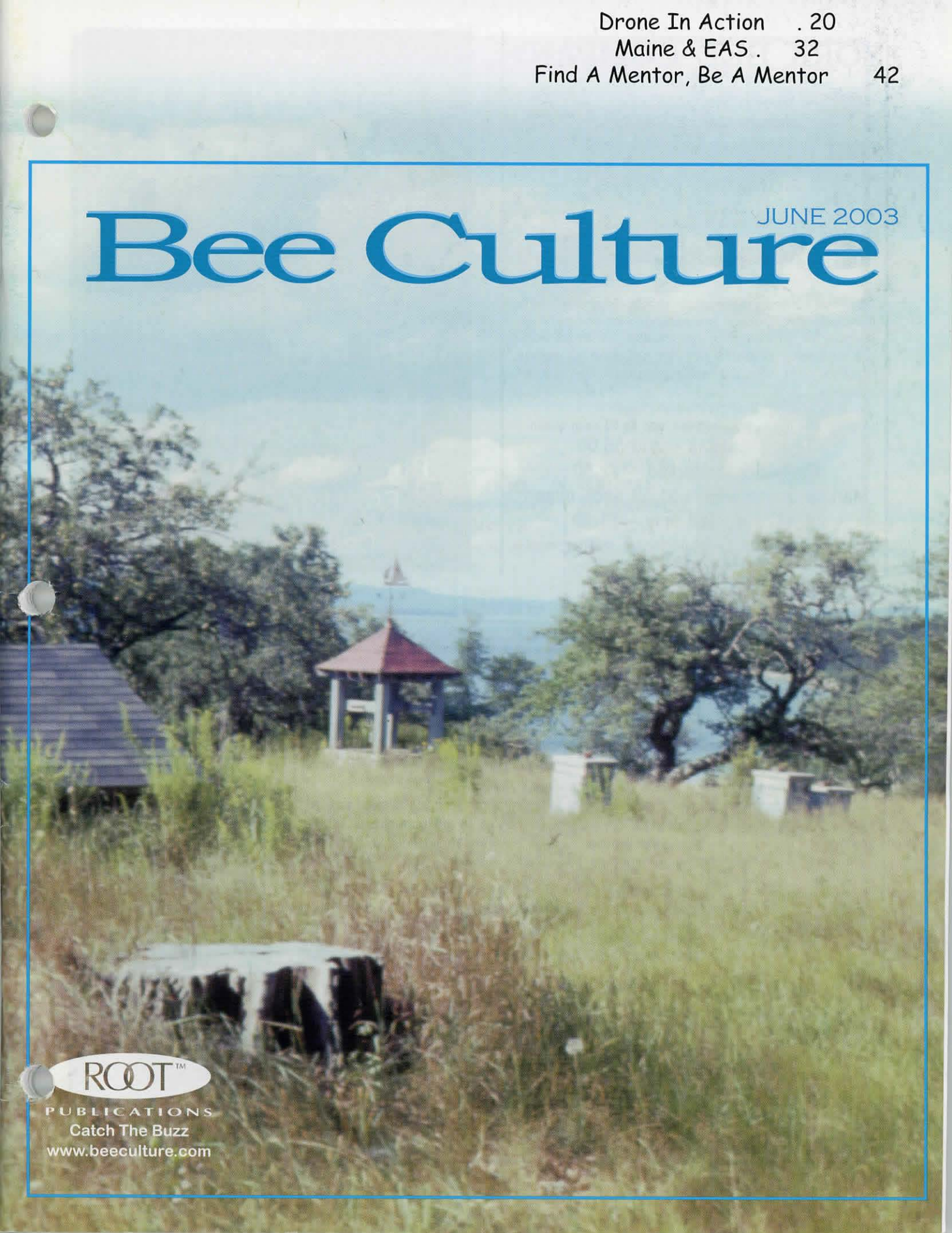
Bee Culture

JUNE 2003



ROOT™
PUBLICATIONS
Catch The Buzz
www.beeculture.com

Can you imagine working these hives, overlooking the ocean on the Maine Coast? Jim Tew talks about scenic beeyard locations, and Peter Sieling is excited about attending the EAS meeting in Maine this Summer. This spot is the best of both worlds.

photo by Kim Flottum

800.289.7668 • www.BeeCulture.com

Publisher – John Root

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

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

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

Publications Sales – Jim Thompson, Ext. 3255, jim@BeeCulture.com

Contributors

Steve Sheppard • Mark Winston • Clarence Collison
Ann Harman • James E. Tew
Malcolm T. Sanford Wyatt Mangum

Subscription Information

U.S., one year, $21.50; two years, $41. Newsstand price: $3.50. All other countries, (U.S. Currency only), $15.00 per year additional for postage. Send remittance by money order, bank draft, express money order, or check or credit card. Bee Culture (ISSN 1071-3190), June 2003, Volume 131, Issue 6, is published monthly by The A.I. Root Co., 623 W. Liberty Street, Medina, OH 44256. Periodicals Postage Paid at Medina, OH and additional mailing offices.

Advertising

For information on placing display advertisements, contact Dawn Feagan in our Advertising Dept. 800.289.7668. Ext. 3220

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

Bee Culture
THE MAGAZINE OF AMERICAN BEEKEEPING
JUNE 2003 VOLUME 131 NUMBER 6

FEATURES

DEPARTMENTS & COLUMNS

Page 25

Page 32

Page 48

KEEP IN TOUCH

Write: Editor, 623 W. Liberty St., Medina, OH 44256
FAX: 330-725-5624
EMAIL: KIM@BEECULTURE.COM

MAILBOX

Nonsensical Arguments

In most cases arguments between opposing factions make interesting reading. Generally the motives are clear, but occasionally arguments develop into a futile charge/counter charge dialog that ignore the issues. Instead, most of the debate will be addressed to the procedural mistakes of the opponent.

I have been wondering why the American Honey Producers Association (AHPA) has given so much attention to the publicity of the recent incident of discovering that some Chinese honey was contaminated with a harmful drug. A full-blown controversy, that gives little attention to the issues, has developed over the best method to publicize the matter.

As I understand the matter the AHPA wants to publicize all with reasoning that the Food and Drug Administration (FDA) should be more firm and actively tell the public "what is what." The American Beekeeping Federation (ABF) and the National Honey Board (NHB) certainly do not question the public's right to know, but, as I see it, they favor a low-key approach based on experience.

At first blush, some of us will probably favor the AHPA's position and will have do-nothing thoughts about ABF and the NHB. To do so will overlook several important issues. A few points need our attention. They are:

1. When we ask a regulatory agency, like the FDA to do something for us, we need to bear in mind what they can and cannot do. It is generally understood that it is virtually impossible for a regulatory agency to check on every business, every problem, every violation. Consequently, in the main, these agencies must rely primarily on voluntary cooperation. This, in turn, means that priorities and political clout figure in the degree of bureaucratic response.

2. Working for favorable comment in the news media is certainly an important objective, but, realistically, the most iffy thing imaginable. I have a vivid recollection of our industry's failed attempt to get some favorable publicity from columnist George Will. We should easily recall the mountain of negative publicity President Clinton generated about price supports. Also, Congressman Dick Armey waxed eloquently with real silliness. Proceeding cautiously, it seems our best approach in the case of publicity in the news media would be limited to facts without editorial comment.

3. Before lodging a complaint before a regulatory agency one must have a little understanding about making libelous statements that might provoke a lawsuit. In some instances, complaints are privileged; in others the data is available for use in the courts. Since laws change from time to time, checking this legal point should be the first step in launching a complaint or writing a series of articles that might be libelous.

I have doubts that the AHPA and the ABF have really tried to give serious consideration to a proper method of generating proper publicity relating to the honey shipments from China. With the exception of a few letters to the editors of the Bee Press our negotiators seem to write and talk for the sole purpose of impressing their members and outsiders. Invariably, this approach, if pursued for any length of time, will develop into a name-calling exchange that ignores the issue.

Proper procedure? The best suggestions that I have seen came from the National Honey Board staff. Briefly the suggestions are:

Carefully, separate people from the problem;

Focus on points that are important to both sides;

Study available literature for options that might interest both parties, and

Stress the need for the discussions to recognize the importance of complying with rules of procedure.

Mr. Producer attention to these matters will be appreciated. And may be fruitful.

Glenn Gibson
Minco, OK

Hang In There

In *Bee Culture's* "Mailbox," February 2003 letter, "No New Beekeepers," John Storey has good reason to be disappointed with keeping bees. Beekeeping like farming in general, has its good and bad times. Beekeeping, though, seems even more volatile. Some problems that earlier seemed overwhelming, pollination fees, honey prices, the introduction of mites, are not of as much concern to us, now.

When *Varroa* was first introduced, I was discussing the outlook of beekeeping with Jim Tew. At the time, I mentioned that I was thinking of either going out of bee breeding and queen rearing, or I would expand considerably. Of course, his answer was "I hope you expand." Expand we did. Now, we cannot raise enough bees to satisfy demand. The saddest part of our bee business is to have to refuse so many beekeepers that wait until we're sold out, to order.

Our Winter loses before mites, mostly because of uninformed management, were around 18%. When the mites first arrived, instead of losing all of the colonies as expected, loses were at some 60 to 70%. Loses for Winter 2000-1, were at 12%. Winter loses for 2001-2, were at an astonishing 3%! Winter loses for 2002-3 might be a different story. That's farming.

Continued on Next Page

MAILBOX

There are some older beekeepers giving up. However, here at our workshops, we start some 40 to 60 new beekeepers each year. Attendance average around 70, which includes some older beekeepers. Folks interested in learning beekeeping come from as far as all of the NE states, NY, Long Island and New Jersey. So, there is still interest in keeping bees, in this general area, at least.

Currently, we are managing more colonies than ever, manufacturing more equipment than ever, purchased more new machines, including a new 2003 platform truck and still cannot keep up with demand. Good thing we decided to expand, rather than quit.

Like Mr. Storey, we have had some bad years with the bees. Luckily we persevered. Hopefully Mr. Storey and other discouraged beekeepers will hang in there. It can only get better for them.

Frank Lagrant
Lagrant's Honeybees
Ware, MA

Excluders & AHBs

Catch a swarm, hive them and now the fun begins. The AHBs start to build comb and the queen is laying eggs. Then they leave. If you get them again, back in the hive, after a few days they may leave again. My mentor, Bob Midleton has the answer.

Hive your swarm. Put a queen excluder between the bottom board and brood chamber. Now if they leave and come back they have no queen.

In a couple of weeks you will know if they are AHB. If they are, leave excluder on. Otherwise take it off. This will keep your drones in and the bees will tear them apart. Open the drone cells.

If you are in an area with a few AHB, a cell will work as the drones can't get out to mate.

I am a hobby beekeeper with eight hives in the city.

Wayne Reedy
San Jacinto, CA

Truck Rules

A blown front tire on a bee truck is always a problem. I will post a few pointers for those who might not know the proper method of handling the problem.

1. Always keep both hands on the wheel.
2. Keep in the slow lane except to pass, so another vehicle cannot get between you and the shoulder if a tire blows.
3. Stay off the brakes.
4. Hold the wheel straight and slowly exit the road.
5. If the road has a shoulder drop off, stay in the road lane until you are almost stopped before moving onto the shoulder. If there is no shoulder (as is the case many times in Missouri) stay on the road and set out flares or reflectors and call for help.
6. NEVER RUN A RECAP TIRE ON THE FRONT OF A BEE TRUCK!
7 Try to choose roads to travel with a shoulder.

Bob Harrison
(2 million miles without accident)
Odessa, MO

Show Me The Money

Since I began producing honey to pay the bills there have been only two significant increases in honey prices. In each case, good beekeepers with common sense used their own money to take appropriate action that brought about the current prosperity we are all enjoying

Realizing an increase of $1.00 per pound for my honey, I sent 1¢ per pound to the American Honey Producers Association. That's a return of 10,000% on my investment after the fact. If the National Honey Board could have provided anything else to that over the last 17 years, why didn't they?

I would like to have the option of giving the mandatory NHB assessment to the American Honey Producers along with the penny they have already earned and enable beekeepers to keep working for beekeepers

Harry Whitehead
Rushford, NY

Good Job IBA

In 1998, *Bee Culture* carried a letter noting the start-up of a new state level beekeeping organization in Indiana.

Here is a summary of what has happened with the start-up of the new Indiana Beekeepers' Association (IBA):

IBA membership now exceeds 600.

State-wide educational programs, including 10 Spring Field Clinics and start-up of the annual Indiana Bee School, were initiated.

- A young Beekeeper of the Year Awards program offering financial and other recognition for participants was started.

Barriers that prevented beekeepers from selling their honey and other hive products under their own labels at the Indiana State Fair were removed.

A quarterly publication called the *IBA Newsletter* was started, focusing on the many aspects of Indiana beekeeping.

As one old timer said, noting two state groups at work, "beekeepers in Indiana never had it so good!"

Dave Laney
North Liberty, IN

AHB Identifications

Effective May 1, 2003 the AHB identification service will be transferred from Beltsville to the USDA-ARS Carl Hayden Bee Research Center in Tucson, AZ. All samples should be submitted to: Carl Hayden Bee Research Center, 2000 E. Allen Road, Tucson, AZ 85719, 520.670.6380.

Mark Feldlaufer
Bee Research Lab
Beltsville, MD

INNER COVER

No man is an island. Neither is a beekeeper. Or a beekeeping association. Nor is the beekeeping industry. Last month a correspondent spelled out the eye-opening experience he had when working with contacts in Washington set up by his Farm Bureau organization. In his words it blew the contacts made by the two National Organizations out of the water. It is, after all, who you know.

You should take note of that observation. If I were to use the current jargon, "You need to partner with appropriate same-goal oriented groups to enhance your respective positions." But I don't talk like that and I'm wary of people who do.

But, we all need friends. Can't have too many of those. And beekeeping crosses many boundaries. Master Gardeners, Farm Bureau, State Agriculture and regulatory agencies. Fruit and vegetable commodity groups. Local, county and even State Parks Departments. Anybody who deals with the real world of being outside benefits from honey bees. And you, and your group need to, dare I say, "Think outside the box," when it comes to who can be an ally when the chips are down, friends are few, or the zoning board is chasing you. The axiom of "Think Globally, but act locally" really pays off.

No, you can't have too many friends. And the more you have that aren't beekeepers the better you'll be prepared for the worst case that will come your way, sooner or later. Be prepared.

•

So when's the last time you entered a honey show? Have you ever entered one? Is there a honey show you could enter if you wanted to?

Time was, entering and winning was a marketing advantage. Time was, entering and winning was a competitive game – you against the judge; or, you against the perennial winner; or, you against your best friend/worst enemy in a particular class.

Time was, the people you sold honey to actually knew the value of that winning ribbon or bowl. Time was, even other beekeepers appreciated the time and effort (and learning experience) it took to produce a superb product.

Time was, even county fairs needed two judges and lots of display space to accommodate the competition. And time was, those in charge didn't need to bribe beekeepers to enter so they could sell their honey later at the same event.

Overall, the number of competitive honey shows, and the number of people who enter them has decreased dramatically in the last two decades. No one can argue that. This reflects, of course, the steady decline in the number of people who keep bees during this same time. Fewer people, fewer entrants.

Certainly, and fortunately pockets of resistance to this trend remain. There are groups that defy the numbers and actually expand some years. But even these, as strong and popular and dynamic as they are must overcome the same obstacles – fewer entrants, less recognition and increasing costs (actual dollars, space, manpower, administration and aggravation).

This feeds on itself, you know. It can become a downward spiral – fewer people, fewer categories, relaxed rules, fewer judges chaos.

Well, it's not that bad. But there is almost no attention to this by the national groups, seldom are there articles on the subject in the journals, and opportunities for judge internships are essentially non-existent.

Some Ag commodities still have strong, competitive shows, fueled by 4-H primarily but they have other inputs as well. Overall though, according to many sources in the Ag community the scope of all of these is shallower and narrower than 20 years ago.

Proponents of competitive honey shows point out that it is still an admirable goal to produce the perfect jar of honey – clean, filled correctly, pleasant taste, correct proportions of solids and water and consistent across at least three jars. A product of such high quality, they argue should be the goal of every beekeeper who provides product for the public. A perfect jar, everytime.

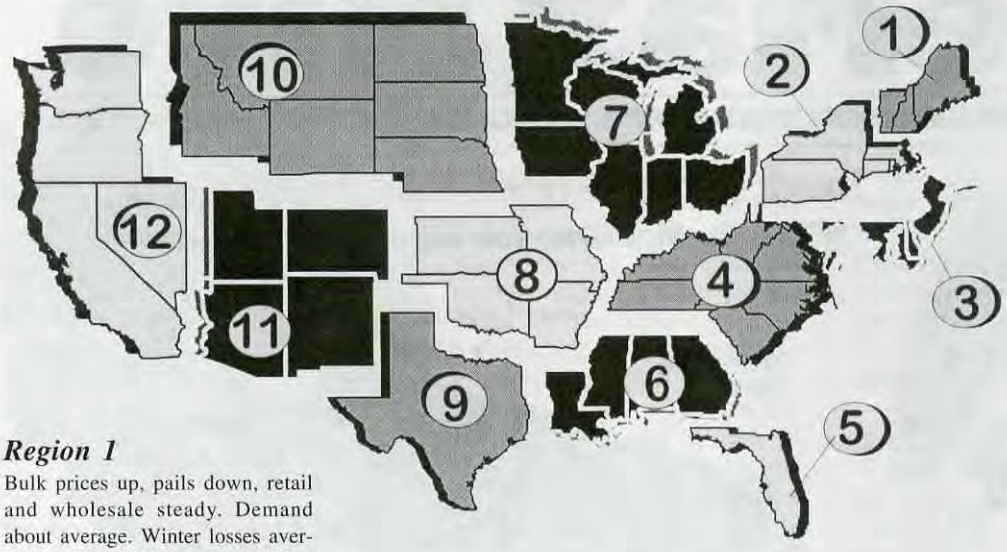
Others, however, point out that the marketplace and ever increasing regulations have forced consistency, cleanliness standards and legal minimums upon those who produce for the public. Pride and discipline have been replaced by rules and regulations.

Striving for perfection, reaching for the top and knowing the what, why and how to do that are skills every beekeeper should be aware of, and a competitive honey show is the only opportunity to test those skills, proponents claim. No argument there.

Continued on Page 62

No Man Is An Island; Honey Shows

JUNE – REGIONAL HONEY PRICE REPORT



Region 1

Bulk prices up, pails down, retail and wholesale steady. Demand about average. Winter losses averaged about 46%, mostly weather related, and colony numbers are down.

Region 2

Bulk steady, pails, wholesale and retail down a bit. Demand up just a tad. Winter losses averaged 40%, weather the main cause. Colonies about average condition now.

Region 3

Bulk prices up, pails and retail steady, wholesale up. Winter losses averaged 30%, with weather the biggest problem. Good condition now.

Region 4

Bulk, pails, and wholesale steady, but retail prices climbing. Winter losses average about 30%, with dry Fall and cold Winter the primary causes. Fair to strong now, but numbers are down.

Region 5

Prices steady across the board. Winter losses spotty, but average only 15%, mites resistant to controls the only reason. Demand increasing.

Region 6

Bulk prices steady, as are wholesale and retail, but pail prices up. Winter losses average 21%, with resistant mites the biggest problem by far. Demand only steady so far.

Region 7

Except for pails, prices up across the board. Winter losses average 42% this Winter. Prolonged cold, and resistant mites the cause. But most colonies in good shape by late Spring. Demand strong, and growing.

Region 8

Prices up across the board this month, especially wholesale. 30% Winter losses reported, with queen problems and starvation the main reasons. Demand only steady so far.

Region 9

Bulk and pail prices up, retail and wholesale prices steady. Demand pretty strong. Winter losses average about 14%, colony numbers down through, and condition only average.

Region 10

Prices steady across the board, but demand increasing. Winter losses average 30%, with resistant mites and starvation the main reasons.

Region 11

Prices down across the board – not much though. Demand holding steady. Winter losses averaged less than 10%, with mites the biggest problem (at 10%, not much however).

Region 12

Prices up for bulk and pails, steady for wholesale and retail. Winter losses less than 10%, mites the (barely) problem. Some migratory operations very different though, with losses of 25-80% after moving.

