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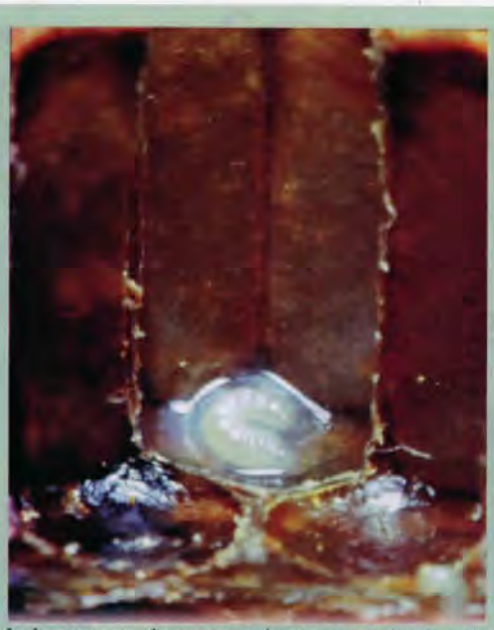
Bee Culture

THE MAGAZINE OF AMERICAN BEEKEEPING

AUGUST 2008 VOLUME 136 NUMBER 8



Brood pheromone plays many important roles in colony behavior and survival. Find out lots, lots more in Clarence Collison's 'Up Close' article on page 38.
(photo by Elbert Jaycox)

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

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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

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FEATURES

DEPARTMENTS & COLUMNS

Using Plastic

I always enjoy your editorials though I really do miss the wise guy

This month you wrote of your frustrations with plastic foundation. You should use Pierco (I own no stock). My Russian bees love especially the black. It makes a beautiful brood frame. I never use added wax and since my colony loss is so minimal I do not mind throwing out any foundation that has been stripped of wax by wax moths. As a hedge against inflation and the rising cost of plastic I just purchased a pallet of 4,800 that will last me for the next couple of years. I know that some of the plastic sold has dirty wax on it, made of cheap plastic, poorly coated and is too heavy for good heat transfer in the Winter cluster Unfortunately our suppliers are under pressure to supply a cheap competitive product and if they do not they may not remain in business. I do not blame them but am glad that quality is at least sometimes available.

Thanks for your good work.

Carl Webb
Clarksville, GA

Package Time

In Jennifer Berry's article "Package Time" in the April 2008 *Bee Culture*. I question the advice on page 44 – "Remove the cork plug next to the candy and staple, wedge or wire the queen cage, candy side down "

I always go candy side up if I hang cages to insure against the possibility of a dead attendant bee blocking the hole and preventing her escape!

Andrew Jones
Huntingdon, PA

Lost His Shorts

Upon reading in the June *Bee Culture*, "Protect Your Hive" by Jennifer Berry and how she deduced what happened to her hives, by the evidence left behind, brought back a memory that happened perhaps 40 years ago. It had nothing to do with my bees, but happened to a very fine beekeeper who was also our bee inspector

He had a piece of property back in the hills, where he put his most "defensive" (mean) hives. I believe there were six or seven.

Anway one day he was checking them, and as he was walking down the trail he noticed what looked like a pair of brand new men's briefs along side of the trail about 100 yards from his bees. He took a stick and proceeded to pick them up and was amazed that they were completely cut in half. It looked like it was done by a knife. He couldn't quite figure why anyone would do this to a new pair of shorts.

As he approached his hives he saw one with the top super half off. As he got there he also noticed some foot prints made by calked boots. (Loggers wear them so they won't slip when walking slippery logs.)

Directly behind this hive with the "catty wampus" super there were a lot of calk boot marks on the ground behind the hive, the hive happened to have a rear entrance which wasn't apparent to the honey robber

Charlie (the beekeeper) figured this guy knew the hives were there and decided to go at night and remove the top super, figure the bees would be down in the bottom. As he wrestled and broke the super loose, Charlie figured the bees crawled out of the rear entrance and up the thief's legs. When they started stinging he took off leaving the super ajar

Then he must have dropped his trousers trying to get the bees out but because of the heavy calk boots he couldn't get his pants off and the bees must have made it all the way to his shorts, so all he could do was take his jack knife to cut his shorts off.

I'm pretty sure that Charlie had it figured out pretty close. The guy never got any honey. In fact he lost his shorts.

Jim Cowan
Aberdeen, WA

Take Ed's Keys

O.K. let me get this straight. In the June issue of *Bee Culture*, Ed Colby paints this scenario. He has a breakdown on an interstate

highway while driving a truck that he knows is unreliable. He's carrying a load of uncovered bees because he failed to order a net in a timely fashion. Then he suggests that a potential crisis would be created by the highway patrol.

Sheesh! What kind of convoluted thinking was that? Somebody, take this guy's keys away from him before he hurts someone or worse.

Dan Harris
Athens, GA

Saving The Weaklings!

If you're like me every Spring you will find hives that have only one frame of bees with a laying queen. Sometimes only a handful of bees. This colony is going to die soon.

I believe the *Varroa* was responsible by the simple fact, they weakened the "Winter" bees by taking nourishment from them while they were in the larval stage.

Whatever the case we have a colony that is doomed. This queen will only lay enough eggs that the bees can cover So when the cluster gets to this size, there is no way they can expand – only get smaller and die.

What I've started doing is placing this colony above one of my strong ones, in the same yard. It makes little difference if a few fly back to the old stand.

The way I do this is place one of my bottom screens (mite screen) on top of my strong hive with the entrance down. Put your weak one on top, with the entrance down. The weak one is trapped in. I usually leave them like this for three days. (I've done it in one and it

worked). The idea is to get them all smelling alike. You then remove the screen, and replace it with a queen excluder I also put a spacer on top of the excluder and then your weak colony. The spacer is simply a feeder frame about two inches high. It's usually used with a ziploc bag full of sugar water Anyway it seems to work better than just placing the weak hive on top of the excluder You can make an entrance in this feeder spacer if you want to.

After three or four days you will notice quite a colony developing, and in two weeks it will be boiling over with bees and brood. You can use it as a two-queen colony or remove it to another yard.

You will be surprised how fast they build up. Also it gives me a good feeling.

You might ask if I'm not spreading the mite. Well I think all of my hives have the mite. Some do better than others.

Jim Cowan
Aberdeen, WA

A Ticklish Situation

Recently Jimmy Don Rowland called me about a swarm of bees and we agreed to meet the next morning to capture them. When we arrived we found the swarm in a most unusual location as shown in the photo. After much laughter, we successfully got the bees into a deep super and took them to one of my hive stands.

Jimmy Don is quite a Western Kentucky story-teller and, of course, he had a tall one prepared for the next meeting of The Lake Barkley Beekeepers Association. He passed the picture around while telling about how well his bird dog was that he would hold his point even under the most trying of circumstances. You can imagine the responses and the laughter It was a meeting that will be long remembered.

Beekeeping is always full of surprises, not all of them painful.

Ken Batcher
Paducah, KY

INNER COVER

John Root had been President of his company for only two years when he hired me back in 1986. He'd spent several months looking for an Editor after my predecessor left unexpectedly, and being President and Editor (again) was wearing thin. We had met months before at an EAS Board meeting in Harrisburg, PA, but meshed as publisher and editor after an introduction by Ed Weiss, one of the Root dealers in Connecticut where I was living at the time. Maybe I was the least bad choice for someone who was worn out looking for a replacement and was constantly harried by having to make a hundred decisions a day in the candle business. He says not though and I'll take him at his word.

Being the new kid on the block I wanted to make an impression and the easiest way to do that, of course, was to make this magazine in a new image...graphics, photos, art, layout and editorial...the works. John gave me a lot of latitude and I got away with a lot early on, but for several years the budget just didn't allow for a lot of glitz and glamour But John gave me one sage piece of advice that has held true all these years. Right at the beginning he told me that it wasn't how pretty the magazine looked...our subscribers didn't pay for good looks....what was important was the content. Good looks don't keep bees alive, he said...good advice does. Our readers want information they can trust, they can use, and they can depend on. Everything else is second, he told me. He was right on, and still is.

During the past 22 years the appearance of the magazine has changed though...innovations in technology have allowed us to do that with marginal effect on the cost. But content has always, always come first. We've published a ton of controversial stuff and we've done a lot of fundamentals, and we've done some really far out stuff...but every issue, or at least I think every issue...has provided solid information, entertainment, and that content that John always wanted. But who could have predicted how many monumental changes would take place in those 22 years...tracheal mites, varroa mites, the Honey Board, African bees, Australian bees, foreign imports, the almond industry and now CCD...who would have thought beekeeping could be so very, very interesting?

John still reads every issue... and almost always has a comment or question on what's inside. I have no doubt he will continue to make sure we mind our p's and q's, and dot all the I's and cross all the T's. With Root Candles the mainstay of the company now, John and I are the old timers, the only ones who remember the good old days of beekeeping. Well, Brad does too I guess, at least to some degree, and he's in charge now. But Brad is an administrator, a good one, but he's not a beekeeper Unlike his father, grandfather, great grandfather, and his great, great grandfather A. I. Root, Brad doesn't have bee venom in his blood, isn't a member of the Brotherhood of Better Beekeepers, and hasn't been sworn in to the Circle of Sore Hands...at least yet. Maybe we can change that...

Say, Brad...you want to go out to the beeyard for a while...get away from the office, the computer, the phone, email and the BlackBerry? Just shrug off the mantle and re-

Continued on Page 66

John Root; CCD & Pesticides

After 24 years as President of the A.I. Root Company, John Root retired from that position in early July this year. Assuming the responsibilities of President will be his son, Brad Root, who has been serving as Vice President for several years.

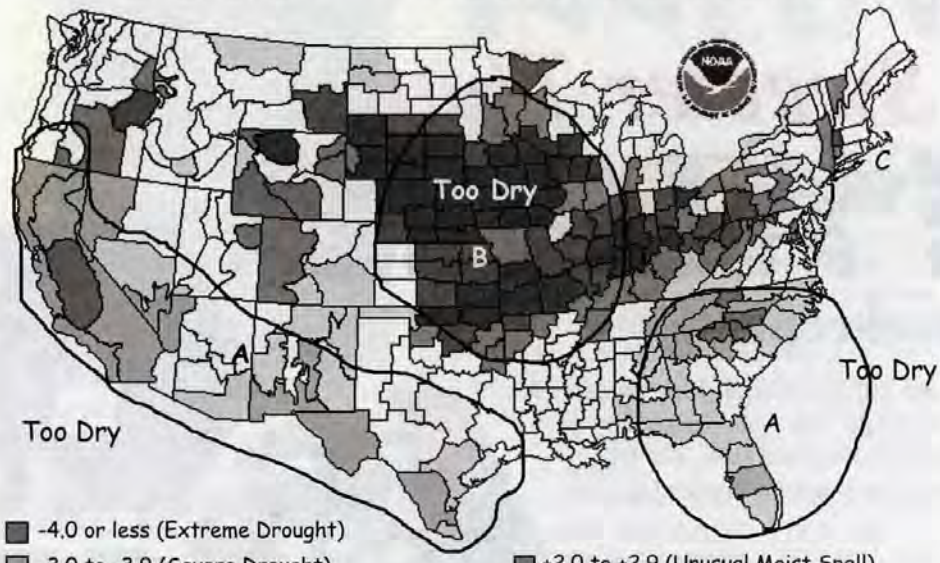
John has served the company in several positions during his tenure here, including Associate Editor and Editor of then Gleanings In Bee Culture, the monthly magazine started by his Great Grandfather, Amos Ives Root, over 136 years ago. John remained active in the production of the magazine for some time after becoming president but the challenges and opportunities of running a dynamic and growing home decorative and liturgical candle manufacturing business, plus overseeing the reduced beekeeping supply business eventually allowed him to step back from Editorial duties and focus on the candle side of the business.

While in the Editor's chair John also served on the Board Of Directors of The Eastern Apicultural Society of North America (EAS), where he also served as the first Temporary Chairman Of The Board in 1977. He served in that position for a second time a few years later. John also served as EAS President, when EAS met in Wooster, Ohio, in 1978 with over 600 attendees. After that John remained on the EAS Board, serving as Sites Chairman for several years, giving him ample excuses to take to the air in his plane for another trip.

John stays on as Chairman Of The Board of the A.I. Root Company, and will closely follow the progress of the company, its employees, and both of the industries he remains a part of.

John Root, President Emeritus

AUGUST – REGIONAL HONEY PRICE REPORT



So far this year the weather has been – Pick One – 1) Really, Really Dry; 2) Flood, or nearly so; 3) Pretty much near normal.

We sent this map to our reporters, taken from the Drought Indexing people to give them an idea of what the weather people were thinking, and asked a few questions, based on their location – wet, dry, or O.K.

Though the weather people defined the area, we left it to the reporters to determine if their particular location was too wet, too dry, or O.K.

Questions were 1) honey & pollen flow so far; 2) if below average will they feed; 3) pest pressure so far; and 4) has CCD been around. Here's the responses, based on wet, dry and O.K. areas.

Honey Flow So Far	**Dry**	**Wet**	**OK**
Better Than Average	22%	22%	20%
About Average	44	59	66
Below Average	33	35	20
If Below Average, I'll			
Feed Sugar	42	35	NA
Feed Protein	22	17	NA
Not Feed	53	26	NA
Pest Pressure So Far			
Less Than Normal	31	26	30
Average	22	65	65
Worse	53	4	5

Colony Collapse Has	**Dry**	**Wet**	**OK**
Hit Others Nearby	14%	6%	20%
Hit Me	6	4	0
Not Hit Here	33	61	60
Hit Everybody	50	0	10

*Not all columns total 100% due to incomplete surveys.

Note the extreme differences between the dry and other areas for pest pressure and Colony Collapse occurrences (we did not define CCD, but this is what our reporters said, and the geographical region loosely corresponds to CCD areas.

	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	1.45	1.35	1.45	1.43	1.30	1.48	1.42	1.45	1.45	1.61	1.41	1.58	1.30 -1.61	1.45	1.53	1.04
55 Gal. Drum, Ambr	1.18	1.25	1.18	1.22	1.06	1.22	1.37	1.18	1.15	1.18	1.23	1.55	1.06-1.55	1.23	1.26	1.00
60# Light (retail)	120.00	123.67	123.00	115.60	120.00	120.00	115.40	115.00	127.00	117.00	128.33	162.50	115.00-162.50	123.96	123.22	117.86
60# Amber (retail)	120.00	115.00	123.00	112.00	120.00	111.25	106.50	110.00	72.00	117.90	128.33	150.67	72.00-150.67	115.55	118.75	113.58
WHOLESALE PRICES SOLD TO STORES OR DISTRIBUTORS IN CASE LOTS																
1/2# 24/case	52.08	62.48	41.40	45.13	62.38	54.00	42.75	62.38	62.38	42.00	40.73	88.50	40.73-88.50	54.68	53.96	51.91
1# 24/case	65.52	68.53	68.40	63.69	72.00	75.07	66.40	70.40	60.00	94.44	75.20	96.00	60.00-96.00	72.97	74.33	68.39
2# 12/case	69.72	63.72	63.00	56.68	66.00	60.60	61.24	81.00	52.00	69.24	54.85	83.10	52.00-83.10	65.09	62.18	62.08
12.oz. Plas. 24/cs	64.32	63.18	49.80	65.21	57.60	64.00	54.52	58.80	54.00	50.64	52.80	72.67	49.80-72.67	58.96	60.46	54.89
5# 6/case	76.40	72.24	71.25	65.56	72.73	84.00	66.32	77.40	72.00	65.91	71.00	80.00	65.56-84.00	72.90	74.55	66.77
Quarts 12/case	89.93	100.35	112.20	92.00	102.00	81.37	75.00	85.15	102.00	120.00	85.20	114.00	75.00-120.00	96.60	95.88	86.51
Pints 12/case	70.84	51.95	66.00	62.93	58.00	47.60	42.00	42.00	66.00	51.84	65.60	63.00	42.00-70.84	57.31	65.07	63.01
RETAIL SHELF PRICES																
1/2#	2.88	2.88	2.27	2.98	2.19	2.75	2.92	2.51	2.29	2.61	2.55	5.62	2.19-5.62	2.87	2.87	3.15
12 oz. Plastic	3.25	3.88	3.33	3.51	3.66	3.60	3.36	4.02	3.51	2.95	3.24	5.00	2.95-5.00	3.61	3.59	3.32
1# Glass/Plastic	3.83	4.36	4.21	4.72	4.75	4.85	3.89	4.87	4.21	4.38	4.60	5.87	3.83-5.87	4.55	4.65	4.24
2# Glass/Plastic	8.25	7.24	6.90	7 18	7 12	7.02	6.84	7.31	6.35	6.23	7.50	9.60	6.23-9.60	7.29	7.30	7.10
Pint	8.35	7.36	6.50	6.07	6.03	5.82	6.32	7 19	6.03	6.70	6.25	10.58	5.82-10.58	6.93	6.93	6.75
Quart	12.10	9.48	11.00	9.68	8.70	9.06	10.08	12.00	10.32	13.74	9.25	16.50	8.70-16.50	10.99	10.51	10.38
5# Glass/Plastic	15.50	14.71	15.65	17.21	18.00	16.00	14.98	13.46	18.95	13.59	16.07	19.75	13.46-19.75	16.16	16.28	14.75
1# Cream	5.25	5.42	4.81	5.31	5.52	4.00	5.02	4.95	5.52	4.72	5.97	6.25	4.00-6.25	5.23	5.16	5.30
1# Cut Comb	5.50	4.78	5.19	4.88	6.94	4.75	6.35	4.49	6.94	8.00	12.00	8.00	4,49-12.00	6.48	6.32	7.26
Ross Round	6.75	5.50	5.19	4.88	6.75	4.00	6.00	6.75	6.75	8.00	6.33	8.46	3.97-8.46	6.15	5.99	6.02
Wholesale Wax (Lt)	2.67	3.32	2.00	2.52	2.15	3.56	2.83	3.25	2.75	2.15	2.83	3.63	2.00-5.56	3.05	3.17	2.36
Wholesale Wax (Dk)	2.00	2.97	2.00	2.26	1.80	2.00	2.25	2.75	1.95	2.73	1.90	3.00	1.80-5.25	2.88	2.76	2.15
Pollination Fee/Col.	72.50	79.33	65.00	44.17	155.00	57.00	55.00	60.00	100.74	140.00	62.50	134.00	44.17-155.00	85.44	81.12	61.95

RESEARCH REVIEWED

The Latest In Honey Bee Research

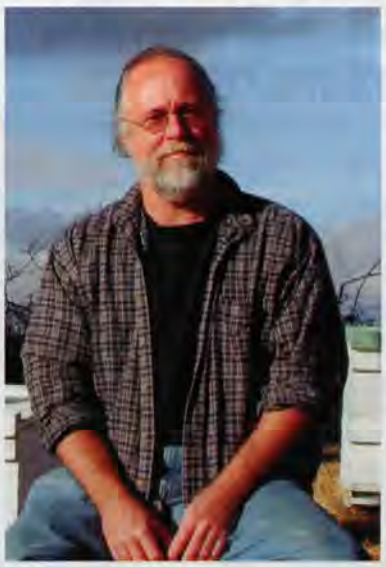
Steve Sheppard

"Total brood comb renewal over two years will not guarantee a complete absence of residues."

One major concern when using certain pesticides for parasitic mite control in beehives is the potential contamination of hive products. Combs are typically reused for several (or more) years by bees and beekeepers and, if miticides (acaricides) accumulate within the wax, there is a greater opportunity to contaminate honey or negatively affect the bees themselves during brood development. Increasing numbers of beekeepers are working to reduce or eliminate the use of synthetic miticides for *Varroa destructor* control. In Europe, regulations exist for the conversion of beekeeping operations to organic production. One of the paths that participating beekeepers must follow is the replacement of existing combs with new combs built from foundation of organic origin. Given the economics and management difficulty of wholesale comb replacement with foundation, Italian regulations allow beekeepers to make this change over a three-year period. A group of Italian researchers recently evaluated the residue levels of wax and honey in operations that converted to the exclusive use of organic mite control methods (in this case thymol- or oxalic acid-based treatments) (Lodesani et al, 2008).

Lodesani and colleagues evaluated wax and honey sampled over a three-year period from seven different experimental apiaries that previously had used various miticides for at least five years. The researchers compared both a "fast" and slow" methods of conversion that involved replacement of five or two combs per year, respectively Samples were taken from old combs in 2000 to establish baseline data and in 2001 to evaluate persistence. Samples of brood comb, capping wax and honey were taken from new combs in each year from 2001 to 2003. The sampled material was evaluated for chemical residues of both registered and non-registered (but known to be in use by beekeepers) formulations of various miticides. These included various miticides with the active ingredients coumaphos, fluvalinate and chlorfenvinphos.

The researchers found that the initial samples of old brood combs taken in 2000 had detectable (and in some cases quite high) levels of contamination with miticides. When sampled one year later, the residue levels in old brood combs were not significantly lower for any compound. For the new combs sampled, there were no differences due to the replacement method (fast vs. slow) in the first year, so the data were combined. The researchers found that after one year the level of "indirect" contamination of new brood combs in 2001 (as a proportion of the contamination level of the old brood comb) were as follows: Apistan (fluvalinate) 29.7%; Supona (chlorfinvenphos) 30.0%; Perizin (coumaphos) 82.5%; Asuntol (coumaphos) – 23.7%). The authors noted that the difference they found in the two coumaphos products was likely due to the formulation and application method. In 2001, the corresponding levels of indirect contamination of honey combs constructed from residue-free foundation (as a proportion of the contamination of the old honey combs) was: Apistan (fluvalinate) – 16%; Supona (chlorfinvenphos) 3.0%; Perizin (coumaphos) – 53%; Asuntol (coumaphos) – 13%). High levels of Apistan (fluvalinate) residues were detected in the combined (old and new combs) capping wax collected in 2001 In 2002, samples of the "non-organic" and "organic" capping contained 23% and 11% of this amount of fluvalinate, respectively. For the two coumaphos compounds, organic capping wax yielded undetectable levels of residues within either two (Perizin) or three (Asuntol) years. In honey, the only miticide residues were detectable in the first year of the experiment (2001) for one of the coumaphos compounds (Asuntol). In only a single case did the replacement method (fast vs. slow) make a significant difference in miticide residue levels found in the combs. Thus, in year three combs from the slow replacement method group had more than twice as much Apistan (fluvalinate) residue in them compared to combs from the fast replacement group. Overall, the researchers found that "independent of the speed of replacement, comb wax at the end of the experiment contained residues of previously used acaricides (compared to the initial concentrations in wax: 4% Supona (chlorfinvenphos), 5% Asuntol (coumaphos), 8% Perizin (coumaphos) and 10% Apistan (fluvalinate)."



Although some of the miticides and formulations that Lodesani et al used in their research are not available in the U.S., their conclusions were highly relevant. Perhaps

foremost..."a total brood comb renewal over two years will not guarantee a complete absence of residues..." Clearly, what we use in our hives today is going to be with us tomorrow. Due to cost and management considerations, a scheduled process to replace miticide-contaminated combs is more practical than immediate and complete comb replacement for the majority of beekeeping operations. While management strategies to reduce or eliminate the use of synthetic pesticides may not seem readily feasible for some beekeepers, for those who are bound and determined and able to get "off the treadmill," the work of Lodesani and colleagues provides valuable information on the persistent nature of prior treatments and what can be realistically expected during a transition.

