amendment for the new Farm Bill. It was put forth by Tom Theobald, and supported by AHPA and other beekeeping groups, plus Farmer's Union. It was not, not surprisingly, supported by members of the farm chemicals industry!

"The present system of laws intended to protect pollinators, specifically honey bees, from the misuse of pesticides has been routinely ignored by authorities in the enforcement field, namely the EPA and State Departments of Agriculture. We feel it necessary to place the responsibility where it belongs, directly onto the chemical companies. We therefore propose that any company that produces a pesticide harmful to pollinators be required to indemnify their products at the manufacturing level, creating a fund to fully compensate beekeepers suffering damage from pesticide use."

Tom Theobald
Niwot, CO

INNER COVER

Several things to start the New Year off right need mentioning this month. But what made the top of the list is that big, fat Calendar in the middle of this magazine.

It's free, and, if I may, it's really special. Kathy's good eye, our advertisers' ideas on how to make their ads look, Lela Dowlings drawings, the management information presented each month – and those absolutely exceptional photos from our readers, when put together – well, when have you ever received a more useful, functional, attractive and practical way to keep track of time?

This year we brought in a talented local artist to assist with judging (we change judges every year, just to keep things fresh). And we kept those attributes from the last two calendars we've done that had the highest reader approval and removed a couple that didn't, and we've added some new tweaks to keep things different. Plus, and this is the best part, we had so many fantastic photos to choose from. Beekeepers know what beekeepers like, and our contributors all of them have a wonderful sense of that. We hope you can use the calendar it is, in and of itself a work of art, but it's also a functional part of any beekeeper's home or office. And thank the businesses who made it all possible. Mention the calendar when you call or visit they need to know their promotional efforts are working in their best interests.

But enough of patting ourselves on the back. There are serious things afoot.

•

Importing bees is coming to a head, again. After the kerfuffle with Australian bees carrying, or not carrying that exotic virus that was already here years ago, that nobody knew they had, but they did have, it seemed that that ruckus was finally over But no, it isn't. Nor should it be for a variety of reasons.

If those bees had that and it was missed, what else do they have that we've missed?, says one group of "Keep 'em out" advocates. Another voice says embargo the bees until we can slap a tax on them to pay for all the trouble they are causing. While still another says leave the Aussies at home, and let's bring in Mexican colonies they're closer, we know what they have (well, maybe we do), and they can go home when they are done. That's what they're saying.

Then, along comes another side of this many-sided story The diversity of the honey bee genetic pool in the U.S. is in a shambles. A bazillion bees have died in the U.S. in the last 25 years. Results from studies by Steve Sheppard, one of our regulars points out that we've lost about 25% of the alleles that were available here in 1994-95.

Some of these have been replaced – from the tiny population of feral bees that remains, from African honey bees that are taking over more and more area, and from the Russian bees imported awhile back. Still, U.S. queen producers have 25% fewer alleles to work with.

Now, Steve Sheppard and Sue Cobey want to bring in samples of alleles from areas of Europe that have had *Varroa* for decades. Sound familiar? That's why the Russians are here.

The feds, though are dragging their feet, probably for over-cautious reasons. Steve and Sue want to bring in semen-only samples – not live bees, not queens-only, or drones-only – just semen to be used to inseminate already-here queens. The semen can be tested for virus and other problems or diseases yet the feds want the same island isolation rigmarole as the live-bee Russians went through – a time consuming experience and, by some opinions – totally unnecessary precaution.

Meanwhile, Australian bees continue to arrive by the planeload without nearly the scrutiny required by these scientific importers. And yet, *Apis ceranae* – a totally different species of honey bee, and whatever devils that lurk within have invaded Australia – goes unnoticed and unchallenged by the same feds that want *Varroa*-resistant, already tested European genes restricted, isolated and slowed to, says one scientist – not "What you are thinking" (about their cautious approach), but rather, "delay until it can't happen," again, this year

APHIS is in charge of this project, rather than Homeland Security, which should give you some hope. If you're as concerned about this as much as we should all be, contact APHIS – they need to hear from you now – before another season, and yet more alleles, have disappeared again.

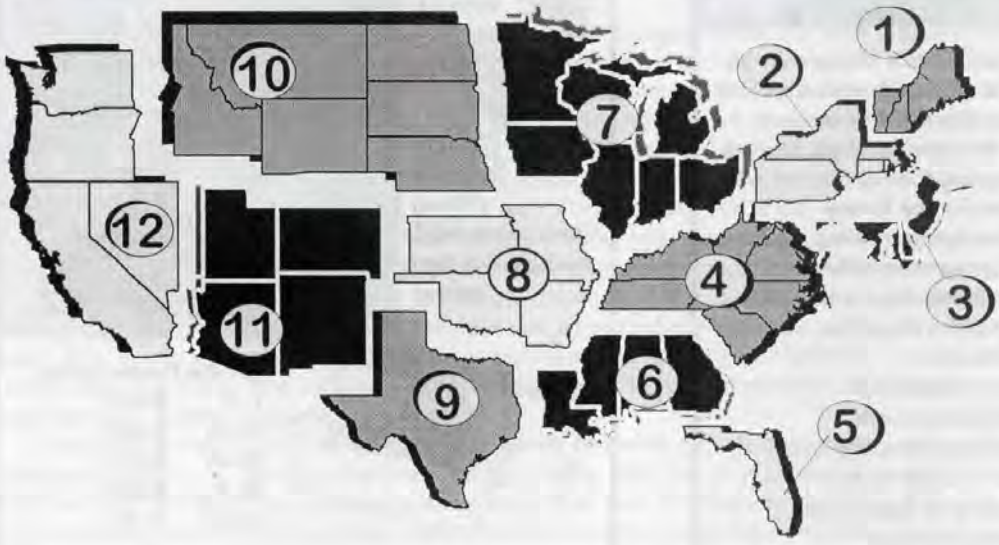
•

As I write this the USDA purse holding about $4 million sits on the table, waiting for the best CCD research proposal to arrive. Rumors have it that there's three groups looking, and another rumor says that USDA decided it's all or none – no

Continued on Page 56

Honey Bee Imports From Everywhere & Nowhere; Pesticides Don't Kill Bees, People Kill Bees

JANUARY – REGIONAL HONEY PRICE REPORT



Where, How Many, How Much?

Welcome to 2008, and Bee Culture's Monthly Honey Report. To start the year off right here's a look at who sends in our reports every month. We have about 125 reporters that receive our questionnaire every month, and we receive back about 90% each time. There's between eight and 15 reporters in each region, depending on, not size, but beekeeper population.

•

As a group 5% keep their bees in an urban setting over 20,000. 16% have them in a suburb or development, 11% in a small town of less than 20,000, and of course the majority, 68% keep their bees in the country.

On average, each reporter has 230 colonies, but that's an average. Colony counts range from 0 (we have a few packers -only in the bunch) to over 2,000. The distribution mirrors the distribution of beekeepers in the U.S. pretty closely. 62% have 100 colonies or fewer, 30% between 100 and 500, and 8% over 500. Beekeepers with a very small number of colonies, say 10 or fewer, tend to not be well represented over all the products listed on the report. Interestingly, neither do those with thousands of colonies, as most simply use barrels.

Since most of our reporters are serious honey producers and sellers, they act as a good barometer on both wholesale and retail honey sales. As a group, this season's honey sales have been mixed. 31% have had better than expected sales so far this year, 52% are having normal sales, but 17% are seeing slower than expected sales.

	REPORTING REGIONS												SUMMARY		History	
	1	2	3	4	5	6	7	8	9	10	11	12	Range	Avg.	Last Month	Last Year
EXTRACTED HONEY PRICES SOLD BULK TO PACKERS OR PROCESSORS																
55 Gal. Drum, Light	1.27	1.30	1.27	1.33	1.05	1.30	1 12	1.27	0.85	1.08	1.10	1.17	0.85-1.33	1.17	1.17	1.06
55 Gal. Drum, Ambr	1.02	1.25	1.02	1.13	1.00	1.03	1.08	1.02	0.80	1.02	0.97	1.05	0.80-1.25	1.03	1.01	1.00
60# Light (retail)	130.73	115.50	120.00	110.00	110.00	121.25	112.10	110.00	130.73	130.73	137.50	139.50	110.00-139.50	122.34	114.33	118.85
60# Amber (retail)	120.26	109.15	120.00	106.67	110.00	125.50	109.80	107.50	105.00	120.26	126.67	125.50	105.00-126.67	115.52	111.29	117.28
WHOLESALE PRICES SOLD TO STORES OR DISTRIBUTORS IN CASE LOTS																
1/2# 24/case	62.03	49.95	41.40	41.52	62.03	54.00	42.22	62.03	62.03	36.50	40.20	60.00	36.50-62.03	51.16	48.94	45.36
1# 24/case	66.00	63.03	68.40	62.32	76.20	74.27	68.80	58.37	51.75	77.76	69.80	89.75	51.75-89.75	68.87	67.62	67.33
2# 12/case	71.81	61.08	63.00	56.60	72.00	59.40	58.59	69.75	47.85	57.84	57.00	76.44	47.85-76.44	62.61	60.28	58.71
12.oz. Plas. 24/cs	65.15	58.23	49.80	59.36	54.00	62.25	56.98	53.16	45.75	47.28	65.40	72.25	45.75-72.25	57.47	53.40	52.82
5# 6/case	78.00	66.98	71.25	60.68	69.16	75.00	68.00	74.40	60.00	61.86	57.85	79.50	57.85-79.50	68.56	67.46	62.71
Quarts 12/case	90.54	100.35	112.20	85.78	78.00	75.00	89.22	79.20	102.00	90.55	86.73	105.00	75.00-112.20	91.21	100.01	89.17
Pints 12/case	58.21	49.95	56.00	54.67	56.50	44.67	53.16	45.57	66.00	64.68	61.85	58.50	44.67-66.00	55.81	61.59	47.50
RETAIL SHELF PRICES																
1/2#	3.00	2.52	2.27	2.83	2.19	2.25	2.63	1.69	2.39	2.54	2.82	5.25	1.69-5.25	2.70	2.68	2.58
12 oz. Plastic	3.75	3.42	3.00	3.23	3.80	3.38	3.17	3.60	3.25	2.93	3.52	4.08	2.93-4.08	3.43	3.47	3.29
1# Glass/Plastic	3.83	3.48	4.19	4.23	4.46	4.13	3.72	4.05	3.48	4.14	4.03	5.78	3.48-5.78	4.13	4.34	4.02
2# Glass/Plastic	7.63	5.65	7.93	6.13	6.62	6.40	6.33	8.00	6.68	6.31	6.90	8.15	5.65-8.15	6.89	7 15	6.87
Pint	6.63	6.88	6.50	5.55	6.08	5.07	5.71	5.77	6.13	7.30	5.01	7.25	5.01-7.30	6.15	6.42	5.95
Quart	11.77	8.95	10.00	9.27	8.95	8.37	8.22	9.49	11.25	14.33	9.41	13.12	8.22-14.33	10.26	10.08	10.01
5# Glass/Plastic	15.50	13.60	15.65	12.96	18.00	16.83	15.11	17.50	15.00	13.85	14.63	19.33	12,96-19.33	15.66	16.11	14.77
1# Cream	4.75	5.37	4.89	4.70	5.80	4.15	5.50	5.07	5.80	5.38	4.60	5.75	4.15-5.80	5.15	5.31	4.92
1# Cut Comb	7.36	4.95	5.19	4.94	7.36	4.50	6.41	5.00	7.36	2.00	7.50	7.00	2.00-7.50	5.80	6.53	5.52
Ross Round	6.64	3.97	5.15	4.83	6.64	4.73	5.52	6.50	6.64	1.82	6.00	8.40	1.82-8.40	5.57	5.75	5.08
Wholesale Wax (Lt)	2.75	2.18	1.80	2.39	2.15	2.45	2.35	2.83	3.38	6.00	2.92	2.87	1.80-6.00	2.84	2.65	2.11
Wholesale Wax (Dk)	1.75	1.85	1.70	2.18	1.90	1.33	2.15	2.75	3.00	2.82	1.42	2.05	1.33-3.00	2.07	2.23	2.00
Pollination Fee/Col.	87.03	91.00	60.00	41.00	90.00	45.50	48.43	60.00	87.03	87.03	75.00	122.50	41.00-122.50	74.54	70.03	61.19

RESEARCH REVIEWED

The Latest In Honey Bee Research

Steve Sheppard

"European honey bees and beekeepers are in the midst of a looming problem with Nosema ceranae."

The recent public attention focused on the plight of U.S. honey bees and beekeepers is unprecedented. Even when Africanized honey bees made their migratory move into the U.S., causing reporter Dan Rather to travel to south Texas to alert our nation to the heightened danger, the issue was presented as public safety (with an overtone of sensationalism) rather than concern for domestic honey bees and beekeepers. Now, with the attention that has accompanied reports of colony collapse disorder, U.S. beekeepers find themselves firmly in the spotlight and routinely field the question, "What is happening to honey bees?" While we can all answer the question based on experience in our own apiaries (or reports in the media), it also makes sense to look outside the confines of our own experience and even the borders of our own country to "see what we can see." A group of Spanish researchers did just that and, in a very recently published paper, they concluded that a microsporidian parasite, *Nosema ceranae*, was clearly associated with honey bee colony losses in Europe (Martin-Hernandez et al., 2007).

Beekeepers in the U.S. are already familiar with *Nosema apis*, a microsporidian parasite associated with significant overwintering losses of colonies, especially in colder climates. A well-known symptom of serious *Nosema apis* infections is so-called "dysentery," whereby bees defecate inside the hive and around the entrance. *Nosema ceranae* is a similar parasite that was first reported from the eastern honey bee, *Apis cerana*. However, recently *N. ceranae* was found to also infect the western honey bee (*A. mellifera*) in Asia, Europe and the U.S. The story of how, where and when the parasite made the host shift(s) remains a mystery that will undoubtedly be the subject of future research, but of immediate concern is the fact that *N. ceranae* is "highly pathenogenic" to *Apis mellifera*. Colonies infected with the parasite can experience rapid population declines when infected workers die prematurely

Martin-Hernandez and colleagues used two experimental approaches in their study of the "colonization" of *Apis mellifera* by *Nosema ceranae*. In their "retrospective analysis," they used traditional microscopic methods to identify *Nosema* spores and determine whether 5,776 samples collected from Spanish beekeepers from 1999-2005 were positive or negative for *Nosema* infection, without discriminating between the two species. For their "species diversity analysis," they developed a novel identification tool for *Nosema* that employed a DNA amplification procedure and "primers" specific for DNA from the two different parasites.

By including both sets of primers in the amplification procedure, the resulting amplified fragments showed the researchers whether an individual sample (derived from 10-20 pooled honey bees) was infected with *N. apis*, *N. ceranae*, both or neither Using the DNA identification procedure, the researchers characterized 290 samples collected from France, Switzerland, Germany and Spain. Of these samples, 149 came from Spain and were also used to determine whether there was a link between colony "condition" and *Nosema*. Each Spanish sample was from a different beekeeper and was classified prior to DNA analysis as coming from one of three groups: depopulated (dead colonies or apiaries with many dead colonies), "weakness" or asymptomatic.

The results of the retrospective analysis indicated that, of the 5,779 samples collected from 1999 to 2005, there was a tremendous increase in the proportion of samples that tested positive for *Nosema* infection. The percentage of *Nosema*-positive samples ranged from nine to 24% during the first four years (1999-2002), then increased rapidly until it reached 95% by year seven (2005) Seasonally, the lowest proportions of positive samples were found each Summer during the first four years. These findings were typical of the seasonal pattern of infectivity known for *Nosema apis*. However, during the 2003-2005 period, the tendency changed and a higher proportion of *Nosema*-positive samples were found in all months regardless of season. By 2005, there were no significant differences in the proportion of positive samples by month, indicating "a total lack of seasonality"; a pattern typical of *Nosema ceranae* infections.

Characterization of the species diversity samples revealed that *Nosema ceranae* was the most prevalent *Nosema* species in all four European countries. *Nosema ceranae* alone was present in 54% of the 290 samples, *Nosema apis* alone was present in about 9% of the samples and mixed infections occurred in about 7% of

the samples. About 30% of the 290 samples were negative for all *Nosema*. Out of the 149 preclassified Spanish samples, 66 were classified as depopulated, 4 as "weakness" and 79 were asymptomatic. In the depopulated group, 54 samples (82%) contained *N. ceranae*, either alone (44) or together with *N. apis* (10), two contained *N. apis* alone and 10 samples (15%) were negative for all *Nosema*. In the asymptomatic group, nine samples (11%) contained *N. ceranae*, either alone (8) or together with *N. apis* (1), 16 contained *N. apis* alone and 54 samples (68%) were negative for all *Nosema*.

Based on the changes observed in the seasonal patterns of *Nosema* infection in Spanish colonies over a seven year period and the dominance of *Nosema ceranae* among *Nosema*-positive samples collected from diverse locations in Spain, Switzerland, France and Germany, Martin-Hernandez and colleagues noted that *Nosema ceranae* has successfully colonized *Apis mellifera*. They suggested, however, there was a lack of equilibrium between *N. ceranae* and its new host. The risk of "bee depopulation" (colony death) from infection with *N. ceranae* (or mixed infections) was six times higher than in uninfected colonies. This contrasts to the relationship between honey bees and *N. apis*, where the authors argued that an "epidemiological equilibrium," with reduced transmission in the Summer, minimizes the effect of the parasite "on the total bee population." The researchers concluded that there was "a significant causative association between the presence of *N. ceranae* and the development of hive depopulation." In other words, European honey bees and beekeepers are in the midst of a looming problem with *Nosema ceranae*. Given the likelihood that *N. ceranae* is already widespread in the U.S. and coincidental (?) reports of significant honey bee "depopulation" losses in many areas, this is a subject clearly worthy of continued scrutiny in the immediate future. BC

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

Martin-Hernandez, R., A. Meana, L. Prieto, A. M. Salvador E. Garrido-Bailon and M. Higes. 2007 Outcome of colonization of *Apis mellifera* by *Nosema ceranae*. Applied and Environmental Microbiology. 73: 6331-6338.

Malcolm T Sanford

Better Stock For Beekeepers

"The beekeeping world is beginning to tread the path that plant and livestock breeders have pioneered over the last four decades."

It looks like the time has come to look much more closely at stock improvement. Finally, the beekeeping world is beginning to tread the path that plant and livestock breeders have pioneered over the last four or so decades. It has not come easy and only appears to be happening because beekeeping is inexorably driven toward this response due to the ravages of exotic organisms and subsequent use of chemicals inside the beehive. In the final analysis, it appears that the honey bee in fact has become more "domesticated."[1]

Many are now coming to the realization that genetic improvement is considered the best long-term solution to the many problems beekeepers face today, whether it be managing mite populations, controlling viruses or attempting to solve the CCD dilemma. The idea is not new; for generations beekeepers have known and practiced that most universal solution for when their colonies failed, replacing the queen. This has always been both an advantage and curse, because so much genetic potential is involved in one individual. The bees know this as well, the reason so much diversity has been programmed into the natural mating process.

A pioneer in bee breeding whose work will be more appreciated in the future was Dr Walter Rothenbuhler, a prominent honey bee geneticist from The Ohio State University I wrote a homily to Walter in the March 2003 *Bee Culture*.[2] One of his most thoughtful and valuable contributions on his favorite subject was published in a two-article series in 1980.[3]

He began his series with "Ever since beekeepers have known that queens and drones mate in flight, they have felt somewhat powerless to engage in bee breeding. It is true that certain queen producers have grafted from carefully selected queen mothers, but very little control could be exercised over the drones with which the virgin queens mated." Even though there have been some improvements Walter concluded, "no great change in the bees of North America was brought about by such limited selective breeding."

Walter then listed the following research that was needed and had been done in order to have better genetic control:

1. Reliable instrumental insemination, pioneered by Watson, Nolan, Laidlaw, Mackensen and Roberts.
2. Recognition that Inbreeding via selection leads to brood inviability over time, such the colonies become unable to maintain themselves. Inbreeding is thus both useful and harmful; the bee breeder must distinguish these.
3. Intentional selection leading to:
   a. Resistance to American foulbrood (what Walter is most known for)
   b. Resistance to chronic bee paralysis
   c. Resistance to wax moth depredation and European foulbrood
   d. Development of high pollen collection and nectar hoarding
   e. Development of "hybrid vigor"

Since Walter's paper, there have been other developments showing the value of selection, including *Varroa* mite resistance (SMR/VSH), careful introduction of resistant Primorski stock (Russian bees), and the incorporation of genes from "survivor colonies." In addition, there is evidence for genetic resistance to tracheal mites in honey bees and dominance of Africanized honey bees in the tropical lowland environment.