	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	1.32	1.50	1.32	1.25	1.40	1.45	1.48	1.32	1.32	1.52	1.00	1.43	1.00-1.52	1.36	1.34	0.82
55 gal. Amber	1.15	1.65	1.25	1.23	1.30	1.35	1.43	1.35	1.25	1.50	1.18	1.15	1.15-1.65	1.32	1.17	0.72
60# Light (retail)	87.17	86.69	75.00	84.50	85.00	110.00	94.25	95.00	110.00	80.00	110.00	105.00	75.00-110.00	93.55	92.50	73.02
60# Amber (retail)	78.75	81.94	70.00	82.75	80.00	90.50	91.40	86.67	87.50	80.00	100.00	90.00	70.00-100.00	84.96	84.62	68.82
Wholesale Case Lots																
1/2# 24's	37.20	32.58	54.99	33.95	54.99	45.20	47.55	54.99	54.99	35.76	44.00	46.82	44.00-54.99	45.25	34.77	35.85
1# 24's	53.44	49.38	48.00	46.56	48.56	54.00	53.58	57.64	56.92	60.71	60.30	70.03	46.56-70.03	54.93	53.92	46.74
2# 12's	48.37	41.39	48.00	45.77	49.97	41.00	46.86	52.44	55.50	57.84	45.00	60.36	41.00-60.36	49.38	47.62	41.97
12 oz. Plas. 24's	45.49	39.10	48.00	42.79	47.49	45.00	43.96	48.10	54.00	50.30	48.30	50.64	39.10-54.00	46.93	44.48	38.50
5# 6's	55.11	45.29	58.50	46.68	54.30	50.25	50.63	60.00	54.30	50.43	50.00	60.90	45.29-60.90	53.03	54.31	47.66
Quarts 12's (**NEW**)	57.50	72.12	72.00	62.54	68.13	81.00	72.24	59.40	72.00	83.40	77.70	82.50	57.50-83.40	71.71	69.18	
Pints 12's (**NEW**)	38.00	37.35	58.63	34.10	58.63	46.50	53.56	42.90	42.00	60.00	36.00	54.00	34.10-60.00	46.81	47.04	
Retail Honey Prices																
1/2#	2.25	1.81	2.49	2.38	1.69	1.65	1.97	2.49	2.79	1.98	3.02	2.89	1.65-3.02	2.28	2.40	2.22
12 oz. Plastic	2.63	2.53	2.95	2.60	3.10	2.95	2.67	3.15	3.10	3.17	3.35	3.10	2.53-3.35	2.94	3.07	2.49
1 lb. Glass	3.31	2.89	3.10	3.34	2.96	3.25	3.23	4.23	3.56	3.67	4.27	4.16	2.89-4.27	3.50	3.68	3.01
2 lb. Glass	5.89	4.71	4.75	5.44	5.99	5.95	5.44	5.81	6.68	6.38	5.60	6.96	4.71-6.96	5.80	5.76	5.00
Pint (**NEW**)	5.75	4.50	4.99	4.38	5.66	5.16	4.57	4.82	4.92	7.36	5.03	9.59	4.38-9.59	5.56	5.39	
Quart (**NEW**)	8.63	6.45	9.50	6.40	10.51	8.97	7.52	7.58	7.83	12.07	7.07	8.24	6.40-12.07	8.40	8.29	
5 lb. Glass	12.32	10.02	8.50	10.73	10.00	11.00	11.93	15.29	13.75	10.58	12.47	13.94	8.50-15.29	11.71	12.05	9.70
1# Cream	3.85	3.83	3.00	4.30	4.01	3.83	3.41	5.15	4.39	4.32	5.10	4.18	3.00-5.15	4.11	4.91	4.86
1# Comb	4.17	4.30	3.95	4.65	4.68	4.00	4.37	4.68	4.25	4.88	6.28	5.38	3.95-6.28	4.63	4.59	4.62
Ross Round	3.58	3.45	3.60	4.53	4.39	3.75	4.33	4.00	4.39	5.00	5.07	4.25	3.45-5.07	4.19	4.31	4.12
Wax (Light)	2.25	2.55	2.10	1.75	1.20	2.50	2.23	2.50	2.00	2.00	2.48	2.33	1.20-2.55	2.07	1.75	2.87
Wax (Dark)	1.65	1.60	1.88	1.52	1.10	1.25	1.69	1.85	1.00	1.42	1.95	2.00	1.00-2.00	1.66	1.25	1.44
Poll. Fee/Col.	42.00	37.33	35.00	38.40	31.25	45.00	41.38	37.50	20.00	52.00	55.00	34.33	20.00-55.00	39.10	42.23	35.77

RESEARCH REVIEWED

Explaining • Defining • Using

Steve Sheppard

"Stubborn as a . . . bee?"

For a typical honey bee colony to thrive, thousands of workers are involved in the collection of materials from outside the hive. The interactions between these foragers and the within-hive work force function to provide feedback and control of many aspects of foraging activity.* The decision-making process of individual foragers at work "in the field" is also of interest to honey bee researchers. The general idea, *e.g.* in the case of nectar collection, is that individual foragers have an internal "threshold" and, as long as a nectar source being exploited is of sufficient quality, the forager will continue to use the same source. Once the reward from the foraging activity drops below the "threshold", the forager will abandon the source. However, due to the unique genetic mix that occurs in a honey bee colony, a question arises over whether the same "threshold" is shared by all foragers. Recall that a queen honey bee mates with numerous males and then uses the sperm throughout her reproductive life. Thus, a honey bee colony can be seen as a collection of "subfamilies," groups of workers sharing the same mother but having different fathers. This opens the possibility that the genetically variable foragers from different subfamilies could have different foraging quality thresholds, something that could affect the overall foraging efficiency of the colony. In a very interesting study, Madeleine Beekman and colleagues (2003) investigated the effect of subfamily differences within a colony on the rate of "abandonment" of food sources that declined in quality through time.

To set up the experiments, the researchers first produced four different families of honey bees. This was done by artificially inseminating four unrelated queens each with semen from a single (and unrelated) drone. Sealed brood produced from these four queens was allowed emerge in an incubator and 1500 young workers of each group were paint marked and united with a queen to form a colony of about 6,000 workers. Note that, in this case, different mothers and fathers were used to produce each family group to maximize the genetic differences in the experimental hive. In a typical colony, the workers share the same mother and the subfamilies result from genetic differences contributed by various fathers. The subsequent experiments were run when the painted workers were 11 to 16 days old. The colony was placed in a location with little natural forage and the bees were trained to forage at two artificial feeders containing heavy sugar syrup (684g sucrose in one liter of water). The feeders were each located 100m from the hive but in opposite directions. The training period lasted one week and all foragers at the feeding stations were marked with individual numbered tags. On the day of an experiment, once feeding commenced, one of the feeders was maintained with syrup at the original concentration and other was refilled with syrup of reduced concentration. After a 10 minute break, the identity of the foragers (via the numbered tags and colored markings) at the feeder was recorded for 30 minutes at both stations. This procedure was repeated through decreasing concentrations of syrup until the final test of the day was run with the experimental feeder containing syrup that was only 25% the concentration of the control. The experiment was repeated on four different days. A forager was considered to have "abandoned" the feeder during a session when it was no longer seen and was not seen (more than once) in later sessions.

The analyzed results showed that there was "no significant change in family composition between the control feeder and experimental feeder" during the course of the experiments. The researchers reported that the finding of no difference in abandonment rate between the four genetically distinct families used in this study was surprising, given that numerous other foraging behaviors are known to exhibit subfamily genetic variability. The researchers also expressed some surprise that the actual rate of abandonment was very low. Thus, even when the syrup concentration was reduced to 25% of the original level – more than 50% of the foragers continued to visit the feeder. Conversely, some foragers even abandoned the control feeder, although its sugar concentration remained high. In their discussion, Beekman and colleagues provide insight into how new hypotheses can arise from consideration of surprising or unexpected results. The researchers reflect on how honey bee colonies "exist in an ever-changing environment"...nectar sources come and go and what has been "depleted today may be replenished tomorrow." The researchers

Continued on Next Page

RESEARCH ... Cont. From Pg. 13

consider their results to be compatible with a model that supports the maintenance of overall colony foraging efficiency. Thus, in the case of apparently profitable sources, the abandonment of the resource by some foragers would permit the colony to continue to scout and potentially find even richer sources of forage. The strategy of having some foragers continue to visit food sources that have become less profitable, provides a mechanism whereby the location information is retained by the colony and, if the resource again becomes profitable, these bees can quickly recruit new foragers to the old location. The authors consider that these "faithful" bees can be seen to represent the memory of the colony. Perhaps the old adage "stubborn as a mule" could be updated to "stubborn as a non-abandoning honey bee" O.k., so it does not roll so smoothly off the tongue, but how many more people work with bees than with mules these days? BC

Reference:

Beekman, M., B. P. Oldroyd and M. R. Myerscough. 2003. *Sticking to their choice – honey bee subfamilies abandon declining food sources at a slow but uniform rate.* Ecological Entomology 28:233-238.

**Dr. Tom Seeley beautifully describes the integration of colony "needs" and overall foraging activity in his book, The Wisdom of the Hive (1995), Harvard University Press.*

Dr. W. Steve Sheppard, Thurber Chair, Department of Entomology, Washington State University, Pullman WA 99164-6382, shepp@mail.wsu.edu, http://apis.wsu.edu

Mark Winston

What's In A Name?

"Our willingness to step up and take responsibility in the beekeeping community is a substantive part of the legacy we leave for the next generation of beekeepers."

Today's beekeeping lesson comes from that source of all wisdom, the Bible, the book of Exodus to be exact. You remember the dramatic readings from your Old Testament, I'm sure, the stories of Moses in the bulrushes, slavery in Egypt, the burning bush and the 10 plagues, crossing the Red Sea, the Golden Calf, and of course the climactic stone tablets from Mount Sinai containing the Ten Commandments upon which western religion, ethics, and laws are based.

Pretty exciting stuff, except the book of Exodus is not its proper title. The real, ancient name of this most stimulating portion of the Bible is Shemoth ("Names"), a pedestrian designation from the book's opening line "*And these are the names* " Indeed, it begins with some pretty boring language, listing the names of the sons of Jacob and their households who entered Egypt from Israel to join their brother Joseph: "*And these are the names of the sons of Israel, who came into Egypt with Jacob, every man came with his household, Rueben, Simeon, Levi, and Judah, Issachar, Zebulun, and Benjamin, Dan and Naphtali, Gad and Asher.*"

I write for a living, and my first writing lesson to writer wannabees is to grab your readers with a great title and sizzling opening line, or you've lost them. Apparently the Bible's scribe, a considerably better and certainly holier writer than I, didn't take Writing 101, because "Exodus" is a better title than "Shemoth," and the opening line for Shemoth/Exodus isn't exactly Pulitzer Prize material.

The great rabbis and sages noticed this, too, and spent considerable time arguing about why the ancients called this book "Shemoth," and why the pivotal chapter of the most important book that ever has been or will be written begins by listing names.

Their wisdom on this issue is informative, and provides some things to ponder as we look around us at the beekeeping community today. The answer, the great ones tell us, is that the book of Shemoth is about the importance of maintaining a good name, about leadership and taking personal responsibility, and about how individual actions for good or evil will resonate for generations, for millennia, for ever.

Events in the beekeeping community today, or even during my lifetime with bees, certainly are not of the magnitude and drama portrayed in Shemoth. The sages recognized that few of us are surrounded by events of great significance, or are thrust into leadership positions on issues of overwhelming importance for humankind. Yet, the texture of personal and communal life emerges through the mundane decisions we less-than-Biblical proportion individuals make about our daily activities, and from the attitudes we take towards those around us.

In that light, our decisions and the language we use to voice our opinions become ethically important. Our willingness to step up and take responsibility in the beekeeping community becomes a substantive part of the legacy we leave for the next generation of beekeepers.

Do we apiculturists conduct ourselves in ways that would leave us with a good name were a Book of Bees ever to be written and read by our beekeeping descendants?

The answer, of course, is yes and no. We, like all human industries and endeavors, have stellar leaders and poor ones, ethical beekeepers and those with no shame, individuals who step up and get the job done when needed and those who are called but do not answer.

Consider, for example, one beekeeper cheating another. Yes, it does happen, perhaps an experienced beekeeper selling hives ripe with disease to a novice, a producer pouring in some corn syrup before shipping honey off to the packer, an importer blending in some cheap foreign honey contaminated with illegal antibiotics, hoping to not get caught.

But consider also those who help each other out during tough times. I recall, for example, the time here in Canada when our border was suddenly closed to importations of bees from the United States. Many beekeepers who overwintered their bees quietly and selflessly shook packages from their own hives to help restock those of their neighbors who had counted on importing

Continued on Next Page

"Perhaps we each should conduct a personal "legacy test" before speaking up at a beekeeping meeting, penning an overly strident letter to the editor, or declining leadership."

packages that year.

Another time a young prairie beekeeper suddenly passed away, leaving his wife and family with a thousand colonies to operate. Again without fanfare the community banded together and ran his bees that Summer, taking time from their own operations to insure that his crop came in and his honey was sold.

Think, too, about the meetings we've been at when hot heads condemn with extreme rhetoric while too many of us sit quietly on the sidelines. Once, at a national meeting, I saw the President of a beekeeping organization rip the hide off of a government employee on an issue that the employee himself was not even involved in. Ironically, this particular employee had recently and quietly passed on some confidential and important information to beekeepers, at considerable risk to his own job. He had become aware of some unethical behavior going on at a higher level of government that would have had negative impact on beekeeping if allowed to continue.

A few of us were shocked at the inappropriate attack on a principled individual, who was being incorrectly portrayed as the stereotyped government employee: lazy, inept, and a parasite on our industry. Some spoke up in his defense, but most were silent.

Where, I thought, were the peacemakers? Communities have overt and subtle ways of containing and marginalizing those whose values are destructive. Yet, the organization's leader was not reigned in then, or later. Would our communal name in the Book of Bees have been an exemplary one if the scribes wrote about this incident, or would those who remained silent have besmirched our good names for generations to come?

The strength of a good name in beekeeping was emphasized for me during the contentious discussions about closing the Canadian border to importations in 1987 I was relatively new to the beekeeping scene in Canada, and still learning about who were the players and who had the respect of the community.

My personal distance from Canadian beekeeping history provided an unusual perspective on those deliberations. What struck me throughout the long meetings and impassioned speeches was how often the "family name" was invoked to provide legitimacy and substance to a speaker's points.

Speaker after speaker rose to state their opinions at meetings across the country, frequently beginning a speech with "*My family has kept bees here in Canada for three generations .*," or "*I have been a beekeeper all my life, my father was a beekeeper, and my grandfather, too.*" No matter what the opinion concerning border closing, pro or con, the family name was invoked repeatedly, elevating these speakers to a more substantive status than recent interlopers into the beekeeping world.

The family name provided an entrée into respectful attention by audiences, but it did not guarantee that esteem would continue. I also observed overly strident, argumentative, and manipulative leaders in the community become gradually marginalized, in spite of their leadership positions and the respected histories of their families. Your name, I learned, might bring attention when you approach the microphone, but what you say and how you behave after the family history has been invoked determine whether your name is respected once you step down from the podium.

Another illuminating lesson from the Book of Shemoth is that we should answer when our names are called. Moses, you recall, was a reluctant prophet, but eventually, albeit reluctantly, picked up the mantle of leadership.

I'm reminded of the awkward transitions at the end of beekeeping associations' business meetings. You know those moments well; it's nomination time for President, Secretary, or Treasurer. Uncomfortable, calculating glances bounce around the room, each potential candidate hoping that one of the others will break down first and say yes.

Our "good names" are enhanced by saying yes when it's our time to lead, but the flip side to agreeing is that many a well-earned reputation has been diminished by not stepping down when our time to lead has ended.

Leaders who overstay their welcome are as damaging to organizations as potential leaders who never heed the call. The good judgment to know when to step up and when to step back is a crucial component of good character.

I have always been impressed, and moved, by the practice of some beekeeping organizations at their annual meetings to read off the names of their members who passed away during the previous year, and to observe a moment of silence to reflect on our individual memories of recently departed members.

These final moments full of memories for good or bad seal whatever legacy the departed has left behind. They provide a potent reminder of the power we each hold while alive to enhance or detract from our good names.

Perhaps we each should conduct a personal "legacy test" before speaking up at a beekeeping meeting, penning an overly strident letter to the editor, or declining leadership. We should ask ourselves whether our tone and content will enhance or detract from our good name, and whether we are embracing or fleeing from our responsibility to work towards positive, constructive actions within the apicultural community.

The sages were right; nothing is more compelling, or important, than the listing of names. BC

Mark Winston is a Professor at Simon Fraser University, Burnaby, B.C. Canada.

Using Liquid Formic Acid For Mite Control

Malcolm T. Sanford

"The 'soft chemical' formic acid is presently used in several countries in Europe as well as Canada and New Zealand, in the continuing struggle to control mites in honey bee colonies."

In the April 2003 edition of *Bee Culture*, Editor Kim Flottum says he fails to understand the situation surrounding the use of liquid formic acid for mite control. Although beekeepers do many things that are potentially dangerous to their health, Mr. Flottum says, the use of a somewhat benign substance, like formic acid, seems to be singled out by regulators as a special case. One of the reasons for this is that no specific label exists, the standard that regulatory officials use when determining pesticide use. According to pesticide regulations, now found as Title 7 of the U.S. Code, any chemical that is intended to control pests is by default a pesticide. According to Mr. Bill Ruzicka, "Using formic acid is similar to using Borax or Baking Soda to kill ants; neither is registered as a pesticide. It is your right and your decision to use acid. Advising someone else to use an unregistered pesticide is illegal on US soil."[1] Meanwhile he says that unless the American beekeeping federation, or some other entity registers the generic use of liquid formic acid, the U.S. beekeeper will in all probability never see its registration.

The "soft chemical" formic acid is presently used in several countries in Europe[2] as well as Canada[3] and New Zealand,[4] in the continuing struggle to control mites in honey bee colonies. Formic acid appears to be a good candidate because it is a relatively small compound with a molecular weight of 46.03, which may be responsible for reports that it can penetrate brood cappings and kill mites sealed in the cell (Mr. Ruzicka says it actually must be brushed on the cappings to be effective). It is also found naturally in many, but not all, honey types. Finally, formic acid is known to control populations of both the internal tracheal mite (*Acarapis woodi*) and the external, exotic Asian mite, *Varroa destructor*. Most chemicals currently in use are effective against only one or the other of these honey bee parasites and cannot kill mites that are protected inside capped brood cells.

Several reasons exist for lack of a liquid formic acid label, including the fact that no commercial entity is expected to undertake the extensive testing necessary to bring the material to market. The liquid cannot be patented and is already manufactured and available for a number of uses.[5] Therefore, exclusively manufacturing and/or marketing it strictly for a beekeeping use has limited commercial appeal. Formulations that incorporate the liquid into self-delivery devices are in the regulatory pipeline in the United States and could be approved in the future. These are considered superior to the liquid acid because they would be easier and safer to handle, but their manufacture has been plagued with problems and they are sure to be more expensive than using the liquid itself.

Formic acid is employed as a fumigant and, therefore, must reach all bees in the vapor state. In addition, because it affects tracheal mites as well, molecules must also be delivered inside the bee's tracheal (breathing) system. Delivery of chemicals through fumigation to honey bee hives is much less reliable than molecules delivered on plastic strips. A reason for this is that the liquid must first be evaporated (a temperature-dependent process) before it becomes effective. The ideal ambient temperature for delivery of liquid formic acid is between 60°F (16°C) and 80°F (27°C). Since honey bees actively regulate the temperature of their hive, this presents a complicating variable. Release of the material through vaporization is also much less reliable with reference to dosage than using plastic

1Mitegone World Wide Web site, accessed April 18, 2003 <http://www.mitegone.com/forms/Legality%20of%20Acid%20and%20Availability.pdf>

2Apiservices Mega World Wide Web site, accessed April 11, 2003< <http://www.beekeeping.com/articles/us/formic_acid.htm >

3Allen Dick's World Wide Web Site, accessed April 11, 2003 <http://www.internode.net/honeybee/Formic/cdnformiclbl.htm >

4New Zealand Beekeepers Association World Wide Web Page, accessed April 11, 2003 <http://www.nba.org.nz/varroa/Formic-acid-guideline.PDF>

5Louisiana State University World Wide Web Page, accessed April 11, 2003 <http://www.camd.lsu.edu/msds/f/formic_acid.htm >

Continued on Next Page

strips. It is easy to make mistakes. Finally, for full effectiveness, formic acid treatment must often be repeated several times at fairly short intervals, whereas most of the hard chemicals can be applied less frequently.

Another reason for a lack of interest in labeling liquid formic acid is that it cannot compete with the so-called "hard chemicals" presently labeled for controlling mite populations. Both the synthetic pyrethroids, fluvalinate (Apistan®) and flumethrin (Bayvarol®), and the organophospate coumaphos (CheckMite®) are reported to eliminate in excess of 90 percent of *Varroa* mites, the most damaging organism in colonies, whereas formic acid only kills around 70 percent. The same is true for the chemical amitraz, a triazapentadiene, which controls both *Varroa* and tracheal mites, but has no label in the United States (marketed as Miticure® for a short while before being abandoned) although in Europe it is marketed as Apivar®. These hard chemicals are also easier to apply. They are formulated on plastic strips and kill by contact; the molecules are distributed by bees' contacting the strips. An important consideration is that if liquid formic acid is labeled, there is a risk that these other hard chemical controls now labeled and legal might no longer be supported, and could easily be pulled from the market by regulators, making them no longer available to beekeepers.

A closer examination of the situation reveals that the relative advantage that hard chemicals now have is becoming less with time. After 10 years of pyrethroid use (Apistan® and Bayvarol®), *Varroa* mites continue to become resistant to this class of chemicals in most parts of the world. More worrisome is that for the relative new organophosphate, coumaphos (CheckMite+®), the time to reach resistence is much shorter (three to five years). And it is not certain whether rotation of these materials, the classic resistance management strategy in agriculture to conserve lethality, will be effective. An alternative hard chemical class to those pesticides already in use is not known at the present time. If one is found, the likelihood that it would be approved is small, and at the very least the application process to become a labeled product would consume a great deal of time and money.

Although pyrethroids are considered fairly benign to mammalian systems, there is concern that these materials accumulate in wax. In addition, there is evidence that long-term fluvalinate use has sublethal effects on honey bee colonies that can affect productivity. Far more problematic is the organophosphate called coumaphos. Many believe the premature failure (supersedure) of many commercial queens in the United States can be blamed on contamination of the nest with this material.

The U.S. Environmental Protection Agency (EPA) has targeted the organophosphate class of pesticides to be eliminated in the near future under the Food Quality Protection Act (FQPA).[6] Chemicals in this class are potent nerve poisons and their long-term use is considered a risk not only for the applicator community, but the food consumer as well. Fortunately, both fluvalinate and coumaphos have allowable residues in honey and wax, which are not exceeded when using the materials according to the label. Both, however, also have the capacity to bioaccumulate in wax over time, setting the stage for contamination of beeswax, which is routinely recycled in beekeeping operations. An increasing amount of beeswax is already suspect, and no longer considered suitable either for cosmetic use or to give back to the bees as foundation to produce more comb. Honey is considered somewhat safe from residues in that the active ingredients are soluble in fats, not water.

Residues and risks, however, are not confined to the above labeled formulations. Unfortunately, there is a large body of anecdotal evidence that many beekeepers are using the active ingredients fluvalinate, amitraz and coumaphos in unregistered and illegal formulations in spite of information that this activity can result in the long-run in unacceptable residues, a "smoking gun" for regulators and consumers (the press). A sign of this is that *Varroa* mites in the United States have become resistant to amitraz, a material that except for a very short time, has had no label. Should substantial amounts of these chemicals be found in honey, there exists the real possibility they will be lost to beekeeping use.