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

Lodesani, M., C. Costa, G. Serra, R. Colombo and A. G. Sabatini. 2008. *Acaricide residues in beeswax after conversion to organic beekeeping methods.* Apidologie. 39:324-333.

Malcolm T. Sanford

Viruses And Honey Bees

"The spread of viruses appears to be continuing around the globe, helped along by mite vectors and other risk factors."

In a previous column (July, 2008), I discussed the role of emerging pathogens in the phenomenon now called Colony Collapse Disorder (CCD). One of those areas I listed that is becoming more and more prominent is concern about the effect of honey bee viruses. A paper in *Bee World* over a decade ago sought to catalog the incidence and world distribution of honey bee viruses.[1] Since then, several others have come into focus as potential problems. In order to understand viruses better, it is necessary to be more informed about their origins, biology and potential treatment.

"A virus (from the Latin virus meaning "toxin" or "poison"), is a submicroscopic infectious agent that is unable to grow or reproduce outside a host cell. Each viral particle, or virion, consists of genetic material, DNA or RNA, within a protective protein coat called a capsid. The capsid shape varies from simple helical and icosahedral (polyhedral or near-spherical) forms, to more complex structures with tails or an envelope. Viruses infect cellular life forms and are grouped into animal, plant and bacterial types, according to the type of host infected.

"Biologists debate whether or not viruses are living organisms. Some consider them non-living as they do not meet all the criteria used in the common definitions of life. For example, unlike most organisms, viruses do not have cells. However, viruses have genes and evolve by natural selection. Others have described them as organisms at the edge of life. Viral infections in human and animal hosts usually result in an immune response and disease. Often, a virus is completely eliminated by the immune system. Antibiotics have no effect on viruses, but antiviral drugs have been developed to treat life-threatening infections. Vaccines that produce lifelong immunity can prevent viral infections." The above two paragraphs come from the Internet's open encyclopedia(Wikipedia.org).[2]

To reiterate, most people talk about viruses as if they are living organisms, but this challenges in fundamental ways how biology text books define "life." For example viruses do not respire; move nor grow. They also do not display irritability. However, viruses do reproduce and adapt to new hosts. If one considers that the only real criterion for life is the ability to replicate, then viruses must be included, even though they require another living host to do so.[3]

Honey bee viruses generally have not been considered problematic for bees or in beekeeping. Some, like the sacbrood virus (SBV), appeared randomly and did not cause significant damage. That all changed, however, as the *Varroa* mite became an integral part of the world's honey bee colonies. There is increasing evidence that the global spread of *Varroa destructor* has resulted in significant change in the type and prevalence of viruses causing mortality in honey bee colonies. This is primarily because the mite has provided new routes of transmission for naturally occurring, endemic virus infections. Adult female mites pierce the thin membranous areas of the adults bee's body or pupal skin, to feed on the haemolypmph. At the feeding site there is some exchange of fluids between the parasite and its host, so the mite acts effectively like a hypodermic syringe."[4]

Although the *Varroa* mite is implicated in the spread of viruses because it is a primary transporting agent or vector, it is not the only organism that can do this job. Another is the tracheal mite (*Acarapis woodi*). This organism also makes holes in the intersegmental membrane when feeding on bee blood or haemolymph. Mites don't necessarily have to transport viruses. Many, it appears, are already present in honey bee populations and are benign (latent), but can be activated by mite feeding activity. Viruses can also be spread in two ways, horizontally and vertically. The former is the case with most contagious diseases where susceptible individuals are in contact with others, such as in human respiratory flu viruses (spread by sneezing) or HIV (exchange of body fluids). Honey bee viruses have been documented to spread from bee-to-bee, bee-to-mite, mite-to-mite, and mite-to-brood.

Vertical transmission is a special case where a virus may be spread within a colony from the queen to her offspring, affecting the next generation. A recent study concludes: "Our work has provided substantial evidence for the vertical transmission of viruses in honeybees, but a number of factors that may play important roles in the efficiency of virus transmission are far from being understood. For example, the host immune responses and virus pathological features that facilitate the vertical transmission of individual viruses are not known. The roles of vertical transmission of viruses in bee disease epidemiology need to be determined. This will be especially relevant for honeybees, where viruses normally persist as latent infections and group living can possibly drive high levels of horizontal transmission or amplification of existing infections. Further studies of host-virus interactions might give some insight into these issues."[5]

Multiple viruses can also be found in honey bee colonies. "Using uniplex RT-PCR we screened honey bee colonies for the presence of several bee viruses, including Black Queen Cell virus (BQCV), Deformed Wing virus (DWV), Kashmir Bee virus (KBV), and Sacbrood virus (SBV), and described the detection of mixed virus infections in bees from these colonies. We report for the first time that individual bees can harbor four viruses simultaneously. Results from field surveys of these viruses indicate that mixed infections of BQCV, DWV, KBV, and SBV in the honey bee probably arise due to broad geographic

"It seems reasonable to suggest that creative researchers should come up with a vaccine(s) to help bees develop stronger immune systems to ward off current and future viral threats."

distribution of viruses."[6]

As noted elsewhere, the spread of viruses appears to be continuing around the globe, helped along by mite vectors and other risk factors. Recently, two are of particular concern and are thought to be associated with significant bee losses.

The first is deformed wing virus (DWV), which by most accounts has become ubiquitous in European honey bee populations. Beekeepers can often recognize symptoms of DWV by simply examining affected worker bees, the wings of which are not well developed or abnormal in some way. At one time these symptoms were thought to be simply the result of feeding by parasitic mites. Deformed wing virus is endemic among honey bees in the U.S., although when the European bees became historically infested with this virus, is unknown. However, simply having deformed wing virus does not appear to cause bees to emerge from the pupal state with deformed wings, nor does it cause colony deaths. In addition, a group of Japanese researchers found that a virus that is 99 percent the same as deformed wing, appears in the brains of aggressive guard bees so there may be some positive effect in this virus that allows it to persist in a colony.[7]

The other virus that is becoming of interest to researchers is Israeli acute paralysis virus (IAPV). It burst onto the scene when it was given wide publicity at the World Apicultural Congress in Melbourne, Australia (Apimondia 2007) as "strongly correlated with CCD." Australian package bees that had just begun to be imported into the U.S. the last few years, therefore, were implicated. This brought a storm of protest from Australian scientists and package producers, concluding that the virus had also been found in hives not suffering from CCD, and asking why if it was so closely linked to the phenomenon, that there are no hives in Australia suffering from CCD.[8] Still, as one U.S. researcher has said, "...the stats are very convincing, with literally every colony showing symptoms of CCD also harboring the virus. We don't find data that plain usually."[9] Ian Parnell, a professional biologist and environmental writer, provides an intensive analysis of the controversy on his blog, which is mandatory reading for anyone interested in this issue.[10]

A subsequent U.S. investigation concluded: "Our results show that IAPV in the U.S. predates both the latest incarnation of CCD and the importation of Australian package bees. Nevertheless, we caution that much work is still needed to absolve or implicate this virus, or specific imports, in CCD. Most importantly, experimental studies are ongoing to determine the relative virulence of imported or domestic IAPV strains, and such studies will provide the best evidence for making importation and management choices. Viruses with minimal genome sequence differences can show greatly different levels of virulence, and all isolates of IAPV we studied showed at least some sequence variation. Given its observed association with CCD, this virus remains an important candidate for honey bee disease."[11]

Besides being inconspicuous to beekeepers, other reasons exist for the relatively little work on honey bee viruses by scientists over the years. They are not easy to detect, and even if there was any evidence viruses were doing harm to honey bee colonies, there were few if any treatment options.

Virus detection methods are now becoming much more available given new genetic technologies. Researchers at the U.S. Department of Agriculture have reported on their efforts in this arena: "We also developed a multiplex RT-PCR assay for the simultaneous detection of multiple bee viruses. The feasibility and specificity of the multiplex RT-PCR assay suggests that this assay is an effective tool for simultaneous examination of mixed virus infections in bee colonies and would be useful for the diagnosis and surveillance of honey bee viral diseases in the field and laboratory. Phylogenetic analysis of putative helicase and RNA-dependent RNA polymerase (RdRp) encoded by viruses reveal that DWV and SBV (sacbrood virus) fall into a distinct group, whereas KBV (Kashmir Bee Virus) and BQCV (black queen cell virus) belong to a distinct lineage with other picorna-like viruses that infect plants, insects and vertebrates."[12]

Another detection method described at the January 2008 National Beekeeping Conference in Sacramento, CA is the Integrated Virus Detection System (IVDS), pioneered by the military, but now being used by civilian scientists in a number of disciplines. "This new invention utilizes the physical properties of virus, virus-like and other nanometer (nm) particles to determine a concentration, distribution and information for discrimination and characterization of nanometer particles (1 nm equals one billionth of a meter). This analysis can identify many known virus families pathogenic to man, as well as a new means for detecting unknown and emerging viruses. Another great advantage is that the IVDS instrument does not require complicated chemistry or reagents."[13]

Potential treatment of honey bee viruses in many ways seems to parallel the human situation. It is unfortunate that many people confuse bacterial infections with those produced by viruses. The symptoms are often similar, and modern human culture has produced a belief that antibiotics are a "silver bullet" cure for most ailments. Physicians may have some of the same perceptions and also are often under the gun by patients who demand treatment by antibiotics no matter the cause or cost. As a consequence, antibiotics are often prescribed for relatively common conditions that often clear up by themselves. This practice and the improper use of the materials by patients (not taking the full dose as prescribed) create a favorable environment for bacterial resistance. Antibiotics only target bacteria and so viral conditions (common colds, influenza).are not affected. In ex-

treme conditions, antibiotics may be taken as preventatives, causing an escalation of antibacterial resistance such that whole classes of antibiotics may become useless. This has in fact happened in honey bees, where presumed overuse of the antibiotic Terramycin® has resulted in American foulbrood (*Paenibacillus larvae larvae*) bacterial resistance and led to the development of another treatment based on tylosin (Tylan®).[14]

The best way to ward off virus infection is to use the patient's own immune system. According to one authority, "it may be hard to accept when the doctor says the only cure is for 'nature to take its course' "[15] The treatment of virus infections in humans usually involves: drinking plenty of water, staying at home so as not the spread the bug, and perhaps taking something to alleviate pain or reduce temperature. Vaccines are routinely developed to provide the body some help in quickly and effectively fighting viruses. This is the philosophy behind the annual flu shot that is recommended each Fall for a large part of the U.S. human population.

The realization that viruses are more and more important in honey bee health has led to a more intense examination of the insect's immune system. "Viral infections induce unspecific cell defense reactions such as phagocytosis and nodule formation. A small number of viruses or viruses of a low virulence infecting the insect are killed by haemocytes whereas heavy infections or virulent strains can replicate and kill a specific type of haemocyte involved in antiviral defensive reactions."[16]

Dr Clarence Collison has provided a closer look at this important area and reports that honey bees appear to have relatively diminished defense systems compared to other insects.[17] It seems reasonable to suggest that creative researchers should come up with a vaccine(s) to help bees develop stronger immune systems to ward off current and future viral threats. BC

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

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OZ Wants It All!

$50 Million /Year For Bees Should Do It Same Problems As The U.S.

Alan **Harman**

Australia's 9,600 beekeepers can be excused if they believe they died and went to heaven as they read a report from a parliamentary committee calling for ***A$50 million a year*** to be provided to the newly formed "Pollination Australia" for research into biosecurity threats and the future of the industry

Saying the country's food security could be compromised if the future of the honey bee and pollination industry is not supported, the Standing Committee on Primary Industries and Resources released its report, "More Than Honey: the future of the Australian honeybee and pollination industries," after an inquiry that began in March last year

The government committee backs its call for aid with 25 recommendations covering almost all aspects of the beleaguered industry The recommendations would create an industry beekeepers now can only dream about if they lived in a perfect world.

In its 16th recommendation, "The committee recommends the Australian government commit A$50 million per annum in pursuit of biosecurity measures and research in support of the Australian honey bee industry and pollination dependent industries."

The report notes the estimates of spending identified by the Commonwealth Scientific and Industrial Research Organization as appropriate to respond to the threat of *Varroa* of A$21 million to A$50 million a year.

"The committee believes that, given what is at stake, a research and border protection effort of A$50 million per annum in support of the honeybee industry and pollination dependent industries is a reasonable expectation, and that the Australian government should take the lead in organizing and funding this effort."

Committee chairman Dick Adams of the ruling Labor Party says protecting the industry from biosecurity threats and preparing it for the future is a significant undertaking.

"The committee believes there is greater scope still for the promotion of research extension and training for the Australian honey bee industry and related industries," he says.

"With this in view, the committee has recommended the government commit $50 million per annum in pursuit of biosecurity measures and research in support of the honey bee industry and pollination dependent industries; and the government use this money to establish a national center for honey bee and pollination industry research, training and extension."

Deputy chairman Alby Schultz, a member of the opposition Liberal Party, says the industry is very important to Australia's wider agricultural sector and must be supported.

"Taking into account all plant-based industries and wool, meat and dairy production it is estimated honey bees contribute directly to between A$4 billion and A$6 billion worth of agricultural production," she tells the Australian Broadcasting Corp.

Adams says if implemented the recommendations will provide resource security for the honeybee industry and pollination dependant industries.

In his forward to the committee report, he says the industry faces a number of significant threats and challenges.

"A major challenge is resource security," he says. "The honey bee industry is dependent upon native forest for honey production and recovery from pollination operations. As native forests are locked away in National Parks, so the floral resources available to the industry have declined and will continue to decline.

"Bushfires and land clearing also have a significant impact on the availability of floral resources. Without access to floral resources, the potential of the honeybee industry to grow to meet the demands for crop pollination is compromised."

This is especially important, he says, in the face of the biosecurity threats facing the industry, which have the potential to remove the pollination services provided by feral honey bees from the production cycle, making agricultural industries largely or wholly dependent upon managed bees.

Keeping such pests as *Varroa destructor* and diseases from Australia should be a priority for governments and industry, and investment in border security measures and research is vital.

"In this regard, Australia needs to lift its game," Adams says. "In particular, the committee strongly recommends the creation of a new honeybee quarantine facility and increased funding for the National Sentinel Hive Program."

The report says the industry is also being challenged by declining profitability in the honey production sector and the problems associated with modernizing an industry based on honey production to provide paid pollination services.

"Yet, for paid pollination services to be viable the honey production sector must also be viable," it says. "Import competition is having a significant impact upon returns to Australian producers - but much of this competition derives from low cost countries with poor quality control regimes.

"Australian exporters on the other hand often face a range of tariff and non-tariff barriers in accessing overseas markets. Clearly, there is no level playing field. In addition, lax labeling laws have allowed foreign honey to be 'rebadged', with serious implications for the reputation of Australian honey. These are issues that must be addressed."

Among the 25 recommendations, the committee wants the government to provide the leadership, funding and organizational resources to establish and run Pollination Australia.

It also says the government should fund research and training in the provision of paid pollination services and

pay for research into alternative pollinators.

The committee wants new labeling requirements for agricultural chemicals to reflect their impact on honey bees and other pollinating insects.

It says the federal, state and territory governments establish guidelines for beekeeper access to public lands and leasehold lands, including national parks, to secure the floral resources of the honeybee industry and pollination dependent industries.

In the committee's view, a critical challenge facing the honey bee industry is resource security Access to floral resources underpins the viability of the industry

"The committee therefore believes giving beekeepers access to public lands is essential to the future of the honey bee industry and pollination dependent industries," it says.

The committee recommends the government provide incentives for the planting and conservation of melliferous flora under federally funded revegetation projects and carbon credit schemes. It wants government-funded research into the impact of fire management on the honey bee industry to find industry friendly fire management practices.

It wants the National Sentinel Hive Program widened to all ports with sentinel and bait hives as well as an effective pre-border security program – all funded by Canberra.

The Australian Pesticides and Veterinary Medicines Authority should fast track the pre-registration of pesticides and other chemicals needed to combat a *Varroa* mite incursion.

The committee recommends the government improve the incursion response capacity by providing for better education of border protection workers; improved diagnostic capacity for pests and diseases; establishment of national diagnostic protocols; create a national integrated pest and disease management protocol; and establish a comprehensive biosecurity research program for the honey bee and pollination dependent industries.

It wants the establishment of a new honeybee quarantine facility as a matter of urgency, this facility to be commissioned prior to the planned closure of the present facility It calls for the facility to be integrated into a national honey bee and pollination research center with a containment laboratory for research on genomics and biotechnology·

It says an import risk analysis for drone semen should be completed by year's end.

It recommends the government, in conjunction with the states and territories, establish and fund a national endemic bee pest and diseases control program.

It wants the creation of bee biosecurity regions based on natural boundaries – Eastern Australia with New South Wales, Victoria, Queensland, Australian Capital Territory and South Australia; Tasmania; Western Australia, Northern Territory; and Kangaroo Island.

It wants a national system of registration for beekeepers, beehives and apiary sites.

Turning to economic and trade issues, the committee recommends the government ask the Australian Competition and Consumer Commission to investigate pricing practices for honey within the honey bee industry and the retail sector

It also wants the government's independent Productivity Commission to investigate the long-term viability of the honey bee industry in respect of industry organization, marketing structures and the financial viability of producers and packers.

The committee recommends the government develop product standards for honey and other bee products for food standards and chemical contamination in line with those in the European Union. It wants all imported honey products tested against this standard.

It also calls for the government to develop labeling standards to more accurately reflect the place of origin and composition of honey and honey bee products. There is also a proposal for the government to pursue a uniform international standard for the testing and labeling of honey bee products and the removal of all tariffs on honey bee products.

It also wants a reduction in Australian inspection charges, if possible, for queen and packaged bees to make their export more cost effective to producers.

Finally, the committee calls for the government to alter funding arrangements to allow for voluntary contributions to research funding to be matched by government funding.

The report says diversification is clearly the way forward. Multiple income streams will facilitate the growth to a more financially robust industry Commercial pollination has the potential to become the foundation of the industry, it says.

"It is clear from the evidence presented to the committee that the Australian honey bee industry, and the pollination industry more widely, faces significant and interrelated threats and challenges," it says.

The report, 15 months in the making, was originally requested by then Agriculture Minister Peter McGauran. With a change of government the inquiry lapsed, but was revived by new Agriculture Minister Tony Burke earlier this year. BC

LOCAVORES & LOCAL HONEY

Marketing To A New Breed Of Consumers

Lisa Amstutz

There has never been a better time to market local honey, thanks to a new and rapidly growing category of consumers, known as "locavores." Locavores are people who seek out foods grown in their own region or state. This movement gained a lot of converts in recent years as several best-selling authors chronicled their adventures in eating locally (see resources). One dictionary even designated the word "locavore" as its Word of the Year for 2007 (just beating out Colony Collapse Disorder). New farmers' markets are sprouting up – the USDA listed over 4500 active markets in 2007 – and locavores are scouring the countryside for locally grown food. So how can you, as a honey producer, capitalize on this trend and educate people about the benefits of buying your honey and other hive products?

Understanding some of the terminology and concerns of this group of consumers can help you make a sale, and hopefully a repeat customer Following are some talking points and marketing tips to help you promote your honey and related products to a locavore – and to anyone else who will listen!

Talking points

1 **Environmental sustainability** is a prime motivation for people to purchase local foods. In the United States, the average food travels at least 1500 miles from field to plate, guzzling a tremendous amount of oil for transport, temperature control, packaging and storage. As Steven L. Hopp put it, "A quick way to improve food-related fuel economy would be to buy a quart of motor oil and drink it."[1]

Many concerned consumers want to lessen their environmental impact by reducing the distance their food travels (food miles). Reducing food miles not only reduces our use of nonrenewable resources, it also reduces emissions that can cause smog, acid rain, and other environmental problems. Long-distance food is not environmentally sustainable. When you sell your honey, you may want to point out the short distance that your product has traveled compared to the jug of cheap, imported honey at the warehouse club or the bags of white sugar at the grocery store.

2. **Food safety** is another huge issue for concerned consumers. News reports about contaminated and adulterated foods are frighteningly common, and many consumers have lost faith in the ability of government regulations to protect them from unsafe products. There have been several honey recalls and warnings in recent years due to drug residues, pesticide residues, and adulteration with corn syrup, sugars, caramel coloring, and other substances. Much of the honey we import comes from countries with less stringent safety standards than our own.

By purchasing from you--a known, trusted source – customers can minimize their risk. They know what they are getting and the story behind it, provided you are willing to be open about your beekeeping practices.

3. Buying local foods supports **local economies** much more effectively than buying from chain stores. A London study found that each $18 spent at a local food business equaled $44 for the local area, as opposed to just $25 when the food was purchased at a supermarket.[2] Locavores are happy to see their food dollars supporting local families and businesses rather than fleeing the state in the pockets of multinational corporations.

4. Many people are concerned about the **working conditions of farm workers**, especially in developing countries. From this perspective, honey and other locally produced sweeteners have a huge advantage over cane sugar Sugar production has a long history of human rights abuses, some of which continue today In recent years, documented abuses among sugarcane companies have included child and/or slave labor in El Salvador, the Philippines and Brazil.[3,4] By choosing local, natural sweeteners, consumers can avoid contributing to such corrupt systems.

5. Some customers seek out local honey for **health reasons**. Local honey is a well-known folk remedy for seasonal allergies. The theory is that the small amounts of pollen present in the honey may act as an immune booster and prevent the immune system from overreacting when those same pollens are inhaled. The scientific evidence on this is somewhat inconclusive, but eating honey is generally a pleasant and harmless experiment for the allergy sufferer to try, and who knows – it just may help.

6. Many locavores want to know the stories behind their food, and want to make a **personal connection** with the people who grew it. They are tired of disconnection with their food supply, of unpronounceable ingredients and jet-setting vegetables. There is pleasure and value in knowing where each food on one's plate came from and the names and faces of those who have produced it. This

is particularly true for children, who seem otherwise prone to believing that food mysteriously reproduces itself on supermarket shelves.

Studies show that people have ten times more conversations at farmers' markets than they do at supermarkets, which may help explain the increasing popularity of farmers' markets.[5] People are hungry for a personal connection with their food – and you can give it to them!

Marketing your local honey

1 People who are seeking a personal connection with their food will like buying it directly from you, at a farmers' market, farm stand, etc. Next best would be a co-op, natural food store, or locally owned grocery store. Other options include restaurants, craft shows, and gift shops. If you have a large quantity of honey, you might even try a "green" chain like Whole Foods – some of these stores are moving toward locally sourced items.

2. Make sure your signs explain where your honey comes from and what is special about it. Terms like "Local Honey," or "Ohio Honey," will catch the eye of someone who is concerned about where his or her food comes from.

3. Use clean jars with attractive labeling/packaging. Be sure to list your location on the label, and a contact – phone, email or address. Giving your label some personality helps to give the locavore a sense of connection with your farm and the personal connection that they are looking for, and a way to get back to you!

Conclusion

Locavores are looking for environmentally and socially responsible foods that are healthful and that offer a sense of connection with the earth and the farmers who grew them. Your local honey and other hive products are a perfect fit. Now that you know it, make sure they do too! BC

Lisa Amstutz is a freelance marketing writer who seeks out her food at farm markets and stores near her home in Dalton, Ohio.