In 1992, I wrote about the possibility of developing a stock center based on ideas presented by Tim Lawrence and Susan Cobey [4] They concluded this would be an expensive endeavor At that time, I said, "Some might not understand what skills are involved in bee breeding and how these might be reflected in the costs of a stock center

"Thus, I am reprinting a slightly edited version of a presentation on queen breeding I received via electronic mail. It is not likely to be published elsewhere in the United States, being presented in July, 1992, as part of the meeting of the National Beekeepers Association of New Zealand. According to Nick Wallingford, the source of this paper, it is one of the most understandable treatments on the subject he's heard. Finally, the talk was given by a commercial queen breeder (Mr D.W.J Yanke) who is intimately acquainted with the many practical aspects of queen production."[5]

The difficulty in improving stocks, according to Mr Yanke, is based on the following barriers:

1. CONTROLLING MATING BEHAVIOR: It has been shown that virgins very rarely mate with related drones, which reduces the chances of inbreeding, one of the perils to avoid in any controlled breeding scheme. Thus, if we allow virgins to mate naturally, we have no control over the drones. Even with isolated mating yards, control is not absolute. What other plant or animal breeder has to make an attempt at genetic improvement with only control over 1/2 of the genetic equation? To compound this there are multiple matings. Each virgin mates with seven or more drones, and thus the colony is made up of seven or more sub-families.

2. RETAINING SEX ALLELES: In most sexually reproducing organisms, sex determination is governed by a sex chromosome. In honey bees, however, sex is determined by a single gene. This gene has many variants or alleles, maybe as many as 18. One should feel lucky, however, to maintain 10 or so in a breeding population. It

"The biggest question facing the industry then is not whether superior stock can be produced, but whether or not beekeepers will continue down the same road they have in the past resulting in cheap queens that produce unproductive and disease-susceptible colonies."

works like this, if two different alleles come together at fertilization, a female (worker or queen) results. Drones are haploid and have one allele. However, if two of the same allele come together, a diploid male results. We never see diploid drones in the hive because when only a few hours old, they are cannibalized by the workers. Evidence of this is a hole (spot) in a slab of newly capped worker brood.

As the number of sex alleles decreases, the more likely it is that two of the same allele will come together, increasing the number of diploid drones. As the percentage of diploid drones produced increases, so does the spottiness of the brood. There is an obvious impact on a colony's productivity, therefore, when some well-intentioned bee breeder reduces the number of sex alleles in a queen. Even if such queens are of high physiological quality and genetic potential, they are handicapped because a percentage of their eggs are not viable.

3. REDUCING INBREEDING DEPRESSION: Hybrid vigor results when two unrelated members of a species are crossed. The vitality of the progeny usually exceeds that of either parent. This is also known as heterosis, a mostly unexplained increase in life force. The crossing of unrelated parents results in many more genes carrying two different alleles. When a pair of genes consists of different alleles the resulting organism is said to be heterozygous. A generalized increase in heterozygosity is responsible for triggering heterosis. The opposite state is when genes carry two of the same allele. These organisms are said to be homozygous.

A reduction in heterosis occurs with inbreeding. An "inbreeding depression" is triggered as the percentage of homozygous genes increases. This results in an unexpected loss of vigor – sluggish colony build-up, loss of disease resistance, decreased production, and higher Winter loss.

Inbreeding depression can result from selections over generations for the best genetic combinations. The breeder's downfall is increasing the percentage of homozygous genes in too small a population. This is not always apparent to a producer who is selecting breeders from perhaps hundreds of colonies. Unfortunately, it is not the size of the test population, but the number of breeding queens used, which determines how quickly inbreeding depression develops.

4. MAXIMIZING QUANTITATIVE TRAITS: The characteristics we are trying to improve in honey bees are quantitative traits. These may involve many genes, each contributing only a small effect. Compounding this is the fact that these traits are not those of a single breeding individual (the queen) but, instead characterized in a colony composed of many sub-families.

It is fortunate that many important economic traits such as honey production and winter hardiness in bee populations, even though they are hugely complex, and controlled by a large number of genes, do show good response to selection. However, once these selections cease, any increase in traits which has been achieved is lost very quickly as gene frequencies return to pre-selection balances. Thus, maximizing quantitative traits is a continuous process which must be done with great care.

5. MINIMIZING ENVIRONMENTAL VARIATION: Evaluations must reliably identify the genetically superior individuals in the test population in order to increase quantitative traits. However, because colony performance is evaluated in the field, it is difficult to control environmental influence. Possibilities to reduce environmental effects consist of equalizing colonies before evaluations begin, minimizing drift; and eliminating evaluations between apiaries. Finally, because a queen's physiological quality itself can have a major effect on some aspects of colony performance, queens undergoing evaluation must be uniform in age and condition.

6. MINIMIZING THE INFLUENCE OF RACIAL HYBRIDS: Even if we implement all the suggestions above, and put into evaluations the care and effort required, it is all for naught if the genetic superiority we identified with our evaluations is not heritable. Unfortunately, the increased vigor provided by heterosis cannot be inherited.

We have two races of honey bees in New Zealand, the Dark European honey bee and the Italian. Even though most of the bee breeding effort goes into maintaining commercial bee stocks as Italian, the reality is that most of the colonies are to varying degrees racial hybrids. Racial hybrids can be great, and through hybrid vigor, are often productive. However, they are of no breeding value, and provide only false leads to someone carrying out colony evaluations.

To get anywhere, we have to breed true to race – whatever that race is. The Dark European honey bee drones appear to be very aggressive in the drone congregation areas because they appear to have a mating advantage of almost Africanized-bee-like proportions. So the only way to keep a test population true to race is to have absolute control over the mating using Instrumental Insemination.

7. KEEPING AN OPEN MIND: It may be a lot cheaper to import a silk purse, than to try and make one out of a sow's ear Taking advantage of different races and breeding work done overseas by importing genetic material could save time and money and be a dramatic shortcut to better bees. Times have changed, importations of genetic material can be done safely, whether

they be semen or breeder queens.

Returning to Walter's paper, he stated that much of the work he referenced produced only information. It was not designed to supply better bees to beekeepers, but to learn how to get better bees. To supply better bees to beekeepers is a greater task he concluded. It will take three links in a chain, 1) field tests, 2) genetic decisions, and 3) commercial production. What has been mostly missing is the second link.

The geneticist, according to Walter, must provide input for the nature or the field tests, how data will be taken and number of colonies tested. In addition he/she must help decide which colonies are to produce queens and drones for the next generation and when instrumental insemination or natural mating should be used. Finally, the geneticist must help decide how to maintain improved stock over a period of years and how to release it to beekeepers.

The complexity of any breeding project is now apparent, Walter concluded: "Someone must manage the whole affair and see that the three components interact cooperatively and creatively on a continuing basis. Almost as an after thought he said; "It may be apparent also that a considerable amount of financing is required."

This goes back to the idea by Tim Lawrence and Susan Cobey referenced above that bee breeding is a costly enterprise. The biggest question facing the industry then is not whether superior stock can be produced, but whether or not beekeepers will continue down the same road they have in the past resulting in cheap queens that produce unproductive and disease-susceptible colonies. It seems abundantly clear that "you get what you pay for," and beekeepers will have to say goodbye to inexpensive queen bees in the future if they wish to be successful in managing healthy, productive colonies of honey bees. BC

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

References:

1. Sanford, M.T 1996, *Apis Newsletter*, Vol. Volume 14, Number 4, April 1996 <http://apis.ifas.ufl.edu/apis96/apapr96.htm#1>, accessed November 18, 2007
2. Sanford, M.T 2003, *The Lasting Influence of Two Men: A Retrospective on the Career of Dr. W.C. Rothenbuhler*," Bee Culture, (March) Vol. 131 (3): 19-22.)
3. Rothenbuhler, W.C. 1980, *Necessary* Links in the Chain of Honey Bee Stock Improvement, American *Bee Journal*, Vol. 120, pp. 223-5, 304-305.
4. Lawrence, T and S. Cobey. 1992 Bee Science, Vol. 2, No. 2, June, 1992.
5. Sanford, M.T Apis Newsletter Volume 10, Number 9, September 1992 <http://apis.ifas.ufl.edu/apis92/apsep92.htm#2>, accessed November 18, 2007

Using The
BEE BRIEF SYSTEM
For Colony Management

David VanderDussen

For commercial beekeepers a high speed colony management program that produces good quality queens and strong hives needs to be at the core of their business. Historically this has involved a lot of juggling of pieces of equipment, ordering queens, training people to find queens, shaking out drone layers, combining colonies and splitting colonies, running mating nucs, caging and introducing queens, and other activities that are time consuming and *the beekeeper does not always end up with the desired results.*

In 2007 NOD Apiary Products brought a new beekeeping tool to the industry after seven years of field testing the design. Called the Bee Brief™, it is a nuc box that holds four standard frames. Made of exterior grade plastic with a fixed bottom and an upper entrance that closes off when the screened transportation lid is set on, it is designed to be the workhorse of a livestock management program.

Why is a different style of nuc box necessary? The starting point for consideration is simply to have a one piece box that can be set out on the ground for fast drop off. That meant the nuc would have to have a bee entrance up off the ground, that it could take the weather and the sun, ants can't eat it, no painting, no stand required. Easy drop and go.

For the beekeeper's back the nuc box needed to be easy to transport. Big handles up off the ground for easy grab and carry, stackable for storage and shipping, designed so the bees can breathe when stacked, light enough to carry four when empty and tough enough they take the abuse of beekeeper handling. Modern logistics demand easy palletization for forklift handling. Shipping for nuc sales means the lid needs to be easily and tightly secured, and easily double screened if being shipped by courier And Voila! – the Bee Brief™!

Achieving the Goals of High Quality Queens and Strong Colonies.

So now we have to see how this tool works into a livestock management program. How can a beekeeper get well mated queens that never see the inside of a cage before going into a production/pollination colony, are available when needed, and are easily accepted by the colony that is being re-queened?

Historically we have raised queens and introduced them into colonies like the survivalist movie character Rambo:

she goes in alone into enemy territory, dropped in, in a cage.

A specialist sent in by a foreign power to depose the current ruler

tries to camouflage herself to blend in with the locals

the goal: take over the population

If discovered, the penalty is death!

What if instead she goes in with 20,000 baby bees ready to hatch, consistent pheromone release and a full support staff that has already accepted her rule?

The Strength-to-Strength Bee Brief Program – seven years of testing.

The beekeeper approaches a hive in the Spring. An empty Bee Brief™ is set down on each side of him. As the colony is inspected, if it has spare brood and feed it can be sorted into the Bee Brief™ on the right. The beekeeper wants two frames of capped brood with covering bees, a frame of feed and an empty comb to grow on. The frames are checked to make sure the queen is not on them, but

Install the queen cell.

Put the screened cover on.

Move to the next yard.

Put the lid on and open the door.

the queen does not have to be found. Frames that are going back into the hive go into the Bee Brief™ on the left, just to hold them until the hive is re-assembled. Once the required frames for the Bee Brief™ are in place, a queen cell is set in and the screen lid dropped on, covering the entrance.

As the beekeeper checks the yard over a harvest of nucs is just part of the flow. New combs can be worked into the outfit very easily, and old combs worked to the outside of the brood chambers to be cycled out.

Onto the truck the Bee Brief™ go, off to the next bee yard. There they are scattered around the parameter and the lids tipped up for the bees to fly Four to five weeks later there is a well mated queen from all those local fly-boy stud drones. Natural selection of the healthiest drones!

Inserting the newly mated queen into a hive.

If the Bee Brief™ is going to be used to boost a hive, replace a failing queen or go into a drone layer remove three or four frames from the hive. Slide all the remaining frames together against one wall of the hive so there is room for the frames from the Bee Brief™ against the opposite wall – not in the middle! Slide the Bee Brief™ frames in to the hive and shake in all the bees. The queen does not have to be found (at no time in the program does the queen need to be found – a great time saving!), just make sure all the bees are in the hive. We have not had any problems with acceptance with this method. Sometimes the original queen continues to lay for a period of time along with the young queen. Not only is a young queen going into the hive, but 20,000 bees emerging over the next two weeks are also being added.

Lots of brood.

The Bee Brief™ can be closed up and go to the next yard or they can be used in the same yard. If used in the same yard all the adult bees will fly back to the Bee Brief™ site over the next few days so the process is slightly different: Set to one side the BB with the young queen and set an empty BB in its place. Remove one frame with brood from the first Bee Brief™, shaking off all the bees. Set that frame into the empty Bee Brief™, add a frame of feed, a queen cell and two empty combs. Although it starts out without any adult bees all the returning field bees will provide an adequate bee population to maintain it. In a month another mated queen with frames of capped brood will be ready to use. This can be repeated again for a continuous flow through the season. If the Bee Brief™ are used in a different yard the Bee Brief™ will need to be started again as was done during the spring examination.

Migratory beekeepers can use this system to give them a reserve of queens, each with her own brood and support staff, ready to be dropped into struggling pollination hives, immediately bringing them back up to strong pollinator status with a shot of 25-30,000 young bees going in and emerging over the next two weeks.

More and more nucs are being rented for small arena pollination such as indoor for greenhouses, cage plots and backyard sites. The Bee Brief™ is the ideal unit for this.

In an outfit focused on pollination, hive numbers and health should be maximized through the season and peak in the Fall. If a beekeeper runs Bee Brief™ numbering 1/2 of his production/pollinating hives within a year he will have young queens in all his colonies and increase his numbers by 27% going into Winter, covering off Winter loss before it happens. The savings in labor and queens pay for it in the first year, plus the beekeeper has the pride of running a self-reliant, continuously improving outfit!

Next Month:

The North as a Refuge: Avoiding Africanized honey bee matings, Use of Queen Cells for stock improvement, Fat Bee mating sites, Mite control and Bee Brief transportation.

For more information call 866-483-2929, or go to www.miteaway.com. BC

A Guide For Sideline Beekeepers

Better Beeyards

Larry Connor

Bobbing for Beehives. As hive bodies float away from the apiary, the beekeeper regrets the convient location by the bubbling brook. (Becky Jones photo)

Colony Placement

The first rule of locating one or more beehives is to avoid harm to the bees or to other animals, including humans.

Make sure you look around a potential site for possible problems. That bubbling brook may become an expanding pond every few years, and the entrances of the hives may be underwater and put the hives at grave risk. In the apiary shown in the photos, one of the colonies was never found again, washed downstream. An open field in March may be a crowded campsite on July 4th, filled with nervous mothers, drunken fathers, and curious children. Nobody wants to endanger fenced animals, so make sure you discuss land use throughout the season with the property owner before you consider putting bees in a location.

Design

Commercial beekeepers often move their colonies on four- or six-unit pallets, so the key aspect of colony placement is level, solid ground where a large truck can be loaded and unloaded with a bobcat or some other equipment. Groups of 24, 48, 72 and 96 colonies are not unusual with commercial beekeepers because of the economics of labor and diesel fuel make it impractical to set out one pallet at a time. While the operator may have a momentary thought about which way the colonies will face, most of the time the bees on pallets are put down where they fit and where they are out of harm's way. There is often little concern which way the sun rises and sets or the direction of the prevailing wind. When large numbers of pallets are placed into one area there is considerable drifting of foragers as the bees experience difficulty with hive orientation, especially after a recent relocation.

In pollination rentals (sometimes in apples and frequently in almonds) growers may insist the bees be placed in the row of trees that produce the pollen for cross pollination, called the pollenizer cultivar I guess growers must think the bees will "push" the pollen out of the pollenizer trees and into the trees they want pollinated, but it does not make sense in terms of bee foraging biology, that suggests that pollenizer pollen is mixed within the colony, rather than from tree to tree. But since the beekeeper is providing a service for a fee, the bees will be placed where the grower wants. It is part of the service.

In sideline and small commercial operations not using pallets, there are two designs I like for colony placement, and one I don't. That is the one that puts colonies in a single line against a fencerow. It is a pretty picture, and I have tried to write about this sort of thing in a creative streak, but I find one must carry everything *behind* the colonies in order to efficiently work them. This may be fine for a stand of two or four colonies, but is tedious for an apiary of 24 colonies. Plus, that straight-line arrange-

High water mark. The gentle slope save some hives in this Farmington, CT flood in 2007 (Becky Jones photo)

Ted Jones labors to pull a colony out of the newly formed swamp and muck of a formerly dry apiary. (Becky Jones photo)

Lush weed growth around colonies restricts forager flight. It might eventually require the beekeeper to keep looking for the colonies after frost.

ment is prone to drifting, resulting in beekeepers wanting to select the end colonies that produced the most honey as their breeders the next season. Some beekeepers just don't seem to get it, do they?

The first design that I like uses two parallel rows, (perhaps one facing East and one facing West, but not necessarily), that permits you to drive the car or truck between the two rows. The entrances face outward. When there are a large number of colonies (more than eight), I strongly suggest you separate the groups some distance so the colonies are not evenly spaced. A simple 2 x 6 or 2 x 8 foot hive stand will put three or four hives on one hive stand, and foragers orient pretty well in this arrangement. If you place the hive stands a few dozen feet apart from each other you will have to move the vehicle to each cluster of hives, but that works well when doing intensive bee work like making splits, honey removal and requeening. You may further minimize drifting by directing flight away from each other The somewhat straight arrangement makes it easier to mow or spray for grass/weed growth.

The second arrangement is a modification of the first, but where you back the vehicle into the apiary and the colonies are in a upside-down U or an open circle (a dozen colonies each facing out toward a different number on the clock-face). This works well when you have a compact area or are against a hill or grade you do not want to climb. Drifting is rarely a problem in this arrangement. For weed growth, many beekeepers rely on the herbicide Roundup® or some other weed control agent to keep the hive entrances clear and permit free flight of the foragers. Nothing is as frustrating as an apiary with weeds up to the hive top and foragers required to *walk* down weeds or grass the last 18 inches before reaching the entrance of the hive.

Other weed control ideas: My brother Mike over-wintered colonies with top insulation made of hay or straw in an empty super placed over a screen. The organic material collected hive moisture and in the early spring the mass was placed at the entrance of the hive to prevent weed growth until midsummer Other beekeepers cut lengths of discarded carpet into strips and place them in front of the hives. Depending on the thickness of the carpet, this keeps the weeds down for a few years. Others have used roofing paper, construction materials and landscape cloth. Of course a scythe or corn knife will work when used by the well-veiled beekeeper Over 100 years ago A.I. Root lectured beekeepers about the importance of a well-trimmed apiary, making the claim it reduced the amount of nectar the colony would produce during the season.

The second rule should be about nectar production. For small operators this is rarely the case.

Our dwindling number of commercial beekeepers in the United States profess that the most important part of colony management is *location-location-location.* The closeness of a nectar source is paramount to their ability to move bees to a crop and produce a large amount of honey. This is especially true after their spring pollination contracts are filled, and they find it is critical for their seasonal management to get the colonies into an area where they will have abundant nectar to replenish supplies of food and rebuild the colony that has dwindled due to poor forage during pollination in crops like blueberries and cranberries, and later in the Summer on melons, cucumbers, and pumpkin/squash.

The second rule also requires that every good beekeeper must be a good botanist.

Too few beekeepers know where their bees are going to get the nectar crop they are gathering. In order to place colonies into an area for nectar production, you better have a very good idea what is going to bloom in that area during the next few weeks and months. Part of this may be done by inspecting the fields and roadsides in a radius of a one to two miles around the potential apiary If the location has nothing but field corn you probably will have a poor nectar crop. Unless setting bees in an area of known nectar-rich monoculture (like a section of alfalfa) I seek areas of diverse floral biology and varied ecological classifications. Look for Spring buildup plants like alder, willow, elm, dandelion, mustards and maple. Look for the nectar-producing tree species like cherry, plum, apple, black locust, tulip popular and basswood. In the Summer months seek hayfields and pastures filled with clovers and spotted knapweed. As the Summer continues, look for abandoned fields with milkweed and a wide range of wildflowers. Look in the wet areas for purple loosestrife. In late summer look for goldenrod and aster Specialty crops like sunflower, oilseed rape (canola), peppermint and other plants should be on your search list.

These examples are typical for the north central and northeastern part of the United States. In other parts of the country you need to learn your local nectar sources from the bee club or your beekeeper mentor Where you

do not have sprawling asphalt, Mac Mansions and box stores, look for a diversity of plants but with a few key nectar producers that almost always produce a crop for the beekeeper

Develop a year-long search for nectar plants. In the Winter you can identify tree species that are potential nectar producers. During the growing season, learn to identify clover and alfalfa plants before they bloom. Search out the growing fields of goldenrod and aster months before blooming starts. Developing these skills may take some time, but are worthwhile investments of your time. Plus, they give you a fine excuse to walk an area and enjoy nature.