A recent example of the risks beekeepers run by using unlabeled materials is rejection at ports of entry of large amounts of Chinese honey contaminated with the antibiotic chloramphenicol. This was first discovered in the United Kingdom and then the Canadian Food Inspection Agency (CFIA). This produced a regulatory furor, and also was in part responsible for a worldwide shortage of honey, causing a price spike.

Residues can be a problem for any chemical introduced into a beehive. Formic acid, however, is found naturally occurring in many (though not all) honey. Because it is a simple molecule, it also will not bioaccumulate permanently in wax and honey. Over time, it is expected to diffuse out of these materials, rather than be chemically bound up as are many hard chemicals. Formic acid is also exempted from the requirement of a tolerance in honey and beeswax by federal regulators.[7] All these characteristics make the use of liquid formic acid favorable to certify "organic" honey production. Whether mites can become resistant to formic acid treatment is not clear. Technically this is feasible, but so far where the acid has been used for a number or years this does not seem to be a concern.

As noted above, there is considerable risk involved in handling liquid formic acid for both honey bee and beekeeper alike.[8] It is not a material to take lightly, but experience shows that it can be applied safely by taking appropriate precautions.

Most research on formic acid has been accom-

6Food Quality Protection Act implementation World Wide Web Page, accessed April 11, 2003 <http://www.ecologic-ipm.com/menu.html>

7Environmental Protection Agency Web Page, accessed April 11, 2003 <http://www.epa.gov/fedrgstr/EPA-PEST/1997/February/Day-05/p2712.htm

8Occupational and Safety Hazard Agency World Wide Web Page, accessed April 11, 2003 <http://www.osha-slc.gov/SLTC/healthguidelines/formicacid/recognition.html>

plished in temperate climates, where the material has been found to be relatively effective. A great deal of experimentation is needed to determine its effectiveness in subtropical and tropical climates. In the final analysis, the application parameters must be developed by each beekeeper using the material under local, specific conditions. Queen and worker bee losses are common when the material is not applied correctly.[9] Effective application, therefore, requires a different mind set than use of previous materials, where a label gives detailed and legal instructions for use in many environments. This also could make formal labeling of formic acid in the U.S. much more complex.

The use of liquid formic acid can be looked at as a way to transfer application "risk" from the consuming public to the beekeeper. The tradeoff is that beekeepers will be much more at risk of harming both themselves and their bees with inappropriate application, while potential product contamination, putting consumers at risk, is minimized. Liquid formic acid can be easily and legally purchased in several concentrations; 85 percent is most common. A concentration of 60 to 65 percent is generally recommended for beekeeping use and so it will often be necessary for users to acquire sufficient education and experience to dilute the material to the proper level.

A number of devices have been developed to vaporize liquid formic acid in bee colonies.[10] The Nassenheider Evaporator, available commercially, has received a lot of exposure.[11] Do-it-yourself evaporators can also be made.[12]

In the Americas, the Canadians have developed some effective devices. The Ontario Beekeepers Association has produced a system using a material called Homsote (Tentest Board) in Ziplock® plastic bags.[13] Mr. Bill Ruzicka has also developed a product using specific evaporator pads. His MiteGone® system is "astonishingly simple," and the cost is very low. He is looking for cooperators and already has an international list of associates published on his World Wide Web site, which also distributes educational materials in various formats.[14]

The Canadian beekeeper Allen Dick on his instructive World Wide Web site discusses in great detail his experiences with formic acid.[15] He concludes: "This article is an attempt to bring information forward without any judgment of the claims of the originators. One of its strongest points is the lack of harmful residues in honey and wax. Its major drawback is that treating with formic involves handling of a dangerous substance." On the horizon, Mr. Dick sees another natural substance, oxalic acid, as a strong possibility in the future of mite control in honey bee colonies.[16] BC

Dr. Sanford is a former Extension Specialist in Apiculture at the University of FL. He publishes the APIS newsletter: apis.shorturl.com

9Canadian Honey Council World Wide Web Page, accessed April 11, 2003 <http://www.honeycouncil.ca/currie02.html>

10Swienty Corporation World Wide Web Page, accessed April 11, 2003 <http://www.swienty.com/engelsk/varroa.html>

11Dave Cushman's World Wide Web Page, accessed April 11, 2003 <http://website.lineone.net/~dave.cushman/nassentest.html >

12Dave Cushman's World Wide Web Page, accessed April 11, 2003 <http://website.lineone.net/~dave.cushman/beesyevap.html>

13Allen Dick's World Wide Web Page, accessed April 11, 2003 <http://www.internode.net/honeybee/Formic/slowformic.htm>

14Mitegone World Wide Web Page, accessed April 11, 2003 <http://www.mitegone.com>

15Allen Dick's World Wide Web Page, accessed April 11, 2003 <http://www.honeybeeworld.com/formic/default.htm>

16Allen Dick's World Wide Web Page, accessed April 11, 2003 <http://www.honeybeeworld.com/formic/default.htm#Oxalic Acid>

DRONES IN ACTION

Larry Connor

Sex among bees is so complicated, so filled with random components, that it is remarkable it succeeds as often as it does!

Of the members of the hive, drones are the slowest to develop from egg to adult. A full 24 days are required for drone emergence, compared to up to 16 days for queens and up to 21 days for workers. Then, as adults, drones have the shortest time to live. Depending on the season and location, drones live an average 16 days as adults, while worker bees average four to six weeks, and queens may live several years.

Newly emerged or callow drones remain within the brood nest for several days where they are fed by worker nurse bees, receiving pollen and nectar/honey just like young workers. They stop nurse bees to beg and receive food, but as they age, the worker bees are less likely to feed them, while the drones start to feed themselves on honey and pollen. Their lives move along a simple progression, starting as soft-bodied young drones found within the brood nest. After their bodies harden they move to the outer pollen combs, where they can be seen putting their heads into pollen and nectar cells to obtain protein and carbohydrates required for sexual development prior to mating. Finally, the most mature drones are found in the honeycomb (either on outside frames in the brood chamber or in the supers), where they restock their energy supply during mating flights by consuming honey.

During hive inspections made during the morning, when drones do not normally fly, very young drones remain relatively impassive if you press a finger against them. Older drones react by moving rapidly away from your touch. The oldest drones, those that are actively flying each afternoon, will often fly when touched.

It is possible to keep drones in cages made with queen excluder material and store the cages against frames of pollen and nectar. If the drones are old, the worker bees may not feed them, and if there are two cages of drones – one containing old drones and one young drones – the young drones will receive the workers' attention, while the old drones will be ignored and will die of starvation unless they are able to feed themselves.

Eight days after emergence the drones begin to make orientation flights. They also relieve themselves of a rectum full of digested pollen and nectar – fecal material. Young drones, when handled by humans, will eject milky, murky, and smelly feces, perhaps as a defensive behavior. The color of the feces darkens before the drone defecates. (I argue that drones aim for the eyes, since the feces are tactically irritating to the skin and sensitive membranes; I developed a serious skin allergy from daily contact with drone feces). Older drones when handled regurgitate clear fluids that are often nectar scented.

Mating flights vary from area to area, but usually start between one and four in the afternoon and last

for several hours. Exact times differ by bee race, latitude, day length, and prior confinement. Drones will be observed at the landing board as they leave the hive. They are fueled with honey or nectar and will fly to a **drone congregation area** where they search with other drones for virgin queens. These areas appear to develop based on geological features of the landscape (fence lines, changes in elevation) and are used year after year by drones that have never had contact with drones from the prior season.

Since drones exist to mate with virgin queens, their role is sexual. They make many trips during the afternoon to find a queen, returning to refuel with honey every 15 or 20 minutes. When there are few virgin queens in an area, drones move from congregation area to congregation area, moving further and further away from the hive. Drones do not always return to their own hive. Within an apiary considerable drone drift is evident when marked drones are released, but drones also move to colonies in other apiaries, allowing for a geographic shift of several miles. Only a small percentage of older drones do this; the majority will stay within the origin of the parent colony. Multiple drones mate with virgin queens before she lays any eggs, and queens almost never return for additional mating once they have started depositing eggs. (Unmated virgin queens confined to a hive by winter or cage, will sometimes mate, but the majority do not seem to do this.)

Sex with a queen means death to the drone. As the drone mounts the queen from behind at about 40 feet in the air, his penis inverts explosively in to her median oviduct, expelling sperm as the drone's abdomen stiffens and shrinks in size and the male bee dies. The abdomen becomes quite hard as the penis is expelled, and the thin, membranous penis sometimes explodes like a balloon. This is the mating sign beekeepers report seeing in newly mated queens returning at the entrance. Subsequent drones remove the penis before they mate with the queen.

Queens mate in rapid succession with a series of drones. For my discussion, I am using the average number of 20 drones per virgin on one or more mating flights. However, many virgins undoubtedly mate with all 20 males in one afternoon, maybe even one flight, providing another meaning to busy little bees.

Estimates of the number of drones a queen mates with range from a low of five to eight to a high of 28 or more. I selected 20 because research over the years has been shifting the number upwards and a conservative figure is needed when we discuss the number of drones a beekeeper must produce to mate large numbers of virgins in a short time period. Plus, it is as good a number as any right now.

Mated drones drop to the earth where they decompose. Unsuccessful drones return to their own hive or may move to any strong colonies where food is plentiful and worker bees are tolerant of their entrance. They migrate from apiary to apiary, spreading their genes (and potential parasites) as they do. Colonies undergoing supercedure or accidental death of the queen will become quite filled with drones, and may be used as a means of measuring drone numbers in a particular area. In fact, a strong colony with a caged virgin is my favorite place to raise, mature and store drones before use in mating, and I will detail this in another segment.

Drones take mating flights in the afternoon, but will make orientation flights in front of their colony any time it's warm enough.

Enough Drones?

While a healthy drone produces about ten million spermatozoa and a virgin queen averages 5.3 to 5.7 million spermatozoa in their spermatheca, we must never think that one drone produces all the spermatozoa that one virgin queen requires. In both natural and instrumental mating, there are extensive reasons why multiple drones must be used to inseminate one virgin queen:

1. Not all drones are able to supply large numbers of spermatozoa. It appears that spermatozoa counts peak between day 12 to day 16 after emergence. Also, as described last month, nutrition of the developing drone influences the number of spermatozoa, and some drones may be sterile or nearly so and still mate with the queen.
2. The age of the queen influences the number of spermatozoa able to migrate to the spermatheca. The number that migrate is lower in old virgin queens (those confined to a hive due to poor weather).
3. Race of the bee stock strongly influences the migration rate; this creates a situation where spermatozoa from different drones have differential migration rates.
4. Confinement of a queen after mating reduces the number of spermatozoa that successfully migrate when compared to queens free to roam about a colony.

Mostly, our attempt to provide complete insemination of a virgin queen is complicated with the competitive nature of sex in the air, the conditions leading up to and following mating, and environmental conditions (wind, rain). One study showed that 87 million spermatozoa filled the queen's oviducts immediately after return to the colony, but only 5.3 million migrated

Continued on Next Page

to the spermatheca. Whatever competitive physical and biochemical conditions are present when the queen returns to the hive, the spermatozoa of the successful drones' are ejected from the queen over 90 percent of the time. We know that the migration is not passive; that the queen's muscles and chemicals in the spermatheca and spermathecal gland are involved. Sex among bees is so complicated, so filled with random components, that it is remarkable it succeeds as often as it does!

Drones and the honey crop

Traditionally drones are either ignored by beekeepers, or considered the enemy because they consume the honey crop. Most beekeepers don't think much about drones, and rarely have, for example, in C.C. Miller's *Fifty Years Among the Bees*, drones are listed in the Index only once, that being Drone-laying Queens. (In Miller's six-line discussion, readers are advised that colonies with drone layers "can be well utilized by uniting with a weak colony having a laying queen.") By comparison, there are three dozen references to queen bees.

Drones are traditionally seen as a drain on a colony's honey production. Yet the presence of drones may have possible positive effects.

1. Colonies only produce drones when forage conditions justify, and only in numbers they can support. They may be used as an indicator of colony conditions.
2. Efforts to reduce drone production by removing drone cell combs inevitably result in the colony rebuilding worker-sized cells to produce drones *when colony conditions so require.*
3. Drones may actually promote nectar production by stimulating foragers to go out and gather more nectar. They may do this by begging for food from workers.
4. Both drone brood and the drones themselves may contribute to the overall metabolism of the hive—contributing to cluster heat on cold evenings and a means of regulating colony mass. Drone brood is often at the bottom and edges of the brood nest, where it may serve as a heat source for worker brood.
5. Drones may be receptacles for nectar from field bees that must be relieved of the nectar before they return to the field.

There are other views of drones. Allan Latham, a noted commercial beekeeper and queen breeder located in Connecticut, wrote[1] about the importance of the drones as a stimulus to worker bees. I believe he was right that drones provide a stimulus, but I think he was wrong in thinking it was sexual, since there is no evidence of any sexual behavior between worker bees and drones. He wrote:

My own theory – and it may be incorrect – is that worker-bees in colonies blessed with numerous drones labor more eagerly than those having few drones. Is it not possible that the mere presence of drones stimulates the workers to greater activity? Everyone knows that young women spending Summer weeks at the seashore find it boring if no men are present. Although the worker-bee is an imperfect female, this fact does not preclude the possibility that she may be stimulated by the presence of the male. At any rate, I have never seen a smaller surplus stored in a hive with many drones than in a hive with few drones. The amount of surplus in a hive is determined by the activity of the working force, and I have always noticed that where drones are numerous, the bees were very active.

Overlooking any sexist anthropomorphism, Latham's observation on the stimulative value of drones is valid, and one we need to remember. Rather than the sexual component Latham describes, it is likely that drones undoubtedly stimulate worker bees by their food seeking and other behaviors.

When asked, commercial beekeepers are hard pressed to show me a healthy, queen-right colony that contains ***too many drones***. In my Florida work, when I needed unrelated drones for instrumental insemination, I asked beekeepers if we could shake a colony into a large screen cage furnished with queen excluder material on the sides. Workers could be driven off with smoke, leaving the drones inside the cage. When commercial beekeepers let us shake all the drones out of colonies they felt were 'loaded' with drones, we usually obtained a very limited number. Perception by beekeepers of drone abundance and actual counts were far apart.

We are wise to remember that drones are part of a normal, healthy, disease- and mite-free colony. Because colonies tolerate drones only when forage conditions are good, they are able to invest part of their incoming pollen and nectar 'assets' into drone brood and eventually drones. When the season is over, drones are driven out or prevented from returning from visits to mating areas. They often flock to colonies undergoing natural queen replacement—supersedure—and will remain there only until the queen has finished her mating flight(s).

The absence of drones in one colony, when others nearby have drones, is a sign of a queen change, and should stimulate the beekeeper to look for an explanation. Drones late in the season and over Winter almost always indicate a queen failure.

Beekeepers today need to expand their usable knowledge of drone production and management as it affects queen production. Drones are also part of our current *Varroa* mite management, but I will not discuss that in these articles.

Next Time

If a commercial beekeeper has 10,000 new colonies and must mate *all* the virgin queens within a four-week period, how many drones does he/she need to produce? Maybe some of his/her queen problems are really drone problems! **BC**

Dr. Lawrence (Larry) Connor is owner of Wicwas Press, New Haven, CT where he edits and publishes books on bees and beekeeping – LJConnor@aol.com or website www.wicwas.com.

[1] Allen Latham, *Allen Latham's Bee Book*, 1949, Hale Publishing Company, Hapeville, Georgia. Page 52

MANAGING NUCS

Terry Fehr

A midsummer colony from a nuc is different than a midsummer overwintered colony. Don't treat them the same.

A swarm, as you know, is Nature's way of renewing a honey bee colony. In the wild, colonies will die due to disease, starvation and queenlessness among other reasons so to maintain a healthy population of honey bees in an environment those strongest must divide to replace those colonies lost. Nature, given opportunity, will take care of itself. An intensively managed commercial honey production business is no different. Colonies are lost annually to disease, starvation, poor queens, theft, and a host of other reasons. If a business is to prosper it must replace those lost colonies. A process often called "nucing" or "splitting" is a good option to increase a hive count or simply maintain numbers.

Splitting stronger colonies to replace colonies previously lost has several tangible fringe benefits. Honey bee colonies should have young queens for optimum production. Young queens lay sooner in the Spring, more eggs per day and have a better chance of continuing through the season without failing. Setting up split colonies ensures a young queen will enter the business. Her higher egg-laying rate will cause the population to expand rapidly. There is evidence to show tracheal mite levels are low in the initial months of a new hive. It seems mite loads cannot keep up with bee population growth.

Equipment from dead colonies must be checked and culled if visible signs of disease are present. Older comb has been shown to contain viruses and spores that detract from general colony health. Cell size shrinks each generation as brood comb is used, producing smaller bees each succeeding generation. It has generally become a rule to replace brood comb every three years. By having a system of hive replacement, equipment will be brought into the honey house for repair and maintenance regularly. Comb can be replaced as needed much easier than trying to cull frames in the beeyard. Having unhindered access to equipment, without bees, makes some of the routine repair and maintenance so much easier. These are several benefits of a systematic replacement regime of hives.

This may sound somewhat elementary but many of us, when raising queens and making splits, do not consider drones. Virgin queens must have drones in the proximity with which to mate before they can return to their hive and begin to lay. Drone mother colonies ideally will have been selected for genetic superiority and should be within a half mile of where nucs are set up. Although not ideal, I find setting the nucs in the same location of over wintered doubles the most convenient. I need only one site for nucs and drone mothers alike but robbing, when setting up nucs, must be taken into consideration. The drone mothers are within a hundred yards of the nucs and mating does occur with high percentages of nucs having a laying queen.

Get rid of that old black comb.

Cleaning Bench. Super fits over chute, blocks push up frames. Collection bucket underneath.

When setting up new hives it is best to do so during the evening. Temperatures are lower and bees will

Continued on Next Page

Brood chambers ready for bees.

not immediately fly when released into their new hive. Cooler temperatures allow easier handling of bees. Adding a mist of water over the bees settles them down temporarily. A few hours overnight along with cooler temperatures and bees will emerge slowly from their entrance in the morning. We want all bees inside their hive initially, then to return there once flight begins. Unfortunately we do not live in a perfect world; bees do drift to other hives after their initial flight, and to a lesser extent, subsequent flights. Some drift can be eliminated by situating hives around landmarks such as trees and bushes or by using different coloured equipment (lids and supers). Setting newly established hives in a circle with entrances pointed to the outside of the circle helps. Despite doing all of the above some drift will still occur.

Having bees move from one hive to another (drift) has several detrimental effects. In this particular situation, queens on orientation or mating flights may drift to another hive and be immediately lost. A lot of work that went into making a split has been wasted if a queen is lost. Certainly if disease is present it will be spread from hive to hive by drifting bees.

Once the nucs (one frame of bees and brood plus another frame of bees) have been established and queen cells placed in them, do not touch these hives for three weeks. Disturbance may lower the percentage of hives with laying queens. After three weeks, I re-enter the site to check my new nucs for laying queens. Probably the most satisfying job I do all year, look at brood of the new queens. Drifting has been mentioned because it is during the initial check of nucs that the results of drift are most easily seen. Very often one or two hives in a yard of fifty nucs has a full super of bees while most others have two frames of bees. The surplus bees of those two full hives must be spread out. Simply find the queen, set her aside, and move frames of bees out of the full super to other hives less populated. Equalization I call it. It will not take long as there are only a couple hives in that situation.

Record keeping seems to be the bane of most honey producers. Keep it simple. It is useful to have each new hive marked as to date of creation and genetic background of the queen. An electronic labeller and small staple gun work well to label a hive. Providing the label material is sunlight resistant the label will last years (we are only interested in two and a half years) and at a glance we can see what queen heads each colony. Labelling will only take 15 minutes for 50 hives and each hive now can be identified as to age, mother, and in some cases the drone source for her mating. Labelling is best done immediately after queens have been checked and before they are moved. This label has provided priceless information when selecting breeding stock over the years.

Small population colonies with a new queen are generally very gentle compared to larger colonies. For this reason, it is best to leave the smoker in the truck when checking nucs. I use mats on top then a telescoping lid. When removing the lid and mat, it is imperative to be certain all bees from the mat are shaken into the hive. Always assume your queen is on the equipment in hand if her whereabouts is not known for sure. I cannot remember the number of times queens have been found crawling on the mat or lid. It's the same even if using just a cover, or you have inner covers. Carelessness would lose her in the grass when checking.

Each hive has nine frames at this point and since the equipment has just been cleaned frames are eas-

Boxes ready to go. Mats on (seen through screens). These hold brood and bees.

ily moved apart. New queens will almost always begin to lay on the frame initially given to the hive with brood. Quickly remove that frame to inspect for eggs and brood pattern. If checking after 21 days capped brood could be developing. With a frame of brood and an additional frame of bees making this nuc, queens often begin laying on day 12 from placement of a 10-day queen cell. I have seen them laying in as little as eight days and as long as 16 days. Once eggs are found and a large laying pattern observed the frame is placed back in the hive. All nine frames can be pushed to one side of the super and a tenth frame added. Extra frames can be carried on the truck or more easily use frames from those nucs without queens. By doing this no bees need to be shaken from queenless colonies and stray bees from those queenless colonies can be immediately put back to productive use.

A circle arrangement for reducing drift and spreading out bees and brood.

Each beekeeper has their opinion about whether a brood super should have nine or 10 frames. The initial brood chamber should have ten frames. At one time about one percent of my nucs would swarm but increasing comb surface by 11 percent (from nine to 10 frames) over a period of years has been observed to eliminate swarms. Of course, this is only part of the solution but it seems to have made a difference. Clean nine frame equipment will shift during transport as well. Best to add the tenth frame to this hive.

Once a nuc has been found to have a queen, laying an adequate pattern and the lid has been replaced, it is ready to be removed from the mating location to a Summer building yard. With tight equipment and cool, windy weather, moving nucs during daylight is not only possible but more enjoyable for those of us not suited to working in the dark. We set these nucs in yards of 40 hives, now four hives to a pallet and treat them much like larger production hives. Some entrance reducers should be opened for the larger colonies at least but most can stay mostly restricted to keep interior hive temperature more easily controlled by a small bee population.