Resources

- Animal, Vegetable, Miracle by Barbara Kingsolver is the well-written memoir of one family's attempt to eat only locally grown foods for a year. Interwoven with their adventures are explanations and statistics about the advantages of eating locally.
- The Omnivore's Dilemma by Michael Pollan chronicles another grand food experiment. In this case, the author prepares four different kinds of meals, and follows each ingredient to its source.
- www.locavores.com. You can read more about the original locavores at this site.
- www.100milediet.org. A similar group, where participants endeavor to eat foods within a 100-mile radius of their homes.
- www.honeylocator.com. Honey producers may list their contact information on this site so that people searching for honey by state can locate them.
- www.localharvest.org. A broader site that lists farm products geographically to help connect people with local food sources.

Footnotes

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Rapid Screening For Viruses In Bee Samples

Jerry Bromenshenk

Thirty years ago, I learned that viruses could be identified based on their morphology. A state of the art electron microscope (EM) was used to photograph minute virus particles. From that image, the shape, size, and number of virus particles in a sample could be determined. For example, Bailey in the U.K. associated Sacbrood virus with a particle of 28-30 nanometers (nm). However, these identifications were laborious, requiring a very specialized microscope and a skilled observer

In 1983, the Cetus Corporation patented Polymerase Chain Reaction (PCR), a molecular technique that provided identifications based on fragments of genetic DNA or of RNA. PCR can be used for a wide array of biological samples. It works on very small sample sizes, since it produces copies of the source material by a process termed amplification.

With respect to viruses, PCR is able to both detect and to identify any virus for which the genomic sequence is known. However, PCR can't determine the amount of virus in the sample, determine viability, nor identify a virus for which the genetic sequence is unknown.

In 2002, Charles Wick of the U.S. Army Edgewood Chemical and Biological Center patented a method of counting submicron particles, especially viruses. He produced a rapid and highly precise instrument that once again bases virus identification on the shape, size, and number of particles, the same physical characteristics that I was taught to use years ago. However, his system, called the Integrated Virus Detection System (IVDS) is far superior in its speed, accuracy, and precision. The instrument, not an observer, identifies and counts the virus particles.

IVDS offers a means of rapidly screening samples for viruses. Its strength is its speed, low per sample cost, and the ability to identify the presence of any and all viruses, as well as to provide the concentration or titer of viruses in a sample.

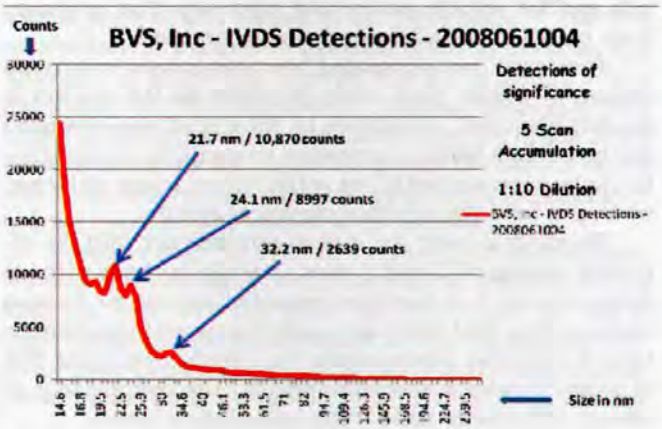
It does not provide the species name of the detected viruses. That requires an additional step, using more conventional approaches such as PCR, assuming that the virus has been sequenced and been named. However, IVDS does provide unique identifiers based on the specific sizes of the virus particles. Once matched up with a name, IVDS can subsequently provide the species name.

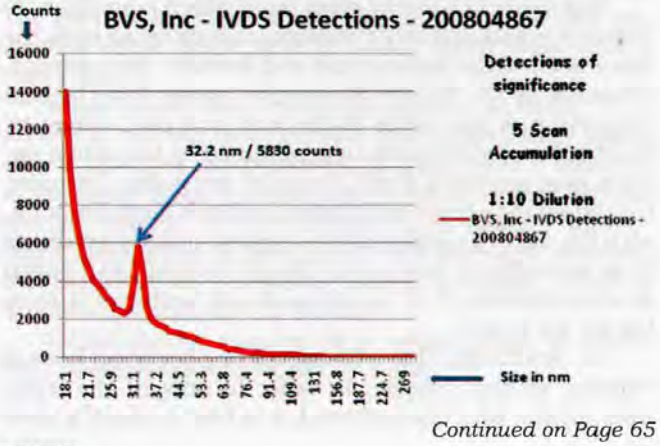
IVDS technology was introduced to the bee industry by Dr Charles Wick, Dave Wick, Colin Henderson, and myself in January at the National Bee Meeting in Sacramento, CA. Subsequently, Dave Wick purchased an IVDS instrument with funds raised by beekeepers, beekeeping associations, and bee research foundations.

On June 6th, 2008, Dave received a signed Patent License Agreement from the U.S. Army's Edgewood Chemical and Biological Center (ECBC) for use of the Integrated Virus Detection System (IVDS) by his business, BVS, Inc. Dave now has unrestricted rights to use IVDS for virus detection in bees and other environmental samples.

BVS's virus detection laboratory moved in next to Bee Alert this Spring. BVS has now been operational for six weeks, processing honey bee samples recently received from various beekeepers in California, Idaho, and Montana. To date 125 bee samples have been processed, and Dave has another – 375 samples in freezers, awaiting analysis. Overall, results are similar to previous work done by the Army ECBC laboratory, using IVDS to screen bee samples.

Some virus peaks (i.e. particles of specific nanometer size) seem to be fairly common in bees (e.g., 32.2 nanometers). The concentrations of any specific virus may vary from a low background to very high counts. Dave has detected a few viruses that occur in bees at very high concentrations. These high virus counts are unusual and are being investigated. Included in the list of viruses





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NATURAL REMEDIES - Part IV

Bee Bread, Beeswax, Mead & Royal Jelly

Abbas Edun

Beebread

A mixture of pollen, honey and a secretion of the bee's salivary gland is known as beebread or cerago.[1] The manufacture of this product in the hive is not fully understood. It is high in lactic acid (L.A.) and promotes healthy digestion, certanly a basis of good health. L.A. can also be converted into glucose, the main source of energy used throughout the body The mixture is exposed to lactic acid fermentation[2] and because of this, beebread is more highly absorbed by the human body than pure pollen. Lactic acid helps our body to strengthen the immune system, prevent the growth of fungus and is essential in maintaining beneficial micro flora in the digestive system. Lactic acid is used for glucose-glycogen synthesis in case of a very poor diet, i.e., one without starch or other carbohydrates. During fermentation, the level of lactic acid increases. This protects the pollen from being destroyed by the fermentation bacteria. The nutritional value of beebread is (a) much higher than air dried pollen because the beebread fermentation process preserves the original chemical composition of the pollen; and (b) similar to pure pollen but contains less proteins and fats and a higher level of acid and sugar

Beebread made artificially for the purpose of apitherapy[3] is an exceptionally nutritious mixture of pollen and honey somewhat similar to that which is made by the bees.

It is made in a sterile glass jar in which more than 20 different yeasts and other microorganisms break open the silica shell of the pollen grain and ferment the contents. Research by Dr Vetaley Stashenko[4] shows that the best proportion is two parts pollen and one part honey by weight. Excellent results were obtained by him when using a good quality of fresh, frozen or dry pollen. He notes that when moistened with honey, pollen's lactic bacteria, with the aid of its high protein content, quickly produces large amounts of lactic acid. The pH level of fresh pollen is approximately 7.2; in one-week-old beebread it is as low as 3.5 to 4.2.

Dr Stashenko states that preparing beebread is more efficient without oxygen. In order to prevent the latter from mixing with the beebread, it is best to place a layer of about a quarter to half an inch of honey on top of it. The jar should be covered tightly and the contents must not be stirred after the initial blending. After a period of fermentation for one to two weeks at 95°F, beebread should be stored in the refrigerator or freezer Theoretically, it can be in cold storage for as long as five years, although, with the passing of time, the amount of protein, sugar and other acids will decline. Therefore, it is best to make beebread in small quantities and consume it within a few days.

Beeswax

Worker bees produce wax for building their comb; it is made by modified epidermal cells which are located on the fourth to seventh segments on the inner sides of the abdominal sternites[5] and are concealed beneath overlapping wax mirrors on each segment. Beeswax is delivered as a liquid secretion of the four paired glands, collects on the wax mirrors and hardens into visible lamellae[6] which are removed by brushing the spines on the hind basitarsi past the mirrors.[7] The glands function best in 12- to 18-day-old bees, according to the needs of the colony Both pollen (protein) and honey (carbohydrate) are required to produce the wax.

The color of virgin beeswax, immediately after being secreted, elaborated and formed into comb, is white. It becomes darker with age in the combs as larval debris, silk and fat-soluble carotenoid pigments that originate from pollen, are inadvertently incorporated.[8]

Rendered, but untreated beeswax comes in various shades of yellow. Pure white beeswax on the market is usually bleached, sometimes by the use of non-chemical methods such as long exposure to sunlight or filtration by diatomaceous earth,[9] at other times using chlorine, hydrogen peroxide or other chemical agents.

Beeswax is inert, i.e. it does not interact with the digestive system at all and passes through the body without being altered. It is therefore regarded as safe for human consumption and has been approved as an ingredient in food in the USA. Honeycomb, i.e., fresh, new comb full of honey creates a special appeal for the connoisseur of honey; it has been called "the beekeeper's lunch."

Beeswax is one of the most time-honored natural ingredients. It has long been utilized as an excipient[10] in the manufacture of drugs for external use. In traditional Chinese medicine, it was used in cases of cardiodynia, detoxification, refractory ulcer, septicemia, and thermal injury; it was also employed where there was diarrhea, blood in the stool and a risk of miscarriage with vaginal bleeding.[11] Beeswax has also been used in the preparation of cold creams, lip glosses and pomades, and non-alcoholic stick colognes.

Its use in such preparations over the centuries is well documented.

Pharmaceutical companies have, when manufacturing some medicinal preparations, taken advantage of the characteristic that certain substances dissolved or encapsulated in beeswax may be slowly released. However, this attribute may cause a problem when the wax is stored near pesticides and toxic chemicals, or after treatment by means of various drugs in the hive. Any fat soluble toxins may be absorbed and then released at a later date when the wax is eaten, given to bees in the form of sheets of foundation or used in cosmetics.

Beeswax contains a significant quantity (approximately 40%) of long chain primary aliphatic alcohols in both the free and esterified forms. Such alcohols containing 24 to 34 carbon atoms have been found to be beneficial in treating hypercholesterolemia.[12]

Some brands of dental floss are laminated with beeswax. Flossing is an essential part of our daily oral hygiene. Gum disease may result from the accumulation of plaque. It is a sticky, gel-like bacterial substance that forms in the interproximal areas (spaces between the teeth), as well as on the surface below the gum line. If plaque is not removed, it hardens and becomes tartar. If the latter is allowed to accumulate, gingivitis, or an inflammation of the gums, may result. Eventually, teeth are lost. Flossing removes plaque as well as bits of food from the teeth.

According to two recent studies,[13] there is evidence that the amount of bacteria in subgingival plaque, the deep one in periodontal pockets and around the teeth, may contribute to an individual's risk of a heart attack.

Floss is believed to have been used by some ancient civilizations. Archaeologists think that grooves in the teeth of certain prehistoric skulls were caused by the use of some kind of flossing material. Such material has been found in the teeth of human skeletons, dating back far as 3500 B.C. More recently, Levi Spear Parmly, [14] a New Orleans dentist, is credited as being the originator of modern dental floss. He promoted the flossing of teeth with a piece of silk thread in his 1819 book. [15] The first commercial silk floss was manufactured by Codman and Shurtleft of Randolph, Massachusetts in 1882; it was not waxed. In 1896, Johnson & Johnson made their own brand of silk dental floss. Because the supply of silk to the US was cut off by the Japanese during the second World War, floss was being made of strong thin nylon filaments twisted together and coated with beeswax.

Beeswax may be used for removing unwanted hair Waxing is a method of semi-permanent removal of hair from the root. New hairs will not grow again for two to eight weeks in previously waxed areas. Almost any part of the body can be waxed, including the abdomen, arms, back, bikini area, eyebrows, face, feet and legs. If waxing is done regularly for several years, permanent hair reduction may be achieved.

Some apple orchardists and manufacturers of candy use beeswax to coat their products in order to lock in the flavor Of course it is also used to make candles.

Mead

Mead is made by fermenting honey and water with wild yeasts. It is the oldest alcoholic drink known to man. Research shows that China has a history of fermented beverages as long as, or longer than anyone else. Chemical analysis of pottery shards found in Jiahu support the suggestion that the jars from which they were made contained a fermented mixture of honey, rice and grape or hawthorn fruit. [16] This concoction was being produced as early as 9,000 years ago, about the same time that grape wine and barley beer were beginning to be made in the Middle East. Scientists from the University of Pennsylvania, including its archaeochemist, Dr Patrick McGovern, thought that the beverage was fermented by the process of mold saccharification.[17]

Archaeochemistry is the combination of archaeology with chemistry. An archaeochemist deals with processes, objects, technical installations, even plants.

Until the late middle ages mead was a very popular beverage, especially in the northern regions of Europe, where it was difficult to cultivate grapes. During the 15th century, the production of mead was governed by guilds, the largest of which was the Free Brewers of London; it controlled all aspects of brewing ale, mead and wine. The guilds not only controlled the manufacture of those products but also their distribution and the laws governing the quantity when they were dispensed. As the production of sugar increased later that century, mead was gradually replaced by cheaper beers and ales and to a lesser extent by imported wines. Mead then became a drink of the socially lower classes. Nevertheless, it was always consumed for its medicinal value and was even prescribed for royalty.

Mead was the weakest of a number of honey derived beverages, collectively known as meth or hydromel. The strongest was metheglin,[18] a one-time favorite of the first Queen Elizabeth.[19] That drink was of such importance to the Royal Court that mead makers in Wales were immune from all prosecution while making it – they could, literally, get away with murder!

Mead is usually clear, with an alcohol content which fluctuates between seven and 20%. A wide assortment may be produced by varying the amount of honey and water and the time at which fermentation is stopped. The types range from a very light and dry one like traditional white grape wine to sweet desert wine with a heavy body

Mead made with other ingredients is called by a variety of names: cyser is made with apple cider, morat with mulberries and pyment with grape juice.[20] Melomel is the name given to mead which contains rose hips or crushed fruits such as blackcurrant, strawberry or raspberry. In addition to being used as a beverage, melomel was employed as a means of food preservation, keeping Summer produce for the Winter

Hippocras (or ypocras) is a cordial made of spiced wine, sweetened with honey or sugar

Propolis

Honey bees gather resin from the buds and bark of birches, poplars, pines and other trees. They chew it and add saliva and some other substances. The finished product is called propolis.[21] It is of the utmost importance for the survival of the colony. Not only does it protect the bees from disease, but also from climatic changes, such as wind and cold.

While the use of propolis is only now being rediscoved, its usefulness can be traced back to the time of Hippocrates, [22] who used it in the healing of sores and ulcers, both internally and externally. Through the ages historical documents record its use. The "Complete Herbal" by Nicholas Culpeper junior[23] makes reference to ointments made of propolis for inflammation and fever The book contains a rich store of herbal knowledge. In the Second World War,[24] propolis was used by the Soviets to treat their wounded soldiers. It is an excellent natural antibiotic and immune system booster with no side effects. It is marketed by health food stores for its claimed beneficial effect on human health.

Natural medicine practitioners often utilize propolis for the relief of various conditions, including inflammations, viral diseases, ulcers, superficial burns or scalds. Some such therapies are based on traditional Chinese medicine, ayurveda or homeopathy.[25] Propolis is also believed to promote heart health and reduce the chances of cataracts; Brazilian propolis may help to fight colon cancer.[26]

Old beekeepers recommend keeping a piece of it in the mouth as a remedy for a sore throat. Lozenges made of propolis are sold in France. Though claims have been made for its use in treating allergies, propolis may cause severe allergic reactions if the user is sensitive to bees or products of the hive.

Depending upon its precise composition, propolis may show powerful local antibiotic and antifungal properties. Studies indicate that it may be effective in treating canker sores and skin burns; it also exhibits immunomodulatory effects.[27] Propolis has attracted the attention of the dental community. In-vitro, animal and clinical studies suggest that propolis has a protective effect against caries and gingivitis. Its use in canal debridement for endodontic procedures has been explored in Brazil.

Royal jelly

Royal jelly (R.J.) is secreted by two exocrine glands in the heads of nurse bees. [28] It consists of a white, lipid-rich secretion of the bee's mandibular glands, and a clear, protinaceous one from the hypopharyngeal glands.[29] All of the larvae of Apis mellifera are fed royal jelly for the first three days of their lives. From the fourth day onwards, those of the drones and workers are fed beebread instead, while larvae with a royalty destiny continue to be fed solely on royal jelly. Thus, the development of a fertilized bee egg into a queen or worker is simply a matter of differing nutrition. Scientists still do not quite understand how this occurs; perhaps it is because R.J. has more sugar than, and a different vitamin content from that of beebread.

R.J. is a very complex substance. Scientists have not yet been able to completely identify and isolate all of its important constituents. However, chemical analysis shows that it is exceptionally rich in natural hormones and has an abundance of the B vitamins including biotin, folic acid, inositol, niacin, pantothenic acid, pyridoxine, riboflavin and thiamine. It also contains vitamins A, C, and E, along with 20 amino acids. R.J. is a highly concentrated source of rich proteins, including arginine, cystine and lysine. It contains important fatty acids, phosphorus compounds and sterols. It provides acetylcholine which is important for the transmission of nerve messages and assists in the production of glandular secretions.

R.J. is full of nucleic acids, including deoxyribonucleic acid (DNA) and ribonucleic acid. The former contains the genetic instructions used in the development and functioning of all known living organisms. The latter plays several important biological roles, including many processes involving translation of genetic information from DNA into proteins. R.J. also contains decanoic acid, which provides strong antibiotic activity against many bacterial and fungal infestations. Scientists explain that If R.J. did not have this built-in antibiotic factor, its nutritive richness would provide an excellent growing medium for all kinds of harmful microbes.

Gelatin, which is derived from collagen, is another component of R.J. Collagen is the major structural protein found in the skin and bones of all animals. It is a powerful anti-aging element that keeps us youthful.

Although R.J. has been traditionally used to prolong youthfulness and improve the beauty of the skin, there is evidence that it bolsters the immune system, increases energy and alleviates anxiety, loss of memory, moodiness and sleeplessness. Researchers at Valhalla, New York, have found that R.J. stimulates glands and normalizes the reproductive systems of both men and women and acts as a natural hormone. According to Rita Elkins,[30] R.J may also be used for anemia, arteriosclerosis, coronary artery disease, atherosclerosis, arthritis, asthma, bladder infections, high blood pressure, broken or weak bones, cancer, high cholesterol levels, depression, diabetes, endocrine system disorders, eczema, weak or tired eyes, chronic fatigue, retarded growth, hormonal imbalances, impetigo, impotence, immune system stimulant, infertility, inflammation, liver ailments, malnutrition, menopause related symptoms, mental exhaustion, mononucleosis, panic attacks, Parkinson's disease, ulcers, viral infections, weight control and the healing of wounds. BC

References:

[1]Derived from the Latin "cera" meaning wax.

[2]A form of anaerobic respiration that has a glucose-consuming catabolic pathway and is used by both bacteria and animals to produce adenosine 5'-triphosphate (ATP) in the absence of oxygen. Lactic acid fermentation breaks down a glucose molecule into two molecules of lactate, which combines with hydrogen ions to form L.A., a syrupy, colorless fluid, soluble in water, with an intensely sour taste and strong acid reaction.

[3]Coe, Priscilla. September 2007 Beebread in Apitherapy. *J. Am. Api. Soc.* Vol. 14, No. 3. See also the January 2008 Newsletter of the Mt. Diablo Beekeepers Association. It is uncertain how long the word "apitherapy" has been in use or who conceived it. It is derived from the words *apis* (Latin) and *therapeuein* (Greek). The former means bee and the latter a method to treat humans or animals for different diseases.

[4]Ph.D., N.D., he is a native of Kiev, the capital and largest city of Ukraine, located in the north central part of the country on the Dnieper River. He trained as an apiculturist and taught at the National Agricultural University in Kiev. Dr. Vetaley later became a naturopath and now teaches Anatomy at South University and Palm Beach College in Florida, where he lives. He also lectures internationally on apitherapy, the therapeutic use of products of the hive. He serves as a Board member of the American Apitherapy Society Inc.

[5]The ventral shields or plates of each segment of the body of an insect or other arthropod.

[6]Thin plate-like structures adjacent to one another, with open space or fluid in-between.

[7]See Winston, Mark L. 1987 The Biology of the Honey Bee, p. 36. The fol-

lowing references are cited by him: Casteel, Dana Brackenridge. 1912. The Manipulation of the Wax Scales of the Honey Bee, *Circ. U.S.D.A., Bur. Entomol.* 161:1-13; Rösch, G.A. 1927. Über die Bautätigkeit im Bienenvolk und das Alter der Baubienen. *Z. vergl. Physiol.* 6:264-298 [translation: Building of comb in the beehive and the age of the construction workers]. Basitarsi are the basal segment of the tarsus in arthropods.

[8]Vansell G.H. & C.S. Bisson. 1935. Origin of Color in Western Beeswax. *J. Econ. Entomol.* 28:1001-1002; Freudenstein H. (1961) Beobachtungen über die Färbung der Waben durch die Honigbiene. *Zool. Beitr.* (Berlin) 7: 311-319 [translation: Observations on the colouring of combs by the honey bee]; Tischer J. (1962) Über die Herkunft der gelben Farbstoffe des Bienenwachses. *Hoppe-Seyl. Z. Physiol. Chem.* 267: 14-22 [translation: On the origin of the yellow coloring materials of beeswax].

[9]Fossilized remains of diatoms, a type of hard-shelled algae. It is a naturally occurring, soft, chalk-like sedimentary rock that is easily ground into a fine whitish powder which has an abrasive feel, similar to pumice powder. The typical chemical composition of diatomaceous earth is 86% silica, 5% sodium, 3% magnesium and 2% iron. It is very light because of its high porosity and is used, inter alia, as a filtration aid.

[10]An inactive substance used as a carrier for the active ingredients of a medication. In many cases, an active substance (e.g. aspirin) may not be easily administered and absorbed by the human body; in such cases the substance in question may be dissolved into or mixed with an excipient. Beeswax is the thickening agent used to convert an herbal oil into an ointment. Unlike mineral oil, which forms a greasy film, it leaves a protective network on the surface of the skin; it is an emollient and is also thought to be mildly antioxidant.