Leave them or move them?

Every beekeeper will face the dilemma of needing to move colonies at the end of the season or leaving them in the same location for Winter Is the location high risk for Winter? Will the colonies have extreme wind exposure, or be subject to hunters and snowmobiles? Will you be able to drive a four-wheel truck into the apiary in February or will you need to borrow that snow machine to feed the bees? Are you set up to move 10 to 24 colonies? Do you have the truck, ramps, motorized tailgate or other equipment that will make moving easier? Is there a chronic problem with bears causing problems in the Fall and Spring? (not that you will have protection by putting bees near a building in many parts of the country).

If you leave the bees in a distant out yard you will need to check wind exposure, leave excess stores, and perhaps wrap the colony for further protection. A snow fence or artificial windbreak may help protect the bees from cold winter blasts. A few beekeepers cluster their hives during the Winter, waiting until late November or December to tightly group the colonies after routine bee flight is finished for the year By placing the full sized hives together, insulating the tops and wrapping with roofing material, they create a microclimate within the group of hives arranged this way in an effort to reduce stores consumption and increasing winter survival. Others group nuclei hives for over-wintering into groups of four or stacks of eight to conserve energy use during Winter

Ed Nowak's home apiary (just a part of it) shows the straight line arrangement and the hives stands. Forager bee orientation is helped by the different sizes of the hives, the colors of the paint, and the background vegetation (and Summer shade). Nowak is a beekeeper in Livonia, Michigan and teaches many beekeepers in this apiary.

Night moves of bee colonies requires solid roadbeds and a clear workspace. This does not always happen in the field. The pallett keeps the hives off the ground. The colored boxes create unique patterns for forager orientation.

The home yard

The home apiary too often becomes a dumping ground for sick and weak colonies. Weak colonies are like bills – deal with them immediately and reduce the number of times you handle them. If you split a weak colony in the Spring or early Summer and give the parts a new queen, you have eliminated the nonproductive unit with something of increased potential (especially if you boost the new units with brood and bees from a stronger colony). With sick colonies use this test – if you are able to medicate the colony in the apiary, do so, and don't move it. If the colony needs to be destroyed due to American foulbrood, do this at a remote location – not the home apiary – where the risk of exposure is somewhat reduced.

Either way, avoid the introduction of a group of weak and sick colonies to the bees in your home apiary The bees kept in the home apiary are mostly breeder stock and queen production colonies, so you can produce queens in the late afternoon and evening and not need to drive to an outyard. If you teach beekeeping to novice beekeepers a few gentle colonies in the home yard are a convenient way to providing instruction without excessive transportation. Keep gentle colonies at home and remove or requeen any colony that shows any sort of personality disorder Keep these colonies well fed and provided with an excellent water source – such as a rainwater pond, made from the runoff of the roof, and filled with rocks, gravel and aquatic plants to attract the bees. BC

The author's latest book Bee Sex Essentials *is at the printers and is due to be delivered about the time this article appears. For pricing and delivery options, contact Dr. Connor at ebeebooks@aol.com.*

Extracting Honey

James E Tew

Extracting, pumping, and settling the honey crop.

Liquid honey

Liquid honey reigns as the premier natural sweetener Increasingly, pollination rental fees pay the bills for many commercial beekeepers, but honey is still the beloved beehive product. Bee biology and beehive management have absolutely nothing in common with the actual machinery of honey processing. One could very easily be a bee biology expert and have no clue how to devise an efficient honey extracting line. In *Extracting Honey Part I, Bee Culture,* November, 2007, I discussed examples of the various types of equipment needed to get honey frames uncapped by hand. In this segment, I will begin at the stage of mechanized uncappers and extractors.

Energized honey processing equipment – a blessed development

Many years ago I had a professional electrician wire my storage barn for electrical power He made the passing comment that my barn was to be "energized" rather than wired. I am using that term to describe processing equipment that heats, pumps, slings, or otherwise helps in the honey extracting process. Energizing honey processing equipment was a grand development in honey processing. Most beekeepers whose bees produce surplus honey dream of electrically mechanized equipment. The challenge is that nothing in the extracting line is standardized. It would be impractical for me to imply that my comments here serve as recommendations for specific equipment you will need. What I can offer is comments on specific pieces of equipment and what they do.

Mechanical uncappers

Any mechanized uncapping device will be a costly addition to your extracting line. After reviewing a few current supply catalogs, $2500 would be the low starting point for an energized uncapping device. Used uncappers are out there, but you will need to have a mechanical background to keep an aging uncapper running. Simple repair kits are available, but true mechanical repairs will usually require the services of a machine shop.

The Sideliner uncapper from Brushy Mountain Bee Farm

I am only announcing the availability of this device from Brushy Mountain Bee Farm. I have no experience using it. The device is called, the *Sideliner* and is manufactured by the Italian equipment manufacturer Guiseppe Lega. The Brushy Mountain catalog states, *"This is a metal device that has a pair of cutting cylinders that uncaps as you slide the frame through them. Lay your frames on the table and easily crank them through the blades to reduce your uncapping time in half."* While the price is lower than that of other devices ($995 plus shipping), it is strictly a manual device without electrical assistance.

Motorized Chain Uncapper

Maxant Honey Processing Equipment makes a vertical uncapping device. Their catalog states, *"No Knives, no steam required. Only 10 second per frame. Operates like a pop-up toaster The motor automatically starts when the frame is hand lowered. Revolving stainless steel chains strip off the wax capping. The machine automatically stops when the frame is raised. Chain reels are adjustable."* The unit sells for $2295 plus shipping.

The tips of revolving chains nick the honey cappings just enough to open them. The resulting cappings residue falls below, and some will have to be caught in a filter in the honey line beyond the extractor

The Handyman from Cowen Manufacturing

The Cowen Manufacturing Company has been producing heavy duty honey processing equipment for many years. They presently offer a part manual/part electrical uncapping device that is named, *The Handyman.* An electric motor operates two serrated, vibrating knives that are heated with either hot water or steam. A hand crank mechanism forces the honey comb between the two vibrating knives that uncaps them to a preset depth. More advanced Cowen uncapper models are fully mechanized using a chain drive to push the frames between the knives and then to push the uncapped frame away from the uncapper While this is not an endorsement, I have a mechanized

A manual uncapper from Brushy Mountain Bee Farm.

A Maxant Chain Uncapper.

Cowen *Silver Queen* uncapper in my lab that has operated for many years. It is essentially trouble-free but does require periodic bushing replacements. Occasional frames don't drop straight down and will jam the machine, but a reversing mechanism allows for quick recovery

Dakota Gunness

The Dakota Gunness Company manufactures an uncapper that uncaps both sides of the frames with two sets of chain flails. No heat and no knives are required. A conveyor moves the honey frames – laying flat – into the uncapper head where the uncapping occurs. This is a heavy duty unit intended for larger honey producing operations.

Characteristics of all uncappers

All uncappers require a solid stand. The uncapper should be firmly attached to the stand. All uncappers require some kind of catch basin underneath the machine to catch oozing honey and cappings that are produced by the uncapper Electrical wiring should be heavy duty and unless specially installed will be somewhat in the way. The potential buyer's market is small so the production of these devices is specialized. If you come across a used model, it is probably worth repairing. Otherwise, select the model that suits your needs and take care to maintain it properly It will last you for many years.

Extractors

All honey extractors work by slinging the honey from uncapped frames. The smallest that I know of is a two-frame while the larger extractors take up to 30-40 frames – some commercial units over 100. Only the very largest extractors have automatic frame loaders. By far, most extractors require loading and unloading by hand.

Through the years many styles and designs of extractors have been marketed. In most instances a four-frame extractor is about as large as hand-cranked extractors can be. Such extractors require positioning the frames tangentially (or flat to the extractor side). This characteristic means that the frame must be removed and the opposing side put to the outside to extract both frame sides. Larger extractors use a radial design in which the frames are positioned like spokes in a wheel. Both sides of the comb are extracted without having to flip the frames. On the used equipment market some vintage hand-cranked extracted are "reversible." Upon throwing a lever, all the frames in the basket flip over without having to individually remove them from the basket. The Walter T Kelley Company still manufactures a few models of small, reversible extractors.

The extractor base – the common problem

The universal extractor problem is its base. It is rare for a freshly loaded extractor – of any size – to be balanced. Some frames are heavier than others. Any extractor must run out-of-balance for a few revolutions to sling out enough honey to balance the remainder of the load. This puts significant torque on the base supporting the extractor whether the extractor is large or small. Unfortunately, there is no perfectly designed base for any extractor Normally, small extractors simply sit on a heavy metal or wood base that you improvise. Larger extractors are manufactured with legs incorporated into the design. Individual legs are commonly attached to either cement or wood floors with lag bolts. It is not uncommon for bolts to work loose as both years and honey loads pass. I have improvised a spring loaded base in my lab which lets the extractor slightly float. The problem is that the machine, when initially loaded, makes a rhythmic tapping and bumping as the springs flex. After the load settles, the extractors run quietly

Extractor base height – a second common problem

Even with small extractors, to get the extractor high enough off the floor to accommodate a five-gallon bucket or a sump, the extractor must sit about 16-18 inches off the floor This height means that each frame must be laboriously lifted high (with honey stringing everywhere) when placing uncapped frames into the extractor Frequently a stand is built beside the extractor for the person loading the machine, but then the problem becomes what to do with the stack of supers as they get near the floor I don't know of a perfect design for a small extractor other than just withstanding the work and getting the job done. Larger extractors can be installed directly on the floor with a sump underneath within the floor structure.

What size extractor do you need – a third common problem

When to upgrade to a larger extractor is strictly your call. In theory, even a commercial beekeeper could use a small extractor if he or she was prepared to *use it a lot*. At some point, the ratio of time vs. task becomes so out-of-balance that the beekeeper decides a larger machine is required. Everything is proportional – the size of the crop vs. the capacity of the extractor vs. the time spent extracting. Larger honey production operations frequently have older, smaller, semi-retired extractors sitting in storage that have been outgrown.

Old extractors

Vintage extractors turn up all the time. They are usually cheap to buy These old units were very well made and nearly impossible to wear out. The problems are the galvanized tanks they have and the solder used to assemble the devices is no longer approved for food contact. Since parts are long since unavailable, be prepared to have a machine shop make required parts, and coat the tank, inside and out, with food grade epoxy paint before using.

Heated vs. unheated sumps

Normally, extracted honey free-flows into sumps that sit just beneath the extractor Basic sumps are single-walled and simply catch the liquid honey flowing from the extractors.

Components

1 Uncapper stand – supports uncapper and temporarily holds uncapped frames
2. Mechanical uncapper – cappings can be seen on the heated knives. Red hot water hoses are plainly visible.
3. Cappings tank – a heated tank for catching cappings. Note the stainless steel hopper underneath the uncapper The cappings tank is unheated but has a valve for draining honey from beneath floating cappings.
4. 33-frame radial extractor with variable speed DC motor The extractor is bolted to a heavy tube steel, spring-loaded base. Honey flowing from the extractor drains into a filter and settling tank (#6) that sits two feet below the extractor
5. Cappings can be seen floating on honey in the uncapping tank.
6. Honey from the uncapper flows, by gravity, into a strainer and 55-gallon drum sitting in a pit two feet below the extractor
7. Small uncapping tank for quick use if only a few frames are to be uncapped by hand.

Heated sumps are double-walled (water-jacketed) and have a heating element to heat the honey to make it easier to pour or pump from the sump. Heated sumps are preferable to unheated ones.

Honey pumps

Honey pumps are worth their weight in gold. No monitoring of sump capacity and no hand pouring is required if a capacity switch is included. Honey pump models for the smaller beekeeper are very few in number in today's market. Not wishing to leave any manufacturer out, I think that only Kelley and Maxant routinely advertise small capacity honey pumps that sell for less than $500. Otherwise, honey pumps can cost more than $1000. It may very well be that you will be required to put a motor on the pump you buy I strongly recommend a motor with a reversing switch. Being able to pump honey back into the sump can really save time when cleaning filters or lines. As with extractors, old honey pumps frequently turn up on the second-hand market. They normally have crystallized honey in them so the pump housing should be opened up, heated with a heat gun to soften the gummy honey, cleaned with hot water, and reassembled with new gaskets. Some of these old pumps get very hot if run continuously Many don't have bearings or bushings. Using heavier oil or heat-tolerant grease will help, but do not use light oil to lubricate these pumps. It won't hold up.

Honey line plumbing

Commonly, rigid, white plastic tubing or clear, food-grade plastic tubing is used to plumb the honey processing line. Unions should be included somewhere in the line to aid in breaking down the lines to clean them when the season is over Clear plastic tubing is easy to install and allows for easy observation of honey flow However, sump-heated honey can cause a clear plastic line to bulge and burst if the filter plugs tightly

Honey filters and settling tanks

Commonly, beekeepers managing smaller operations allow the honey to settle in heated tanks. After a few days of settling, debris rises to the top where it can be skimmed off. The honey coming out of the bottom valve of the settling tank will be clear Strainers and filters speed this process along. Strainers of various sorts are available from suppliers, but few filters for smaller operations are available. Dadant markets a filter that works well in my extracting line. It currently costs $450 and requires frequent maintenance, but it works well.

It is important to know that any filter or strainer is intended to clog. Be prepared to provide frequent maintenance. Heated honey passes through a filter much, much faster than cold honey Also, the filter will work for longer intervals if the honey flow is not allowed to stop. Once the flow stops and the filter empties out, the detritus will flow against the filter wall and will cling there. Starting the honey flow again means the filter is already partially clogged. Cleaning honey filters is a messy but necessary job.

Settling tanks and bottling tanks are essentially the same piece of equipment. Though more expensive, double-walled, temperature-controlled tanks are worth the extra costs. In heated tanks, honey particulates rise to the top faster making the bottling process go faster

Your extracting system

The extracting line I described above is not ideal. I am always changing and experimenting. You will come to know the strengths and weaknesses of your personal honey processing system. No system is perfect and honey is always sticky Accidents will happen, but aside from that, you will process your own crop and it will be rewarding. I end where I started – the machinery needed for honey processing has nothing to do with bee biology. It is another component of your bee world. BC

Dr James E. Tew State Specialist, Beekeeping, The Ohio State University, Wooster, OH 44691, 330.263.3684, Tew 1@osu.edu; http://www.beelab.osu.edu

JZs BZs Queen Cage

Not since the Benton 3-Hole Cage has a piece of beekeeping equipment so revolutionized this industry.

Jm Paysen

With so many queen cages on the market, why would anybody want another one? Many beekeepers would because the three hole wood cages are bulky and when placed between the frames a large gap remains where the bees usually build burr comb. They are also heavy to ship and require too much work to prepare for use. Previous plastic queen cages were made by die makers who live by the rule that says "Make the surfaces as slick as you can."

The economical cell protector used with the cage.

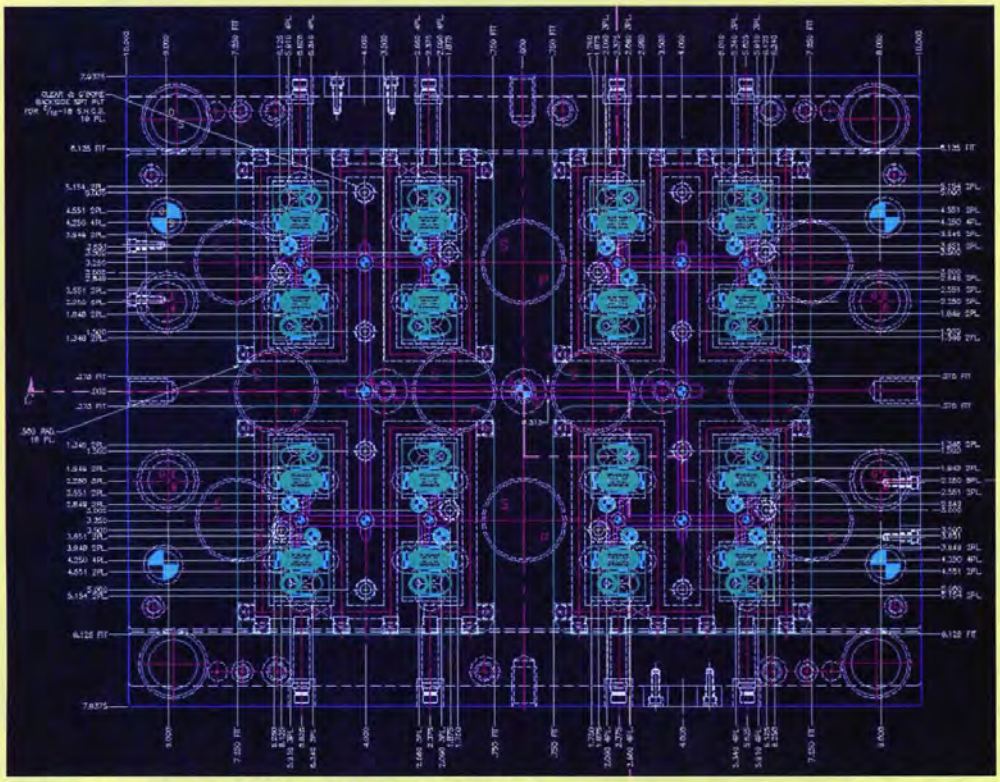
This is unfortunate because bees can't cling to the walls of a slick cage, which puts the bees and the queen under stress and results in lower acceptance rate. In addition a two-piece plastic cage (which most were) costs about twice the price of a one-piece cage because the greatest cost is in run time of the molding machine.

Before starting on the queen cage as visualized, it had to be proven that what the die makers said couldn't be done could indeed be accomplished. Specifically, it had to be established that the annular rings on a circular object could be stretched enough to remove them from the male part of the die without fracturing the part. This was proven as practical when the plastic cell protector was developed.

In our beekeeping operation this economical cell protector permitted us to place a cell in a nuc as it was moving down our nuc assembly line. This made it possible to put cells in nucs the day we made them, rather than waiting until the next day This freed up two employees to help with the tasks involved in making up 850 nucs everyday This assembly line in action may be seen on the video "A Year With The Bees" which is available from JZsBZs@aol.com.

In 2005, our die wore out after producing about 3,750,000 cages, and a new die was made. When build-

Continued on Page 35



This is a two dimensional CAD View Layout (Computer Aided Design) which shows almost all the information required to construct the mold base, yet you and I can't see much more than a jumble of lines and circles. Let's see if we can't make out some important features! The 16 green areas are the queen cages. The 10 largest circles are pillars between the layers of the die and are for the purpose of providing support for the face plate of the die to resist the tremendous pressures, (3000 psi) which are exerted when the solid particles of plastic stock are compressed enough to turn them into a liquid which flows into the runners, (the purple lines), and finally into the cavity which forms the queen cage. Although not visible there are water lines running through the die which keep it cool.

Each cavity is a dead end and the trapped air has to go someplace. The die is designed so that it is made up of pieces of steel which appear to be a net fit, but there still remains a crack. If that crack is .0005" or smaller the trapped air can escape to permit plastic to flow into the cavity but won't enter the .0005" crack. If the crack were larger the plastic material would flow in resulting in slivers of plastic where they are not desired, called flash. By the magic of the computer and the special software, the designer can extract a cross section of the finished part, or cross sections of any part of the die itself.

At any facilities where injection molds are made, there will be a series of CNC milling machines (Computer Numerical Control), which are controlled by computer. All the computers in the shop are networked to the designer's computer so that the operator of any one of the CNC machines can make any of the parts which are in the designers computer.

It is truly amazing to watch one of these machines in action while they magically follow the instructions of the computer. They make all the necessary machine cuts, and do it many times faster than if it was controlled by a human.

When all the die parts have been fabricated, they are assembled in the injection mold base.

Notice some of the ejector pins are in the extended position. These pins push the finished queen cage out of the die which weighs 925 pounds and fits in a molding machine that can make 16 queen cages in about 40 seconds.

The Milling Machine.

The completed queen cage die.

The two styles of cages now.

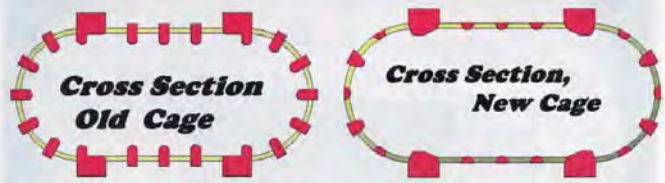
ing the new die, the die maker added small vertical ribs beside each opening to permit the part to be ejected from the die more readily (Big mistake, and I didn't catch it.) It was like adding a wall around each communication opening.