Locations for nucs should be somewhat different from those locations used for production hives. Production hives need good Summer forage and can tolerate less shelter if none is immediately available. Small colonies using the Summer honey flow to build population require shelter and modest forage during the Summer. The nuc population will build and if late Summer forage is available surplus honey is not only possible but probable. It can be difficult to find locations that will provide late Summer flows but these are best for the small split. If that location can be provided, enough honey could be produced to pay for the split before Winter. What a different economic situation than the traditional method of buying bees, producing a crop then paying for the bees with their production. Our bees are paid for before their main production season. The second Summer, the main production season, is mostly profit.

When first moved out to Summer locations, all nucs will have queen excluders placed on with the strongest colonies receiving a super. Entrances are opened partially to allow more air. Young queens in these units will lay prolifically until they have enough brood for the available bees to maintain. Egg laying will slow until bees begin to emerge. Those emerging bees provide cells for our queen to lay but also begin to increase the population allowing more brood to be maintained. Thus for the first five weeks after initial set-up, nucs of this size will only produce about two or three full frames of brood but with the double effect of emerging bees, brood area will grow exponentially thereafter. Eight weeks after initial set-up we witness a population explosion. By the seventh week all nucs have at least one honey super and some will have three on top of the queen excluder. If the honey flow is short these late hives will miss it but with a late flow considerable honey can be harvested. Depending on the year, it may be necessary to remove honey twice before early September (northern areas) when all supers are removed prior to feeding.

Operating a large number of nucleus colonies has many advantages already discussed, in addition to operational advantages. Work associated with these miniature colonies comes when work with the larger production hives is slow. During June when the large hives are building, brood is removed from them to establish nucs. While nucs are mating, thirds will be placed on the large hives, etc. the workload shifts back and forth between the two types of hives. Not until mid-August does the work schedule of the two groups clash, when honey should be taken from both types of hives. These hives complement each other when scheduling labor requirements.

Management of nucleus colonies is different than managing larger colonies. Each colony has unique requirements we should cater to for best results. This requires a shift in attitude toward bees for some of us. If managed properly nucs can be the basis of a highly successful business. Populations in single brood chamber splits are much smaller than traditional doubles and need, again, unique management, for Winter preparation. This will be the basis for the next article. BC

Terry Fehr operates about 1,000 colonies in Gladstone, Manitoba. He started with 14 colonies 20 years ago. Nucs are a profitable part of his business, and he's very good at it.

James E Tew

Bee Culture's Beeyard

New Help, and New Yards

New help (Or any for that matter)

At one point in our lives, my brothers, my Dad, and I had nearly 200 hives. Though there were four of us in the project, it always seemed that there was a shortage of help not necessarily good help just any help. Cousins, friends, spouses, aunts, other brothers (I don't have any sisters), uncles we tried them all (or should I say, we abused them all?). It was rare to get someone out to a bee yard more than twice. Working with new – or inexperienced help – is always an event. Be patient with new people in the beeyard. We were all new once.

#1. It has been my experience. It has been my experience that new help requires exceptional protective equipment having absolutely no holes anywhere. Not a single bee can get in to do harm to the new helper. Obviously, in addition to high quality equipment, this requires the better part of a roll of duct tape. How much will all this protective equipment cost you if you must buy it new? Will the new help be worth it?

#2 It has been my experience. When the new helper does get a bee inside (and he or she will, sooner or later), they will react in ways ranging from the funny to the dangerous. I once had a new helper scream in pain, drop his half of the hive we were loading – which meant I had to drop my half – run and stand in the road when he beat himself all over. This was a daylight move and cars were traveling the road at high speeds. Catching him was like trying to catch a wild animal.

#3 It has been my experience. Due to the great heat that the protective clothing generates, new help tires quickly. They ponder along, barely able to stoop over and the heavy new gloves make them especially clumsy. Probably the stress of the perceived threat working bees is also fatiguing. All this fatigue requires water or colas. If the new help is in the teen years, you will need to keep shoving hamburgers down him. Add this to the cost of the new equipment.

#4 It has been my experience. Especially with younger new help, there is an inflated value attached to the task of bee moving. A bee task that I would value at $10.00, most of my new help values at $50.00. It's just a generational difference, but when added to the cost of quality protective gear, food and drink, new help combined with a high per hour rate, can be expensive.

For the foreseeable future, assistance in the bee yard will be a limiting factor. As beekeepers age, they tend to increasingly cut colony numbers, but at some point, that does not work. All of us will need help in our beeyard at some time in the future. We will always need to find and use new labor and it will always come with a set of common problems.

Finding the new yard.

Much like all the old, bad jokes long past, the question "Where does a beekeeper put an apiary?" now has the truthful answer, "anywhere he/she can" Urbanization and "improved" farming practices have made getting apiary sites more of a challenge than it once was. In reality, a hive or two can probably survive anywhere with exceptions being either of the arctic poles or in a large body of water. The second reality is that most hobby beekeepers put their home apiary (or their principle apiary) in the only spot they have. So....why all the discussion about

Ten Characteristics of a Good Beeyard Location

1. Dependable nectar and pollen flow
2. Dependable yard accessibility
3. Constant clean water availability
4. Good, clear long-term commitment from land owner
5. Minimal pesticide exposure
6. Protection from summer heat and winter cold
7 Minimal danger from wildfires
8. Good air drainage (no frost pockets), generally flat
9. Not near other major bee yards (bee disease prevention and robbing)
10. Pleasant scenic surroundings

Continued on Next Page

BEEYARD ... Cont. From Pg. 29

finding the "perfect" location? From the hobby perspective, it's the principle of the thing. By knowing what the perfect location should look like, you'll be able to rate your own location. If you could have anything you want for an apiary site, I would suggest the following characteristics - in no order of importance.

Finding a location having all ten characteristics listed is only possible for the heavenly beekeeper especially the listing about minimal pesticide exposure.

Yard accessibility. However, of all the listings, one of my long-term favorites has always been #2 Dependable yard accessibility. The amalgamation of a career's worth of conversations I've had with land owners would go something like this, *"Well, I don't suppose I would mind having some bees on the place. My Dad kept bees when I was just a young sprout."* [Landowner removes cap, scratches head and, without making eye contact with me and ponders the next obvious question - where to put them?]. *"Why don't you put them over back behind that watermelon field* (while pointing generally toward South America). *You can put 'em down there by that wood line"* (which also happens to be in the general direction of South America). Then the next comment should make your hair stand on end, *"It's always dry over there."* You name it. I've bogged it down (or I know someone who has) while getting into locations that are "never wet" There's not much you can really do at that moment. The owner is trying to think of a place that is never used for anything else. Too much of #3 (Constant clean water) can be a very bad thing. It's going to be hard to find 1-10 above when talking about locations that "can never be used for anything else" But, be careful for what you wish, you may get it. If the yard is readily accessible to you and your hives, then it probably that accessible to everyone else, too.

New help in new suits. Once the zipper is up, both should be pretty much bullet proof.

Afternoon shade For those of us who keep the bees in warm/hot climates, having afternoon shade is great; however, it's probably more of a benefit to the beekeeper rather than the bees. Conversely, having good wind breaks for those of us in cool/cold climates is also a good feature - again mainly for the beekeeper.

Moving to the new beeyard. Is this worth $50?

Neighbors Neighbors are a fact of societal existence - you just can't get away from them. There's not many in the community that don a full-length white suit, build a smoldering fire in a bellows-driven smudge pot (which is called a bee smoker), cover their face with what appears to be part of a NASA outfit, reinforces the entire garb with duct tape, and then meanders across the backyard. Neighbors notice things like that. Try to keep your yard out of your neighbor's sight. Tall shrubbery is good not only for wind breaks, but also for getting the bee's landing approach above the heads of everything and everybody within the community. Try to protect the hives from curious kids which are little more than baby neighbors. Always avoid property lines for apiary sites. Always avoid neighborly disputes. Even when you win, you lose.

Ultimately, finding good locations requires investigation and good luck. Usually, as your colony numbers grow your reputation as a beekeeper will grow. In conversations with others, always be listening for someone suggesting new locations. Many times one may simply ask a land-owner for permission if the location is convenient to the beekeeper's operation. Sometimes, the land-owner may ask you to put bees on the place if the owner has a need for supplemental insect pollination. I have had good luck here in Ohio putting bee yards near oil wells. Such locations have year-round access roads that are maintained by the oil companies and are usually in isolated areas.

The best time to set the yard up "When to set the yard up" depends on the beekeeper. Practically any time of the year is okay for moving bees onto a permanent location. In the springtime colonies are lightest

and easiest to move, but even easier, a yard could be established using newly hived swarms or newly purchased packages of bees. The best time for setting up a permanent yard is not really a beekeeping question so much as a beekeeper question.

Hive numbers How many hives can be kept in one apiary? Now there's a question requiring a common sense answer. I have known of an urban beekeeper who kept a couple of hives on his roof. To get to the "apiary", we had to climb out his bathroom window. It wasn't a large roof, so by definition it had to be a small apiary. Another beekeeper kept one hive on his sixth floor balcony. Again not a large apiary, but it was readily accessible from his living room. Generally, a large apiary in most of the rural continental U.S. would be about 25 45 colonies. Fewer in a suburban setting and, fewer still in an urban setting. At what point is per colony production lowered due to high colony numbers? There's no right answer. It depends on the nectar and pollen sources available within the approximately two mile radius of the yard, and the productivity of those sources that year. Keep location records. After a few seasons, you will begin to know the quality of your locations. Better, you'll be able to predict the productivity of a given yard knowing the weather last year, and this year.

Hives should be approximately three feet apart and, in large apiaries, should have enough space between rows to allow for truck or mowers to move around freely. Hive stands and pallets are laid out essentially the same. Avoid low hanging limbs. They snag your veil when working bees and snag your face while mowing. Keeping hives in nice rows is a beekeeper convention. Bees can find home easier if colonies are staggered about, but such an apiary doesn't look very neat.

New help and new yards It is a fact – if you keep bees long enough, you will need to find new locations. If you find new locations, you will – no doubt – need help to move the hives to the new location. If you keep bees long enough, you will have to find new help. That is one of the roads of a beekeeper's evolution. BC

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

MAINE and the EAS Meeting

Peter Sieling

I attended my first Eastern Apicultural Society conference last year. It was just down the road from me at Cornell University and provided a chance to meet people and put faces with the columns, articles and books I have been reading for years. Besides local bee association meetings, it's one of the few places where you can find people who enjoy talking about bees.

This year the EAS conference convenes August 4-8 at Bowdoin College (pronounced "Bodin") in Brunswick, Maine, right on the coast. The picturesque, 110 acre, 200 year old campus is walking distance from downtown Brunswick. It looks like the perfect place to spend a week during the hottest month of the year. The first 2½ days consist of the Short Course. The second 2½ days continue with conference and workshops as well as several social events.

What a deal! I can expense the trip. We'll put on an eight track tape of Barry Manilow singing ***Weekend in New England*** (*"Long rocky beaches, you by the bay..."*) and make the 600 mile trip to Maine. My in-laws have a cottage in New Hampshire just a few hundred feet from the Maine state line. I can surprise them by dropping off the kids at their place along with the electric guitar and drum set. I talked with Bill Truesdell, hobby beekeeper and registrar for the conference. He says they'll be serving lobster at the conference so I may even persuade my wife to come. If the lobster dinner doesn't persuade Nancy, the beach at Brunswick will. She grew up near the ocean and has fond memories of splashing in the ice cold surf until her parents pulled her out, shivering and blue. I dipped my toe in the ocean off Maine once. The feeling returned later that afternoon. If the ocean is too cool for you, Bowdoin College has an Olympic sized pool. Thomas Point Beach in Brunswick looks like a nice place for spouses of beekeepers to spend an afternoon or a day. There is also the Maine Maritime Museum to visit, plus the Perry/MacMillan Arctic Museum right at Bowdoin College.

Here in rural western New York we think of New Englanders as people who talk funny and eat meat that hasn't been properly field dressed – dishes like clams, shrimp, and lobster, the food that looks at you reproachfully while you eat it. I called some Maine beekeepers to find out about the customs, language and which side of the road Mainers drive on, as well as how their colonies are doing. Fortunately, the language spoken in Maine is similar to the English spoken in the rest of the United States except for the extreme South and West of the country. But even folks from Louisiana and Texas can make themselves understood in Maine by speaking loudly and slowly. Mainers drive much like rural New Yorkers. They take their half of the road out of the middle, but are pretty good about moving to the right when out of staters are driving towards them.

Maine is the largest New England state, almost as big as the other five New England states combined. The population is less than 1.3 million. Compare that to the eight million people packed into the southeast corner of New York. According to Rick Cooper, president of the EAS and Maine resident, you can drive 10 or 15 minutes from the center of any city in Maine and find an area rural enough to keep a few colonies without upsetting the neighbors. Rick has almost 100 colonies and supplies beekeeping equipment and bees to other beekeepers in the area as well as teaching beekeeping classes.

Memorial Hall (photo by James Marshall)

Gibson Hall and Bowdoin College Museum of Art (photo by Dean Abramson)

Beekeeping in Maine is similar in most respects to beekeeping in the rest of the northern states. Their summers typically are short, with the honey season running from the first of June to Labor Day. They do get some special weather. Hurricanes come up the coast, hit Maine, and then turn out to sea. This has not been much of a problem recently. Rick Cooper tells me the last one, Hurricane Bob, barely achieved wind speeds of 90 mph. The coastal plains stay pretty cool and windy in the Summer. The morning fog delays bee foraging. Inland, above Bangor, the forests don't provide a lot of forage except in logged over areas where raspberries can produce a honey crop.

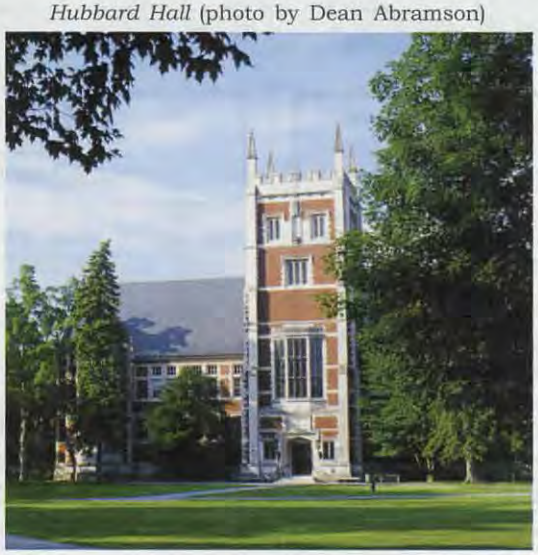
Maine's state berry is the blueberry and its state insect the honey bee. It's a good combination. So why is their state flower a pine cone? Ninety percent of lowbush blueberry production comes from Maine, and it's still mostly harvested by hand. In western New York we have domestic blueberry farms, but only a few areas with wild blueberries. I rent a few colonies for blueberry pollination here in Bath, NY I tried to impress Bill Truesdell, who happens to live in Bath, Maine with my knowledge of blueberries. He told me we had high bush blueberries here. "Oh no," I explained. "Our bushes are only two to three feet tall..." imagining I'd have to look up at a high bush blueberry. Bill corrected me. Low bush blueberries grow to barely one foot in height. Blueberry pollination is a big business in Maine. 50,000 to 60,000 colonies are trucked in from as far away as Florida, Georgia, Carolinas and even Arizona to pollinate Maine's wild blueberry crop.

Other smaller crops such as apples and cranberries also require pollination. Some people keep bees to improve their own crops. Elaine Bradbury, a hobby beekeeper, maintains six hives on their farm to pollinate their gardens and small apple and pear orchard. They get a better yield plus the honey provides some extra income from sales at local gift shops.

One of the best known honey crops is, not surprisingly, blueberry honey. According to Rick, blueberry honey is dark and full flavored. Bill Truesdell harvests blueberry honey from his colonies, as well as clover and purple loosestrife honey later in the season. After blueberry honey, raspberry is the second major honey producing plant. It yields honey that is light and mild in flavor. Large quantities of brambles grow on paper company clear cuts in northern Maine. These clear cuttings can yield as much as 150 lbs of raspberry honey per colony in a good year. Mid Summer honey crops include clover and milkweed, followed by vetch and goldenrod in late Summer and asters in the Fall.

Bears are a problem here in upstate New York as well as in Maine. The worst bear problems occur inland, away from the coast. Elaine has had a couple run ins. Moving the colonies closer to the house seems to have solved the problem. I didn't have the heart to tell her about the bear that dumped a honey bucket on my neighbor's porch in town. Perhaps New York bears are ruder and more aggressive than Maine bears. Honey yields can vary dramatically. Elaine typically harvests six to seven supers per hive. Rick has similar results. He told me about moving some hives into a field of sweet clover. "The sky was full of bees and there was a hum that could be heard from a hundred yards away." Ten hives in that big field yielded a whopping four frames of honey. Yes, beekeeping in Maine is much like beekeeping anywhere.

Hubbard Hall (photo by Dean Abramson)



Mark your calendar. The bees will be busy with goldenrod. They won't need you Aug. 4-8. You'll need a vacation after a hot sweaty Summer, preferably near the ocean. Best of all, you can hang out with other bee people. BC

Peter Sieling is a hobby beekeeper getting ready to attend this year's EAS leaving from his home in Bath, NY.

Spring Dwindling and Other Questions

James E Tew

Many of you write me concerning various aspects of beekeeping. I try to respond to each of you in a timely way, but I know I miss some of you. I apologize for that. Your correspondence is helpful to me in that it keeps me abreast of current beekeeping issues. Though you are reading several months after of my writing, one of the main things that is on your mind right now is, ***"Why did my colonies die this past winter?"*** Most of us are now accustomed to exotic explanations like a virus vectored by mites, a small hive beetle problem, or some remote hive chemical contamination. But, I suspect most the time, it nothing more than time-honored *Spring Dwindling*. I ask you look at this discussion as preparation for the 2003-2004 Winter season rather than rehashing the past season.

Spring dwindling. Note dysentery on the hive body.

As I have discussed in previous articles, many of us – me included – tends to pine for the good ole' days when beekeeping was predictable and profitable. Not like today when beekeeping is unpredictable and frequently unprofitable. If I may, could I present to you, verbatim, a discussion on Spring dwindling from some of the past glory days of beekeeping? In *ABC of Bee Culture*[1], 1882, A.I. Root wrote:

April 15, 1882

Today is the 15th of April, and scarcely a bit of pollen has been gathered. The buds of the soft maple are open, but for some reason which I cannot give, not a bee is to be seen hovering near them; the slippery elm is also in bloom, but, strange to say, not a bee hums about it either. The weather has been very warm, and there is a cool north wind which may account in part of the seeming indifference of the bees to the blossoms. Last month, I reported 85 colonies left. Since then, one after another, they have been dwindling down, in a wonderfully short space of time, and stocks that were called fair, having brood on several combs a week ago, are now found with only a handful of bees, the brood dead by exposure, the unsealed larvae starving and drying up in the cells, and there is a general air of discouragement all about the hives. Some colonies bring in a little pollen now and then, but the great part of them seem to have suspended work, and the bees are loafing idly about on the combs. The heavy combs of sealed stores remain untouched, and not a cell of honey is placed close to the brood for immediate use, and every bee seems to have stopped work. When we open the hives, there is no need of a smoker, for the greater part of the bees seem too listless to care to show fight.

April 25, 1882

We have now had nearly a week of beautiful weather, and the troubles are all over. The bees are at work on the maples, and under the influence of new honey and pollen, everything is promising.

From J.B. Bray, Lynnville, TN, March 28, 1879

Well, I went into winter with about 130 colonies of bees. Today, I think I can house all I have left in a ½ bushel mea-

[1] *Root, A. I. 1882. ABC of Bee Culture. A.I. Root Company. Medina, OH 288pp.*

Continued on Next Page

DWINDLING ... Cont. From Pg. 35

sure – yes, I think I could put them in a peck basket. It would cost me about $500 to replace them. What's the matter? However, I shall not give up. Can you offer me any consolation? I hope you had better luck than I have had. Don't publish this.

J.B. Bray

(Note: To put Mr. Bray's situation in better perspective, $500 in 1879 would be equal to about $9100 in 2003.)

The primary cure for Spring dwindling in 1879 was simply the arrival of warm weather. The primary cure for Spring dwindling in 2003 is simply the arrival of warm weather – not exactly great advances in hive management recommendations during the last 124 years.

Some Possible Causes of Spring Dwindling[2]

- Poor quantity or quality of Winter stores of honey and pollen
- Weak queen that does not overwinter well
- Drafty, damp hive interior
- Colony has been weakened by Nosema, mites or insecticides
- Excessive drifting has occurred before Fall

"Why Did My Colonies Die This Past Winter?"

Last November, I wrote a comprehensive article on the issue of Spring Dwindling (also called Disappearing Disease). To review that article, look at: **http://www beeculture com/beeculture/months/02nov/02nov2.htm**

As though it was written this past Winter, in 1882, Mr. Root said, *"Therefore, my friends, I am sorry to say that, though you nave hitherto never lost a colony in your life, you must not be astonished or disappointed should you, some Spring, see all your colonies go down to handfuls, in spite of all you can do, and perhaps perish outright. If I am mistaken, I shall be very glad to know it, but I think it will be safest, to base our calculations on the assumption, that bee culture, in some respects is a hazardous business, even with the most thorough and careful."*

Salt in the Beehive

Through the years, on several occasions, I have written about the use of small amounts of salt in the beehive as a dietary supplement. I don't know if it is a good idea or not. By far, most beekeepers don't provide salt to their hive any longer, but I have the following comments from you.

