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Bee Culture

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Bee Culture

THE MAGAZINE OF AMERICAN BEEKEEPING

OCTOBER 2005 VOLUME 133 NUMBER 10

Asters are a staple Fall honey source almost every year, and there are a multitude of varieties in all parts of the U.S. (photo by Zachary Huang, MI State University)

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FEATURES

DEPARTMENTS & COLUMNS

Tap, Tap, Tap

I'm a beginning beekeeper who enjoys your magazine very much.

I was visiting relatives recently in southern Ohio, and my uncle, Fred Loop, who's in his 70s, told me the following information about capturing swarms.

He grew up living in the country east of Portsmouth, Ohio. When he was a teenager, he would sometimes be out working in the field with a hoe with several other teenage boys when they'd see an airborne swarm of bees. They would remain standing in the field, holding their hoes in a vertical position, and each boy would tap on the wooden handle of their hoe with their fingers at a rate of about two taps per second. The sound of the tapping on the wood would apparently attract the swarm, and the swarm would land in a tree not far from the boys. Then they would capture the swarm by wetting them down, spreading a sheet on the ground below the swarm, and knocking them loose by hitting the branch with the bees falling onto the sheet. They then carried the bees in the sheet to the new hive, and would spread the sheet out on the ground in front of the hive. Fred said all you had to do to get the bees to go into the hive was for one person to stand at the back of the hive and tap the back of the hive with their fingers. He said it only took about 10 minutes for all the bees to go into the hive, and you just kept tapping until they all got in.

I've done a fair amount of reading, for a first-year beekeeper, but have never heard of anything like Fred described for capturing swarms. Our ancestry is of the Scotch-Irish people of the KY hills, a rather isolated group in previous generations. I'm wondering if this knowledge is some long lost "hillbilly know-how."

Have you ever heard of this before? Do you have any theories why this method would work? This part of the country has a lot of broad-leafed deciduous trees, and it rains all year round. Maybe the bees associate the sound of the tapping on the wood with the sound of raindrops hitting the leaves, so they think they must land immediately. (The humidity is *always* very high there, so you can't judge the possibility of rain by the humidity. When it rains, it usually starts very suddenly, and can end suddenly, sometimes occurring several times a day.)

If this guess is true, then the tapping on the back of the hive could fool the bees into thinking it is raining again, and the hive is a hollow tree which they can take refuge in. I'm curious to know if this method is known in other parts of the country. Maybe it doesn't work in parts of the country where swarms aren't used to dodging sudden and frequent rains.

Karen Pruitt
Campbell, CA

Editor, 623 W. Liberty St.,
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Ammonia vs. Propolis

I would like the last word on removing propolis from hands and tools.

Over 40 years ago my wife gave me household ammonia to clean my hands. While I was an IL State Bee Inspector, I carried a bottle in my car trunk. I use ammonia to clean all my equipment, mixed with water for desired strength. When finished I pour it on my wife's flowers. She has beautiful flowers and I have clean equipment.

Let's keep beekeeping simple.

Charles Leitner
Troy, IL

8-Frame Hives

I am going to make my own hive bodies, medium depth, as I enjoy woodworking.

My question is, I can get walnut here cheaper than pine. Different woods have different aromatic properties. Would walnut properly aired out be safe to use as hive bodies? I cannot find anything in the literature about wood to use, except based on cost, meaning Pine.

Steven Williams
Poplar Bluff, MO

Editor's Note: Other beekeepers I've known have used walnut for the same reasons and I've never heard of any problems. Dried to the appropriate moisture level walnut works fine. And if you're lucky, you won't have weeds growing around the bottom of the hive. Take pictures before you paint it should be an attractive box or better, just apply a clear wood preservative.

Dear Editor

I told you so!

Wise Guy

The Sparrow

In one of my beeyards there is a sparrow that comes over and visits with me every time I am working the bees in that yard. The sparrow will come up within a couple of feet from the stool I am sitting on. Some times I feel I could reach out and touch him. I am sure he is just looking for me to scrape out some fresh larva, as I often do. So I did not pay much attention to him the last time I was in that yard. It was Fall and the weather was cool and no scraping was going on. He still came over as usual on the ground around my feet. I was busy pulling out combs from the top of a two-story colony and I looked over to the other side and there he was perched on the top of the other side of the super, just sitting there watching me.

When I saw him a certain serenity came over me and I felt a relaxed happiness that I had never felt before. And I started singing *"His Eye Is On The Sparrow and I Know He's Watching Me."* For that brief period could I have been a link between God and Mother Nature? Could this be what makes beekeeping so fascinating?

Ancel Goolsbey
Spokane, WA

Comb Honey

Shallow 5-5/8 makes 40 4x4 boxes of comb honey.
Medium 6-5/8 makes 40 4x4 boxes of comb honey/ 1x17 waste.
California 7-5/8 makes 40 4x6 boxes of comb honey.
Deep 9-5/8 makes 80 4x4 boxes of comb honey @ 8x3/4" waste.
Bee-O-Pac makes 80 4 oz. sections in each super.
Ross Rounds makes 32 8 oz sections in each super.
Hogg Halfcomb makes 40 sections in each super

The waste comb you can eat, cut in 1" strips and sell for 25¢ or give back to the bees to clean, put on the inner cover, set on wet supers. Don't let the cover blow off. Put brick on top. Don't start robbing! Save your wax. Don't use black brood wax because the bees have brought it up to the cappings.

Preparing for comb honey, for wedge top bar, lay wax on the frame, set in the wedge, put two nails in the center and one nail one inch from each end. Don't hit the wax when nailing. For the split top bar, use the top bar spreader to open the gap and slide the foundation through fold over and pour hot wax to lock the foundation.

Preparing for chunk honey, decide what size of frame that you want and size jars with a nice piece of comb about 1" from top. Jars and labels with packing equipment with honey is available when buying comb honey check each piece for sour orange smell. Hive beetle infestation. Preparing for a big colony to bring in a lot of honey, find out when the Spring flowers bloom, 75 days before this time start feeding your bee syrup and pollen, and study swarm control.

Bryce R. Young

Richard's Evodia Trees

Thanks to the late Dr Richard Taylor, who first sent me the seeds, I now have a blooming Evodia tree. The tree has been in bloom for nearly a month now. My honey bees work it heavily in early morning and late evening.

I will be happy to send seeds to anyone wishing to grow their own trees. Please send a SASE.

David Bilbo
16755 Nella Road
Mena, AR 71953

Finding A Home

There are many fascinating facets to beekeeping. How bees select a new home and what they do after finding it. Especially one that has never been occupied by bees. I've cut many bee trees and taken bees out of buildings and even a 55-gallon drum once. What was always amazing was how the comb was arranged, in buildings especially. There seemed to be no corrolation with direction of comb and the shape of the cavity. Sometimes it would be built at right angles to the studs, and other times obliquely either to left or right.

I read an old book that said, "When bees find a new home with no comb the wax builders will construct their comb in the same direction as the parent hive."

I got a call about a swarm in a blackberry patch right off the ground. I put together a hive and snippers, plus a sheet of 1/8-inch plywood 4 x4 and drove to the spot. I then slid the plywood carefully under the swarm and placed the hive on the plywood. I gave a quick shake and the bees fell to the plywood like they are supposed to. As soon as they hit the plywood, they took to the air, with a loud buzzing, within seconds they were moving west.

When we got to where I thought they were, an old hive, all was quiet around the hive. We sat for another five minutes, when here they came across a large field from the direction of the swarm. As we watched them enter the hive, I thought everything was fine.

About a week later I had to check them. I could tell something wasn't quite right. The hive was on a stand about four feet off of the ground with a plywood base and 4x4 post. I could see comb built from the base downward. It was beautiful comb, very even and quite straight. There were 10 or 11 combs tapering from large int he middle to very small on the outside. There were no bees inside the hive. Evidently the queen didn't go in and this was the result. I thought what a mess. Then I remembered how bees build comb. I got my compass and was amazed to find it was only off by two degrees.

My thinking is how can 20 30,000 bees, inside of a dark chamber build comb without some pre-determined direction?

Jim Cowan
Aberdeen, WA

INNER COVER

Let's talk about something nobody wants to talk about...illegal chemical residues in U. S. honey. Nobody, that is, except everybody at the International Beekeeping Conference – Apimondia – held in Ireland in August. There were several talks on the subject and data on residues found in E. U. honey were discussed at length. The E. U. has been doing residue analysis there for several years...thousands of tests a week actually, and they've found what they were looking for – pesticides and miticides – legal to use and not legal to use; antibiotics of every sort, again both legal to use and not; and a variety of other chemicals I was unfamiliar with. In other words, lot's of stuff that doesn't belong in honey. Where was the honey from? Primarily China, Italy, Turkey and Argentina. Other countries were involved, certainly, but most had fewer chemicals discovered, and far fewer incidents of discovery. But then, what countries produce enough honey to export? Exactly.

How did U. S. honey do, you ask? It didn't, is the simple answer. We don't export enough honey to make the chart, essentially. And we don't test, at the government level, what we do export. The message, whether intended or not, was crystal clear we are the scourge of the planet. It was as if the international community took a taste of our product and spit it out at our feet.

A few companies do sell honey to the E. U. and they have to have the testing done at their expense I understand. But it amounts to a drop in the barrel on the global scale. Something like 400,000 metric tons of honey is moved every year, and we barely scratch the surface. Not that we could if we wanted to, mind you. Because we don't test and hardly anybody wants the stuff we have to sell.

The testing that's been going on in the E. U. for the last three years has shown that over that time honey imported into the E. U. is getting cleaner. That is, fewer chemicals are being found, reduced amounts are found when they are discovered, and they are being found with less frequency. The residue picture is getting better, according to the speakers I heard. No one knows what's happening in the U. S. Or no one is saying. That was the message I heard many times from several speakers.

But it's not as clear as these speakers would have you believe. Here's one of the problems associated with this. How much is too much? Really, how much? When the chemical residue was an illegal antibiotic, found in both Chinese and Argentine honey coming into the U. S. a couple of years ago, none was too much. There was no tolerance for the stuff. This was appropriate because antibiotics in honey are not a good thing, plus, it made it easy to keep honey from those countries out of the U. S., reducing the available supply and beefing up the price for domestic honey. For some it was a win-win situation. But fair play suggests that if any antibiotic would be found in U. S. honey it should receive the same treatment...it should be regarded what it is...tainted honey...and not sold. Was U. S. honey treated the same as the imported stuff?

In any event, I'll ask again, how much is too much? Is 0.01 parts per billion (ppb) too much of something? 0.10 ppb? 1.0 ppb? 10 ppb? 10,000 ppb? How much? And what's realistic in international trade? A couple of international trade groups are wrestling with this question right now...how much is too much? If it's none, then U. S. beekeepers are going to have to become way more careful in how they treat bees for all the things they treat with...and what they treat with. And further, if none is the level to seek, equipment used before (i.e. barrels), old comb (!), even handling equipment (uncappers, extractors, storage tanks) will need to be reviewed or replaced so they do not contribute to the problem.

But here's another wrench in the international works. All of the speakers alluded to, or admitted that testing is not an exact science when it comes to parts per billion. Results vary by tester, by location, by standard, by technique, by day and even by time of day. So how much is too much needs to be really, really well defined, doesn't it?

What else can be done?

Well, options exist, certainly, and we've talked about them here many times. 1) don't use chemicals to control pests and diseases, period. 2) use extreme IPM measures to control pests and diseases, including resistant or tolerant stock, mechanical devices such as screened bottom boards, drone comb (and old comb) removal, and burning infested bees and equipment, using soft chemicals and organic acids, and only as a last resort (and maybe not at all anymore) before turning to hard chemicals and antibiotics. 3) Forsake honey production altogether and just stick to pollination for income. And 4), some combination of these.

These may seem easy to accomplish for a small-scale operation where time and labor are less of a concern, but when the operation gets bigger, time, labor and money get managed a bit tighter. But in this brave new world, bigger may not be better.

The fact remains though, all over the world more and more people are looking at what's in honey. If you buy honey in barrels for cereal, candy, iced tea or medicine, what choice will you make when it comes to purchasing that product and the liability that goes with it? Will you choose a product that has been tested by a responsible government agency and found to be at or above some standard of purity and safety; or, will you choose a product that has not been tested, at all, for anything?

This is, in my humble opinion, the marketing opportunity of a lifetime for a U. S. honey producer and certainly for a U. S. honey packer and exporter. And it just makes good sense. Pride in your product (the National Honey Board will appreciate this), Safety, and Good Marketing. Right now, according to much of the rest of the world, the U. S. beekeeping industry isn't displaying much of any of these. It is time to change that impression, don't you think?

•

On a much cheerier note, at the very end of August I made my way to Oregon and saw the culmination of the wedding plans my daughter Jessica and I have been working on for about a year. It was an elegant ceremony, outside in wonderful weather, with lots of friends and family around. I finally had the chance to meet the people in her life, in the world she lives in. It was a grand way to spend a week. Congrats kids.

Kim Flottum

Testing Honey

OCTOBER – REGIONAL HONEY PRICE REPORT

What's Bugging Your Bees?

	2000	2001	2002	2003	2004	2005
Weather	-					1
Varroa	1	1	1	1	1	2
Queens		-	-	2	3	3
Tracheal Mites	3	3	3(tie)	3	2	4
Chalkbrood	6	5(tie)	3(tie)	4(tie)	4	6
Low Prices	2	2	2	4(tie)	5	5
Skunks	5	6	4	5	8	8
Resis. AFB	9	5(tie)	7	6	6	7
Bears	8	7	6	7	9	9
SHB		-		8	7	10

For the last five years we've polled our reporters to find out what's causing their bees the greatest problem. The chart shows the results from each year, and the additions (small hive beetle and queens in 2003) we've made as the situation evolves. This year we added a somewhat generic category – weather – to the list without asking for a reason – too wet, dry, cold, hot, etc. The response was predictible and this year, obvious.

Within each region, following, the maladies are listed in the order of their severity – the first is the worst, the last essentially no problem. There are some surprises.

Region 1
Weather, *Varroa*, queens, chalk, prices, T. mites, bear, skunks, AFB, SHB.

Region 2
Weather, *Varroa*, prices, queens, chalk, T. mite, skunks, bear, AFB, SHB.

Region 3
Varroa, weather, T. mites, queens, SHB, AFB, prices, chalk, skunks, bear.

Region 4
Weather, *Varroa*, T.mites, prices, queens, chalk, skunks, AFB, SHB, bear.

Region 5
T. mites, SHB, *Varroa*, AFB, queens, chalk, weather, prices, bear skunks.

Region 6
Weather, T. mites, *Varroa*, queens, SHB, skunks, AFB, chalk, bear.

Region 7
Varroa, weather, queens, T. mites, AFB, chalk, prices, SHB, bear, skunks.

Region 8
Weather, queens, *Varroa*, T. mites, prices, chalk, AFB, skunks, SHB, bear.

Region 9
Varroa, weather, prices, queens, T. mites, AFB, chalk, skunks, SHB, bear.

Region 10
Weather, queens, *Varroa*, T. mites, prices, chalk, AFB, skunks, bear, SHB.

Region 11
Weather, *Varroa*, bear, skunks, T. mites, SHB, chalk, queens, prices, AFB.

Region 12
Weather, *Varroa*, bear, skunks, T. mites, SHB, chalk, queens, prices, AFB.