Minor complaints were received from queen suppliers complaining that the bees would propolize over the small openings. Chris Werner of Indian Summer Honey Farms did us the favor of calling and complaining that his queens were starving in the cages. Dennis Lohman used a more effective cage. Only then were we able to analyze the complaints and take corrective action which resulted in a complete rework of the die to eliminate the ribs adjacent to the small communication openings so the bees would have full access to the openings which were there.

There are two styles of the new JZsBZs Queen shipping and introduction cage. One has small communication openings, exactly the same size as the screen mesh which has proven to be best by test. The other has larger communication openings which bees and queen producers also like. Both types have the following features: A pheromone like scent is impregnated in the plastic material to mask the odor of the queen and thus improve acceptance rates. This scent is released when the cage is warmed, as when placing it in a hive.

There's a large "Hiding Place" provided where the queen may hide when she senses that the outside environment is hostile. When in this hiding place, the queen and her feet are protected on five sides. Although it doesn't appear so, there is intentionally more area in which the queen may travel than in a typical three hole cage.

The inside of the candy tube is smaller in the middle than at the ends, which greatly improves retention of the candy Some users fill the candy tube by first rolling the



Cage cross sections showing differences.

dough into a snake and then stuffing it in the tube while muttering some newly found profane words. An easier way is to roll the dough into a pancake about an inch thick, then with your thumb over the back end of the tube, push the tube into the dough, like a cookie cutter When the tube is slightly over full, squeeze both ends of the tube with your thumb and fore finger to "lock" the candy in place. A few larger queen raisers use the air powered gun described in the March issue of *Bee Culture*. No plastic sheet to place over the candy, no screen to staple in place and no corks to fumble with when putting the queen in the cage. A future model will probably have a worm gear driven piston, which is actuated by a switch when the candy tube is in position.

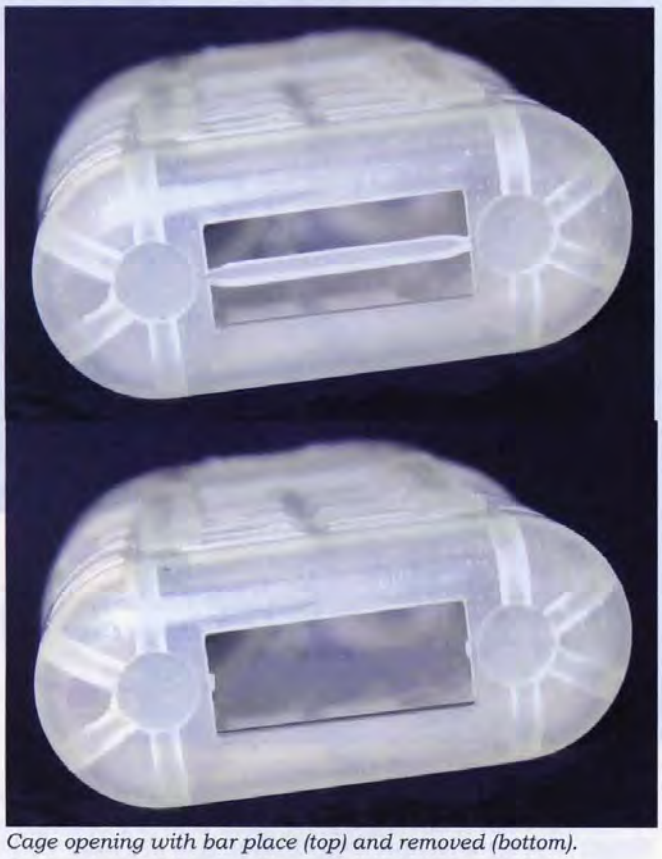
The cages are supplied in light pink, light yellow and clear so the shippers may color code their special queens, and provide the customer with the color of their choice.

A breakout bar is provided in the bottom end of the cage. When this bar is removed the opening becomes a queen excluder size which will retain the queen but permit a small number of workers to enter the cage and establish communication with the new queen. A Canadian beekeeper reported that he requeens early every Spring (the toughest time to requeen) and achieves 100% acceptance by breaking out the bar and packing a little candy in the opening. This keeps any bees out of the cage for about a day and permits gradual getting acquainted.

With a push in cell protector attached to the queen cage with Krazy glue, a ripe queen cell may be placed in the cell protector By this means a higher acceptance rate of a virgin queen can be achieved than with only a cell protector

Many of these cages are sold to Canadians. This was a puzzle because it is too cold to raise queens early, so we asked. The reply was that they receive their queens

The Candy Tube



Cage opening with bar place (top) and removed (bottom).

Queen cage with cell protector in place.

in other cages and then transfer the queen to a JZs BZs cage for improved introduction, better acceptance, and because they fit nicely between the frames.

Please call, or email, and we will send you four of each style cage, at no cost, so you may evaluate the new JZsBZs Queen Shipping and Introduction Cage.

Ask your queen supplier to ship your queens in this superior cage.

These cages and other JZsBZs parts may be obtained by ordering toll free at 866.559.0525 or email Jim at JZsBZs@aol.com. BC

Jim Paysen was a B-24 pilot in WWII, a mechanical design specialist in the New Products Proposal group of the Boeing Company. He worked with Bill Lear on the first eight-track stereo and obtained his first log beehive at age 12. He became a commercial beekeeper in 1967 at the age of 43. When he was still a youngster he had five self sufficient outfits totaling about 14,000 colonies. He produces the JZs BZs line of plastic parts for beekeepers. He will soon celebrate 86th birthday.

Testing An Open Bottom Board

John Hoffman

Test units are scattered from Maine to Washington, and results are all favorable.

I have been testing this OBB device since May 2005. However, the official testing program began January 2007 when I began shipping test units to interested beekeepers across the United States. These test units are scattered across the nation from Maine to the State of Washington. All test data received from various sites has been very favorable and consistent.

I. Test Procedure:

• At least once each month for one year, prepare the sticky board and insert it into the sticky board slot as described in earlier *Bee Culture* publications. Note: Usually, this step is impossible, and therefore omitted, during an approximate period from late July thru early September This is because a normal healthy hive will, at that time, have a lot of bees hanging day and night (swarm fashion) from the bottom of the OBB screen. You cannot move them without disturbing them (e.g., using smoke, etc.) and your mite count data will be invalid if they are disturbed. Our enterprising tester from Ohio solved this problem by placing a sticky panel of FRP board (large enough to receive debris from the entire brood chamber) on the cement pad directly below the cluster of bees for 24 hours. It worked!

• Remove the sticky board after a 24 hour exposure and then count the mite drop within the next 24 hours. Since I first started counting mites in May 2005, I have left every live mite I have found remain on the sticky board to determine how long they could live on the board. All live mites found died between 24 and 48 hours after the panel was removed from the OBB.

• There are three distinct categories of the mite drop components to be counted. (a.) Live mites (b.) Dead mites (c.) Empty shells. Maintain a separate record for each category

Identification of each category is described on page 52 of the March 2007 *Bee Culture*. Although we continue to record the count of all three categories, the live mite information is the only group, thus far, that has shown any significant relationship to the current mite population.

II. Mite count statistics:

The total live mite count, taken within a few days of installing a new swarm, package or nuc will range anywhere from 0 to 300 plus. However, during the first four weeks of using the OBB, that level will drop to a "normal level" peculiar to that colony The normal level count will be a value ranging between zero and nine, most often zero to five. It will remain at that level, plus or minus several mites, for the life of that colony, providing you continue to use the subject OBB. During the life of the colony, the normal level will occasionally drop to zero and remain at zero. That indicates the mite population has been destroyed. However, within several weeks (during the Spring, Summer or Fall) new mites will migrate into the hive from other areas and raise the mite count to a new normal level.

Occasionally, the live mite drop count may suddenly increase into the double digits (15 to 35 per 24 hour exposure). When this has occurred, the test report from the field always included remarks such as "it was difficult counting the live mites; they ran around too fast." *Varroa* mites cannot run through the thin coat of petroleum jelly What the test person saw and counted were not mites, they were the Bee Louse (Braula coeca) which is actually a wingless fly When it is lying on the sticky board, the bee louse looks identical (color, shape and size) to the mite. It does have longer legs than the mite, which allow it to run through the petroleum jelly with ease. The mite count returns to normal within two months if there is no other problem. The dead mite and empty shell counts are usually higher than the live mite count. The count fluctuates quite a bit with both of them peaking in the Spring and Fall. That is when the bees are busy cleaning out used brood cells to reclaim space for the anticipated surge of new brood or food storage.

III. Additional notes:

On November 9 & 10 2007, I attended the Pennsylvania State Beekeepers' Association Annual Meeting at Lewisburg, PA. On Friday afternoon, Mike Williams (Penn State U.) presented a report titled: "Effective Varroa Mite Monitoring: Can Mite Drop From a Specific Colony Accurately predict Mite Drop for Neighboring Colonies?" His data presentation illustrated some of the pitfalls that may be encountered during the mite drop process. Basically one of his charts (a correlation chart) illustrated the degree of correlation between the control colony and each individual adjacent test colony. I assume, along with his second chart (a line chart), that it also illustrated a

BUILD IT

This hive stand was designed for use with our Open Bottom Board device to provide wind protection from the east and west winds. However, it can be used for the same purpose with most any hive configuration. It can be set on solid ground if you use pressure treated wood that is approved for "Ground Contact." (Note: The little label on the end of the wood indicates if it is approved for ground contact.) I prefer to set the stand on a 2' x 2' x 1 ½" concrete paving pad for better stability. It also provides a smooth, flat and easily cleaned surface to facilitate the study of the debris that falls out of the brood chamber through the open bottom board. I consider the pad a necessity in a wooded area where the ground is soft and spongy. The pad also prevents grass and weed growth under the hive.

Material Requirements: (per Hive)

Six 4" x 4" x 2' Pressure treated landscape timbers ("Ground Contact Approved" preferred).

Two - 2"x 2"x 16" Pressure treated lumber (Ground contact approval not necessary).

Eight 6" Galvanized spikes.

Four 3" Flat head deck screws.

Assembly procedures:

Select two of the best (i.e., straight and having a smooth top surface with no loose knots) landscape timbers. They will be the top timber on each stack. Cut two slots in the top surface of each of the selected timbers. The slot centerlines are 14½" inches apart with the slot pattern being centered on the length of one edge of the landscape timber. The slot is 1½" wide by 1½" long and 1½" deep. The depth is an important factor· it should be cut carefully so that, when assembled, the top surface of the 2" x 2" treated lumber is flush with the top surface of the landscape timber. Trim each slot, if necessary, to accept the end of a piece of 2" x 2" lumber. Set these two pieces aside.

Select two of the remaining landscape timbers and stack them two high. Keeping them lined even with each other, drill a ¼" hole centered, four inches from the end of the timber and approximately six inches deep. (Note: Check the diameter of the 6" galvanized spike. The diameter of the spikes I use vary between .270 and .275 inches. The ¼" size hole works great for this size spike.) Drive a 6" spike into the hole until the top of the nail head is flush with the timber surface. Join the other ends together using the same procedure. Place one of the timbers with two slots on top of the two timbers just joined together. Be sure the two slots are on the top surface of the stack of three landscape timbers. Nail the ends together using the same procedure shown above (except, the ¼" hole location is centered and three inches from the end).

Repeat the same procedure for the remaining landscape timbers. Place the two stacks of joined timbers on a flat surface with the slots on top and facing each other. Align the stacks square with each other and maintain a 13" wide space between the top timbers. Place a 2"x 2"x 16" piece of lumber in each pair of slots. Trim the ends of the 2"x 2"x 16" if necessary, to maintain the 13" clearance between the top landscape timbers.

Select a drill bit of the diameter size recommended for your 3" deck screws. With the 2" x 2" in place in the slot, mark a drill location on top of the 2" x 2" centered and 3/4" from the end. Drill a hole approximately 3" deep, through the 2"x 2" into the landscape timber. Countersink the hole to assure that the screw head will be at least flush with the surface. Use the deck screw, with beeswax on the threads, to attach that end of the 2" x 2" to the slotted timber. Repeat to attach the other end of the 2" x 2" to the slot in the other stack of timbers.

Repeat the same procedure to attach the other piece of 2" x 2" to the slotted timbers.

The Open Bottom Board is placed on top with the front end (the end opposite the panel slot) flush with the outside surface of the 2" x 2"

comparison of the neighboring colonies data.

However, the data was so scattered and inconsistent that it appeared, at first, to be quite useless. Mike stated early in the presentation that his answer to the title question was NO."

A cursory analysis of the charts revealed that the "Correlation Chart" was quite similar to the "Probability Chart" we used in a Product Test Laboratory where I was a Test Engineer The probability chart identified all outliers which, when corrected, allowed us to optimize both the process and the product.

Mike Williams had done a very good job. He needs to be complimented on his design of the experiment and selection of data analysis tools. Although not obvious, there is a lot of excellent information in Mike's data, enough to lead to identification of confounding ("mixed together") factors which would be our first step in optimizing other varieties of open bottom board systems.

If I had time to present my views, I would have asked Mike four questions.

1 Did you use just the live mite count data for your data analysis?
(If the answer is "no", we have found a culprit supporting some of the outliers).

2. Did you use any form of wire screen (e.g., #7 or #8 mesh) or barrier that would allow the mites to drop through but prevent the bees from contacting the "sticky board" surface?
(If the answer is "yes", we have found another culprit).

3. How long did you expose the sticky board to the mite drop?
(If the answer exceeds 24 hours, the mite count data is invalid).

After installation, it works continually and efficiently with no effort or expense on the part of either the beekeeper or the bees.

4. How soon after removing the sticky board from the hive did you finish counting the mite drop?
(If the answer exceeds 24 hours, the mite count data is invalid).

IV Benefits and Conclusion:

This OBB has reduced the mite population to a level sufficient for the bees to cope with the problem. It is also capable of maintaining the established level. It is a perpetual system. After installation, it works continually and efficiently with no effort or expense on the part of either the beekeeper or the bees. The life of the unit, without maintenance being required, should exceed that of all other wooden hive components. Another benefit: This OBB combined with my particular form of "Winter Configuration" provided me the ability to control and maintain moisture in the hive at the low level required to create the elusive but very necessary "Dead Air Space" within the Winter brood chamber

John Hoffman keeps bees and tests open bottom boards from his home in Mount Holly Springs, PA. BC

Get Ready To POLLINATE This Spring

Jennifer Berry

If you're going to pollinate for money this Spring and Summer, you better be getting your bees in shape now

While the cold January winds continue to keep colonies tucked in up north, our southern girls are beginning to stir By the end of this month, if current trends continue, most of South Georgia will be seeing the New Year's first bloom, red maple. Even further south, beekeepers are gearing up their colonies for blueberry and citrus pollination. But January in the south can be a rollercoaster ride, weather wise. We can experience all four seasons in a 24 hour period. One day we are outside working hives in t-shirts while the bees are buzzing about checking out their new landscape. Then the next day icicles dangle down from lids and hive entrances.

It is just a few days past Thanksgiving (when I'm writing this), and finally Winter and rain have arrived. It is forty degrees outside with a steady downpour If it wasn't so cold we would all be outside dancing about and enjoying the rain. As most of you have probably heard by now, the southeast has been gripped by a severe drought. The Piedmont region of Georgia (hardest hit by the drought so far) is still 17 inches below normal, but at least it's raining today Hopefully, by January the drought will only be a bad memory I bring this up because the drought has not only affected Atlanta's water supply but may have also influenced your colonies as well. Late Fall and early Winter inspections revealed little to no pollen in many of our colonies. Pollen patties were fed last month to most colonies; a procedure I plan to repeat again. If your area experienced dry conditions I would highly recommend feeding pollen or pollen substitute patties. There is also a question about the quality of the pollen that was collected last year With the extremely hot and dry conditions experienced over most of the Summer and Fall months, plants were severely stressed. What pollen was being produced and collected may not have been as nutritional as it should. But that is just speculation. Feeding is cheap insurance.

Like I mentioned earlier, beekeepers in Northern Florida are already gearing up for blueberry and citrus pollination with melons and squash not far behind. Beekeepers provide pollination because most commercial farmers don't keep bees. Having bees in the field year round can eventually interfere with normal farming operations. Therefore, they rent bees from beekeepers to pollinate their crops. In the old days when natural pollinators were more abundant and farming practices didn't include thousand acre monocultural plots, there wasn't such a need for pollination services. But that is not the case today Just look at the California Almond industry Every year they must produce more almonds, therefore more trees have been planted which in turn need to be pollinated hence more bees are required. Seems like a vicious cycle to me. But almond production is a profitable business and so is pollinating them.

If you are willing to work long hours, travel for days and move heavy equipment, pollinating crops can be a lucrative business but there are a few things you should be aware of. To begin, it is not as easy as it seems. What's the big deal right? Throw a few hives in a field and collect a check. Not so fast. Beekeepers are farmers, but most farmers are not beekeepers. This is important to note. The farmer, like the beekeeper, will hopefully be able to profit from all his hard work. However, there is a lot that needs to be accomplished before this can happen. On the farmers' side, fields need to be prepared and seed sown, fertilizers applied, weeds and pests controlled, and crops harvested. Several of these procedures can be harmful to colonies so precautions must be taken. But let's start at the beginning.

First, you need strong colonies. Colonies used for pollination services can quickly go down hill during crop bloom. That is why it's important for them to be as strong as possible to start. Many crops requiring pollination aren't good sources of pollen and nectar Weak colonies not only are poor pollinators in terms of the field force but also, with the added stress of moving and poor forage, can crash fast.

Strong colonies in late Winter are a result of properly managed colonies in the fall so hopefully you planned ahead. Now, when the lid is removed bees should boil over six to eight frames. The colony should also have at least five frames of brood. Bees are more motivated to forage when there is lots of open brood. If colonies are not quite up to par, feeding sugar syrup and adding pollen or pollen substitute patties can help build up populations.

After you locate a grower in need of your services, it is important that the two of you sign a pollination contract before any bees are moved into the field. Unfortunately the days

when agreements were sealed by a "gentleman's handshake" are long gone. After a quick search on the internet I found an excellent example of a contract from the Mid-Atlantic Apicultural Research & Extension Consortium. The MAAREC contract is pretty self explanatory But take great care when it comes to the responsibility of the grower You must make it very clear that no pesticides or herbicides can be applied to crops while your bees are in the fields unless you have agreed to it. Losing all your colonies to pesticide poisoning is not worth any pollination fee. There are other pollination contracts online if you want to compare. These contracts will prevent any miscommunications between you and the person you are providing pollination services for

Growers want to push the system in order for their product to be first to market. Demand is high and supply is low, therefore wholesalers and consumers are willing to pay more money for the early produce. Makes sense. Think about how much you pay for those first season blueberries. If you had only waited a few weeks the price would have been much lower, but it's been almost a year since you tasted that last berry As the grower pushes for earlier yields he has to push for earlier blooms. This in turn means an earlier presence of bees in the field which can pose several problems. One, the bees may not be strong enough early enough. Late in the Winter months the queen begins laying eggs in anticipation of the first Spring nectar flow and colonies begin to rapidly build up. However, if early blooming cultivars are awaiting pollination, the bees may not be ready to handle the work. Therefore many commercial beekeepers needing colonies early will over-Winter them in southern Texas or Florida.

The other problem is the grower demanding to see bees in the field before the first bloom ever appears. This can be a serious mistake. Bees are opportunists. They will always go to the bloom that offers the biggest "bang for the buck." Let's say several hives of bees are placed on two acres of blueberries. The berries are a few days from blooming. However, there are dandelions, clover and other scrumptious wildflowers blooming down the road. In just a few days the bees are trained to fly *over* the blueberry patch and *into* the fields beyond. Once the blueberries begin to bloom, they will be mostly ignored. Then, the grower visits his field, discovers that there are blossoms but no bees and he's not too happy He paid for a service which the blooms are not receiving.

The optimum plan is to bring the bees into the field just after the crop begins to bloom. You want the bees to be inexperienced foragers in the area. You don't want them trained to other floral sources before the crop bloom begins. Foraging behavior is not a fixed behavior but an adaptable one. It is controlled by the attractiveness of the nectar and pollen, and not necessarily the total number of blooms. So an acre full of open blueberry blossoms may be less attractive than sporadic wildflowers in the next field. Remember, the farmer is not a beekeeper and will not understand until you explain. But back yourself up by adding the arrival dates in the pollination contract. It will benefit both his yield and your future in the pollination business.

Weather can also play an important role in pollination. Rainy Spring days are great for the drought stricken areas here in the south, however, bees don't forage when it rains. Yields from early Spring blooming crops can be extremely hampered by cool, wet days. However, there is nothing you or the grower can do about the weather The rain in the night is a farmer's delight, with bright sunshine beaming right at first light. It goes something like that.