From David S. in Maryland

In the April *Bee Culture – Spring Season* on page 51 – you comment that: "Now, no beekeeper, of whom I am aware, feeds salt to their colony." I thought you might be interested in the work that has been going on for several years by Dr. Jim Amrine of WV and Bob Noel of here in Maryland. Their recipe for grease patties includes mineral salt, obtained from a local feed store. The web page for this is:**http://rnoel.50megs.com/2000/part2.htm**

At the Ohio Tri-County Beekeepers' meeting a year ago, Rick B. gave me a pack of "Happy Hive Salts" that he had gotten from a beekeeping organization in England. Information included with the packets reported that the salts block the cellular transport of oxygen through the mites' peritremes (breathing tubes) and is harmless to bees and larvae. I know nothing else about the product.

So, while I can't personally comment on the usefulness of salt in the hive, I can report that in some circles, salt is still an important part of the bee keeping procedure.

Some hive management questions

From Grant M.

I was wondering if you would have any comments on the use of 6-5/8" supers as brood nest supers.

Grant, there is no problem using 6-5/8" supers for brood chambers from a bee management stance. You will need to use at least three of these supers to replace two hive bodies. If there is a problem it is that you will have to invest about 35% more per colony for purchasing and assembling the extra brood body. However, this size equipment is smaller and therefore lighter than a deep hive body. As I grower older, that becomes a strong selling point.

From Laura S.

I am a novice beekeeper, and while I am having great fun, I cannot locate my queens. [I know you have a video and much excellent advice on this subject, but somehow....] If I did, I would probably traumatize the entire colony because it would take a bee by bee inspection; probably take hours! And then, having located her, I have a hard time killing her, and she would doubtless move away while I considered it! So, requeening is a major challenge.

Couldn't a cage be designed that would trap the old queen? She will come to kill a newly introduced queen, so if the new queen were in a protected cage and the queen could

[2] Spring Dwindling. http://www.beecare.com/Feeding/Dwindling.htm

enter but not leave an "entrance" and then after a few hours I could let out/kill the old queen and let the new queen into a regular access-release cage...well, if you have nothing better to do, I suspect many beginners would appreciate such a device. Enjoy the Spring.

Laura, presently no such capture cage exists. I have heard it rumored that a cage is being developed that mimics the sounds of rival queens in order to attract the established queen to a capture cage – but this device is not yet on the market.

The problem with such cages is that the established queen is not normally the antagonist. Worker bees would quickly "ball" the cage in an attempt to suffocate the new, caged queen. If the new queen stayed in the colony long enough, both the resident bees and the established queen will become accustomed to her. Sorry, but I don't think it would work enough to be worthwhile.

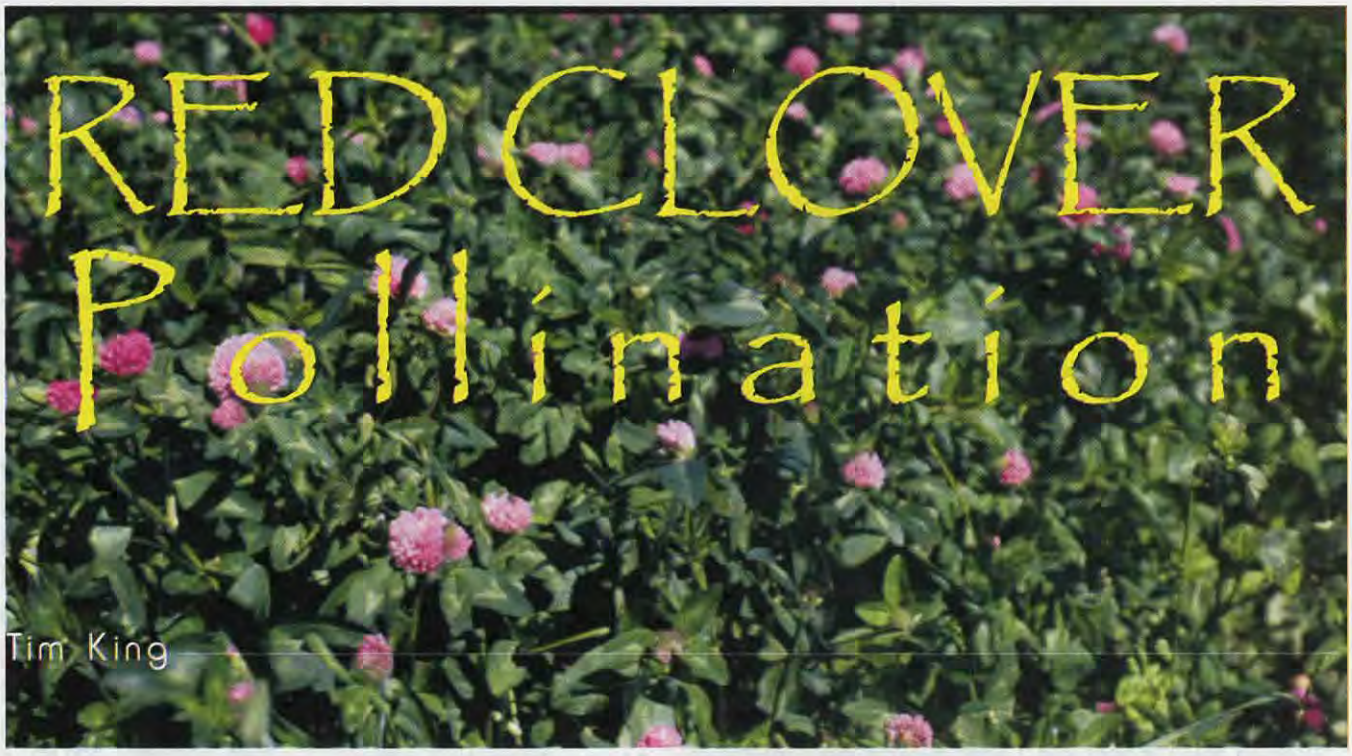
Finding the queen is difficult and time consuming. You will get faster at it, but there will always be times when she just gets by you. Any way to use GPS systems?

From Charles W.

Good day! I've captured 2 small swarms this Spring from my two overwintered colonies, and I'd like to combine them. I've read about the technique using a single sheet of newspaper. Should the colony placed on top be provided a means to leave the upper super, or should those bees be trapped until they eat through the newspaper?

Charles, leave the top unit confined if possible; however, I suspect it really won't make much difference if there is a small upper entrance. The two parts of the hive being combined will diligently work together to remove the paper. The paper removal process usually only takes a day or so. Good luck. BC

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



Honey bee pollination can increase red clover seed production. That's the good news. The bad news is that with declining clover seed prices it doesn't pay to hire beekeepers to put hives in clover fields.

That is the conclusion of a three season research and demonstration project conducted by Grey Eagle, Minnesota dairy farmer and red clover producer Leland Bucholz between 1999 and 2001. Tim Venis, an Eagle Bend, Minnesota beekeeper, who Winters with his bees in California, worked with Bucholz on the project.

"Leland learned that enhanced pollination doesn't guarantee profit or economic viability. The results were positive for yield increase, but because of low clover prices and hive fees, he had a net loss. He believes that placing bees near a clover field could mean the difference between having a crop or not having one," reported the Minnesota Department of Agriculture's (MDA) 2002 Greenbook. The Greenbook is published by MDA's Energy and Sustainable Agriculture Program which provided funding for Bucholz and Venis to conduct the project.

The somewhat negative conclusions of the report over look two positive results that were obtained from three years of cooperative experimenting between Venis and Bucholz.

Between 1999 and 2001 the price Bucholz obtained for red clover seed declined from 45 cents per pound to 30 cents per pound. During that same period Bucholz saw seed production in the heavily pollinated fields improve dramatically as Venis experimented with hive placement. In 1999 the fields with bee colonies only yielded five pounds more per acre than a control field without bee colonies. In 2000 that increased to 50.2 pounds more in the pollinated field. By the last year of the project the "Bee Test Field" yielded 71 pounds more than the control field. If 2001 prices had been the same as those the two previous years Bucholz would have actually made a small profit by hiring Venis to place hives in his clover fields. In 1998 clover seed sold for $1.00 per pound. Those prices would make a beekeeper and clover farmer relationship very productive. Venis held his $30 per hive charge steady during the three years.

The second portion of the project that yielded useful results was that seed production improves based on where in the clover field hives are placed. The Greenbook's conclusion that just placing hives on the edge of a field may mean the difference between obtaining a seed crop or not is hardly borne out by Venis and Bucholz' experience.

"The first year we just put the hives on each end of the field," Venis says of the 32 hives placed in the 30 acre field.

That was the year that the Bee Test Field yielded only five pounds more than the control field. That's a yield improvement the Greenbook called insignificant. That was also the year that Bucholz sat in his flowering clover field and counted bee visits to flowers. There were five to six visits, in a 20 minute period, in the Bee Test Field, as compared to three to four visits in the control field.

Initially Tim Venis thought that there were enough pollinators for the clover.

"We thought there were already so many bee colonies in the neighborhood that Leland was getting pretty good pollination before we came in," Tim says.

But the five pound increase in seed bothered him. Based on his experience in the California almond and cherry orchards Venis thought he could do better.

"In an almond grove we figure a couple hives per acre and we kind of spread them out through the field," Venis, who runs between

1,800 to 2,000 hives, says. "If it's a cool day they don't have to fly more than a hundred yards to pollinate and the orchard is still covered."

Bucholz's clover field never had more than just over one hive per acre. But the second year he and Venis tried to approximate the system Venis uses in California's orchards.

"He placed the hives in four clusters with each cluster placed approximately 1,760 feet apart covering the entire one-half mile length of the field on the east perimeter," the 2002 Greenbook reports.

Although there may have been other variables, such as weather, the leap from a five pound to a 50 pound per acre improved yield strongly suggests that the carefully spaced placement resulted in improved seed production.

In 2001 Venis moved the hives from the edge of the field.

"We spread them right down the middle of the field," he says. "I saved some good strong hives for him and then I supered them up and took them in and checked them once or twice so I didn't drive over the field too much and then I'd wait until he had the clover harvested before I came and pulled them out."

If seed prices hadn't declined the improved production would have justified putting the hives in the fields.

Although extension experts who discuss placing bee colonies near, or in, red clover fields suggest the one hive per acre density that Venis and Bucholz actually used, Venis is convinced he could bump seed production up further by going to two hives per acre.

For Bucholz the number of hives was limited by the grant funds available and, under normal circumstances, pure bottom line economics.

"We initially talked about two hives per acre and then he figured out what he could spend and we came up with 32 hives for the field," Tim says. "We'd be glad to do it again if the farmer could afford it, especially if honey prices dropped down to 50 cents again. The average yield per hive in Minnesota is 70 pounds. At 50 cents that's 35 dollars per hive. I was getting 30 for pollination and I didn't have to wonder all Summer if I was going to get a crop."

Tim did get a honey crop each year from the hives at Bucholz' The first year the hives had more basswood honey in them than clover honey, however. Red clover, Tim says, is not a preferred forage species during the all too short season in Central Minnesota.

"Red clover is hard for bees to work," Venis says. "The flower (floret) is too tall."

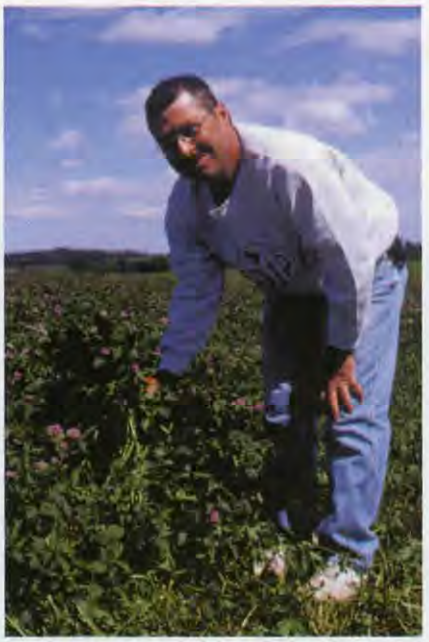
Dandelions, sweet clover, white Dutch clover, and the multitudes of blossoms on the 100 foot tall basswoods will draw bees before red clover.

"In a good year though, basswood can put 80 pounds on your hive," Tim says. "I've seen years when I've gone home and told my wife the year is a bust and three weeks later there's 80 pounds in the hive. You can make your crop on basswood. You can put in the whole crop in a couple of weeks but when it's raining and the basswoods are blooming the beekeeper is laying awake at night."

In the part of Minnesota where the basswoods grow thick and tall and farmers like Leland Bucholz grow red clover because it builds the soil as well as provides cattle feed and seed the honey bees are leaving, however.

"I'm not going to put many hives in Todd County (where Bucholz lives) this year because of the hybrid poplar plantations," says Venis, who has sold his honey to Sioux Bee since 1992. "We moved completely out of Douglas County a couple years ago. The damage to the hives varies every year depending on what the cottonwood leaf beetle population is and what the plantation owners spray. That's part of what's so frustrating. We don't know where they're spraying, what they're spraying or when they're spraying. One year it'll be good and the next year it won't."

By moving his bees further east Venis has protected them from hybrid poplar insecticides and extended his honey making season. In Todd and Douglas Counties there is a heavy goldenrod bloom in August but no nectar flow. The nectar does flow in the goldenrod to the east in Venis' new beeyards.



Leland Bucholz and his clover (Jan King photo)

"It must be the soil type," he says.

Although the experiment conducted by Venis and Bucholz did not result in a resounding success and further experimentation is not likely to go forward because of the expanding hybrid poplar industry the lessons from the project should not be ignored. Venis believes other midwestern crops, such as sunflower and canola, could benefit from placing beehives directly in them.

"I know guys who have done it in sunflowers," he says.

Hive rental fees could go a long way to adding to the profitability of beekeeping and smoothing the bumps in the road as prices go up and down.

GETTING GRANTS

Leland Bucholz was able to finance his experiment in red clover pollination thanks to funding provided by the Minnesota Department of Agriculture's Energy and Sustainable Agriculture Program. ESAP, as it's known, is a 14 year old program that encourages farmers to ask their own research questions, to seek out collaborators to assist them in answering those questions, and than conduct the research project on their farm. The projects can last up to three years and receive up to $25,000 funding.

Continued on Next Page

RED CLOVER ... Cont. From Pg. 39

Over the years ESAP has awarded nearly $2.5 million to over 220 livestock and crop farmers to conduct on farm research and, in recent years, marketing research projects.

"The grant program provides a unique opportunity for farmers, non-profit groups, agricultural researchers, and educators across the state to explore ways of enhancing the sustainability of a wide range of farming systems," writes ESAP's 2002 Greenbook, which includes summaries of existing projects.

Beekeepers have been largely absent from "wide range of farming systems" represented among ESAPS grant recipients.

"The Minnesota Department of Agriculture Sustainable Agriculture Demonstration Grant Program is open to Minnesota beekeepers. Several of Minnesota's high value crops rely on bees as pollinators and there is always a demand for locally produced honey," says Mary Hanks, director of the ESAP. Hanks emphasizes that grants are only available to Minnesota producers and that, due to a state government deficit, funding will be in short supply in the next few years.

There is a federal producer grant program run by the USDA under its Sustainable Agriculture Research and Education (SARE) program, however. For thirteen years the North Central Region of SARE has been giving out grants to farmers and ranchers in the Midwest.

"The Producer Grant Program allows farmers and ranchers to identify specific obstacles to more economical, environmentally friendly, production, and then address them," Ken Schneider of NCR SARE says. "We take pride in funding producer initiated projects that can be transferred to other farmers as they strive to remain viable."

In 2003 the North Central Region SARE had grants for individual producers of up to $6,000 and up to $18,000 for groups of three or more producers working together. In recent years other SARE regions, in the west, south, and northeast have also instituted producer grant programs. Although beekeeping projects are not common among SARE grants they are welcome.

"We don't know where they're spraying, what they're spraying or when they're spraying."

"Beekeepers certainly are eligible for NCR SARE grants. We have funded several projects related to beekeeping in the past and will probably continue funding in the future," SARE's Schneider says.

ESAP and SARE have proposal formats that the inexperienced grant maker will find easy to fill out. SARE and ESAP staff are available to assist grant writers prepare their proposals. Both emphasize collaboration. Collaboration between beekeeper Tim Venis and dairy farmer Leland Bucholz, which also included involvement of a County Extension Agent and a representative from a seed buying company, would be acceptable for a SARE producer grant. SARE and ESAP both emphasize sharing what the producer learns with other farmers. That is usually done via an on-farm field day each year during the grant period. Grant funding usually pays for half of most expenses, including the producer's labor and certain costs for holding field days. Generally only one-third of capital costs related to the project are paid for.

Here are some tips on writing a successful SARE proposal. If you live in MN the tips are applicable to writing an ESAP proposal:

1. Make sure SARE is the right granting program for your project. Take a few moments to review the proposal guidelines, focal areas and evaluation criteria in the Call for Proposals for your region.
2. The strongest proposals clearly demonstrate that the project will be relevant to producers, providing practical answers to their questions. The best way to accomplish this goal is to involve farmers and growers in the planning, design and implementation of the project.
3. Collaborate. SARE encourages projects that examine multiple issues simultaneously. To be successful, such projects must involve a variety of disciplines.
4. Keep the writing simple. Proposals with clear objectives and methods are generally the most successful.
5. Have someone proofread your proposal. A fresh set of eyes can help you identify sections that are unclear and catch typographical errors.
6. Follow directions. Every year, proposals are disqualified because the writer failed to follow general format directions regarding the number of pages, appendices, fonts, spacing etc.

Although producer research projects funded through SARE or ESAP are not free to the producer the funding assistance can go a long way towards reducing the risk of an experiment that might have long term value for the individual farmer, as well as others farmers. There is no reason why beekeepers with a good idea can't have access to the same benefits. To find out more about SARE producer grant funding write to your regional SARE office or SARE headquarters.

National Office, Jill Auburn, SARE Director, USDA-CSREES Stop 2223, 1400 Independence Ave. SW, Washington, DC 20250-2223, 202.720.5384; jauburn@reeusda.gov

*North Central Region SARE 13-A Activities Bldg. University of NE-Lincoln, Lincoln, NE 68583-0840 402.472.7081 ncrsare@unl.edu

*Northeast Region SARE University of VT Hills Bldg. Burlington, VT 05405-0082 802.656.0471 nesare@zoo.uvm.edu

*Southern Region SARE (includes Puerto Rico and the U.S. Virgin Islands) Univ. of GA Ag Experiment Station 1109 Experiment St. Griffin, GA 30223-1797 770.412.4787 groland@gaes.griffin.peachnet.edu

*Western Region SARE (includes the Island Protectorates) UT State University Plants, Soils & Biomet. Dept. Ag Science Bldg., UMC-4865 Logan, UT 84322-4865 801.797.3537 wsare@mendel.usu.edu

Contact ESAP at 90 West Plato Blvd., St. Paul, MN 55107 or visit www.mda.state.mn.us/esap BC

FIND A Mentor
BE A Mentor

We were all virgins once

Ann Harman

It's June and your brand new hive of bees appears to be busy. At least bees are flying in and out the entrance. But you are a virgin beekeeper – new to the hobby of keeping bees. Your main question is – what's going on in there? That question is followed by more questions: Are my bees doing what they are supposed to be doing? How do I know what they are supposed to be doing? What if they are not doing what they are supposed to be doing? What if they are?

Calm down. Stop running around and saying "Now what?"

You have many ways of finding guidance through your first year of beekeeping.

Many local beekeepers' associations have short courses, some just for a day or two, some for several weeks. If you did not attend one of these, it may be too late for this year. But keep it in mind and sign up next year. These short courses are usually given during January, February and March – well before the start of the beekeeping season.

Local associations frequently have summertime field days at a member's apiary.

Beekeepers love to open hives and discuss bees. A field day is an excellent time to ask questions because you can point to something instead of trying to describe it over the phone to a friend. June, July and August are popular times for open-hive field days. Even if you have been keeping bees for a year or two, you will learn something, even if it is how not to do something.

Oh. You did not know there were local beekeeping associations? You can find these and other useful information about university, extension and inspection on the *Bee Culture* web page, www.beeculture.com. Go to Who's Who and you can find really useful information about contacts in your state (along with a lot of other good information). Don't be shy – join your local *and* your state associations. You will benefit both from the speakers at meetings and from the conversation with experienced beekeepers.

Obviously you have a copy of *Bee Culture* in your hands. But do you have a subscription or is this a copy someone gave you? Subscriptions to the two beekeeping journals are the best way to keep up with new information, new equipment, disease problems and solutions, and other important topics. Yes, you can explore the Internet but some of the information is not edited for accuracy. You, as a virgin beekeeper, will have to use some caution in selecting what is worthy and what is weird. That can be difficult without guidance.

More and more local associations are developing mentors for beginning beekeepers. This is a great idea and should be implemented in all associations. With a mentor, you have someone who can guide you, answer some questions, and perhaps be at your side when you inspect your hive. If your local association does not have designated mentors, suggest that it adopt the plan (then be prepared to participate). Mentors make better beekeepers and better beekeepers are precisely what are needed. Pollination of home gardens, orchards, farmer's crops and wildlife forage is essential for our food supply. Hobbyist beekeepers, even those with two hives, can improve production in that large foraging area surrounding the hives, which, by the way, is about 18,000 acres.

Now is an excellent time to establish a beekeeping library. You do not want to become a slave to your bee books but having a good beginning beekeeper's bookshelf is truly useful. You will want to start with a good manual – a book that will instruct you in the basic skills. You may wish to add a book that is basically a reference type, one that will answer assorted odd questions about bees and beekeeping. Literally thousands of books have been written over the centuries about bees and new ones are still appearing. The bee equipment catalogs all carry an assortment of books. You may wish to ask your mentor about which will be of value to you now and in the future.

By the way, do you have a nice collection of equipment catalogs? They are free. In them you will see pictured all sorts of equipment, some useful, others

mere gadgets. But these catalogs will show you what you can expect if you wish to expand your beekeeping activities. Furthermore, you can budget your expenses since the catalogs show prices. Catalogs can expand your beekeeping vocabulary so that when you hear about "drone cell foundation" at a beekeepers' meeting you will know that it exists and perhaps even what it is used for. You can find a nice list of equipment suppliers in the list of advertisers, or in the ads, of this beekeeping journal. A few phone calls will help you enlarge your beekeeping bookshelf.