	Reporting Regions												Summary		History	
	1	2	3	4	5	6	7	8	9	10	11	12			Last	Last
Extracted honey sold bulk to Packers or Processors													**Range**	**Avg.**	**Month**	**Yr.**
Wholesale Bulk																
55 gal. Light	0.93	0.75	1.00	1.12	0.65	0.83	0.99	1.25	0.57	0.78	1.00	1.15	0.57-1.25	0.92	0.99	1.10
55 gal. Amber	0.86	0.70	0.80	0.90	0.56	0.66	0.88	0.86	0.60	0.60	1.04	0.93	0.56-1.04	0.78	0.85	0.96
60# Light (retail)	95.00	107.40	69.00	99.00	82.00	105.00	88.13	103.33	145.00	113.47	150.00	100.00	69.00-150.00	104.78	104.08	103.19
60# Amber (retail)	95.00	99.30	63.00	97.70	82.00	95.50	78.00	102.50	126.67	112.08	130.00	85.00	63.00-130.00	97.23	95.52	95.13
Wholesale Case Lots																
1/2# 24's	40.56	47.98	39.03	38.14	39.03	32.50	34.32	39.03	39.03	35.76	30.00	42.56	30.00-47.98	38.16	51.31	35.82
1# 24's	55.84	68.28	66.48	56.25	60.44	56.00	59.34	62.40	49.92	63.12	74.90	69.27	49.92-74.90	61.85	62.20	62.22
2# 12's	52.68	59.58	56.81	51.87	58.20	48.00	55.61	66.00	45.20	57.84	46.00	59.29	45.20-66.00	54.76	54.06	53.64
12 oz. Plas. 24's	51.72	59.28	58.30	56.83	46.00	48.00	45.64	51.60	43.09	47.64	70.80	53.02	43.09-70.80	52.66	53.05	48.56
5# 6's	53.57	62.98	63.74	56.33	63.74	66.00	59.48	50.00	52.87	56.43	58.00	65.25	50.00-66.00	59.03	59.85	57.00
Quarts 12's	86.80	105.18	86.80	80.50	72.00	79.00	83.70	76.00	84.00	90.80	84.20	86.64	72.00-105.18	84.63	84.00	80.16
Pints 12's	56.33	54.98	56.33	58.17	38.00	49.75	57.66	45.80	48.00	49.50	55.00	51.38	38.00-58.17	51.74	53.14	49.11
Retail Honey Prices																
1/2#	2.42	2.68	2.50	2.80	1.99	2.66	2.46	1.89	3.19	2.44	2.36	2.53	1.89-3.19	2.49	3.03	2.57
12 oz. Plastic	2.83	3.22	4.00	3.16	3.33	3.25	2.69	3.51	3.45	3.09	3.73	3.20	2.69-4.00	3.29	3.21	3.11
1 lb. Glass	3.67	3.83	5.20	4.07	3.41	3.75	3.79	3.20	3.96	4.08	4.39	4.10	3.20-5.20	3.95	3.94	3.88
2 lb. Glass	6.90	6.81	8.00	5.85	6.24	6.99	5.85	8.12	6.10	6.12	6.73	7.01	5.85-8.12	6.73	6.51	6.43
Pint	5.63	7.08	6.45	5.67	5.79	5.69	6.11	5.48	5.60	7.00	5.37	5.62	5.37-7.08	5.96	5.93	5.46
Quart	10.38	10.03	11.75	8.15	7.60	10.24	8.19	8.76	8.83	11.25	9.00	9.96	7.60-11.75	9.51	9.39	8.93
5 lb. Glass	12.17	12.70	18.00	13.33	15.00	11.50	12.76	15.99	12.80	13.24	13.75	12.29	11.50-18.00	13.63	13.62	13.30
1# Cream	4.50	5.58	4.99	4.51	4.67	3.75	4.58	4.96	4.67	4.84	4.95	4.28	3.75-5.58	4.69	5.88	4.57
1# Comb	4.38	4.93	6.61	5.32	6.61	4.25	6.16	4.08	6.61	5.50	6.00	6.27	4.08-6.61	5.56	5.48	5.00
Ross Round	4.75	3.90	5.15	5.43	5.15	3.00	4.27	5.00	5.15	5.63	5.25	6.13	3.00-6.13	4.90	5.07	4.48
Wax (Light)	2.91	3.08	1.50	2.37	1.42	2.10	2.24	2.50	3.88	1.95	2.40	1.42	1.42-3.88	2.31	2.38	1.97
Wax (Dark)	2.34	3.23	1.40	2.13	1.15	2.08	1.77	2.00	3.50	2.86	1.70	2.77	1.15-3.50	2.24	2.13	1.42
Poll. Fee/Col.	50.00	51.75	38.00	37.67	40.00	41.50	45.00	60.00	35.00	57.24	75.00	55.00	35.00-75.00	48.85	45.66	41.46

Exotic Viruses

Virus particles cannot be seen with the naked eye and they normally persist as low-level latent infections, so what would make us suspect their presence in a colony? The answer is - nothing. But despite that, one or more of them can usually be found in most colonies at most times of year!

Brenda Ball

What are viruses and how can we recognize if they are present in our bees? How common and widely distributed are they and why are some of them termed "exotic"? What effects do they have and should we be concerned? What action can we take?

All these questions spring to mind when we start considering viral infections in relation to honey bees. We are all aware of *Varroa destructor* and can see it on our bees or in the hive. The same goes for Small Hive Beetle. These pests are both large in relation to the size of their host and can be easily identified.

In spite of this visibility, the importation of bees and the movement of colonies by beekeepers have served to introduce and distribute these pests to new areas. Imagine just how much more difficult it is to detect and identify new (nearly invisible) strains of bacterial and viral infections of bees. These can persist in very low amounts in apparently healthy individuals; they cannot be seen with the naked eye and require special techniques for their recognition. We remain unaware of their presence unless they cause visible damaging effects on their hosts – our bees.

WHAT IS EXOTIC?

When a pest is moved from a country where it is naturally present, to one where it isn't, it is generally referred to as 'exotic.' *Varroa destructor* is exotic to the U.S. and the UK because it originated is Asia. The subsequent movement of *Apis mellifera* colonies between and within countries has served to distribute it just about worldwide. With the increasing ease and speed of movement of commodities, other plant and animal pests and diseases are similarly being spread to new areas. However, in order to classify something as an exotic pest or disease, we need to know what is present in our own country as well as knowing what is present elsewhere. This means that we have to have methods available for the detection and recognition of these potential threats.

We are fortunate in Britain to have more information on the incidence and prevalence of honey bee virus diseases than any other country. We owe this capability to the pioneering work of Dr Lesley Bailey who started the research on these minute particles at Rothamsted in the 1960s. Although progress was initially quite slow, from the mid 1970s a new honey bee virus was discovered every year for the next 10 years. Now over 20 viruses of honey bees have been identified, mostly at Rothamsted. We know something of their seasonal incidence and distribution but still have much to learn about their natural history and epidemiology.

KASHMIR BEE VIRUS

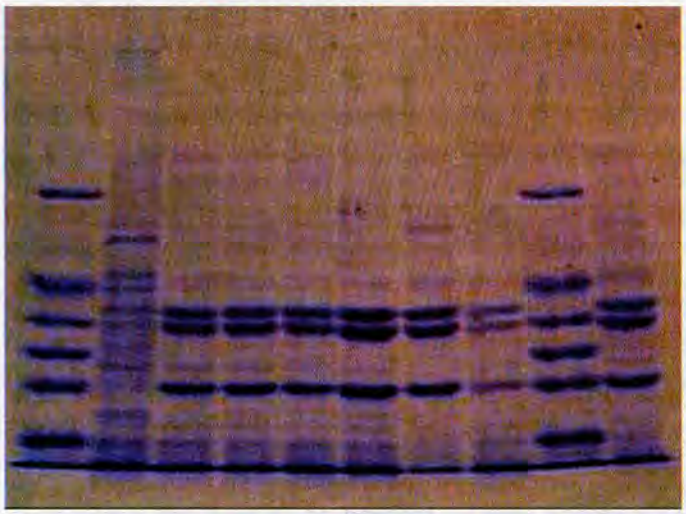
Kashmir bee virus (KBV) is very topical at present because it is known to be present in *Apis mellifera* in Australia, New Zealand and the U.S., all countries which export bees, and it seems to have a limited distribution elsewhere. The virus differs from most of the other bee viruses in that it is both highly variable and very virulent.

KBV was first identified in *Apis cerana* from Kashmir in the late 1970s. In the 1980s, it was detected in dead adult bees and brood from different regions of Australia and each region was found to have its own slightly different and distinguishable strain. However, all strains seemed equally virulent, causing death within three days when injected into a bee. KBV is related to acute bee paralysis (APV) and both of these particles can persist in live individuals at low levels with no apparent effect. However, unlike KBV, APV had never been known to cause bee mortality in nature in the absence of *Varroa destructor*.

When KBV was first detected in Australia, the UK imposed a temporary ban on bee imports to permit investigations on virus prevalence in imported queens and attendant workers and the colonies headed by these queens. Using sensitivity infectivity tests, where extracts of live bees are injected into other bees, it was found that the attendant bees did, indeed, carry the virus but none was detected in the queens. Similarly, no KBV was detected in colonies headed by the imported Australian queens.

WHAT DO VIRUSES LOOK LIKE?

Viruses can only be seen with the electron microscope and this instrument allows us to recognize some particles by their distinctive size or shape. Unfortunately, most of the viruses of bees look the same, like featureless ball bearings. However, the proteins that make up their outer shell, which encloses the nucleic acid, are different and we can make use of this property to distinguish them. There are a number of specific techniques



SDS Page

we can use to help us to detect and differentiate these similar particles.

Polyacrylamide Gel Electrophoresis (SDS PAGE)

One method is SDS PAGE (sodium dodecyl sulphate polyacrylamide gel electrophoresis) where the naturally electrically charged virus coat proteins are dissociated into their constituents and put on a vertical gel which is subjected to an electric current. The proteins are attracted to the end of the row due to the opposite electric charge. The distance traveled by the protein fractions depends primarily on their molecular weight, with smaller components traveling further down the gel. Each virus has a characteristic protein profile which aids its recognition.

The proteins of the virus coat are also folded in unique ways to expose special immunologically active binding sites on the surface which are known as epitopes. These recognition sites can assist attachment to particular cell types and enable the virus to gain entry. The virus then takes over the biochemical processes within the cell to make further copies of itself.

The immune defense systems of mammals enable them to recognize viruses as foreign proteins and they produce antibodies which are specific to the individual virus epitopes. We can utilize this property by inoculating rabbits with purified bee virus preparations and using the antibodies they produce in a range of serological tests.

Immunodiffusion

In the immunodiffusion test, an extract of the dead bee or larva containing virus and the virus antisera are introduced into adjacent wells made in a thin layer of gel on a glass slide. Both the virus and the antibodies diffuse out into the gel and, if it is the correct antiserum to the virus, an insoluble complex is formed producing a visible line.

Although this test is specific it is relatively insensitive, but an individual bee killed by virus multiplication will contain sufficient virus to react and the technique is useful in the recognition of biologically significant infections.

Enzyme Linked ImmunoSorbent Assay (ELISA)

ELISA in another more sensitive technique that uses specific virus antisera, but this time the reaction is amplified by using an enzyme/substrate system. Specific antibodies are used to coat the wells of a plastic plate and after washing out the excess reagent, test extracts are added. The antiserum coating the wells will capture any of the specific virus in the extract and this is detected with a second antibody bound to an enzyme. When the enzyme substrate is added, a color reaction occurs and the deeper the color, the more virus is present. This technique is sensitive enough to detect virus in individual mites.

VARROA IN NEW ZEALAND

In 2000, *Varroa destructor* was discovered in New Zealand and exports of package bees were suspended for awhile. KBV was known to be endemic there and this presented us with an ideal opportunity to study the events of mite-virus interactions in natural circumstances during the initial stages of infestation.

Our studies, in collaboration with HortResearch in Auckland, aimed to investigate the prevalence of KBV and other viruses in varroa infested colonies in New Zealand. We also wanted to determine if imported queens carried unapparent virus infections and lastly, we wanted to examine the interaction between KBV and *Varroa destructor* under controlled conditions in a containment facility (bee flight room) at Rothamsted.

"Has prevalence of KBV increased in New Zealand colonies because of the introductio of *Varroa destructor*? Has this resulted in increased colony mortality?"

NEW ZEALAND STUDIES

From November 2001 to April 2002, dead bees were collected on a monthly basis from 30 infested, untreated New Zealand colonies at two apiary sites in North Island, and extracts were tested for a number of different viruses using immunodiffusion and ELSIA.

The immunodiffusion test detected the presence of chronic paralysis virus (CPV), black queen cell virus (BQCV), sacbrood virus (SBV) and KBV in very few of the samples and all these were transient infections not associated seasonally with colony death. However, during the period of observation, 29 of the 30 study colonies died. Using ELISA, the most prevalent infection detected was cloudy wing virus (CWV) but no deformed wing virus (DWV) was found and, in the majority of

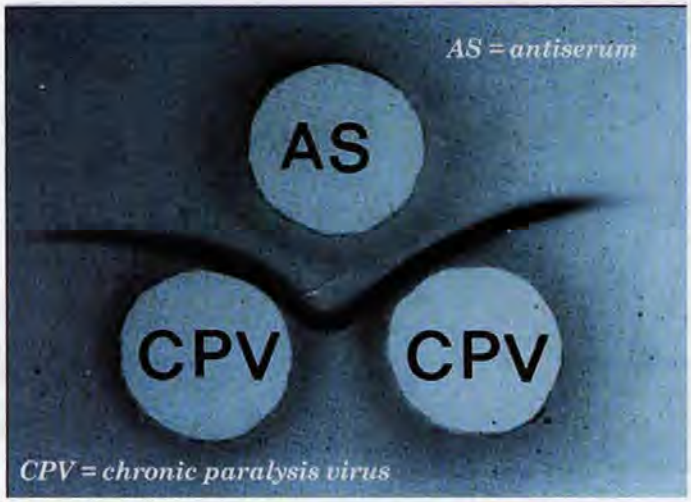
cases, there was no clear cause of the colony mortality.

Live bees were also collected from these study colonies and these were used for infectivity tests. Only about 100 particles of KBV are required to cause infection when injected and it multiplies more rapidly than any other bee virus. Infection experiments using live bee extracts are therefore probably the most sensitive means of KBV detection. Test bees injected with extracts of the live New Zealand bees all died within three days. Extracts of the dead bees from the 30 study colonies and extracts of bees killed in infectivity tests were compared using SDS PAGE. Both sets of results indicated the presence of a virus with a coat protein profile similar to that of KBV

In 2002/2003, further investigations were undertaken from November to July on a group of 12 colonies in Auckland, New Zealand. The colonies were again infested with varroa and not treated and extracts were tested serologically and by SDS PAGE as before.

All but two of the colonies were dead by the end of the period of observation and the dead bees were shown to contain large amounts of KBV for several months before colony collapse. However, the KBV detected was a strain that differed from other strains. It was found to be more closely related, serologically, to a Canadian KBV isolate.

Immunodffusion



STUDIES IN IMPORTED QUEENS

In 2003, extracts of 10 queens obtained from South Island (where *Varroa destructor* was not present) were injected into young adult bees and pupae at Rothamsted.

Very few of the adult bees died and no KBV was detected in those that did. The pupae that were injected continued to develop normally and emerged. This indicates that there was no unapparent KBV or other virus infection in the queens.

The study was repeated in 2004 using queens obtained from North Island. The results were strikingly different, with 50% of the adult bees injected with the queen extracts dying within three days. Two-thirds of these dead bees were shown to contain KBV The injected pupae developed blackened abdomens and died, almost all contained large amounts of KBV

"Analysis of individual mites showed that KBV was detected in over 70% of those collected in the first month but this rapidly fell to less than 10%, indicating that the spread of the virus may have been sustained by bee-to-bee transmission."

WHAT DOES THIS MEAN?

Has prevalence of KBV increased in New Zealand colonies because of the introduction of *Varroa destructor*? Has this resulted in increased colony mortality?

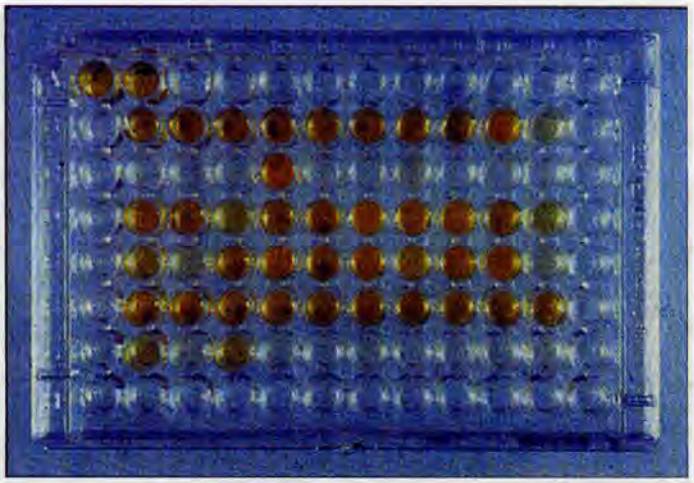
Has this increased the probability of queens being reared by overtly infected worker bees and becoming unapparently infected with the virus?

STUDIES ON VARROA-VIRUS DYNAMICS

New Zealand is a long way to travel to do field work so to undertake more detailed studies of host-parasite-pathogen interactions, we needed to establish a small experimental colony that was both infested with *Varroa* and infected with virus but held in a safe environment in this country (UK). Our bee flight room at Rothamsted is ideally suited to such studies. In order to initiate infection in the colony, pupae at the white-eyed stage of development were injected with KBV and *Varroa* mites were allowed to feed on them for several days before being transferred to marked, newly emerged bees. The marked bees and their associated mites were then added to the colony in the flight room.

Dead bees (marked and unmarked) were collected from the floor of the flight room on a daily basis and tested individually for KBV infection using ELISA. All of the mites that were recovered were tested in a similar way. The experiment was conducted in two separate years and during different seasons.