[11]See *Zhong Yao Da Ci Dian.* [in English: A Dictionary of Chinese Materia Medica]. Science and Technology Press, Shanghai, 1986, p. 2581. Cardiodynia, also known as cardialgia, is a localized pain in, or close to the heart. Detoxification is the removal of toxic substances from biological fluids of the body. In conventional medicine, it may be achieved artificially by the use of a dialysis machine, or, in a very limited number of cases, chelation therapy. A refractory or intractable ulcer is an ulcer which fails to heal completely after eight to 12 weeks, despite appropriate treatment with a modern anti-ulcer therapy in a compliant patient. Undiagnosed or persistent Helicobacter pylori infection and surreptitious or unrecognized NSAID use are the most common causes of refractory peptic ulcers. Septicemia is the presence of bacteremia (bacteria in the blood) and is often associated with severe disease. It can arise from infections in the lungs, abdomen, and urinary tract, and is a serious, life-threatening infection that becomes worse very quickly. Thermal injury may be caused by flames, contact with a hot surface, steam, hot liquids or electricity. Diarrhea is an increase in the frequency of bowel movements or a decrease in the form (greater looseness) of stool. Although changes in frequency of bowel movements and looseness of stool can vary independently of each other, changes usually occur in both.

[12]*See Jackson Michael A., and Fred J. Eller. April 2006. Isolation of long-chain aliphatic alcohols from beeswax using lipase-catalyzed methanolysis in supercritical carbon dioxide. J. Supercritical Fluids. 37(2):173-177. The term "aliphatic" is derived from the Greek word aleiphar which means oil or fat. In organic chemistry, compounds composed of carbon and hydrogen can be divided into two classes: (a) aromatic, and (b) aliphatic. The former contain benzene and other similar substances while the latter do not. See International Union of Pure and Applied Chemistry (1995). "Aliphatic compounds" Compendium of Chemical Terminology Internet edition. Hypercholesterolemia is a disorder that is characterized by an extremely high concentration of cholesterol in the blood and cells. It is not a disease but a metabolic derangement that can be secondary to many diseases and can contribute to many forms of them, most notably cardiovascular ones.*

[13]Doğan, Ba°ak & Eralp Buduneli. May 2005. *Characteristics of Periodontal Microflora in Acute Myocardial Infarction.* J. Perio. 76(5):740-748; Fiehn, Nils-Erik and Tove Larsen. *Identification of Periodontal Pathogens in Atherosclerotic Vessels.* J. Perio. 76(5):731-736.

[14]He was born on July 29th, 1790 in Braintree, Vermont and died on July 8th, 1859 in Versailles, France. A member of a prominent family of dentists, he first practiced in New York City but later moved to New Orleans.

[15]*A Practical Guide to the Management of the Teeth.* See also *Guide to Sound Teeth* by Shearjashub Spooner (1809-1859).

[16]See *Proc. Natl. Acad. Sci.* USA, 101, 17593 (2004). Jiahu was the site of a Neolithic Yellow River settlement in the central plains of ancient China, Henan Province. It dates to sometime between 7000 and 6600 B.C.

[17]The process of breaking a complex carbohydrate such as starch or cellulose into its monosaccharide components is known as saccharification.

[18]Defined by the Oxford English Dictionary as "a spiced or medicated variety of mead, originally peculiar to Wales." See Renfrow, Cindy. 1994. *A Sip Through Time: A Collection of Old Brewing Recipes.* Metheglin may contain either spices, e.g., cloves, cinnamon or nutmeg, or herbs such as chamomile, lavender or oregano.

[19]The sixth and last monarch of the Tudor dynasty, she was born on September 7 1533 and became Queen of England and Ireland on November 17,1558. The reign lasted until her death on March 24, 1603. This daughter of Henry VIII and Anne Boleyn was also known as The Virgin Queen, Gloriana or Good Queen Bess.

[20]The Celts were making payment long before the Romans started fermenting their Falnerian.

[21]Derived from the Greek words, "pro," meaning "in defense of" and "polis" meaning "city."

[22]Circa 460 370 B.C., considered to be one of the most outstanding figures in his field. He was revered as the father of medicine in recognition of his lasting contribution as the founder of the school which is named for him. This intellectual school revolutionized medicine in ancient Greece, establishing it as a discipline distinct from other fields (notably theurgy and philosophy) with which it had been traditionally associated. He is commonly portrayed as the paragon of the ancient physician and is credited with greatly advancing the systematic study of clinical medicine, summing up the medical knowledge of previous schools, and prescribing practices for physicians through the Hippocratic Oath and other works.

[23]The English astrologer, botanist, herbalist and physician. His life is notable both for its brevity and for personal tragedies. His father, the Reverend Nicholas Culpeper, died 13 days before his birth on October 18th, 1616. He was in love with his childhood.sweetheart, the heiress Judith Rivers. However, her coach was struck by lightning and she was killed while on the way to marry him. He died on January 10th 1654 at the age of 37 shortly after completing "The English Physitian."

[24]A global military conflict, the joining of what had initially been two separate ones. The first began in Asia in 1937 as the Second Sino-Japanese War; the other began in Europe with the German invasion of Poland two years later. The war split the majority of the world's nations into opposing military alliances: the Allies and the Axis powers. The Allies were victorious, and, as a result, the Soviet Union and the United States emerged as the world's leading superpowers. The United Nations was formed in the hope of preventing another such conflict.

[25]Ayurvedic medicine is an ancient system of health care that is very common in India, Nepal, and Sri Lanka and is used by millions of people. It is also gaining popularity in the west. The word "ayurveda" is a Sanskrit tatpurusha compound of the words ayus meaning "life principle," or "long life" and veda, which refers to a system of "knowledge." The term "homeopathy" is derived from the Greek words hómoios (similar) and pathos (suffering or disease). It was coined by Samuel Hahnemann (1755–1843), a German physician, and first appeared in print in 1807, although he began outlining his theories of "medical similars" in a series of articles and monographs in 1796. Homeopathy is a safe and effective system of natural healing that has been verified experimentally and clinically in the everyday lives of millions of people around the world for over 200 years. It is based on the principle that 'like cures like'. If a substance can cause symptoms in a healthy person, then it can also treat and remove similar symptoms in a sick person. The Lancet and the British Medical Journal have confirmed homeopathy's effectiveness.

[26]See Kumazawa, Shigenori and Masahiro Yoneda. 2003. Direct Evidence for the Plant Origin of Brazilian Propolis by the Observation of Honeybee Behavior and Phytochemical Analysis. *Chem. Pharm. Bull.* 51:740-742.

[27]An immunomodulator is a drug capable of modifying or regulating one or more functions of the immune system. There are two types of such drugs based on their effects: immunosuppressants and immunostimulators.

[28]For the first few days of their lives, workers are nurse bees. The queen lays eggs in the cells of the honeycomb and the nurses care for the developing larvae and regurgitate food to them. Exocrine glands are those from which secretions pass into a system of ducts that lead ultimately to the exterior of the body.

[29]The hypopharynx (or laryngopharynx) is the bottom part of the pharynx; it is the part of the throat that connects to the esophagus.

[30] *Healing from the Hive: Royal Jelly, Bee Pollen, Propolis and Honey.* Woodland Health Series. This 58-page book provides valuable information on those four incredible products. It is a fascinating look at their history, nutritional content, benefits and the medical research which has been conducted.

USING SCREENED BOTTOM BOARDS

Besides helping with mites, the screened bottom board seems to improve the air circulation within the hive, helping to keep the hive cooler in the Summer and assisting the bees in controlling the humidity levels and removing moisture from the hive which is essential for Winter survival in cold climates.

Ross Conrad

Varroa Mites. After first being identified within the United States in 1987, they quickly multiplied and spread out across America to become the biggest challenge U.S. beekeepers face today The initial response from the beekeeping industry was to follow the same path other agricultural commodity groups had trod, and turn to chemicals to control these damaging pests. History has proven however, that whenever we use chemicals to control insect pests, the insects always develop resistance to the chemicals forcing us to use larger doses of insecticide, or resort to chemical alternatives that attack the target organism differently and are often more toxic. History simply repeated itself when the use of Apistan (fluvalinate) quickly led to fluvalinate resistant mites, ushering in Checkmite+ (coumaphos, an active ingredient in VX nerve gas) which *Varroa* also began to tolerate, thus leading to the latest chemical panacea to be (maybe) promoted: Hivastan (fenpyroximate). Rather than continue on this chemical treadmill, there are numerous non-toxic alternatives that are available that offer longer-term solutions for healthy hives.

The Screened Bottom Board

The use of chemicals to control *Varroa* create opportunities for human exposure during application, along with contamination of the beeswax that can lead to chemical residues and their breakdown products in honey and pollen. These contaminants end up having sub-lethal effects on the bees. Then there are the synergistic effects that occur when two or more chemicals combine to form potentially more lethal and toxic compounds. Every cloud has its silver lining however, so the saying goes, and this can be applied to the use of toxic chemicals to control mites in bee hives.

During the initial studies on chemical controls for *Varroa*, researchers needed to be able to monitor the number of mites that died following the introduction of various test chemicals into the hive. They came up with the idea of placing a screen on the bottom of the hive so the mites killed off by the chemical treatment would fall to the bottom of the hive, pass through the screen and be captured for counting later, thus providing a means for evaluating the effectiveness of each chemical tested. During the various trials, control hives were maintained. While these hives did not receive a dose of the acaracide, they were still outfitted with a screened bottom board and treated the same in every other way as the test hives in order to reduce as many variables as possible between the various hives. Researchers found that mites fell to the bottom of the control hives as well, though typically not in as high a number as in the hives that received the various compounds being studied. This led to the observation that during the course of the year,

'These hives have been outfitted with screened bottom boards that are open to the ground. The screens are not closed up in the winter and are left open year around for improved air circulation.

Dusting the bees with powdered sugar is becoming a common method of increasing the number of mites that are removed from the hive by a screened bottom and is being used as the sole source of mite control by a growing number of beekeepers.

anywhere from 10-25 percent of the mites in a hive will normally lose their grip and fall to the bottom of a hive. If the hive is outfitted with a screened bottom, the mites can be effectively removed from the colony permanently This is because once the mites are approximately one and a half-to-two inches away from where the bees are located, they have trouble sensing where the bees are and have difficulty making their way back to the brood nest area.

The screened bottom can be an invaluable tool in helping the beekeeper to determine the level of mite infestation in a hive. By monitoring the number of mites that normally fall to the bottom of the hive during a given length of time, educated estimates can be made about the hive's overall *Varroa* mite population level and treatments can be applied at the most appropriate time to prevent the population from overwhelming the colony and precipitating a collapse.

Even without the use of treatments, or the monitoring of daily mite fall, the installation of a screened bottom on your hives will facilitate the removal of a small percentage of mites year-around without any additional effort on your part. In the long-run, a screened bottom is the most efficient way to remove mites from a hive in terms of time, labor and expense, when compared to all other control methods with the exception of natural tolerance by the bees themselves. Due to the spread of *Varroa* mites throughout North America, I am of the opinion that a screened bottom should become standard equipment on all managed honey bee colonies in the United Sates.

The Evolution of the Screened Bottom

The first screened bottoms that were created placed a screen on top of the solid conventional wooded bottom board so that the surface of the screen sat about an inch and a half or more away from the surface of the bottom board below. The screen in effect became the bottom of the hive for the bees. The former space that was used by the bees as the entrance to the hive just above the wooden bottom board had to be blocked off so the bees wouldn't confuse their old entrance immediately above the solid bottom with the new entrance that now existed between the screen and the first brood box. Alternatively, the bottom board can be turned around so the opening between the wooden bottom and the screen is located in the back of the hive and the bees will not confuse it with their entrance. A catch tray can then be set on the bottom board beneath the screen. Such trays are often coated with adhesive glue, or a thin layer of petroleum jelly, or oil. This ensures that mites that land on the catch tray will become stuck after falling through the screen, removing any chance that they will somehow be able to find their way back into the hive. This also makes it easier to handle the board when counting the number of mites that have fallen through the screen in an effort to evaluate the population level of *Varroa* within the colony

Unfortunately, along with mites from the hive above, the solid wood bottom or the catch tray below the screened bottom tends to also accumulate wax and other hive debris. This requires regular cleaning otherwise wax moths, hive beetles, ants and other critters will be attracted to the area. The additional equipment (bottom board screen and closure for the false entrance), the additional labor involved in cleaning out the area between the screen and the wooden bottom board, and the fact that the space below the hive became an attractive home for wax worms and other insects prompted me to experiment with removing the solid bottom board altogether Today all of my hives are now outfitted with a screen open to the ground beneath the colony

There are a number of benefits to eliminating the solid wooden floor at the bottom of the hive and replacing it with a screen aside from not having to clean out the area between the screen and the wooden bottom on a regular basis. You are able to reduce the pieces of equipment each hive requires by two so you have less stuff to purchase, assemble, maintain and store. Additionally, and perhaps most importantly, the screened bottom board seems to improve the air circulation within the hive, helping to keep the hive cooler in the Summer and assisting the bees in controlling the humidity levels and removing moisture from the hive which is essential for Winter survival in cold climates.

To create screened bottom boards, I simply cut out the center of my existing bottom boards and stapled a piece of one-eighth-inch hardware cloth, available at the local hardware store, over the opening. Now that the bottom of the hive consists of a screen, mites and

hive debris that fall to the bottom of the colony will fall through the screen and land on the ground below. Initially I was concerned about how the hives would survive the Winter with a screen for a floor in their hive. However, I have found that opening up the bottom of the hive, as opposed to reducing the openings during the Winter months as is often done in northern climates, does not seem to adversely affect each colony's ability to survive during the long, cold Vermont Winters. Logically one might worry about the possibility of increased winter kill due to the increased draft the screen bottom would create. However, these concerns are based on anthropomorphic thinking and seem to be quite unfounded. Unlike our Winter homes, which must be tightly sealed and heated to keep us comfortable, the bees build their Winter accommodations with their bodies by creating a cluster By snuggling together and using their body heat to warm one another during cold weather, the bees are able to regulate the temperature of the living space that they occupy, the cluster, and the rest of the hive is left unheated. As a result, the bees don't seem to have much regard for the size of the opening built into the floor that surrounds them.

I have even heard reports of beekeepers who have removed the bottom of their hives altogether Unfortunately, this may not be a practical solution if you intend to transport your colonies to other locations, or if you live in an area where predatory insects or animals sometimes try to help themselves to the contents of your hives.

Increasing the Screened Bottom Board's Effectiveness

The relatively small percentage of mites removed during the course of the year by a screen located at the bottom of the hive is typically not enough to prevent the *Varroa* population from growing to the point where it overwhelms our colonies of European honey bees and causes the hives to collapse within the first 12-24 months. However, there are ways to dramatically increase the mite removing effectiveness of the screened bottom and screened bottom boards so that they can be used as the sole method of keeping the mite population in check. The most common method is to dust a hive of bees outfitted with a screened bottom with powdered confectioners sugar This approach is sometimes called the Dowda method, named after Florida Bee Inspector, Tom Dowda, who pioneered this technique. By sprinkling powdered sugar all over the bees, the sugar particles interfere with the mite's ability to grip with their feet, making them more likely to lose their footing. In addition, the bees themselves don't particularly like to be covered with powdered sugar, so they groom themselves in an effort to clean themselves off and are likely to dislodge mites in the process. Once the *Varroa* have fallen through the screen at the bottom of the hive, they are removed from the colony.

This technique only effects the mites that are on the bees in the hive at the time of the treatment. It does not effect *Varroa* that are reproducing inside brood cells, or the mites that are hitching a ride on foragers in the field. Thus, in order to effectively reduce mite levels to the point where they cease to be a significant source of stress on the health of the hive, several dusting treatments are required. It is a good idea to repeat treatments at least four-to-five times and stagger them about seven to 10 days apart in order to get the desired results. A number of beekeepers in Florida report keeping their *Varroa* infested colonies alive and well for many years in a row using no other mite control method other than dusting with powdered sugar combined with a screened bottom board.

Unless you are using 100 percent pure powdered sugar the Dowda method should only be used during the Spring, Summer and early Autumn. This is because the bees are likely to use the powdered sugar as a minor food source and most brands of confectionery sugar available have corn starch added as an anti-caking agent. The bees are unable to digest the corn starch and this can lead to dysentery issues in cool climates should the bees start to cluster and are not able to make regular cleansing flights. In addition, sugar dusting should not be done when honey supers on a colony so that the harvest of pure honey is not contaminated with honey made from the confectioners sugar

While some folks recommend a quarter cup of sugar as the "ideal" dosage, the quantity of sugar used should match the population of the hive. It takes less sugar to cover the bees in a weak hive than it will to dust the bees in a strong hive containing tens of thousands of individuals. Whether you are treating a strong or weak colony, this approach to mite control is labor intensive. To reduce the time it takes to treat each hive, one can simply remove the inner cover, and just dust the hive body on top, allowing the powder to fall down between the frames and reach the bees in the lower hive body(s) at the same time. When treating a few colonies, a sugar shaker can be make by drilling some holes in the cover of a five pound honey jar. For those with a larger number of hives to deal with, California beekeeper Randy Oliver promotes the idea of making a screen to fit over the top hive body, dumping your ¼ cup or so of sugar on the screen, and then using a bee brush to break up the clumps and brush the sugar down through the screen. Remove the screen and a quick flick of the brush will knock any sugar sitting on the top bars down between the frames. Randy reports that using a screen allows him to treat each hive in about 15 seconds.

In the end however we have to remember that the screened bottom or screened bottom board, with or without the use of dusting with an inert powder like sugar is just another crutch. A temporary solution to help buy time for our bees. Time the honey bee needs to evolve where it can co-exist with the *Varroa* mite without the beekeeper's constant intervention. BC

Ross Conrad is the author of Natural Beekeeping: Organic Approaches To Modern Apiculture *published by Chelsea Green.*

All The Buzzz in...

Send me some of your writing or art and be a part of a prize drawing.

Hello Friends,

It's my birthday month! Everyone who has sent me something over the year will have a chance to win a prize. You have until the end of September to be in the drawing.

Your Friend,

Bee B. Queen

Addie Griffith, age 6, MI

Hannah Hayes, age 8, MI

The Big 500

Ana Walrod, age 11, from Mississippi is our 500th Bee Buddy! She received a copy of the book *Kendal the Baker Bee* by John A. Hartigan. Congratulations!

Samian Schmilski, age 9, WA

What do you get when you cross a bee with a seagull?

A beagle

Phillip, age 9, TX

Word for the Day

Apiary – a place where beehives of honey bees are kept. It's also known as the bee yard.

Recently archeologists have discovered an apiary in Israel believed to be around 3,000 years old.

Beehives, Bee Homes

The Wild Bunch

Bees in the wild make their homes in trees, in the wall of a house, in water meters or under stacks of wood. You get the picture. Bees can make a home about anywhere.

75% of the beekeepers around the world use the Langstroth hive.

Utah is known as the beehive state.

In the Old Days

Years ago beehives were much different than the hives we have today. There were three basic styles of traditional beehives. Skeps were baskets made from grass or straw coils. Tile hives where made of clay tubes. Bee gums were made from a hollow tree or log.

Fifty years ago there were about 5 million colonies of bees in the U.S. Today there are about half that many at 2.5 million.

Modern Hives

There are two kinds of hives that we use today – the Langstroth hive and the top bar hive. Most people use the Langstroth hive named after the inventor Rev. Lorenzo Langstroth.

Back in the 1960's there was a hairdo called the beehive.

www.hairarchives.com

Swift, Author - Trapp, nun, - Powell, boy scouts - Jefferson, president - Aristotle, philosopher - Fonda, movies - Tolstoy, Russian - Hippocrates, doctor - Washington, Mt. Vernon

... Bee kid's corner

Produced by Kim Lehman -www.beeladyprograms.com
www.beeculture.com
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And You're a Beekeeper Too?

These folks were all beekeepers but they are better known for other things. Can you match the person to their description?

Jonathan Swift	Founder of the Boy Scouts in England
Maria von Trapp	Mt. Vernon was his home and his face is on the one-dollar bill.
Lord Baden Powell	Russian author who wrote the book War and Peace.
Thomas Jefferson	Greek philosopher, scientist, author, and teacher.
Aristotle	Author who wrote the book Gulliver's Travels.
Henry Fonda	The real life nun and governess portrayed in the film *Sound of Music.*
Leo Tolstoy	Greek doctor, is considered the father of medicine.
Hippocrates	He was a president, horticulturist, architect, author, and inventor.
George Washington	A movie star in over 96 films and earned an Eagle Scout badge for beekeeping.

Old Timey Bee Hive

Make a skep by rolling play dough into a "snake". Start at the bottom by making a circle then gradually coil the dough so it gets smaller and smaller at the top. Make the bees by wrapping chenille sticks into a ball. Poke the end of the chenille stick into the hive. Let dry.

Made by Rianna Henson, age 9, TX

Play Dough Recipe

Mix 1 cup flour and 3/8 cup salt in a medium bowl. Pour in 3/8 cup hot tap water and stir well. Add food coloring and knead for about 5 minutes on a floured board.

Ask a Biologist

Arizona State University features a great website called "Ask a Biologist." You will find excellent podcasts including one about the bee genome. Another podcast called "Bee Movie Maker" talks about how bees sense and communicate.

http://askabiologist.asu.edu/

Beekeeping Bee Buddy

My name is Samian Schmilski. I am nine years old. My father started to keep bees three years ago. We are six children and are home schooled so that gives us an opportunity to work with our daddy. I like to light his puffer. After my daddy, I'm the second most stung person in our family. I would like to become a beekeeper some day.

Beecome a Bee Buddy

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

Name: _____

Address: _____

City, State, Zip Code _____

Age: _____ Birthday: _____

E-mail (optional) _____

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

a closer look

BROOD PHEROMONE

Clarence Collison

Brood pheromone has a twofold effect on pollen foraging.

In honey bee colonies, adults are responsible for the care of all immature stages – eggs, larvae and pupae. The task of brood care falls to the nurse bees, which must recognize the various brood instars (stage of insect from one molt to the next), age and sex of the larvae in order to provide the appropriate nutrition and environment for development (Maisonnasse et al. 2008). For example, the quality and quantity of the nutrient jelly provided by nurse bees determines whether a three-day-old (or younger) female diploid larva (possessing a double set of chromosomes) will become a worker or a queen. Although it is not clearly understood whether the brood cues influencing the behavior of nurse bees are primarily mechanical or chemical in nature, research supports that both types of stimuli are present (Le Conte et al. 1995).

Much of the success of brood rearing lies with the ability of nurse bees to distinguish between young and old larvae, as well as between the different larval castes. Being able to recognize the three types of brood cells (worker, drone, and queen) is attributed to mechanical factors such as diameter and orientation of the cell. Free and Winder (1983) showed that physical characteristics of the brood are of relatively little significance, and that a contact pheromone may be the prime brood recognition signal. The larvae emit a general signal indicating their presence in the cell, and by some lesser known intrinsic mechanism are able to communicate their state of starvation to the nurse bees (Free et al. 1989, Huang and Otis 1991a,b). Other cues, related to the quantity of food in the cell could also regulate food deposition (Huang and Otis 1991b).

The chemical messages passed from brood to nurse bees are from two different categories of pheromones: releasers and primers. Releaser pheromones are chemicals that elicit an immediate response from the recipient. Primer pheromones physiologically alter the endocrine or reproductive systems of the recipient, thus moderating behavior patterns over a period of time.

Honey bee brood pheromone was first identified as a kairomone (an interspecific messenger substance that benefits the receiver but not the releaser) that attracts the parasitic *Varroa* mite (Le Conte et al. 1989). Later, it was found that some components of this blend have releaser-like effects on various aspects of brood care (Le Conte et al. 1990, 1994, 1994/1995).