For those of you who are fortunate to have a mentor, here are some hints on obtaining the benefits of a mentor without being a complete pest. For that all-important question that pops into your head at 11:00 PM, have your mentor's e-mail handy. An e-mail can be opened and answered during rational hours. As you stand there viewing your busy hive, write down your questions. There is no point in phoning to say you forgot what you were going to ask. Delivering a barrage of questions is probably preferable to making six phone calls in one night. Write down the answers so you can think them over before asking the same question twice. Offer to visit the mentor's hive instead of insisting that the mentor visit yours all the time. If the mentor's answer to a question seems completely off the wall ask politely for an explanation. Perhaps you both will understand the problem better.

And so some years pass and you, no longer the virgin beekeeper, decide to become a mentor. How are you going to go about this project in order to be of real assistance instead of someone just showing off an accumulated pile of information? A mentor helps and encourages but does not dictate.

First of all, think back to the first time you stood by your newly acquired bees and how you wondered what was going on. Yes, it may be many, many years back but the virgin beekeeper you choose to help today has just those same questions you had – what is going on in there?

The first thing you, as a mentor, have to realize is that beekeeping has its own vocabulary, a separate language. But so does any sport or hobby. (What's a first down, a bunt, a leg before wicket? Is an eagle a birdie? What's the difference between beating and folding?) Anyway, a mentor has to be careful using beekeeping jargon – the terms used in beekeeping. A good mentor will make certain that the new beekeeper understands the explanation, the answer to a question.

Define terms and repeat them if necessary. Be very careful in your choice of words. I have heard beekeepers refer to supers, meaning brood chambers, and in the next breath say it's time to add supers, meaning boxes for honey. What is a virgin beekeeper to think with this multiple use of one word? The same for the term "swarm box." Is that a box to catch a swarm? I guess that, as beekeepers, we really are rather confusing in our use of terms. If we have been around long enough there is no problem. But the beginning beekeeper cannot go to a dictionary and find out just what is being said.

Mentors, take your beekeeper to association meetings and be certain that your virgin beekeeper is introduced to experienced beekeepers. During the beekeeping season find out if anyone is requeening, making splits, moving bees. All of these activities can benefit the new beekeeper.

A mentor may well ask what benefit is obtained from being a mentor. Well, it has been said many times that the best way to learn is to teach. If you do not understand a particular topic you will not be able to convey anything to a student. Being a mentor may well send you back to the books, particularly after a thoughtful question comes from your new beekeeper. That is certainly a benefit. You now know and understand something much better than before. You have been made to think about how to do something, such as making a nuc, and now know why and where to put what so that the nuc is successful.

Some of the most important words in teaching are – "I don't know." Do not be afraid to say these. But be sure to follow with – "Let's find out." Now there is a good project for both of you. You, the mentor, may look through books and make phone calls. Be sure to tell your virgin beekeeper what you found out and how you found out. Now both of you are all set for the next question.

The apprentice system served man very well

"What is the benefit from being a Mentor?"

through the ages. That system gave us great and beautiful buildings. Stone masons taught future stone masons. Even in this age of computers, all skills cannot come from books. In fact there are times when you wish the computer would read the book so it can figure out what you are trying to do. Being a mentor is becoming a part of the apprentice system. It works very well in beekeeping. Encourage your new beekeeper to become a mentor in the future. In that way the art and craft of beekeeping will continue.

New beekeepers – show your appreciation to your mentor and to your association who encouraged this way of helping new beekeepers. And mentors—show your appreciation to those virgin beekeepers who are trying to become good beekeepers.

Terms That Mentors Understand but Must Be Explained to Beginning Beekeepers

- Super – does not mean "wonderful!"
- Brood – does not mean "think deeply"
- Cell – nothing to do with jail
- Larva – term taught in high school biology but now forgotten
- Pupa – see larva
- Foundation – not cement blocks holding up a house
- Top Bar – not Topless Bar
- Comb – not spelled or pronounced "cone" and does not improve hair
- Excluder – it is perfectly polite to do this
- Rabbet – does not have long ears and fluffy tail
- Bee Escape – not a jailbreak
- Thin Surplus – not an oxymoron
- Queen Cup – not for afternoon tea
- Splits – not a gymnastic term
- Draw Comb – not done with pencil and paper

Ann Harman goes all over the world mentoring new beekeepers and also teaches close to her home in Flint Hill, Va.

by Keri Hayes

The Artists

Jonathan Taylor

Lela Dowling

If you've never thought of bees as humorous, think again. Just try spending a couple of hours with Jonathan Taylor and Lela Dowling and its difficult not to find yourself in stitches. Artists by day, beekeepers on the side, these two are the personalities behind the cartoons that have graced the pages of *Bee Culture* for the past five years.

It started in 1996, when Dowling's beekeeping research brought her to a Sonoma County Beekeeper's Association meeting. At the time, Taylor was writing an advice column, "Buzz Beesley," for the association's monthly newsletter. Dowling and Taylor hit it off – "we had the same twisted sense of humor," Taylor notes – and started envisioning cartoons for the newsletter. "We just had a wonderful rapport," Dowling says. Taylor would call her up with an idea for a cartoon, Dowling would sketch out her interpretation and send it over to him, and inevitably Taylor would be amazed at how closely Dowling depicted just what he'd envisioned. A few edits later, they'd have the finished product – a hilarious cartoon playing on everything from the trials and tribulations of adolescent bees to the daily ins and outs in the life of a bee. Many of the cartoons poke fun at humans more than bees; for example, one in which a mother bee tells a father bee "Dear, I really think it's time you talk to Junior about the birds and the people."

"It's people who are funny, not necessarily bees," says Taylor.

Taylor has plenty of people and bee experience to draw on. After a friend recruited him in 1990 to help remove bees from houses, Taylor started keeping the bees he removed and, before he knew it, he was hooked. For 10 years Taylor ran a bee business – he offered bee removal services, pollination services for farmers, and of course ran a honey business on the side. "I dealt in fear," Taylor says of his bee removal service. He points to a survey that listed Americans top fears; insects was number three on the list, with bees leading the pack. Taylor also did a fair share of educational outreach – both in addressing the concerns of his clients and in presenting educational programs at Sonoma County schools and fairs.

Taylor's honey business was successful, but "there's only so much honey that people will buy," he says. His "Bee Barf" brand definitely caught shoppers' attention; one New York businessman was so enthralled with the funnily named sweet pots that he ordered a whole case to be shipped out overnight to dispense as gifts for clients.

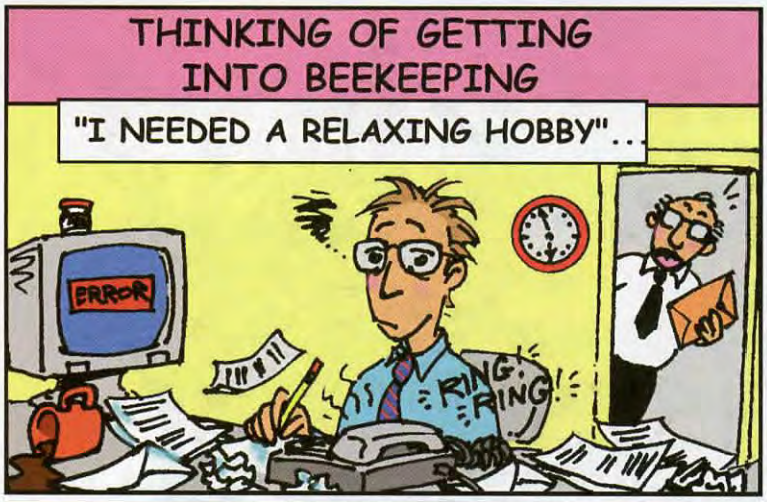
Taylor has shifted his focus onto his woodworking and copper sculpture creations. He says that, at times, he felt tied down by his beekeeping business. "I'm basically just a lazy guy," Taylor jokes, "and bees don't wait for you if you want to take a beach day."

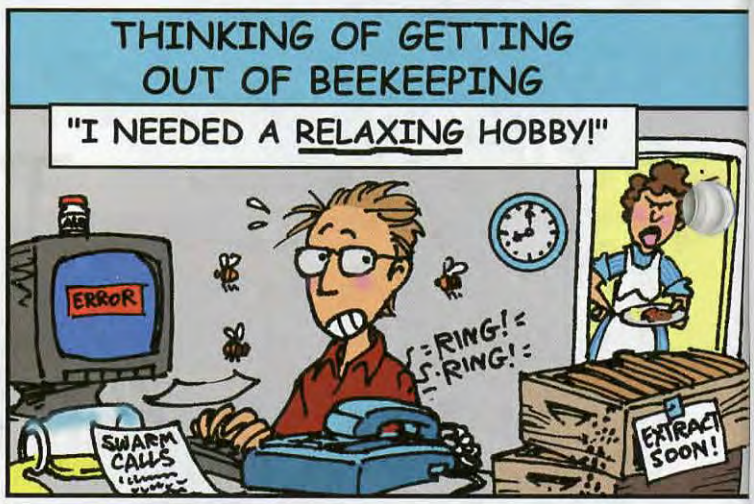
Dowling has her own beekeeping and cartooning history, the latter of which reaches back into her youth. "I've been drawing every since I was a kid," she says. After college, she spent five years as a comic book artist, working with small, independent comic publishers. These days her livelihood comes from her work as a commercial illustrator – Dowling's portfolio includes everything from fantasy illustrations to 2D computer animation to, of course, cartoons and characters.

Dowling's foray into beekeeping began seven years ago when a former boyfriend impulsively decided to purchase some bees and explore beekeeping. Dowling was roped into doing a lot of the research, and soon she was a serious hobby beekeeper. For years she's kept about 12 hives at Imwalle Gardens, a fruit and produce stand close to downtown Santa Rosa. Dowling gives the owners honey and pollination services in exchange for a happy home for her hives. A recent move has put Dowling about half an hour away from her bees, so she's now contemplating their future.

Taylor and Dowling are also together contemplating their cartooning future. The two have plenty of ideas for cartoons, bee-related and otherwise. Although they haven't published their collaborative efforts outside of the beekeeping world, many of their ideas would certainly translate to other audiences. But they both freely admit that it's a bee-eat-bee world out their in the cartoon publishing business, so for now Taylor and Dowling are sticking with their bee cartooning niche.

Continued on Next Page


THINKING OF GETTING INTO BEEKEEPING
"I NEEDED A RELAXING HOBBY"...
ERROR
RING! RING!


THINKING OF GETTING OUT OF BEEKEEPING
"I NEEDED A RELAXING HOBBY!"
ERROR
RING! RING!
SWARM CALLS
EXTRACT SOON!

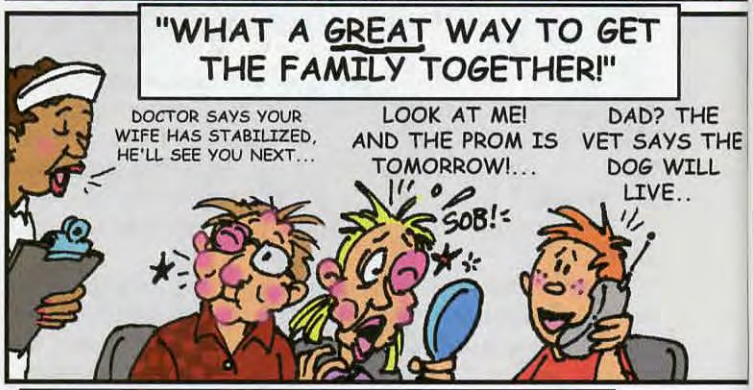

"AN ENDEAVOR THAT WOULD MAKE A FEW EXTRA DOLLARS"...
HONEY SALES
CANDLE SALE


"AN ENDEAVOR THAT WOULD MAKE A FEW EXTRA DOLLARS!"
HONEY SALES
CANDLE SALE
OVERDUE BILLS

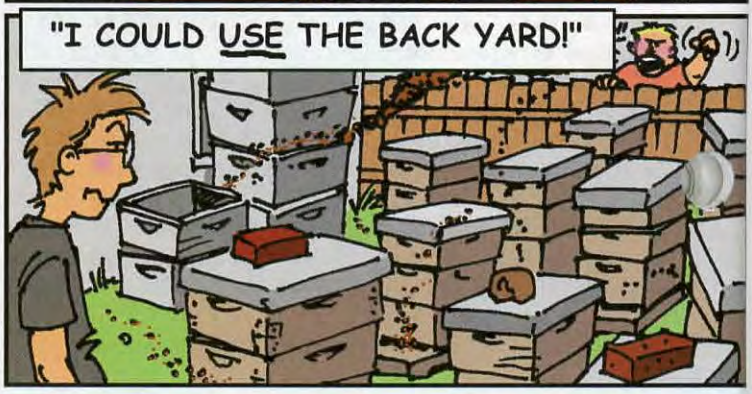

"I LOOKED FORWARD TO DOING SOMETHING NATURAL AND ORGANIC"...
WHAT ARE YOU LOOKIN' AT?..

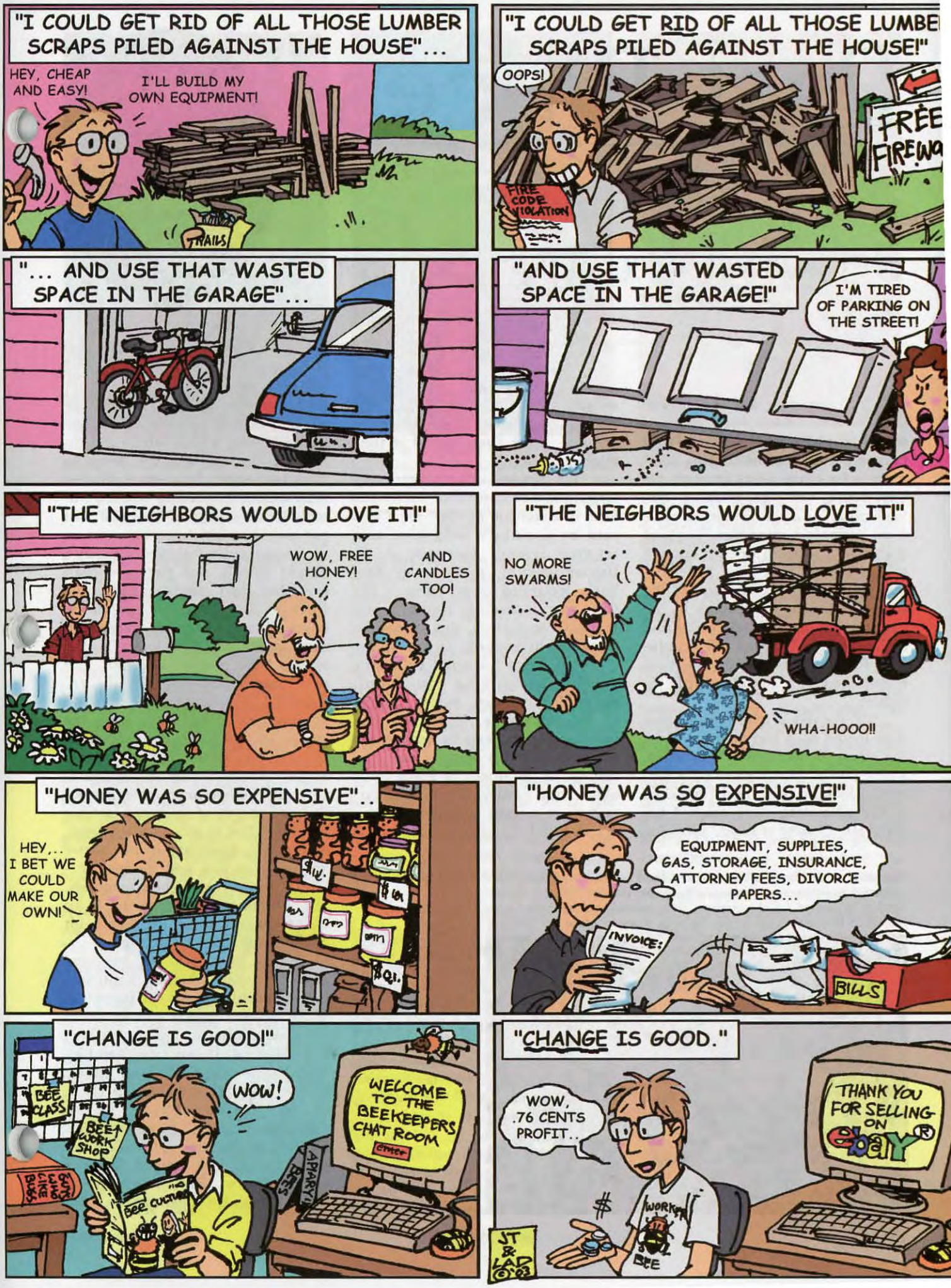

"I LOOKED FORWARD TO DOING SOMETHING NATURAL AND ORGANIC!"
MITEOCIDE
HIVE BEETLE NUC
RAID FOR ANTS


"WHAT A GREAT WAY TO GET THE FAMILY TOGETHER"...
BEES ARE OUR FRIENDS!


"WHAT A GREAT WAY TO GET THE FAMILY TOGETHER!"
DOCTOR SAYS YOUR WIFE HAS STABILIZED, HE'LL SEE YOU NEXT...
LOOK AT ME! AND THE PROM IS TOMORROW!...
SOB!
DAD? THE VET SAYS THE DOG WILL LIVE..


"I COULD USE THE BACK YARD"...
HMM...


"I COULD USE THE BACK YARD!"


"I COULD GET RID OF ALL THOSE LUMBER SCRAPS PILED AGAINST THE HOUSE"...
HEY, CHEAP AND EASY!
I'LL BUILD MY OWN EQUIPMENT!
TRAILS
"I COULD GET RID OF ALL THOSE LUMBE SCRAPS PILED AGAINST THE HOUSE!"
OOPS!
FREE FIREWO
FIRE CODE VIOLATION
"... AND USE THAT WASTED SPACE IN THE GARAGE"...
"AND USE THAT WASTED SPACE IN THE GARAGE!"
I'M TIRED OF PARKING ON THE STREET!
"THE NEIGHBORS WOULD LOVE IT!"
WOW, FREE HONEY!
AND CANDLES TOO!
"THE NEIGHBORS WOULD LOVE IT!"
NO MORE SWARMS!
WHA-HOOO!!
"HONEY WAS SO EXPENSIVE"..
HEY,... I BET WE COULD MAKE OUR OWN!
"HONEY WAS SO EXPENSIVE!"
EQUIPMENT, SUPPLIES, GAS, STORAGE, INSURANCE, ATTORNEY FEES, DIVORCE PAPERS...
INVOICE:
BILLS
"CHANGE IS GOOD!"
BEE CLASS
BEE WORK SHOP
WOW!
WELCOME TO THE BEEKEEPERS CHAT ROOM
ENTER
APIARY
BEE CLOTHES
"CHANGE IS GOOD."
WOW, .76 CENTS PROFIT..
THANK YOU FOR SELLING ON ebay
WORKER BEE
JT & LAD

Past Pieces

The Quinby Smoker: It Changed Beekeeping Forever

Wyatt Mangum

On a Saturday a long time ago in May 1875, beekeepers said goodbye forever to a beloved friend. That person served the beekeeping community for many years through his experience, writings, counsel, and leadership. As a young man he came from humble beginnings, working nights in a sawmill to earn enough money for his first hive. Nevertheless he rose to become one of the most prominent beekeepers in the country. Yet his most admirable and endearing quality was his reputation for universal kindness, best exemplified by a revealing little incident.

"On the day of his funeral, some bare-footed boys had followed down the street to the front of the house, where one of them turned up a sorrowful-looking face, and remarked to the officiating clergyman: 'I am sorry Mr. Quinby is dead;' on being asked why, he replied, 'He gave us apples, and pears, and sometimes grapes.' They then asked if they might see him."

This glimpse into that virtually forgotten day comes to us in the form of a miracle in itself for it was told by Quinby's long-time and trusted friend, Captain J. E. Hetherington of Cherry Valley, New York. Wounded three times in the Civil war, incredibly Hetherington managed to survive, though his life remained in jeopardy for two years.

Ever since I started collecting antique beekeeping equipment, some 30 years ago, Moses Quinby of St. Johnsville, New York has been one of my favorite beekeepers of the nineteenth century (see Figure 1). In my quest to learn more about him, I found one bit of information in a most unexpected way.

In 1853, Quinby published the first edition of his now exceptionally rare book, *Mysteries of Beekeeping Explained*, a book whose haunting title I'm sure had the power to draw beekeepers to it – as it did me. After a long frustrating search, I finally found a copy of his book, but not just any copy. A previous owner, who apparently followed Quinby's career closely and perhaps even knew him, had pasted on the inside cover his obituary from a local newspaper. That obituary of course did not appear until 1875, long after the book's 1853 publication date. The article gave personal details, recounted Quinby's beekeeping achievements, and gave even his stance on two compelling social issues of his time. "He was thoroughly identified with the Anti-slavery and Temperance movements." So I had stumbled upon not just his first book, but by an unknown hand, one with a summary of his entire life, as a person and beekeeper – all under one cover – how astonishing. Admittedly holding such an encapsulation of his life was a bit chilling and most humbling.