Another thing to consider is the placement of the hives. It is best if you can spread the hives throughout the field at 500 ft intervals. Bees prefer foraging within a short distance (300 feet) of their colony However, bees will fly several miles if necessary Placing colonies so their 300 ft radii overlap is the best situation. If the inner fields are inaccessible, group a large number of hives in the center of the edge with a few isolated ones on the ends. Bees from hives placed along the edges may not penetrate to the center of the field resulting in poor pollination of those particular plants. Again, they will only fly as far as they have to.

Ok, you found a grower, the contract is signed, your bees are healthy and strong, and now it is time for the hard part; deliver the bees to the field. Moving hives is a chore and should be well planned out in advance. Seriously, it can be disastrous. Take your time, have plenty of help, don't be in a hurry, have more equipment than you will need, slow down, and most important be careful. Unless the temperatures are below 50°F it is recommended to move bees in the evening hours. They are less active and the temperatures are cooler which in the Summer months can mean the difference between arriving with dead bees or live ones. For smaller operations, screen each entrance and use a top screen. Use hive staples or those inexpensive hive straps bee suppliers sell. They're almost disposable, work well, are easy to use and keep everything together Hive lifters work

Feeding protein is good insurance against having slow, weak colonies down the road.

well if you have two people, but better yet use a couple of hand trucks. Just scoop those hives up and away you go. Hand trucks will save on countless trips to the chiropractor Make sure hives are well secured in the back of the truck or trailer and to the deck – no sliding, and no jack rabbit starts. Check to make sure brake lights are working. Not fun running into a trailer full of bees.

One last thing, make sure the grower knows you are coming and has made any arrangements necessary so you can enter the fields. It would be most unpleasant (fake British accent) to be standing at a locked gate at three in the morning with a truck load of unhappy bees. Some beekeepers always carry a large, heavy duty bolt cutter under the front seat. "My universal key," said one.

The commercial folks who move thousands of hives use pallets and load them unscreened onto trucks with forklifts. They then cover the entire truck with nets to prevent bees from escaping. A tractor trailer loaded down with hives is a sight to see. Bees are then moved from Florida to Maine, Pennsylvania to California and North Dakota to Mississippi to name a few. From time to time one hears about the semi that lost its load of bees. Then the next day, the front page of some local paper has the picture to prove it.

With gas prices and other hits to the economy it seems everything is going up in price. That includes the price per hive for pollination. Don't sell yourself short, this is hard work. The day of the $35/hive is gone. Beekeepers have to charge more for their colonies plain and simple. Not only with increased transportation costs, but with the trickle down effect there are increased costs in packages, queens, beekeeping equipment, medication, sugar, etc. It is passed on to us, we pass it on to the grower, he passes it (if he can) on to his supplier, and eventually we pay for it again at the check out line.

With the increase of human activity on this planet natural bee habitats are rapidly being destroyed. The days of "free" pollination are also quickly disappearing. This opens up new business opportunities for beekeepers. Know your skills, your limitations and your costs – both real costs and opportunity costs, and charge accordingly

See ya! BC

Jennifer Berry conducts honey bee research at the University of Georgia bee lab in Athens, Georgia. She is a frequent contributor to these pages.

Beeswax,

It's so easy to make creams, lotions, wood & leather finishes.

I am absolutely fascinated by the number and types of cosmetic, cream, lotion and other recipes that include beeswax as their main ingredient. Many cosmetic companies use beeswax in beauty creams, lip balms and other types of body care products. Leather shoes can even be waterproofed with a beeswax and oil mixture. Even the celebrated Stradivarius made the finest wood polishes for his violins from beeswax.

Worker bees that are 12-18 days old make beeswax from specialized glands on the underside of their abdomens. The white wax capping on the honeycomb are the cleanest and most desirable to use in cosmetics. This wax can be melted and mixed with various vegetable and essential oils to make a luscious emollient base and acts as a natural preservative for your creations. Beeswax holds in moisture and is known to have sun-blocking properties. This quality is great for your skin as well as wood and leather If you have sensitive skin or allergies this could be a dream come true since most store bought skin care uses alcohol and paraffin wax which dries your skin.

Ingredients include beeswax, olive or other oils, essential oils for fragrance and butters.

Beeswax skin care falls into two categories – salves and balms, I have provided recipes here for both. Salves are based upon beeswax recipes that are used topically to heal skin that is damaged. Balms are also beeswax based but by definition sooth exceptionally dry areas of the skin. Either way the beeswax products you make at home will be superior to anything you will purchase at a store. A little experimentation with the recipes below and you can create wonderful honey bee products that will make you, your wood and leather feel and smell great.

Making your own handmade beeswax products requires very few special skills or equipment. Most of the ingredients can be found in your kitchen or garage. The following recipes below can be tailored to your personal preferences and if you are experiencing sensitivity to a certain ingredient, it is advisable to substitute the offending ingredient with one that is compatible with your own skin. The final products you create should be tested before committing to regular use. The most reliable test is by putting a small amount on the tender skin inside your elbow, cover it for 24 hours and if no redness or reaction occurs, you can feel comfortable that the product is safe enough for regular use.

When I make my beeswax recipes in my kitchen I reserve my glass bowls, stirring spoons and other tools for mixing *only* my skin care products. I do not use those same bowls for mixing up a batch of my grandmother's favorite pasta sauce recipe later in the afternoon. Nor do I suggest making salves and balms in the same bowls used for making wood and leather preservatives. So pick up some bowls and other supplies at a yard sale or secondhand shop and keep them specially for mixing your beeswax recipes.

For each recipe, slowly melt the beeswax in a crock-pot or double boiler A double boiler will allow you to safely heat the wax in a glass or stainless steel bowl over a second pot of boiling water without scorching the wax over a direct heat source. Never place a pot of beeswax on a direct flame; it will not boil it just gets hotter and hotter until it ignites when it reaches the flash point. Do not cover the wax when using water to heat. Otherwise, water could condense on the lid and eventually get into the wax. This will mess up your recipe. If you use a microwave oven be extremely careful since the wax could reach the flash point and ignite not to mention splatter all over the inside of your microwave. Since beeswax is naturally scented by the honey and nectar of flowers it gives off a subtle fragrance as it melts. It will make your kitchen smell glorious.

BEESWAX BUZZ #1. Beeswax is solid at room temperature. It will have putty like consistency at around 80-90°F and will melt around 145-147°F Depending upon what you are using it for you may just let it sit in a bowl of hot tap water for a few minutes to allow it to turn into a putty like consistency Do not exceed 160-170°F

Beautiful Beeswax

Every beekeeper should try these recipes.

for any long period of time, as it begins to darken, and you should be fine.

BEESWAX BUZZ #2: Over time beeswax gets what is called bloom. Bloom looks like a light powdery substance that comes from within the wax. It is does not mean it is old or moldy and can be simply buffed off or removed by a warm hair drier for a quick 30 seconds.

TOOLS:
Glass or stainless steel bowls, medium sized
Metal pot filled halfway with water for double boiler
Plastic or metal spoons for stirring, I like a metal whisk.
Measuring spoons
Heat source, stove or microwave
Rags or paper towels for clean up
Jars, tins or tubes to put final products

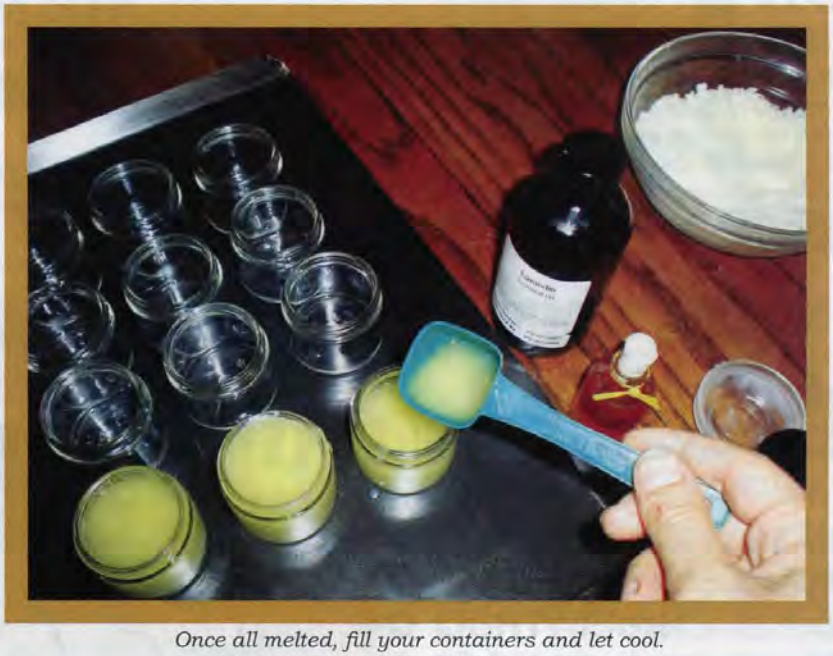
Basic Lip Balm

This recipe is the first one I ever made. It is so easy and you will be surprised at your results. If you don't happen to have a vitamin E capsule at home omit it. Various essential and flavor oils may be added to taste. Try a few drops of peppermint, rosemary, orange or lemon essential oils, or any flavors you might enjoy. You can use the candy flavoring oils found in your local craft shop.

Ingredients:
1 teaspoon beeswax
2 teaspoons olive oil
1 vitamin E capsule
2-3 drops flavor or essential oil

Instructions:

In a small glass bowl pour beeswax, olive oil, and vitamin E. Over medium heat, melt together in microwave or a double boiler Do not boil. Then add your flavor or essential oil. Pour into a sterilized lip balm tube or jar Place lids on tube or jars, allow to cool.



Once all melted, fill your containers and let cool.

Basic Balm Recipe

There are endless variations using other ingredients for this recipe. Try substituting sweet almond, jojoba or grape seed for the olive oil. The butters create a luscious moisturizing quality. All of these can be found in your local health food shop. To make this a true healing balm, add tea tree essential oil for antiseptic properties or eucalyptus for sinus relief and muscle aches. There are endless choices so experiment.

Ingredients:
1 teaspoon beeswax
1 teaspoon olive oil
1 teaspoon shea, mango or coconut butters
2-3 drops essential oil

Instructions:

Melt wax and olive oil in a microwave or double boiler Stir in butter mixing well until completely dissolved. Reheat if needed. Remove from heat source and add fragrance or essential oil. This basic balm can be softened with more oil or hardened with more wax or butter Pour into containers or jars, let this set and cool a few hours before using.

Herbal Healing Salve

This gentle healing salve will help cuts, scrapes and burns while smelling marvelous.

Ingredients:
1 ounce beeswax
2 ounces calendula oil
1 ounce avocado oil
1 ounce jojoba oil
1/2 ounce cocoa butter
1/2 ounce shea butter
1 teaspoon of honey
1/4 ounce tea tree essential oil, lavender essential oil

Finished products.

Instructions:

Melt wax and oils in a microwave or double boiler Stir in butters and honey and blend well until completely melted. Reheat if needed. Remove from heat source and add essential oils. Pour into sterilized jars, let set for a few hours.

Beeswax Wood Finish or Leather Polish

When refinishing wood, remove the older layers of your beeswax finish with an organic solvent, such as turpentine. This beeswax finish can also be used to protect, preserve and restore leather Caution. Use care, turpentine is flammable, harmful by inhalation, in contact with the skin and if swallowed.

Ingredients:

1 pint linseed oil
1 pound beeswax
Double boiler
1 pint genuine turpentine, odorless
Soft cotton cloth

Instructions:

Bring one pint of linseed oil to a boil in a medium saucepan and set aside to cool. Do not allow the linseed oil to burn, or it will add a dark color to the finish. Once boiling, remove from heat immediately

Melt one pound of beeswax slowly in a double boiler and remove from heat. Never heat beeswax in a standard pan, as it can easily catch fire when exposed to direct heat.

Add the linseed oil to the melted beeswax and stir in one pint of turpentine. Odorless turpentine is best if you can find it. Let cool.

Apply the polish with a clean cloth and rub in small circles. Turn the cloth as it becomes dirty Allow the polish to dry, then buff with a clean cloth. It is best to apply the finish when warm, so reheat the beeswax mixture before use.

LABEL TIPS

Now that you have mastered your favorite recipes and have sampled all your friends and family members, you may decide that you would like to sell your beeswax creations at your local farmers market or craft fairs; it's time to make your own labels.

There are no rules on designing your product labels except they must be legible, originality and color helps.

Here are a few things you should consider regarding your labels.

All labels are required by law to have the following:

• you must identify the manufacturer or distributor (by name) of the product and have a way for the customer to reach them. Use company name, address and phone number

• you must list the ingredients in the order that they appear in the formula product type and use. The ingredients must be identified by their botanical name. A marketing description and use of

The product is nice, as is the fragrance name, but it is not required unless the product use is not obvious.

• The Department of Weights and Measures requires the actual weight of the product both in standard and metric to be disclosed on the label. Metric should be first to comply with EU requirements.

• Include any warning statements needed (IE: "Warning: Not for use in or around eyes.")

• It is a good idea to UV-coat or waterproof your labels if they will be shipped or handled with wet hands. BC

Marina Marchese makes salves and lotions and balms, creates encaustic paintings and keeps bees from her home in Connecticut. Her business is Red Bee Studio.

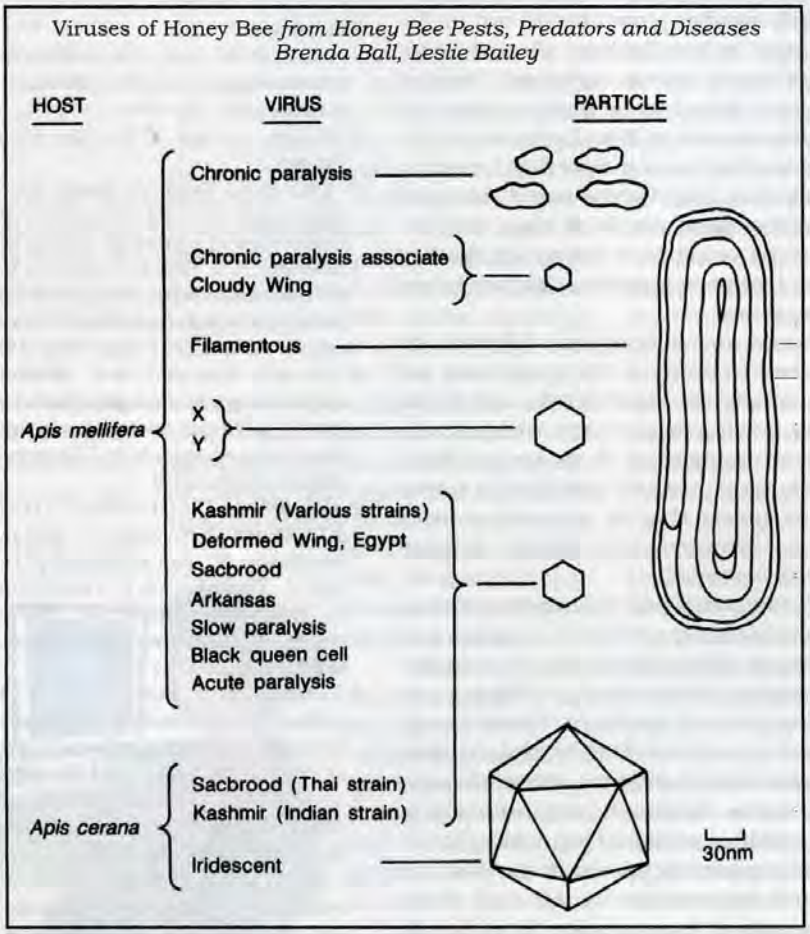
CCD – A View From Across The Pond

Acute Paralysis and Kashmir Bee Virus need further scrutiny when it comes to CCD And what about Nosema, and Varroa?

Norman Carreck

Journalists and the public often talk vaguely about "the balance of nature," but biologists know that this is a very dynamic balance. Populations of insects, for example, fluctuate wildly from year to year in a pattern of "boom and bust." A good season may allow an explosion in the population of a plant pest such as an aphid. This may then be followed by an explosion in the population of a predator, such as a ladybug, which then exhausts the food supply, so the population of both insects crashes and may then exist at a low level until the next boom cycle.

Why should honey bees be any different? Perhaps they are not, and by managing them we keep them in a state of perpetual "boom," so that "bust" must inevitably follow There is much evidence that major losses of honey bees have occurred in various places at various times. For example, more than 100 years ago the spectacular loss of 20,000 colonies was reported in Utah. At around the same time, colonies of bees here in Britain were alleged to be in the grip of the "Isle of Wight Disease," thought to be caused by a new and highly infectious disease. These losses led to a number of culprits being suggested including *Nosema apis*[7], and finally led to the discovery of the tracheal mite *Acarapis woodi*[12] which became firmly fixed in the minds of beekeepers as the cause of the colony losses, despite the original experimental evidence not supporting this conclusion. Sober reevaluation of the disease many years later[2] suggested that the primary pathogen responsible may in fact have been chronic paralysis virus, at that time unknown, the reasons for the sudden outbreak of infection actually being a combination of factors including poor weather and too many colonies being kept for the forage available. It is clear, however, that after the first few years, all losses of bees, from whatever cause, were put down to "Isle of Wight Disease."



Viruses of Honey Bee *from Honey Bee Pests, Predators and Diseases Brenda Ball, Leslie Bailey*

In recent years there have been extensive colony losses in various parts of Europe, almost certainly largely caused by inadequate control of *Varroa* due to acaricide resistant mites, but especially in France, pesticides such as the neonicotinoid insecticide immidacloprid have been widely blamed. So what has been different about the recent losses in north America? Firstly their unprecedented scale, and secondly their economic importance, coming as they did at the critical time for almond pollination. But are the symptoms of CCD truly unique? Certainly in 1995, similar deserted hives with perhaps the queen and a few workers remaining amongst combs filled with pollen and honey were seen in southern England, when in some areas a large proportion of colonies perished. These losses proved to have been caused by a previously obscure virus, slow paralysis virus, in association with heavy *Varroa* infestations[5]

The recent paper by Cox-Foster *et al*[6], which implicates a similar virus, Israeli acute paralysis virus, in CCD in the USA is thus of great interest. It should be noted that the paper does not actually make the claim that IAPV causes CCD, but is it likely to do so? Firstly, what is Israeli acute paralysis virus anyway? It is a previously obscure virus isolated in Israel in 2004[9] from bees found to be crawling and unable to fly Using molecular techniques, the discoverers decided that it was sufficiently different from the previously described and closely related viruses, acute bee paralysis virus (ABPV) and Kashmir bee virus (KBV) to warrant a separate name. Earlier work using serological techniques had already shown that whilst samples of both ABPV and KBV from various parts of the world were very variable, the two are closely related and may in fact be the same species[1]

There is no doubt, however, that different strains can vary in virulence. When injected into healthy bees in the lab, ABPV takes five to seven days to kill bees, whilst KBV takes only two to three. There is currently considerable debate about how different genetic sequences have to be for them to be classified as separate species[11], so whilst this debate continues, it is probably safest to consider ABPV, KBV and IAPV as all belonging to the same virus "complex".

So what do we know about the pathology of ABPV and KBV? ABPV was first isolated at Rothamsted Experimental Station, UK, in the 1960s, and regarded as a laboratory curiosity until the 1980s, when it was found to be the principal cause of death of bees infested by *Varroa* in various parts of Europe[2]. It was then found that the mite had the ability to transmit this and a range of other viruses. KBV was discovered later, also at Rothamsted, and was subsequently found to be commonly present in Australia and New Zealand as a harmless inapparent infection[2]. Its close relation to ABPV, however, led to suspicion that in association with *Varroa* it could prove to be extremely harmful. Although circumstantial evidence linked KBV with losses of *Varroa* infested colonies in north America[8], no satisfactory scientific studies were carried out at the time. The arrival of *Varroa* in New Zealand allowed closer investigation. Both previously known and newly isolated strains of KBV were soon found to be a major cause of death of *Varroa* infested colonies in New Zealand[3] At the same time, controlled studies in an indoor flight room at Rothamsted[4] demonstrated that *Varroa* could transmit KBV, that this led to the rapid death of bees, and interestingly, that the virus could then persist in the bee colony in the absence of mites, suggesting that bee to bee transmission can take place.

Infestation by *Varroa* and subsequent infection by ABPV and KBV can lead to many of the symptoms associated with CCD, namely the spectacular and rapid loss of strong colonies, leaving empty hives with just the queen and a few workers remaining. If, as seems likely, the pathology of IAPV is similar to APV and KBV, it seems entirely reasonable to expect that in association with *Varroa*, it could produce symptoms very similar to those that have recently been observed.