Honey bee brood pheromone, found on the cuticles of larvae, is a blend of 10 simple fatty-acid esters and are described as important compounds in the chemical communication between brood and workers. These esters include: ethyl linoleate, ethyl linolenate, ethyl oleate, ethyl palmitate, ethyl stearate, methyl linoleate, methyl linolenate, methyl oleate, methyl palmitate and methyl stearate. These 10 simple esters were first identified on drone larvae, then later on worker and queen larvae (Le Conte et al. 1989, Trouiller et al. 1994). Some components are more active than others, but all ten individual compounds show some releaser activity (Le Conte et al. 2001). In the three brood types, the esters are secreted in different proportions according to the sex and caste of the larvae (Trouiller et al. 1991, Trouiller et al. 1993).

Worker honey bees can discriminate between old and young larvae because of the different pheromone blends. Le Conte et al. (1994) found that cuticles of young worker larvae (two to three days old) contained 64 percent of the ethyl esters, whereas old larvae (eight to nine days old) contained 69 percent of the methyl esters. Emergency queen rearing behavior was triggered by the higher concentration of ethyl esters in the cuticles of the younger larvae. Methyl linoleate, methyl linolenate and methyl oleate are present on the cuticle of the queen pupae and are involved in the recognition of the queen cells by the workers (Le Conte et al. 1994/1995). In the presence of a fully functioning queen, workers will tear down any freshly constructed queen cells, but the presence of methyl oleate in or about these cells results in a greater acceptance of new queen cells by workers.

Differences in the concentration of these fatty-acid esters on the larval cuticle were used in locating the secretion site (Le Conte et al. 2006). The highest concentration was found on the anterior part of the head region, and the salivary glands were identified as the source. The absence of brood pheromone in the hemolymph (blood) indicates that the esters are not being transported via hemolymph to the salivary glands from some other tissues such as fat bodies.

"Honey bee brood pheromone, found on the cuticles of larvae, is a blend of 10 simple fatty-acid esters and are described as important compounds in the chemical communication between brood and workers."

One known releaser effect of brood pheromone is to induce cell-capping. Four methyl esters (methyl palmitate, methyl oleate, methyl linoleate and methyl linolenate) present on the cuticle of mature drone and worker larvae trigger this process (Le Conte et al. 1990). When larvae are young, these esters are present in low amounts, but they are secreted heavily just hours before the cells are closed. The total amount of brood pheromone secreted reaches its maximum just after the cells have been capped, when worker and drone larvae are 8.5 and 10.25 days of age, respectively (Trouiller et al. 1992). At the time of cell-capping, the amount of pheromone is 5.6 times higher in drone brood than in worker brood (Trouiller et al. 1993), which may explain the preference of *Varroa* mite for drone larvae. Queen larvae are also less likely to be infested, as the three components of brood pheromone known to be attractive to *Varroa* mite (methyl palmitate, methyl linolenate, ethyl palmitate) are three times less abundant in queen larvae than worker larvae at the end of cell-capping (Trouiller et al. 1994). In addition, methyl oleate is repellent to the *Varroa* mite and is secreted in large amounts compared to the attractive esters in queen larvae, thus further explaining mite avoidance of queen brood.

In the honey bee colony, brood stimulates development of hypopharyngeal glands of nurse bees. During these nursing activities, larvae are fed a mixture of nutrients that contains a proteinaceous gland exudate. When nurse bees are treated with a blend of methyl palmitate and ethyl oleate, protein levels in the hypopharyngeal glands are elevated, probably through stimulation of the gland's biosynthetic capacity (Mohammedi et al. 1996). Differences in the activity of the hypopharyngeal glands are associated with the honey bee division of labor suggesting that brood pheromone might also act as a primer pheromone in the division of labor among worker bees.

Brood pheromone in addition to its releaser activities also has primer pheromone effects on adult bees. In addition to stimulating the hypopharyngeal glands of nurse bees (Mohammedi et al. 1996), these esters have been shown to inhibit ovary development of workers (Mohammedi et al. 1998). The full blend of esters also modulates the behavioral development of young bees and stimulates workers to forage for pollen (Pankiw 2004, 2007).

These 10 compounds were tested as an additional chemical stimulus in the artificial rearing of queens (Le Conte et al. 1995). At least three of the compounds act as cues to modulate queen rearing behavior of the worker bees when they were applied to wax queen cups in amounts similar to those naturally found on larval cuticles. Methyl stearate produced the best acceptance of the wax cups, methyl linoleate enhanced the amounts of royal jelly deposited by workers in the accepted wax cups and methyl palmitate resulted in a production of heavier larvae. This lead the authors to assume that qualitatively a different royal jelly may be given to the heavier larvae. Thus, methyl linoleate and methyl palmitate appear to induce differential royal jelly production in quantity and quality, respectively.

In queenright colonies, ovary development and oviposition behavior of workers is inhibited by both queen-produced pheromones and the presence of brood. The role of brood pheromone in retarding ovary development was examined using synthetic brood pheromone (Arnold et al. 1994). The mixture was applied to workers by three different techniques (contact, diffusion, ingestion) and all three treatments induced a strong inhibitory effect on ovary development compared to the control. Of the 10 esters, ethyl palmitate and methyl linolenate were identified as preventing ovary development in caged bees (Mohammedi et al. 1998).

Brood pheromone has been shown to have a twofold effect on pollen foraging. Bees treated with brood pheromone decreased pollen forager turnaround time between foraging trips by approximately 72 percent. Decreased pollen forager turnaround time is a measure of increased individual foraging rate and a mechanism for increasing pollen intake. Concurrently, brood pheromone increased the ratio of pollen to non-pollen foragers entering colonies (Pankiw 2007). While the physiological aspects of the system are not clearly understood, brood pheromone is responsible for triggering the mechanisms known to increase pollen intake by colonies, therefore acting as an important regulator of colony foraging decisions and growth.

Pankiw (2004) has demonstrated that treatment of colonies with brood pheromone is a promising technology for increasing the pollination activity and efficiency of honey bee colonies. Brood pheromone increased the pollination activity of colonies in late autumn, when colonies are relatively inactive due to the lack of foraging stimuli.

Since several components of brood pheromone can result in the augmentation of the production of royal jelly and modulate the weight of queen larvae, they could potentially also be used by the beekeeping industry to increase the production of royal jelly and optimize the quality of young queens in artificial queen rearing operations (Le Conte et al. 1995). BC

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

Making Summer Decisions That Affect Winter Management

Some Summer decisions that affect Winter management.

Complaining about beekeeping – an unlikely art form

Like so many beekeepers, I have become an expert at complaining. I can do it well and on short notice. I can complain about a variety of dissociated topics. It's an acquired talent requiring years to achieve. *"My bees all died." "Varroa is killing us." "Insecticides are insidious." "We never see swarms anymore." "Today's queens are terrible." "Our bees are just not what they once were."* Accomplished complaints fluidly roll off my tongue.

This past Spring, I was completely geared for the usual bout of concerns and predictions. While my Winter-kill was not too great, it was strange. Some of my strongest colonies last year died during the Winter with hundreds of pounds of honey on them. That alone predicted future bad karma for the 2008 season. I came through Winter with about a 25% Winter-loss. I have written about this in earlier *Bee Culture* articles. As Winter faded and Spring became established, I did the normal Spring preparations. I scraped bottom boards, removed entrance reducers, and rearranged food stores among the surviving colonies. I got the dead equipment out of the yards, and I did the Spring tune-up on the mower I wasn't Johnny-on-the-spot, but I did okay Then I mentally prepared myself for the usual late season freeze that had killed so many bees and blossoms in recent early Spring seasons. Time passed. The late freeze never came. That's strange. I already had my complaints and quotes prepared and edited. My bees built up nicely on the early pollen and nectar sources.

Full supers being taken from productive colonies.

I began to hear that bees in the Southeast were looking good. Across the Mid-west, beekeepers were remarkably positive about the way their bees looked. After all we have been through in recent years, this up-beat attitude was an oddity

The Spring flow started. I honed my negative attitude. *"It will rain." "Sure, there are blossoms everywhere, but they won't produce." "Varroa will take the bees all out."* We have been through this over and over again. Why should I dare hope that this year would be any better? But the season was better – it was even gloriously better than previous years. In much of the country, everything came together and we got an old-fashioned nectar flow. I had put on the usual few supers per colony This year, I should have put on many more. I should have brought some of the old, dusty equipment out of deep storage to net this entire crop. While I was completely prepared to complain, I was not completely prepared for a true nectar flow.

This "super" shortage was brought home in a personal way I put on some supers and gave the remaining colonies a promise of supers to come. Then, for six days, I took a road trip to south Alabama to visit family As I rode south along the interstate, I knew I had screwed up. Everywhere, locust and tulip poplar were hanging nearly to the ground. The world was green and lush. You could just tell, this was a good year I phoned home – desperately trying to find anyone to put on a few more supers, but all my friends have now become far too smart to get caught up in a request like that. What I had given the bees was what they were going to get. The return trip home was stark. Just six days later, all the white blossoms were nearly gone. The nectar window had begun to close. I now had populous, packed-out colonies. Then the swarming started.

Swarms, swarms everywhere

In this regard, I was not the only one caught unawares. Everywhere, there were reports of swarms hanging about. And pleasantly, the caller usually started the call with, *"I know bees are in short supply so I didn't want to kill them....."* At bee meetings, one beekeeper reported that he was being killed by swarming. Ninety-five percent of his 100 colonies swarmed. That seemed nearly impossible. We are accustomed to our season being killed by many things, but being killed by bees being so strong that

they split themselves was not something I was expecting. Other beekeepers had comments like, *"I couldn't work for the phone ringing." "We have no more equipment so we had to stop going for swarms."* You see, as seasoned complainers, we can take a season that is so good that it becomes bad. Then we complain.

The 2008 season – a good year

After all our beekeeping tribulations, it needs to be said – it is even difficult to say – but the 2008 season was a good year At meetings, beekeeper spirits were high and significant numbers of new beekeepers were on hand. There was talk of crops and swarms and how to split big colonies. It seemed like beekeeping from years past. It felt warm. It felt good. Now what am I going to do with all this honey?

Removing the crop

A good nectar flow is something like a Summer storm. For most of us, it is sudden and intense. Scrambling for extra beehive equipment and trying to get it on strong hives is common during this event. Then, the nectar storm begins to pass and finally, is gone. Quietness and sanity returns. Now all those supers that I put on just a few weeks ago need to come off – but this time, they are much heavier

Now, here is the real reason for my article. After all the past winter kills; after all the previous die-offs, after all the colony splits and after cleaning all that dead equipment; how much honey should I take? I don't want to go through all that headache again. Are happy days here to stay or was the season of 2008 just a fluke? Should I go by the old recommendations or should I still suspect that my bees are recovering from a long, bad bout of bad luck?

Bee colony management is not exact

All bee colony management is a "best guess" process. How much honey to take and how much to leave is just another guess that we are required to make. There appears to be no reason to leave too much honey on the colony. I continue to be shocked to have taken hundreds of pounds of honey from colonies that died during the winter of 2007-2008. Clearly, proper honey stores are only one of the requirements for successful colony wintering.

How much honey to remove and how much to leave?

The following plans are just for me and are not intended to be a recommendation for others, but for the next few years, I am planning to winter in three deeps. I may or may not implement the insulation ideas that I discussed in previous articles. Even though I took hundreds of pounds of honey from dead colonies early last Spring, I still plan to leave more honey on than I did 15-20 years ago. This management change is a clear result of my years of bad luck and complaining. So, right now, if my colonies have three full deeps of brood and honey and feel like dead weight when I heft the colony, I will take anything above that.

Now, yet another change – I will not rush to extract all the crop I removed. Indeed, I will let some of it sit around until well into the upcoming Winter Before you ask, this is not particularly good for the honey and the supers must be placed upon drip boards, but as were many of you,

Take it or leave it? Give it your best guess.

I was burned several years ago. I had colonies starving and I had nothing to give them but sugar syrup, which is a poor plan for truly subsidizing a struggling Winter colony. I wrote about the plan I have used for the past two years of supering only in deeps. Honey is these boxes are truly miserable to handle but I now have ready honey in deeps both in my lab and on the bees. This honey is my *"strategic honey reserve."* I will run the extractor and I will process some of the crop, but I will not be as greedy as I was just a few years ago.

An unintended side-effect of this procedure is that I will have to clean the processing equipment more than once or I will have to let that sticky mess sit there for several months awaiting the extracting of the second part of the crop – should I decide to do so. Dare I write it? I am drifting toward exacting honey in the Spring after it becomes clear that the bees will not need it for their Winter survival and Spring build-up. Is this drift efficient or sloppy? For those new to beekeeping, honey has traditionally been extracted in the Summer and Fall. But once you extract it from the comb, it is nearly impossible to give it back to wintering bees. Spring extracting would throw off the entire traditional management scheme for seasonally manipulating bee colonies.

As aside

While I was phone talking to a *Bee Culture* reader who had questions about his bees, he politely said, *"In your articles, you don't give specific recommendations." "New beekeepers like me need somewhere from which to start."* He was correct. I don't tend to make specific recommenda-

tions. Specific recommendations would require specific situations. So, in general, how much honey should you take and how much should you leave? I offer the following generalized honey stores comments.

Generalized wintering suggestions for late Summer/Autumn management of a average honey bee colony

1. During September or October, do whatever it takes to have the general colony in two deeps to weigh about 170 pounds. More weight is even better When picked up from the back, the colony should feel like dead weight.
   a. To achieve this colony weight
      i. Leave abundant honey on the colony all season (best)
      ii. Put honey (in combs) back on the bees as needed (good)
      iii. Feed colony copiously until desired colony weight is obtained (poor)
      iv. Wintering bees in two deeps is good and is the most common wintering sized colony Wintering bees in three deeps may be best for most parts of the U.S., and wintering in a single deep would be the riskiest sized unit.
   b. Gross colony weight (primarily honey) is not everything. The colony needs to be "balanced."
      i. So much as possible, the colony should be disease and pest free (best) or at least disease and pest reduced (good).
      ii. The colony should have a productive queen supported by abundant worker populations.
      iii. Pollen supplies should be stored by the bees in frames for future springtime use. (Not much the beekeeper can do about this point.)
      iv Food stores should be positioned above and in constant contact with the brood nest.
      v. Reduce entrances and provide for ventilation. Essentially, employ general winter preparation protocols.
2. We must accept beekeeper limitations. If statistics prevail, about 25% of your colonies will fall short in some of the categories listed above.
   a. Do whatever is practical to address those shortages, but don't "over-manage."
   b. Hope for a mild Winter and a bountiful Spring. (Luck – both good and bad – is an integral component of beehive management.)

Here's the guess

In order to meet the requirements for having a heavy colony in the late fall, I am required to make "best guesses" when removing honey crops in the late Spring or early Summer In a very real beekeeping way, important wintering decisions are made nearly six months prior to the cold season. On those beautiful, productive early Summer days, you must imagine that same colony, during the coldness of February. How much to leave and how much to take is always a calculated guess.

Robbing – a comment

Robbing behavior deserves more than a paragraph, but just a mention is better than nothing. Logically removing honey after the flow is over is the norm, but it is also an excellent way to train bees to thieve from each other and even kill lesser colonies or deplete strong colonies. Robbing is annoying and frustrating, but oddly useful. If there is a nectar flow on, I will not see a single live bee in my storage barn. If I drive by the barn and see robbers trying to enter the doors, it is a clear indicator that the present flow is over No scaled colonies, no pulling frames, no looking for bees on blossoms – I just look at my barn doors to determine if the bees are on a nectar flow. Checking my storage barn doors before moving to my bee yard gives me an idea of how much robbing behavior I can expect from my management activities.

An odd way to address and old topic

To be sure you and I are on the same page, in summary, what I have been saying is: In recent Winters, I have had too many bees die – from starvation and otherwise. Abundant honey stores are part – but not all of the solution. As I did last year, I plan to leave my colonies heavier by leaving more honey on. Again, as I did last year, I plan to hold some of the honey supers I remove until early next year in order to have a honey reserve. If my bees don't need it, I will extract it in the spring of 2009. As will you, I will be forced to make wintering decisions while in the heat of Summer As much as my energy, time, and funds allow, I will otherwise manage my colonies by employing current recommendations. Sorry, but I can't be any more specific than that. BC

Dr. James E. Tew, State Specialist, Beekeeping, The Ohio State University, Wooster, OH 44691, 330.263.3684; Tew.1@osu.edu; www2.oardc.ohio-state.edu/agnic/bee/; beelab.osu.edu/

'Bout a 100 – Sideline Beekeeping

SIZE MATTERS

How Important Is The Size Of The Queen?

Larry Connor

He was a soft-spoken gentleman serious in his intention of setting me straight. I had been discussing the importance of size of the queen to a group of beekeepers, and after he quietly challenged my thesis that big queens are good for the colony.

This happened a long time ago, and I don't recall where or the circumstances of the conversation, just the intensity of this man, himself of diminutive stature, who nonetheless appeared to be able to out-work and out-argue even the best.

The easiest thing to do with beekeepers like this is to immediately agree with their arguments, regardless of the content, and then try to swing them around to your point of view. His statement was simple and direct: Small queens are very good.

So I agreed with him, hoping that somewhere there really are small queens that produce quality hives and a good honey crop. That there are undoubtedly racial or genetic lines that produce variability in size, so if one wanted to use that stock, the queen may be smaller than what we ordinarily used.

I stood my ground that it was important to produce and use the largest queen that that genetic line could provide; that larger queens are superior to smaller queens, and last longer in the colony before being superseded.

Then he explained that he lets bees in nucs raise their own queens. The bees in the nucs came from strong colonies, he argued, and thus the queen they would produce would also be good.

Indiana beekeeper Ross Hunter shows off queen cells he grafted that were in the starter colony overnight. All the cells he grafted had royal jelly in the cells, along with the larvae.

I thought I had him. While the stock might be very good, the fact that a small group of bees, with perhaps just 10 or 20 percent of the population of the full colony, was responsible for raising the queen. How can that queen be equal to a queen produced in a full sized colony, I argued?

They were raised by bees from a good colony, he countered. We were at a stalemate when someone interrupted our conversation and it was over We had both started repeating our major points.

This gentleman did not change my opinion about queen size, but he did make me think about the role of smaller queens in bee colonies and in beekeeping operations. If everything has a time and a place, there must be a role for small queens as well.

Years later, I am still looking for that role.

That size thing

Queen size is determined by nature and nurture. The genetics of the queen's parent lines (mother queen and father drone) are critical to the final size of a queen. Add to this the conditions prior to and under which the queen is produced: number of bees in the colony, overall food supply, status of the nectar flow, ratio of nurse bees to house bees, stores of food, amount of food coming into the hive, and its exposure to pesticide, disease and mites. The list goes on an on; topics that will make most beekeepers pull out their hair

Research has shown that the largest queens are produced by colonies with excellent food reserves that select the right-aged larvae for the initial queen cells. Most of the queen stock available in North America features large queens. It is their nature to be large. There are a number of advantages to having large queens:

1 More eggs. Larger queens are able to produce a larger number of eggs per day than small queens. This is because the larger queens possess more ovarioles in their two ovaries. These structures nearly completely fill the abdomen. A laying queen is an egg-laying machine. Let's consider a queen with a hypothetical genetic potential to produce 1400 eggs per day This queen may have about 350 ovarioles, each producing four eggs per day Over the course of one 21-day brood cycle, the queen will lay 29,400 eggs. If these were all to develop into adult bees (they will not because of diploid drones), then there will be 8.4 pounds of new bees produced by the colony

Consider if the same queen is poorly fed during her larval development, and she does not have as many ovarioles. If there are one quarter less or 262 ovarioles

producing four eggs per day, there would be about 1050 eggs laid per day In a 21-day brood cycle, this would result in 22,050 bees or only 6.3 pounds of bees.

Conditions present during queen development include the number of nurse bees present to feed and care for the developing queen cell during that critical period from egg hatching to cell sealing. This is 5.5 to six days. If the colony is large, has an abundance of nurse bees, stored food, incoming food, and excellent health (no disease or significant mite load), the queen will reach her potential.

When these conditions are less than perfect – there are fewer nurse bees, food supplies are small, or the colony is suffering from a disease like chalk brood or has a mite load that interferes with queen feeding, then the queen will develop with fewer ovarioles.

We have known for years that the presence of *Nosema apis* in a colony will reduce queen productivity Now, with *Nosema ceraena* in many hives, it is abundantly clear that a queen may be produced by *Nosema*-infected bees and the resulting queen is smaller and has fewer ovarioles, Moreover, when an adult queen is infected with a pathogen, her ability to lay eggs is reduced by the infection in her mid-gut. In fact, *Nosema* is often associated with queen replacement through supercedure.

2. More stored sperm. A larger queen will have a larger spermatheca than a small queen, and even a 10% difference in the size of this structure will make a volume difference of about 25% of the sperm stored in the fluid-filled sac. Since queens only mate (average of 13.2 drones) for a brief period of their early life and spend the rest of their life in the hive (except for swarming), then the number of stored sperm is directly related to the number of eggs the queen can fertilize until she runs out and starts to produce unfertilized eggs in worker cells. As a drone-laying queen, she may or may not be superseded by the worker bees, and the colony may or may not survive.

Evaluating queen cells

This Spring I've been teaching a number of queen rearing classes to hobby and sideline beekeepers. In the multi-session classes, we are better able to evaluate how we have done in our efforts. The challenge of teaching these classes is the limitations posed by using someone else's bees. Every beekeeper has his or her individual objectives in their craft, and for an outsider (me) to walk in and expect conditions to be ideal for queen rearing is not a reality We can come close, but that is the best we can do.

I teach a traditional starter and finisher system of raising queens because it is the basic system. There are many variations for making queen cells, but I like to look at the essentials of starting the cells in a queenless, broodless, flightless mass of nurse bees, where the emergency instinct is strong and they will start many cells.

After the cells are started they are moved to strong, two-story finisher colonies where the queen is confined below an excluder and open brood, pollen, and nectar are placed in a second brood chamber above the excluder A feeder is provided as well.

The advantage of the starter system is we look at the cells 12 to 18 hours after the grafted larvae were placed into the starter box. At that point the larvae that have been accepted will have royal jelly added (if we primed the cells, the old royal jelly has been removed and replaced with new), and the two-day old larva is floating on a bed of right-aged royal jelly When using plastic cell cups, you can see the royal jelly from the side. If the bees have added wax to the cell (like the tops of little volcanoes) and there is abundant food in the cell, then we know that the larva has been accepted and the starter colony has done its job. This is shown in the photos.