As we learned in the previous article, Quinby's lasting contribution to apiculture was the invention of the bellows smoker in a practical form. According to his son-in-law, L. C. Root (again don't confuse him with the Roots of Medina, Ohio), Quinby invents his smoker in 1873. In 1874, he advertised it in the *Gleanings in Bee Culture*, (now *Bee Culture*), at the time a fledgling bee paper having just started the year before. Also in 1874, he advertised his smoker in the *American Bee Jour-*

Figure 1: *A pantheon of beekeepers (and relatives) of the 1800s collected together in a arare photographic collage. On the center-right is Reverend L.L. Langstroth, who devised our standard hive based on the bee space. Moses Quinby, inventor ofthe bee smoker, is on the center-left. Hetherington is above Langstroth and a little to the left. L.C. Root is next to Quinby on the left. This picture encompasses many more beekeepers, but only the middle of it is seen here.*

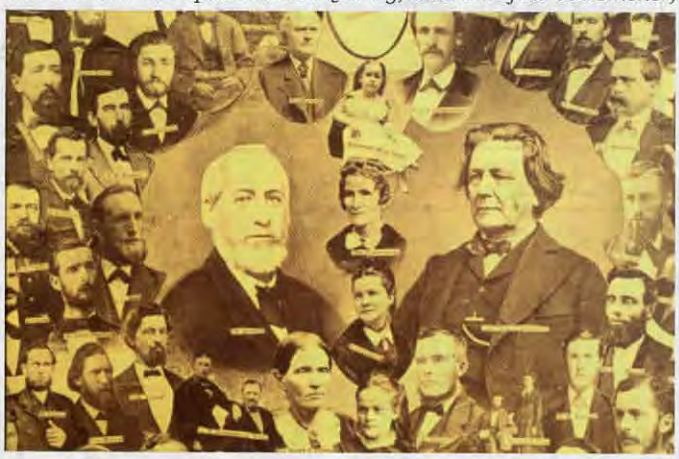


Figure 2: *An early Quinby smoker. The smoker has a solid pipe connection between the bellows and firebox. The round hole in the bellows, covered internally by a piece of tin, is a one-way air valve.*

Figure 3: *A Quinby smoker as sold by L.C. Root. Note the cast iron brackets attaching the bellows to the firebox. Also the lower bracket and the bottom of the smoker are made of one piece of iron. Why this odd construction?*

Figure 4: *The label in the valve hole of a Quinby smoker.*

nal, then a more established periodical, having started in 1861, though it was not published during most of the Civil war. Given the advertisement of his smoker and presumably its sales distributions, something was noticeably absent. Quinby did not care to patent his smoker, and essentially gave it to the beekeepers of the country to copy, a sentiment in keeping with his philosophy. As Hetherington put it, "Whenever he obtained any new idea that would benefit others as well as himself, it was forthwith given to all who would receive."

The Quinby smoker was a huge advancement and worked well when the beekeeper pumped the bellows. However the old bee literature voiced a rather common complaint. The fire went out when the smoker was set down, a problem attributed to the lack of draft through the firebox. From my Quinby smokers, I can see how this would happen. The earliest one, as sold by him, has a solid connecting pipe between the bellows and the firebox. While this connection gave a stronger blast of smoke when the bellows are pumped, it prevented a passive draft of air through the fire when the bellows were not operated (see Figure 2).

With the solid connection, another problem can occur. Upon expansion of the bellows, hot air and flame can be drawn into them. With repeated use, the bellows can become scorched and burned on the inside. Apparently Quinby accounted for this problem because he put a tin valve in the bellows, allowing a one-way airflow to refill them. The front board of bellows had a circular hole, covered from the inside by a small piece of tin that could move slightly. When the bellows expanded, the tin let in the air. Upon compressing the bellows, the internal pressure pushed the tin against the board, making a seal, and forcing the air through the firebox.

Since the invention of his smoker came so late in Quinby's life, little time remained for him to improve it. Just look at the brief time-line. In 1873, he invented his smoker; in 1874, it's advertised for sale; in 1875, he passes away. So it was left to others to make improvements on Quinby's original design, one of which was L. C. Root, Quinby's son-in-law (see Figure 3).

Although changed somewhat, the smoker he sold still bore the Quinby name. It appeared on a paper label in the circular valve hole in the bellows, but instead of tin the valve was made of leather. A close-up of one version of the label is seen in Figure 4. L. C. Root also addressed the draft problem. Although the solid connecting pipe appears to remain in Figure 3, it actually has a small opening underneath to let in more air.

This modified Quinby smoker also has some unusual construction features. The upper and lower brackets holding the bellows to the firebox are made of cast iron. The lower bracket and bottom of the smoker are even molded from one piece of cast iron. For a long time I wondered, why this odd construction? My answer came when I found a patent issued to L. C. Root on March 11, 1879 (see Figure 5). The lower bracket is attached to the bellows by screws. This construction allowed easy removal of the bottom of the smoker including the grate for easy cleaning, a feature claimed in the patent. Figure 6 shows one of my Quinby smokers disassembled for cleaning.

Of my three Quinby smokers as made by L. C. Root, all have this type of construction. Furthermore it's consistent with the pictures of the smoker in bee books, journals and supply catalogs. And thus I use its particular construction to help identify these rare smokers, especially if their labels are missing.

Looking carefully at the Quinby smokers shown so far, one sees they are all hot-blast smokers,

Continued on Next Page

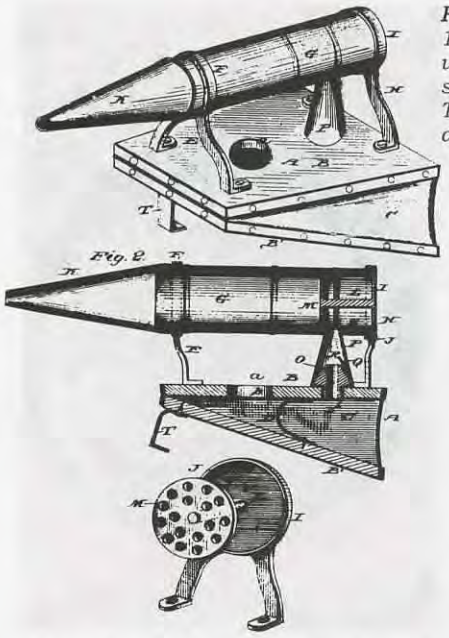


Figure 5: The patent issued to L.C. Root in 1879. Note that the grate (the circular piece with the holes), along with the bottom of the smoker, and the lower bracket are all one piece. This patent revealed why the smoker had such an unusual construction.

where the air blows directly through the fire, making a hot blast of smoke. As we learned in the previous article, some smokers were cold-blast, where the air essentially went around the fire, drawing out a cooler blast of smoke. Without a strong blast of air coming through the fire, a cold-blast smoker could be hard to light.

To make a cold-blast smoker that was easy to light, L. C. Root redesigned the Quinby smoker to be *both* hot and cold blast, calling it a double-blast smoker (see Figure 7). Notice the two pipes connecting the bellows and firebox. The lower one is the hot-blast pipe and the upper is the cold-blast pipe. The smoker is lit in hot-blast mode and then switched to cold-blast mode for smoking the bees. So how do you change back and forth between hot and cold blast? Well, just above the hot blast pipe on the bellows is a small switch for making the change. Imagine that, a smoker with a switch on it – quite unusual (take another look at Figure 7).

As best as I can determine the single and double draft smokers initially came in three sizes with diameters of three and a half, two and a half, and two inches. By 1888, L. C. Root sold his business to W E. Clark of Oriskany, New York. Clark continued selling the smokers and other beekeeping supplies, though I'm not sure for how long. Judging from the only two catalogs I have from him (1888 and 1890), the cold blast feature was dropped unless requested, and later some smokers were fitted with a hinged funnel, probably to compete with other smokers having that feature.

For price comparisons we can look in the April 1896 edition of the A. I. Root Company catalog from Medina, Ohio. A large Quinby single-blast smoker cost $1.25. A small one sold for 50 cents, but keep in mind that's quite a dainty smoker. On the other hand, the popular Clark cold-blast smoker, seen in a previous article, also cost 50 cents. That made the large-sized Quinby a bit expensive. Also Bingham smokers were being advertised heavily and were competitively priced. The Quinby smoker could not keep up and eventually its production ceased. Regrettably most of them fell victim to the ravages of time and neglect. The surviving ones have become rare pieces of our beekeeping history and should be preserved and cherished.

At the time of Quinby's death, Captain Hetherington, perhaps drawing upon his courage steeled in the Civil war, saw past the grief and despair of the moment to make a prophetic and inspiring comment. "I predict that his invention of a smoker, combining the principle of an upright tube and bellows, will, in the near future, be in the hands of every beekeeper in the land."

And now from millions of beekeepers since then, ranging from distant places around the world, one can fairly ask, "Has a truer prediction ever been made?" BC

Acknowledgments

The author thanks Suzanne Sumner for her comments on the manuscript.

Dr. Wyatt A. Mangum is a honey bee scientist, life-long beekeeper and part-time mathematics instructor at Mary Washington College, Fredericksburg, Virginia 22401-5358, wmangum@mwc.edu

Sources

Root, A.I. 1891 *The ABC of Beekeeping.* A.I. Root Company, Medina, OH.

Root, L.C. 1883 *Quinby's New Beekeeping.* Orange Judd Co. New York, NY.

***Figure 6:** A Quinby smoker disassembled for cleaning. Now it's easy to scrape out the soot from the tube. Cleaning the grate is also easy, and now it's even easy to clean under it. All that seemingly odd construction had a definite purpose and was actually quite clever. It just wasn't apparent since such smoker disassembly is unheard of today. Also note the opening in the pipe connecting the bellows and firebox to let in air between bouts of smoking the bees.*

***Figure 7:** Two rare and exotic Quinby double-blast smokers – in different sizes no less! Finding just one of these smokers is quite difficult unless one is very lucky.*

?DO YOU KNOW?

Disease Symptoms

Clarence Collison
Mississippi State University

The first line of defense in protecting honey bee colonies from bee diseases is the beekeeper's ability to detect and recognize early disease symptoms. Every time a beekeeper breaks down a honey bee colony, it is important that the brood area be checked for any symptoms that might be associated with an unhealthy condition. Being able to recognize the early symptoms of a serious disease and knowing what to do about it is an important aspect of successful colony management. Failure to identify even the minor diseases can lead to lower production and weakened colonies.

Please take a few minutes and answer the following questions to determine how well you understand the biology and characteristics of bee diseases, their method of spread and control.

The first 11 questions are true and false. Place a T in front of the statement if entirely true and an F if any part of the statement is incorrect. Each question is worth one point, unless otherwise indicated.

1. ___ Colonies with chalkbrood have reduced problems with American foulbrood and European foulbrood.
2. ___ Spores associated with American Foulbrood and chalkbrood disease remain viable in the hive for several years.
3. ___ Sacbrood, chalkbrood, and European foulbrood are most commonly found in the Spring.
4. ___ Sacbrood rarely kills a colony.
5. ___ Larvae with European foulbrood usually die when they are four to five days old.
6. ___ Finding dead larvae of all ages within a honey bee colony would indicate that the brood was killed by either sacbrood or European foulbrood.
7 ___ Larvae that die from American foulbrood have tracheae that appear as fine silvery tubes immediately below the skin, especially as the larvae turn brown.
8. ___ Severely infected American foulbrood and European foulbrood combs have a mottled appearance due to a mixture of healthy capped brood, cells containing the remains of diseased larvae, and empty cells.
9. ___ *Melissococus pluton*, the causative agent of European foulbrood, overwinters on the sides of the cell wall or in feces and wax debris on the bottom board of the hive.
10. ___ Larvae die of chalkbrood after their cells have been capped.
11. ___ A good nectar flow speeds up the recovery of European foulbrood, American foulbrood, nosema and sacbrood.

(Multiple Choice Questions, 1 point each)

12. ___ When purchasing used beekeeping equipment that has been in storage, the greatest risk to establishing new colonies in the equipment is:
    A. European foulbrood
    B. Tracheal mites
    C. American foulbrood
    D. *Varroa* mites
    E. Sacbrood
13. ___ Chronic bee paralysis and acute paralysis are caused by a:
    A. Fungus
    B. Rickettsiae
    C. Protozoan
    D. Virus
    E. Bacterium
14. ___ If a colony is exposed to American foulbrood, what is the shortest possible time before a colony will show recognizable symptoms?
    A. 5.5 days
    B. 10.5 days
    C. 12.5 days
    D. 21.5 days
    E. 35.5 days
15. _____ is caused by the bacterium *Pseudomonas aeruginosa* and it destroys the connective tissues of the thorax, legs, wings and antennae of adult honey bees. (1 point)
16. Please explain how you would differentiate between a healthy and unhealthy honey bee larva. (2 points)
17 Requeening is often recommended for colonies that have European foulbrood, chalkbrood and sacbrood. Explain why this is a useful approach. (2 points)
18. What are the primary ways in which brood diseases are naturally spread between colonies within an apiary? (2 points)
19. What are the two newest antibiotics being considered for the control of American foulbrood? (2 points)
20. Please examine the two diagrams below and indicate what killed the larva (A) and pupa (B). (2 points)

A. B.

ANSWERS ON NEXT PAGE

?Do You Know? Answers

1. **True** Research has shown that colonies with chalkbrood have less American and European foulbrood. This effect is caused by the presence of linoleic acid which suppresses the development of foulbrood bacteria. Chalkbrood has a high level of this acid.
2. **True** Tests have shown that chalkbrood spores are viable for at least a year in pollen samples and over 15 years inside a beehive. American foulbrood spores have been shown to be viable for at least 35 years in the scale stage in the hive.
3. **True** Chalkbrood, sacbrood and European foulbrood are most commonly found in the Spring of the year when colonies should be building up to maximum populations. European foulbrood also can be found in the Fall, but it is not as common as in the Spring. Chalkbrood appears primarily in the Spring, although outbreaks in the Summer and Fall can occur.
4. **True** Death of a colony by sacbrood is rare. Most colonies appear to recover spontaneously from the disease. Beekeepers rarely consider sacbrood a serious threat since the symptoms are generally observed in a few colonies and only during late Winter, Spring and early Summer.
5. **True** European foulbrood generally kills larvae 4-5 days old while they are still coiled in the bottom of the brood cells.
6. **False** Finding dead larvae of all ages within a honey bee colony would normally indicate chilled brood or possibly death due to insecticides. The primary symptom associated with chilled brood is brood of all ages being killed at the same time. No single brood disease kills equally in the egg, larval or pupal stages.
7. **False** When a larva dies from European foulbrood, not American foulbrood, the tracheae appear as fine silvery tubes immediately below the skin, especially as the larvae turn brown. This symptom is highly characteristic of European foulbrood.
8. **True** A severely infected American foulbrood comb has a mottled appearance due to a mixture of healthy capped brood, cells containing the remains of diseased larvae, and empty cells. This condition is often refereed to as the "pepperbox appearance." When the infection is light, the pepperbox symptom may not be apparent. If European foulbrood is widespread in a colony, the combs also take on a pepperbox appearance.
9. **True** *Melissococus pluton*, the causative agent of European foulbrood, is a nonspore-forming bacterium that survives the Winter within the hive on the sides of the cell wall, or in feces and wax debris on the bottom board.
10. **True** Spores of *Ascosphaera apis*, the fungus that causes chalkbrood are ingested with larval food. Larvae are most susceptible if they ingest spores when they are three to four days old and then they are chilled briefly two days later. The spores germinate in the hind gut, but mycelial (vegetative) growth is arrested until the larva is sealed in its cell. Infected larvae usually die within the first two days after they have been sealed in their cells. They are at first somewhat fluffy and swollen, taking on the shape of the cell, but later they shrink and become hard. By this time the cappings have frequently been removed by the bees.
11. **False** A good nectar flow will usually speed up the recovery of European foulbrood, sacbrood and may aid in helping a colony recover from nosema. Field flights and brood emergence are most helpful with nosema. Nectar flows help with recovery since it forces the bees to catch up on house cleaning chores. With American foulbrood, the bees are unable to remove the scales (spore reservoirs), so once the equipment is contaminated with spores, the colony is doomed.
12. C) American foulbrood
13. D) Virus
14. C) 12.5 days
15. Septicemia
16. Healthy larvae have a glistening, pearly white appearance, whereas, unhealthy larvae are no longer white, with all or parts of the larvae turning dull white, yellow, creamy brown and eventually becoming dark brown or black.
17. Since European foulbrood, chalkbrood and sacbrood are stress diseases, requeening accomplishes two things: it gives the colony a more prolific queen which may be genetically less susceptible to the diseases and permits a time lag between brood cycles that allows the house bees to remove diseased larvae from their cells.
18. Robbing, Drifting of bees between colonies
19. Tylan Soluble® (Tylosin Tartrate) Lincomix Soluable Powder® (Lincomycin HCL)
20. A) American foulbrood B) American foulbrood

There were a possible 25 points in the test this month. Check the table below to determine how well you did. If you scored less than 12 points, do not be discouraged. Keep reading and studying- you will do better in the future.

Number Of Points Correct
25-18 Excellent
17-15 Good
14-12 Fair

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

Colony Spring Operation

It's all geared toward efficiency.

Walt Wright

In this segment of survival traits an ambitious agenda is planned. The operational changes prompted by season advancement and swarm preparation will be integrated for the Spring season. In this article, we take the next step and offer a hypothesis for the "whys" of what we see happening in the Spring season. It is not possible to look at a frame of bees and guess what each bee was doing before you opened the hive. The hypothesis presents conclusions drawn from the effects we do see.

In April a brief introduction was provided to the full season honey bee internal operations that support survival. In May condensed description of survival traits applied during swarm preparations were described. The survival considerations of the existing overwintered colony were described for both reproductive and overcrowding swarms. In this segment and future articles, discussion of overcrowding swarms will be discontinued for two reasons. It is assumed that the point has been made that overcrowding swarms are generated by beekeeper mismanagement, and secondly, in the nectar management approach, overcrowding swarms are not a problem. A key consideration of nectar management is the deliberate provision of space very early for colony growth in brood volume and population. It should come as no surprise that this series on survival traits is written to promote the concepts of nectar management, which are based on those survival characteristics. Nectar management is a reliable swarm prevention approach with the side effect of increasing honey production.

The descriptions of colony activities or "internal operations" presented to this point are consistently repeatable in all kinds of seasons. Some seasonal variations in timing can be traced to forage availability in that location, that season. The indications reported until now can be substantiated with anecdotal observations. No scientific tests have been performed to verify any of the reported observations. The writer of this series is just another beekeeper who does his own thing, by himself, in the boondocks. He is not staffed to mark and count bees. Those are very poor credentials for taking on the bulk of beekeeping academia, but it's important enough to me that I try.

The seasonal colony operations and the reproduction operations will be integrated as seen in Central/ Middle Tennessee. The composite internal operations will be limited to the early season build up, Spring swarming season, and subsequent beginning of the main flow. The hypothesis parts fit together well and explain some vague elements of the popular literature. The following descriptions may not be 100% correct – some interpretations of observations is involved. But we believe it to be a fairly accurate presentation of what is happening in your beehive in the Spring season.

The summary chart presented includes several controversial entries. Elements of the following hypothesis are factored in. The changes described in earlier articles are based on solid observation, but elements of the hypothesis deal with worker bee duties. Although the duties are supported by observation, the evidence is circumstantial. A full explanation of any one of those would take more print space than available for a single article. For the most part, even anecdotal evidence will not be included. The intent here is to provide an overview of Spring colony operations tailored to survival and reproduction. Subsequent articles may provide anecdotal evidence of the more controversial parts.

The development schedule by calendar dates is for the Alabama/ Tennessee state line. Climatic conditions locally are close to median conditions for the European honey bee races. Unlike the northern tier of states, where bee literature emanates, we have a better opportunity to see operations as they might be in their origins. One northern "expert" told me he did not believe the colony saved a reserve of capped honey through the swarm season. He would only need to tend bees for one season in Tennessee to revise his opinion.

The first horizontal section of the summary chart is the period dedicated to generation of the reproductive swarm. This period is actually divided into two phases. In the early build up the emphasis is on honey consumption for brood nest expansion. Swarm preparations are dependent on many variables such as colony overwintered strength, forage availability, flying weather, etc. There is, therefore, no calendar reference for the start of swarm preps. Stronger colonies, under good environmental conditions, might start swarm preps in late February, and weaker colonies not start at all.

In addition to the opinion that this period is dedicated to reproduction, this hypothesis has a more controversial aspect. Anecdotal evidence suggests that nurse bees graduate to foraging capability, *with-*

Continued on Next Page

SPRING ... Cont. From Pg. 53

out passing through house bee duties. This is a major divergence from literature descriptions, but makes good sense from an efficiency perspective for two good reasons. During the build up they are not storing honey. Nectar is used for feed. There is no need for nectar processors or wax makers. Second, early season foraging opportunities are limited to short duration periods. To be able to send nearly the whole work force to the field during those short windows of opportunity is a definite asset. The colony operations are tailored for efficiency There should be little disagreement that wax makers and nectar processors are not needed during the build up period, but the shortage of house bees is not limited to those duties. When you look for other clues, you will find them.

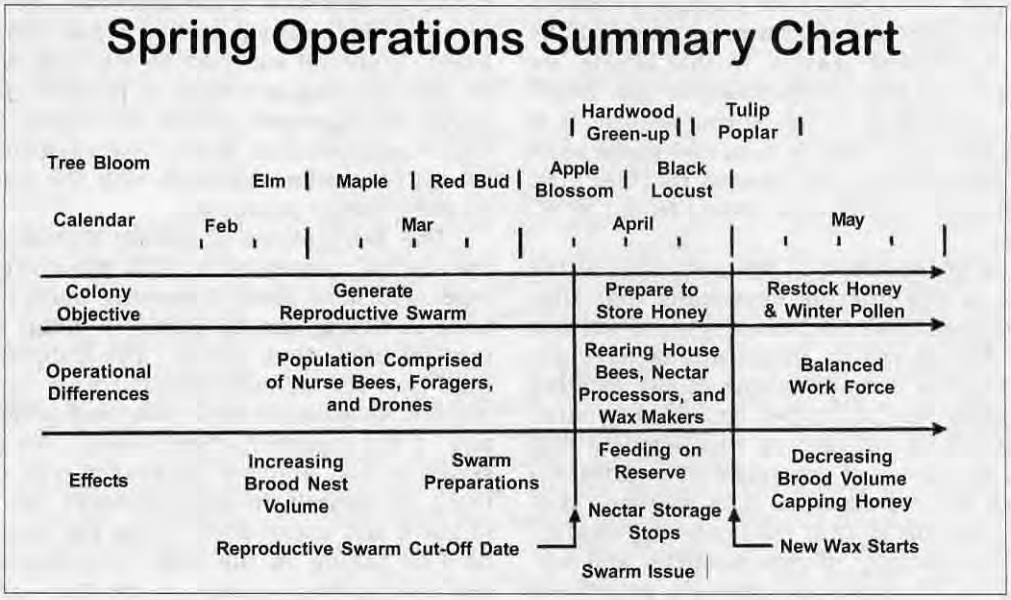
It was mentioned above that the parts of this hypothesis fit together well. The minimal presence of house bees above nurse bee age during the build up provides an introduction to the storage lull the last three weeks of April. At reproductive swarm cut off the colony must generate the house bees to support restocking Winter provisions. The storage lull is a strong three weeks, or a worker brood cycle. We conclude that the colony internal operations for this period are dedicated to rearing the house bees for storing. When the colony emerges from the full brood cycle with a full complement of house bees, they are prepared to store honey at efficient rates. The wax makers and nectar processors are available to support nectar foragers with curing and capping honey. We have no knowledge on how many house bees are required to support a nectar forager. If that data is in the popular literature, we missed it. Intuitively, we would guess there should be more house bees than foragers for the "main flow." Tongue drying sounds like slow work and wax makers have a reported 10 day delay to secrete wax.