So far so good. Unfortunately for this theory, *Varroa* does not appear to be universally present in colonies suffering from CCD. Although some colonies have undoubtedly had heavy infestations, other colonies suffering collapse have had few mites present, leading to *Varroa's* early removal from the list of possible definitive explanations for CCD. The flight room study mentioned above[4] though, does perhaps provide a clue. Although large numbers of mites are required to produce an initial virus infection[10], once established it can apparently persist in the absence of the mite. This should not surprise us. After all, there must be a natural means of transmission from bee to bee, otherwise KBV would not be so common in *Varroa* free Australia as it is.

As with the "Isle of Wight Disease" in Britain a century ago, it is by no means clear that all colony losses, even those within the USA, are all due to the same cause. It is clear that CCD is caused by a combination of factors, undoubtedly including various pests and pathogens, but is also probably affected by beekeeping or agricultural practices. It is also clear that greater cooperation and sharing of information and expertise by scientists and beekeepers throughout the world is essential in order to fully understand the complexity of the situation. It furthermore also remains clear that our understanding of the world distribution, taxonomy and epidemiology of honey bee viruses, and the relation between recent results obtained from molecular techniques, and earlier results from using serological techniques, is currently far too fragmentary to yet allow us to point a finger at the definitive cause of colony losses. BC

Norman Carreck read Agricultural Science at Nottingham University, UK and joined Rothamsted Research in 1987 Between 1991 and 2006 he was apiculturist in the Plant and Invertebrate Ecology Division, maintained about 80 colonies and was fully involved in the two research groups, on pollination ecology with Prof. Ingrid Williams and Dr. Juliet Osborne; and bee pathology with Brenda Ball. He obtained the National Diploma in Beekeeping in 1996, and was elected a Fellow of the Royal Entomological Society in 2004. He is a member of the Technical Committee of the British Beekeepers Association, a Committee Member of the Central Association of Bee-Keepers, Secretary of the Examinations Board of the National Diploma in Beekeeping, and Senior Editor of the Journal of Apicultural Research, published by IBRA.

References.

1. Allen, M.F., Ball, B.V 1995 *Characterisation and serological relationships of strains of Kashmir bee virus.* Annals of Applied Biology 126, 471-484.
2. Bailey, L., Ball, B.V 1991 *Honey bee pathology.* Academic Press.
3. Ball, B.V., Todd, J., Reed, A.V 2004 *The impact of* Varroa destructor *on virus prevalence.* Proceedings of 1st European Conference of Apidology, Udine, Italy, *19-23/9/04.* 86.
4. Carreck, N.L., Ball, B.V., Reed, A.V., Wilson, J.K. 2004 *Studies on the interaction between Kashmir bee virus and* Varroa destructor *under controlled conditions.* Proceedings of 1st European Conference of Apidology, Udine, Italy, *19-23/9/04.* 97.
5. Carreck, N.L., Ball, B.V., Wilson, J.K., Allen, M.F. 2005 *The epidemiology of slow paralysis virus in honey bee colonies infested by* Varroa destructor *in the UK.* Proceedings of XXXIXth International Apicultural Congress, Dublin, Ireland, 21st-26th August 2005. 32-3.
6. Cox-Foster, D.L., Conlan, S., Holmes, E., Palacios, G., Evans, J.D., Moran, N.A., Quan, P., Briese, T., Hornig, M., Geiser, D.M., Martinson, V., van Engelsdorp, D., Kalkstein, A., Drysdale, A., Hui, J., Zhai, J., Cui, L., Hutchison, S.K., Simons, J.F., Egholm, M., Pettis, J.S., Lipkin, W.I. 2007 *A metagenomic survey of microbes in honey bee Colony Collapse Disorder.* Sciencexpress 6 September 2007: 1-9.
7 Fantham, H.B., Porter, A. 1912 *The morphology and life history of* Nosema apis *and the significance of its various stages in the so-called 'Isle of Wight disease' in bees (Microsporidiosis).* Annals of Tropical Medicine and Parasitology 6, 163-195.
8: Hung, A.C.F., Adams, J.R., Shimanuki, H. (1995) *Bee Parasitic Mite Syndrome (II) The role of* Varroa *mite and viruses.* American Bee Journal 135, 702-704.
9: Maori, E., Tanne, E., Sela, I. 2007 *Reciprocal sequence exchange between non-retro viruses and hosts leading to the appearance of new host phenotypes.* Virology 362, 342-349.
10: Martin, S.J. 2001 *The role of* Varroa *and viral pathogens in the collapse of honey bee colonies: a modelling approach. Journal of* Applied Ecology 38, 1082-1093.
11: de Miranda, J.R., Drebot, M., Tyler, S., Shen, M., Cameron, C.E., Stoltz, D.B., Camazine, S.M. 2004 *Complete nucleotide sequence of Kashmir bee virus and comparison with acute bee paralysis virus.* Journal of General Virology 85, 2263-2270.
12: Rennie, J., White, P.B., Harvey, E.J. 1921 Isle of Wight disease in hive bees. *Transactions of the Royal Society of Edinburgh* 52, 737-779.

This Year

TURN OVER A NEW LEAF

Ann Harman

Almost every new year we swear, this is the year I'll keep good records. Really, I will!

Can you guess who first said: "I'll turn over a new leaf." It's from Cervantes' "Don Quixote de la Mancha" written in the early 1600s.

I'm asking you now to turn over a new leaf, actually a new page in your beekeeping records because the calendar says it is January, 2008. You are keeping records, aren't you? It's more important than ever to have some sort of record-keeping system for your apiary With the thoughts of CCD now firmly planted in our minds we should be keeping track of what our bees are doing and what we are doing with our bees.

Most of us start out the New Year with great plans for everything, from record keeping to reading the journals. Too often these plans tend to fizzle out in a few weeks or months. Is that what happened to your beekeeping records of 2007? If so, one of the first things to keep in mind is – **K**eep **I**t **S**imple. The minute your records become too detailed, wordy or complicated the sooner you will abandon record-keeping.

Now is a good time to start this project because beekeeping is quiet at this time of year so you have some time to work on a good program. If you were a record-keeper last year sit down and take a look and see how everything worked during 2007 If you are completely satisfied, good for you, keep it up and move on to the next article. But if you find something that needs fixing, fix it now. Don't wait until the spring rush. If you were not keeping records – hmmm. Time to start.

Your approach to colony records should be useful to you, and your style of keeping bees. The rest of the world is not interested. Therefore you design your plan for keeping records. It must be quick and easy and depend on the number of colonies you have and what you are doing with them. Only honey production? Moving for honey or pollination? Rearing a few queens for your own use (now there's where you need good records!)? Making nucs for sale?

In spite of all the wonders of computers and hand-held gadgets the "Brick" method can still be a good way to keep track of a few simple things. All you need is a brick. You may have one holding down your hive cover already You design the dictionary for your brick placement. The position of the brick is a wonderful quick reminder of the condition of the colony or of something that needs to be done. Yes, you can use two bricks per colony but be careful – two bricks can be set in too many ways and you'll too easily forget your dictionary definition. You can make position marks on your cover so you don't forget – queenless, for instance, can be one osition, honey bound another

Sometimes beekeepers keep a slip of paper between the telescoping cover and the inner cover That may work for some, but to retrieve the information you have to remove your brick or rock, take off the cover and read what is written. Make sure you have a *pencil* to write down what your next plans are for that colony Later, you may find that an efficient bee, ant or cockroach has nibbled away the information you need. Besides did you remember from the last time you opened up hives just what it is you need to do and need to bring to the apiary to do it?

You can use any sort of bound spiral, or three-ring notebook to write information down as you examine each colony That's a good start but retrieval of the information can lead to flipping back and forth endlessly to find out what was done to a colony the last time you examined it. Such a notebook is fine for two colonies but if you happen to have 10 or 20 or more you will spend much time trying to recover any useful information. However if you plan to transcribe the information to a calendar or computer, you can make a spiral or bound notebook work.

A nice big calendar can be useful as a recording method. But again, no matter how big the calendar, room to put information for more than two or three colonies just is not there. You can use a calendar to give you warnings – order queens, buy medications, mouse guards on, next treatment for *Varroa*, and other all-colony tasks. *Bee Culture* has a calendar in the January issue, as do some of the beekeeping associations. Make use of it for those important days.

A three-ring notebook is really useful. Such a notebook allows items to be moved around, added and taken out. It can take care of many colonies. You can get all sorts of stationery items for it: lined paper, dividers and indexes of all kinds including ones with pockets, page protectors, and lots of colorful things. Visit your local office supply supermarket to get ideas for organizing a three-ring notebook. If you have an inexpensive three-hole punch you can buy a pack of colored paper, punch a set of holes and have a color-coded notebook. You can punch holes in a calendar and put it in the notebook. The possibilities are endless – but remember, keep it simple!

Now we move to the world of

WEATHER, PLANTS, QUEENS, HONEY, EQUIPMENT, WHATEVER NEEDS RECORDING

computers. Certainly you can take a laptop to the beeyard and just enter your information in as you go along. That can be quick and easy And can result in a keyboard full of sticky propolis, wax, dust and dirt, and the inevitable squished bee. Just hang a sheet of plastic over it – and don't drop it on the ground.

So your computer isn't a laptop and lives inside your house. Now you need to record your information out in the apiary and transcribe it to the computer later Does "later" ever happen? There's the game on TV tonight, your phone rings with an hour-long conversation (about bees?), the grass needs mowing, and. well, you get the idea.

Now let's move into the 21st Century electronic world and be really up to date in record-keeping. Do you have a cell phone? Good. And have you tried text messaging? If not, now is a great time to start. You might want to put your phone in a little plastic bag to take to the beeyard. Sticky fingers, remember? Now open up a hive, text message to your own e-mail what you see, what needs to be done and when. Many cell phones can take a photo. Now these two features – text messaging and photos have another great advantage. You've opened up a hive and – oh, oh, this looks weird. What's going on? What to do? Just send an e-mail and photo to your beekeeping buddy or mentor You may not get help immediately but you have sent the information before you have forgotten any of the details. With the information now in your home computer you can place it where you wish and arrange the information as you wish. When you get an answer back from your beekeeping buddy about that weird problem you can just move the information into the record for that particular colony

Now for the ultimate in record-keeping. Instead of a cell phone you may have a PDA. Any of these will serve as the cell phone does in taking your information. It can be transferred into your computer if you wish. You can have your computer tell the PDA what actions you need to take. You can just use the PDA as your record-keeper, storing the information you want and notes on what to do next. As you move through the beeyard you will be accumulating information from each colony you visit and performing the tasks your PDA had stored. Quick, simple, easy

What if you don't have any of these gadgets? Now may be the time to think about acquiring one or updating your cell phone. Don't get stuck in a rut when some new gadget will ease your record-keeping.

Even if you have just two hives you will have to designate which is which. If you have many hives it is essential to know which is which. Scribbling a number or hammering numbers on hive bodies might work for you. And it might not. Hive bodies can get traded around and you could end up with two hive bodies with the same number on the same hive. One beekeeper puts numbered discs on his queens and that number is the number of the colony Now you need a map of your apiary to know which queen is in which hive (unless Superman comes to help you with his x-ray vision).

Unfortunately I don't think Superman will help us out with the problem of identifying the hives in your beeyard so you will have to invent your own method. Be sure it's simple.

Now we have to take a look at the information that needs to be recorded. I found on the Internet a "Hive Inspection Sheet" of the Puget Sound Beekeepers Association, dated 2000. You might wish to take a look at it. It is designed with topics and items to check. It seems fairly thorough and certainly can serve as a guide for you to develop your own or use it as it is. I would like to see some weather information and plant information included in your records. Go ahead and Google and see what other hive inspection formats you can find. After you have designed one for your use, go ahead and put it on your association's website. Another beekeeper may find it useful.

Weather influences many things with honey bees as well as nectar and pollen plants. Drought conditions, excessive rain, frosts and freezes, heat, and cold influence first the plants and then the bees. Noting the dates of blooming of early pollen plants, major nectar flows, and various crops can guide you now and in the future.

Besides weather and plants, what other inspection items are vital? Certainly presence of a queen and her performance, disease and food supply—honey and pollen—come at the top of the list no matter what the season or region of the country. Other items are seasonal: adding honey supers, testing for *Varroa*, medicating, signs of swarm preparations. Be certain that you can add and remove items in your checklist. As the scientists find new ways to cope with the small hive beetle, nosema, and other problems, you need to have your checklist flexible to keep up with new developments.

If all goes well, along about July you can be proud of the one New Year's Resolution that you really did keep – a quick, easy, simple way of keeping your colony records. BC

Ann Harman is text messaging her articles and colony records from her home in Flint Hill, Virginia.

Starting Your Bee Plants From Seeds

Connie Krochmal

A primer for gardeners, and gardeners to be.

Whatever sort of weather the winter may bring to the country, this is a good time to begin planning for the bee garden. The seed catalogs seem to arrive daily as a reminder to place those orders.

When your shipments arrive, here are some basics on starting bee plants indoors.

Why Grow Plants from Seed?

Quite often you'll save money if you use seed. This is especially true if you need a large number of one particular variety

In addition, this gives the beekeeper a wider selection of plants that aren't always available as transplants in local stores.

Beekeepers in cold climates will benefit in particular if they start seeds early indoors well in advance of the expected date of the last frost.

When to Start Your Seeds

For those plants that you're starting indoors, first decide when you wish to transplant them into the garden. Then, count back the number of weeks the seedlings need to reach transplant size. Take into account the time it will take for the seeds to germinate.

For fast growing crops, such as squash and cucumbers, a couple of weeks are enough. If started too early, they can get leggy Typically, slow growing seedlings like peppers and eggplants will need four to six weeks. Some kinds of flower seeds benefit from even more time – eight weeks or more.

For perennials that bloom the first year it is worthwhile to begin these early indoors. Other perennial species and woody plants will do just as well if they're started outdoors in pots or flats after the danger of frost has past.

Getting Organized To Start Your Seeds

Gather everything together that you'll need for starting seeds. This will include containers, potting soil or peat pellets, labels, and, of course, your seeds.

Containers and Potting Mix for Starting Seeds

Many gardeners prefer to use black plastic flats with plastic cell inserts. These are available in different configurations. I prefer inserts that have larger cells for the individual plants. Usually, these turn out to have four or six spaces per plastic pack. In my experience, the ones with very small cells don't allow enough room for the plants to establish good root systems. In addition, these tend to dry out more quickly

If you buy a seed starting kit, this often comes with a clear dome lid that fits over the flat.

If you're reusing pots, cell inserts, or flats you already have, clean these thoroughly Otherwise, damping off may occur This is a soil borne fungal disease that infects young seedlings right at the soil line. The plant dies and falls over This is by far the most serious potential problem for seedlings. In most cases, this can be prevented by starting with clean, sterile containers, sterile potting mix, and clean, disease-free seeds.

Wash any used containers with regular dishwashing liquid to remove dirt and old potting soil. Rinse carefully Then, disinfect them, using a solution of one part household bleach to ten parts water While you're doing this, go ahead and disinfect all the other things you'll be using for starting the seed. Examples would include plant labels, scoops, and buckets.

In addition to plastic packs and pots, there are many other options for starting seeds. Some bee gardeners swear by peat pots. Available in various shapes and sizes, they're especially good for species that don't transplant well, such as nasturtiums. At planting time, the entire pot can be placed directly into the garden. Just be sure to remove the rim of the pot so it doesn't remain above ground.

Peat pots should be clean and new. Avoid using old, dusty ones that have been lying around a basement, garage, or crawl space. Under such conditions, they are no longer sterile if they aren't sealed in their original wrapper

Something else that is very popular with gardeners is individual peat pellets or cubes. Made of peat moss

Various sized Jiffy peat pots.

Symptoms of damping off.

that is compressed into thin, round disks, the most common brand is Jiffy They're like a container and seed starting mix all in one. When these are soaked in a dish of water, they expand to their full size. These are quick and easy to use since there are no pots to fill. Just insert the seed in the center of the soaked pellet.

Various other kinds of food and drink containers can also be used, such as cardboard milk or juice cartons, and yogurt cups. Some gardeners roll their own paper pots using newspaper or paper grocery bags.

For best results, start with fresh potting soil to limit the possibility of damping off. Special seed starting mixes are available. With a very fine texture, this is especially good for hard-to-start seeds.

Many seed starting mixes are peat-based. Others may have coir, a coconut by-product. Some gardeners have also used compost, or mixed their own using garden soil. If you decide to go this route, be sure the ingredients are sterile.

Preparing the Media

Whatever potting media you use, moisten it thoroughly before you place it in the containers. Add water a little at a time until it is thoroughly moistened but not soggy Peat-based mixes tend to absorb a lot of water Be sure and use a sterile bucket or plastic dish pan for this operation.

Place the damp potting mix in the containers. When filling cell packs, you may find it easier to use a small measuring cup or spoon. Either shake the container, or gently tamp the soil mix into place. There is no need to press really hard as it will settle slightly when you water Depending on the size of the container, leave one-fourth to one-half inch of space at the top. This allows the water to soak into the potting soil without overflowing.

Planting the Seeds

For best results, you'll need to know the proper planting depth for each species of seeds. This information is crucial to gardening success. For example, some seeds require light in order to germinate.

Often, planting instructions will be right on the seed package. This is true for Renee's Garden seed packs. It is also available in some seed catalogs, such as Thompson and Morgan. If you can't find it elsewhere, check some books on propagation, such as "Park's Success with Seed" by Karen Park Jennings.

As a general rule of thumb, most seeds are planted to a depth that is three times their diameter In other words, the smaller the seed, the shallower the planting depth.

In most cases, I press two seeds into each cell or pot. For small seeds, I plant three to four per container A community pot or tray could be used for very tiny seeds. However, this will add one extra step – transplanting the seedlings to individual pots once they get their first set of true leaves.

For tiny, powder-like seeds, I mix these with a very small amount of dry potting mix or fine sand. This mixture is then sprinkled on top of the moist media. Gently press this in place to get contact between the seed and the potting mix.

Before planting seeds, do any special seed treatments that are needed. Examples include species with hard seed coats. These often germinate better if you soak them in warm water for 24 hours before planting. For some species, the seeds will need scarified or chipped with either a knife or a sheet of coarse sand paper This provides an opening so water can enter the seeds.

As you plant the seeds in the containers, insert a label on which you've written the date and seed name. Use a pencil or a permanent marker as regular ink will fade.

Caring for Seed Trays and Pots

After the seeds are planted, most seed trays and pots should be placed in a warm spot indoors or in a greenhouse. Avoid drafty places. At this stage, direct sun isn't necessary. When seeds need darkness in order to germinate, the containers can be put into an unused closet. If that isn't available, set the pot or tray in a cardboard box and close the top.

For most seeds, an indoor temperature of 65°F or higher is considered ideal. Generally, you'll get better germination if you use a special propagation heat mat under the tray An example is the one offered by Hydrofarm.

However, certain cool season annuals and perennials actually germinate better at cooler temperatures, around 60°F In such cases, supplemental heat is undesirable. These include bachelor's button, hound's tongue, and sea holly

Until germination takes place, keep the clear plastic domes over the trays. Clean, clear plastic bags can serve the same purpose. This helps to provide a warm, humid atmosphere, which will result in uniform, quick germination rates.

Monitor the amount of humidity in the dome or bags. If necessary, lift the dome so you can wipe the inside with a paper towel to remove excess moisture. Rather than doing that, I prefer to leave the dome slightly ajar for part of the day to allow some ventilation. Or poke a few holes in the plastic bags to get the same effect. This provides a little fresh air in the pots or flats.

Watering Seedlings

Until the seeds sprout, it usually isn't necessary to water most containers. Exceptions might be seeds that take three to four weeks to germinate.

Allow the surface of the potting soil to become slightly dry before watering. After germination, excessive moisture can lead to damping off.

Seedlings that are started indoors should be watered with care. Once these reach a decent size, a regular indoor watering jug can be used to water the pots or trays. Until then, it is best to water from below Set the container in a shallow pan of water The moisture will rise through the holes in the bottom of the container in about 10 minutes. Remove the container from the water once the potting soil is moist.

After watering, drain the containers thoroughly before placing them back in their trays. This is especially important since some plastic flats have no drainage holes, which allows water to collect in the bottom.

Plastic flats from Uncle Tom's Garden.

Indoor Lights for Seedlings

Once the seedlings emerge, they need full sunlight or artificial light. Lots of bee gardeners use fluorescent lights for this. It isn't necessary to buy special grow-lights. Regular ones work just as well.

The fluorescent fixture should be adjustable in height so it can be raised a couple inches as the seedlings continue to grow. Keep the fixture fairly close to the plants – around four inches or so above the seedlings. The lights should be on for about 14 to 16 hours per day

Fertilizing Seedlings

Most commercial seed starting mixes will have an initial application of fertilizer to get the seedlings started. However, this isn't enough to keep them growing well. Use an all-purpose, soluble fertilizer once a week, a 10:10:10 mix is fine, at half the rate recommended on the container Just add this to the water you would normally use.