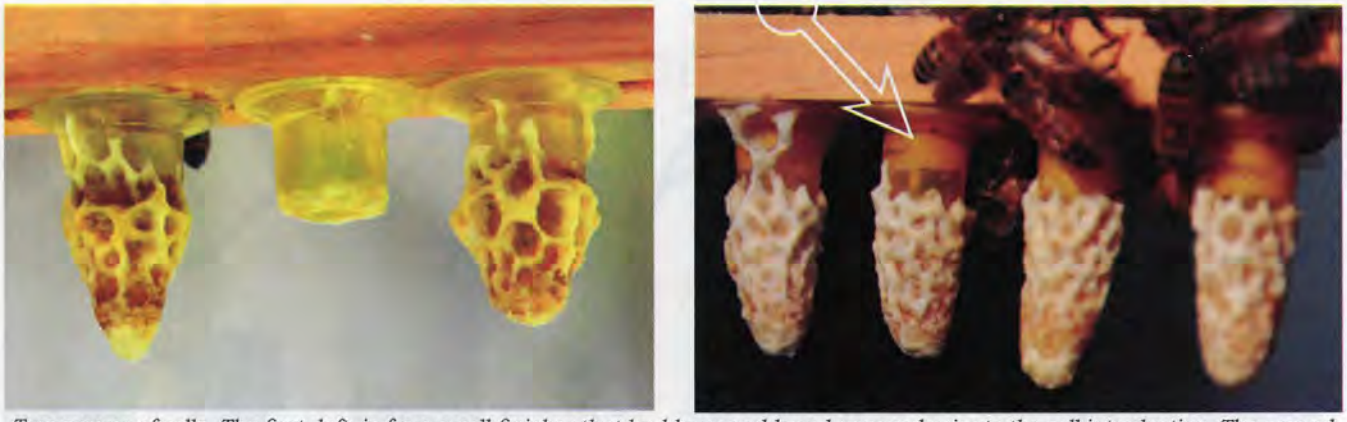
Closeup of the cells in Photo 1. The dark blue cells make it difficult to see the thin layer of royal jelly at this stage.

When the starter is not strong enough, there is a reduced amount of royal jelly in the cup. This is excellent justification to remove such cells from further production. In the transferal system we have taken a worker larva (that was never going to be a queen) and moved it to the starter colony where the bees feed it with the same food they feed to queens during natural queen replacement and swarming. The earlier this happens the more success we have with the final cells. When students move an older larva as they learn the process, it does not have as many hours of optimal feeding with royal jelly as a younger larva. That larva will come back to haunt everyone when the resulting queen emerges a day or more earlier than the rest and destroys the appropriately aged queens we want!

So, a simple inspection of cells from the starter colony will confirm if the starter did its job or not. The started larvae should be floating on a bed of royal jelly.

Those cells with adequate royal jelly are then moved to the cell finisher colony. That colony must also feed the developing larvae. The colonies are set up with lots of bees, stored food and incoming food. Under those conditions the bees will feed the started larvae well. In a few days the cells will be sealed by the worker bees and the queen larvae will complete the metamorphosis into an adult bee.

In one of the classes I taught the colonies used as cell finishers had been pulled down in strength by the removal of brood to make up increase colonies. While I am the first person to applaud the use of strong colonies for increase colonies, the removal of bees and brood from a colony makes it less than ideal for cell production. This was the case this Spring. The colonies that were



Two groups of cells. The first, left, is from a cell finisher that had bees and brood removed prior to the cell introduction. The second group of cells shows the benefit of a much stronger cell finisher. Viewed from the side, the stronger colony produced larger amounts of royal jelly and larger cells, see arrow.

the strongest in the apiary were not strong enough to be ideal cell finishers.

One of the students in the class with a little prior experience with queen rearing took the techniques home an raised queen cells of his own using a very strong over-wintered colony. The differences were striking. The weaker colony, even though it is in the middle of a nectar flow, did not produce enough royal jelly to create well-filled queen cells. The cells were shorter and there was only a thin layer of royal jell on the bottom of the cells. With the stronger colonies, the difference is striking. The cell cups appear to be nearly full with the queen food. The cells appear to be much larger and longer

Bottom line

Monitoring the amount of residual royal jelly is one of the best methods I can give beekeepers as a method of evaluating queen cells they produce. If the cells are well started and finished, they will have surplus royal jelly in the base of the cells. The use of plastic cells makes easy to inspect the cells – it is not necessary to cut open a few cells to check them for food stores. This is perhaps the best way to control queen size. BC

Dr. Connor's books, including Bee Sex Essentials, are offered for sale through many bee supply dealers, and at his website, ***www.wicwas.com****. A PayPal store is available on that site for those who want to have the convenience of purchase via this option.*

GEORGIA BEEKEEPERS - Carl & Virginia Webb

The rest of us beekeepers could learn a lesson from these two!

Jennifer Berry

Two years ago most people didn't have a clue that bees, especially honey bees, were important in the chain of events necessary to provide the food found on their plates. But probably more importantly, they just didn't care. And why should they?

When 'Joe& Josephine Public' go to the produce section of the grocery store they are typically unconcerned about where the rows and rows of fruits and vegetables come from. They don't need to be bothered with the logistics of how they were planted, watered, fertilized, picked, packaged, transported, delivered, or *pollinated*. Why so? Because the food is always there in its flawless, blemish-free state and in the same, neatly arranged, well sprinkled, color coordinated, brightly lit bins and shelves. Even better are the sections equipped with delightful little thunder storms, raining down on their produce at regular intervals, making them feel good about the freshness of their choices.

These days most of us have been completely removed from our food sources. We have more important things to think about than the how's and where's of the food we eat, but we do pay attention to the price. How much is the cantaloupe this week? Can I afford the vine ripe tomatoes? Is the pre-washed organic salad mix on sale? Did I pay my phone bill? When do I give the dog his heart worm medicine? Is my butt fat in these jeans? Few of us stop to consider that a lack of bees often leads to a considerably smaller harvest, which in turn results in a decrease in the food supply which ultimately leads to higher prices at the grocery store.

Of course quantity isn't the only issue. Without honey bees pollinating crops in the field the variety of produce will be drastically reduced also. My favorite saying to date came from Dennis vanEngelsdorp in a recent interview, "If you don't mind eating gruel then we don't need honey bees..." and that's exactly what we would find on our dinner table; bland, grey, creamy, lumpy, boring, ole' gruel.

Recently, as a result of CCD, honey bees, beekeepers and researchers have found themselves in the spotlight. The fate of the bees has been highlighted on radio shows, public television documentaries, 60 Minutes, and countless news reports. The question of honey bee survival has been written about in scientific and popular magazines, and countless newsletters and newspapers. However, the public interest won't last long. While we have their attention beekeepers have a unique opportunity to educate the public about the importance of bees and other pollinators. We in the industry are aware that the public sorely needs a thoughtful, basic beekeeping 101 class! So here's our chance to make some lemonade out of all the lemons tossed our way recently Come to think of it, we could take our lead from one couple who is doing just that: Carl and Virginia Webb.

Carl Webb entertains the kids with free samples of honey.

When I started my graduate work at UGA I met Carl while working on Dr Delaplane's and Dr Hood's IPM economic threshold study. Carl was a collaborator on the project. Instantly I became enamored by his knowledge about honey bees and his practical beekeeping skills. Over the years I had the opportunity to work with Carl in the field and honey house. He taught me more about bees and beekeeping than I could have ever learned in a book or classroom. He was my first mentor and I am grateful to have had been exposed to his expertise. It is always great being taught by the best.

This wasn't the only time Carl collaborated on a research project. All an all he has helped out by donating numerous colonies, queens and much valuable time for over 13 years. It is beekeepers like him who have made our large scale research projects possible. I know I have mentioned this in previous articles but without the help of beekeepers like Carl our large scale research projects and field studies would not be possible. The cost of the colonies needed for the experiment and the labor in collecting data is simply too high. Carl has been an invaluable resource for both.

Carl's beekeeping days began in 1965 when he purchased his first colony of bees. He was still employed by the U.S. Forest service and work-

ing bees was a way for him to relax after a full day After he retired in the 1980s Carl decided to turn his hobby into a full time business. At first he slowly built up the number of colonies, and primarily used them for honey production. In the 1990s, he started grafting his own stock and his operation has been completely self-contained ever since. In 2000 he purchased his first breeder queen and began raising queens for sale. But by this time the stock had completely changed. It was a Russian queen and since his first experience with Russian bees he has never wanted any other stock inhabiting his hives. "I have better queens and bees since my introduction to Russians" Carl said. "Plus they overwinter better and come into the Spring with a much stronger cluster " Since switching his operation to a pure Russian stock Carl claims his bees are healthier than ever before. "They're healthier now than the Italians I had back before the introduction of *Varroa*."

In 2000, Carl and Virginia purchased one of the first Russian Breeder Queens released from the USDA Baton Rouge Lab. In 2007 when the Russian Queen Breeder Association was formed, Carl and Virginia became charter members. Currently there are 18 members in the association. Their mission is to "maintain and improve the genetic lines of Russian honey bees through propagation and selective breeding." Russian bees were chosen years ago for their resistance to *Varroa* mites. This project started back in 1994 with trips to Russia to find queens whose progeny were resistant. Since that time Carl has specialized in raising Russian queens. Carl now runs 300 colonies which yields around 20,000 pounds of honey each year He uses these colonies for honey production, making nucs and raising queens.

Even with his full time bee business Carl still finds time to be involved in state and local clubs and associations. He is a regular attendee and speaker at the Georgia Beekeepers Association (GBA) meetings. Beginning in 2000 he served two terms as GBA President. He is also a regular at the Northeast Mountain Beekeepers Association meetings.

Ten years ago Carl married Virginia who is also no stranger to the world of honey bees. Virginia's father and grandfather were both beekeepers. In 1962 Virginia's father, Joe Stevens, gave her a colony of bees, her first, and she's never looked back. Growing up in North Carolina and then later in Tennessee she and her dad ran 75 colonies. It was a hobby they both loved, as well as a way to generate honey for the family Virginia remembers being so proud while selling honey bears at local fairs and festivals for 75 cents. What a bargain!

Carl and Virginia start their life together.

In 1975 Virginia became the Tennessee State Honey Queen and this is when her true calling began. During her reign as queen Virginia talked to kids and local bee clubs, gave radio interviews, wrote newspaper articles, and even demonstrated how to cook with honey at fairs. She was determined, even then, to explain how wonderful pure honey could be. She also began educating people about the importance of honey bees not only as producers of honey but as the ones responsible for pollinating our crops.

After attending East Tennessee State, she moved to Ohio, then California and finally in the mid 1980s returned to the south and made her home in Buckhead (Atlanta), Georgia. Virginia quickly earned the title of the "Buckhead Beekeeper" since she kept colonies in her back yard. (For those of you unfamiliar with Georgia, Buckhead is a community of Atlanta within close proximity to downtown.) She also kept bees on her farm located in Northwest Georgia. Soon after her arrival in Georgia she joined the Metro Atlanta Beekeeping Association which is one of the oldest associations in the U.S. dating back to the 1920s.

Over the years Virginia's momentum continued. In 1995 she became the first women president of the Metro Atlanta Beekeeping Association and remained president for four years. During that time she was also president of the Georgia Beekeepers Association holding office for two terms. I meet Virginia while attending my first GBA meeting and was immediately impressed by her passion for all that's involved with honey bees but particularly her interest in the political arena. At every board of directors and business meetings, Virginia would inform the group about what legislation relating to honey bees was being passed, or how the farm bill was looking or what other political issue was of concern for beekeepers in the state and nation. She was usually the only member on the legislative committee but she was not letting that stop her She was making honey bees and their plight well known at our state capital. In 1993 Virginia was awarded the second Beekeeper of the Year Award for the state of Georgia. In 2002 Virginia was named North Georgia Farm Woman of the Year by the Georgia Farm Bureau.

Virginia has also been a member of the American Beekeeping Federation for 20 years. Over time she has served on the Research and Technical Committee, chaired the Audit Committee as well as the Budget and Finance Committee, and sat on the Board of Directors. She was also a past member of the National Honey Board Nominations Committee.

Because of all the hard work Virginia has accomplished over the years, Zaxby Chambliss, U.S. senator and Minority Ranking Member of Agriculture, recently invited Virginia to Washington DC to attend a hearing about the decline of beneficial pollinators. In a separate session she was invited to attend a meeting about a request sponsored by Barbara Boxer They were asking for $20 million in emergency funds for honey bee research. Virginia has also been very instrumental in the U.S. Farm Bill, and has fought for years on keeping honey bee research in the forefront. She is the only female member of the Farm Bureau Honey Bee Advisory

Virginia helps out an eager youngster fill his bear with honey.

Committee, and 10 years as acting board of director member for the Georgia Fruit and Vegetable Growers Association.

Currently Virginia has taken on yet another task, one she feels tremendously passionate about. Her goal is creating a universal standard for the identification of honey She said it is "critical to maintain the health of not only honey bees but the honey we consume. So much of our imported honey has been tampered with, it is adulterated, not pure." She fears that because there are no regulations governing the purity of honey, who knows what the public is consuming.

It is very easy to add ingredients to honey in order to increase volume; high fructose corn syrup being one of the culprits. Another problem can occur when large quantities of honey are packaged and sold containing chemicals unsuitable for human consumption. Recently a group from Chicago was arrested for selling honey that was mislabeled, (country of origin), as well as contaminated with a banned antibiotic. There are two other concerns also worth noting. How is honey being produced? Are colonies actually collecting nectar from flowers to generate the honey or are they being fed artificial sweeteners (HFCS) to create the honey?

At this time there is no standard of identification for honey in the United States. The FDA has informed Virginia that they neither have the time nor the resources to take on such a large endeavor They can only address health issues as they occur The European Union adopted a standard of identification over a decade ago. Once again America seems to be lagging behind when it comes to protecting our food sources, especially those coming in from other nations. Florida has recently adopted a standard of identification, and now Virginia is pushing to have the same standard adopted in the state of Georgia.

A few years ago a company located in the southeast was falsely mislabeling honey of some unknown origin as Sourwood. The honey was definitely not Sourwood. However because there was no standard of identification there was nothing anyone could do. So the fraud continued, and the public became the victim. Sourwood honey is sold at a premium. Unsuspecting tourists, (primarily), were purchasing these jars at road side stands for higher prices because they knew or had heard that Sourwood was a superior honey Then they take it home, taste it and find out that it really isn't that extraordinary. In fact it doesn't taste much different from honey purchased at the store. So why pay the extra price? Hence the problem.

This is especially upsetting for Carl and Virginia and other beekeepers located in the mountains of Georgia and North Carolina who take great pride in the Sourwood honey they produce. The northern region of Georgia has two substantial honey flows; one in the spring (primarily Basswood, Tulip Poplar, Blackberry, and Black Gum) and the Sourwood flow which begins in June. The Webb's produce about 10,000 pounds of Sourwood honey, and they are very vigilant about the purity of their product. Before the Sourwood flow begins the entire spring crop is removed and fresh supers added. In 2005 the Webb's Sourwood honey received the distinguished award of "Best in the World" at the Apimondia World Honey Show in Dublin, Ireland.

Not only are Carl and Virginia involved in all aspects of the beekeeping world, they have now taken on yet another, even more powerful endeavor They are tackling the task of educating the public about the importance of honey bees. This past May Carl and Virginia hosted an open house at their honey farm in Clarksville, Georgia. They invited over 200 people for this event. The morning hours were for invited guests and the media while the afternoon hours were open to the general public. Being an election year local and state politicians attended. Bob Binnie, president of the Georgia Beekeeping Association and owner of the Blue Ridge Honey Company along with Dr Keith Delaplane helped Carl and Virginia teach about honey, basic beekeeping, equipment beekeepers use, extraction, and of course the importance of honey bees and agriculture. The Georgia Fruit and Vegetable Growers Association provided Georgia Grown brochures of different agriculture crops pollinated by honey bees. Carl gave tours of the beeyard and Virginia was in the honey house giving demonstrations on how to extract and bottle honey Even the Habersham County Farm

Habersham county extension agent Steve Patrick speaks about the Farm Gate Value and its importance for the beekeeping industry.

Carl Webb explains how honey is extracted.

Carl & Virginia accept the 'Best in the World' award for their Sourwood honey at Apimondia in Dublin, Ireland.

Bureau Women's Committee was involved, offering samples of nine different honey varieties from around the state drizzled over home baked biscuits.

After their wonderfully successful open house Carl and Virginia still haven't slowed down one bit. They are being invited to speak for all types of groups; recently to 65 young adults participating in a summer "bug" camp at Piedmont College. Virginia said it would be easier for them to stay at home hidden from the public, but they just can't do that. They want the public to be aware of not only the importance of bees, but the joy and rewards in keeping bees.

It is their mission to continue fighting for these little creatures which have been a part of their lives for over 40 years. Virginia was quoted saying, "Bees are truly the angels of agriculture." I wonder if Carl and Virginia have stopped to realize they too are angels.

See Ya! BC

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

The Honey Garden

Connie Krochmal

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

Plums

Home grown plums have a rich, luscious flavor that can't be beat. They're grown over much of the U.S. with the exception of warm, sub-tropical regions. Because they have a chill requirement, zone 10 is about their southernmost limit.

Plum trees come in several different sizes. Standards are 15 to 20 feet tall. Semi-dwarfs are in the middle, growing 12 to 15 feet tall. Dwarfs only reach eight to 12 feet in height.

Growing Conditions

For the most part, these plants aren't terribly fussy European plums are adapted to most regions of the country

Needing full sun, plums thrive in a deep, rich, well drained soil that is high in organic matter While European and Damson plums do fine in heavy loams and clays, the Japanese trees need a somewhat lighter soil. All plums prefer a pH of 6.0 to 8.0.

Bluebyrd plum. (USDA photo by Scott Bauer)

Because plum blossoms can be damaged by late Spring frosts, avoid planting trees in low-lying areas.

Hardiness depends upon the species. While the Europeans are suited to zones five through nine, the Japanese are only hardy to zone six. However, some Japanese hybrids are about as hardy as the Europeans. Catalogs will list the hardiness for each variety.

Planting

Plums are sold as grafted plants. These don't come true from seed. Unless you're buying container plants at a local nursery, they're shipped bareroot during the late fall or early Spring.

Planting distance depends upon the trees' ultimate

RECIPES

Ann Harman

Plums come in a rainbow of colors: green, purple, blue, yellow and red. Some are too juicy for pies, but others can be used. Some are good for cooking but others turn to sauce. If you are cooking plums you will find that some are better if peeled. So you see how plums are very versatile. Plums are frequently found in late summer or autumn but some do ripen early. Take advantage of the different plums so you can enjoy them for many months.

Now let's see what we can do with plums.

PLUM KUCHEN

1/2 cup unsalted butter, softened
1/2 cup plus 1 tablespoon sugar, divided
1/4 cup packed brown sugar
1 egg
1/2 cup sour cream
1/2 teaspoon vanilla
1 cup all-purpose flour
1/2 teaspoon baking powder
1 pound plums (about 4 plums), unpeeled
2 tablespoon honey
1/4 teaspoon ground cinnamon

Slice the plums about one inch, making about three cups. Spray bottom of nine-inch round pan with cooking spray; sprinkle lightly with flour Beat butter, 1/2 cup of the sugar and brown sugar in large bowl at medium speed three minutes or until fluffy Beat in egg just until blended. Beat in sour cream and vanilla. Whisk flour and baking powder in small bowl; beat into batter at low speed one minute or until just moistened. Spread batter in pan. Arrange plums over batter; sprinkle with remaining one tablespoon sugar Bake at 350°F for 55 to 60 minutes or until cake is puffed and golden brown. Cool on wire rack 30 minutes or until warm. Warm honey in microwave-safe bowl in microwave 20 to 30 seconds. Stir in cinnamon. Brush over plums. Serve warm. eight servings.

Cooking Pleasures

This next recipe can be used with roast meats or it can be served as a simple but wonderful dessert. In addition it will keep covered and chilled for a week.

PLUM APPLESAUCE

2 pounds gala or McIntosh apples, unpeeled, quartered, seeded
2 pounds red or black plums, quartered and pitted
1/4 cup water
1/4 cup honey

size. Space standards about 20 feet apart. Semi-dwarfs only need 10 feet between plants. Dwarfs require the least space – about six feet or so.

Pollination and Status as a Honey Plant

Japanese plums and some European varieties require pollination. They need pollen from a compatible tree within their own group.

Even when a plum variety is capable of self pollination, they produce better when cross-pollinated.

Flowering about two weeks before apples, blossoms on European plums open on long-lived spurs. On the Japanese, these appear on spurs as well as on one-year-old wood.

Assuming the weather is favorable, plum flowers can yield lots of nectar and pollen. There can be a surplus of honey.

Caring for Plum Trees

Care is similar to that of other tree fruits. They need watered about every 10 days or so during the growing season if rainfall is insufficient. To prevent fruit cracking, reduce watering once the fruits are well developed.

Do a soil test every couple years. With the test results, you'll receive fertilizer recommendations telling how many pounds to add per tree and what formula to use. Compost is a suitable alternative.

Because Japanese plum trees are very vigorous, they need more nitrogen than European plums. Generally, the trees are fertilized once a year in early Spring.

Japanese plum trees are trained to a vase shape with an open center This allows the sun to reach all of the limbs. Europeans are trained to a central leader

The amount of pruning depends upon the type of plum being grown. Japanese plum trees need pruned every year Once the other types are trained, they require minimal pruning. This is best done during the dormant months.

Because plum trees often set heavy crops, fruit thinning is usually needed. This is particularly true for Japanese plums. Some plum trees can be thinned by gently shaking the tree. The fruits should be one to three inches apart.

Problems of Plums

Plums can suffer from various insects and diseases. The most common insects include aphids, borers, scale, and mites.

Plum curculios cause the fruits to rot. These can be controlled by removing and destroying the infested fruits.

Bacterial canker, bacterial spot disease, and plum leaf scald are potential problems in the East due to high humidity Japanese plums are susceptible to brown rot.

If black knot fungus occurs, prune and destroy the affected part. Voyageur European plum is resistant to this disease.

Harvesting and Culinary Uses

Most plum trees begin bearing about three to four years after they're planted. If you plan on cooking plums, harvest them before they're fully ripe. Otherwise, European plums are allowed to ripen on the tree. The Japanese can be picked when they're slightly under ripe.

Pick with the stems intact. Avoid damaging the skins. For best results, refrigerate the ripe fruits.

Plums are prepared in various ways. They're made into jams, jellies, marmalade, sauces, puddings, pies, and prune whip. Plums are also stewed. These can be dried and made into fruit leather.

Cook all ingredients in a four to five-quart heavy pot, covered, over moderately low heat, stirring occasionally, until the fruit is very tender and falling apart, one to 1-1/2 hours. Force mixture through a medium-mesh sieve using a rubber spatula or put through a food mill.

Gourmet

Grills get put to good use during the Summer Choose red plums for a rosy addition to the grilled pork.

GRILLED PORK TENDERLOIN WITH SPICE-GLAZED PLUMS

For the pork:

2 (3/4- to 1-pound) pork tenderloins
1 tablespoon olive oil
1/2 teaspoon salt
1/4 teaspoon pepper
1/4 teaspoon ground allspice

Brush pork with olive oil and sprinkle with salt, pepper and allspice. Cover and refrigerate for up to eight hours. Heat grill and grill pork, covered over medium heat 12 to 15 minutes, turning once. Cover loosely with foil and let stand 10 minutes before slicing.