More than 50% of the marked bees on which the KBV-fed mites had been introduced, died within the first two weeks. By contrast, the proportion of unmarked bees in which KBV was detected was about 20% but it remained fairly constant throughout the observation period. This was unexpected. KBV kills bees very quickly and, in order for the virus to persist, the mite must transmit it at a faster rate than infected individuals are lost from the population. Our previous studies in the UK and Europe have shown that,



Elisa

over time, the rapidly fatal viruses have been selected out in naturally infested colonies. The less virulent viruses, such as DWV, now predominate.

Analysis of individual mites showed that KBV was detected in over 70% of those collected in the first month but this rapidly fell to less than 10%, indicating that the spread of the virus may have been sustained by bee-to-bee transmission.

VIRUS VIABILITY

When a bee infected with virus dies, the virus particles remain protected within its cells and tissues. Here, the virus can remain infective for longer than if it is extracted or exposed to the environment. The infectivity of a virus will also decline over time and this is especially true of the single-stranded RNA viruses, like many of those affecting bees. When these types of viruses are outside the body of the bee, exposed for example in fecal material deposited on a surface, they are very vulnerable to UV light and fluctuations in temperature. Honey bee viruses, like many of those infecting plants and animals, have partially overcome these problems of vulnerability in the environment by maintaining latent or low-level unapparent infections in individuals and populations.

SYMPTOMS

Virus particles cannot be seen with the naked eye and they normally persist as low-level latent infections, so what would make us suspect their presence in a colony? The answer is – nothing. But despite that, one or more of them can usually be found in most colonies at most times of year! Unfortunately, even when virus infections become established and cause disease outbreaks and mortality there are few reliable visual symptoms. For KBV replicating in adult bees, the only symptom is that the bee dies! However, it should not be forgotten that bees have evolved in association with their virus infections and have been very successful in developing physiological and behavioral responses to the challenges. Unfortunately, by acting as a hypodermic syringe and a virus vector, *Varroa destructor* has disrupted the normal mechanisms that limit virus transmission. This has had a profound effect on the type and prevalence of virus infections causing mortality in infested colonies worldwide and increases the vulnerability of bee populations to the introduction of new parasites and pathogens.

SUMMARY OF FINDINGS

Our work at Rothamsted and in collaboration with colleagues in New Zealand has shown that:

- New strains of KBV have been identified as damaging infections in New Zealand colonies infested with *Varroa destructor* These strains seem to be most closely related serologically to KBV strains found in Canada.
- In the initial stages of mite establishment in New Zealand there is a strong association between KBV and the mortality of honey bee colonies.
- KBV has been detected for the first time in queens reared in colonies of mite-infested areas of New Zealand.
- Studies of KBV epidemiology suggest that bee-to-bee transmission may be more significant than was previously thought

The recent report of the discovery of KBV in honey bee colonies in this country will be the subject of collaborative studies between the Central Science Laboratory and Rothamsted Research and more information will be available in due course

ACKOWLEDGMENTS

The collaboration of Jacqi Todd and colleagues in HortResearch New Zealand is gratefully acknowledged. Funding for these studies was provided by Defra and the C Alma Baker Trust. Rothamsted Research receives grant-aided support from the Biotechnology and Biological Science Research Council. BC

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RESEARCH REVIEWED

Explaining • Defining • Using

Steve Sheppard

". . . prophylactic and wholesale treatment of non-symptomatic honey bee populations with antibiotics . . . will lead to increased resistance of the disease-causing organism of AFB to antibiotics."

American foulbrood (AFB) is certainly the most well known disease of honey bees in the United States and the scourge that led to the establishment of apiary inspection programs within many individual states. The causative agent of this disease is a bacterium known scientifically as *Paenibacillus larvae larvae*. The problem with AFB is that it is highly contagious, being readily spread by spores that are formed by the infective agent. In the past, AFB in the U.S. was often controlled "prophylactically" by the application of the antibiotic oxytetracycline and, thus, remained a "minor" problem in the minds of many beekeepers. However, over time, some strains of AFB developed resistance to oxytetracycline and the disease has again become prominent as a newsworthy foe.

In a recent paper, Eischen and colleagues from the USDA lab in Weslaco TX, reported the results of a survey for the presence of AFB spores in 570 colonies used for almond pollination in California in 2003 (Eischen et al., 2005). The researchers then reported their results based on the regional origins of the samples. The method used to determine the spore levels involved grinding 30 adult bees from each colony in purified water Following temperature treatments and decanting, some of the material was placed on an appropriate medium under conditions promoting germination and growth of the bacteria to allow the researchers to determine the relative number of spores. The sensitivity of detection was evaluated by a comparative assessment of the method applied to disease-free bees to which various levels of spores had been added. Similarly, the researchers added diseased and dead immature bees to healthy colonies in different numbers to assist in determining the significance of the spore count levels as recorded in the survey.

The results showed that 33.3% of the 570 colonies sampled during pollination of the California almond crop were positive for the presence of *P. larvae larvae* spores. The geographic breakdown of the positive colonies showed that the highest percentage came from the Rocky Mountain states (Colorado, Montana, Utah and Wyoming) and California. About 39% of the colonies from these locales were positive for AFB spores. The lowest percentages (20-22%) were found in colonies that originated in the upper Midwest (North and South Dakota and Minnesota) and the Pacific Northwest (Washington, Oregon and Idaho). Similar to the presence of spores, the colony spore levels (defined as colony founding units or CFU's) were highest in the Rocky Mountain states and California (408 and 324 CFU's respectively) and lowest in the colonies from the upper Midwest (1.3 CFU's). Colonies from the Pacific Northwest, Central (Missouri, Nebraska and Kansas) and Southwestern (Arizona and Texas) were intermediate, with CFU's ranging from about 30-139).

Based on the experiments that involved adding diseased immatures to colonies, the researchers estimated a "disease equivalent spore level" to be around 400 CFU's (plus or minus 150 CFU's). The authors estimated that about 3.86% of the colonies surveyed in the study overall had "an active infection" of AFB. The colonies with the highest percentage of "disease equivalent number of spores" were from the Rocky Mountain states, with 8.7% of the colonies infected. The reasons for the differences between regions were unclear, although the authors suggested that differences in the historical use of antibiotics as a prophylactic treatment might be involved. Further, based on an initial estimate of the 1.4 million colonies involved in almond pollination in 2003, the authors pointed out that with 3.9% of colonies having "one disease equivalent or more," about 28,800 colonies in California probably had active cases of AFB during the pollination period. Adding to this the number of colonies that exhibited moderately high to high spore levels (but no AFB symptoms), the authors concluded, "prophylaxis must be used to avoid disease outbreaks." Unfortunately, in many places AFB is resistant to the only antibiotic that can be legally used for prophylactic

treatment and this suggestion must be considered with real caution. Other alternatives, including improved colony inspection effort and recognition of symptoms, common sense destruction of highly infected equipment and the use of AFB-resistant genetic strains of bees should become the front line of defense. Clearly, prophylactic and wholesale treatment of non-symptomatic honey bee populations with antibiotics (even alternative antibiotics that may be labeled for AFB treatment) will lead to increased resistance of the disease-causing organism of AFB to antibiotics. Alternatively, judicious use of antibiotics only when needed to control active disease symptoms, will help retain them as viable weapons of defense against AFB. BC

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Eischen, F A., R. H. Graham and R. Cox. 2005. *Regional distribution of* Paenibacillus larvae subspecies larvae, *the causative organism of American Foulbrood, in honey bee colonies of the Western United States.* Journal of Economic Entomology 98:1087-1093.

E. F. Phillips

Book Collector, Scientist and Teacher

Dewey Caron

E.F (Everett Frank) Phillips the "Dean" of American Apiculturists is a familiar name to many who know and read the literature of honey bees; his legacy was his efforts in founding the three best American bee libraries. Dr. Phillips, born in 1878, became interested in honey bees as a graduate student at the University of Pennsylvania where he studied the development of the compound eye of the honey bee. Knowing little about honey bees and having to keep a bee colony for his research he spent one Summer of his graduate program (1903) in Medina, Ohio with the A.I. Root family, becoming especially close to E.R. Root. During this time he wrote the first of what would be over 600 publications on honey bees – it appeared in the September 1, 1903 issue of *Gleanings in Bee Culture.*

His first position after his degree was with the USDA as "acting in charge of Apiculture." He became permanent head of USDA work on honey bees two years later (1907), replacing Frank Benton, who was the first to head the program. Phillips would go on to employ some excellent scientists such as G.F White, who discovered the causes of American and European foulbrood under his direction; R.E. Snodgrass, who became the preeminent insect anatomist, who initiated his works on honey bee and insect morphology and anatomy under Phillips' leadership; George S. Demuth whose studies on wintering biology (conducted on the rooftop of the Science building at the University of Pennsylvania in Philadelphia) are still relevant today (and who went on to become Editor of *Gleanings in Bee Culture)*; G.H. Cale, Sr and many others.

G.H. Cale, Sr. in an *American Bee Journal* obituary (Oct. 1951) wrote of those days at the USDA:

"He (Phillips) worked without rest on anything he started until he had it done...He liked best to do things which brought some new concept into being; he wanted to understand so many things and to let others learn about them." Often in his office, we were worn out with drive and on one occasion, when Doctor Phillips was away a few days, we almost exulted. One brave person found a metal pan and spoon, with which he pounded away, until he imbued us with his joyous relief from toil, and soon a line of happy employees, hands on shoulders, were marching about the building, in wild abandon. When Phillips learned about it he promptly planned an office party and himself played with the rest of us."

At USDA, Phillips developed the modern scientific work the bee industry needed. He insisted that his scientists carry the fundamentals of beekeeping out to the rank and file beekeepers by going to beekeeping schools, writing publications, giving lectures, and performing extension and field work. He worked initially to insure passage of the first Pure Food and Drug Act and would later work with his friend, President Franklin D. Roosevelt to insure that the law was not weakened. During World War I, commercial honey production increased about 400% under his leadership as he sought to convert beekeepers from comb to extracted honey production.

Phillips eventually became annoyed with Washington politics and bureaucracy and left the USDA in 1924 (James I. Hambelton would succeed him) to join the faculty at Cornell University as Professor of Apiculture; he remained in that position until his retirement in 1946 when he became Emeritus Professor He died fiver years later in 1951 shortly after finishing a paper on the contributions scientists and practical beekeepers like Langstroth had on beekeeping development. The paper was published in the *Minnesota Beekeeper* Vol. 4, No. 4: Pgs. 4-15 (1951) (a copy of that paper will be available on this magazine's website, under the Current Issue head).

E.F Phillips kept up an extensive correspondence

Mrs. Phillips

with European beekeepers throughout his career; he visited Europe four times, and Europeans were frequent visitors in his USDA and Cornell offices and laboratory. He was truly a world leader. Phillip's book, *Beekeeping*, was published in 1915 and later revised in 1928 while he was at Cornell; it was the standard classroom textbook on the subject for many years.

Well-known for his book and extensive publications both as a government and University scientist, Phillips however is best remembered today for his contributions to the three greatest library collections of bee material in the U.S. During his time in USDA, he sought to increase the bee holdings of the Federal USDA library. In 1922, he was instrumental in persuading the University of Wisconsin to honor C.C. Miller by establishing the Miller Memorial Bee Library rather than erecting a plaque to honor him. After moving to Cornell, Phillips donated his extensive collection of books on bees to establish yet another bee library. He persuaded 28 beekeepers each to donate the income from one of their colonies to the library and asked his friend E.R. Root to have beekeeping associations around the world send their materials to the Cornell Library in return for a subscription to *Gleanings in Bee Culture*.

The Cornell library bee holdings, subsequently named after Phillips, include entire book collections. These include both the library and the original editions of his popular beekeeping books plus the diary of Moses Quinby, the first commercial beekeeper Plus, there's the majority of the L.L. Langstroth bee library located inside. One of the choicest items in the collection today is the original Langstroth diary in which the "discovery" of the importance of bee space is recorded. There's also the first, second and third editions of Langstroth's book on bees, along with extensive correspondence Langstroth had with C.P. Dadant for the revised fourth edition (the first of many editions published by Dadant – continued to the present as *The Hive and the Honeybee*). This library also includes many original and first editions, including the original handwritten manuscript of Phillips Beekeeping, a *Discussion of the Life of the Honeybee and of the Production of Honey*, the first edition (1915) of his book published by the MacMillan Company (457pages) and a copy of the 1928 resided edition.

For more detail of the public and private life of Professor Phillips consult *The BeeMan, Life and Letters of Everett Franklin Phillips* written by Mrs. Phillips, a Home Economics professor at Cornell and also a distinguished honey bee, insect and children's author. BC

Modified from original prepared for E.F. Phillips Library tour, held at 2002 EAS Meeting.

Dewey Caron is a professor of Entomology at the University of Delaware and a past chairman of the Eastern Apicultural Society.

REFLECTIONS

Carl W. Sypolt

Sometimes, even a single sting can evoke a lifetime of memories.

One day last year, I ruled it absurd to attribute a single honey bee's angry dart to my sudden unusual physical experience. I thought I had awakened from an ordinary nap. At the telephone, my wife Marcy had summoned an ambulance for me. Reporting her observations of my reactions led paramedics to believe I had either a stroke or heart attack!

According to Marcy, my malady consisted of groaning, body twitching, tongue protruding, gasping and applying both hands to my chest. (I faintly remember pain in that area.) Marcy said that most of the time my eyes were open but failed to indicate registering reality of surroundings. She said it was though I had been *mentally* asleep. She and our 17-year-old daughter, Michelle, tried communicating with me but received no response. My own awareness was of having a runny nose and perspiring profusely. Hip and crotch area of my denim trousers, front and back was wet, as happens when I'm working in hot weather.

To me, it was preposterous espousing the thought of *suddenly* becoming allergic to honey bee stings. I was mystified of what precisely triggered such strange behavior. Especially so because being midway between 69 and 70 years old, I am not overweight and feel exceptionally healthy.

Years ago, dad recalled helping his brother cut a tree in which resided a colony of honey bees. Uncle referred to those bees as the "ones with the diamond points." In uncle's hiving, this particular restless swarm evaded him. Recounting the event, he stretched his arm in the direction the rambunctious bees had gone. He then uttered the immortal words, "them bees went *straight* to hell!"

Kermit, a brother-in-law kept a dozen colonies. He stressed the amount of patience required attending honey bees. For this reason, he opined, of all beekeepers with which he conversed, he never met *one* who displayed a bad temper Reminiscent of the beekeeper visited by a honey thief. Obviously, a good comparison to sweetness of honey is the heart of a beekeeper.

In olden times, a certain beekeeper didn't fear man nor honey bee. For years, in casual dress, he went about his hobby. One day a miscue ensued, honey bees worked him over, sending him to the hospital. Beekeepers with similar experiences may abound. In fact, yours truly no doubt narrowly missed joining the over confident beekeeper. My children, quite young at the time, wanted me to look at a "funny nest." Finally, at their insistence, as I walked outside, a swarm of honey bees took flight from a pine tree. Disappointed at not investigating sooner, I figured they could have been put into a cardboard box until a hive could be purchased. Not yet a beekeeper, I based the task on information passed on by Brother Kermit. Before swarming, he had said, honey bees stuff their bellies with honey, become complacent with no desire to sting anyone. He was a scripturally born-again Christian, so I knew he wouldn't lie. However, later on I discovered he could be *mistaken*, for I met swarmed honey bees that hadn't tagged along when he went to church services. Kermit also said when one devotes a lot of time among the hives, honey bees relax as they recognize the odor of their keeper.

My study of honey bees has been too slack. Sour weather and lack of time often hindered me from pulling frames for observation.

When I first obtain colonies of honey bees, I followed a suggestion for hiving. I placed a used white sheet on the ground with the hive on top. With veil and gloves in place, shaking a limb sent bees onto the sheet where they marched into the hive. Elementary! One day, in attempting to corral a swarm, security was breached, a bee scored with a sting, leaving a whiff of banana odor. Sound of the colony confirmed my assumption that the scent was a signal to hit the warpath. Another surprise was when I learned of more experienced beekeepers than I being unaware of this honey bee code!

A few years, I had no honey bees. Year before last, my only colony hadn't survived. Spring of last year, according to the calendar, the time was ripe to receive packaged bees. The weather though, was wet and cold. I dumped honey bees in from top of the hive. Holding the queen cage, I

took a banana flavored jab to the base of my right thumb. Felt like my hand got nipped by an alligator. Who was I to defy instructions from the masters, anyway? They clearly stated that when removing bees from outside of the queen cage, *don't* do so by *brushing* them aside. Surprised I didn't instantly become a human sting cushion, I reasoned the swarm ignored the perfumed alarm because they were too busy trying to keep warm.