Thinning Seedlings

The goal is to get one healthy seedling per pot or cell. After the plants get their first set of true leaves, thinning may be necessary. Leaving the strongest plant, I take a very small pair of scissors, and snip the unwanted seedlings off at the top of the potting soil. Pulling them might disturb the remaining plants.

Hardening the plants off

To survive in the real world, seedlings that you start indoors or in a greenhouse must be hardened off. Plants that aren't properly prepared will likely die from sunscald the first day or so after they're transplanted outdoors.

About 10 days before you expect to transplant the seedlings outdoors, begin hardening them off. This consists of gradually exposing them to outdoor conditions, which gives them a period of time to adjust.

Start by placing the containers or flats in full shade outdoors for an hour or so on the first day Then, increase this by about an hour or so a day until they're fully acclimated to shade, then move to partial sun for a few days, then to full sun. Make sure they don't dry out during this exposure. Finally they're ready for a rigorous garden life. BC

Connie Krochmal is an award winning garden writer and a beekeeper in Black Mountain, South Carolina.

CALENDAR

♦ALABAMA♦

Auburn Univ., AL Extension will hold their Annual Beekeeping Symposium February 2, at Auburn Univ., Lowder Bldg, College of Business, 415 West Magnolia Ave.

Registration at 8:00 a.m. Lunch provided. Fee is $17.

Contact Angie Rodgers 334.844.5006, rodgeas@auburn.edu or Sherry Ferrell 330.263.3684, ferrell.6@osu.edu.

♦ARIZONA♦

Organic Beekeepers will hold their first meeting February 15-17 at the YMCA Triangle Y Ranch Camp and Retreat Center in Oracle. This is for organic beekeepers to associate for clean sustainable beekeeping with NO treatments.

The cost is $80/person and includes two nights in dormitory style cabins and six meals. The fee must be paid in advance. Speakers – Michael Bush, Dee Lusby and Randy Quinn.

Visit http://groups.yahoo.com/group.organicbeekeeers/. Payment to Organic Beekeepers, Dee Lusby, HC 65, Box 7450, Amado, AZ 85645. Evenings 520.398.2474.

♦CALIFORNIA♦

The 1st International Symposium on Honey and Human Health will be held at the Doubletree Hotel in Sacramento January 8. This is a full-day symposium presenting researchers, physicians, scientists and authors reviewing findings relating to the role of honey in the human diet.

Contact info@prohoneyandhealth.com or www.prohoneyandhealth.com.

The 2008 National Beekeeping Conference – the joint conventions of American Beekeeping Federation and American Honey Producers will be held January 8-12 at the Doubletree Hotel in Sacramento. To reserve a room at the special rate of $95/night call 800.222.8733.

Contact ABF, 912.427.4233 or info@abrnet.org.

♦CONNECTICUT♦

The Connecticut Beekeepers Associaiton will hold their 2008 Bee School February 2, in Jones Auditorium at CT Agriculture Experiment Station, 123 Huntington St., New Haven. Registration starts at 9:00 a.m. til 4:30 p.m.

Stephen Dinsmore, steveandden@sbcglobal.net.

♦DELAWARE♦

Bee and Vine Crop Pollination Workshop will be held January 8, 1:00 - 4:00 p.m. at the DE State Fair Grounds, Dover Building, Harrington.

This is a free workshop covering these topics – Protect Native Bees, Provide Resources For Native Bees, Preserve Native Bee Habitat On Your Farm.

Contact Bonnie MacCulloch, 302.353.6243 or bmacculloch@gmail.com. Pre-register by January 3.

♦INDIANA♦

The Indiana Beekeepers' Association will hold its IN Bee School VI in Indianapolis, February 23 at the Southport Presbyterian Church, 7525 McFarland Blvd.

Marion Ellis is the keynote speaker. Registration is at 8:00 a.m. Cost is $25/person, $35/family and includes lunch. Pre-register by February 15.

Contact Steve Doty, 317.485.5593, jsdoty@indy.net.

♦MICHIGAN♦

MI Beekeepers' Assn. hold their Spring meeting at MSU, Kellogg Center, E. Lansing, March 7-8. The speaker will be Larry Connor. Break-out sessions include Honey Judging Class, Bee Biology, and more.

Dave Anthony 810.621.4371, www.michiganbees.org.

♦KENTUCKY♦

The 2008 KY Bluegrass Beekeeping School will be March 8 on the campus of KY State Univ. in Frankfort.

Tom Webster will teach the beginner's class.

Contact Phil Craft, 502.564.3956, phil.craft@ky.gov or visit www.kyagr.com/statevet/bees/index.htm.

♦MAINE♦

Knox Lincoln County Beekeeping hosts the 7th Annual Bee School in Waldoboro March 6 and for six consecutive Thursday evenings.

To register – Adult Ed 207.832.5205. For information Dick Vose, 207.563.7564 or klcbee.com

♦MARYLAND♦

The MD State Beekeepers Association will hold its Winter meeting February 16 at Howard County Fair Grounds in Friendship. Featured speaker is Gordon Wardell.

Contact David Morris, 301.725.6185 or beefriend@verizon.net or visit www.msbeea.org.

♦MISSOURI♦

The Boone Regional Beekeepers' Association will hold their Beginning Beekeeping Workshop January 26-27 at the Columbia Insurance Group, Columbia. The cost is $50/person, $40/student (with ID) and includes manual and dinner Saturday evening, and an April session on "Working With Package Bees." Class is limited to 30

Art Gelder 573.474.8837, walkaboutacres@agristar.net.

♦MONTANA♦

MT State University and the MT Dept of Ag will present a beginning beekeeping workshop February 2 at MSU. New beekeepers can learn how to get started, how to over-winter. Sessions run 9:00 a.m. to 4:00 p.m. and cost is $15/adults and $5/children 18 and under. Registration by January 25 is limited.

David Baumbauer 406.994.2231, baumbauer@montana.edu.

♦NEW YORK♦

New England Farms of Granville is hosting a weekend of Organic Beekeeping classes taught by Chris Harp from New Paltz, February 9-10. Intro to Organic Beekeeping, Saturday, $95, 10:00 a.m. to 6:00 p.m. Understanding and Caring For Your Bees, Sunday $95, 10 a.m. to 4 p.m.

Pre-registration and advance payment required. www.HoneybeeLives.org, 845.255.6113, 518.642.3270.

The Southern Adirondack Beekeepers Association will hold their 2008 Spring Seminar March 29 9:00 a.m. to 4:30 p.m. at LC One of The Univ. at Albany.

Anne Frey, 518.895.8744, SABA@capital.net.

Winter Classes 2008 Intro Lecture on Bees and Beekeeping, January 15, 6:00 8:30 p.m., $25. Intro To Organic Beekeeping: Planning A New Hive For Spring, January 19, 10:00 a.m. - 6:00 p.m., $95; February 2, 10:00 a.m. 6:00 p.m., $95. Understanding and Caring For Your Bees (Advanced Class), January 20, 10:00 a.m. - 4:00 p.m., $95; February 3, 10:00 a.m. 4:00 p.m. $95.

Visit www.HoneybeeLives.org, or email HoneybeeLives@Yahoo.com or call 845.255.6113.

♦NORTH CAROLINA♦

The Buncombe County Chapter of the NC Beekeepers Association will February 2-3, 9-10 at the Folk Art Center. The school is free but preregistration is required.

Contact Diane Almond, 828.684.8488, dialmond@bellsouth.net or visit www.wncbees.org.

The NC State Beekeeers Association will hold their Annual Spring Conference March 7-8 at the Ramada Inn Convention Center in Burlington.

Speakers include Kim Flottum, John Ambrose, David Tarpy, Randall Austin, Alonzo Suazo, and more.

Visit www.ncbeekeepers.org/meetings or contact Charles Heatherly, 919.859.6995, heath7@bellsouth.net.

♦OHIO♦

OH State Unive. Extension and Tri-County Beekeepers' Association of NE OH will hold their 30th Annual Beekeeping Workshop March 1 at The OH State Univ., OARDC located on St Rt 83 south of US 30 in Wooster.

Cost is $35/person if you pre-register and $45/person at the door, and $5/child (17 and under). Lunch is $11 for a hot lunch or $6.75 for a box lunch.

Sherry Ferrell, 330.263.3684, ferrell.6@osu.edu.

The Lorain County Beekeepers Association will hold their 13th annual Beginner Beekeeping Class, beginning March 7 for four Friday nights, 7:00 - 9: 00 p.m. at the First United Methodist Church, 45 S. Professor St., Oberlin.

Cost is $35/person and includes a year membership.

Contact Valerie Weiss, buzzzeditor@verizon.net.

30th Annual Southwestern Ohio Beekeepers School will be held March 29 at the Oasis Conference Center near Loveland.Registrationi is limited to 300 and you must pre-register. Walk-ins are not accepted.

Visit http://warren.osu.edu or call 513.695.1311.

♦OKLAHOMA♦

OK State Beekeepers will hold their Annual Meeting March 8 in Enid at the OSU extension office 9:00 a.m. 4:30 p.m. at the student training center.

Contact Teresa Bell, Teresa.Bell@tinker.af.mil.

INNER ... Cont. From Page 10

sharing. Maybe they'll change their mind when they see (at least) the three together

Meanwhile, right now, the Farm Bill finally moved off center and there's $86 million there for 'Bee Stuff,' as one reporter put it. How much of that $86 million goes to cover what's already there – regular Bee Lab salaries and overhead and such, and how much is actually new, and how much of that new goes where is still up in the air Maybe by now the champagne has been opened and the bubbly is being shared by those who got their wish.

I just hope beekeepers get something in the end.

•

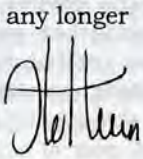
Finally, Tom Theobald, in our letters section, makes a proposal that's hard to ignore. Basically he says companies that make crop pesticides – those that can harm honey bees – should pay into an indemnity plan that would compensate beekeepers for losses to those same pesticides. The more toxic, the more you pay

This would put the burden on those companies to make sure their chemicals were applied correctly. He contends that since Federal and State regulatory agencies have abandoned any semblance of oversight, make enforcement a financial burden, rather than offer a criminal result.

The chemical manufacturers, of course, reject this idea out of hand stating that application errors absolutely should be disciplined – with the applicator Pesticides don't kill honey bees, people kill honey bees.

They neglect to mention their continuous efforts to get labels changed so that spraying blooming crops is demoted from a crime to a Tsk, Tsk, and hard core label restrictions on what and when and where to spray be reduced to simply mere suggestions.

I support Tom's recommendation, several farm groups do also, and, one would hope, so should beekeepers. It's time to take the lead in this instead of having to restock colonies every year, move colonies every season, and be second class agricultural citizens any longer



? DO YOU KNOW ?

Basics Of Bee Biology

Clarence **Collison**
Mississippi State University

Here it is the beginning of another year and colonies will soon begin producing a small patch of brood, even in the far north. Along with the New Year comes the national meeting, transportation of colonies to California for almond pollination, preparations for spring and bee schools. In the south beekeeping operations are beginning to gear up for the production of queens and package bees.

Please take a few minutes and answer the following questions to determine how familiar you are with basic beekeeping knowledge.

Level 1 Beekeeping

Comparison of Russian and Italian colonies in the fall that were established at the same time in the Spring, one would expect the following:

1 ___ Russian colonies tend to have higher colony populations than Italian colonies. (True or False)

2. ___ Russian colonies have significantly lower *Varroa* mite populations than the Italian colonies. (True or False)

3. ___ The Italian colonies have higher amounts of constructed comb and honey (True or False)

4. ___ The Russian colonies have smaller brood areas than the Italian colonies. (True or False)

5. Name two miticides registered in the United States that contain the active ingredient thymol. (2 points)

6. ___ Defensive bees are more likely to attack dark colors than light colors. (True or False)

7 What do the following floral sources (salt cedar, purple loosestrife, Brazilian pepper, yellow star thistle and melaleuca) have in common? (1 point)

8. ___ The vitelline membrane is associated with the honey bee egg. (True or False)

9. The valve fold is associated with the queen's _____.
A. heart B. mid-gut C. rectum D. vagina E. crop

10. ___ The quadrate plate and triangular plate is associated with the honey bee sting. (True or False)

11 ___ Drones, like workers and queens have mandibular glands. (True or False)

12. An invagination of the body wall of a bee, serving for the attachment of muscles is known as a(n) _____
A. apodeme B. auricle C. arolium
D. chitin E. sclerite

Advanced Beekeeping

13. ___ Plasmids are small RNA molecules containing up to several dozen genes that bacteria pass on when they reproduce. (True or False)

14. ___ A specific plasmid (pMA67) found in *Paenibacillus larvae* has been shown to contain the gene that causes resistance against oxytetracycline "Terramycin." (True or False)

15. Dopamine, Serotonin and Octopamine are known as _____.

16. These chemicals are associated with the honey bee's _____ system.

17 ___ As worker honey bees age, the levels of dopamine, serotonin and octopamine declines. (True or False)

18. ___ The mushroom bodies of the honey bee brain are involved with learning and memory (True or False)

19. Age-related division of labor in honey bees is most closely associated with _____ levels.
A. Serotonin B. Dopamine C. Octopamine

20. ___ Large-sized drones have larger mucus glands and seminal vesicles and produce more spermatozoa than small drones. (True or False)

21 ___ European drones produce more spermatozoa than Africanized drones. (True or False)

22. ___ Drones produced in *Varroa* infested drone-size cells may produce less spermatozoa than drones produced in uninfested drone-size cells. (True or False)

23. ___ Drones produced in drone size cells in queen-right colonies are significantly larger than those produced in drone-sized cells and worker-sized cells in laying worker colonies. (True or False)

24. ___ Treatment of newly emerged adult workers with juvenile hormone speeds up the degeneration of the hypopharyngeal glands and induces the premature production of two alarm pheromones. (True or False)

25. ___ There are profound changes in a queen's brain after mating, where the ratio of the neuropil/cell body volume in the mushroom bodies significantly increases. (True or False)

ANSWERS ON NEXT PAGE

?Do You Know? Answers

1 **False** In a study in which 250 pairs of Russian and Italian colonies were established in mid- to late-Spring and compared in the Fall found that the Italian colonies had significantly higher average colony populations.

2. **True** *Varroa* mite levels were 24.8% and 21 1% lower in the Russian colonies, on average, as measured by the sugar shake and sticky board assays, respectively.

3. **True** Italian colonies in comparison to the Russian colonies had a significantly higher average amount of constructed comb and stored honey.

4. **False** The number of frames of brood in the Russian and Italian colonies were not significantly different, even though Russian colonies are known to either slow down or cease their brood production in response to the scarcity of local food resources. Thus the timing of colony measurements may explain the lack of significant differences in brood area.

5. Apiguard®, Apilife Var®

6. **True** It is well known that defensive bees attack dark colors, thus everyone is aware that beekeepers clothing should be light colored.

7 While all of these plants listed are considered to be good honey or pollen sources, they are invasive, noxious plants that are on the USDA hit list.

8. **True** The vitelline membrane is a protective membrane inside the chorion of the egg.

9. D) vagina

10. **True** Both the quadrate plate and triangular plate are sclerites associated with the sting. Some of the muscles of the sting are attached to the quadrate plate.

11. **True** Queen's, workers and drones all have mandibular glands that produce caste- specific chemicals. The drones mandibular gland secretions are effective in attracting flying drones and are fully developed at seven days of age.

12. A) apodeme

13. **False** Plasmids are small DNA molecules containing up to several dozen genes that bacteria pass on when they reproduce.

14. **True** A natural plasmid called "pMA67" has been discovered in *Paenibacillus larvae*, the bacterium that causes American foulbrood, that contains a gene that is responsible for resistance against oxytetracycline "Terramycin® " Among 35 *Paenibacillus larvae* strains tested from across the United States and one from Canada, all 21 Terramycin® resistant strains possessed this plasmid and all 15 Terramycin®-sensitive strains did not.

15. Neurochemical amines or biogenic amines

16. Nervous system

17. **False** Several studies have shown that older bees, notably foragers had higher brain levels of all three amines than did younger bees that work within the hive.

18. **True** The mushroom bodies of the honey bee brain are multi-modal integrative centers that are involved in learning and memory.

19. C) Octopamine

20. **True** Comparison of different sized drones indicated that large drones have larger mucous glands and seminal vesicles and produce more spermatozoa than small drones.

21. **True** Africanized honey bee drones are smaller in size and weigh less in comparison to European drones, 194.6 mg and 220.2 mg, respectively. Africanized drones produce fewer spermatozoa than European drones (4.6 million vs. 5.7 million/seminal vesicle).

22. **True** Drones emerging from cells infested with *Varroa* mites may produce less spermatozoa than those emerging from uninfested cells, but results are highly variable. In one study both normal and parasitized drones, but not deformed, by *Varroa* mites during pupation, had equally viable sperm. The volume of semen and concentration of sperm were also similar In a second study, drones emerging from cells uninfested with *Varroa* produced 7.5 x 10^6 spermatozoa and those emerging from slightly infested cells produced 5.7 x 10^6 spermatozoa.

23. **True** Cell size is a key factor in determining body size and weight of drones. Large drones emerged from drone cells in queenright colonies while small drones emerged from worker cells in laying worker colonies. However, drones reared in drone comb in laying worker colonies never reached the weight and size of drones reared in drone comb in queenright colonies. The differences between the two groups of drones may result from dietary differences.

24. **True** Treatment of young worker honey bees with juvenile hormone, its analogues or mimics, causes the workers to shift from the broodnest to the food storage region prematurely and display precocious foraging behavior Other changes includes premature degeneration of the hypopharyngeal glands and induces premature production of two alarm pheromones, two-heptanone and isopentyl acetate.

25. **True** It has been shown that mating and insemination quantity significantly affects the physiology and behavior of the queen. Among the changes after mating are changes in the queen's brain where the ratio of the neuropil/cell body volume in the mushroom bodies significantly increases.

There were a possible 13 points in each test level this month. Check the table below to determine how well you did. If you scored less than six points, do not be discouraged. Keep reading and studying- you will do better in the future.

Number Of Points Correct
13-11 Excellent
10-8 Good
7-6 Fair

Clarence Collison is a Professor of Entomology and Head of the Department of Entomology and Plant Pathology at Mississippi State University, Mississippi State, MS.

GLEANINGS

JANUARY, 2008 • ALL THE NEWS THAT FITS

RUSSIAN BEE BREEDERS FORM ASSOCIATION

The Russian Bee Breeders Association received its' Articles of Incorporation in 2007 and held its' first annual meeting on November 1st, 2007, in Hattiesburg, Mississippi. The purpose of the association is to maintain and improve the various lines of Russian honey bees through propagation and selective breeding. All members are required to contribute to this extensive effort.

The initial Board of Directors of the group is made up of Charles Harper, CRADA holder and cooperator with the USDA Russian bee program, as well as Hubert Tubbs and Manley Bigalk, also both longtime cooperators with this program. As other members begin to contribute to the maintainence and selection of the various lines of bees these members will be certified by the Board of Directors as Russian Bee Breeders.

Collectively, all involved are pleased with the number of participants and their level of commitment. With many participants focused on this effort we anticipate even more rapid improvement in these bees.

For further information contact Vice President Hubert Tubbs at karen_tubbs@bellsouth.net.

OBITUARY

Charles Martin Simon died of cancer October 23 in Santa Cruz, CA. He was 66 years old.

Born in New Jersey, Mr. Simon was raised in Clifton, NJ and also lived in New York City, Mexico and Los Angeles. He first moved to Santa Cruz County in the late 1960s and was a resident of Soquel.

Mr. Simon attended Rutgers University. He was a writer, musician and artist who worked as a beekeeper and ran a stinging insect removal business. He wrote and published more than a dozen books, both fiction and nonfiction, including *Goodnight Cambodia* (with Vibol Ouk), which tells the story of surviving the Cambodian holocaust, and *Speeding Through Satori*, a true tale of love and death in the 1960s. He was a regular contributor to *Bee Culture* magazine.

Under the name Charlie Nothing, he painted, sculpted and played music. He played soprano saxophone in the 60s and was in the First Uniphrenic Church and Bank Band, which included the pre-Blondie Debbie Harry. Later, he played guitars called "dingulators" that he made from old cars because he said "old cars have the right kind of steel." Charlie Nothing and his dingulators are featured in the Summer 2007 issue of *The Fretboard Journal* and dingulators are on the back cover art of the book *Hearts and Minds: Musical Instrument Makers of America.* Recently he performed at the Pauze Festival in Ghent, Belgium, and at the Two Million Tongues Festival in Chicago. His family says he was a man of many gifts, the greatest being friendship.