For the plums:

2 tablespoons butter
3 tablespoons minced shallots
1-1/2 pound plums (4 to 6 plums), unpeeled, sliced 1/2-inch
2 to 4 tablespoons honey
1/4 teaspoon ground allspice
1/8 teaspoon ground ginger

Melt butter in large skillet over medium heat. Add shallots; cook 30 seconds or until fragrant. Add plums; cook five minutes or until plums jut begin to soften. Sprinkle with two tablespoons honey, adding more if plums aren't very sweet. Sprinkle with allspice and ginger Reduce heat to medium-low Cook seven to 10 minutes or until tender Serve over pork. Plums can be prepared one hour ahead. Serve warm or at room temperature. Makes six servings.

Cooking Pleasures

While you still have your grill out, make this dish with nectarines and plums. Slightly firm fruit will stand up to the heat. If you are using ripe fruit take it from the grill just a few minutes sooner

GRILLED NECTARINES & PLUMS WITH VANILLA BEAN SYRUP

2 cups water
1/3 cup honey
1 (3-inch) vanilla bean, split lengthwise
1/4 cup frozen fat-free whipped topping, thawed
2 tablespoons mascarpone cheese
1 tablespoon honey
4 nectarines, halved and pitted
4 plums, halved and pitted
2 cups cherries, halved and pitted
2 tablespoons sliced almonds, toasted and chopped

Preheat grill. Combine the two cups water and 1/3 cup honey in a small saucepan over medium-high heat. Scrape seeds from the vanilla bean and add seeds to the honey

Fresh plums are eaten for snacks and desserts, especially with cheese. They're also excellent with cereal and in fruit salads.

A standard size tree can yield one to two bushels, while a dwarf gives about one-half to one bushel.

Species and Varieties of Plums

Be sure and select plums that are suitable for your area with regard to hardiness and Winter chill requirements.

A number of plum varieties are available. The following are highly recommended.

European Plums (*Prunus domestica*)

This species bears oblong or egg-shaped fruits, which are mostly purple to black. This is widely adapted to most areas of the country. The Green Gage is one of the most popular European varieties. The prune or Italian plum is a type of European.

Blues Jam European plum

This Damson-type plum was developed at Cornell. Very productive, this upright tree is disease resistant. It bears small fruits with a sweet/tart, dense flesh. Ripening in September, these make a great jam.

Bluebyrd European plum

Released by USDA, this is particularly suited to the Mid-Atlantic region. Bluebyrd is recommended for zones five through nine. It is disease resistant.

The clingstone fruits ripen in September They have deep purple skins. With an excellent flavor, the amber flesh is very sweet. This produces reliable, heavy crops of high quality fruits.

Japanese plums (*Prunus salicina*)

Generally suited to zones six through ten, this species bears large, sweet, juicy, yellow to red plums. These fruits are rounder and shorter than European plums.

The trees can reach 25 feet tall. The flowers are smaller than those of European plums.

Cocheco Japanese plum

Quite hardy, this Japanese plum is recommended for zones four through nine. Very productive, it has red foliage that is disease resistant. This upright, vigorous tree bears round, yellow fleshed fruits with pinkish-orange skin.

The Gulf Series Japanese Plums

The Gulf Series was bred specifically for zones six through nine. These low chill varieties are recommended for Florida, Texas, the Gulf, and other warm regions.

These trees are very productive. They're resistant to two diseases that are particularly prevalent in the region – leaf spot and plum leaf scald.

They yield full flavored, round fruits. In Florida these begin ripening in late May and early June.

Gulfbeauty and Gulfruby plums have dark red skin and sweet yellow flesh. Gulfblaze has reddish-purple skin and sweet orange-red flesh. Gulfrose is red fleshed.

Black Ruby Japanese plum

Released by USDA in 1996, this freestone variety is especially recommended for humid areas, such as the Southeast. It tolerates plum leaf scald, and shows moderate resistance to bacterial diseases, including bacterial canker and bacterial spot.

The large, high quality fruits are covered with a heavy bloom. Mostly round, these two inch plums have reddish-black skins and firm yellow flesh. BC

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mixture. Discard bean. Bring to a boil. Cook until reduced to 1-1/2 cups, about 15 minutes. Set aside. Combine whipped topping, cheese and 1 tablespoons honey, stirring until smooth. Set aside. Lightly coat both sides of nectarines and plums with cooking spray. Place nectarines and plums cut side down on a grill rack coated with cooking spray. Grill two minutes on each side or until soft. Place a nectarine half and one plum half in each of eight shallow bowls. Top each serving with 1/4 cup cherries. Drizzle each with two tablespoons honey mixture. Spoon two teaspoons cheese mixture over each serving. Sprinkle each serving with 3/4 teaspoon nuts. Makes eight servings.

Here is a very refreshing simple dessert for a hot summer day You can adjust the sweetness but remember that some of the apparent sweetness is lost when very cold.

SIMPLE PLUM SHERBET

3 cups pitted and chopped ripe plums
1/2 cup honey or as needed
1/3 cup fresh orange juice
1/2 teaspoon ground cinnamon

Puree plums, honey, orange juice and cinnamon in blender on high speed until very smooth. Taste for sweetness and adjust Pour mixture into shallow pan and freeze until slushy. Stir well to break up ice crystals, then pour into six wineglasses or dessert dishes. Place glasses or dishes on a tray and freeze sherbet until almost solid. Serve immediately. Makes six servings.

Cooking For Good Health
Rodale Press

This plum sauce can be used over cake, frozen yogurt, grilled meats and vegetables or egg rolls.

HONEY PLUM SAUCE

1 cup quartered and pitted tart plums
1/2 teaspoon ground cinnamon
1/2 teaspoon ground nutmeg
juice of 1/2 large orange
1/4 cup honey or to taste
1/2 teaspoon grated orange peel

Combine all ingredients in saucepan. Cover and simmer over medium heat 10 to 15 minutes or until plums are soft. Puree in blender until smooth. Adjust sweetening as needed. Let cool before serving. Keep refrigerated. Makes about 1-1/4 cups.

Cooking For Good Health
Rodale Press

Remember the nursery rhyme about Little Jack Horner who "stuck in his thumb and pulled out a plum?" Well, keep your fingers out of your food. BC

How To Dry Lots Of Honey

Pierre Faure

We have run a 700 hive beekeeping business in Notre Dame de Lourdes in southwestern Manitoba since 1999. We realized, after a short time, that the drying down of honey prior to extracting was a primary problem when it came to performance in our field of business. Time is a scarce commodity for beekeepers, especially during the honey flow, and producing high-quality, dry honey can be quite difficult when relying on traditional drying methods.

Our extracting facility resembles any typical outfit in Manitoba or in Canada for that matter It consists of a hot room right beside the extracting room. Six huge fans run continuously on the hot room ceiling in parallel with a state of the art floor heating system which maintains the appropriate temperature 90°F (32°C). An industrial dehumidifier (Drisair 1200/2400 model) operates when the room is full of boxes from the day's harvest.

During our first four seasons, high moisture honey was a huge concern in our operation, causing major slow down times in honey extraction and loss of revenue on the employer's side as well as for the employees. Frequently, hired personnel had to be sent back home because of high moisture levels in the honey In an operation where success heavily relies on everything to run smoothly and rapidly, high-moisture levels in the honey to be extracted was a huge issue.

Our only solution to this persisting problem was to stop the extraction line altogether and wait an extra day for our "Drizair" dehumidifier to bring the moisture down to a reasonable level. When honey graded over 20% moisture and sometimes more, the day was basically wasted.

In 2004, after the construction of our new honey house, we decided to go back to the drawing boards and rethink the way we extract honey We decided against installing a better hot room system that we knew from experience did not work in the way we wanted.

After some research we decided on a new approach or strategy which was to run our extracting facility on a daily basis without taking into consideration the moisture levels in the honey The plan was to return empty super boxes to the bees more regularly and to extract honey moisture at the end of the extracting process, the exact opposite of what most beekeepers do.

It is well known in the business that honey moisture levels can be lowered in the hot room over a period of time using a dehumidifying system. But we decided to investigate the opposite side of moisture removal from honey by examining a process to use **after** the honey has been extracted from the supers. In addition every beekeeper knows that bees use a lot of time and energy to evaporate honey moisture from the cells and my other focus was to redirect this energy to maximize their field foraging time.

With my bees visiting more flowers instead of spending time drying down honey, I should be able to definitely increase my average honey production and that's what we hoped to do in planning for the 2005 beekeeping season.

How do we operate Now?

At the end of season 2004, when the new honey house was finished, we installed a brand new Honey Moisture Removal System (HMRS) bought from the well-known Cooks and Beals beekeeping equipment manufacturer in Nebraska, in the USA. This machine cost over $5,000.00 US at that time.

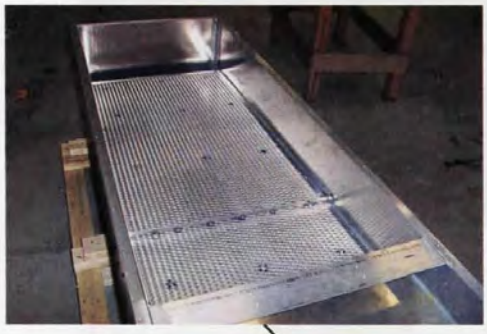
This machine does two operations at the same time. First it blows warm dry air over the incoming honey that flows on a very long tray (16 feet long) and then it recycles the hot air inside a condenser which collects moisture from the air (See the sketch drawing.)

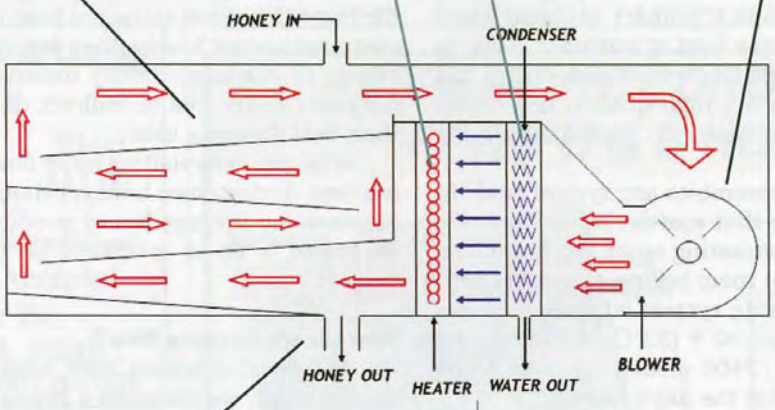
In other words, water evaporates very slowly during the few minutes that honey flows on the tray, then the water is trapped inside the condenser and removed thru a simple drainage system. (This process is very similar to an air conditioning system.)

At the end of our extracting day, if honey is too wet (which can be easily determined with a regular refractometer), the HMRS is turned on. A little bit later, when the HMRS reaches the correct air temperature 113°F (45°C), the honey pump is activated and the liquid honey starts its long drying down process.

This unit uses a powerful heater which blows warm air 113°F (45°C) inside a very long tray on which honey is pumped continuously. Honey slowly flows on the long tray and as it gets warmed up is pumped throughout the HMRS with a Viking pump (1 inch ¼ diameter) that is installed just under the stainless steel tank. (Formerly a milk storage tank.)

The HMRS machine has been installed at the end of the extracting line where extracted honey is stored in




HONEY IN
CONDENSER
HONEY OUT
HEATER
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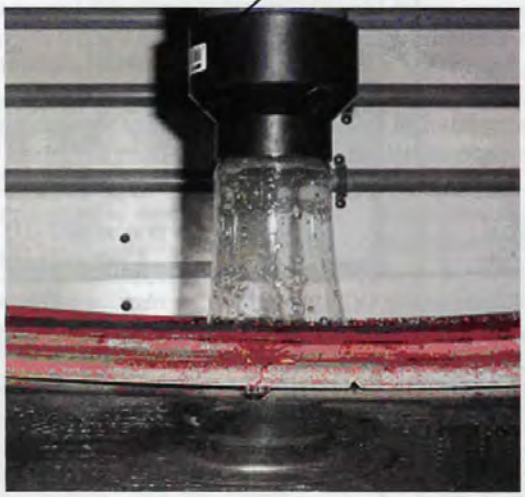
BLOWER



Installing the condenser.

large stainless steel tanks below the drying machine. We have chosen to use a stainless steel milk tank (7000 Lbs capacity, approximately 11 drums) to store our honey with a built in oil heater to keep our honey warm. The thermostat for this milk tank is set to 90°F 32° Celsius.

Our 14 feet honey house ceiling gives us enough clearance between the tank and the HMRS (see picture) to hang the drying machine with 8 threaded rods from the honey house rafters just above the milk tank. Honey flows throughout the HMRS and goes back to the milk tank using gravity so it can be pumped again and again inside the HMRS.

This machine works continuously, that means that the 7000 Lbs of honey are pumped inside the HMRS several times till the drying down process is finished. We check for moisture levels several times a day with a digital refractometer to see if the drying process must be stopped or not. With two years of experience, we know approximately how long the process will be depending on the quantity of honey or the level of moisture.

With a full tank of honey (which holds 11 drums) and 20% moisture honey, we know that process can be as long as 24 hours. If the honey holds 2% extra moisture, we have to get rid of 45 liters of water (sometimes more) to get a high quality honey (18% or less), which is up to two liters per hour of water, an amount that can be easily reached within 24 hours.

Sometimes, when honey is very wet, the HMRS is turned on at noon to start the drying process sooner Most of the time, we know roughly the percentage of honey moisture just by listening to the noise of the honey splashing inside the Cooks and Beals spin float machine. Dry honey doesn't make much noise, but wet honey splashes against the sides of the spin float.

The HMRS machine has changed a lot of things in our business ,especially for me, regarding the organization of the farm and the harvest schedule. Now, we extract on a regular basis without taking the high moisture honey into consideration. Empty supers are returned back to the fields after only 36 hours spent in the honey house, not more. The rounds for collecting and returning supers now take a very short period of time and bees can keep busy filling empty cells. Turning on a power switch to solve the high moisture honey problem has been a large pain relief to me.

During the beekeeping season of 2005 (our first season with this machine), we saved approximately 14 days of waiting time, doing hundreds of other things instead of waiting desperately for honey to dry before extraction. Employees were occupied every day of the season and didn't lose any wages.

We are able to ship dry honey to Winnipeg and get a good bonus on the honey price which pays for the investment we've made and its operating costs.

Increase of production is very difficult to estimate as the honey flow is never the same year after year However this machine is very useful when the main honey flow doesn't last very long as it happened in 2007

Our 200 amp electrical panel has been more than sufficient even if all our machines run at the same time. Regarding some technical specs, our new honey drying system needs a 60 amp breaker just by itself and an additional 30 amp breaker for the condenser unit. Putting costs together, the full unit uses 14,500 watts per hour at about six cents per kilowatt. So the total cost for one cycle of drying is around 21 dollars per 24 hours, which means about $1.90 per drum. (However the capital cost allowance of this machine is not included). Other costs for setting up this system were about $5000.00 for the electrical wiring, milk tank and stand, pumps and materials.

If other producers could dry their honey as low as I do, for example in the range of 17 1% to 17.4%, a bonus of $18.90 dollars per drum would be added to their regular price compared to a 18.1% honey drum. (This is based on Beemaid's current grading policy for dry honey.)

Any beekeepers who want to see this machine are very welcome to my place. Please telephone me at the French Bee Farm, 204.248.2645 in Notre Dame de Lourdes or contact Pierre Faure at my email address fbf@mts.net. BC

Pierre Faure runs 700 hives in Notre Dame de Lourdes in Manitoba, Canada.

Bee Club Anatomy

Though we may wander from club to club, the basic club anatomy remains constant.

Gwen **Rosenberg**

I think it was Mark Twain who once said that "I would never want to be in any club that would have me as a member " Not me. Wanting me as a member is my only criteria. I am delighted to pay my dues and become a part of any club willing to put up with me. I belong to a bee club and a dog club and a cooking club and have phased myself into and out of knitting clubs, book clubs, poetry clubs, wine clubs, and that's not counting volunteer organizations, professional and academic associations. While my name rambles along membership rosters like pollen on the wind, there is one thing that remains constant – the club anatomy. Not the human anatomy, but the composition of the club; the types of individuals responsible for meeting together once a month to discuss some order of minutia and squabble over by-laws.

In every club, regardless of the uniting factor, there are a distinct set of characters, and I mean characters, that comprise the anatomy of that club. The faces and years may change, but this cast of characters remains largely unchanged. The bee club in particular is a marvelous specimen, anatomically speaking, of such an organism. The outside observer sees the whole organism promoting bees and selling honey. In reality it's a mob of men and women who generally can't agree on the day of the week let alone the best beekeeping practices or price of honey.

If you belong to a bee club or a local fly fishermen's club, dutch rabbit enthusiasts or giant remote controlled airplane flyers organization the list that follows will look very familiar to you. If you've ever been forcibly dragged to some gathering of people who all want to talk about the same thing, then you will also recognize the following people who I have cleverly assigned anatomical nicknames.

Allow me to introduce you to the spine of the bee club. If the spine of an animal is the central player in all functions for survival, then this person is single-handedly responsible for the life of the bee club. All bee clubs, in order to survive, have at least one workaholic member They usually head some laborious committee or some other high ranking position which is high on work and low on recognition. Whatever their position, it is generally assumed that without this person the club would cease to exist. They cannot say no to responsibility, and view the bee club in a big picture kind of a way They worry about legacies and things for posterity and other lofty

B-Tox & Meetings

Peter **Sieling**

The Steuben County Honey Bee Association (SCHBA) meets the second Monday of every month at 7:30 PM. (Everyone is welcome to come). Last Fall we were amazed when Rosie O'Donnell walked in. I didn't even know she kept bees. She took the president's chair and no one dared ask her to move. I looked toward Don, the program committee chairman. Maybe he had booked her for the program. He looked at me, then at Rosie, and shrugged.

At 7:29, Sue, our club president still hadn't arrived. We all were getting nervous. Some people, when they are nervous, display tic behaviors. Chuck, our vice president, has glossophobia – the fear of public speaking. He'd have to run the meeting if Sue didn't come. He was slapping himself in random places, as if he felt bees crawling under his clothes. Dick, our secretary, held his hands forward, making pumping motions like he was smoking an aggressive colony. Jesse sat very still with his hands outstretched. Every now and then he'd suddenly jerk his arms as if he had just shaken a swarm loose from a branch into a bucket.

I'm glad I don't have any nervous tics. Lash's tic was particularly annoying. He kept jabbing his elbow into my side. I finally turned and snapped, "Do you realize you are repeatedly poking me?"

Lash shot back, "Would you stop vibrating your lips? You sound like a hedge trimmer."

The clock struck 7:30. Chuck ducked under the table. From somewhere I heard President Sue's voice say, "Will the meeting of the Steuben County Honey Bee Association please come to order " Rosie O'Donnell's lips were moving and Sue's voice was coming out! Was this a ventriloquist act?

As Rosie talked, I realized she wasn't Rosie. She really was Sue. Her face had puffed out like a balloon, like maybe her face swelled maybe a couple bees got under her veil the day before, stung her in just the right spots, and she came out looking like Rosie.

I felt a new lucrative business idea coming on. Better than honey production or pollination, better than pollen trapping, better than removing bees from houses, better than bee venom therapy. Bee-tox plastic

goals. They have great ambitions and noble intentions. I suspect that this person is the original founding member and they are reincarnated every half century or so to toil away in the bee club and preserve it for another few decades. Without getting into a religious debate, I wonder if this is beekeeper heaven or beekeeper hell. In mythology, Sisyphus had to push a rock up a big hill for eternity; in beekeeping you return over and over to find volunteers to operate an observation hive during the town's Memorial Day picnic. These people are the backbone of any club and are driven by such a passion that they infect other members. Thank this person often because if they decide to leave, the club collapses in a heap, stops breathing and dies instantaneously.

If there is a backbone, then there is a pain in the tailbone so to speak. This member is usually also on a committee or holds some other office but does not work nearly hard enough to justify all their complaining. What they contribute is overshadowed by how much they talk about what they contribute. Tailbones show up to the field day that took three months to plan, and complain about the weather They probably also take home all the leftover snacks after the meeting. Tailbones are cheap, noisy and contribute little, but every club has one. The one positive is that there can only be one tailbone because tailbones hate to hear other people complain.

The opposite end of the tailbone is the brain. Brains are great, not every club has one but they should. The brain is someone who has all kinds of skills that they share generously with the club, usually without even being asked. Brains will show up to a meeting with a custom built honey display table they whipped up in their wood shop. Some can build websites, navigate IRS tax codes and even work that gigantic coffee maker They worry about details that would completely escape most members. Very often the brains are the unsung heroes of the newsletter Brains have lots of good ideas and good solutions. Always ask the brain of the club for their opinion.

Aging brains and spines sometimes turn into nervy types. It may be tempting to think of these members in terms of sciatica or root canal but this is not an accurate portrayal. There are always nerves lingering around clubs. They are one of my favorite types of club members. These people are experts. They have a tremendous amount of experience, mountains of advice and piles of reasons why you're probably wrong- and they're probably right. These men and women have been keeping bees and attending meetings since before you were born, no matter how old you are! These are the members who insist on parliamentary procedure when electing the same officers that have been elected for the past eight years. They frequently play devil's advocate, resist changing the honey prices and simultaneously complain that the club doesn't make enough money Usually these are the only people who volunteer to mentor new members and they'll even give them a crack at a swarm. They may forget your name, but they won't forget beekeeping blunders, ancient club gossip or the names of the individuals who helped shape and build the club into what it is today. All clubs have their share of drama and upheaval and when catas- ➢

surgery!

I could, through careful injections of bee venom, sculpt your face into the face of anyone you want, temporarily at least. I think I'll call it the Hollywood Bee-tox Body Sculpting Company I'll start slow, practicing on simpler body parts, maybe bust and pectoral enhancements. I already have experience creating big sexy lips like Angelina Jolie's with bee stings. I'll work up to other facial features as my skill increases. First, easy ones like Herman Munster and Prince Charles, then up to Josh Groban and, well, there's a lot of guys who might like to look like me.

That night I took digital photos of my face. On the computer I converted one to a three dimensional contour grid. I did the same with a photo of Tom Cruise. I superimposed the two images with my face just behind his and used the trim/weld tool to create a positive image of the negative space between our faces.

The day before the next SCHBA meeting, I drew little x's on my face corresponding to the thickest areas on the image. I squeezed bees against the x's. I felt the sharp jolt of pain slowly spread until my face swelled out into a perfect image of Tom Cruise. Well, not exactly like Tom Cruise, because it's hard to get the exact amount of venom by squeezing bees. I thought I looked somewhat like Tom Cruise after he'd been stung a couple of times around the lips and eyelids. My wife said I reminded her of the Pillsbury Doughboy if someone left him out of the refrigerator overnight.

Monday night at 7:29 PM, I put on a pair of movie star sunglasses and strolled into the bee meeting.

"Hey, Sue!" Dick said, slapping my back. "Did your face stick that way or did you forget your veil again yesterday?" He looked closer "Sue, why do you have little x's on your face?"

I was about to correct Dick in a disguised voice, but at that moment Sue entered the room and sat down in the president's chair The other members looked at Sue, then looked at me. I saw Don and Dick making eye contact. Don shrugged. Dick sat down and started making pumping motions with his hands. Chuck was slapping himself and Jesse sat with arms outstretched, jerking occasionally I nervously took my seat next to Lash as Sue called the meeting to order Suddenly Lash jabbed my ribs with his elbow.

"Pete! What happened to your face? You fall into a hive?"