Was it my incompetence, or were these bees actually anti-social? While in short sleeved shirts, I replaced jars of sugar water Occasionally, from 2:00 high, a female would nose dive past my head with her volume control set on max. Adorned with gloves and veil, and without smoke, I removed the outer and inner covers. The crowd inside roared like a lynch mob. I must confess that at times, I set a poor example as a beekeeper Retreating a time or two from the hive, a sqaudron escorted me to yonder place. There, they remained in assault formation, each contesting to be the last one returning to base. Their constant threats punctured my ego.

Is it possible for one to achieve *complete* understanding of honey bees? Why is it, sans protection, many beekeepers don't warrant a second glance from honey bees they stir up? So last year, after replacing a jar of sugared H_2O, why was I awarded a backward kiss from a forward maiden?

The little lady utilized the top of my left ear as a landing pad. There, without provocation or my permission, she injected a shot, keeping me rheumatism free. I brought up my left hand to scrape the sting aside but it remained without my knowledge. I was surprised at the low reading on the hurt meter, in comparison to "getting the point" on other body areas. A couple of minutes later, in the living room, Michelle saw and removed the sting. As I was about to sit in the recliner, a vertical bright halo, two inches in circumference appeared before my eyes. The "nap" came quickly.

A paramedic explained that on top of the human ear is a *nerve* that can affect vision, tongue, throat, chest and stomach. Before departing, he advised me not to eat or drink liquids for an hour or two. My stomach ached, but I downed a swallow of water It returned with vengeance.

Untold thousands of beekeepers, completing duty at the apiary, get into vehicles, driving to another location. One sting on the ear nerve plus driving a vehicle can equal to that of anyone's imagination. For the victim in poor health, circumstances would no doubt be compounded.

A few weeks ago, my veil wasn't tied securely. Coming inside, she became fascinated with my right ear At that precise moment it seemed I had read of "tell tale odor" emitted in association with extreme apprehension. Before the veil could be removed, she settled for the lobe. I thanked the Lord that when he made man, He didn't thread the ear nerve down that route. The next day, if the condition of the lobe could have been preserved, the right ear would require no muff in the cold weather

Do you know it is possible to pout and rejoice at the same time? Last Winter had been tough on many My last year's colony had given up the ghost. I lamented over more financial loss invested in honey makers. I wondered if I had stumbled onto another clue on the trail to explain why, across the land, we don't see *new* beekeepers multiplying as the ladybugs. With a wry smile though, to my honey bees of yesteryear, I can heartily toast: May you be resting in the bosom of the swarm that got away from my uncle.

DOES THIS SMELL RIGHT TO YOU?

A light look at pheromones.

Dick Marron

When we want to know if the milk has soured we test it with our nose. This nose of ours is a guardian of what goes in the stomach. That's an important job. When a bee wants to be sure she didn't get drunk on some fermented nectar and arrived at the wrong home address she uses her nose, or rather, the specialized equipment she uses to smell with, her antennae. She goes to the hive that smells right. Who would suggest this is not an important job? Sour milk is not a pheromone. (Though there is a hive-messaging odor that smells like a kind of cheese.) The hive smell is based on pheromones. The equipment for smelling them, or for smelling just plain odors is very similar. In fact, in keeping with nature's frugality, it's dual use equipment.

I want to keep this simple. Nasonov, mandibular, Koschernikov; tergite, tarsal, and 10 other glands; exocrine, semio-chemicals, allemones; chemoreceptors and releaser pheromones are just a few of the words I've screened out for you. I hesitate to mention 10 hydroxy-(E)-2-decenoic acid. Aren't you glad?

A hormone is an internally produced compound and is internally used in a regulatory process. Some of them are "steroids," the latest household word. A pheromone (read; external hormone) is for external consumption and is emitted by a special gland as a means of communication within a species. It is usually received by some version of a nose. Put bluntly a pheromone is an odor If it isn't, it's a taste. They are close. I'll get to that later.

In the bee queendom just about everything is regulated by odors or tastes. Some behavioral reactions are immediate (releaser pheromones) such as an alarm reaction. If you think this is crude, or rigid, *you* devise some way to mobilize 50,000 individuals in a matter of seconds. Some reactions are observed later, as when the Queen pheromone inhibits laying workers. This is in advance of the behavior. (These are primer pheromones). But you knew that intuitively. What we all know is that a beehive is a beehive of subtle and gross regulatory commands and is a wonder in the universe. The more we know of it, the more there seems to be to learn. I learned this month that the smell of brood inhibits the emergence of laying workers. Imagine, just babies and they are influencing the hive. It's such a wonder, we can be forgiven for thinking of the bee as unique in its use of smell. Or at least that it's limited to the insect world. Not so.

The animal kingdom is full of species that rely on using odor to control behavior and to navigate. The production of odors is interesting but the receptors are fascinating. Without pheromones the world would be a barren place except for the birds. Most of them don't smell too well. Vultures do however, or they would never find carrion. In fact, they patrol natural gas pipelines. The pipeline people add the smell of rotten meat to the gas and when they see the vultures circling, they know they have a leak. Or a dead buffalo. I don't know how a vulture would use pheromones to find a mate. Somehow I don't think they'd be too fussy about how that mate smelled.

Fanning is one way to spread the word.

Mammals however are a different story They do use odor to find a mate. Birds have to do a fancy bit of dancing to ensure that they have a mate of the same species. Some mammals dance but they must dance close enough to get a good whiff of a potential partner. Smell is the clincher

Humans have lost most of the ability to process scent, although it remains important. A large part of the brain is given over to handling scent. This indicates how important this task was in early man. Another sensor, the vomeronasal organ, important in other species, has become disconnected in humans. The deer have a version of this, which is brought into play during their mating cycle. It's not in the nose but in the roof of the mouth. The scenting organ in the snake is internal and on both sides of the mouth. Snakes dart out their tongue and bring back what that organ has collected and deposit it for analysis. It's not "smelling" but it works for them, especially when coupled with their ability to sense heat.

What still works for us, however, is impressive. Consider that we only taste a few things: salt, sweet, sour and bitter. All the rest of what we think of as flavors are actually sensed by the nose. Grandmas cooking didn't merely taste good it smelled good. You know this because you tried it at least once when you had a cold. If you have any doubt about this, put a clothespin on your nose for supper tonight. It'll make you trust me, but it may affect your relationship with the cook. If you think relationships have nothing to do with pheromones, read on.

There's a lot of subtle sensing that goes on with humans but out of their awareness. Mothers can pick out the smell of their children's clothes, blindfolded, when given a number of choices. I read about this 30 years ago and it wasn't a new study then.

Psychologists get interested in all kinds of things. When they noticed that a group of women who were living together in close proximity, tended to have their menstrual cycle occur at the same time ... it had to be studied. They paid some volunteers to allow them to paint their upper lips with something, at intervals. I hope they were paid well because the "something" was perspiration from the first group. Guess what? They were all on the same schedule in brief order Is this scenting skill limited to females? Unlikely.

Nature is concerned with mating. She wants the healthiest most fit of her children to mate with each other Both sexes are attracted to healthy mates. Male deer, elk or bear go on the prowl when it's time to mate. Cleverly, the yearly mating cycle is tied to the length of the day. This ensures that the young are born at the right time of year When that timing is right the females begin to produce pheromones that evidence themselves mainly in their urine. As they graze, they leave this evidence like a trail of breadcrumbs for the males to follow. At this point, urine has become more than a mere excretion of waste fluid. The following males can tell the age, health, reproductive history and readiness to mate ... all from this trail. Humans need to make those judgments on what they see. Of course the buck is leaving his scent too. He has scent glands between the toes, near the eyes and on the rear legs. This last is called the Tarsal gland and is in exactly the same place (with the same name) on our bees. Both deer sexes will visit "scrapes" or "rubs" to see who is in the area and to leave their deposits. These "Scent posts" are like bulletin boards in the woods. (Dropping a handkerchief is much neater, I think)

The bull elk is a study in perfuming. Somehow his urinary equipment allows him to wet himself down pretty thoroughly. As if that weren't enough, he'll find a puddle in a swampy place and wallow in it. Then he'll urinate in it and roll in it again. He'll come back to this practice every day for a while. Then, black with mud, he'll strut around the pasture and scream his presence. Cow elk will drop by to see if he smells strong. The scream also challenges other bulls to duel or stay away. Other stuff goes on but I can't tell you about it. This is a family magazine and I've gone far enough.

Does human urine carry messages? Let me tell you about this dude that was living in a remote part of Alaska, in a tent, studying a den of wolves. These four wolves had clearly marked the boundary of their territory with a string of scent posts. (You knew that was what your dog was doing, didn't you?). In a bold move our hero moved his camp into the middle of the boundary, while the pack was out hunting. He then drank a gallon of tea and went out and peed a circle around the tent. On returning, the wolves screeched to a halt as if they'd hit an invisible wall. Then, after consideration, they followed the researchers "scent posts," honoring each one with a new deposit. How's that for cross species communication?

When a cat rubs his head against you it is not a sign of affection. He's marking you as his territory with small glands near the eyes. It's similar to what some male cats do to the furniture. They sort of spray their urine. When a cat "sharpens his claws" he's really working some scent out of his paws. When a cat buries his feces he's not just being neat. He's hiding the presence of a carnivore within his territory. Apparently that augers well for a continuing supply of groceries. The only real affection you'll get from your cat is the occasional pink-tongued lick.

Two bees 'touching base' with their antennae.

The world of a creature that can process an aroma in detail must be like the one in which we upright walkers handle sound. How can every voice be different? I only have to say the name "Walter Cronkite" and you (at least, some of you) will imagine that voice. If you heard it without introduction you'd know it. What

makes any voice different enough for us to remember it after years without contact? Your dog may have a similar archive of his associates coded in exquisite aromatic detail. To him you are a symphony of interacting scent molecules. One would suppose that this needs updating and you can see this in action. My friend has a dog. No matter what kind of shape I think I'm in, when I go to visit, I get a check up!

We use our eyes pretty well also. There are special circuits in the brain for face recognition. Consider all the expressions possible with the 200 muscles of the face. A recent study proves that at least some expressions are cross-cultural. That means we must have been born with the program for them. A smile (which allays aggression) is the first social move a baby makes. A human cannot fake a smile. Try it.

Freud thought that when man evolved to the point where the sexual stimulus came from the eyes rather than what he could smell, the urge to procreate was no longer limited to times of fertility in the female. That ladies, is why we men want sex all the time. The size of hips with enough fat to nurse a child through tough times and the mammary system adequate to the task signaled health to the early males. A nice coat didn't hurt either (It still works) The great man also thought that it was fear of women that caused the current ideals to be more like those of a prepubertal virgin. A narrow waist accentuates hips but it's the hips that count. It's harder for women to lose weight because nature wants it there.

The broad shoulders and muscular frame signaled to prospective females that a male could take care of her Seeing him in action would be icing on the cake. Men have been doing daring things since boyhood to impress females. Seems like it wouldn't hurt if he didn't smell too bad, either This visual-auditory approach seems a lot better than smelling stuff.

I should point out that we Americans are thought to be aloof in other cultures because our social distance is determined by smell. We keep a circle of space around us to insulate us from the odor of the other person. Other cultures do not do this. Just this year I thought two women were flirting with me because they got close. As I write this, I'm starting to worry. Maybe they *were* flirting. (If you saw my picture, you'd get the joke).

Of course Freud didn't stop with sexual signaling. He considered such weighty problems as why everyone seems to think their own flatulence doesn't stink; it's everyone else's that does. And here I thought that I was just fortunate. Could he have been on the verge of uncovering a hive smell?

Just when you thought we were safely evolved here comes a Wall Street Journal article recently, dragging us back down. Using extracts from male sweat and female urine, researchers found that certain regulatory areas of the brain light up in response to them. Actually they heat up and we are good at measuring temperature. Women heat up to the male pheromone and men to the ladies in similar fashion. Apparently just for kicks they threw a group of gay men into the study. Guess what? They tested just like the ladies. It doesn't prove anything but it makes you think, doesn't it?

Jut as a reward for reading this far, I want you to do something. Close your eyes and remember your first kiss. Now, what is the important element in that memory? Did you taste it, smell it or was it the simple pressure of skin to skin. Methinks without the pheromones a great deal was missing. Of course the chemistry of one begets chemistry in the other. Then this continuous loop explodes into love. Go smell someone you love! BC

Dick Marron is a retired psychologist living in a beeyard in Connecticut.

They Are NOT My Bees!

But somehow, I am responsible.

James E Tew

Warning: This article does not have a happy ending. It may not even have an ending at all. You decide.

In fact, they are not even bees

They're Yellowjackets and they are a fact of life from midsummer until frost. At my office from now until cold weather, I will get several daily communications concerning what to do about these *"bees"* that are stinging me, my family, and my family pets. County fairs representatives and village street fairs directors will ask how to eliminate *"bees"* from their outdoor events. I've been called by an international jelly producer in our community to review how they could keep these pests our of their multi-million dollar production facility. Then there was the chewing gum factory in Chicago with Yellowjackets around their dumpsters. It doesn't matter if the caller is a large business or a homeowner, the recommendations are similar During late Summer, I will frequently hear, *"Boy! Those ground-nesting bees are really bad this year!"* Every year, I will scurry to the literature to see if anything new has been developed. I will still see many of the nonsensical recommendations like the "fish trap" that is presented in an Ohio State fact sheet. This procedure instructs the caller to hang a smelly fish over a bucket of soapy water In a perfect world, greedy Yellowjackets will take more fish than they can carry and drop into the soapy water where they will drown. Clever idea and, yes, the procedure far from boring, but I really doubt that it cuts down the resident Yellowjacket population very much.

The common yellowjacket.

But we have to do something

It's in our nature. We have to do something to control this invader You own the house. You own the property and this animal just moves in and makes itself a pest. *(Mice do this, too, but that's a different article.)* Simply put, you want these interlopers killed even though in almost every instance; the simplest procedure is to live with them until frost. In general, and I do mean in general, these stinging insects don't cause harm other than making us fretful. But occasionally, things get beyond generalities.

The nests of Yellowjackets start small. You rarely notice the comings/goings of the founding queen. I suspect most nests fail, but obviously many don't. They grow...and grow...seemingly logarithmically. Or written another way, you didn't see them yesterday and then – boom – they are everywhere today. The caller frequently says, *"These bees just moved into my house a few days ago!"* Nope. They've been there all Summer but only in small numbers you didn't notice.

Good insects gone bad

I consider it strange that these Summer/Fall pests start life as beneficial insects. Their spectacular growth, to which I referred to above, is achieved by using other insects as a protein food source. From aphids to caterpillars, Yellowjackets consider their insect neighbors as lunch. When the nest reaches its largest size, significant amounts of protein are required to satisfy the nest's needs. These guys really scavenge the immediate neighborhood to meet their needs. While much of this protein is insect protein, these aggressive insects will readily help you eat your hot dog at the ball game. Can it get worse? Yep, for they will also visit your soda can for the sweet drink they need for carbohydrates. Here's the rub – when this nest reaches its peak population and is ridding your property of countless other insects, they wear out welcome and become pests at your picnic or fly in large numbers from a small opening just over your front door Abruptly, their badness outweighs their goodness.

They are NOT my bees!

These insects are not even honey bees, but if your neighbors know you keep bees, ***ALL*** stinging insects become yours and your responsibility – and yes, it can get worse. Your family can turn on you. My wife feels that my beekeeping skills somehow translate to hornet killing. True, I am better at it than some, but I would rather just live and let live, but that was not to be this past Summer.

The situation

On my home acre I presently have five active Yellowjackets nests, one bald-faced hornet nest and 3½ beehives. On a quiet day, I could probably shout to about 24 surrounding neighbors' homes. Even if I cut my personal Yellowjacket population in half that means that within eyeshot there would be 48 other enterprising Yellowjacket nests. Whoa – is that possible?

I don't know, I am only guessing, but of the Yellowjacket nests in question, the one that has driven me crazy was immediately outside my back door – right in front of the barbeque grill. During early summer, I explained to my family the goodness of foraging hornets and how many other bad insects they were consuming. I didn't realize how large the nest would grow. It grew, and grew to the point where one would need to run a hornet gauntlet to get into my house (just ask the UPS man). My wife complained. My son-in-law, Doug was stung on his arm at a family outing, but the worst – the very worst – is that a single foraging Yellowjacket dive-bombed my 19-month old granddaughter. My wife, (Grandma) who was holding her went ballistic. Kill 'em! Kill 'em dead and kill 'em now! My assignment was to kill a well entrenched nest behind the aluminum soffit of my house. The Western cedar reverse board & batten siding on my house was installed in 1978 before the days of T1-11 siding. Every 10 inches there is a 1½ opening that opens into the walls of my house.

Removing caulking – a team effort.

Control Efforts

Caulking

Last Summer, I applied nearly 40 tubes of silicon caulk to plug hundreds of these openings. It was a tedious job. The nest in question had opened several of the caulked entrances in my house siding. I used the caulking to re- close all but one opening near the offending nest. I tried spraying a commercially available wasp & hornet spray, but as is the usual case, the nest was too far removed.