In a declining brood volume there would always be fewer house bees than foragers. That is, if we assume about equal time as house bees and foragers. Each brood cycle is smaller than the last, and house bee duties come first. With standard management brood nest reduction is underway in the swarming season. With nectar management brood nest reduction starts early in the storage lull (about mid April).

The colony investment in a full brood cycle of rearing house bees is another indication of efficiency in survival tactics. This is done at the peak of woodland forage availability. Note on the chart that black locust and tulip poplar overlap at this time. If the build up population is heavily weighted with foragers, (very few house bees), then a full brood cycle of house bees makes sense. For reasons we will not go into here, the accumulation of foragers during the build up to swarm also makes sense. A concentration of foragers has benefits for both the swarm and the parent colony.

When the colony has wax making capability at the beginning of the "main flow," honey accumulation starts in earnest. This is the period after May 1 on the chart. We put quotes on "main flow" because it is *not* a function of field nectar availability. Locally, field nectar has been plentiful for six to eight weeks prior to that time. The internal operations of the colony in *preparing* to store honey have been completed at the appearance of new wax. Contrary to popular opinion, the appearance of white wax is not related to field nectar availability.

We are aware that all entries on the summary chart have not been described above. The entries on the chart were intended to be self explanatory The top section identifies objectives of the colony, the middle section reflects colony operations, and the bottom section of effects identifies the indications that can be seen by the beekeeper. If you have questions or comments, I am never too busy to talk bees. BC



Walt Wright is a sideline beekeeper and enthusiastic experimenter, who lives in Elkton, Tennessee.

ON MAKING SENSE

Rules Of Thumb

Richard Dalby

"It's the exception that proves the rule." You've probably heard that one before. Like most old sayings, it carries a certain air of authority. But what does it mean? If a rule has exceptions, is it still a rule? I suppose it all depends on the meaning of the word *rule*. Words are sometimes slippery things, particularly so when they have a number of different meanings. My dictionary gives 11 possible meanings for the word *rule* when it is used as a noun. The one that seems to fit best here is this one: "something that usually or normally happens or obtains; the customary or ordinary course of events." Given this meaning, the old saying makes sense. It is using the word *rule* to mean a general rule, a rule with occasional exceptions, rather than to mean a hard-and-fast rule, a rule with no exceptions.

Does all of this have something to do with beekeeping, you may be wondering. Yes, it does. Most beekeeping books contain rules about bees and their behavior. Rightly so. If the natural world did not proceed in an orderly fashion, it would be difficult to write anything meaningful about it. Nonetheless, as many beekeepers have discovered, bees don't always do what the books say they will do. This was brought home to me last Winter out in my apiary as I checked my hives in the January sunlight. I noticed two things that are exceptions to the general rules of beekeeping.

First, and this was an easy one to notice, a bee stung me on the thumb as I was removing a lid to check the location of the Winter cluster. As the bee books state, bees typically have less venom when wintering. I know this to be true from my own experience. Winter stings are usually very mild. But this sting on my thumb was one of those that gets your attention, to the point that I held some snow on it for a time to alleviate the sensation. Well, I now know for a fact that not all wintering workers have less venom. Apparently some, for some reason, remain fully armed even when snow covers the scene.

The second strange thing I noticed there among my hives on a January day was that one hive still had at least a few drones in residence. I know this because there were several drones near the hive entrance on the landing board seemingly enjoying the warmth of the afternoon sun along with a bunch of worker bees. No, the workers weren't kicking those drones out of the hive belatedly, because I watched as a drone came out of the entrance, strolled about a bit, and then went nonchalantly back inside the hive, with no attempt on the part of any worker bee to stop him.

Finding drones in a hive out of season can be an indication that something is amiss. Perhaps

Rules Of Law

Larry Goltz

I sold honey at the Redding, California Farmer's Market where certification meant its rules and regulations are determined and enforced by the State Department of Agriculture in Sacramento. I should say that I did sell honey, until we had three years of failure of our premium crop from yellow star thistle. I continue to receive marketing regulation updates despite the fact that I no longer sell honey on the market. I have changed my address as well, but the market information continues to arrive; apparently the Post Office considers it important that I continue to receive their mail.

Actually, I do read the correspondence, but I don't understand much of what to me is incomprehensible. The latest Informative Digest/Policy Overview out of Sacramento is apparently meant to clarify some earlier directives which I didn't understand either.

I don't mean to ridicule the efforts of these sincere and intelligent individuals who sent out these official letters, but, I wish they could send me the pertinent information written in a pointedly simple style for readers as myself who may be less cultured than the writers.

For example: "Under lease and partnership agreement requirements the applicant applying for certification is required to provide the County Agricultural Commissioner" (who seems to spend 11½ months of the year out of office – probably in Sacramento forging these regulations) "with a current copy of the agreement. Section 1392.9.2 requires applicants to enter into these agreements prior to a specific time frame. Section 1392.4 requires the certified producer, when selling for another certified producer, to sell a greater amount by volume of their own products than the certified

Continued on Next Page

MAKING SENSE ... Cont. From Pg. 55

the hive has developed laying workers or the queen is being superseded and the bees are keeping the drones handy in case they are needed. But these scenarios are much more likely in September than in January. And this particular hive was and remains very strong, without the dwindling commonly seen in a hive with problems. So here was an apparent exception to one of the general rules of beekeeping. This hive had not driven out all of its drones.

Why? Well, one interesting hypothesis I have read holds that weak hives sometimes keep their drones through the Winter in order to help heat the cluster and keep the brood warm. Also, there is some evidence that drones are essential to the morale of a colony during its active months and perhaps some colonies, for reasons as yet undiscovered, allow their drones to join the Winter cluster.

I suppose I can sum up what I have been trying to say here by saying that, in general, you can rely on all the rules of beekeeping, more or less. Just remember that some of them are not hard-and-fast rules. Rather they are rules of thumb, and sooner or later you may find exceptions to them. I'm happy this is so. When the bees do something they're not supposed to do, it makes beekeeping all the more fascinating. BC

Richard Dalby writes and keeps bees at his home in Levan, UT and is a frequent contributor to these pages.

producer they are representing, etc., etc."

The way I figure it (arithmetically) having long ago forgotten my spherical trigonometry, is that you must sell two tomatoes to every one you sell of your compatriots to qualify for certification of both parties.

It is doubly disheartening at a farmer's market membership meeting when the chairperson gives the impression that he or she understands perfectly everything in the communiqués. To sit dumbly while others deliberatively share complicity with the president, pretending to understand the issues supposedly explained in the memorandums from the USDA in Sac. City, is humiliating. I don't know what such humility would be called since I have also long ago forgotten my Freudian and Jungian terminology from Pscy. 101.

The worthy authors may be only innocently attempting to elevate themselves in the estimation of their supervisor, who no doubt must in turn hire an interpreter to explain the documents being sent out bearing the overseer's signature.

Then again, today's messages must carry precise instructions and classical language is needed to leave no doubt in the mind of the recipient, although this is often where communication breaks down. Good examples of messages that score a bulls eye is the one on bill return envelopes that reads "The post office will not deliver without a stamp." Someone will eventually and surely find a way to convolute this simple statement. Or, "Do not drink this product" on the label of a drain cleaner. These precise and simple instructions are understandable to the majority of Californians, even those who detest simplicity.

Possibly the legal profession is partly to blame for government verbosity/periphrasis. The processes and science of jurisprudence has perhaps rendered simplicity of expression as dead and extinct as the bird *Raphus calculatus*. As fearsome as mortality may be, being accused and convicted of being casual is far worse and possibly carries monetary penalties that could stagger even defense department purchasing agents. Of course that is an extreme example of cause and effect but you get the idea, as do responsible government authors of directives. Confounding speech and writing is befuddling but will likely always be with us. While apparently necessary in our increasingly technical society, governmentese is not for those who have either yet to take that great leap forward into cyberspace or are behind in development of their cognitive horsepower.

I am afraid I am guilty on both counts. BC

Larry Goltz is the former editor of Bee Culture *magazine and lives and keeps bees in Redding, CA.*

GLEANINGS

JUNE 2003 • ALL THE NEWS THAT FITS

Comments From Keith Delaplane

NEW IBRA EDITOR

It was in my first Summer of graduate school that I was introduced to *Journal of Apicultural Research*. I was a freshly-minted college graduate eager to begin my thesis field work. My major professor, Dr. John Harbo, amid the preparations for that first season startled me with an unexpected assignment – once finished you must publish your thesis in a scientific journal. Up to that point I had not thought beyond the thesis itself, bound handsomely and tucked away in the university library. But publishing in a *scientific journal*? The mandate was reinforced by none other than Dr. Eva Crane, founder of the International Bee Research Association (IBRA), *JAR's* first editor, and active writer to this day. She visited our lab for two days in 1984. One by one we graduate students sat down with her and explained our research. I remember talking with her about my work on queenlessness and receiving her solemn charge, 'yes by all means you must publish this.' Ultimately I complied, and my thesis found its way into *JAR*. As a young person that was pretty heady stuff.

With the first issue 2003, the senior editorship of *Journal of Apicultural Research* passes from Dr. Tom Rinderer to me. I am honored to be joining Tom in a stream of senior editors beginning in 1962 with Drs. Eva Crane and James Simpson. I am pleased to report that Drs. Bob Danka and Pamela Munn will continue in their current posts as associate and production editors, respectively.

As *JAR* begins its fifth decade I invite you to lend your support to this venerable journal – in your submissions of original research, your timely reviews, your subscriptions and your goodwill. It is our intention to earn your confidence, build upon our earlier successes, and be in fact as well as word the flagship journal of bee science.

Dr. Delaplane is Professor of Entomology, University of Georgia, Athens, Georgia.

Bee Culture congratulates Dr. Delaplane on being chosen to fill this position. We also want to thank Dr. Tom Rinderer for his many years of service as Senior Editor. You can contact Dr. Deleplane at ksd@arches.uga.edu, and IBRA at www.IBRA.org.uk.

MITES NEEDED

Varroa has now been reported to be resistant to fluvalinate and coumaphos in some areas but there is no clear understanding of the extent of resistance. To help track this, the Carl Hayden Honey Bee Research Lab in Tucson is currently doing a survey of mites that show resistance to the pesticides. In order to test for resistance, they need live mites shipped to them, after which the mites will be frozen and destroyed. The tests include putting mites in vials with different doses of pesticides.

If you wish to participate, contact Jennifer Finley, USDA-ARS, Carl Hayden Bee Res. Center, 2000 E. Allen Road, Tucson, AZ 85719, 520.670.6380, Fax 520.670.6493, jfinley@tucson.ars.ag.gov; gears.tucson.ars.ag.gov/

GUELPH POSITION OPENS

The Department of Environmental Biology at the University of Guelph invites applications for an Assistant Professor, three-year contractually limited, in the area of Apiculture/Entomology. The successful candidate will develop and teach undergraduate and graduate courses in apiculture and/or entomology, depending on his/her area of expertise.

The position requires a Ph.D. in apiculture or a related field. Salary will be at the assistant professor level.

Applications should be forwarded to the Department Chair. In addition the candidate should provide a list of at least three references that the Department can contact directly. The closing date for this competition is June 15, 2003.

Submit all documentation to: Dr. Michael A. Dixon, Chair Department of Environmental Biology, University of Guelph, Guelph Ontario N1G 2W1, Fax: (519) 837-0442, Email: mdixon@ces.uoguelph.ca

Mostly From China

ULTRAFILTERED HONEY NOT HONEY

The National Honey Board is aware of reports over the last few months of "ultrafiltered" (UF) honey entering the United States. The Board has obtained samples of UF honey and is presently having the product tested by certified laboratories for various components.

The ultrafiltration of honey involves adding water, then removing it after the diluted product has passed through a filter so fine that it can remove components at the molecular level. This process also removes many *natural* components of honey. Consequently, the Food and Drug Administration has determined that UF honey should not be labeled as "honey" or even "ultrafiltered honey," but must be labeled as "sweeteners derived from honey" or "sweeteners from honey."

The National Honey Board fully supports the FDA's position. As additional information becomes available it will be passed on to the industry. **www.nhb.org**

KROGER GOES ORGANIC (and natural)

Supermarket retailer Kroger Co., Cincinnati, has launched Naturally Preferred, its private brand of natural and organic products, to all of the company's nearly 2,500 stores. The 140 items offered under the Naturally Preferred label will be one of the larger brand launches in the company's 120-year history. Kroger is supporting with regional media campaigns that include newspaper, POP and sampling. The national tagline: "Health Conscious, Earth Conscious" creation was overseen in-house. The line includes such categories as baby food, pastas, cereal, snacks, milk and soy items. Some products have been available in Kroger stores, but consumer response encouraged the company to go national and add more goods. Kroger operates supermarkets in 32 states under such banners as Kroger, Ralphs, Fred Meyer, Food 4 Less, QFC and City Market.

NO SOUTH ISLAND MITE

New Zealand horticulturalists want the government to fund the fight to keep the *Varroa* mite out of the South Island.

The Vegetable and Potato Growers Federation said in a submission as part of discussions over a proposed national pest management strategy for the mite that it supports the establishment of the strategy.

It said it believes the funding should be provided by the central Government because of the widespread economic benefit of keeping *Varroa* out of the South Island, including the benefit to beekeepers, the public, pastoral farmers, horticulturists and arable farmers.

The government funding was also necessary because of the length of time between the establishment of *Varroa* and the impact felt by the major beneficiary, the pastoral industries.

It said there is no other equitable funding mechanism available and the cost of collecting the funds would likely be high relative to the total cost of the strategy.

100 FOR MSBA

Celebration of 100th year for Missouri Beekeeping Association founded April 22, 1903. From left – Past Presidents Sharon Gibbons & Glenn Davis, Honey Queen Hannah, Past President Art Gelder, Current President Chris Gibbons and Past President Ian Brown.

JUST COINCIDENCE?

The swarm entered the grille and collected under the hood. Do you think the interesting shape of the grille apertures had anyinfluence on this behavior? Or just coincidence? (*photo by Charles Simon*)

SIR EDMUND HILLARY

Sir Edmund Hillary is featured on the New Zealand five dollar note.

Fifty years ago last month Ed Hillary, a tall, lean beekeeper from New Zealand, and his Sherpa colleague Tenzing Norgay became the first climbers to reach the summit of the world's highest mountain.

Among the many acts of recognition for Sir Edmund, as he soon became, was being appointed an honorary vice-president of the young Bee Research Association, predecessor IBRA, itself then only four years old.

Sir Edmund's connection with beekeeping dwindled as his life was taken up with other activities – initially further climbing and exploring. But he never forgot those early days. Ten years ago he served as patron of the 'Young beekeeper of the year' scheme in New Zealand.

The dominant focus of Sir Edmunds' life since scaling Everest has not been climbing, or the recognition of being the conqueror of Everest, but the welfare of the Sherpa people in Nepal.

With his wife, June and a global network of supporters, Sir Edmund still works diligently in his eighties to support these Himalayan endeavors and other environmental, you th and health projects. His life since Everest has been one of tireless humanitarian service.

This has been widely recognized in different ways in many countries; from membership of Britain's Order of the Garter and of the Order of New Zealand (limited to 20 members), to the honorific 'Burra sahib' in Nepal, meaning 'big in stature, big in hears.' When the Reserve Bank of New Zealand redesigned its banknotes in the early 1990s to incorporate famous New Zealanders, with a process of extensive public consultation, the person known through out the country simply as 'Ed Hillary' became the only living New Zealander to feature.

The 50th anniversary of his most famous climb is being marked by events around the world. One is 'Sir Edmund Hillary Everest and beyond,' an exhibition produced by the Auckland Museum in New Zealand and the National Geographic Society in the U.S. Having recently concluded in new Zealand, it will soon be opening in the society's Explorer's Hall in Washington, DC. As with his autobiography, the exhibition tells much more than the story of the first ascent of Everest – it chronicles the lifetime of achievements and humanitarian service of this remarkable, yet ordinary man.

reprinted from Bee World

Paul Ballard

OBITUARY

Paul A Ballard, 73, passed away April 23. He was from Roxbury, NY.

Paul was born April 24, 1925 in Roxbury. He married Barbara Green in 1978.

A well-known beekeeper, he took over the family business, Ballard's Honey, from his father in 1960. He was named Beekeeper of the year for New York State in 1988.

He belonged to the American Beekeeping Federation and the Empire State Beekeepers Association.

He is survived by his wife, five sons and one daughter, 15 grandchildren and eight great-grandchildren.

Respectively Paul was buried in his faded khakis with his familiar wide-striped "beekeeper" suspenders.

Display Advertisers

Aphid Spit & Other Honeys I Have Known

Ed Colby

BOTTOM BOARD

She actually called it "aphid-spit" honey, and she was the only person who flat-out refused to even taste my honeydew honey.

I refused to accept this.

Penny and I have both ski-patrolled at Snowmass for, well, let's just say for a very long time. We're old friends, and she's a regular honey customer, but "aphid spit" is pretty strong language. I found Penny's candor frankly alarming. Pretty soon everyone on the patrol was calling it "aphid-spit" honey.

I'm not sure this was good for sales.

If you like dark beer, you'd probably like aphid-spit honey. It's strong-flavored, like Guiness Stout ale, and it can be that dark – almost black. You either like it or you don't.

Aphids secrete honeydew – sweet, sticky, shiny stuff that ants love. Ants and aphids have a symbiotic relationship in which the ants "farm" the aphids, collecting the honeydew and defending the aphids from predators. When you see ants in trees, aphids are usually there, too.

Honeydew also attracts honey bees. When there's a big aphid infestation, bees sometimes choose honeydew over flower nectar as raw material for honey production. Where we live in western Colorado – maybe one year out of seven – we have huge aphid infestations in the Gambel Oak trees. When that happens, we can have a dark-honey year, because we have lots of oak.

I retail my honey to friends, co-workers and unsuspecting strangers, and I look at aphid-spit honey not as a curse but as an opportunity.

Hold up a jar of this honey, and it looks like molasses. People want to know why. The truth is, folks like a story, and they want to feel that what they're buying is unique. After all, they can buy honey at the supermarket, but it's not going to be the color of Coca-Cola, it's not going to have such a distinctive flavor, and it's not going to come with an entomology lesson.

This was an entomology lesson Penny didn't want to hear. An ardent gardener, she knew all about aphids. She certainly wasn't going to eat anything even remotely associated with their sticky-sweet secretions. The very thought disgusted her. She would be delighted to buy a jar of alfalfa-sweet clover honey, however.

Honey production here normally shuts down right after Labor Day, but this year the little darlings made some late honey on rabbit brush, or "chamisa," as they call it in New Mexico. It grows along with the sagebrush, and bees love its thick clusters of feathery yellow flowers.

Rabbit brush honey tastes like butterscotch. Last fall when I sold honey at Potato Day in Carbondale, I offered three varieties – rabbit brush, Flattops wildflower from 9,500 feet, and alfalfa/sweet clover.

I get the wildflower from my beekeeper boss Paul, who has a Forest Service permit to keep bees in the high country. The wildflower gets a very nice smoky flavor from coneflowers, but this year the Flattops bees also got into some rabbit brush. My customers agreed that the rabbit brush honey and the wildflower honey tasted pretty similar, although the wildflower maybe tasted a little sweeter.

The wildflower is notable for its exceptional resistance to granulation. I have customers who marvel that they have liquid honey on their shelf a year or longer after buying it. This makes a good sales pitch.

At Potato Day I could hardly sell a jar of alfalfa honey until I sold out of the other two varieties, even though I charged a little more for them, and even though that alfalfa honey is very good indeed.

Back on the job at Snowmass, when the word got out that I had something rare and special, I couldn't keep the rabbit brush in stock. Sales got delayed, not because I had no honey, but because it was the wrong kind. Folks referred to rabbit brush honey as "the gold," or merely as "the good stuff."

So whenever I ran out of rabbit brush honey on the shelf at work, I found myself trying to convince people that they weren't getting a second-rate product when they paid $7 for a quart of alfalfa honey, instead of $8 for rabbit brush. "There's nothing wrong with this honey. This is wonderful honey," I'd say.

They'd say, "I'll wait for the gold."

I frankly find this absurd. Rabbit brush honey is interesting, and certainly unusual, but I eat a lot of honey. Rabbit brush is good, not great. Alfalfa honey is great. But I'm not selling a basic food to these people, anymore than the Lexus dealer sells basic transportation. I'm selling something rare and expensive, and therefore desirable.

I could maybe sell even more rabbit brush if I raised the price, but I'm about sold out anyway, and I really hate to rip people off, even if they deserve it.

Penny and Eric run a bed-and-breakfast in Teasdale, Utah, during the off-season. The summer after Penny made the aphid-spit fuss, Linda and I checked in for an overnight visit. We didn't tell our hosts that we'd brought a present.

Next morning those two served us an elegant breakfast, and I couldn't help but notice that there was no honey on the table. A beekeeper always does.

Later that day we bid our friends adieu until another ski season and struck out for adventure. We left the gift on the bed.

It was a quart of honeydew honey. The label read, "Double-Black Aphid-Spit Honey – Especially Made for the guests at the Muley Twist Inn, by the 'girls' at Colby Farms."

Like I said before, I refused to accept this.