"How'd you know it was me, Lash?"

"Your lips were vibrating. You know, you should find a good psychologist and get that checked out." BC

Peter Sieling is reconsidering his new business, from his home in Bath, New York.

trophe strikes your club, look to the nerves to put it in perspective and tell you the story of how a similar thing happened not too long ago...

No club anywhere should be without a stomach or two. The stomach of a club has the most frustrating task of organizing the refreshments for the same beekeepers who can't agree on a rain date for the club picnic- to which only a third of the members responded to the RSVP. These people beg, plead and bargain so that regardless of the quality of the speaker, the food is always good. Stomachs prepare homemade goodies more than anyone, and never point out that the heartiest appetites belong to the people who signed up to bring snacks but forgot.... again. They lug in five gallons of soda (including diet for the picky drinkers) and wrestle with that giant coffee pot while everyone else gets to mingle and joke. At some point someone accuses the stomach of derailing weight loss attempts or poisoning the allergy prone. At meetings, children wreak havoc with the refreshment table and the stomach is left to search out extra napkins and clean up. The stomach has a thankless job. Refreshments at a meeting are a special civility that all members enjoy, so we should all share the burden that the stomach has so dutifully accepted.

The appendix is an interesting little mystery No one knows what it does, no one knows if we are better off with it, or without it. In a club, there are usually a fair number of these types of individuals. They do not attend meetings, picnics or holiday parties. They do not volunteer to work and they do not voice opinions on club business. They pay their dues on time every year and receive a newsletter every month. In the absence of an explanation we make assumptions like that these are members who subscribe to the newsletter as an idle threat to family members who are allergic to bee venom, or maybe they are just really, really busy, maybe they don't even keep bees but have a love of reading meeting minutes. If you recognize yourself as an appendix, what gives? And why don't you save the club 42 cents and get the newsletter sent to your email?

New members are all heart. They are totally smitten with their new-found hobby and are full of ideas and energy. They can be exhausting and naive, but usually the new members are a joy to any club and should be treated delicately. Do not allow negative voices to diminish all that enthusiasm (See pain in the tailbone). In time, hopefully, these optimistic newcomers will season into the hands and feet of the club by volunteering at activities, holding office and generally making it possible for the club to flourish. Hands and feet are responsible for field days, honey sales, and the snacks that appear at every meeting. Usually they are juggling the responsibilities of work and family and enjoy a brief respite to talk about bees. Be a hand or a foot at your club and if that's not possible then bring a snack to share and ask the new folks about their bees.

Every club has a soul. The soul of a club is the combined energies of the club members who have gone to forage in the great ethereal field. Their names are no longer on the roster and their memory fades with each passing year The soul's presence is still felt in the people who were introduced to beekeeping by these bygone members. It is the greatest accomplishment of a club to survive, grow and make more beekeepers. It should be every member's goal to contribute to this legacy. Make your contribution by sharing a talent, advice or peanut butter chocolate chip cookies. BC

Gwen Rosenberg is an occasional contributor to our magazine, and one of the hands at her monthly bee club meeting.

SCREENING ... Cont. From Page 27

David Wick pictured here with the IVDS – Integrated Virus Detection System.

showing unusually high counts is a virus particle not previously seen by ECBC (e.g., 21 7 nanometer).

I and my research team at Bee Alert Technology continue to work closely with Dave Wick at BVS. Bee Alert is coordinating all bee sampling and sample analysis. We have posted a protocol for taking and shipping samples on our web site, as well as a sample description sheet that identifies colony location, colony condition, and the types of analysis requested.

At this time, Bee Alert and BVS are emphasizing rapid turnaround analysis for viruses and *Nosema ceranae*. Commercial beekeeping operations in the midst of colony failures should contact us immediately In most cases, we can provide preliminary *Nosema* and virus results within 24-48 hours.

We recognize that beekeepers need help when a problem emerges, not months later. As such, samples from beekeepers with crashing colonies will take priority over the archived samples in our freezers. We will continue to process the frozen samples as rapidly as we can.

In the meantime, both companies are delighted to be able to announce the immediate availability of virus screening for bee samples. People have been hearing that we are open, and more samples are coming in each week.

In these initial stages, we are still working out the best laboratory practices for maintaining quality while increasing throughput capacity We currently are processing 15 samples per day, and we are looking at ways to increase this. The limiting factor is sample preparation, which is a function of the number of centrifuges and filter systems available to us. The IVDS instrument can easily analyze a sample every five minutes.

For information on submitting samples, please visit www.beealert.info. BC

Dr. Jerry Bromenshenk is a Professor at MT State Univ., Dept. of Entomology, and President of Bee Alert Technology, Inc.

INNER ... Cont. From Page 10

sponsibility of being President for a bit. Come with us, enjoy the sun on your shoulders and the pleasant buzz of the bees, feel the calming quiet of a warm afternoon in the woods with the birds and the breeze, and the simple peace and quiet. You'll enjoy it, it'll be fun....here, put on this veil and make sure it's tight...and always remember...keep your hive tool sharp and your smoker lit and you'll do just fine...

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The controversy over CCD hasn't abated one bit after nearly two years running. The last bit of news was that the Congressional Subcommittee on something or other held a hearing to see how the USDA was getting along on their promises to do research on this beast. And USDA showed up to show that they had actually done something...allocated some money, published some papers and planned more research...to be worthy of all the money congress was promising to throw their way to study CCD. Mostly, it was an exercise to kill time for the administrators and the congressional folks who don't have enough to do, while the soldiers keep on keeping on.

But some of those who showed up to testify have way more to do that they have time for, and I really hope those congress folks, and especially those USDA administrators stayed around to listen. The front line scientists, the beekeepers who have lost bees, the growers who have had to cut production because of no bees all need to be heard...this is where businesses go broke, where people lose their homes, where there's no food on the table....

Dave Mendes, the VP of the American Beekeeping Federation detailed some of the research he's involved in, but the take home message was that he started his experiment with 18 colonies, and after 10 months on the road pollinating a series of crops only four were left and not one was strong enough to pollinate almonds. He gave it a 95% loss...I'd say 100%.

The real message came when a cucumber grower from North Carolina testified that he had to cut his production 50% because he couldn't find bees, or was pretty sure he wouldn't be able to find bees at the

Continued on Page 68

Fruitless Fall ... Cont. From Page 13

Dave Hackenberg discovering his lost colonies, all the way to the almond orgy last year. He takes a careful look at the African bees, a good look at keeping bees, growing plants for bees and the healing power of honey. He ends up being a beekeeper, which isn't a bad thing. Better, his mentor is Kirk Webster, the Russian bee breeder in Vermont, and, interestingly, a charter member of the Brotherhood of Better Beekeepers. Rowan is in good hands.

He also looks at honey plants, other pollinators, and all the maybes of CCD...pesticides, industrial agriculture, mites, viruses, nutrition, and beekeeper abuse.

From a beekeeper's perspective there's not much new here if you've been following CCD for the past two years (reading The Beekeeper on www.thedailygreen.com would have given you similar information, but over a much longer time period). But Jacobsen gathers his information well, and has edited and condensed it to be at once a nail biter, and a good history, for history's sake. This is a good documentation of what went on. Since it is still going on, this is only chapter 1, maybe 2, but the end isn't in sight yet.

From the ordinary citizen's perspective, however, it is a wonderful collection, and a well-told story that brings them up to date with the facts and fancy of CCD and beekeeping. Unlike A Spring Without Bees, reviewed here last month, Rowen doesn't narrow his focus to just pesticides, or virus, or any one thing...he keeps an open mind, and offers several suggestions for improvement.

It's an easy read...you'll easily finish it in an evening...and when done you'll know as much, or more, than anybody else at the next bee meeting.

Kim Flottum

Keeping Bees ... Cont. From Page 13

only so many things an author can cover in 150 – 200 pages. One focus here, like *BackYard*, is in design and presentation. Both do it well. And both do the basics well I think, with the differences more with culture than anything. *Beekeeping* covers a few more topics, but none of them very detailed, while *BackYard* has more detail, but covers just a little less in both topics and timeline. It's a tradeoff.

If you want a beginner's book, both work well. *BeeKeeping* is newer and the authors did a grand job of explaining the basics, and it comes in a delightful package.

Yes, this was written by Kim Flottum. If you noticed a bias, so be it.

Without Bees ... Cont. From Page 13

the details, an excellent reference.... not unlike *Fall*...as she, too explores the contributions of pesticides, GM crops, mites, a changing environment, nutrition, pests and diseases and industrialized pollination. Both books quote all the players in this lethal game (our magazine manages to show up in one form or another in both), but since the approach is a little different, you get a little different view of each of these important people, which makes it interesting and combined, gives a better picture.

In the end the conclusions and recommendations are similar...less stress, more flowers, fewer pesticides and kinder beekeepers will all help. Helpful at the end is the CCD timeline...which starts with Dave Hackenburg finding empty hives in November, 2006, and ends in May of this year with the AIA downplaying the role of the Israeli virus.

This book, too, you will read in an evening, but it will be an evening well spent. *Kim Flottum*

GLEANINGS

AUGUST, 2008 • ALL THE NEWS THAT FITS

OBITUARY

Norberto Milani, Professor of Entomology at the University of Udine in Italy and a researcher whose work has made a huge impact upon the world of beekeeping, has died at the age of 58. He was a world-renowned expert in entomology, honey bees, mites, and pheromones.

Dr. Max Watkins of Vita (Europe) Ltd said: "Norberto was a remarkable person with a brilliant mind. I began working with him in 1991 and was always impressed by his knowledge, diligence and attention to detail. He was quiet and self-effacing, but a real powerhouse in the discovery and application of knowledge.

Photo by Paul Cleaver

"He played a leading role in the development of Apistan, Bayvarol, and Apiguard – all key products in the fight against the *Varroa* mite that are being used by beekeepers across the globe. More recently, we had been working with him on pheromone systems to control *Varroa*.

"Norberto's attention to detail was astonishing – a key to his success.

"When he inspected a frame for research purposes, he was meticulous. He would examine every last cell. Often he was to be found in his offices or laboratory long after others had gone home. As well as being top in his field of biology he was also a first class physicist and made much of his laboratory equipment himself.

"Even though relatively few beekeepers outside of Italy might have known the name of Professor Norberto Milani, they certainly benefited from his work and knowledge. We at Vita felt a great personal loss of a good friend and collaborator, after his departure from the University in September 2006, but we intend to pay tribute to the foundations he laid by continuing to research with the team he established at the University of Udine." – *from Bee Craft*

NEW SPORTS ENERGY GEL

GloryBee Foods has introduced Liquid Gold™, an organic honey-based sports energy gel. Liquid Gold was in development for four years before the product made its debut at the U.S. Olympic Team Trials – Track and Field in Eugene, OR June 27 to July 6. With an estimated 200,000 attendees, the Eugene 08 Festival was the largest event the company has ever taken part in.

Liquid Gold is a sports gel athletes can look forward to using. While many believe honey is a sugar, it is actually a complex carbohydrate that contains multiple types of sugars. Studies have shown that honey is an excellent whole food to use during exercise because its mix of carbohydrates help to prevent sugar spikes and it is unprocessed, making it easy to digest.

Liquid Gold also contains potassium from blackstrap molasses and sodium from sun-dried sea salt. The gel comes in five great-tasting flavors, which are extracted from organic essential oils – citrus, strawberry, mint, chocolate mint and natural. Liquid Gold is made with 100% organic ingredients, so not only does it taste great, but it's great for you.

Liquid Gold is also great for the environment. The product comes in a five-serving refillable flask that is easy to carry, easy to squeeze, and is completely recyclable.

GloryBee Foods is located in Eugene, OR. Please visit GloryBee – www.glorybeefoods.com.

IMT CONTRIBUTES ARTICULATING CRANE FOR TV SHOW

A grateful beekeeper is enjoying increased productivity and safety, thanks to the generosity of Iowa Mold Tooling Co. Inc., an Oshkosh Corporation company. IMT contributed an articulating crane and operator-training services to a lucky trucker in Tipton, Okla., for an upcoming episode of "Trick My Truck" on CMT.

Gary Grose, manager of Tipton Valley Honey Co., received a Hino chassis decked out with an IMT 4/29 articulating crane. The episode featuring Grose premiered at 10 p.m. (on July 4 on CMT. The IMT® 4/29 articulating crane features a maximum reach of more than 22 feet and a maximum lifting capacity of 4,520 pounds. It also sports an overload protection system, and Grose's model came with radio remote controls.

"We are honored to participate in this unique opportunity and be part of such a special occasion," said Steve Fairbanks, IMT president. "When we heard about Gary's situation, we quickly realized how much he would benefit from one of our cranes."

Grose said the IMT 4/29 unit would save him an immense amount of manual labor. "I was ecstatic when I found out I was getting a truck outfitted with a crane. A crane has so many benefits for my business – all the back-breaking labor that it saves," Grose said. "The crane is absolutely phenomenal. It's going to save so much time and money that we should be able to drive our costs down to better compete in the global honey market."

CMT's hit series "Trick My Truck" aims to improve the lives of American truck drivers who are in need of a much-deserved break. The cast of the show "steals" the rigs of lucky drivers and then alters the trucks, ultimately improving the truckers' lives.

Grose is going to use the new crane to deliver pallets of beehives across the country. He previously used a skid-steer loader to move the hives around, but that method involved a great deal of manual labor. He said that not only is the crane going to help him be more productive, but it's also going to mean safer operations for his field crew.

"Beekeepers face safety issues such as heat stroke. We wear protective gear in 110° heat while lifting 100 boxes of honey, 75 pounds each, every day," Grose said. "Now that the crane will do the heavy lifting for us, we're going to cut down immensely on heat stroke and back injuries."

For information about IMT, please visit www.imt.com.

Iowa Mold Tooling Co., Inc. began in 1961 as a business providing new tread designs for recapping tires. The company has grown to become the leading manufacturer and supplier of service vehicles, cranes, hydraulic loaders and air compressors for tire, mining, construction, material handling and utility markets around the world.

CALENDAR

♦INTERNATIONAL♦

EurBee3, the Third European Conference of Apidology will take place at Queen's University, Belfast, UK, September 8-11.

Speakers include Tom Seeley, Cornell; Vassya Bankova, Bulgaria; Martin Giurfa, France; Steve Martin, UK and more.

For details and information visit www.qub.ac.uk/EurBee3/ or contact curbee3@qub.ac.uk.

Western Apicultural Society will hold their annual conference August 17-21 at the Holiday Inn, Victoria, BC.

Visit http://groups.ucanr.org/WAS for more details.

Bees For Development Beekeeper Safaris – Turkey, August 2-14; Tanzania, November 13-27; Trinidad & Tobago, February 2-12, 2009. For more information contact safari@beesfordevelopment.org or visit www.beesfordevelopment.org/info/activities/safaris/index.shtml

2nd World Symposium of Queen Breeders & Artificial Insemination, October 15-19, at the Hotel Marival Resort & Suites in Nuevo Vallarta, Nayarit, Mexico. Registration is $75 before July 31 and $85 after that. For hotel contact reservaciones@clubmarival.com or 52(322) 226 8200.

Contact Marco Munoz, apicolaelite@hotmail.com or Enrique Carrillo, enriqueabeja@hotmail.com.

2nd International Beekeeping Congress will be held August 19-21, 2008 in Thimphu, Bhutan.

The objective is to showcase research and development activities in bees and bee products.

For information contact ibcbhutan@gmail.com or sivaram900@gmail.com.

♦ALABAMA♦

The 2008 Annual Meeting of the AL Beekeepers Association will be held in Prattville at the Imagine Suites on October 10-11. Speakers include Dr. John Skinner of the University of Tennessee, Dr. James E. Tew of OH State University, and Jerry Hayes of *The Classroom* and the FL Deparrment of Agriculture & Consumer Services. Check www.alabamabeekeepers.com for information.

♦CONNECTICUT♦

The Backyard Beekeepers Associaiton will meet September 30. The speaker will be Dr. Ernesto Guzman. For more information please visit www.backyardbeekeepers.com or contact Serge Boyce, 203.259.4861.

Southern New England Beekeeping Assembly will be held November 22 in Hamden. This event will be cosponsored by The Back Yard Beekeepers Association and The CT Beekeepers Association and Wicwas Press.

Watch for details and visit www.sneba.com.

♦GEORGIA♦

The GA State Beekeepers will meet September 26-27 for their Fall meeting. It will be at the Rabun County Civic Center, 201 W. Savanna Street, Clayton.

Speakers include Tom Rinderer, Randy Oliver, Steve Forrest, Dann Purvis, Barry Wright and Robert Brewer.

For information contact Tom Bonnell, 770.473.5434.

♦KENTUCKY♦

The Eastern Apicultural Society will hold their annual week-long Short Course and Conference, August 4-8 at Murray State University in Murray, Kentucky.

Please visit www.easternapiculture.org for details.

♦NEW YORK♦

The Cornell University Master Beekeeper Program will conduct its one-day Apprentice Level Fall Workshop, August 9 at Dyce Lab, Cornell University, Ithaca from 9:00 a.m. to 6:00 p.m.. The cost is $75 which includes the manual and refreshments.

Topics include preparation for the Fall flow, Winter management, honey removal and more. The day includes two hours of field work.

For information or to register go to masterbeekeeper.org. Classes are limited to 20 people.

TENNESSEE♦

The Tennessee Beekeepers Association will hold its Annual Conference October 17-18 in Memphis.

Speakers include Jerry Hayes, Jamie Ellis, Amanda Ellis, Ed Levi and Kent Williams. There will be a honey show and hoto contest.

For information please visit www.tnbeekeepers.org.

♦UTAH♦

The UT County Beekeepers Association will meet August 23 5:00 9:00 p.m. at Benjamin Farms, 8297 South 3200 West, Benjamin, UT.

Please RSVP before August 18 at ut.co.beekeepers@gmail.com or 801.822.4114.

INNER ... Cont. From Page 10

right time and price to pollinate his crop. This was finally the smoking gun...CCD has caused a reduction in the food supply, plain and simple.

CCD, or whatever it is that colonies are dying from, is worse this year than last year, and even though the weather has abated some in the worst areas, it's still bad, and CCD is still causing problems all over the place. Take a look at the Honey Report for some interesting data on problems, the weather and CCD....interesting, certainly, but not hard data...unless you live in one of the dry areas and your bees are dead or dying as you read this.

But there is some hope and good news from all of this. USDA did manage to dig up $4.1 million for a four year grant (it wasn't exactly their money, since they brokered it from their CSREES subgroup...that's Cooperative State Research Extension and Education Service. There was a bit of kerfluffle on who was to get this grant...three, or maybe four groups applied for that money but it was eventually awarded to a group that USDA had been working with earlier, which seemed a bit odd at the time.

Anyway, one thing to come out of the hearing that bears additional scrutiny I believe is the role of pesticides, both in-hive and external, are playing in colony health. Some beekeepers firmly believe that agricultural pesticides are the beginning and end of CCD, especially those neonics everyone is talking about. Others, scientists mostly, are pretty certain it has to do with the build-up of in-hive mite control chemicals...fluvalinate and coumophos...while most – both scientists and beekeepers are either undecided or quite certain they aren't playing a role in CCD.

I don't care, actually, if they are or aren't. They are, absolutely, causing problems, whether related to, affecting, or causing CCD or not. Pesticides kill bees, and there are way, way too many pesticides being found in beehives...way, way too many

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It's August, and harvesting is done or underway. Be wise this year and make sure you take care of the bees that take care of the bees that go into winter Without them ... well, you're simply gambling, again, that you'll have bees in March.

Display Advertisers

Ever since Dr Al told me to get more aerobic exercise, I've been trying. This morning walking on the county road I paused to talk to a neighbor

"Did you make the 'God Rally' this weekend?" she asked.

I said I missed it.

"Well, then you must have gone to Strawberry Days," she said.

I said, "On Saturday I went to the Colorado state beekeepers meeting down the road, and then yesterday I went to that auction."

Okay, you didn't hear this from me, but at the bee meeting, a guy told me he had a problem bear A third party told the two of us that a guy told him that if you coat a can of starting fluid with peanut butter and leave it for the bear, he'll bite into the can and never visit your yard again. You need to put a big rock on the can, so that critters like raccoons or coyotes can't get to it.

Our speaker this Summer was Dr Frank Eischen, from the Weslaco bee lab, who spoke on bee nutrition. His colony-size studies indicate that, at moderate to low Nosema Ceranae spore counts, feeding pollen substitute might be as effective, or more effective, than treating with Fumagilin.

Hey! A good diet helps to keep bees healthy! This was good news to me, because I've neither tested nor treated for Nosema. But bees around here gather and store prodigious quantities of natural pollen. Maybe all will be well, after all, without chemicals or supplemental feeding.

It's nearly forgotten now, but in 1989 press reports about the use of a chemical called "Alar" on apples alarmed the public and threw the American apple market into chaos. Some pooh-pooh natural or organic bee treatments, but one day the honey industry may have its own food-safety scare – probably related to the use of illegal chemicals – and we'll all wish we could say our product was organic.

At the auction the first thing I did was get caught shoplifting. The flyer advertised "food provided," and I assumed it was free food, courtesy of the auction company. I said good morning to the gal at the food table, picked up a bag of chips, and walked off.

She never said anything, but a couple of minutes later, I got a tap on the shoulder from a chain-smoking and I might add humorless woman who explained that I couldn't just walk off without paying.

This was at least partly a bee equipment auction. There wasn't a big turnout of beekeepers, however, which was unfortunate, because for every buyer there's a seller, and one day the seller might be you or me. But beekeepers are few and far between in sparsely populated western Colorado, and I guess most folks who attended the state bee meeting the day before didn't want to stay an extra night.

Some bee equipment went for pennies on the dollar, if it got a bid at all. I bought a barrel of "powdered" sugar, a pallet of medium supers, and a big old-fashioned commercial scale rated to 600 pounds. It's a beauty

When I got home, I opened my "powdered" sugar barrel and discovered that it contained granulated sugar in 50 and 25 pound bags. Which was fine with me. I weighed a 25 pound bag on my new scale, and what do you know? The scale registered precisely 25 pounds! When I weighed the 50-pound bag, the sliding weight pointer topped out at 50 pounds exactly Impressive.

But the add-on weights turned out to be for a different scale. I purchased a scale so massive that it takes two people to lift it -- yet it tops out at 50 pounds.

I bought a diesel Kubota tractor at an auction years ago. It was only 25 years old, and it ran perfectly. I paid $1400 and thought I was so shrewd. What I didn't realize was that my machine didn't have a three-point hitch. I was green, and I'd never even heard of a three-point hitch. You need a three-point hitch to tow mechanical implements, like a plow or a creaser This was back before EBay, and afterwards, when I shopped around, the cheapest hitch I could find was $600. Unfortunately, I was already over-budget, according to my wife.

But I really bought that tractor so I could spray my orchard. I wanted to run a sprayer off the tractor's power takeoff (PTO), but I discovered to my chagrin that this particular Kubota had the only counterclockwise-turning PTO in the history of tractors on the Planet Earth. And the only place you'd find a counterclockwise PTO-driven sprayer might be a junkyard in Japan.

I couldn't tow mechanical implements or run power implements. I couldn't do anything but drive around. I sold my little bargain tractor for $100 at a garage sale.

Ed Colby

The Auction