If you close the entrances to the nest, expect the insects to look for other entrances – frequently inside the house. Since Yellowjackets can chew through caulking, consider pushing 4-0 steel wool into the entrance before caulking over it.

Insecticides

I referred to insecticidal sprays above. For the purposes of this nest eradication and for background for this article, I only used commonly available and approved insecticides. While these materials work rapidly, actually getting them to the nest is normally a problem. Plus, I didn't want to spray an entire can of this stuff and fumigate my house with it. In this case, and in multiple past cases, insecticides have only been moderately useful. I really hope that you only use approved insecticides should you decide to apply them.

Vacuuming

I routinely vacuum bees from colonies so why not vacuum hornets that were buzzing around the plugged nest entrance. I concocted a simple holder for attaching the vacuum tube from my shop vacuum at the plugged entrance of the nest. Maybe it shows part of my personality that I would rather keep hidden, but it was rewarding to hear the gentle thump of a Yellowjacket being vacuumed. I let the vacuum unit run for a couple of hours (yes, it was very noisy). And then for the next week, I would vacuum extraneous foragers. The sun struck the side of the house where the nest was. The enclosed nest must have been miserable. As time passed, I vacuumed a few thousand of Yellowjackets. Yet, every few days, a few more would be out. While the vacuuming procedure worked, it was (1) very slow, (2) very noisy, and (3) not very deadly; however, it was a chemical-free process. In most cases where a vacuum could be used, I sense that it would only be useful for reducing and not eliminate the offending nest.

Insect electrocution devices

Years ago, these black-light, electrocution units were popular for controlling insects. I have an industrial unit from those days. On another of the nests directly over my front door, *(It's true. Both my back and front doors were blocked by Yellowjacket nests)*, I noticed that Yellowjackets came to my door light and to my flashlight. I thought maybe I could caulk all the entrances but one, set up the electrocution device and eliminate vast numbers of these beneficial pests by attracting them to the black-light death trap. Though my neighbors were intrigued, the Yellowjackets weren't. Only a few curious hornets got too curious, but what did happen was the amazing numbers of other insects – of all shapes and varieties – readily came to be zapped. The next morning, Yellowjacket foragers were around the device gathering toasted insects from the night before. While entertaining, this procedure was completely ineffective.

Roofing tar

Roofing tar, for roof repair, comes in caulking-type tubes. After clearly being shown that these insects would remove silicon caulk, I tried this black, tar-based material. This stuff, at least initially, backed them down. Eating silicon is bad enough, but eating tar is inconceivable. It's messy and if combined with steel wool, I suspect that these guys would have a real problem

chewing through it. As a tool, but not as a control procedure, this product gets thumbs up.

Heat

My plan was to use the tar to close entrances, and then apply non-flame heat to the area to see if I could kill the nest or at the least the brood. Realizing how often one unintentionally sets fire to houses, I will really cautious – maybe too cautious because this procedure didn't work – or not so that I could tell.

I first used high-intensity shop lights and put them a few inches from the aluminum soffit. How long to leave it? I don't know and still don't know. I didn't want to burn the paint off the soffit and I didn't want some surprise by applying heat to an unusual place. I lose my nerve. *(The neighbors had lawn chairs out by this time. This had turned into a real show.)*

Secondly, I borrowed a commercial heat gun that puts high heat in a small area. I thoroughly heated the area where I thought the nest would be, but I have no real idea if I was even close to the nest. Things began to heat up and again I began to lose my nerve.

I suppose that heat control would have some application is specific instances, but it (seemingly) didn't do anything in this case other than make me nervous. Do not burn down your house all because of a nest of Yellowjackets. I am not recommending heating procedures to eliminate a hornet nest.

Laser light

I used the laser light from my leveling device just to see if it had any obvious effects on hornets at night. Is there anything less than nothing? That's what this light did – nothing. But the bright red light did clearly show the hornets outside at night without attracting any attention.

Boric acid[1]

I tried this as an academic effort, but I do not offer these comments as a recommendation. Several people felt that this old compound was useful in Yellowjacket control. If it is, it's too slow – at least for my family. Plus, I could never find a label supporting its use. For my purposes, this product was too slow and, pending more literature exploration, not label approved.

Time moves on

By now, weeks have passed. Due to article space, I did not get involved with the multiple ground nests in my backyard. They can stay there and I will avoid them until they die naturally; however, the two nests blocking my doors and harassing my family had to be dealt with. The nest at my back door finally, and with considerable respect from me, died. The nest at my front door managed to find an entrance higher up the wall. I can live with that *(I'm not really sure what other options I had).*

A happy ending?

Not really. In fact, I must nearly admit that the Yellowjackets have won. One nest is fully functional while the other nest took weeks to die out. If you have read to this point, I put you through all of these futile efforts because, as a honey bee person, somehow all stinging insects become my and your domain. The main thing that hornets and honey bees have in common is that they both sting.

Finally, a difficult approach to sell is that Yellowjackets are actually beneficial insects. Unless they are a problem, I would suggest leaving them alone. If they are really a problem, after all my experiences, I would suggest you do whatever it takes to open the cavity and remove the nest. Sometimes this will be a small job while other times, this recommendation will be a major pain. Either way, you and I both know that Yellowjackets will be back next season and we both know that you and I will be responsible for their activities. Good luck to both of us. BC

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[1]Registered in 1983 for control of cockroaches, ants, grain weevils and several beetles, it has also been used as an herbicide along rights-of-way and as a fungicide for citrus, and as a wood preservative/fire retardant, and even as an insect repellent in insulation. As an insecticide, boric acid acts as a stomach poison for ants, cockroaches, silverfish and termites, and as abrasive to the insects exoskeleton.

http://www.beyondpesticides.org/infoservices/pesticidefactsheets/leasttoxic/boricacid_borates_borax.htm

AGGRESSION IN OUR COLONIES

Bees can be pretty nasty to their own kind - cases in point

Larry Connor

As new beekeepers we learned that bee colonies have a section of their population called *guard bees* that are responsible for protecting the colony from invading "foreign" bees, other insects, and other animals. After the invasion of African-stock bees into the Americas, we have been very careful to describe bee-stinging events as *defensive behavior* by a colony as it attempts to protect itself from invasion. In Africa, these behaviors are attributed to predation by honey badgers and humans.

This last August I had several experiences that helped put some of the *aggressive* behaviors of bees into focus. Fortunately, I had my camera in hand to record some of the biology and behavior at work. Most interesting to me was the seemingly aggressive attacks several honey bees were making on bumble bee workers as they foraged on bull thistle flowers on my Mother's farm in Southwestern Michigan. I do not recall ever seeing honey bee workers attack other bees on flowers (I have seen one honey bee forager run off another honey bee many times, but never physically attack it!). More on this at the end of the article.

Bees at the colony entrance during a dearth

The 2005 EAS conference was in Kent Ohio, and a local beekeeper, Dan, brought in colonies that had been stripped of honey from the earlier flow. There was not much in bloom in the Kent area, and the situation approached classic dearth conditions. It was dry and the temperature was in the 90°F. all week. The bees were still recovering from the stress of being moved. It was a good time to check the entrances of the hives before we smoked the colonies.

We found that here were quite a few bees at the entrances of these hives, even hanging like grapes under the bottom board and to the casual observer, these bees were all "hanging out" because of the heat and perhaps ventilating the hive. Upon inspection I did not see any bees actively ventilating (the colonies were located in a shady area). Active ventilation takes the efforts of a large number of worker bees, and they face the direction of the airflow with their wings moving at a rapid rate. Photo 1, taken at the Univ. of Nebraska in June, shows colonies rapidly ventilating a colony located in full sun on a day in the

high 90s(F). The nectar flow was underway and nectar ripening was going on in the hive, requiring considerable ventilation.

Compare the bees on the landing board in Photo 2. Here the bees are somewhat evenly spaced out on the landing board, perhaps allowing space for returning foragers (which were few in numbers). It rapidly became clear to us that these bees were poised in a classic defensive posture of guard bees: front legs up against the thorax, head up, antennae out, and mandibles prominent and slightly separated. These bees were not defensive to the human visitors.

One reason for this defensive behavior was clear, as several yellow jacket wasps were trying to enter the colonies. One colony in particular had a number of wasps at the entrance, and wasps were being dragged away by guard bees into the grass in front of the hive. My camera suffered momentary operator error and I did not record the wasp being escorted off the premises. However, in photo 3, taken last fall, shows a yellow jacket wasp on a frame of honey in an opened hive, with a ring of guard bees ready to run the intruder away from the open honey buffet.

Back in Kent, I found the same behavior being expressed on a drone bee. As readers of this column have been told many times, the workers constantly *trim* or *tune* the population of drones in the colony, and later in the season, when the nectar flow is done, they will selectively expel perfectly functional drones for no reason other than they are a drain on colony resources. Photos 4 and 5 show the worker bee dragging a drone away from the hive in the grass (this started on the landing board). As the bee drags the bee, she seems to be holding onto either the leg or the wing base of the male bee. Remember this behavior for later

Worker attacking worker

At the entrances of most of the hives there were worker bees being attacked by other workers. I assume the attacking bees are all guard bees, but I was not sure the bees they were attacking were all "robber bees" – bees from other colonies intent on removing honey from the hive.

We generally identify robber bees by appearance and behavior; they are often very nervous and flighty (too fast for this photographer), and quite often denuded of body hairs so they look black or "greasy" in appearance.

The bees being attacked in photos 6 and 7 were not making any attempt to flee the landing board, and appeared to be very much identical to the bees attacking them, as if they were hive-mates. The attacking bees were often turned on their side so they could fasten onto a leg or wing with their mandibles. Sometimes the bee being attacked would flex or gyrate so as to be free of the attacking bee. But she did not fly off.

Viral disease infections of adult bees create a similar behavior, and this could be the case here, except the bee is not hairless. One name of this virus is Hairless Black Syndrome.

Sometimes young bees that have eaten insecticide contaminated pollen (especially Sevin and Penncap-M) stored in the brood

nest are attacked by housemates. Somehow the other bees detect something wrong – perhaps just that the bee is dying – and expel the not-yet-but-soon-dead bee from the colony.

While the above explanations may help in this set of observations, I wonder if these guard bees were responding to some super-sensitive to returning bees, and will attack hive mates when conditions are stressful. These colonies had been moved and put into an area of poor forage. Could there be so much stimulation that robbing is a threat – and heightened by the intruding yellow jacket wasps – that the guard bees were (to use a human term) a bit trigger-happy? Or, does a bee that has been dragging a yellow jacket away from a colony pick up enough of the wasp's odor that she herself is attacked for carrying wasp-detection signals? It would take a series of carefully structured experiments to determine this, but it is a remarkable feature of bee behavior.

Honey bee foragers attacking bumble bee foragers on flowers

After EAS I was in Michigan to visit my 90-year-young Mother for a few days and took the camera out to photograph the bees and other insects on the six huge bull thistle plants that had grown as large as holiday pine trees. (The plants, considered weeds by many, were the source of great interest to visiting bees, butterflies, beetles, gold finches and neighbors) There, at 5:26-5:28 P.M. EDT August 10, I observed honey bee foragers attacking bumble bee workers while the latter were gathering nectar and pollen from the flowers. Both species had pollen on their legs, and more than one honey bee was ob-

served attacking the much larger bees. In a series of photos, I recorded one worker bee on top of a bumble bee as the larger bee attempted to remove her attacker with her hind leg. (Photo 8) The worker bee went into the air, circled around the thistle plant and returned, even though her pollen baskets were filled with pollen identical in color to the pollen of on the bumble bee's legs. (Photo 9) She landed on top of the bumble bee and seems to be biting its wing base (Photo 10) Again she took to the air and circled the plant, returning in a few seconds from the other side of the flower (Photo 11). This time she lands on the flower and works on her side to reach her goal (Photo 12). The appearance of a second bumble bee does not interfere with the attack (nor does the Japanese beetle working the base of the flower) (Photo 13).

In this final shot (Photo 14), the worker bee has her mandibles on the back leg of the bumble bee, in much the same way the guard bees use their mandibles to attach to the legs of the yellow jacket wasps, the drones, and the workers being attacked as described above. Then the honey bee flew off.

What does this mean?

Not having seen this behavior before, I asked Mom's neighbor Cathy King (who has a commercial beekeeper's apiary on her property), if she had ever seen this. Cathy is also a photographer and observer of nature, and said she had watched the same thing on her own thistle plants. Because the colonies on the property are originally from Florida, it would be easy to take the leap that this is a behavior of African-stock bees found in the state.

It would be unfortunate to leap to that conclusion. There is no evidence of any Africanization. We need to remind ourselves that in North America we have had an entire shift in the genetic makeup of our bees since the early 1980s. We have gone from primarily Italian bloodlines to a mixture of stocks selected expressly for mite and disease resistance. Any time an animal is selected for one set of traits, others traits appear that may not have been observed before. Also, we have imported Yugo and Russian stocks, and they too may express behaviors different than our familiar Italian bees.

But as far as any biological advantage to attacking foragers, it seems possible to suggest that under limited foraging conditions one bee's competitive advantage at the flower may help the entire colony survive. But the bumble bee being attacked is much larger than the honey bee, and did not appear to ever stop probing florets for nectar Perhaps this behavior is wasted on larger foragers? Perhaps the size and form of the bumble bee triggered some drone-expulsion behavior? If so, why would a forager do the work of a guard bee? And at the flower? What will happen with smaller species of bees? Will honey bee colonies depress their populations through competitive displacement? Is there more to this story than a few minutes of observations and photographs? BC

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So, how do you do this?

Beekeeping can be complicated, but with the help of a mentor anyone, even a high school student, can do it successfully.

Parry Macdonald

The Summer before tenth grade I was looking for an experiment for a science competition, and I wanted it to involve insects. I consulted some books to find a project, but everything they offered was too juvenile. Trying to think of my own experiment came to nothing, too, so finally I did what I should have done in the first place, and asked an entomologist friend for a suggestion.

"Why don't you work with bees?" she said.

Bees? I hadn't expected her to say that. What could I do with bees? "You mean *honey* bees?"

"Sure. People do experiments with bees. They're really interesting." She didn't think it was odd at all.

Well, that might be true, but where on Earth would I get a hive of bees to work with? I voiced this concern.

"You could make your own hive. It would be cool." She said her husband had taken some beekeeping courses, and that it couldn't be that hard.

I was open to the idea (it did sound cool), but I still felt some trepidation. First of all, I'd seen beehives – not up close – on farms that I passed on the road. They seemed to me to be towering, monstrous structures that I would only ever admire from afar Also, and more importantly, I did not live on a farm. My house was smack-dab in the middle of a neighborhood with smallish backyards that the neighbors' children ran through often, chasing runaway dogs or playing football. They wouldn't take kindly to a large box of stinging insects that would encroach on their playing area. Still, the idea was growing on me. I was already picturing the hive in my backyard, the bees flying in and out

My parents raised no objections, so I got a book and read it cover to cover This beekeeping business was just as complicated as I'd anticipated, but in a different way. I'd always thought of honey bees as more similar to livestock – cows and pigs and sheep – than as real insects. After doing more research on the subject, I realized that they were indeed no different from any other insect I may find in a field; they just happened to occasionally be put in boxes and taken care of by people like me.

I figured I could handle the beekeeping, but where would I begin? It was too late to start a hive now, and though I had to procure all the equipment I would need, I figured I had a few months before I needed to start working on that. I read the book again, learning the lingo and all the functions of every part of the hive.

That's when I realized I would need some help. I mean, it's one thing to read about a method and nearly understand what to do, and quite another to talk to a real, live beekeeper who has done it personally a hundred times. I didn't know of any beekeepers, so I took to asking everyone I knew if they happened to know one. This earned me countless funny looks ("you need to find a *beekeeper?*"), but no leads. Finally I asked the right person: the mother of one of my violin teacher's other students knew someone from her church who kept bees as a hobby. She gave me his number, but said I wouldn't be able to contact him for a while as he was out of town.

After about a month (it was now getting towards the end of Winter), I gave him a call. He was a little surprised.

"I'm sorry. How do you know me?"

I was more surprised. Our common acquaintance was supposed to have tipped him off that I would be calling. I told him that.

"Oh, yes. She did tell me something about you," he recalled. I told him what I was trying to do, and he invited me out to see his hives over my Spring break.

He had a handful of hives in the woods around his house that he showed me, and he recommended some beekeeping suppliers and lent me some books to read. He told me to hurry up and order a swarm of bees or I wouldn't get any for this season, and said I had to start acquiring and assembling my woodenware.

This was the shove I needed to get going with my bees. I'd been dilly-dallying for too long and justifying this time wasting by saying I didn't know where to get the equipment I needed. Now I did. I went home and called a recommended apiary to reserve a package of bees. Luckily they still had some. The previous season had been a bad one for bees and everyone was buying their limited number of available packages. The swarm would come pretty late – May 10th – but that would give me time to get my equipment ready.