Mr. Simon is survived by his partner of more than two years Maria Correla of Soquel; daughters Leaves Garnett of Anchorage and Holli Littell of San Diego; three grandchildren; one niece; and one nephew.

ROYAL JELLY PROBLEM

A New Zealand researcher has won an NZ$85,000 (US$64,643) grant to find out how royal jelly kick-starts the complex series of biological changes that makes the difference between the development of a queen and a worker bee.

The answer to how two different organisms are produced from the same genetic code is surprisingly simple in some species.

The difference between a queen and a worker bee, for example, is just royal jelly. Larval bees fed royal jelly emerge as queens – larger, long-lived, reproductively active bees destined to rule the hive.

Genetically identical larval bees that don't get royal jelly are doomed to a life of drudgery as worker bees.

Peter Dearden from the University of Otago has won a grant from the Marsden Fund to seek an answer to this biological enigma.

Recent advances in honey bee genetics have given Dearden and his team the tools to identify and characterize the genes that are switched on and off by royal jelly.

The researchers will test the function and interaction of these genes to understand more about the way they work together to create this natural phenomenon.

The team also hopes to gain insight into a more wide-ranging question relevant to many health and agriculture researchers -just how does diet affect the way genes are switched on and off?

The Marsden Fund was established by the New Zealand government in 1994 to support excellent ideas-driven research initiated by researchers. This year's round of grants will see 93 projects receive NZ$44 million (US$33.46 million).

Alan Harman

HONEY AND KIDS' COUGHS

Now that the safety and effectiveness of children's cough medicines are in question, what can parents do to help their child deal with a troublesome cough?

A new study by a Penn State College of Medicine research team found that honey may offer parents an effective and safe alternative. The study found that a small dose of buckwheat honey given before bedtime provided better relief of nighttime cough and sleep difficulty in children than no treatment or dextromethorphan (DM), a cough suppressant found in many over-the-counter cold medications.

Honey did a better job reducing the severity, frequency and bothersome nature of nighttime cough from upper respiratory infection than DM or no treatment. Honey also showed a positive effect on the sleep quality of both the coughing child and the child's parents. DM was not significantly better at alleviating symptoms than no treatment.

These findings are especially notable since an FDA advisory board recently recommended that over-the-counter (OTC) cough and cold medicines not be given to children less than 6 years old because of their lack of effectiveness and potential for side effects.

The results are published by Penn State College of Medicine researchers, led by Ian Paul, M.D., M.Sc., in this month's *Archives of Pediatrics and Adolescent Medicine.*

In a previous study published in 2004, Paul and colleagues showed that neither DM nor diphenhydramine, another common component of cold medications, performed better than a placebo at reducing nighttime cough or improving sleep quality. However, honey has been used for centuries in some cultures to treat upper respiratory infection symptoms like cough, and is considered to be safe for children over 12 months old. Honey has well-established antioxidant and antimicrobial effects, which could explain its contributions to wound healing. Honey also soothes

Continued on Next Page

COUGHS ... Cont. From Pg. 59

on contact, which may help explain its effect on cough as suggested by the World Health Organization.

In the latest study, the researchers enrolled 105 children between the ages of 2 and 18 at a single university-affiliated physician practice site. On the first night of the study, children received no treatment. Parents answered five questions about their child's cough and sleep quality as well as about their own sleep quality. On the second night, children received either honey, artificial honey-flavored DM or no treatment about a half hour prior to going to bed. Parents answered the same five questions the following morning.

The randomized study was partially double-blinded: Medical staff did not know what treatment each participating family received when distributing their sealed syringe-containing envelope. Parents of children who received honey or artificial honey-flavored DM in a measured syringe were blinded to their treatment group. Parents of children in the no treatment group received an empty syringe, and therefore were aware of their child's treatment group.

Across the board, parents rated honey as significantly better than DM or no treatment for symptomatic relief of their child's nighttime cough and sleep difficulty. In a few cases, parents did report mild side effects with the honey treatment, such as hyperactivity.

"Our study adds to the growing literature questioning the use of DM in children, but it also offers a legitimate and safe alternative for physicians and parents," said Paul, a pediatrician, researcher and associate professor of pediatrics at Penn State College of Medicine and Penn State Children's Hospital. "Additional studies should certainly be considered, but we hope that medical professionals will consider the positive potential of honey as a treatment given the lack of proven efficacy, expense, and potential for adverse effects associated with the use of DM."

Potentially dangerous effects of DM in young children include dystonic reactions, severe involuntary muscle contractions and spasms. Further, DM is a commonly used as a drug of abuse by adolescents.

Cough is the reason for nearly three percent of all outpatient visits in the United States, more than any other symptom. It is particularly bothersome at night because it disrupts sleep. Consumers spend billions of dollars each year on OTC cough and cold medications despite little evidence that these drugs provide significant relief.

About Penn State College of Medicine and Penn State Children's Hospital *Enrolling its first students in 1967, the College of Medicine at Penn State Milton S. Hershey Medical Center confers the Doctor of Medicine degree and, in conjunction with Penn State's Graduate School, offers Doctor of Philosophy and Master of Science degrees in anatomy, biochemistry and molecular biology, bioengineering, cell and molecular biology, genetics, integrative biosciences, microbiology and immunology, neuroscience, pharmacology, and physiology.*

Penn State Children's Hospital is south central Pennsylvania region's only children's hospital.

This study was funded by an unrestricted grant from the National Honey Board, an industry-funded agency of the United States Department of Agriculture.

HONEY AND WEIGHT GAIN

Use of sucrose and mixed sugars are more likely to lead to weight gain than use of honey, according to a new study published in the April 2007 issue of Food Science.

The study led by L.M. Chepulis from Waikato University in Hamilton, New Zealand showed rats that were on a diet with honey had significantly lower weight gain than rats on a diet with sucrose and mixed sugars.

In the study, Chepulis assigned 40 six-week old Sprague-Dawley rats a powdered diet either with no sugar, or eight percent of mixed sugars as in honey, or 10 percent honey for 6 weeks.

The weight gain by rats on the honey diet is comparable to that by rats on the diet without sugars, according to the study.

Sugars in the diet increased levels of HbA1c and triglycerides compared to the diet without sugar. But no difference in percentage of body fat or protein levels was observed.

from Foodconsumer.org

HONEY PRICES SOAR IN THE UK

British consumers are being warned that they can expect honey prices to soar by 25% because of bad weather and a global shortage of product.

Analysts predict the price for a 100g (3.52-ounce) pot of honey will rise early next year from about £1.79 ($3.70) to £2.24 ($4.63).

The UK trade magazine *Grocer* says the shortage follows an unusually cold summer and a drought in Argentina, the biggest exporter of honey to Britain.

The drought kept the flowers from blooming and the cold weather cut bee foraging to just three hour a day with the result Argentina's honey harvest is down 50%.

Elsewhere the harvest is down in Eastern Europe and Australia because of drought and in northern Europe and North America because of too much rain. Colony Collapse Disorder (CCD) in the U.S. is also being cited as a reason for the low global harvest.

At the same time there is a significant increase in consumer demand in developing economies including China and India

UK Honey Association chairman Thomas Heck says the result is a worldwide shortage that is driving up the price of raw honey.

"We would expect to see a 25 per cent price rise in the raw-material price for honey compared with last year," he is quoted as saying. "These rises should hit manufacturers in Spring next year."

"While importers are doing everything they can to ensure that UK honey demand is being met, the significant increase in raw honey costs will unfortunately affect the cost of some retail products purchased by consumers."

Alan Harman

CANADA LOSES 35 PERCENT

The loss of 35% of Ontario's honey bee colonies last Winter was likely caused by a combination of diseases and environmental factors, research conducted by the Ontario Beekeepers Association finds.

At a value of C$225 a hive, this loss equated to almost C$6 million as some large beekeepers and beekeepers in regions such as Niagara and Haldimand-Norfolk suffered losses more than 90%.

Winter losses are normal in Ontario, though not at this level as almost 27,000 of the province's 76,000 hives died. Many of the remaining colonies were severely weakened.

To determine what happened to the colonies, the Ontario Beekeeper's Association's Bee Tech Transfer Team collected 446 samples of bees from 25 beekeepers across the province over the Spring and Summer.

Management surveys were undertaken to understand the different techniques that beekeepers were using.

"We also sampled both dead and live bees for *Varroa* mites, tracheal mites and nosema, a protozoan which affects the bees' digestive systems," association technology transfer specialist Alison Skinner says.

What the team found was surprising.

Nosema was evident in every sample with many of the spore counts numbering more than one million. In over half of the samples, a more aggressive, dominant strain was detected

"When a colony is infected with Nosema apis, there is evidence of 'bee dysentery' on the outside of the hives," Skinner says. "This isn't the case with *Nosema ceranae*. The bees don't show the characteristic dysentery symptoms and therefore it goes unnoticed by the beekeeper."

Skinner says the nosema wasn't the sole factor in the bee deaths.

"The bees were already under stress from a high incidence of *Varroa* mites as well as the environment. Due to a wet Fall, the bees were not able to gather enough pollen to use as a protein source for raising young bees in the Spring."

Now that the problem has been diagnosed, the Tech Transfer Team is outlining the only known treatment – the use of Fumagilin B fed in sugar syrup to kill the nosema spores.

The association says the prognosis is good for the bees. Many of the province's 2,400 beekeepers either split their colonies, or purchased new bees throughout the Summer, so the populations are back up and its hoped will be healthy through the next Winter.

The remaining sick bees are being treated, monitored and should recover.

"Our bees look good right now going into Winter," Skinner says.

Alan Harman

BEE SUPPLIES

BEES & BEEKEEPING SUPPLIES – Free catalog. Ruhl Bee Supply, 503.657.5399, www.ruhlbeesupply.com. (208)

MEAD

MAKE MEAD! FREE CATALOG for making Mead/Wine/Beer. Since 1967 Kraus, Box 7850-BC, Independence, Missouri 64054. 816.254.0242. (1207)

ROYAL JELLY

HIGHEST QUALITY, 100% PURE Fresh Royal Jelly $52.50 per kilo plus shipping. Quantity discounts available. Potency tested, certificate of analysis shipped with each order Lyopholized (freeze dried) royal jelly also available. GloryBee Foods, Inc., P.O. Box 2744, Eugene, Oregon 97402. Call toll free 800.456.7923, Fax 541.762.7173 or email sales@GloryBeeFoods.com. Order online at www.GloryBeeFoods.com (108)

HONEY FOR SALE

OIL, DRUG, CHEMICAL-FREE So. AZ honey produced by organic methods. Testing welcomed. Call for round cut-comb prices. Ph/FAX Dee Lusby 520.748.0542.

POLLEN

CAN YOU AND YOUR NEIGHBORS USE a truckload of pollen patties or more each year? Call Mike at 866.948.6084, toll free for big savings. (TF)

VIDEOS

BEGINNING BEEKEEPING VIDEO 2 hrs! All survival essentials: building hive; installing, feeding, medicating, inspecting, managing bees; harvesting, diseases & parasites; behavior $35. Dr Iacobucci, 172-BC Washington, Pembroke, MA 02359 www.roctronics.com/bee.htm.

PERIODICALS

RURAL HERITAGE – bi-monthly magazine in support of farming and logging with horses, mules, and oxen. Subscription includes THE EVENER Workhorse, Mule & Oxen Directory; $29 for 6 issues; sample $8.00. Rural Heritage, 281-B Dean Ridge Lane, Gainesboro, TN 38562. 931.268.0655, www.ruralheritage.com

THE SCOTTISH BEEKEEPER. Magazine of The Scottish Beekeepers' Assoc. Rates from Enid Brown, Milton House, Main Street, Scotlandwell, Kinross-Shire KY13 9JA, Scotland, U.K. Sample $1

IBRA: INFORMATION AT YOUR FINGERTIPS. IBRA is *the* information service for beekeepers, extension workers and scientists. Our members support this service and enjoy the benefits of belonging to IBRA, which includes *The Journal of Apicultural Research incorporating Bee World*. For more information contact: IBRA, 18 North Road, Cardiff CF10 3DT UK. Telephone (+44) 29 2037 2409. Fax (+44) 29 2066 5522; mail@ibra.org.uk.

THE AMERICAN BEEKEEPING FEDERATION has many benefits to offer its members. Send for a membership packet of information today! Contact the American Beekeeping Federation, P.O. Box 1038, Jesup, GA 31598, 912.427.4233, fax 912.427.8447 or email info@abfnet.org.

IRISH BEEKEEPING. Read An Beachaire (The Irish Beekeeper) Published monthly. Subscription $22.00/year, post free. Mr. Graham Hall, "Weston", 38 Elton Pk., Sandycove, Co. Dublin, Eire, email: Graham Hall@dtti.team400.ie.

THE AUSTRALASIAN BEEKEEPER. Published monthly by Pender Beegoods Pty. Ltd. Send request to: The Australasian Beekeeper, 34 Racecourse Road, RutherfordNSW 2320, Australia. Sub. $US 38 per annum, Surface Mail (in advance). Payment by Bank Draft. Sample free on request.

Bee interested. For beekeeping information read the AMER. BEE JOUR. New editorial emphasis on practical down-to-earth material, including question & answer section. For information or free copy, write to: AMERICAN BEE JOUR., Hamilton, IL 62341.

THE AUSTRALIAN BEE JOUR. Monthly, Annual subscription outside Australia, sent by airmail, $100 Australian. Write to: Victorian Apiarists' Association Inc., Annette Engstrom & Lauren Mitchell, P.O. Box 71, Chewton, VIC 3451 Australia. Sample on request. Email: abjeditors@yahoo.com.

BOTTOM ... Cont. From Page 64

wagon. The children then loaded the saws and the other tools into Dunbar's wagon and followed Tessie and the buckboard's sodden cargo back home.

It was dark by the time Tessie drove into the campsite where she was greeted by Alice and the other children. It took some doing but they finally got both men into their own wagons and onto their beds. Words could scarcely express what those countless, venomous stings had done to the men. As staunch and hardy as these men were, agonizing moans fell from their swollen, bloodied lips. As the wives carefully undressed them, they no doubt wondered whatever had possessed them to endure such folly Whether a foolish contest or whatever it was that they were trying to prove, they had gotten themselves bee-bit over every inch of their now reddened, bloodied, swollen bodies. Puffed up like turkeys before the harvest and hot to the touch, the women knew that infection had already set in.

Although generally used for burns, they used a salve of comfrey root, honey and castor oil. The comfrey would help with both the infection and was known to be a speedy healer, but it was all that venom inside them that really fretted the women. There was no telling how much poison was in them and what damage it might do to their inners. Having journeyed nearly a thousand miles these past months, any doctoring that had to be done they did themselves, and thankfully it was minor

With all the excitement in camp that night the children were hard pressed to go to sleep so the mothers kept them busy gathering firewood, tending the fire and bringing buckets of cold water from the creek. The women worked unceasingly through the night laying the cold water compresses on their husband's burning bodies to help draw the heat.

It was after midnight when all the children were bedded down at last. The salve was apparently doing its job too as the men's groans had quelled somewhat and they were resting easier It had been a long night and now Alice and Tessie sat down by the fire sipping tea from a pot suspended over the coals. As tired as they were and still a bit apprehensive about their men's condition, they mused over the fact that if their husband's thought that they were miserable now – just think how they were going to feel in the morning when they sobered up.

As amusing as that thought was to the women, they diligently sat by their husbands, lovingly nursing them through the rest of the night. Come sun up both men awoke, and although they both looked like they'd been caught underfoot in a stampede, the swelling was down a little and they at least could open their eyes. And there by their sides sat their dutiful wives, but not a word slipped their lips. Somewhere here there would be a lesson, but it would need to be learned from the husbands without the wives having to utter a word. With a wincing smile from their husband's puffed up lips the wives could see the sting of their conflict was still ablaze from every bee-gotten battle scar that would be a constant reminder for many days to come.

Both Mitchell and Dunbar, unquestionably recalling a glimmer of the day before, but surely feeling too manly to ask about the details; their supporting, yet perceptive wives just smiled at them. Whether or not the men had yet realized; it was the wives who had determined the night before that if they hadn't have had so much of that moonshine in them the venom would surely have killed them!

Display Advertisers

It wasn't like Mitchell to ever miss a meal at home unless he might be sleeping one off in jail somewhere. He was a good man when he didn't drink. Not that he drank that often, but when he did drink he drank with the same zeal and conviction that he did everything else. Mitchell was a big man and when he stood alongside his wife Tessie, his six foot, three inch frame looked even bigger as Tessie was only four feet, 10 inches.

It was 1924 when the Mitchell family – Arthur, Tessie, their five children, and the Dunbar family, James, Alice and their three children began their trek from Burley Idaho heading west. Their hopes were to settle somewhere in Central Oregon. The men made their living along the way mostly digging potato cellars and carving out new roads with their teams of mules. Sometimes they'd come across rivers that had swelled, keeping them, as well as other wagon travelers from crossing. However, oftentimes those same rivers, though finally receded, left nothing but what appeared to be acres of soft, sticky, gooey mud. And wouldn't you know it – a greenhorn and his wagons would be helplessly bogged down to their hubs and haunches.

Most folks back then were just born with a thing called 'horse-sense'· something vital to surviving harder times; but folks are folks and as much as you might feel sorry for their poor judgements, for a price, Mitchell and Dunbar with their ropes and mules would pull them out.

Unlike the conventional Conestoga's with their bowed tops, these two families drove wagons that were wider than normal. They were fashioned after the hay wagons with wooden sides almost half way up to which was built an A-type frame that supported a canvas tent that covered the entire wagon. Designed to be a traveling home, the tent had outlets cut in the canvas giving it windows that could be tied open in good weather and then fastened tight during the cold nights or the driving rains. A stove pipe poked through a hole in the top of the canvas, connected to the wood burning stove in the wagon. A four-poster bed took up its share of space along with the other children's beds and a fair-sized tin tub that doubled for both for bathing and canning. There were trunks with clothes and personal things, a table and chairs, pots and pans, and in every other part of the wagon; inside and out, their life's possessions were stuffed, bagged, boxed or hung; filling every nook to capacity

Dusk was encroaching when the two men should have been back for dinner They had gone out that morning to harvest the first of the trees they had marked out for their cabins and much to their delight – a windfall in the form of a bee-tree. Now they would have sweet honey to bring home as well. And speaking of good-fortune, wherein Mitchell's expertise fell to woodworking and the sort, Dunbar had a flair for making corn squeezings. He had a still back home and although they knew it was illegal, Dunbar considered it his private stock; just making enough for himself and maybe a few friends and neighbors. He insisted that it was the only remedy that helped his mule-kicked knee, and his long time friend Mitchell used to say that he thought it remedied almost everything – so the clay jug was never far from either one of them.

A little concerned that the men hadn't returned home, while there was still light in the sky, Tessie had John and Mona, the two oldest children hitch up the buckboard. Alice watched the other children while Tessie and the two children headed toward the tree line where the men said they would be that day The buckboard hadn't gotten much more than a mile, and although they couldn't see them, they could certainly hear them. It sounded first like someone was crying out in pain, but then almost immediately the sound of laughter rang through the cool air Then another shout of anguish echoed through the small rolling hills and then more laughter The children looked at Tessie; their questioning faces in utter bewilderment, but Tessie with only a halfhearted smile just shook her head in disbelief and drove the horse onward in the direction of the hullabaloo.

With all that laughing along with all that hollering, Tessie figured they couldn't be that bad off. Well, there they were. There was Mitchell and Dunbar; both sitting on the downed tree with the clay jug between them. It wasn't until they drove up close that they could really see. Right in front of them on the ground lay a huge bee-tree, split wide open, and you could see the bees furiously swarming all around them. But instead of taking cover there they each sat, grabbing handfuls of the bees and shoving them down each other's bib overalls. One would scream in pain from the stings, and then he'd take another hooker from the jug while the other laughed at him. Then the other would do the same. They kept doing it over and over again and were so caught up in their encounter that they were totally oblivious to the arrival of Tessie and the children and couldn't even hear their yelling at them. Finally, at long last the men caught a glimpse of the children waving frantically in the distance. Then with jug in hand, one staggered to his feet and then the other, still flailing their arms against the attacking bees. But instead of heading toward Tessie, they just stood there in the middle of the swarm. Tessie and the children began to yell again, urging them to get away from the bees. That's when Tessie saw their faces – or what the bees had done to them. Their faces were blood-red and sorely swollen and their eyes were almost closed shut. They began to make their way in the direction of the yells and finally they were out of the angry swarm. As they helped the men onto the buckboard they saw that their hands were red and swollen too. Figuring their backs probably had the fewest stings, they laid them on their backs in the bed of the

Continued on Page 62

Donna Madora Mitchell

The Booze And The Bees

BOTTOM BOARD