I hung up the phone, realizing with a surprise that there was no going back now. The bees were coming and I was going to have to be able to work with them properly. I breathed a sigh of relief that my mentor had insisted I call the apiary so promptly; a brief comparison-shopping had shown that there were nearly no packages of bees to be found and that those that there were selling fast. I ordered the woodenware and other necessary equipment and began assembling it when it arrived.

As May 10th approached I began reviewing the instructions in the book on how to hive a package of bees. It seemed impossible that I would be able to simply pour the bees out of the box into the hive, but my mentor backed this up and clarified several other uncertain points of the process. He also advised me to spray sugar syrup onto the package rather than brush it on with a paintbrush as spraying eliminated the possibility of injuring the bees' feet. (This makes perfect sense when you think about it, although it never occurred to me. He has a knack for pointing out things that I should notice but never do).

Finally the bees arrived. I picked them up from the post office before school, fed them, and kept them in the dark in my basement until I got home. The hiving took place without a hitch; the bees behaved exactly as I'd been told they would and they all seemed perfectly glad to take up residence in a wooden box rather than fly away to find their own home. My only surprise came later that night when what seemed like the entire population of the hive marched out onto the front of their new house and sat there for hours. I'd read about this behavior; it's normal, nothing to worry about, but it didn't seem right that so *many* bees should sit outside the hive. My mentor said the bees were fine when I called him, certain that there was something wrong with them and that they would all leave or die. He said they were just too hot and were trying to cool off. Well, that's what the book said, but sometimes I need a little reinforcement from a real person.

The next night it rained. I suppose this shouldn't have bothered me; the outside of the hive was painted with waterproof paint and I had assembled it myself so I knew there weren't any chinks for water to get in through, but I was still worried when I could look out the window and see the hive standing under the deluge, no bees in sight. I convinced myself that the bees were fine and closed the curtain, wishing that I lived in the woods, like my mentor, and could hide my hive among the trees were I wouldn't be able to see it and worry about it all the time.

After these initial troubles (which weren't even real problems, just me worrying too much about nothing), the rest of the season went very well. My mentor came out to look at the hive himself one day and pronounced it perfectly fine and thriving. I completed my experiments for the science competition (I was working with bees' ability to tell time. The competition was in the Winter of my junior year. I got first place, and will compete at the state meet.), and when instructed, put on a super to see if I'd get any honey. The bees filled it with very dark wildflower honey that I harvested in the Fall. I made preparations for winter, medicating the colony and making sure the bees had enough food. After much prodding I opened the hive a crack to provide ventilation ("You have to ventilate your hive, Parry, or condensation will form and drip on your bees and stress them out"). The bees overwintered successfully, and I have had a productive new season.

Having a mentor has been a big help to me in this endeavor. He has been there to answer any question I've had about beekeeping, and has generally made the process much easier for me. He's given me useful tips I wouldn't otherwise have known, like where to put extra nails in frames to keep them from popping open when they're full. He's pushed me in the right direction when I've been reluctant to do something and kept me from making any terrible mistakes. He helped me make the transition from non-beekeeper to beekeeper quite painlessly, so that it's gotten to the point where I can't remember what my yard looked like without a beehive in it, and I can't imagine not having bees for the rest of my life. Beekeeping can be complicated, but with the help of a mentor anyone, even a high school student, can do it successfully. BC

Parry Macdonald is a senior at Sewickley Academy in Sewickley, Pennsylvania and because of her mentor has been keeping bees for two years now.

BASIC BOOKS

Ann Harman

There are several basic beekeeping books to use for your Short Course.

Last month you began planning your spring Short Course for beginning beekeepers. This month we are going to look at various books that could be used as a text or as supplemental reading for your course. The books have been chosen as ones easily available from the beekeeping equipment suppliers.

The first thing is to obtain a copy of the book you are considering. You can, of course, look through your own library but be careful – make certain you have the latest edition. Some books have been updated, but the vast majority has not. A few are in the process of updating but may not be in print by the time you need one.

One problem inherent in books is the difficulty of keeping them up to date. Your students should be encouraged to subscribe to one or both of the bee journals for current news of mite treatments and anything else new that beekeepers must be aware of. You will have to make handouts on such topics as the small hive beetle, the new medications and IPM methods for mites. Many of the books give the former name of the *Varroa* mite (*jacobsoni*). Only a few books deal with the Africanized Honey Bee. You will have to show and discuss the plastic equipment, such as the frame-foundation combination and the plastic hive. Even if you do not use all the new equipment your students will ask about the things they see in the catalogs.

You will need to consider quite a number of things in selecting a book. Price, of course, is one. You can contact the equipment supplier to get a quote for the quantity you think you might need. Depending on the book and the supplier the quantity discounts will vary quite a bit. The next thing to consider is the ease of use of the book for a beginner This really has to do with the index and the way the book is formatted. Is the index inclusive or is it too short? Go ahead and use it to look for something basic. That way you can see if it is useful.

Take a good look at the photos and drawings. Both should be clear, easy to understand and useful. Are there a sufficient number of them or just a few scattered here and there. Diagrams of the hive, some equipment, apiary sites, and management techniques are sometimes better than a photograph. Some books have bad photos – take a critical look at them. Beginning beekeepers really appreciate good photos and diagrams.

Next, take a pad of paper and a pencil and sit down and read the book. Make notes about things you feel are outdated, need more explanation, need to be added, plus your general thoughts about the book. If your list grows longer and longer as you go through the book you chose, then it is time to look for another book. There is no point in having the students be told throughout the course that the information needs to be changed. That's really confusing! They would be better off without that particular book.

Here is some information on the books that are available. There is no particular order to the list. You will find that prices vary between the equipment suppliers.

Three books can be considered as small, short and basic. One from the A. I. Root Company, one from the Dadant Company and one from the Walter T Kelley Company. These books have gone through revisions and numerous printings. One advantage of this group is the low price.

How to Keep Bees & Sell Honey was originally written by Walter T Kelley. It was revised in 1993. Price: $5.00 It has 144 pages, Table of Contents, Index, many black & white photos and some diagrams. Chapter 10 is about selling honey. Although there is no glossary, part of the first chapter gives beekeeping terms and a description.

The New Starting Right with Bees; revised 2002 by Kim Flottum and Kathy Summers. Price: $9.00 It has 138 pages, Table of Contents, Index, Glossary, a list of reference books carried by A. I. Root Company, black and white photos and some drawings. One chapter is on marketing and includes honey cookery The final chapter, called Social Skills, gives information on being a Good Neighbor along with information on zoning problems. This chapter also includes information about beekeepers associations.

First Lessons in Beekeeping, by C. P.

Dadant, Revised Edition 1976 (revision is planned). Price: $4.95 It has 130 pages, Table of Contents, an extensive Index, black and white photos, a few diagrams. The photos of package installation show two different types of packages, one of which is no longer in use. A nice chart of major honey plants for eight regions of the USA can be found in the chapter on Bee Pasture.

The next three books have much current information and are moderately priced. They are the newest books for beginning beekeepers and would be suitable for a class.

Beekeeping Basics, a MAAREC Publication, 2004. Price: about $8.00 from Pennsylvania State University. It has 98 pages in an 8-1/2X11-inch spiral-bound format, Table of Contents, no Index, a Glossary, a five-part Appendix with many useful resources, no diagrams. The chapter on Managing Maladies includes IPM information along with mite control and good information about the small hive beetle.

The Dummies series of books did not leave beekeeping behind. *Beekeeping for Dummies* was written by Howland Blackiston, 2001. Price: $20.00 It has 303 pages, Table of Contents, an extensive Index, a Glossary, an Appendix with resources and another Appendix, a Beekeeper's Checklist to guide hive inspections. The book has black and white photos, a center section with some color photos, no diagrams, lots of cartoons. The format of the book is characteristic of the Dummies series.

The newest book on the market is *The Backyard Beekeeper* by Kim Flottum, 2005. It is part of the Backyard Series of books. Price: $20.00 It has 167 pages in an 8X10-inch format. Table of Contents, Index, color photos, a few diagrams, four pages of Resources, a Glossary. Sidebars throughout the book bring emphasis to various information. The author recommends the eight-frame hive for ease in handling for the hobbyist beekeeper. Beeswax crafts are described and Chapter 5 gives many recipes using honey.

A popular book has been *The Beekeeper's Handbook*, Third Edition, by Diana Sammataro and Alphonse Avitabile, 1998. Price $30.00 It has 190 pages in an 11X8-1/2-inch (long rectangle) format, Table of Contents, extensive Index, Glossary, eight Appendixes, twelve pages of References, no photos but numerous, excellent drawings. Information is given on both mites. The chapter on Pollination and Bee Plants gives extensive information.

Honey Bees & Beekeeping , Second Edition, by Keith S. Delaplane, 1996 (revision is planned). Price: about $12.00 It has 138 pages in a spiral-bound 8-1/2 x 11 inch format, Table of Contents, extensive Index, an Appendix listing books and periodicals, and an Appendix giving a few equipment suppliers, many black & white photos, a few diagrams. Since the page numbers are in the center of the book they are hard to find. Chapter 11 gives a quick overview of the package bee and queen production.

Beekeeping Principles by James E. Tew, 2000. Price: 18.00 It has 245 pages, Table of Contents, Table of Figures, comprehensive Index, Glossary, three Appendixes and a brief Bibliography, black and white photos and a few diagrams. Appendix 1 is a long list of pollen and nectar sources giving the plant's common and scientific name, nectar and/or pollen source and blooming season. You will find a useful section on the small hive beetle and its control. A short chapter on Honey Bees and Pesticides gives good information.

Beekeeping: A Practical Guide by Richard E. Bonney, 1993. Price: $19.00 It has 184 pages, Table of Contents, extensive Index, a Glossary, two Appendixes giving publications and a few equipment suppliers, no photos, some diagrams. The lack of photos and diagrams does limit the usefulness of this book for the beginning beekeeper. The Africanized Honey Bee section is quite good. Better, more up-to-date books are available in this price range.

Another book in the same general category as the one by Bonney is *The New Complete Guide to Beekeeping* by Roger A. Morse, 1994. Price: $17.00 It has 200 pages, Table of Contents, Index, Glossary and Sources of Information, black and white photos, no diagrams. Unfortunately the book has limited information on bee biology. Pollination is covered. Chapters on queen rearing and honey shows are of limited value to beginning beekeepers.

The *How-To-Do-It Book of Beekeeping* by Richard Taylor is now out of print. At this time it is being thoroughly revised. Therefore no information is available. Keep watching the beekeeping journals for news of its availability.

Beekeeping in the Midwest by E. Jaycox was written in 1984. Although small and inexpensive a better choice of book of this type would be one of the Root, Dadant or Kelley companies.

One other book is worth considering: *Honey Bee Biology and Beekeeping* , Second Edition, by Dewey M. Caron. Price: $35.00 This has 355 pages in a hardcover 8-1/2X11-inch format. It has a detailed Table of Contents, a comprehensive Index, and a Glossary, numerous black and white photos and drawings. Each chapter lists a few publications for additional reading and a section of discussion questions and exercises for the student. Although the highest priced book listed, it also contains the most information.

Two little books just on diseases and pests would make a good addition to the class text. One is *Honey Bee Parasites, Pests, Predators and Diseases,* a MAAREC publication available from Penn State University. Price $9.00 It is a pocket-size 4X9-inch spiral-bound book filled with excellent color photos. The other book is *Honey Bee Diseases and Pests* done by the Canadian Association of Professional Apiculturists (CAPA). Price about $6.00 and available from equipment suppliers. It also has color photos; format is 8-1/2 x 11 inches.

At this point you may well realize that there is no one perfect book that will fit your short course exactly. Although you will find a proliferation of books about bees, select your short course text carefully and be prepared to augment that book with whatever is necessary to give your students the current information.

Ann Harman reviews beekeeping books in her spare time before, during and after class in Flint Hill, Virginia.

Honey Plants

Connie Krochmal

Lavender (All-America Selections photo)

Autumn In The Bee Garden

Autumn is a time of opportunity Cooler temperatures bring ideal conditions for working outdoors in the bee garden. While the bees are busily collecting nectar and pollen from Fall-blooming plants, we need to look ahead and prepare our gardens for Winter. In addition, this is a great time to prepare new garden beds and do Fall planting.

Fall Planting

Though Spring is the time we usually associate with planting, Fall also works well as far north as zone five. In general, perennials and most woody plants should be transplanted at least six weeks before the ground freezes. Evergreens require a little more time. This time frame allows the roots to grow and get well-established before the onset of Winter

Perennial Mums (Anthony Tesselaar)

Many kinds of bee plants are suitable for Fall planting. These include perennials, fruit trees, most ornamental shrubs, Spring flowering bulbs, and even flower seeds. Of the herbaceous perennials, a number prefer Fall transplanting to Spring. Among these are Oriental poppy, and peony. Though the majority of woody plants respond well to Fall planting, there are some exceptions. Some of the bee plants that prefer Spring are hollies, red maple, birches, flowering fruit trees, weeping willow, tulip poplar, and hawthorn.

Regarding Spring flowering bulbs, these need cool temperatures to make their best root growth during the Fall. The best time to plant them is when the average night temperatures have dropped to the forties and fifties. This means beekeepers in warmer climates need not rush to get this done.

When you're planting, don't forget to sow seeds of annuals and perennials for next year's bee garden. These will come up the following Spring as soon as the ground is sufficiently warm. Hardy annuals, such as borage, cornflower, and cosmos, are especially suitable for sowing in the Autumn. In some cases, exposure to cold Winter temperatures actually improves the rate of seed germination. That's the case with numerous bee perennials, such as garden phlox, mallow, purple coneflower, speedwell, and sea thrift.

While you're planting, look around to see if any of your perennials need dividing. The more the merrier when you're holding an open house. On the other hand, most perennials prefer more spacious conditions. Some tend to stop blooming and die out in the center when the clumps get overcrowded. About every five years or so, most of mine need dividing. Some species prefer that this be done during the late Summer and Fall. These include purple coneflower, Shasta daisy, avens, basket-of-gold, and black-eyed Susans.

Most perennials are easy to divide. Dig the clump. Then, either cut or pull it apart into sections so that each new portion has at least two growing points. Replant the healthy outer portions, and water

If you live in an area with very cold Winters, wait until early Spring to fertilize Fall plantings. Once the ground freezes, the fertilizer becomes less available to the plants.

In much of the country, rainfall may be plentiful enough to get new Fall plantings off to a good start. However, be ready to step in and water if it doesn't rain once a week in your area.

Helleborus (Perennial Plant Association photo)

Putting the Bee Garden to Bed

Putting the garden to bed includes Fall cleanup and providing the plants with the various kinds of protection they need to face the Winter weather that is ahead.

Clean-up

The bee garden will benefit greatly from a general cleanup. Often, beekeepers are too busy to do much. In that case, focus attention on the most important detail. That would be removing plant debris from all of those garden plants that were attacked by diseases or insects. Typically, this would happen to fruit trees. Disease spores and insects can overwinter in this debris, and return to attack the plant the following year

If time permits, remove all the dead annuals. Cut back the dead and dying stalks and foliage of perennials. With a few exceptions, many of these can be cut to the ground. Avoid trimming ones that are semi-evergreen or evergreen, such as bergenia, lavender, thyme, sage, candytuft, and hellebore.

In addition, there are several kinds of herbaceous perennials that resent being cut back. Examples are mums and scabious. These are more likely to survive over the Winter if they are left undisturbed.

Avoid pruning woody perennials, such as butterfly bush and Russian sage. Allow their stems to remain in place over the Winter. Early Spring is best for cutting these back.

So far as woody plants are concerned, limit pruning to the removal of branches that are dead, diseased, or damaged. Any other trimming should wait until very early Spring or late Winter In general, pruning encourages new growth, which wouldn't have time to harden off before Winter arrives.

As I cut the perennials back, I like to make a clean sweep through the beds and remove weeds. The most common cool season species seem to be chickweed and bedstraw. If at all possible, remove weeds before they go to seed. The perfect time to pull them is after a rain. When the ground is dry, this is a challenge.

Plant Protection

Help your bee plants face the Winter ahead. Give them the protection they need. Hardy outdoor plants – especially those in colder spots, shallow-rooted ones, and all new plantings – require attention. Otherwise, Winter damage may result. These benefit from Winter mulches, protective wind breaks, and other measures.

Except for established irises and peonies, most herbaceous plants need Winter mulch, particularly from zone five northward. Though snow acts as a natural mulch, there isn't always enough around when you need it. Winter mulch should be applied after the ground has frozen. Avoid spreading it too soon.

Winter mulch preserves soil moisture and minimizes the risks of frost-heaving, which results from alternate freezing and thawing.

For evergreen kinds of perennials, herbs, and ground covers, the preferred mulches are pine needles, pine cones, and evergreen boughs. These plants tend to be sensitive to mildew. So, airy materials are best.

Most other perennials and woody plants can be protected with a four to six inch layer of leaves. Though some gardeners add more, this probably isn't necessary.

All leaves aren't equal. I prefer sycamore or oak because they curl up, thus promoting good air circulation and allowing the water to soak through. Since flat leaves can sometimes form a thick mat, they can smother the plants. I had this happen with those from the Norway maple. For that reason, these should be shredded before they're used as Winter mulch. This step is easy enough with a mulching mower or a leaf mulcher, such as the one available from Charleys Greenhouse (http:www.charleysgreenhouse.com). Partially decayed leaves can be used as is.

Other suitable Winter mulches include salt hay, straw, all kinds of bark mulch, wood chips, and compost.

For most perennials and woody plants, it takes very little time to spread the mulch around. However, certain species do require individual attention. These include evergreens and ones with foliage in the form of basal rosettes. Among these are foxgloves, hollyhocks, and mums. In these cases, I carefully place mulch around the crown without having it actually touch the leaves.

Avoid putting mulch against the trunks of woody plants. Leave several inches clear

Gusty Winter winds tend to blow loose leaves around. To prevent that, I hold them in place by sprinkling a little compost or wood chips on top. For small beds, an alternative is to install netting around

the perimeter

Sometimes we have hardy bee plants that are still in their containers. Perhaps, they weren't quite large enough to transplant into the garden. In some cases, we may have been too busy to get them planted. These plants definitely need Winter protection. The easiest method is to dig holes, and sink the containers into the ground. Then, protect them with a heavy layer of mulch.

These container plants can also be overwintered in their pots inside a cold frame. An alternative is to remove the plants from the containers, and transplant them directly into the cold frame. In either case, they need mulched.

The base of the cold frame should be set into the ground. Be sure the top slants towards the south. To prevent overheating and minimize disease outbreaks, open the cold frame on mild, sunny days. Automatic pneumatic systems are best because they vent as needed on their own.

Evergreens will need protection from windburn during the Winter months. This damage results when the Winter wind and sun dry the foliage out. As a result, the tips and edges can turn brown and die back. Prevent this by spraying the plants with an anti-desiccant, such as Wilt-Pruf. Leaving a transparent coating on the foliage, this material slows the loss of water through the leaf pores. These products are recommended for boxwood, rosemary, lavender, and other evergreens that are prone to windburn.

Anti-desiccants should be applied in very late Fall or early Winter when the temperature is still relatively mild. For specific instructions, check the label on the container In zone five and farther north where Winters last longer, it may be necessary to reapply again in mid-Winter

In colder climates, large evergreen shrubs – especially newly planted ones – will likely need temporary wind breaks during the Winter months to protect them from strong winds. Typically, these barriers are made from burlap, which is stapled to stakes. These screens should never come in contact with the plants, and should remain loose.

Hollyhock

At one time, tree wraps and paints were used to protect young trees over the Winter. Now, plant experts say this is unnecessary. This procedure was done to prevent sunscald on the sunny side of the tree where the extreme change in temperature of the bark occurs once the sun goes down. Thin-barked ones, such as flowering fruit trees, and red maple, are most susceptible to sunscald.

In some areas, woody plants are vulnerable to Winter damage from rodents. Mice, voles, and rabbits routinely chew on the bark when other food sources are unavailable during the Winter months. To create protective barriers, place cylinders of ¼-inch mesh hardware cloth around the trunks. Sink these three to four inches into the ground. They need to be several inches wider than the plant's trunk. For the most part, these barriers should be at least 1½ feet tall. In areas where heavy snows are the norm, they could be a bit higher since rabbits can stand on top of the snow banks to get to the trunks.

Preparing New Garden Beds for Spring Planting

Fall is an excellent time to prepare new garden beds for Spring planting. This will give you a head start. By doing so now, you won't have to wait until the ground dries out after the Spring thaws. To create new beds and expand existing ones, I use a relatively new method known as sheet composting. It kills weeds and unwanted grass with no tilling.

The first step is to mow or cut weeds to the ground. Next, I put down a thick layer of newspaper or cardboard. I avoid doing this on windy days for obvious reasons. As the final step, I spread several inches of wood chips on the paper By the following Spring, the weeds and sod will be dead. I plant right through the paper, which eventually composts on its own. This method is really an updated, no-till version of Ruth Stout's system. She placed thick layers of hay on top of the soil, and planted in the hay.

Under certain circumstances, fall tilling is needed, particularly if you are working lots of organic matter into the soil, or are creating new raised beds. Deep tilling (more than six inches) is not necessary.

The reds, yellows, and oranges of the Fall foliage are signals for action. They let us know this is the time to finish up our planting and get the bee garden ready for Winter BC

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

Malcolm T Sanford

EAS' 50th Anniversary In Ohio

"EAS looks to the future with anticipation and excitement."

The Eastern Apicultural Society's 50th meeting concluded at the end of the first week of August. It convened on the campus of Kent State University, and presents another turning point in the history of this institution, albeit one far more pleasant than the event that occurred on that Ohio campus May 4, 1970. Four students were shot and killed by the Ohio National Guard while protesting against the war in Vietnam.[1] It's certainly worth visiting the memorials there that also arguably commemorate a turning point in public opinion about the course of that conflict in Southeast Asia. This is doubly so as the U.S. finds itself engulfed in similar situations in Afghanistan and Iraq.

This reporter did not expect the meeting to be as "emotional" as it turned out. But the remarks by Dr Mark Winston when he said goodbye to his career in writing about apiculture brought a tear to many eyes, including his own. As he writes in his final column in the August 2005 *Bee Culture*, his life has moved away from bees. Could EAS 50 in fact be his last presentation at a bee meeting? Perhaps, but there was a gleam in his eye when he unwrapped a package that consisted of a nucleus with several frames of "art" created by bees employing beeswax to modify and perhaps amplify human contact with these insects. The silent dialogue represented by these frames seems to fit aptly with Dr. Winston's new passion for engaging students about civic issues and art.[2] He retires from one phase of a career only to start another, but will continue to use his training in bees and beekeeping. As he concludes in his -30- column,[3] it provides "limitless opportunities to think, reflect, and write about everything from nature to politics to people."

It is intriguing to read the history of EAS during the last five decades admirably put together in the commemorative program by Kim Flottum and Kathy Summers of the A.I. Root Co., the official historian Dick Chapin and others. This is certain to be a collectable in years to come. It reports a wealth of information about the history of beekeeping in the east as it relates to the Society's activities. EAS was inaugurated in 1955. At the time George Abrams, Apiarist at the University of Maryland, said this yearly meeting, "should be a program with subjects of particular interest to the type of beekeeper most numerous in the region, that is, the hobby and sideline beekeeper "

One of the things not readily apparent to many participants is the link between the commercial side of beekeeping and the hobbyists and sideliners that continue to flock to the meeting. It began with the first convention when the A.I. Root Co. asked managing editor of then *Gleanings in Bee Culture* to be a representative to the initial meeting in Maryland.

John Root writes in the commemorative program that A.I. Root Co. was signed up as THE Charter Commercial member and the organization is "incredibly proud of that distinction to this day." He adds that the company has been represented at every meeting EAS has held. Mr. Root was selected as temporary Chairman of the Board when that position was created in 1977 He helped organize the 1978 meeting at Wooster, OH attended by over 600 people, and the Root Co. was heavily involved in the Year of the Hive in 1995 (600 in attendance) at the same venue, as well as this year's meeting in Kent.

Each year the number of commercial booths reveals that the hobbyist and sideline markets are alive and well. As the commercial aspects of the beekeeping industry change, so too will these be reflected in the relationship between EAS and its potential commercial sponsors.

The 1950s and 60s were formative for the Society when it met at The Pennsylvania State University, University of Massachusetts at Amherst, and Cornell and Rutgers Universities among others. In 1961, EAS joined Apimondia, paying the $46.50 dues. It incorporated in 1962. The first "foray into Canada" was to Guelph, Ontario. 1967 was a banner year for U.S. beekeeping as the University of Maryland hosted Apimondia that year EAS was heavily involved and there was no separate convention. The 1970s began with EAS achieving non-profit corporation status. The Hambleton Award was established initially given to Rolf Boch from Canda, and the now familiar workshops began to be organized. The memorable Ohio meeting in 1978 mentioned above revealed a vote of eight to seven to stay in Apimondia after the American Beekeeping Federation dropped paying half the dues. They would finally be eliminated by EAS in the 1980s, leaving the U.S. with no membership in this world beekeeping organization.

In 1979 Roberta Glatz became "the first female to speak at a formal EAS conference," and Mark Winston then at the University of Kansas received the recently inaugurated student award. His student, Lora Morandin, won it in Kent, in a sense completing an academic circle. The short courses got stronger in the 1980s and a new generation of faces began to emerge at the annual meeting. In 1981 Roger Morse turned his Master Beekeeper program over to EAS.

The grandest meeting to date

would be held in 1984 with a record 738 attending, in the same place where the Association was first mentioned as a possibility in1954 at a tri-state meeting in Rhode Island. In 1985, a transition among the officers occurred and "was filled with tension and argument," according to Bob Cole from North Carolina who was summarily thrust onto the scene being elected Chairman of the Board. Fortunately, he writes in the comemorative program, "Eventually, things calmed down and we were able to get on with the work of EAS, so here is our half a century meeting and all is well with EAS." The Divelbiss Award was established in 1988, first won by Al Delicata from Maine.

"The 15 years since 1990 have been generally steady, stable and calm," according to the history in the commemorative program. Not so the forces surrounding beekeeping, however, including challenges by tracheal and *Varroa* mites, followed by the Africanized honey bee and small hive beetle. On top of that there have been "wildly fluctuating honey prices, increasing costs of equipment, slow and persistent loss of forage areas and increasing difficulty with urban locations." 1991 saw several firsts, including a hotel venue in North Carolina and a registration fee surpassing $300.00 for a couple. The Foundation for Honey Bee Research was formed in 1993. The Year of the Hive in 1995, marked EAS' 40th anniversary and the 100th anniversary of L.L. Langstroth's death. In spite of this, he makes an appearance at the meeting and has "a striking resemblance to John Ambrose of North Carolina."

Roger Morse, one of the rocks of EAS, died in 1999 and that year the award for teaching, extension and regulatory was given for the first time in his name to Jim Tew. This reporter was proud to win it in 2003 in Maine. In the year 2002 at Bees by the Sea, Massachusetts Maritime Academy, Roberta Glatz returns, Mike Burgett won the Morse award and Mark Winston's mentor, Dr Orley (Chip) Taylor took home the Hambleton. The EAS gave the Hartland Association seed money as it did almost two decades earlier, to help begin the Western Apicultural Society (WAS), and donated money to the Mann Library in Ithaca to begin digitizing historical beekeeping books in the E.F. Phillips Collection. As the information age matures so does EAS now managing its own web site that also archives the sites for all conferences since the year 2000, a list of master beekeepers, and updates on the Mann Library digitization project.[4]

The EAS commitment to beekeeper education is perhaps best expressed in this year's program, which ran the gamut from presentations by the nation's largest beekeeper, Richard Adee, who discussed moving to the California almonds and raising queens in Mississippi, to Dr. Anita Collins taking on the esoteric topic of sperm preservation in bees. It's intriguing that during Mr. Adee's presentation he gave credit to most of those present as true beekeepers being "in and with" the bees, while characterizing his owns efforts as a "mover of boxes."

Dr. Collins said studies in sperm preservation were important for a number of reasons. These include conserving genetic diversity (being lost as parasitic mites take a great toll on honey bees around the world), saving selected commercial stock, rescuing valuable bee types from disappearing and enhancing the export/import process. A great conundrum is how the queen manages to store her sperm, when she has no integral refrigeration mechanism. Sperm preservation in honey bees appears to be more problematic than other animals (mammals), although scientists are trying through use of what are called cryoprotectants. These are added to water, which when subsequently frozen, do not produce ice crystals that can damage the sperm. The problem is that in spite of this process, storing bee sperm leads to a high proportion of drones in inseminated queens as their viability is reduced to less than 20 percent. Most intriguing is the concept that maybe the queen doesn't act alone in sperm preservation. Could the drone also contribute? Dr. Collins promises more on this subject at a later date.

Exciting news at EAS was the announcement that finally a formulation of formic acid is going to receive a label from the regulatory authorities. Thus, a product called Mite-Away II® is being given registration in the U.S. in a growing number of states. It is manufactured in Canada by Nod Apiary Products Ltd.[5] This is one of a growing number of alternative treatments to the traditional Apistan® and Check-Mite+® that are now on the market. Another organicacid with potential is oxalic acid. The Morse award winner this year, Dr. Marion Ellis, presented some of his preliminary data on this material's effectiveness. This is being used in Canada and Europe with success and no doubt registration in the U.S. will be affected by its use in other countries. The American Beekeeping Federation will be vigorously pursuing registration over the next year by purchasing Canadian data to facilitate the process.

Both organic acids and to some extent other organic materials (products based on thymol or other essential oils) reveal that a shift must take place in beekeepers' thinking. Again, EAS is the perfect venue to bring these materials to the beekeeping industry's attention because of its strong educational emphasis. They have been described as "dumb products for intelligent beekeepers," as opposed to those currently marketed for which the reverse is the case. The same will be true for the next generation antibiotic to be used for foulbroods resistant to the current antibiotic Terramycin® (oxytetracycline). Tylosin lactate, first discovered as a treatment against foulbroods by USDA ARS in the 1970s,[6] looks to be the next material to be labeled. However, it will require a veterinarian's prescription and cannot be used prophylactically as is currently done with Terramycin®, another shift in the beekeeper mind set.

The emphasis on queens at this year's EAS is also without precedent. There were presentations on queen behavior, anatomy, breeding (sperm preservation as described elsewhere) and production. Sue Cobey gave perhaps the most impassioned speech. She and her New World Carniolan program[7] have reached somewhat of a crossroads

with changes at The Ohio State University's Walter Rothenbuhler Bee Laboratory. It's time she said for beekeepers to get on the queen breeding bandwagon and support the handful of those out there like herself who have dedicated a huge amount of work and effort to increasing queen quality It seems likely that it will be the hobby and sideliner beekeepers that make up the majority of EAS participants who must lead the charge toward a more healthful beekeeping by supporting incipient breeding programs. This is already being done in Europe with associations like the BIBBA, the Bee Improvement Program of the British Beekeepers Association,[7] and the Galtee Bee Breeding Group.[8] It is certainly an endeavor that organizations like EAS will no doubt be more supportive of in the future.

The 50th Anniversary Celebration of the Eastern Apicultural Society of North America, which began the general convention in Kent featured the attendance of many past presidents and all five board chairmen since that post was created. Each got to speak about the special moments they remembered during their tenure. And what's next? asks the commemorative program. Whatever it is the Society looks forward to it with "anticipation and excitement." And you can be sure that the EAS membership, including over 170 life members and 130 master beekeepers, will be up to the challenge. Come see for yourself next year when for the first time EAS ventures into the peach state. The beekeepers of Georgia are sure to host a great show.

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? DO YOU KNOW ?

Basic Bee Biology & Behavior

Clarence **Collison**
Mississippi State University

Having just spent the entire week at Kent State University attending and working at the 50th anniversary meeting of the Eastern Apicultural Society of North America, we were reminded of the historical contributions of numerous individuals, businesses and professors who have left a significant imprint on the organization and numerous beekeepers lives. Plus, we were treated to some excellent lectures and workshops that continue to broaden our working knowledge about our favorite insect, the honey bee. The industry continues to struggle with parasitic mites, small hive beetles, resistance against antibiotics and miticides. Understanding the bee's basic biology and how it relates to colony management and behavior was the basic theme of the conference's short course. Some of the topics from EAS are covered here.

Please answer the following questions to see how familiar are with basic bee biology and behavior

Level 1 Beekeeping

1. The phrases "open brood" and "capped brood" are routinely used within the beekeeping industry Please indicate what honey bee life stages are associated with each phrase. (3 points)
2. ___ Honey production can be increased by eliminating drone brood in a colony. (True or False)
3. ___ Field honey bees generally exhibit more defensive behavior than house bees within the colony. (True or False)
4. ___ Within a colony's adult drone population, diploid drones are often encountered. (True or False)
5. ___ Worker honey bees will take better care of young adult drones than they will older drones. (True or False)
6. ___ Comb honey exposed to high humidity will pick up moisture and ferment. (True or False)

Please match the following pieces of plastic equipment with the appropriate use.

A. Bee-O-Pac Half Frames B. Ross-Rounds
C. Hogg Halfcomb Cassettes

7 ___ Used in the production of circular section comb honey
8. ___ Used in the production section comb honey
9. ___ Two-piece, flexible comb honey production frame.
10. What is the active ingredient in the following miticides: Apicure, Mite-Away II and Mitegone? (1 point)
11. ___ Adult and larval small hive beetles will attack and feed on caged queens. (True or False)

Advanced Beekeeping

12. ___ Queen mandibular pheromone is highly volatile so air currents within the hive are responsible for its dispersal. (True or False)
13. ___ There are two subclasses of pheromones: releasers and primers. A releaser pheromone acts to physiologically alter endocrine or reproductive systems; recipients may acquire new behavior patterns. (True or False)
14. ___ 2-Heptanone is a stronger alarm pheromone in comparison to isopentyl acetate. (True or False)
15. ___ Mated queens produce a more complex version of queen substance than virgin queens. (True or False)
16. Biologically what is basic function of the egg pheromone and queen cell pheromone in the colony? (2 points)
17 "Queen substance" is a mixture of ___ different chemical components.
A. 12 B. 5 C. 9 D. 7 E. 2
18. Queens have two different sex pheromones: Mandibular pheromone (9ODA, primary component) and Tergite pheromone. Please indicate the basic function of each. (2 points).

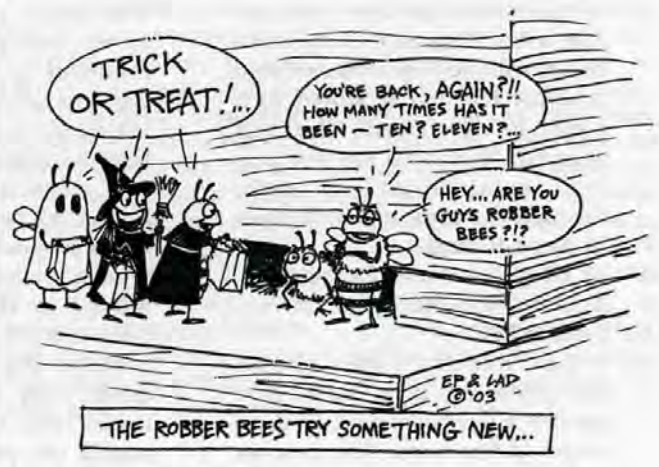
There are several different types of pheromones found in the honey bee society.

Please match the following pheromone types with the appropriate result.

A. Queen pheromones; B. Alarm pheromones
C. Scent gland pheromones; D. Brood pheromones
E. Worker regulation pheromone

19. Inhibits worker ovary development (2 points)
___
20. Inhibits or delays the initiation of foraging (2 points)
___

ANSWERS ON NEXT PAGE



?Do You Know? Answers

1. Open brood = Egg and Larva
   Capped brood = Pupa
2. **False** Drones eat three times as much food as workers, therefore beekeepers believe an excessive number of drones in the hive certainly places an added stress on the colony's food supply and impacts honey production. Several studies have been done to see if elimination of drone brood would increase honey production, but it has not been successful.
3. **True** Honey bees increase in their defensive behavior as they age. Beekeepers take advantage of this when they are working their colonies. The best time to work honey bee colonies is when the colony's foraging force is in the field and the beekeeper has primarily house bees left to deal with.
4. **False** Diploid drones can only be reared under laboratory conditions. In nature workers selectively kill all diploid larvae, so beekeepers never encounter them.
5. **True** Drones are aged by worker honey bees and when colony food stores are declining or there is a nectar dearth, workers will take better care of young adult drones than they will older drones. The older drones are the first to be driven from the colony
6. **True** Honey is hygroscopic, which means it will pickup moisture if stored in a humid environment and lose moisture if in a dry situation. Even comb honey will pick up moisture and possibly ferment if stored in a moist environment. The wax cappings over cells are not perfect seals. Water can move through the cappings with ease.
7. B) Ross-Rounds
8. C) Hogg Halfcomb Cassettes
9. A) Bee-O-Pac Half Frames
10. Formic Acid
11. **True** Research has shown that adult and larval small hive beetles will attack and feed on caged queen bees. The process that beetles employ is very alarming. Queen cage candy is very attractive to the beetles. Beetles feeding on this candy will defecate inside the cage, the queen and or attendants will get stuck in it. Larvae will feed on the bee carcass as well as the candy.
12. **False** Queen mandibular pheromone is distributed within the honey bee colony through bee to bee contact. The pheromone does not permeate through the hive. Members of the queen's retinue either lick the pheromone from her body or contact the pheromone by antennating her These bees then spread the pheromone by bee to bee contact.
13. **False** A releaser pheromone stimulates an immediate behavioral response, whereas, primer pheromones act to physiologically alter endocrine or reproductive systems; thus recipients may acquire new behavior patterns over a period of time.
14. **False** 2-Heptanone is a weak releaser of alarm in comparison to isopentyl acetate. Isopentyl acetate is a volatile pheromone that generates a rapid response, in preparing workers to attack. 2-Heptanone is produced by older workers of foraging age and may be used to mark hive intruders and to mark flowers to repel other foragers.
15. **True** Virgin honey bee queens produce a less complex mixture of "queen substance" than is produced by mated queens. These differences in "queen substance" allows the workers to differentiate between mated and virgin queens. The queen pheromones affect queen acceptance during the requeening process.
16. Egg pheromone is produced by the queen and its primary function is discrimination of queen-laid versus work-laid-eggs. Serves as an aid to worker policing of worker-laid eggs.
    Queen cell pheromone is involved in the recognition of queen cells. The pheromone inhibits the initiation of new queen cells. It serves as part of a feed-back control system governing the production of queen cells.
17. C) 9
18. Mandibular pheromone (9ODA) is the primary sex attractant, attracts drones from a distance. Tergite pheromone is involved in close range mating, stimulates release of copulatory activity.
19. A) Queen pheromones
    D) Brood pheromones
20. D) Brood pheromones
    E) Worker regulation pheromone

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

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

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

GLEANINGS

OCTOBER, 2005 • ALL THE NEWS THAT FITS

COOL LABELS

Food Standards Australia New Zealand abandoned its 'information on request' approach to the country of origin labelling of food and now is proposing a comprehensive package of measures to provide consumers with adequate information.

This would make it mandatory to declare the country of origin on all packaged foods and, in a new provision, the standard has new requirements for the labelling of unpackaged fish, fruit, vegetables and nuts, whether fresh or processed. The country of origin statements will appear on a food label or on a sign displayed with a food in a manner that is clear and unambiguous.

"The proposed standard seeks to strengthen the current country of origin labelling provisions in the Food Standards Code," FSANZ general manager of food Standards Dean Stockwell said.

"Packaged food must state the country of origin of the food in a separate statement. Unpackaged fresh fruit, vegetable, nuts and seafood must also state the actual country of origin, and not just state 'imported.

"If they are locally produced, these unpackaged foods must be labelled as 'Australian produce' in Australia and as 'New Zealand produce' in New Zealand."

BASHKIR EXPORTS TO U.S.

The Russian republic of Bashkortostan is shipping 15 metric tonnes of honey to the U.S.

The Novosti news service said Bashkortostan, in the south Urals, has a reputation for high-quality honey that is already sold in Europe as a luxury product in some expensive restaurants.

Bashkir Trade Minister Boris Kolbin said it is the first trial export of Bashkir honey to the U.S.

"If the U.S. shows an interest, our republic is prepared to supply honey in large volumes," he said.

SAVE THE CARNIES

A bee breeding center has been established in Slovenia as part of a European Union-funded project for preserving the Carniolan bee.

Regional beekeeping association president Bostjan Noc told a news conference the Zelenica centre is to be home for queen of the indigenous Slovenian type of bee.

He said the project involves beekeepers from the Slovenian region of Gorenjsko and the Austrian province of Carinthia.

The EU contributed 50,087 euros (US$61,456) for the 19th project with another 12,521 euros (US$15,363) contributed by donors including the Zirovnica municipality, which considers the project important for preservation of the species and the work of legendary beekeeper Anton Jansa.

"The Gorenjsko region is the home of the Carniolan bee, therefore it is important for its breeding to continue here," Zirovnica Mayor Franc Pfajfar said.

He said the municipality will use beekeepers to promote Zirovnica as a tourist spot.

The Slovene Press Agency said beekeepers used the funds to restore Jansa's amelioration station in Zelenica in the Zavrsnica Valley of northern Slovenia. The overhauled 40-year-old station, in which the breeding capacity for queen bees is to increase from 200 to 1,000, was opened Aug. 20.

The purebred queen bees costing 40 euros (US$49) each are intended to meet the needs of Slovenian beekeepers but Noc says they are also attracting a lot of interest abroad where they are hard to obtain.

MEMBERS NAMED TO NATIONAL HONEY BOARD NOMINATIONS COMMITTEE

Agriculture Secretary Mike Johanns appointed 16 members to the National Honey Nominations Committee, which nominates individuals for appointment to the National Honey Board.

Newly appointed to a term beginning immediately and ending June 30, 2006 is Eric Goodrich of Metamora, MI.

Newly appointed with terms beginning immediately and ending June 30, 2008 are: Troy Bunch, Hughson, CA; Johnny Haefeli, Monte Vista, CO; Stephen Mayes, Mackinaw, IL; Lloyd Snyder, White Hall, MD; David Ellingson, Ortonville, MN; Kit Mayers, Woonsocket, RI; Alphonse Fucik, El Campo, TX; William Gaylon Yack, Myton, UT and Troy Holbrook, Lewisburg, WV.

Reappointed with terms beginning immediately and ending June 30, 2008 are: Richard Leber, Mobile, AL; Rollin Hannan, Southbury, CT; Lincoln Sennett, Albion, ME; Leonard Joy, Reno, NV; Alden Marshall, Hudson, NH and Judith Doan, Hamlin, NY.

The National Honey Board administers an industry-funded national research promotion, and consumer information program to increase honey consumption in the United States and abroad.

USDA's Agricultural Marketing Service monitors operations of the National Honey Board.

GRANTS OFFERED FOR PROJECTS IN AGRICULTURAL SUSTAINABILITY

The Northeast Sustainable Agriculture Research and Education program (SARE) offers three different grant programs to advance agriculture and sustainability across the region, all with application deadlines in the Fall and early Winter.

Farmer/Grower grants are offered to commercial farmers who would like to explore a sustainable and innovative marketing practice, often by conducting an experiment, trial, or on-farm demonstration. Applicants must be a farm business owner or manager with a farm product that is sold on a regular basis, although it is not necessary to farm full time. Also, farms affiliated with a nonprofit institution may apply, provided the farm produces and sells agricultural products under the same economic constraints that affect commercial growers. The application deadline is December 6.

Northeast SARE defines sustainable agriculture as profitable, environmentally sound, and beneficial to the wider community. Past projects have addressed a wide range of production, marketing, and processing issues, including new tool development farm labor, soil health, adding value to an existing farm product, pest management, and improved stewardship.

These three grant awards are capped at $10,000 per project, and the project must take place within the Northeast SARE region, which is made up of CT, DE, MA, MD, ME, NH, NJ, NY, PA, RI, VT, WV, and Washington, D.C.

To learn more about the SARE program and its grant offerings, go to www.uvm.edu/~nesare or call 802.656.0471.

NZ CO. RAMPS UP

New Zealand natural health food company Comvita Ltd. named a new chief executive with extensive international business development experience.

Comvita chairman Bill Bracks said the company is on a strong international growth path and Brett Hewlett has the skill set to help achieve further significant expansion abroad.

In its last financial half-year exports made up 60% of Comvita's sales.

Hewlett, has spent 15 years overseas with the global food processing and food packaging solutions provider Tetra Pak.

Bracks said Comvita has been taking control of its own marketing overseas and under current chief executive Graeme Boyd, has made significant gains in key markets, including the UK, Australia, Taiwan and Japan.

"Plans include an office in the UK which will also become the base for expanding into Europe, and to grow new business in the U.S. where significant opportunities exist in the medical honey products market," Bracks said. "The new CEO has the skills to help make those happen."

Comvita has more than 90 staff in New Zealand and a further 10 offshore in subsidiaries in Japan, Hong Kong, Australia and Taiwan.

It uses contract manufacturers throughout New Zealand to boost its in-house capability. This month it was named food and beverage Exporter of the Year.

Earlier, Comvita Ltd. won the award after increasing annual export earnings by 47% in 2004 to NZ$14.6 million.

The judges said Comvita had successfully established the company as a premium brand internationally.

Boyd said the Comvita brand is a valuable asset, providing competitive advantage through its association with pure, high quality natural health products.

"We are the only New Zealand company specializing in adding value to the whole range of apiculture by-products," he said. "New Zealand's international clean, green image and unique natural resources such as manuka honey with exceptional antibacterial qualities provide us with a competitive advantage and is something that we highlight in our branding."

Imports Western Australia is easing its ban on imports of honey and other bee products from New Zealand.

New Zealand's Comvita Ltd. said that it has received Western Australian approval to sell 28 products including propolis and its medical honey dressings.

The Australian state restricts bee product imports because of the risk they may introduce European foulbrood.

Comvita successfully sought a risk assessment by the Western Australian chief veterinary officer.

Comvita consumer division manager Scott Coulter said the products allowed entry are those with no honey or a low-honey content.

He said Comvita's sales in Australia had grown 50% in the first half of this year and sales in Western Australia were expected to account for 10% of Comvita's total Australian revenue.

Coulter said exports make up 60% of Comvita's sales with strong growth in its main UK market and new markets in Taiwan, China and Japan.

Wounds Comvita New Zealand signed an agreement with British medical products company Brightwake to sell an improved version of its ApiNate wounds dressings to markets in Europe, Australia and New Zealand.

Comvita medical division manager Ray Lewis said the new longer-lasting dressing had a different structure.

"We have improved the handling and release of honey to the wounds," he said. "The dressing would be applied to the hardest-to-heal wounds and could be left on longer."

The dressings combine absorbent alginate – seaweed – fibers and active manuka honey.

Comvita chief executive Graeme Boyd said the agreement with Brightwake means the company has the necessary manufacturing capability to move forward in the global wound care market.

"The early acceptance and sales of medical honey products mean we can accelerate the development of next generation products," he said.

COSTS ADD UP IN U.K.

The Forum of Private Business, which represents 25,000 small businesses in Britian, is backing a campaign to safeguard the British honeybee population whose future is threatened by government.

The forum said the government has "got a bee in its bonnet" about cutting costs with its plan to reduce the amount of money spent on the Honeybee Health Program by a quarter of million pounds to an annual overall cost of one million pounds.

The cut backs will involve the loss of half its 40 strong staff of bee inspectors.

While most of England's 20,000 beekeepers do not make money from keeping bees and the sales of honey totals only 12.5 million pounds a year, a government survey showed that honeybees contribute at least 120 million pounds to the agricultural economy by spreading pollen.

Fortum chief executive said beekeepers were small businesses that needed help because of their vital contribution to our agricultural industry.

"Bees are highly productive workers," he said. "Many small businesses in the countryside, including our members, benefit hugely from the work done by people whose hobby is looking after bees.

"If the government is serious about wanting to trim regulation and red tape we would be happy to provide ministers with a hit list that will help small businesses and at the same time maintain a large population of busy honey bees working for all of us"

The forum said the small hive beetle was not the only threat to British bees posed by Europe.

A European Union directive stipulates that remedies to fight bee diseases must be prescribed by vets, who will also have to make regular inspections of all hives, even though most of them know nothing about bees. The cost of these regulations on beekeepers would be considerable.

But the government can argue that beekeeping is a special case and can "opt out" of this directive and Goulding said that the European Commission should be told to buzz off.

"It would indeed be ironic if the government accepted damaging European regulation while chopping effective British regulation," he said.

"A quarter of a million pounds is nothing for a country that can spend billions on hosting the Olympics. The FPB urges its members to support the British Beekeepers Association's campaign. There is still time for the government to think again."

CANADA CAMPAIGN

Bee Maid Honey Ltd. announced a "Good For You" marketing campaign to be launched this fall. It will feature new packaging on all Bee Maid branded products, a revamped consumer website with recipes and honey use tips as well as information about the nutritional, health and beauty profile of honey.

The company said skateboarders, smoothies, smiling faces and healthy snacks are some of the images that support the campaign.

Bee Maid, North America's largest single source marketer of 100% pure Canadian honey, is owned by Canadian beekeepers.

INDIA EXPANDS HONEY PRODUCTION

The Jammu and Kashmir government announced it will open beekeeping centers in all the districts of the Indian state and conduct training camps to show farmers thelatest beekeeping techniques.

Deputy Chief Minister Mangat Ram Sharma said the program was part of a plan to generate employment and create self-reliance in rural areas.

Jammu and Kashmir is the northern most state in India and is bordered by Pakistan, Afghanistan and China.

The flora ranges from the thorn bush type of the arid plain to the temperate and alpine flora of the higher altitudes.

Agricultural workers account for :49% of the population

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